

POPULATION GEOGRAPHY

TOOLS AND ISSUES

SECOND EDITION



K. BRUCE NEWBOLD

Population Geography

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K. Bruce Newbold

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To Christine

Contents

List of Figures and Tables xi

Acknowledgments xv

Population Geography: An Introduction 1

What Is Population Geography and Why Study It? 3

What Is the Geographical Perspective? 5

Current Research Themes and Contributions of Population

Geographers 7

Overview of the Book 8

Focus: The Importance of Spatial Scale 9

Methods, Measures, and Tools: Tools of the Population

Geographer 11

Chapter 1

World Population 15

A Brief History of World Population Growth 15

The Demographic Transition 18

Future Population Scenarios: Who Gains and Who Loses? 21

Conclusion 28

Study Questions 28

Focus: Population Growth Regimes in India, Germany, and the United States 29

Methods, Measures, and Tools: Graphical Representation 31

Methods, Measures, and Tools: Population Estimates and Projections 36

Chapter 2

Population Data 41

What Is a Population? 42

Types of Data 43

Data Sources 44

Data Quality 48

Conclusion 50

Study Questions 50

Focus: Census Data and the American Community Survey (ACS) 50

Methods, Measures, and Tools: Working with Data 56

Chapter 3	Population Distribution and Composition	59
	<i>Population Distribution</i>	59
	<i>Population Composition</i>	61
	<i>Conclusion</i>	69
	<i>Study Questions</i>	70
	<i>Focus: The Changing Face of the US Population</i>	70
	<i>Focus: Aging in China</i>	74
	<i>Methods, Measures, and Tools: Life Tables</i>	74
 Chapter 4	 Fertility	 79
	<i>Fertility Patterns</i>	79
	<i>What Determines Fertility?</i>	81
	<i>Fertility Levels: Too High or Too Low?</i>	86
	<i>Africa's Fertility Transition?</i>	89
	<i>Women's Reproductive Health</i>	92
	<i>Conclusion</i>	93
	<i>Study Questions</i>	94
	<i>Focus: Contrasting Fertility Rates and Choices in North America and Uganda</i>	94
	<i>Methods, Measures, and Tools: Measuring Fertility</i>	96
 Chapter 5	 Mortality	 99
	<i>Mortality Transitions</i>	100
	<i>Differences in Mortality</i>	102
	<i>Infectious and Parasitic Diseases (IPDs)</i>	107
	<i>HIV/AIDS</i>	110
	<i>Conclusion: The Future of Mortality</i>	118
	<i>Study Questions</i>	121
	<i>Focus: Mortality Differences—the United States, Mexico, and Zimbabwe</i>	122
	<i>Methods, Measures, and Tools: Measuring Mortality</i>	125
 Chapter 6	 Internal Migration	 127
	<i>Defining Migration</i>	128
	<i>Why Do People Migrate?</i>	130
	<i>Theories of Internal Migration</i>	133
	<i>Migrant Selectivity and Migrant Characteristics</i>	139
	<i>The Migration Process</i>	141
	<i>Conclusion</i>	142
	<i>Study Questions</i>	143
	<i>Focus: Contemporary Internal Population Movement in the United States</i>	143
	<i>Methods, Measures, and Tools: Measuring Migration</i>	147

Chapter 7	International Migration Flows: Immigrants and Transnational Migrants	149
	<i>Major International Flows</i>	150
	<i>Theories of Immigration</i>	151
	<i>The Impacts of Immigration</i>	153
	<i>Immigration Policy</i>	156
	<i>Transnational Migrants</i>	170
	<i>Conclusion</i>	171
	<i>Study Questions</i>	171
	<i>Focus: The “Immigration Gap”</i>	172
	<i>Methods, Measures, and Tools: Counting Immigrants, Illegal Immigrants, and Emigrants</i>	174
 Chapter 8	 Refugees and Internally Displaced Persons	 177
	<i>Defining Refugees</i>	177
	<i>Alternatives for Refugees: No Easy Way Home</i>	180
	<i>Internally Displaced Persons</i>	184
	<i>The Future of Refugees and IDPs</i>	185
	<i>Conclusion</i>	189
	<i>Study Questions</i>	190
	<i>Focus: The United States—Welcoming Refugees?</i>	190
	<i>Methods, Measures, and Tools: Counting Refugees and IDPs</i>	195
 Chapter 9	 Urbanization	 197
	<i>Defining Urban and Urbanization</i>	198
	<i>A Brief History of Urbanization</i>	198
	<i>The Growth of Modern Cities</i>	201
	<i>Implications of Urban Growth</i>	209
	<i>Conclusion</i>	209
	<i>Study Questions</i>	210
	<i>Focus: Planning for Growth</i>	210
	<i>Methods, Measures, and Tools: Defining “Urban” across Countries</i>	213
 Chapter 10	 Population Policies	 215
	<i>Immigration Policy</i>	216
	<i>Internal Migration</i>	218
	<i>Fertility Policies</i>	220
	<i>Economic Policy as Population Policies</i>	224
	<i>The Role of the International Community: Conflicting Messages</i>	225
	<i>Conclusion</i>	228
	<i>Study Questions</i>	229
	<i>Focus: Population Planning in Selected Regions</i>	229
	<i>Methods, Measures, and Tools: Pass or Fail? Evaluating Population Policies</i>	233

Chapter 11	Population Growth: Linking to Economic Development, Resource Scarcity, and Food Security	235
	<i>Thomas Malthus and "Essay on the Principle of Population"</i>	236
	<i>Setting the Stage: The Debate and Current Perspectives</i>	236
	<i>Linking to Economic Development, Resource Scarcity, and Food Security</i>	240
	<i>Conclusion: The Potential for Conflict?</i>	246
	<i>Study Questions</i>	248
	<i>Focus: Resource Conflict</i>	248
	<i>Methods, Measures, and Tools: What Have Geographers Contributed to the Debate?</i>	252
	 Conclusion: Doing Population Geography	 257
	<i>Marketing</i>	258
	<i>Population Projections: Health Care, Education, and Transportation</i>	259
	<i>Political Planning</i>	261
	<i>Conclusion</i>	261
	 Notes	 263
	Glossary of Key Terms and Acronyms	305
	Population Websites	311
	Index	319
	About the Author	323

Figures and Tables

FIGURES

Figure IF.1	Per Capita Income by State, 1999	10
Figure 1.1	World Population Growth	16
Figure 1.2	The Demographic Transition Theory	19
Figure 1.3	World Population Distribution by Major Region, 2012	24
Figure 1MMT.1	Impact of Changing Class Interval	33
Figure 1MMT.2	Total Population as a Cartogram	35
Figure 2.1	The Hierarchy of Census Geographic Areas	46
Figure 2F.1	The 2008 ACS Questionnaire	54
Figure 3.1	United States Population Density by State, 2010	62
Figure 3.2	2010 Population Distribution in the United States	63
Figure 3.3	United States Age Pyramid, 2010	64
Figure 3.4	Projected Population Structure with AIDS, Botswana 2025: The AIDS “Chimney”	65
Figure 3F.1	Mean Center of Population for the United States, 1790 to 2010	71
Figure 4.1	Total Fertility Rates, 2012	80
Figure 5.1	Life Expectancy in Selected Countries, 2011	101
Figure 5.2	HIV Prevalence Rates, 2011	113
Figure 5.3	The Effect of HIV/AIDS on Life Expectancy in Sub-Saharan Africa, 1960–2012	115
Figure 5F.1	Age-Specific Death Rates: United States, Mexico, and Zimbabwe, 2010	122
Figure 6.1	Age Schedule of Migration (Percent): United States, 2011–2012	139
Figure 6F.1	Mobility Rates by Type of Movement: United States, 1950/1951–2010/2011	145

Figure 7.1	Persons Obtaining Legal Permanent Resident Status, 1820–2011	160
Figure 7.2	Caution: A Roadside Sign in San Diego	164
Figure 7.3	The US–Mexico Border	168
Figure 8F.1	Refugee Admissions to the United States, 1980–2011	191
Figure 9.1	World Urbanization by Country, 2005	204
Figure 9.2	Major Cities of the World, 2005	207
Figure 10F.1	China’s Age Pyramid, 2005	231
Figure 11F.1	Israel and Neighboring States	251

TABLES

Table I.1	Professional Geographical Organizations in Geography and Related Disciplines	4
Table 1.1	Current Population Statistics by Selected World Regions, 2012	22
Table 1.2	The Ten Most Populous Countries in the World, 2012 and 2050 (Projected)	24
Table 1F.1	Population Growth in India, Germany, and the United States, 2012	30
Table 3.1	Dependency Ratios, United States, 1990–2025	68
Table 3MMT.1	Life Table: United States, 2009, Both Sexes	76
Table 5.1	Leading Causes of Death: Black and White Males Aged 25–34 in the United States, 2009	105
Table 5.2	Regional HIV/AIDS Statistics and Features, 2011	112
Table 5F.1	Top Ten All Ages Causes of Death: United States, Mexico, and Zimbabwe, 2008	124
Table 6.1	Reasons for Move by Age (Percent), 2011–2012	131
Table 6.2	Migration Rates (Percent) by Selected Demographic Characteristics: United States, 2011–2012	140
Table 6F.1	Interregional Migration Flows (in Thousands): United States, 2010–2011	145
Table 7.1	Class of Admission of Legal Immigrants to the United States, Fiscal Years 2009–2011	162
Table 7.2	Immigrants Admitted to the United States by Selected Country of Birth, Top Ten Origins, Fiscal Years 2009–2011	163

Table 7.3	Yearly Border Patrol Apprehensions, Fiscal Years 2005–2011	169
Table 8.1	Refugees and Internally Displaced Persons by Major Source Countries, 2010	178
Table 8F.1	US Refugee Arrivals by Top Ten Origins, Fiscal Years 2009–2011	192
Table 8F.2	US Asylees by Country of Nationality, Fiscal Years 2009–2011	194
Table 9.1	The Ten Largest Urban Agglomerations, 1950 and 2025	208

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Population Geography

An Introduction

What Is Population Geography and Why Study It?

What Is the Geographical Perspective?

Current Research Themes and Contributions of Population Geographers

Overview of the Book

Focus: The Importance of Spatial Scale

Methods, Measures, and Tools: Tools of the Population Geographer

FOR MOST OF humanity's history, the global population was small and grew at a slow pace. Estimates of the world's population at the start of the seventeenth century, on the eve of a faster population growth regime, are about 500 million. Since then, advances in medicine, sanitation, and nutrition have allowed the world's population to grow at a faster rate. By 1900, the world's population was approximately 2 billion, growing to over 7 billion in 2012.¹ Most of that growth has occurred in the developing world²—Africa, large parts of Asia, and South and Central America. Moreover, much of the future growth of the world's population is expected to occur in the developing world, fueled by comparably high birth rates, reduced death rates, and young populations.

To view population processes, including fertility, mortality, and population movement, at work across the globe is to begin to understand many of the underlying issues in today's society, including conflict, resource use, environmental degradation, and relations between countries and their peoples. Societies around the world are characterized by or shaped by their population processes and characteristics. We may characterize, for example, populations and regions by differences in mortality and fertility processes. For instance, the infant mortality rate (IMR), which measures the number of deaths to infants

less than one year of age per one thousand births, was five in developed countries, compared to a world average of forty-four in 2012. Life expectancy at birth, which measures the number of years an individual is expected to live, averaged seventy-eight years in developed countries, but only sixty-eight in developing countries. In many cases, the poor life expectancy outcomes and high death rates reflect poor or inadequate health care, the failure of governments to provide basic necessities, or educational differences. In sub-Saharan Africa, the HIV/AIDS epidemic has reshaped population profiles and reduced life expectancies.

Countries or regions are also tied together by population movement. War, refugee movements, and simple geographic interaction across space perpetuate poor health and disease. Population movement includes local residential changes as housing needs change; domestic migration associated with, for example, employment opportunities or amenities; or international migration. While local or domestic migration is rarely controlled, most countries tightly control international movements, often restricting entry to those who qualify under specific programs. With population mobility and migration typically selecting the young and those with skills, who moves is just as important as the origins and destinations of migrants. Most developed countries actively promote the entry of individuals who are able to invest in the host country or embody the education or skills that are demanded by developed countries.

While the movement of legal immigrants is not inconsequential, illegal immigrants and refugees dominate the international movement of people. For those seeking a better life elsewhere, illegal immigration may be a desperate, but the only, option. Exemplified by the sagas of Mariel Cubans and Indochinese boat people and recent events in Afghanistan, Darfur, and Congo, refugees and displaced populations have become an increasingly visible issue. Defined by the United Nations, refugees are persons who are outside their country of nationality and are unable to return owing to fear of persecution for reason of race, religion, nationality, or association in a social or political group.³ Major refugee-producing countries in 2012 included Afghanistan, Syrian Arab Republic, Serbia, China, and Pakistan. Overall, the United Nations High Commissioner for Refugees (UNHCR) estimated that there were more than 35.4 million individuals of concern worldwide in 2011, including some 10.4 million refugees.⁴

The importance of considering fertility, mortality, and population movement is realizing the multiple interconnections with population, such that population underlies many of the issues facing the world today, including resource and environmental issues. Packaged with understanding population processes is the ability to understand and interpret their measurement. The primary motivation of this text is to provide the reader with a set of functional tools—measuring or

describing population processes, data, and population composition—for studying population geography, while linking to population issues such as fertility, mortality, and immigration. Although the study of population is interdisciplinary in its scope, the geographical perspective is valued through its emphasis on the role of space and place, location, regional differences, and diffusion and its ability to provide insight and bridge disparate issues. Second, the book is motivated by the need to understand population processes. In other words, in addition to introducing population studies, it also makes available to readers an overview of current and future issues related to population by drawing linkages to economic, political, and resource issues.

WHAT IS POPULATION GEOGRAPHY AND WHY STUDY IT?

Population geography is the study of the human population with respect to size, composition, spatial distribution, and changes in the population that occur over time. Populations are altered by three basic processes: fertility (births), mortality (deaths), and migration (movement of people across space), topics that this book explores in greater detail in subsequent chapters. Population geographers, like others interested in population, seek to understand the society around them, the structure of a population, and how it changes through births, deaths, and migrations. This interest is reflected in a number of professional organizations, including the Association of American Geographers (AAG) and its Population Geography Specialty Group, the Canadian Association of Geographers (CAG), and the United Kingdom's Royal Geographical Society—Institute of British Geographers. Outside of geography, the Population Association of America (PAA) is also an important venue for population geographers (see table I.1).

Population research draws on many disciplines and research traditions, a multidisciplinary that is reflected in its various titles. For instance, economists, geographers, sociologists, planners, and anthropologists regularly contribute to population studies, and their methods, perspectives, and findings cross-fertilize other disciplinary perspectives. More formally, *demography*, with its roots in the analysis of mortality and fertility statistics, is the statistical analysis of population, while *population studies* is often used to describe other approaches to looking at population issues, including nonstatistical approaches. *Population geography* is the geographical study of population, with an emphasis on location and spatial processes.

While population geography as a formal field of study only dates from the 1950s and is therefore relatively new,⁵ this work has assumed an important

Table I.1. Professional Geographical Organizations in Geography and Related Disciplines

Geographical associations

Association of American Geographers (AAG)	www.aag.org
Canadian Association of Geographers (CAG)	www.cag-acg.ca
Royal Geographical Society—Institute of British Geographers (RGS-IBG)	http://www.rgs.org/HomePage.htm

Other groups

Population Association of America (PAA)	www.popassoc.org
Population Reference Bureau (PRB)	www.prb.org
UN Population Division	http://www.un.org/esa/population/

Note: For a more complete list of web resources, including data sources, please refer to the websites section at the back of the book.

role within the discipline of geography. Interestingly, although there are some geographers that consider fertility and mortality differences across space, migration and the study of population mobility have assumed prominence among geographers. Perhaps it is the very nature and outcome of population movement, which has an ability to rapidly alter the population structure and characteristics of a region, that has focused geographer's attention. That is, population mobility is inherently spatial, connecting places both local and international. For instance, interest in movement between cities in the United States has demonstrated the impact of out-migration from the northeastern Rust Belt and the astonishing growth of the South and Southwest over the past few decades as people move in search of both employment opportunities and amenities. Complementing this movement has been that of retirees heading southward as well.

More recently, population geographers have turned their attention to international migrations. Geographers have, for instance, analyzed the economic, social, and political effects associated with international movement into the United States and other countries. Others have focused on the movement of labor between countries in the developing world. In both cases, various theoretical approaches, including gender studies, political-economic theory, Marxist theories, and utility-maximizing theories, have been brought to bear on the questions and issues, all highlighting the diversity of the field and its research. Population geographers have also explored questions related to ethnicity and race.

Populations are governed by various natural laws—we are all born, age, and must ultimately die. On that journey from birth to death, we may go to university, be married, have children, change jobs and occupations, and move. Understanding the population around us and the transitions that are occurring within

it is key. All levels of governments, for example, are interested in the structure of their populations: What percentage is over sixty-five? What proportion can vote? What proportion is less than fifteen years old? How many move and who moves or changes residential location or moves nationally or internationally in a year? What is the ethnic or racial composition of an area? From this information, governments can direct program delivery to ensure that the needs of their constituents are met. Consequently, an understanding of the composition of a population, its distribution, and how it changes over time is important and needed for planning purposes in the private as well as the public sectors. For example, school boards and universities will wish to be able to project enrollment or participation in schooling. Service organizations will want to know about the elderly or immigrant populations—their size, age structure, and location—so that the appropriate services may be delivered. Likewise, retailers will wish to know similar information about the population so that they can target specific segments with their products or learn more about the buying power or retail needs of a particular group.

At an international scale, governments and other international bodies such as the United Nations and the UNHCR are interested in these issues, including population growth, fertility, and the movement of people. Encompassing legal and illegal immigration, refugees, and internally displaced people, interest focuses on where people are moving from and to, the reasons for movement, and the implications for the individual, the receiving community, and the sending community. Much international immigration is prompted by economic issues and the dream of a better life.

WHAT IS THE GEOGRAPHICAL PERSPECTIVE?

As Gober and Tyner note in *Geography in America at the Dawn of the Twenty-first Century*, “geographic issues loom large.”⁶ Legal and illegal immigration; assimilation and adjustment of new arrivals to the host country; economic, social, and political responses to population movement; and population aging are among the relevant topics that are addressed by population geographers. Moreover, these are not just “American” issues but ones that are faced across the globe. Although the study of population is interdisciplinary in scope, with contributions by sociologists, economists, and anthropologists, the geographic perspective is especially valuable. Geography, by its nature, offers an integrative framework through which to view population (or other) issues. The disciplinary concerns of geography—space, regional variations, diffusion, and place, and their role in human and natural processes—provide this unique framework for looking at population issues. Space is not a unique concern to geography, and geographers do not deal exclusively with space, but it is the understanding of

spatial processes, such as the diffusion of ideas associated with small families or birth control techniques, which is of interest. Whether we are interested in population issues related to fertility or immigration, spatial processes are implied as states and their governments alter the demographic makeup of nations through policies related to, for example, immigration or families. Similarly, economic systems will influence fertility behavior, and the mortality of populations and environmental crises related to pollution, deforestation, and water scarcity provide examples of the linkage between regions. These are also dynamic processes, changing over time and across the landscape, and a geographical approach enables the explanation of past, present, and future relationships and patterns.

Population geography first rose to prominence as a field of study in geography with Glenn T. Trewartha's call for its increased study at the 1953 AAG annual meeting.⁷ Trewartha envisioned population geography as a separate sub-discipline, along with physical geography and cultural geography. Since then, geography has more commonly been divided into physical and human geography, with population geography a component of the latter.⁸

Population geography initially dealt with the geographic character of places, content to describe the location of a population and its characteristics and to explain the spatial configuration of these numbers. Wilbur Zelinsky's 1966 book on population geography⁹ helped to further cement the field, including the description of populations, explanation for the spatial configuration of populations, and the geographical analysis of population phenomena. Reflecting population geography's close ties to formal demography, many population geographers relied on logical positivism (combining empirical study with mathematics and scientific inquiry), quantitative methods, and the analysis of large data sources through the 1970s and 1980s. Moreover, there was a corresponding increase in computational abilities. The emergence of desktop computing and statistical software packages greatly increased the flexibility and tools at the disposal of researchers, including the ability to test hypotheses through inferential techniques and apply more complex multivariate statistical analysis.

Since Trewartha, population geography has grown in importance and scope, and many geographers have made important contributions to the field, with the field growing to draw upon a multiplicity of methods and theoretical approaches. Qualitative approaches offer detailed insights, and geographic information systems (GIS) and spatial analytical techniques offer newer insights into population processes. Most writers and researchers now place population within a broader context, recognizing the importance of place and drawing upon the diverse insights provided by geography and related social science disciplines. The diversity of conceptual approaches provided by geography provides a framework through which to view complex phenomena. Economic and cultural geography provide insights into fertility choices, which may

reflect the economic needs of the family, including a trade-off between children as labor or “pension plans” and the ability to provide an education or the larger cultural expectations of society. Similarly, political, social, and cultural geography provide insight into the potential for conflict by bridging disparate issues, enabling the recognition of the interrelationships between resources, environment, politics, and policy within the realm of population geography.

CURRENT RESEARCH THEMES AND CONTRIBUTIONS OF POPULATION GEOGRAPHERS

We cannot hope to completely enumerate the variety of research subjects (or researchers!) that are included within the fold of population geography, particularly when, as Ogden noted,¹⁰ some geographers who do population-related work do not call themselves population geographers. Instead, they may describe their work through cultural, ethnic, or rural geography. The 2005 publication *Geography in America at the Dawn of the Twenty-first Century*¹¹ identified six research themes in population geography: (1) internal migration and residential mobility, (2) international migration and transnationalism, (3) immigrant assimilation and adjustment and the emergence of ethnic enclaves, (4) regional demographic variation, (5) social theory and population processes, and (6) public policy.

Among these, internal migration and residential mobility has largely defined population geography and includes the work of geographers such as Plane, Brown, Moore, Rogerson, Long, Clark, and Cushing. Research themes include the relationship between migration and economic cycles and restructuring, the effects of demographic cycles (i.e., population aging and the baby boom cohort) on migration, life course perspectives on population mobility, and ethnographic approaches to migration.

Research associated with international migration, transnationalism, immigrant assimilation, adjustment, and ethnic enclaves remains important for population geographers. Edited volumes such as *EthniCity*¹² and *Migration and Restructuring in the US*¹³ highlight the varied contributions of geographers to this area. Other individual researchers have explored the evolution of immigrant settlements and enclaves over time,¹⁴ residential dispersion,¹⁵ circular migration,¹⁶ tied migration,¹⁷ and the economic integration of new arrivals.¹⁸ David Ley¹⁹ has explored concepts of transnationalism, particularly in the context of Canada. In a similar way, Crush and McDonald²⁰ have explored the role of transnationalism in Africa.

Research evaluating regional demographic variation highlights such questions as differential population aging, fertility rates, and migration propensities.

Geographers have long noted significant variations in migration rates between US states, particularly with respect to retirement migration, aging in place, and poverty migration.²¹ Other population processes have not escaped geography's attention, with, for example, Franklin²² exploring regional variations in Italian fertility levels, while many "health geographers" study mortality and morbidity patterns within populations.

Social theorists, including Blue,²³ Findlay,²⁴ McHugh,²⁵ Silvey,²⁶ and others, have sought to incorporate issues such as gender and race into alternative approaches to the study of population geography. This approach has often included greater emphasis on ethnographic and qualitative methods. Finally, public policy has been engaged by researchers including Morrill²⁷ and Clark and Morison,²⁸ who explore the intersection between population structure (i.e., race, ethnicity), legislative redistricting, and voting.

The use of diverse quantitative and qualitative techniques including GIS and spatial analysis techniques builds upon the tradition of spatial population geography.²⁹ This has meant that population geographers have applied themselves and their work outside the traditional domains of population research, engaging in health, transportation, and economic analyses. Concurrently, newly emergent themes and research directions include more active links to environmental geography. Although population issues frequently lie at the heart of environmental issues, as with the relationship between human migration and environmental degradation, social and ethnic unrest, or food security,³⁰ there has been relatively little attention to the shared research agendas, although this is now changing.³¹ Arguably, nongeographers, including Homer-Dixon,³² have been quicker to realize population-environment linkages, while other nongeographers have noted the relationships between population and health³³ or population and economic growth.³⁴ This is not to say geographers have not contributed to these debates, but rather that there is much room for additional geographical insight. Similarly, population geographers need to further address the relationship between population and economic development.³⁵ Additionally, increased ties are emerging between population geography, GIS, and spatial analysis, reflecting the increased integration of these tools into geography in general.

OVERVIEW OF THE BOOK

The primary motivation of this text is to identify and discuss population issues such as fertility, mortality, and immigration, while also providing the reader with a set of functional tools—measuring or describing population processes, data, and population composition—for studying population geography. The book is structured into substantive chapters that focus on particular population

processes and related issues. Each of the substantive chapters also have “Focus” and “Methods, Measures, and Tools” boxes embedded in the text. The intent is to weave the overall discussion of each chapter into more specific examples, including issues or areas of particular interest as well as a discussion of how population geography research is performed. While measures and tools that population geographers frequently use are presented in the text, the intent is not necessarily to provide full explanation and descriptions—existing software programs, basic statistical analysis packages, and the increased use of the World Wide Web essentially mean that many of the tools are easily and quickly automated. Instead, the intent is to provide an understanding of the tools and link their use to issues. As such, “Focus” boxes will present “real-world” examples to illustrate the concepts discussed in each chapter, including their use and interpretation. “Methods, Measures, and Tools” boxes will illustrate methods and measures commonly used by population geographers (i.e., population projection techniques).

FOCUS: THE IMPORTANCE OF SPATIAL SCALE

It is important to realize that spatial phenomena, such as population movement, do not occur at just one geographic scale. The phenomena of interest for the geographer may occur at a variety of spatial scales ranging from the individual to the international. For instance, people may move between houses within their immediate neighborhood, within the same city, across the country, or internationally, with each move potentially explained by a different set of factors. For the household moving locally, for example, the move may be driven by the need for more (or less) space as the family size changes, while they want to remain in the same area where friendships have been established. For the household moving across the country, the move may reflect starting a new job or going to school, the search for employment, or retirement to a location with greater amenities or that is closer to family. Similarly, at one scale fertility choices may reflect the particulars

of that place—its ethnic or religious make-up, for example—details which may be “washed out” at larger scales as larger populations are averaged together.

For this reason, we must be aware of the implications that our choice of spatial scale has on the outcome and its interpretation. First, changing the scale of analysis often implies that a different set of questions (and potentially methods) must be applied to the problem. For the researcher interested in local issues, questions may focus more on neighborhood and household/family effects, while economic and amenity effects may dominate larger-scale analyses. Second, changing spatial scale often changes what we can physically observe. For the migration analyst, this is particularly acute, given the well-known fact that people are more likely to move over short distances than they are over longer ones, a conclusion that dates back to the writings of Ravenstein in the 1800s.¹ More generally,

the number of observed migrants depends on the size, shape, population distribution, and characteristics of the population (i.e., older populations are less likely to move than younger populations) within the study area.²

Third, the so-called modifiable areal unit problem (MAUP) has been an issue that has concerned geographers and cartographers alike. MAUP is a potential source of error that can affect studies that utilize aggregate data sources and is closely related to ecological fallacy, or the errors in allowing inferences about individual behavior when the analysis is based on group or area statistics. In order to present results, geographical data are often aggregated and

mapped to spatial objects such as census tracts, providing an illustration of the spatial phenomena. However, these zones and their boundaries are often arbitrary in nature, defined by statistical organizations such as the Census Bureau. While changing the geographical scale (i.e., moving from the census tract to an enumeration area) can be just as meaningful for the presentation of the data, the revisualization may also provide a different representation of the information. For instance, the appearance of spatial clustering at one scale may not be visible at another. Moreover, different processes may be responsible for the outcome of interest.

Clearly, these issues of spatial scale are not mutually exclusive. However, the choice

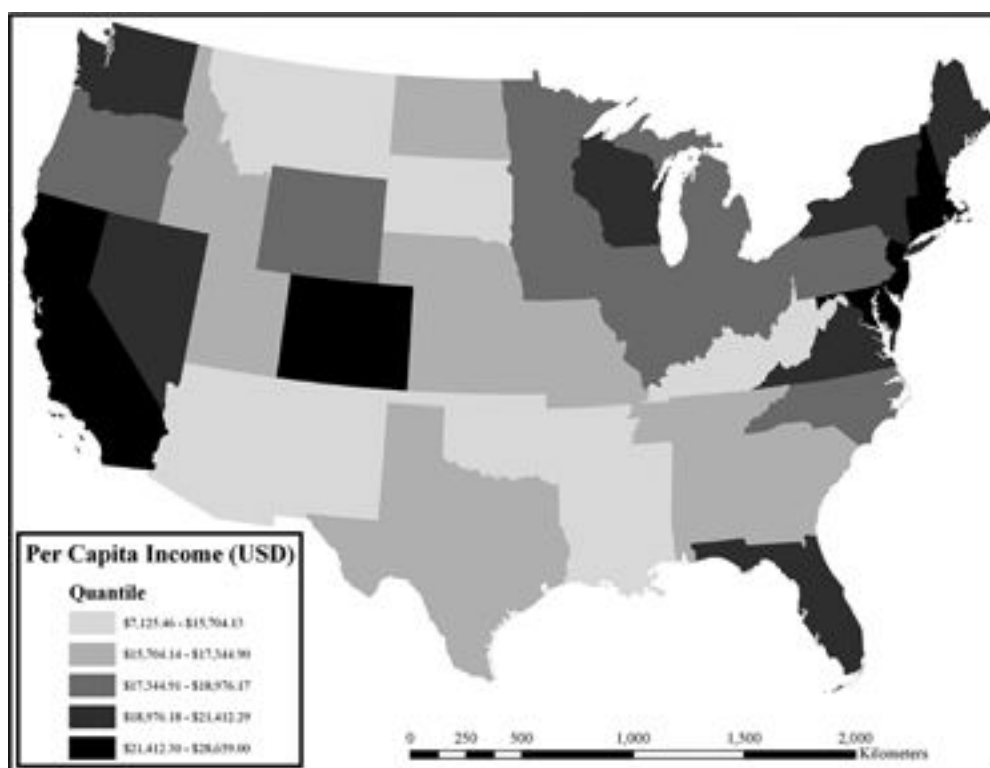


Figure IF.1 Per Capita Income by State, 1999

Compare this figure with that in 1MMT.1b, which maps the same data at the county scale. The detail in the latter map is missing in this one.

Source: Author.

of the spatial zones that are to be used must be given careful consideration, with a preference to use the smallest, and most meaningful, spatial scale possible. However, it should also be noted that this preference only holds when the data at that scale is reliable and when any processes at smaller scales are stable. Failing either of these, the analyst should turn to the geographic scale that does meet these

requirements. This is not to say that the impact of spatial scale should be avoided and that comparisons across spatial scales are inappropriate. In fact, complementary results based on analyses at different scales are often noted, and comparisons yield important insights into underlying spatial processes, with an understanding of the process at one scale aiding the analysis at another scale.

METHODS, MEASURES, AND TOOLS: TOOLS OF THE POPULATION GEOGRAPHER

Population geography, like demography in general, has traditionally been strongly rooted in empiricism and statistical analysis. As a field of study, population geography does not have its own set of analytical tools that define the field of research, although geographic information systems come close. Instead, the tools of the population geographer reflect those of related disciplines, including cartography, demography, economics, anthropology, and sociology. As such, population geographers rely on a variety of tools and methods that are shared across disciplinary fields. These tools can be broadly summarized under data, methods, and presentation.

DATA

Clearly, any analysis or insight into population processes is dependent on data. If, for example, we wish to gauge the fertility of a population, we need to know such things as the number of children born to each woman, the age of the mother at the time of the child's birth, and the total population of women eligible to give birth. In considering

these population counts, we do not want to attribute births to males or to individuals who are either too young or too old to conceive, although we also need to make some assumptions, including that most births occur to women between the ages of 15 and 49. While births can (and do) happen to either younger or older women, these are a numerically small proportion of all births, and are not typically included in formal measures.

Data are therefore an important part of the population geographer's toolbox. Researchers often turn to large, publicly available data sources such as those collected by the US Census Bureau or other statistical agencies. These large surveys are typically representative of the total population, are geographically extensive, and include demographic, economic, and social data pertaining to a specific time on all persons in a country. Alternatively, researchers may conduct their own surveys and data collection. These are typically associated with more specialized research questions or geographic areas, may include a qualitative component, and capture information that may not be available in larger surveys.

Data can be divided into two main types: qualitative and quantitative. *Qualitative data* consists of nonnumerical information such as text, images, or verbal descriptions. Qualitative data may be obtained through case studies, open-ended interviews, focus groups, participant observation, or diary methods. *Quantitative data* is numerical and includes counts, rates, or scales reflecting experimental outcomes or data collected from questionnaires. Quantitative data provide information to which statistical analysis can be applied, including population projection methods such as the cohort component model, life tables from demography, and other multivariate methods including regression analysis. These methods commonly provide an indication of statistical significance and therefore either prove or disprove hypotheses.

METHODS

Methodology is also important, with methods often reflecting data sources and how data is collected. Both qualitative and quantitative data have different assumptions and reflect different theoretical approaches to the analysis and questions that are brought to bear on population issues. How population processes are defined and measured may alter the empirical measurement and the derived conclusions. How, for example, are the data operationalized and interpreted? What analytical methods are to be used?

Echoing the two broad types of data, *qualitative methods* are concerned with describing meaning rather than with drawing statistical inferences. While qualitative methods (e.g., case studies and interviews) lose generalizability and reliability, they provide greater depth of analysis along with typically rich descriptions of the process

being studied. Qualitative analysis is aided by computer programs, including Nvivo (www.qsrinternational.com). *Quantitative methods*, on the other hand, are those methods that focus on numbers and frequencies rather than on meaning and experience. Methods including descriptive, inferential, and multivariate statistical techniques such as regression analysis allow the researcher to understand and model the outcome of interest, and are aided by the many statistical packages that are available. Common packages include SAS (www.sas.com), STATA (www.stata.com), and SPSS (www.spss.com). Quantitative methods are associated with the scientific and experimental approach and are criticized for not providing an in-depth description. The use of large data files such as those generated by the US Census Bureau has often been accompanied by positivistic theoretical approaches, the goal of which is to verify (or falsify) empirical observations and to construct laws that can be generalized to a wide variety of models and theories.¹

Population geographers also have at their disposal a series of other measures that can be used to describe population composition, fertility, mortality, and movement. For instance, the total fertility rate provides a numerical representation of the number of children born to a woman over her reproductive life, migration rates capture the propensity to move or likelihood of moving relative to some geographic area within a population, and mortality rates define death processes within a society. Such measures are defined in greater detail elsewhere in this book.

The wealth of data sources, including census products, has enabled population geographers and other social scientists to understand population trends and their spatial consequences. Their widespread use, and the use of related data files, is due

in large part to their validity and the detail found in data sources such as the census. At the same time, increasing emphasis has been placed on the use of qualitative methods within population geography.² The ongoing reliance on empirical analyses has led some researchers to charge that too much emphasis has been placed on empirical data, with the data influencing the choice of methods and approaches while missing or failing to give adequate attention to questions of theoretical development and relationships. In other words, research questions have been limited by and, in many cases, defined by the availability of data such as the census.³

PRESENTATION

Presentation of the data and final results is also important. While tabular or written (report) formats are common, the amount of data and its geographical nature means that maps are frequently used to easily and conveniently display information. The emergence and availability of mapping tools and geographic information systems (GIS) over the past two decades have enabled the storage, presentation, and analysis of large amounts of geographical data. The Methods, Measures, and Tools discussion in chapter 1 covers this material in greater depth.

Chapter One

World Population

A Brief History of World Population Growth

The Demographic Transition

Future Population Scenarios: Who Gains and Who Loses?

Conclusion

Study Questions

*Focus: Population Growth Regimes in India, Germany,
and the United States*

*Methods, Measures, and Tools: Graphical
Representation*

*Methods, Measures, and Tools: Population Estimates
and Projections*

HOW QUICKLY has the world's population grown? Where is it growing the fastest? How can we characterize world population growth and transitions from high to low mortality and fertility? What are the implications of population growth and what is the ultimate size of the world's population? Starting with a brief review of world population growth, these and other issues are explored in this chapter. The “Focus” section contrasts the current growth regimes in the United States, Germany, and India, and the “Methods, Measures, and Tools” sections explore the graphical presentation of population data and population projection techniques.

A BRIEF HISTORY OF WORLD POPULATION GROWTH

For much of humanity's history, world population was small and population growth was slow (see figure 1.1). Aided by food security, the shift from hunter-gatherer societies to agricultural-based societies (around 8000 BC and 5000 BC) allowed the population to grow, but the population was still probably only

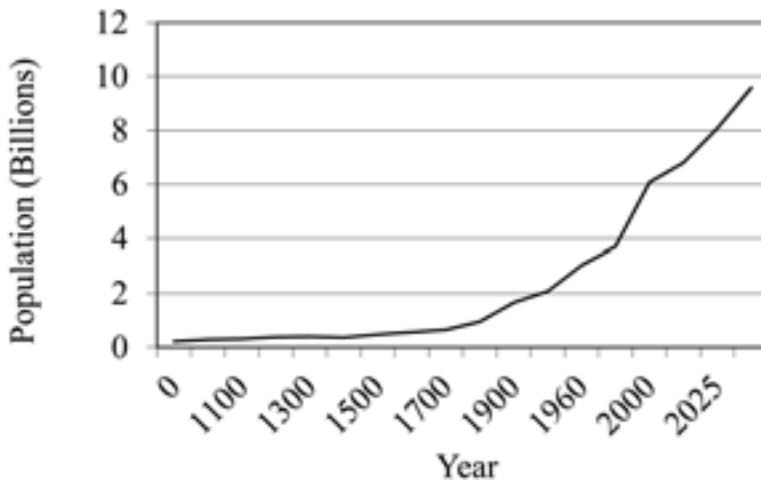


Figure 1.1 World Population Growth

Source: US Census Bureau.

slightly more than 200 million around AD 1. High birthrates were offset by high death rates from famine, war, and epidemics. It is estimated, for example, that the bubonic plague reduced the populations of Europe and China by one-third to one-half in the fourteenth century.¹ Even by 1600, the world's population was estimated to be only 500 million—not all that much larger than the current population of the United States.²

Beginning in the mid-1600s, the world's population started to grow more rapidly as life expectancy slowly increased with improvements in commerce, food production and security, and nutrition, with the world's population reaching approximately one billion by 1800. The nineteenth century would, however, bring a surge in population growth, particularly in Europe. Coinciding with the Industrial Revolution, the population of Europe doubled between 1800 and 1900. Fueled by European immigration, North America's population multiplied by twelve in the same period.³ The population of less developed countries grew more slowly during this time, but they already held the bulk of the world's population. Advances in medicine and sanitation increased survival and life expectancies. By 1900, world population was approximately 1.7 billion, increasing to two billion by 1930. The mid-twentieth century saw unprecedented population growth, with the world's population reaching three billion by 1960 and four billion by 1974. The fifth billion was reached just twelve years later. The world's population surpassed seven billion in 2011 and is projected to reach 9.6 billion by the year 2050.⁴ Up-to-date world and US population figures can be found at www.census.gov/main/www/popclock.html.

Between 1960 and 1998, the world's population doubled from three to six billion. Demographers often refer to the amount of time it would take for a

population to double in size, assuming that the growth rate remained constant into the future. A simple way to determine the doubling time is

$$\text{DoublingTime} = \ln 2/r$$

where $\ln 2$ is the mathematical notation for the natural logarithm of 2 and r is the annual percentage growth rate, expressed as a decimal. So, given that Egypt is growing at 2.0 percent, it would take just 35 years for its population to double (from 82.3 million in 2012)! For the United States, the doubling period would be over 87 years, given its 2012 natural growth rate of 0.8 percent. This assumes, however, that the growth rate (r) remains unchanged by shifts in fertility and mortality over the period.

Regional Growth

The population growth patterns that we observe around the world are not the same. We can roughly divide the world into three broad regions: the developed world, the less developed world, and the least developed world. The developed world includes the United States, Canada, western Europe, Japan, and Australia. Following United Nations convention, the balance of the world is less developed, with the least developed countries including forty-eight with especially low incomes, high economic vulnerability, and poor human development indicators, most of which are found in sub-Saharan Africa.⁵ Most of the world's population growth originates in the less developed world, which represents over 80 percent of the world's population and where 98 percent of the world's population growth is now occurring. Put in another perspective, over 120 million children were born in the less developed world in 2012, compared to about 13.9 million in developed, industrialized countries.⁶

Even within the less developed world, however, there are great differences in terms of population growth regimes. China, currently the world's most populous country, has a growth rate of just 0.5 percent, meaning that while its population continues to grow, it is growing at a much slower rate and could ultimately be faced with population decline. It is already grappling with issues of population aging because of its one-child policy, issues that are explored further in chapter 10. China also has an impressive impact on population statistics. For instance, if China is included in population statistics for the less developed world, the fertility rate is just 2.6, compared to 3.0 when China is excluded. As a result, the Population Reference Bureau (PRB) regularly provides statistics that both include and exclude China.

As the world's second-largest country, India has a population growth rate of 1.5 percent and a fertility rate of 2.5, meaning that its population continues to expand rapidly, and it is projected to overtake China as the world's most populous country by 2028, reaching a total population of 1.6 billion before the end of the century. Elsewhere in the less developed world, Africa, and in particular

sub-Saharan Africa, has growth rates in excess of 2.4 percent and fertility rates that exceed 5.1. In short, population growth rates remain high and long-term population growth is ensured. Population growth rates are much lower in Central America, South America, and the Caribbean, although fertility rates remain in excess of 2.1, so that the population continues to grow as well.

In most of the developed world, population growth rates are much lower. The natural growth rate in the United States is just 0.8 percent, and its fertility level hovers near replacement (1.9). Even this, however, is comparatively fast when compared to some of the western and Eastern European nations, where growth rates are much less. As a whole, Europe's growth rate was zero percent in 2012, but with below replacement fertility levels in many countries, Europe's population will shrink over the coming decades. This population decline is already seen in several Eastern European countries, including Hungary, Romania, and Russia, which had negative growth rates, while the population of western Europe, including France, barely managed to grow. Population decline brings with it multiple questions of state identity, political power, and economic growth that are further discussed later in this chapter.

Urban Growth

Accompanying the world's population explosion has been the explosion in the size and number of urban areas. As recently as 1975, only 33 percent of the world's population lived in urban areas, with most of these living in relatively small cities of less than one million.⁷ In 2012, approximately 51 percent of the world's population lived in urban areas. While the less developed world lags the developed world in the proportion urbanized (46 percent to 75 percent, respectively), only 28 percent of the least developed world is urbanized. However, the urban population in the less developed world is expected to grow rapidly in the coming decades, with upward of 61 percent of the world's population living in urban areas by 2030.⁸ Placing urban growth in another perspective, the number of cities in the less developed world with populations in excess of one million is expected to jump from 394 in 2011 to 573 by 2025. The number of megacities (cities with populations in excess of ten million) has also grown from ten in 1990 to twenty-three in 2011, and the number of these superlarge cities is projected to grow to thirty-seven by 2025. Most of these new megacities will be located outside of the developed world, with their growth driven by natural increase,⁹ net rural-to-urban migration, and urban reclassification.

THE DEMOGRAPHIC TRANSITION

The population explosion in Western countries during the 1800s marked the beginning of the shift from high to low mortality and high to low fertility, known

to demographers as the demographic transition and formalized by the demographic transition theory (DTT) (figure 1.2). The theory argues that prior to transition, birth and death rates are high and largely cancel each other's effect, meaning that populations grow slowly. As a society develops and modernizes, death rates decline, but fertility remains high, corresponding to the period of rapid population growth. At the conclusion of the demographic transition, birth and death rates are again comparable, but at a much lower level than prior to transition, and population growth again stabilizes.

Within this theory, the most important determinants of population growth are the pretransition fertility rate and the time lag between the decline in mortality and fertility. That is, while fertility rates remain high and death rates are low, the population can grow quickly. The former captures how far fertility rates must fall, with high fertility reflecting a large demand for children in a society and with fertility reduction generally taking longer in high-fertility societies. The latter effect (the lag between mortality and fertility declines) captures the length of time over which rapid population growth can occur, with longer time periods translating to a longer period over which the population can grow rapidly.

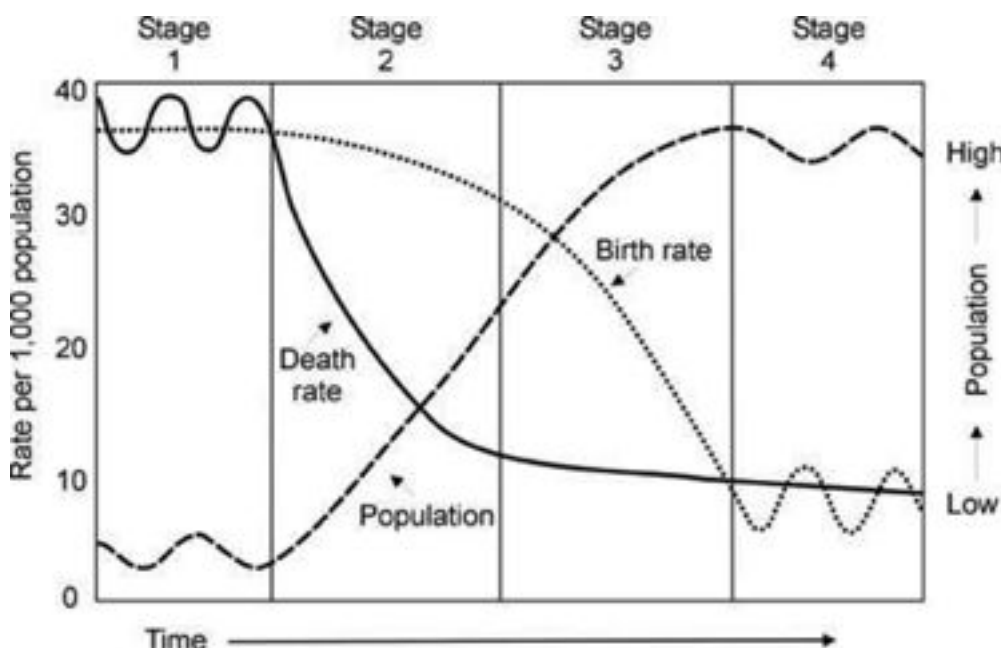


Figure 1.2 The Demographic Transition Theory

Rapid population growth occurs when births exceed deaths (stages two and three), with total growth reflecting the length of time over which these two stages occur and the difference between the maximum birth and death rates (stage one) and the minimum rates (stage four).

Source: Author.

Although the concept of demographic transition can be roughly applied to all countries, with a decline in mortality rates followed by an eventual decline in fertility rates, the timing, pace, and triggers of the transition vary. Within the developed world, shifts in mortality and fertility occurred in the later parts of the nineteenth century and early twentieth century as the Industrial Revolution progressed and as major public health improvements led to declines in infant mortality rates and increased life expectancy. Fertility rates were somewhat slower to change since social and behavioral changes defining the desired family size tend to be slower, but fell rapidly after 1900 as more children survived to adulthood, marriage patterns changed, women moved into paid work, and parents placed greater value on the education their children received. In the United States, the total fertility rate dropped from an average of four or five children in 1900 to approximately two children per woman by the 1930s. Canadian and European rates followed a similar pattern.

This demographic transition has generally not yet finished in the less and least developed world, where rapid population growth continues. On the one hand, mortality rates in the less developed world have generally fallen rapidly from the 1950s onward, particularly with the introduction of antibiotics, immunizations, and better medical care and nutrition. On the other hand, fertility rates largely remain above replacement level, and average approximately 2.6 children per woman in the less developed world (3 children per woman if China is excluded). Fertility in the least developed world is even higher (4.4), with much of sub-Saharan Africa having high fertility. Even as mortality and fertility rates in the developed world stabilized and low and stable rates of population growth were realized, much of Africa, Asia, and Latin America are still experiencing relatively high mortality and fertility levels.

As countries outside of the developed world started their demographic transition, they frequently had higher levels of birth and death rates than those observed in developed countries a century earlier, with fertility rates in many countries continuing to average more than six children per woman. Fertility reduction has also typically been slower than experienced in the developed world (i.e., the lag between the decline in mortality and fertility has been longer). Instead, it varied across countries, defined by differences in social, cultural, and religious expectations; literacy rates; female participation in the workforce; family and economic considerations; and the availability and acceptability of family-planning programs. Rates of natural increase (the birthrate minus the death rate, indicating the annual rate of population growth) remain high in much of the less developed world.

Although the demographic transition theory has been widely applied, it has also been extensively criticized because of its Western-centric biases. It was, for all intents and purposes, validated on the demographic experiences of Europe

and assumes that all other countries would progress similarly through its stages. Outside of the developed world, the triggers for fertility reduction differ, including differential access to education and employment and differential roles for women within society. It is also relatively unable to account for myriad variations such as higher fertility levels, alternative forces associated with the decline in mortality, or social and cultural issues.¹⁰

FUTURE POPULATION SCENARIOS: WHO GAINS AND WHO LOSES?

At the dawn of the twenty-first century, there was some evidence that the developing world was finally transitioning from high to low fertility, evidenced by a 2012 total fertility rate (TFR) of 2.6 (3.0 if China is excluded), a rate that is considerably lower than that observed just a quarter of a century earlier.¹¹ With the expectation that fertility rates will continue to decline, some analysts have concluded that the risk of population growth has been greatly diminished.¹² Indeed, some authors have suggested that the new problem is a population *deficit* and an aging of the world's population,¹³ and others have suggested that the threat of world population growth is now more regional than global and of consequence only in countries such as Pakistan and India where high fertility regimes remain.

While the world's population growth rate did peak in the 1960s and has declined since then, the global population is still rapidly expanding, evidenced by a global growth rate of 1.2 percent. In effect, to say that it is a regional problem allows the Western world to ignore the problem, but only at its peril. The current fertility rate in the less developed world translates to a growth rate of 1.4 percent (1.7 percent excluding China), allowing the population in the less developed world to double in approximately fifty years (assuming growth continues at its current rates) or forty years if China is excluded. Even as fertility rates have dropped in Asia, Latin America, and the Caribbean, they remain stubbornly high in the world's least developed countries, with a 2012 TFR of 4.4, with a doubling time of just sixteen years. In sub-Saharan Africa, the 2012 TFR was 5.1. Moreover, in countries where fertility rates have dropped quickly, the young age structure of the population will ensure growth for the next two to three decades. Put another way, a huge proportion of the world's population has not started having children. Instead, they *are* children. Consequently, a total world population of eight billion by 2025 likely cannot be avoided, and most projections place world population between 7.3 and 10.7 billion by 2050, with nearly all of this growth occurring outside the developed world (table 1.1).

Table 1.1. Current Population Statistics by Selected World Regions, 2012

	<i>Population mid-2012 (millions)</i>	<i>Total fertility rate</i>	<i>Natural increase (annual, %)</i>	<i>Doubling time (years)</i>	<i>Projected population 2025 (millions)</i>
World	7,058	2.4	1.2	58	8,082
North America	349	1.9	0.5	139	391
Central America	160	2.5	1.6	43	185
South America	397	2.1	1.1	63	441
Caribbean	42	2.3	1.1	63	46
Oceania	37	2.5	1.2	58	44
Northern Europe	101	1.9	0.3	231	111
Western Europe	190	1.6	0.1	693	194
Eastern Europe	295	1.5	−0.2	—	287
Southern Europe	154	1.4	0.1	693	158
Asia (excluding China)	2,910	2.5	1.4	50	3,377
Asia (including China)	4,260	2.2	1.1	63	4,779
Western Asia	244	2.9	1.9	36	303
South Central Asia	1,823	2.6	1.6	43	2,145
Southeast Asia	608	2.3	1.3	53	696
East Asia	1,585	1.5	0.5	139	1,635
Sub-Saharan Africa	902	5.1	2.6	27	1,245
Northern Africa	213	3.1	1.8	39	263
Western Africa	324	5.4	2.6	27	450
Eastern Africa	342	5.1	2.8	25	477
Middle Africa	134	5.9	2.7	26	193
Southern Africa	59	2.5	0.7	99	63

Source: Population Reference Bureau, 2012 *World Population Data Sheet*.

(—) indicates data not available or applicable.

So while population growth is indeed slowing, we must still feed, clothe, and shelter a growing population, a task that it is unclear whether the world can accomplish.

While many countries in Asia still have above-replacement TFRs, China, South Korea, Taiwan, and Thailand have fertility levels lower than replacement. China is, in fact, an important exception to the generally high fertility rates of the less and least developed world. With a population of 1,350 million in mid-2012 and an annual growth rate of 0.5 percent, China is the world's most populous country. Despite fertility levels that exceeded 7.0 recorded as recently as the 1950s, China's fertility rate has plunged to below replacement level (1.5), largely attributed to its one-child policy, which has artificially lowered fertility levels since its inception. India, too, has attempted fertility control policies but

has had much less success.¹⁴ Although it has a smaller population (1,260 million), India is growing at a rate of 1.5 percent, meaning it will surpass China's population by the middle of the twenty-first century. In other parts of Asia, there has been little change in fertility in places such as Iraq and Pakistan. In Africa, the transition to a lower fertility regime is still in progress. Total fertility rates still exceed 6.0 in countries including Mali, Uganda, and Somalia, and there is little evidence that a downward shift in fertility is about to occur. Throughout much of Africa, infant mortality rates remain high (74 per 1,000), and life expectancies are short (fifty-eight years). In contrast, most developed countries are experiencing slow growth or even population decline, long life expectancies, and low infant mortality rates.

At a very general scale, the developed world is largely characterized by relatively slow rates of population growth, low fertility levels, and controlled immigration. With a current growth rate of 0.2 percent per year, it will take approximately three hundred and fifty years to double the current population, assuming a constant rate of natural increase. Some countries in Europe, and especially Eastern Europe, are experiencing negative population growth rates, meaning that their populations are declining. For example, the Population Reference Bureau projects Latvia's current population of 2.0 million to decline to 1.7 million by 2050, attributed to extremely low fertility levels. Germany's population, currently 82 million, is projected to decline to 71.5 million by 2050.

What do these population trends mean and what are their implications? We will briefly explore issues related to overall population growth. While many are expanded in later chapters, their discussion contextualizes world population growth. For instance, high fertility in much of the less developed world ensures population growth, while low fertility in the less developed world points to population decline. Urban growth, population aging, and immigration also spill out of these broader trends.

Continued Population Growth

The current distribution of the world's population (figure 1.3), coupled with high fertility in much of the less and least developed world, means that the global population will continue to grow into the near future before leveling off between 7.3 and 10.7 billion later this century, despite falling fertility rates and slowing population growth rates since the 1960s. Rapid population growth in the second half of the twentieth century has meant that the share of the world's population residing outside the developed world climbed from 68 to 82 percent, a proportion that will grow to 86 percent by 2050 according to projections made by the United Nations.

The certainty of continued global population growth is grounded in three assumptions. First, improvements in life expectancy (reduced mortality) will

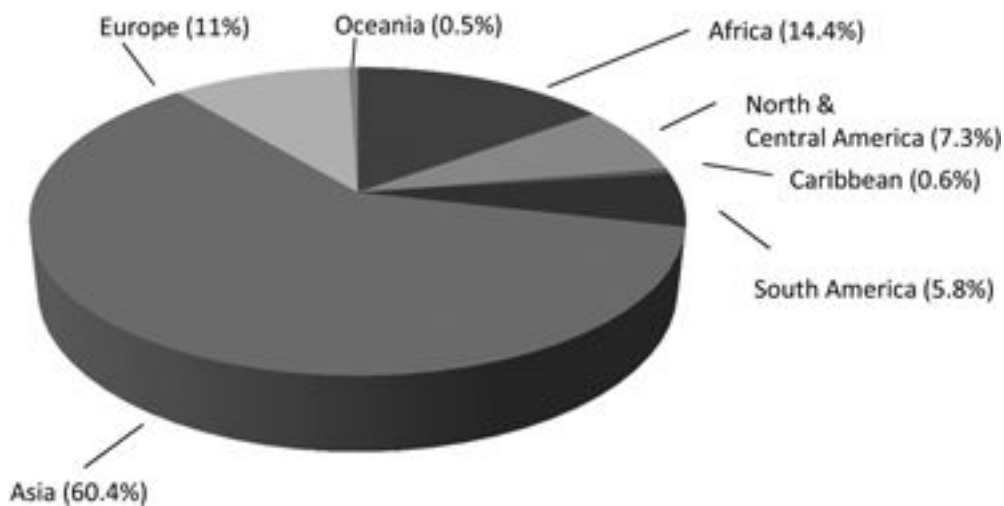


Figure 1.3 World Population Distribution by Major Region, 2012
 Data derived from *2012 World Population Data Sheet* (Washington, DC: Population Reference Bureau, 2012).
Source: Author.

Table 1.2. The Ten Most Populous Countries in the World, 2012 and 2050 (Projected)

2012		2050	
Country	Population (millions)	Country	Population (millions)
China	1,350	India	1,691
India	1,260	China	1,311
United States	314	Nigeria	402
Indonesia	241	Pakistan	314
Brazil	194	Indonesia	309
Pakistan	180	Bangladesh	226
Nigeria	170	Brazil	213
Bangladesh	153	Dem. Rep. of Congo	194
Russia	143	Ethiopia	167
Japan	128	Philippines	155

Source: Population Reference Bureau, *2012 World Population Data Sheet*.

contribute to population growth, as individuals survive longer. Longer life expectancies increase a child's likelihood of surviving infancy and childhood and completing his or her reproductive years. Second, the age structure of a population is key to the expected future growth, with populations having a greater number of individuals in their childbearing years tending to grow faster irrespective of the fertility rate. Women may have fewer children than in the past, but there are more women having children. Excluding China, which has seen a shift in its age structure associated with its one-child policy, 32 percent of the population outside the developed world is less than fifteen years old. In the least developed world, 41 percent of the population is aged less than fifteen years. The young age profile of the least developed world means that this population still has to enter its reproductive years. Even if fertility rates decline, population momentum will ensure sustained population growth. In comparison, only 16 percent of the population in the developed world is less than fifteen years old, a proportion that continues to decline.

Third, most demographers expect that fertility rates will eventually decline below replacement, ending the population explosion. Yet fertility rates continue to remain above replacement in many regions of the world. Declines have been noted, but it is unknown whether further declines in fertility can be expected, with recent surveys in both Bangladesh and Egypt pointing to the danger in assuming that fertility will drop below the level needed to replace the population. Despite early successes in reducing fertility in Bangladesh, with fertility rates dropping from over six children per woman in the early 1970s, fertility rates have remained relatively unchanged since the 1990s. Similarly, Egypt's birthrate has remained approximately 3.0 since 1993. This trend is far from isolated, with Argentina's birthrate remaining at about three children for nearly fifty years, although by 2012 it had fallen to 2.4.¹⁵

A look at worldwide demographic data quickly highlights the fact that differential population growth regimes are occurring around the world. The combined impact of slowing population growth or decline in some countries and continued growth in others leads to issues associated with population aging and immigration, discussed below.

Population Aging and Decline

It is rather paradoxical that while we talk of continued population growth at the global scale, we also observe population decline in some regions or countries where population aging and fertility decline have emerged as new issues.¹⁶ Globally, the proportion of the population over sixty-five has grown from 5 percent in 1950 to 8 percent in 2012. While seemingly a small change, it is in many ways the tip of the iceberg. By 2050, for example, approximately 24 percent of Asia's population will be sixty years or older. In large part, this is driven

by China, where its one-child policies have resulted in a dramatic aging of the population. Likewise, 25 percent of Latin America's population is expected to be aged sixty or greater by 2050.

In much of the developed world, population aging is further advanced. Japan as well as much of Europe already have some of the highest proportions of older populations (aged sixty-five-plus). In 2012, Japan's older population share was 24 percent, among the highest in the world. The United States, Canada, Australia, and New Zealand are not far behind, as their baby boomers age into retirement and fertility rates remain low. At the same time, numerous countries were already experiencing negative rates of natural increase, including Estonia, Latvia, Japan, Germany, Hungary, Russia, and Ukraine. Other countries such as Canada, which had a natural increase rate of 0.4, have experienced slowing natural population growth.

Consequently, population *deficits*, and the economic and social consequences of these, have increasingly emerged as an important issue for some developed countries, with commentators openly worried about the consequences of aging populations and declining population growth.¹⁷ In particular, while it is unclear what impacts aging societies will have, most commentators assume negative consequences, including declining national and international political influence, loss of national identity, altered political agendas that favor older populations at the expense of younger cohorts, slower economic growth, and increasing demands on health and social welfare programs at the same time that the labor force and economically active population is shrinking. Concurrently, countries have looked to policies to actively promote population growth through increased fertility and immigration.

Immigration

Human populations have been inherently mobile throughout history. In 2005, the PRB estimated that there were 191 million international migrants, meaning that 3 percent of the world's people had left their country of birth or citizenship for a year or more. For the developed world, the number of international migrants stood at 120 million, while approximately 61 million migrants moved within the less and least developed world.¹⁸ Most of these migrations are closely linked to economic opportunities and are encouraged by globalization, which has linked economies and employment around the world, encouraging the use of low-skilled and low-cost workers worldwide. While most countries now attempt to control entry through various pieces of legislation, immigration remains a potentially large source of population change. For developed countries such as Canada and the United States, most immigrants arrive from the less developed world, and immigration policies are typically structured to attract "the best and the brightest" immigrants. While benefiting the receiving

country, such policies have been criticized because they skim talented individuals from less developed countries that need them.

The international movement of people has raised concerns within many countries. While not denying past immigration policies that were openly racist and exclusionary, both the United States and Canada have historically been receptive to immigration. In the United States, this history may be in danger, illustrated by the fear of demographic “Balkanization,” welfare reform, and the tightening of immigration and refugee policies in a post-9/11 world. Anti-immigrant sentiments are especially visible in Europe, coloring national political debates and economic opportunities. European countries have only recently shifted from being labor exporters to importers of labor, a shift that is difficult to digest. Yet the demographic realities of low fertility and an aging population mean that European countries are faced with a crisis in their labor force. Increased immigration may be the only option for meeting employment requirements, but it remains an option that carries significant political, social, and cultural problems, since most Europeans continue to associate the foreign-born with unskilled work and unemployment. Most likely, Europe will ultimately need to address its new role as a receiver of immigrants. In addition, both North America and Europe are grappling with illegal immigration, imposing burdens upon local service providers at the same time that illegal immigrants sustain the economy by working for low pay and in positions or conditions that few others are willing to tolerate.

Most governments in the developed world have moved to control immigration, limiting the type of immigrant (i.e., family reunification and economic), origin, and overall number allowed entry over any given year. Despite their efforts through both legislation as well as active enforcement of borders, most countries have found it increasingly difficult to control the entry of immigrants, creating an immigration crisis reflected in what has been described as the “gap” between immigration control policies and their outcomes. The reality is that governments are less able to control immigration now than in the past. Globalization and the increasing flow of labor and capital, the emergence of civil rights and liberalism, and the domestic need for inexpensive labor, which legitimized immigration flows, have contributed to this inability to control both illegal and legal migration flows.

Immigration is also a significant source of labor in the less developed world. Laborers from countries such as Indonesia, India, and Pakistan are, for example, attracted to Persian Gulf states for work in the construction and oil industries. These migrants become an important source of income for their families through the money sent back home, which is then invested in new housing or other goods. This money, or remittances, has become an important source of income for families and countries alike.¹⁹ Typically, movement is into a richer

less developed country for temporary work. Although entry is often unregulated, states in the less developed world are increasingly moving to tighten their own entry requirements. Another source of population change is the movement of refugees across international borders.

CONCLUSION

The current rapid pace of world population growth reflects comparatively low mortality levels, fertility rates that remain high in much of the less and least developed world, and the impact of a young population that remains in its childbearing years. The end result is that the world's population will continue to grow for the foreseeable future. While we may be content in this realization, it is only the beginning of our discussion. Why, for instance, are fertility rates relatively slow to decline, while mortality rates declined early and rapidly? What is the outlook for mortality, particularly in the face of HIV/AIDS? How does immigration shift populations from country to country or within countries? What does population growth mean for the development and growth of urban areas and the potential for conflict? These, and other related issues, are explored more fully in the following pages.

STUDY QUESTIONS

1. Many population projection models assume a constant population growth rate throughout the projection period. What are the potential problems with this assumption?
2. Using a country from (1) the developed world, (2) the less developed world, and (3) the least developed world, where might they each be in terms of their demographic transition? Use data (i.e., fertility rate, mortality rate, dependent population) to support your argument.
3. Using three different countries, create a table similar to table 1F.1. What can you infer about population growth and the composition of the population in the selected countries?

FOCUS: POPULATION GROWTH REGIMES IN INDIA, GERMANY, AND THE UNITED STATES

It is easy to recognize that different regions, and indeed different countries, face alternate population growth regimes, with some growing rapidly while others are in decline. We focus here on three different countries: India, a rapidly growing country; Germany, a country faced with population decline; and the United States, a country that is experiencing modest population growth but that has also completed the demographic transition (see table 1F.1).

Like other countries in the less developed world, India's population growth exploded in the twentieth century. Between 1900 and 2000, its population grew four-fold, from approximately 238 million to one billion.¹ With a 2012 population of 1,260 million, India's population is growing at a rate of 1.5 percent per year, adding over 18 million to its population each year.² Fueled by high total fertility (2.5), a relatively young population (31 percent are aged fifteen years or less), and increasing life expectancies, its population is expected to grow to 1,691 million by 2050, surpassing China's population by 2030. On its own, the country's young age structure will ensure that its population continues to grow due to demographic momentum, given that so many women have yet to enter their childbearing ages. Fertility decline since the 1960s has slowed population growth in India, but there are wide disparities in birth rates between the northern and southern states, with northern states characterized by high birth rates (approximately four children) and the southern states by, additionally, greater life expectancy. Fertility is also higher and life expectancy lower in rural rather than urban areas.³

Germany presents almost the mirror image to India, having completed its demographic transition. With a much smaller (2012) population of 82 million, its growth rate is -0.2 percent, such that its population is in decline. By 2050, its population is expected to have shrunk to 71.5 million, or a decrease of approximately 13 percent. This population decline is exacerbated by limited immigration and a low total fertility rate (1.4), meaning neither immigration nor natural increase is a source of population growth. Germany's changing population structure also means that its population is rapidly aging, with 21 percent already aged sixty-five and over, with this proportion expected to grow as its population continues to age. In contrast, just 13 percent of its population is less than fifteen years, and the youngest generation (aged zero to four) is less than half the size of the forty-five- to forty-nine-year age group.⁴ Its age and population structure are similar to those of other western and Eastern European countries, where debates over population trends and policies have focused on increasing immigration levels or increased fertility.⁵ Immigration provides a short-term solution, although Germany does not see itself as a destination for immigrants, with some fearing the erosion of culture and nationality, reflecting both Germany's history and experiences with its guest worker program, which imported workers for German factories.⁶ Changes to fertility rates, however, are much more difficult to encourage.⁷

While the United States has also completed its demographic transition, population growth has been comparatively rapid relative to other developed countries: its

Table 1F.1. Population Growth in India, Germany, and the United States, 2012

	Population 2012 (Millions)	Growth Rate (%)	Total Fertility Rate	Projected Population (Millions)		Projected Population Change (%) 2012–2050	Percent of Population Aged	
				2025	2050		<15	>65
India	1,259.7	1.5	2.5	1458.2	1691.1	34	31	5
Germany	81.8	–0.2	1.4	79.2	71.5	–13	13	21
United States	313.9	0.5	1.9	351.4	422.6	35	20	13

Source: Derived from Population Reference Bureau, 2012 *World Population Data Sheet*.

population was just 100 million in 1915, with the next hundred million added by 1967, and 300 million in 2006. As of 2012, its population was 313.9 million, and it is expected to grow to 422.6 million by 2050. Its population growth can be partially attributed to high immigration levels, with approximately one million new arrivals each year, and with immigration projected to be the principal driver of population growth by the middle of this century (i.e., greater than natural increase).⁸ In addition, fertility remains relatively high (1.9), although it has dropped below the replacement level. In fact, the fertility rates of ethnic minorities and the foreign-born population—especially Hispanic immigrants—in the United States tend to be somewhat higher than that of the native-born population, pushing the national average rate upward.⁹ Fertility rates among Hispanics, for instance, were 2.8, compared to 1.9 among non-Hispanic

whites.¹⁰ Even among whites, this is a relatively high fertility rate in comparison to fertility rates observed in other developed countries. The combined effect of differential fertility rates and immigration from Hispanic countries means that the number of non-Hispanic white Americans is expected to start to decrease by 2020, such that the US will become more reliant on immigration for future population growth.¹¹ While foreign-born Hispanics have higher fertility rates than their native-born counterparts, immigrant fertility rates have been found to decrease sharply in the second generation, related to improved education and income.¹² Although the aging baby boom population is increasing the proportional share of those aged sixty-five and over, this group still only represented 13 percent of the population in 2012, a comparatively low share relative to other countries in the developed world.

METHODS, MEASURES, AND TOOLS: GRAPHICAL REPRESENTATION

Robert Kaplan, in writing for the *Wall Street Journal*, notes that “maps capture the key facts of history, culture and natural resources”¹ and can be used to concisely portray a large amount of information. While Kaplan was referring to the use of maps to understand global conflicts, population geographers are frequently faced with a large volume of data that must be presented. What is the best way to portray population statistics? One of the clearest ways to display population information is through mapping, largely because of maps’ visual impact and their ability to easily communicate information, along with identifying and

illustrating spatial patterns. Maps are used in multiple ways, including in public health (i.e., disease surveillance), transportation (i.e., optimal vehicle routing or analysis of pollution along major arteries), site locations for stores and services, disaster planning, and so on. In many cases, maps are used to highlight the presence of a spatial relationship that can then be explored further through modeling and other techniques.

MAP TYPES

Population *dot maps* provide a simple way to graphically represent the distribution of

a population. The basic idea of this sort of map is straightforward: a dot is used to symbolize the location of a person (or group of people or other object) of interest. An early use of this sort of map is John Snow's mapping of London's cholera epidemic around the Broad Street pump in 1854.² Snow mapped the locations of the homes of those who died during the outbreak, observing that the majority of cases were located close to the pump, which acted as the contaminant source and was ultimately closed. Dot density maps are most useful for showing where particular data occur. However, caution should be exercised as the dot location does not always indicate the precise location of the data of interest. Instead, dots often represent data occurring within a geographical area such as a census tract, zone improvement plan (zip) code, or county.

Choropleth maps, whereby regions are shaded corresponding to the value of interest, provide an alternative representation and are frequently part of the geographer's toolbox. While commonly used, choropleth maps can be misleading due to the artificial boundaries, such as borders between census tracts or counties, that are used to define the map. The fixed geography of these imposed boundaries creates an artificial order on the data. In addition, differences in the size of units in the map can lead to visual distortion. Moreover, choice of class interval (i.e., standard deviation, percentiles, equal interval) (figure 1MMT.1) or changing the spatial scale of the map, while still mapping the same phenomenon, can lead to different interpretations (the so-called modifiable areal unit problem mentioned in the introduction).

Cartograms are maps where the area is not preserved (figure 1MMT.2). Instead, regions are reportioned relative to the

magnitude of the data displayed (as opposed to their true physical size). For example, population size may be substituted for regional area, distorting the area of the map to convey the information.³

Finally, population geographers have also consistently made use of *flow maps*, particularly to represent migration streams (flows) from one region to another.⁴ Other uses include transportation flows, information exchange, and disease transmission. By changing the width of the lines, flow maps can be used to portray differences in the size of the flow, and directions of the flow are represented with arrows.

GIS AND MAPPING

Data display, storage, management, and manipulation have been assisted with the increasing availability of geographic information systems (GIS) over the past decade. Using digital maps and geographic information, GIS systems provide the capability to store, retrieve, display, and analyze geographic data. Most mapping and GIS packages, such as MapInfo and ESRI's popular Arc series of programs, provide the user with the quick and relatively automated ability to create and analyze maps. However, the caveat of "garbage in—garbage out" remains, as users must still consider how best to represent the data and which data to present. Changing the nature of the data to be presented, for example by replacing absolute population counts with proportional representation or a population rate, may alter the final product and its interpretation. Similarly, the seemingly mundane choice of color and data categories can result in misleading maps.⁵ In addition, the imposition of boundaries between mapped units and variation in the size of

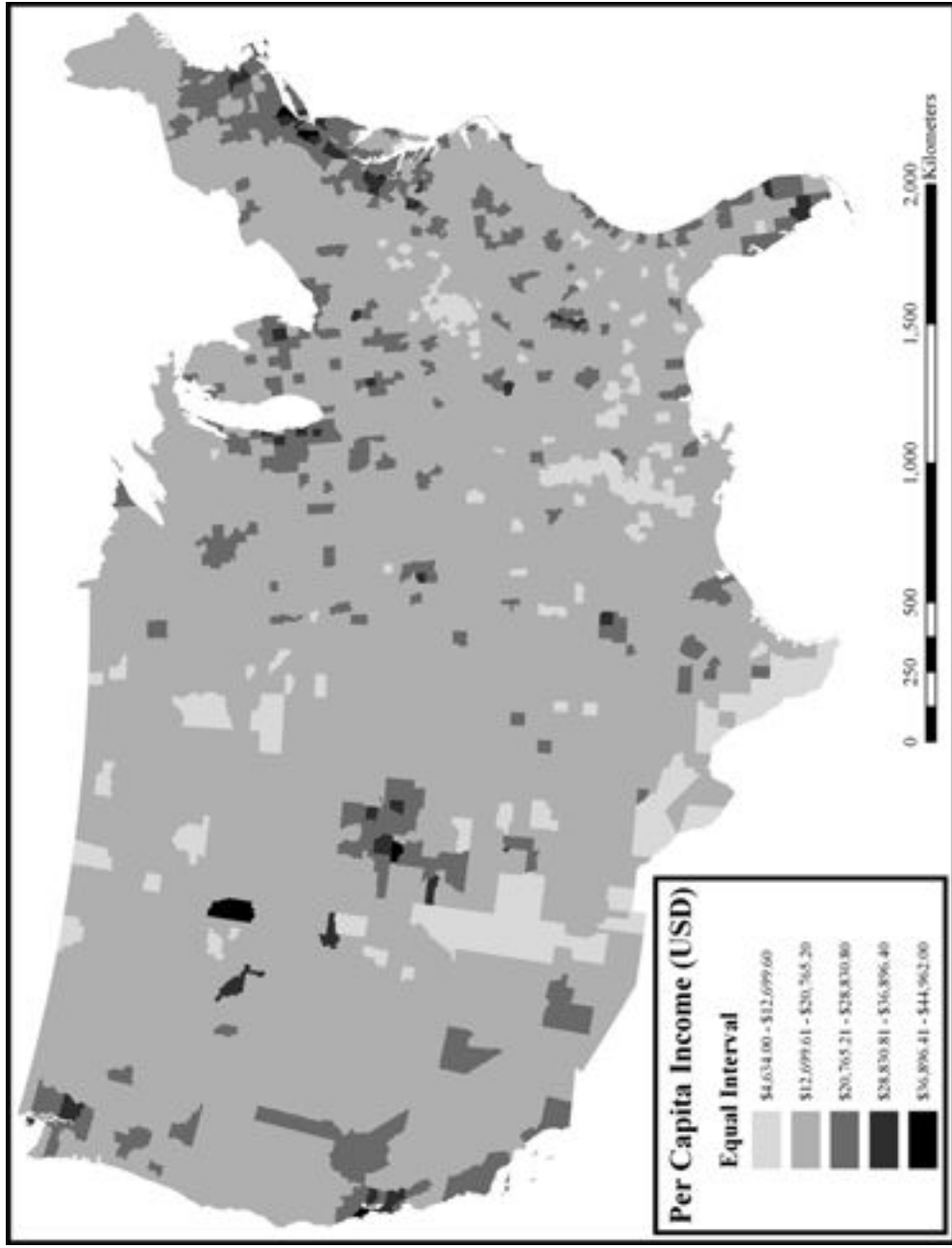


Figure 1MMT.1a Impact of Changing Class Interval

Figures 1MMT.1a and 1MMT.1b show the impact of changing class intervals in a map projection. Both maps illustrate income by county (1999), with the first using class intervals based on equal intervals and the second based on quintiles.

Source: Author.

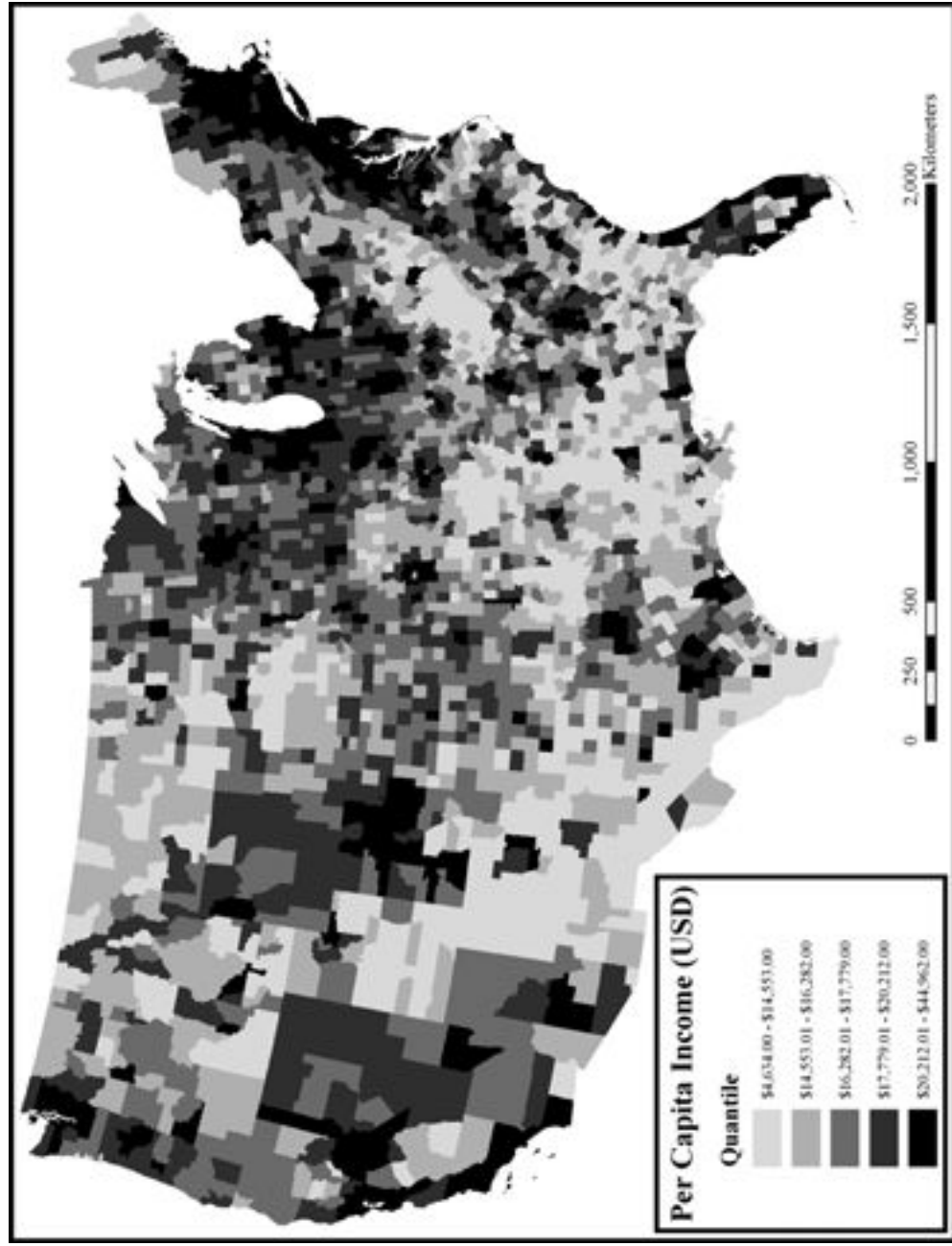


Figure 1MMT.1b

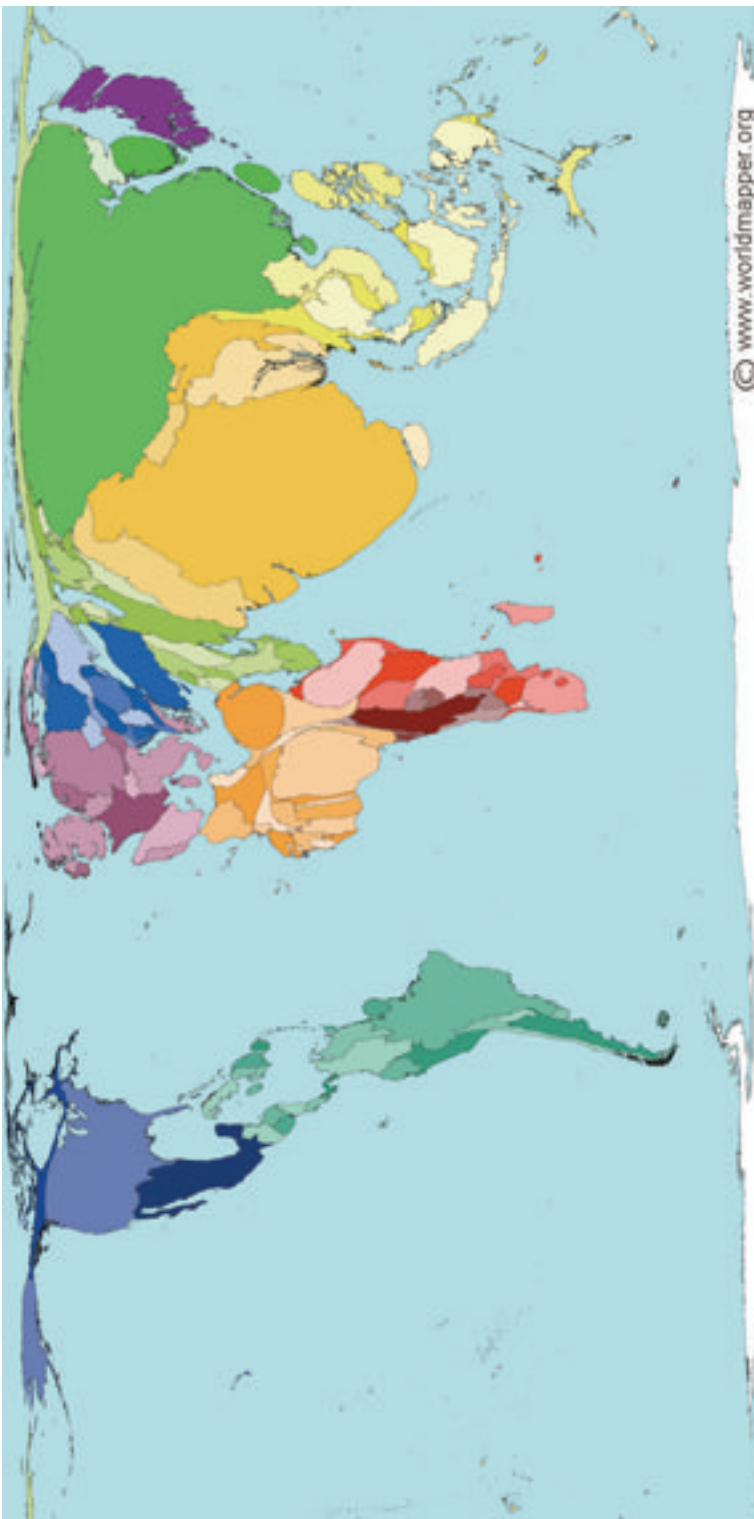


Figure 1MMT.2 Total Population as a Cartogram

The size of each territory shows the relative proportion of the world's population living there.

Source: Copyright 2006, Social and Spatial Inequalities (SASI) Research Group (University of Sheffield) and Mark Newman (University of Michigan), <http://www.worldmapper.org/copyright.html>. Used with permission.

the spatial units tends to create a somewhat artificial pattern. Indeed, there is a large geographical literature on the best way to represent data in graphical and map form.⁶

As an alternate to mapping, spatial analytical techniques such as kernel estimation, spatial moving averages, or kriging provide options for a smoother representation of the data that gets around issues associated with borders. Rather than limiting data representation to specific boundaries (such as census tracts or counties), which can result in a biased interpretation since it

frequently appears that the value of interest suddenly changes at the boundary, these methods typically work by essentially averaging data over some defined geographic area, and can be found in many popular GIS and mapping programs, as well as more specialized spatial analysis programs such as R, S-Plus, CrimeStat, and GeoDa.⁷ These programs are also able to perform more complex analyses that enable understanding and modeling of underlying geographical trends and testing for the presence of autocorrelation or geographical correlation over space.

METHODS, MEASURES, AND TOOLS: POPULATION ESTIMATES AND PROJECTIONS

Population geographers and demographers are frequently called upon to provide population estimates or projections.¹ Although these two terms are frequently used interchangeably, they differ in important ways. For instance, a *population estimate* is a calculation of the size of a population for a year between census periods or for the current year. Estimates are frequently based on existing census numbers; components of population change such as migration, fertility, and mortality; and other information that reflects changes in population, which may be derived from employment information, postal location, or tax records. *Population projections* are calculations of population size for a future point in time.² Information on past, present, and future population size can be used to project the population. In both cases, the accuracy of estimation and projection tools is based on the rules and assumptions of the methods used.

POPULATION ESTIMATES

We can consider the estimation of a population between census periods, using the following

$$P_{t+x} = P_t + B_{t,t+x} - D_{t,t+x} + M_{t,t+x}$$

where P_{t+x} is the population to be estimated at time $t + x$, P_t is the beginning period population, $B_{t,t+x}$ is the number of births between t and $t + x$, D is the number of deaths, and M is population change due to migration (international migration and domestic migration if the projection is for a subnational scale) over the same period. In effect, this equation is simply a “residual method” seen elsewhere in this text—the difference in population size over a period of time reflects the demographic processes that occur. However, not all of this information may be available, and estimates may be required. For instance, as most governments do not collect emigration statistics,

net international migration (total immigration minus total emigration) would not be available, and estimates of emigration would be required.

Alternatively, midyear population estimates may be made as a simple average between two known years

$$P_e = P_1 + \frac{n}{N} (P_2 - P_1)$$

where P_e is the estimated population size; P_1 and P_2 are the known beginning-of-period and end-of-period population sizes, respectively; n is the number of months from the P_1 census to the date of the estimate; and N is the number of months between the P_1 and P_2 censuses. This method assumes constant (linear) growth between the two census periods and, provided that the period between the two census intervals is relatively small, yields an acceptable population estimate.

A third technique is to apply a known (or estimated) rate of population growth to a population, such that

$$P_e = P_2 - r [(P_2 - P_1) / t]$$

where t represents the number of years between the censuses and r is the population growth rate, defined as follows (where \ln refers to the natural logarithm).

$$r = [\ln(P_2 / P_1)] / t$$

While relatively simple, these methods are also problematic in their inherent assumption of linear population change. In fact, the assumption that population change is smooth is not supported within the literature, given that population mobility has frequently been tied to both short-term and long-term economic events. Moreover, the reliability of such estimates decreases (1) at smaller geographic scales, either because of less reliable data or because they are more subject to short-term

shifts in population, and (2) with longer periods between censuses.

POPULATION PROJECTIONS

Population projections use past and current census information to project future population size. Projections can be as simple as an extrapolation of current population trends into the future. That is, for example, if we know the population for several past census periods, we can roughly fit a line into the future to project the population. A similar approach is to assume that the current population growth rate can be applied to project the population forward, as follows.

$$P_{t+10} = P_1 + rP_1$$

It should be noted that the above equation assumes that the growth rate, r , is based on a ten-year period (i.e., $n = 10$), with the resulting projection ten years into the future. The projection period can be adjusted to fit other time frames. Nonlinear growth (i.e., exponential, where the population curves upward over time) can also be considered, such as follows.

$$P_{t+10} = P_1 (1 + r)^n$$

A related projection technique is to use regression analysis. The advantage of this method is that multiple historical census figures can be used in the analysis, and the analyst can also pursue nonlinear representations of population growth.

While these methods may provide a useful and “rough-and-ready” short-term projection, they do not reference population processes and are therefore subject to the same problems as discussed with population estimates, namely that the growth rate, r , is valid into the future.

Oftentimes, these methods are used to project populations for some total population, such as a country or state. They can

also be applied to multiple subpopulations, which raise an interesting accounting issue. Suppose, for instance, that you have been requested to project the future populations of each state and that you know the overall national population. However, addition of each state population to find the national population would more than likely yield a national estimate that was different from the known estimate, meaning that the estimated state populations would need to be rescaled. This can be done through, for example, apportionment. In this case, the projected state populations can be multiplied by the known (current) state share of population. This is, however, a largely unsatisfactory measure, as it assumes that the proportional distribution of the population does not change over time.

Overall, these simple projection tools require limited information yet can assist in projecting the total population of a region. They do, however, come with drawbacks. First, they do not distinguish the components of population change, such as fertility, mortality, and migration, separately. Second, information about the age and gender structure of a population is frequently required, and these tools generally do not provide this level of detail. Third, the methods presented above assume that past trends will continue into the future, although short-term and long-term changes to the economy and changing personal preferences can influence future population structures.

COHORT COMPONENT MODELS

As a partial response to the criticisms of the above projection methods, we can turn to cohort component models. These models typically allow age-sex disaggregation of the population, along with the consistent

estimation of regional populations and the total population. Two principal concepts underlie the cohort component method. First, the population is typically divided into age and sex cohorts of like individuals. Second, the models focus upon components of change, with the population of each cohort subjected to fertility, mortality, and migration processes that advance the population and change its structure.

Assuming first a single-region cohort component model with no migration, the model can be defined using matrix notation as

$$p(t + n) = G^n p(t)$$

where $p(t)$ is a column vector of a age-sex groups within the population at time t , $p(t + n)$ is the projected population at time $t + n$, and G is a “growth” matrix containing birth rates and survival probabilities obtained from vital statistics. Note that birth rates are associated only with the child-bearing age groups, and all rates are assumed to remain constant throughout the projection. Multiplication of G by $p(t)$ projects the population forward in time, thus “aging” and “surviving” a population over time via extrapolation.

Multiregional cohort projection models use the cohort survival concept to age individuals from one age group to the next while extending the basic model by introducing interregional migration. In a two-region system, for example, each region is linked to each other via migration flows, such that out-migration from one region defines in-migration to the other. Like basic cohort projection models, multiregional population projection models typically involve determining the starting age-region distribution and age-specific regional schedules of mortality, fertility, and migration to which the multiregional population has been subjected during the past period.

Based upon the initial population, the projection procedure is identical to that described above, with fertility, mortality, and migration rates applied to the initial population and projected into the future.

While the matrix equation remains unchanged from that presented above, each of the matrices becomes increasingly complex as additional regions are added. For instance, population is subdivided into age groups, with each age group further subdivided by region. The structure of the growth matrix is also altered so that the age and location of individuals can be simultaneously modeled. As in the single-region model, the growth matrix is assumed to remain constant throughout the projection period. Commonly, the length of the projection period is equated with the width of the age group. That is, if the migration interval is five years (the interval used in the US, Canadian, and Australian censuses), the age group is defined by an interval of five years, as is the projection period. Therefore, the present number of ten- to fourteen-year-olds who are subjected to the appropriate rates defines the expected number of fifteen- to nineteen-year-olds in a population five years from now. Repeated multiplication of the matrix equation projects the population further into the future, so that projecting the population fifteen years into the future ($n = 3$) may be written as follows.

$$p(t + 5n) = G^3 p(t)$$

While these models are useful short-term projection devices, projections associated

with longer time horizons are questionable given the assumptions inherent within the models. Most models assume, for instance, that (1) the probability of movement between regions does not change over time; (2) the population is homogeneous, with each individual governed by the same set of probabilities; (3) the probabilities apply to a fixed time; and (4) the *Markov property* holds, which assumes that the probability of migrating between two areas is dependent only upon the current location.

Clearly, most of these assumptions are unrealistic. First, the stationarity of migration rates over the life of the projection is unlikely, given that different groups (i.e., blacks and whites, immigrants and the native-born) will have differential migration probabilities. Moreover, migration probabilities should reflect shifting economic opportunities or amenities and the general aging of the population. Second, the Markov property assumes that the probability of migration is dependent only upon the current location. In other words, previous locations and behavior do not influence current migration decisions. While simplifying the modeling task, the Markov assumption is problematic given the high mobility of most individuals. The return migration literature,³ for example, is well documented, with returns to a “home” region invoking the importance of prior migration experiences. Despite these problems, long-term projections utilizing this method offer insight as to where the population is headed, *if* present demographic rates are to hold over the longer term.

Chapter Two

Population Data

What Is a Population?

Types of Data

Data Sources

Data Quality

Conclusion

Study Questions

Focus: Census Data and the American Community

Survey (ACS)

Methods, Measures, and Tools: Working with Data

DATA IS THE CORNERSTONE of demographic and population analyses. The existence of high-quality, publicly released data files enables much of this research, with the use of such data often accompanied by theoretical approaches commonly grounded in positivistic science, the goal of which is to verify (or falsify) empirical observations and to construct laws that can be generalized to a wide variety of models and theories. However, their use can also be problematic. In part, such data files are often considered incomplete. For example, they often miss details and the motivations for migration, immigration, and assimilation and instead rely upon empirically quantifiable notions of movement, acculturation, and statistical inference. Even the immigrant population is typically broadly defined and fails to distinguish between legal immigrants, illegal entrants, and refugees. Likewise, few data files detail the motivations for fertility choice. Perhaps not surprisingly, questions have arisen over the continued use of public data files and positivistic methods as a primary insight into population questions at the personal and societal levels.

Data differs in its content (what variables or constructs are included in the data), quality (how representative is it of the population), timeliness (what time period does it cover, or how related is it to specific events), coverage (geographic area), and availability (whether the analyst can access the data). Given that each of these are important issues that can affect the analysis and interpretation of the data, it is useful to spend some time discussing alternate data

sources. This chapter presents and discusses different types of data. It begins by differentiating between populations and samples before discussing both qualitative and quantitative data, their sources, issues of data quality, and the benefits and costs of each type of data. The “Focus” section examines the US census and the American Community Survey (ACS), and the “Methods, Measures, and Tools” section discusses working with data.

WHAT IS A POPULATION?

Before going too far, we should define what we mean by population, as it is a word that can be used to describe various concepts, with a biologist’s definition differing from that of a population geographer, by whom it is usually used to define a group of people. So far in this text, the concept has been generally used to describe the population of the world, a country, a city, or some other geographic unit. A population could equally represent people in a class at school, the population of juniors on campus, or the entire campus population. Regardless, each population has some boundary that defines who is included in the population (and equally important, who is excluded from it) or a common, shared characteristic (i.e., students in the class), so that the definition may be as precise as possible by either including or excluding individuals from the population. If, for example, our population is that of New York, we also need to specify what we mean by “New York.” Without a geographical reference, answers that include the state, New York City, or the New York metropolitan area would be equally correct, yet each gives a very different answer. We must also consider the time period we are looking at. Are we, for instance, interested in the population of New York in 1900 or 2010, or somewhere between these two dates? The inclusion of time in the definition can make population a dynamic or changing concept.

While the intent is to carefully define what we mean by population, it is often difficult or impractical to work with a complete population, particularly if we are dealing with something as large as the population of a country. The numbers may be too large, the logistics too great, or the price tag too outrageous to count everyone on our own. Imagine, for instance, trying to count everyone in New York or another metropolitan area, and to also get them to answer questions on age, marital status, family size, education, mobility, and so on at the same time! The US Census Bureau does this every ten years with its decennial census (see “Focus”), but it is a huge, massive, and costly undertaking.¹ The 2020 census, for example, is projected to cost about \$151 per household compared to \$96 per household in 2010, making it the most expensive census ever!² As an alternative, population geographers will frequently use *samples* to represent a population. Samples may be representative of the population, such as

the American Community Survey or the Public Use Microdata Sample (PUMS), which is a 1 or 5 percent sample of the population based on the census. Samples such as these accurately reflect the structure and composition (age, gender, income, education, etc.) of a population and can be inflated with the use of sample weights (a concept that essentially means one respondent in the sample is representative of a larger number of people in the population) to yield the actual population size for a specific geography. Samples may also be nonrepresentative or purposive in nature, such that the researcher includes individuals of particular interest, such as new immigrants, older migrants, or women from a particular ethnic group. In such cases, results cannot be generalized or transferred to a larger population, as they are often specific to the group that is studied,³ but fill the particular role needed by the researcher.

TYPES OF DATA

Generally speaking, there are two broad classes of data. *Primary data* refers to data that is collected by the researcher. It is usually collected one time only, is likely confined to a particular geographical area, and is typically a relatively small sample reflecting a particular problem or issue. While primary data can be costly and time consuming for the researcher to collect and produce, it is usually flexible in that the researcher can define the questions and content of the survey along with the sampling frame—or how individuals are selected—to suit the particular needs or research questions.

Secondary data reflect data that has been collected by an organization, government body, or someone else using predefined questions, sampling frame, and geographic area. This data has also been typically checked, verified, and “cleaned,” so that it is ready for public use. Advantages of such data sets are their (often) national representation and the detailed, robust sampling methodology that is used to construct the sample, so that data users can be assured of the representativeness of the sample: that it accurately represents the population it is based on. Sources of secondary data include, but are not limited to, formal statistical agencies such as the US Census Bureau, Bureau of Labor Statistics, or other national or international statistical agencies, with statistical agencies such as Statistics Canada or the US Census Bureau offering a number of different data sources, including censuses, labor force surveys, and health surveys. In the United States, data files include the census and the Current Population Survey (CPS) and longitudinal files such as the Population Survey of Income Dynamics (PSID), the National Longitudinal Survey of Youth (NLSY), and the ACS, which has replaced the decennial census “long form.”

Both primary and secondary data sources can include qualitative and quantitative data. Qualitative data consists of nonnumerical information and may be

obtained through case studies, open-ended interviews, focus groups, participant observation, or diary methods. Participants may, for example, be asked for an oral history of their moves, including the reasons for moving and their destination choice and other related questions. Typically, these oral histories provide a rich understanding of the process in question but are also limited in terms of their ability to generalize findings beyond the sample or context of the analysis, given that they are often based on a small sample size. In contrast, quantitative data is numerical and includes counts, such as the number of people by age and gender in a specific area, measures of their educational attainment, place of residence and mobility data, and other socioeconomic or sociodemographic details. From these, rates, proportions, and other measures can be generated through statistical means to describe the population of interest.

DATA SOURCES

Geographers are often interested in such things as population structure and composition, transportation, population-environment issues, and population health. To understand, comment on, and offer solutions to these problems means that appropriate data is important. Where can population geographers turn to find the data and how “good” must data be to answer these questions? We can consider five main data sources: censuses, representative sample surveys, vital/civil registrations, indirect sources, and primary data that are collected by the analysts themselves.⁴

Census Data

The census—defined as the collection of demographic, economic, and social data pertaining to a particular time and country—is perhaps one of the best known and most used sources of population data. Counting or enumerating every individual in a population, the census offers a “snapshot” of a population at a particular time. In counting people, most censuses allocate them to their usual place of residence. These so-called *de jure* censuses differ from *de facto* censuses, which allocate people to their location at the time of enumeration. That is, if a person who works in Chicago, Illinois, but lives in Gary, Indiana, were enumerated at work, they would be allocated to Chicago based on the *de facto* method but Gary based on the *de jure* method. *De jure* censuses are preferred as they provide a better indication of the permanent population in an area. In most cases, basic demographic and social characteristics of each person are also collected, including age, gender, marital status, household structure, educational attainment, and income. In addition, other household

characteristics may be collected, such as type of dwelling, occupation, and ethnic origin of respondents. In most cases, people are counted at their usual place of residence.

The widespread use of census data and other public data is due in large part to their validity and the degree of geographic, social, and economic detail embedded in the files (figure 2.1). Moreover, the growth of data has corresponded to increasing computational abilities and a refinement and broadening of the analytical tools used within population research, including the ability to test hypotheses through inferential techniques and gain insight into the causes and consequences of population movement. Not surprisingly, therefore, censuses represent a primary data source used by many population geographers. In the United States, the census has been carried out every ten years since 1790 (in years ending in 0), while Canada collects its census every five years (in years ending in 1 and 6). Both originated with the simple need to have a count of the population but evolved to collect information relating to a variety of population characteristics. Most other nations also carry out censuses, although data quality and timing will vary.⁵

Representative Sample Surveys

Representative sample surveys are another source of population data, including national, regional, or state/province representative sample surveys that collect population information on individuals or households. A representative data source allows the user to draw generalized conclusions. These surveys do not have to focus exclusively on population topics to provide useful information. For example, in addition to running the census program, Statistics Canada runs a number of nationally representative data collection tools, including health, immigration, and youth surveys. While not meant to be population counts, these data sources provide background population characteristics, including age, location, gender, income, educational attainment, and household structure, to name a few. Other representative data sources that are frequently referenced by population geographers include other data files from the US Census Bureau, such as the ACS, which was designed to replace the census long form (see “Focus”), and the CPS. The CPS is a monthly survey of the American population and is the primary source of information on the labor force characteristics of the US population.

Vital Registrations

Vital registrations or civil registration systems record demographic events such as births, deaths (including cause of death), marriages, divorces, and population movements and provide yet another source of demographic data. Mortality

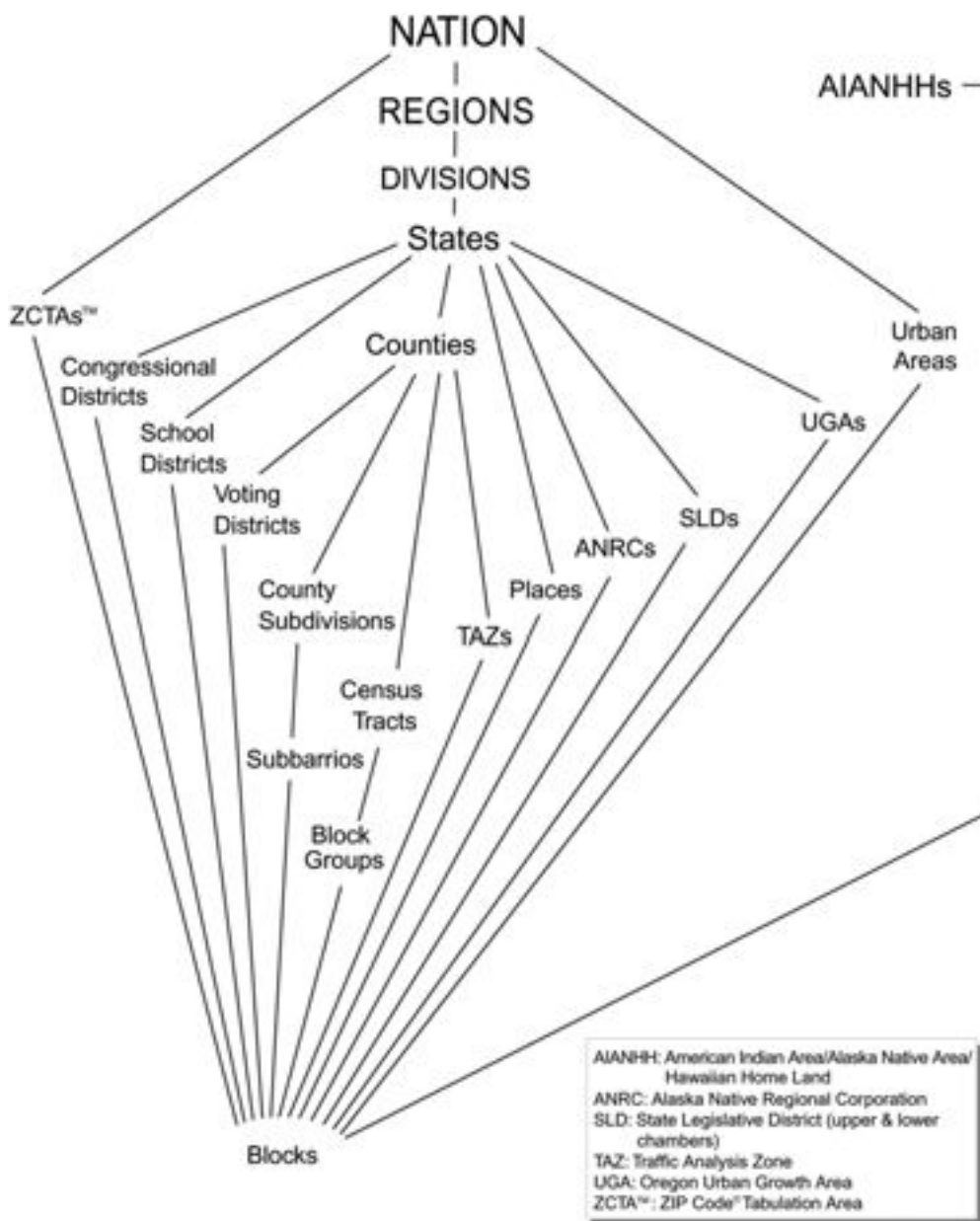


Figure 2.1 The Hierarchy of Census Geographic Areas

Source: "Appendix A: Census 2000 Geographic Terms and Concepts," US Census Bureau, <http://www.census.gov/geo/www/tiger/glossry2.pdf>.

statistics are, for example, used in population projections to calculate the probability of surviving into a future period of time, while information on cause of death can be used to protect the health of communities. Most countries have legal provisions within their constitutions to ensure that vital events are recorded, although the type of information that is registered will vary from country to country, with vital registration systems more expansive (i.e., capturing population mobility in addition to births and deaths) in several European countries.

Other Secondary Data Sources

Beyond the census and its related products, numerous other secondary data sources are available for use by population geographers. In the United States, for example, agencies such as the Departments of Health and Education and the Bureau of Labor Statistics (BLS) also commonly collect statistics that either directly or indirectly provide population data. The Internal Revenue Service (IRS) also publishes migration data based on the addresses of tax filers, which allows the mobility of the taxpaying public to be tracked from year to year.⁶ Immigration statistics (including refugee and asylee numbers) can be sourced from the Department of Homeland Security, and comparative international data can be sourced from Integrated Public Use Microdata Series (IPUMS) International, the PRB, and various United Nations agencies.⁷ In addition, other agencies or organizations, such as the World Health Organization (WHO), the UN, and country-specific statistical agencies, collect and disseminate population data, and the Center for International Earth Science Information Network (CIESIN) has interesting data applications, including a “census by satellite.”⁸

Analysts may also turn to less conventional secondary data sources for population information. One such use of these sources is illustrated by Foulkes and Newbold,⁹ who turned to data from local school boards and utility companies to measure mobility in small rural communities. In this case, data from the US Census Bureau was dated or was not available at the scale of analysis (small rural villages) used in the study. School board data was drawn from the Illinois State Board of Education’s School Report Card file, which provided mobility and poverty data for each school district and individual school in the state, from which mobility rates could be calculated based on movement of students in and out of the school district. In addition, and as a potentially more inclusive source capturing mobility across all households (as opposed to just those with children in the school system), sewage-billing records were used to provide additional insight into local mobility, with change in billing name associated with movement into or out of the community. Although the use of this data allowed an analysis of population mobility among a subgroup of people (rural poor

migrants) that was otherwise missing from both the literature and from other data sources, it also illustrated the issues of using indirect sources, including data quality, comparability, replication, costs, and moral and ethical concerns.

Individualized Data Sets

In some cases, data from secondary sources is insufficient. Data may, for example, be outdated (as it was in the example above). Data may also miss or lack sufficient numbers for a particular population group or represent the wrong geographical scale. In each case, the researcher may be forced to construct her or his own data set(s). These “personalized” data sets offer a number of advantages, including enabling the researcher to select the sampling scheme, define the geographic scope and range of questions that are to be used, and include both qualitative and quantitative components in the research. Of course, there are also drawbacks to individual data sets. Most research questions or scripts will need to be vetted by institutional review boards, and researchers need to be aware of confidentiality and privacy issues. Although this is far from insurmountable, researchers need to ensure that quantitatively based samples will be sufficiently large or generalizable if they want to do statistical analysis or generalize to a larger population. Although the intent of qualitative studies is not to arrive at generalized conclusions, the collection, transcription, and coding of both quantitative and qualitative data can also be costly and time consuming. The rewards, in terms of a data set that fits exactly the researcher’s needs, can be large.

DATA QUALITY

Not all data sources are created equal, and they will differ in terms of their universality, quality, spatial scope, generalizability, validity, reliability, and replicability. In any data set, errors can be introduced in multiple ways, including the data collection process itself. For a census to be universal, everyone must be counted, but problems arise when some individuals or groups, such as the homeless, are difficult to count or refuse to be counted. For example, while there is always some undercount in any census, a postcensus survey of the 1990 US census found that approximately four million people were missed. Populations were undercounted at different rates, with greater undercounting among the homeless, minority males in poverty, and Native Americans.¹⁰ Underenumeration was particularly significant for cities. Apportionment of congressional seats and legislative redistricting was also affected by the undercount. Local governments demanded (and received) population recounts, as federal transfers were reduced given the underestimated population sizes.

Respondents may also introduce errors into the data, affecting its quality. In some cases, respondents may not answer a question or set of questions, with questions regarding income often poorly answered. In other cases, individuals may attempt to deceive or provide answers that they feel are socially appropriate rather than their own. Famous among respondent (mis)information is age, with many tending to provide a younger age than reality. Likewise, questions related to past events are subject to “recall bias,” such that facts, dates, or events are not recalled with complete accuracy and are dependent upon memory. In fact, most any question may be subject to some respondent bias, and a large literature exists on how best to construct and implement a survey.¹¹ Common issues also include the incorrect recording or transcribing of information or incorrect phrasing of questions. There was much discussion, for example, over the phrasing of the “come to stay” question for immigrants in the 1990 US census, with the question variously interpreted to mean the person’s first entry into the United States, when they received permanent residency, or ultimately when they received US citizenship.¹² For researchers interested in immigration and adjustment, the timing differences can have significant implications! Finally, statistical agencies themselves may alter data quality by suppressing data, particularly for small populations or small areas, where data may be suppressed to protect confidentiality. The ACS (see “Focus” section), for example, only releases data for small geographic areas based on five-year rolling averages. In comparison, data for larger units will be released yearly.

For a geographer, space and its definition are often key. For those wishing to compare phenomena across space, representative data sources or census files offer a pragmatic solution: to generate space through a custom survey is probably time and cost prohibitive! But, if the analyst is interested in a particular locale or space, especially those for which formal data is inadequate or not available, individual one-time surveys are often best. For instance, a researcher interested in neighborhoods may need to use census-defined tracts to proxy the neighborhood.¹³ But, given the spatial variability of census tracts, particularly in rural or less dense areas, and the variability with which people define their neighborhood, this definition may be wholly inadequate.

As such, and despite the availability of a broad variety of data sources, caveat emptor (buyer beware) applies. Analysts should be careful to note whether data sources are nationally (or regionally) representative. Similarly, do vital registration systems capture all the data? For instance, births and deaths (particularly infant deaths) may not be reported, and causes of death may be mislabeled, incorrect, or missing. In general, completeness of registration is fairly high in the developed world; in some South American countries, including Argentina, Chile, and Colombia; and in some Asian countries, including China, Sri Lanka, South Korea, and Japan. However, vital registration systems in most sub-Saharan African countries do not adequately or completely collect information on vital events.

CONCLUSION

In recent years, the abundance of secondary data sources has enabled geographers and other social scientists to make important contributions to understanding the demographic trends that shape our societies. The widespread use and availability of census and other public data are due in large part to their validity and the degree of geographic, social, and economic detail embedded in the files. The growth of data has also corresponded to new computational abilities and a refinement and broadening of the analytical tools used within population research. Moreover, given the geographer's interest in space and spatial relationships, the use of such large data files is therefore somewhat pragmatic: generating "space" through other means, such as individual one-time surveys, is typically cost (or time) prohibitive, as the sample size either needs to be large to adequately represent a particular location or needs to be replicated across space to capture spatial differences. This has not, of course, stopped researchers from constructing their own data sets or relying on qualitative data to understand demographic processes. In fact, these data sources should be seen as complementary rather than competitive, allowing different approaches and insights into population processes.

STUDY QUESTIONS

1. What are the advantages of having a youthful population?
2. Selecting a country other than your own, identify and describe the data sources that would be available to describe (1) fertility, (2) mortality, and (3) migration processes and patterns in that country. How does the quality of data differ from that found in the United States or other developed countries?
3. Population geographers frequently use statistical data and methods. How might a qualitative geographer look at population composition?

FOCUS: CENSUS DATA AND THE AMERICAN COMMUNITY SURVEY (ACS)

THE CENSUS

Censuses serve as a tool to count the population and ascertain its basic makeup. Many nations conduct censuses (counts) of their populations as tools to allocate

government seats, funding, or other resources. Mandated by the United States Constitution, the first US census was conducted in 1790 and has been collected every ten years since then. The information collected by the Census Bureau is then

used to distribute congressional seats and federal funds and to make decisions at every level of government.¹

While the US census originated as a simple population count, it evolved over the years to include a variety of related population questions beyond age, gender, and address. In addition, a proportion of the population in the United States was frequently asked to complete the so-called census long form. Answered by approximately one in six people, the long form included detailed socioeconomic and sociodemographic questions, including schooling and education, income, housing type, citizenship, immigration status, ethnicity, and race of all respondents in the household. This data is typified by the Public Use Microdata Sample (PUMS), published by the US Census Bureau. PUMS files are large, representative samples (1 or 5 percent) of the US population based upon the decennial census.

The main advantage of working with a file like the PUMS is the detail embedded in the files and the ease of generating population statistics such as migration numbers, flows, and net migration rates at a variety of spatial scales. Another significant advantage is the size. The fact that the PUMS is representative of the entire US population enables generalizability, validity, reliability, and replicability of analyses. Analyses can, for example, be replicated across space and time, such that changes in the structure or makeup of a population can be observed and tracked over time. For geographers interested in population mobility and migration, the PUMS also included a question on place of residence five years ago. First appearing in the 1940 census, it provided a measure of the mobility of the US population by contrasting place of residence at the time of the census with place of residence five years earlier, allowing a window into

the migration habits of the population. In addition, the census includes information on nativity (immigrant or nonimmigrant) and period of entry into the country, which enables analysis of the mobility and economic characteristics of the foreign-born population.

While data files such as the PUMS provide detailed snapshots of the total population, secondary data sources have their limits. Oftentimes, key assumptions regarding relationships, measures, or definitions within the data must be made in order for the analysis to proceed. Because of their nature, analyses of secondary data files are often constrained by the data contained within them. For example, although the US census asks about immigrant status, it does not include information on whether an immigrant is legal or illegal. Thus, secondary data files typically offer little flexibility in defining variables or constructs.² Second, much of the information collected by the decennial census is quickly outdated. In effect, the census provides a snapshot of the population at one point in time on census day, while missing changes to the population that happened in the intervening years. Third, although long-term census data is available, with census files dating to 1850 available from the Integrated Public Use Microdata Series USA (IPUMS-USA),³ the data is not always comparable. If the researcher is interested in comparing populations across time, changes in variable definitions (i.e., the changing nomenclature for cities or occupation codes) or the introduction/rephrasing/removal of questions to surveys complicates analyses. The comparatively new National Historical Geographic Information System (NHGIS)⁴ provides US census data from 1790 onward and helps to overcome the data comparability issue. Its greatest value may be the inclusion of "historical GIS," which provides shapefiles for

geographic areas based upon each census, such that population characteristics can be compared over time.

Demographers and other social scientists have long relied on the census for their research, providing detailed demographic and socioeconomic information. But governments have increasingly stepped back from collecting data associated with the census. Given budget issues and congressional concerns with the invasiveness of questions in the census long form, the 2000 census in the US was the last time the long form would be used.⁵ The 2010 census returned to the more simple idea of a population count, collecting just name, age, sex, date of birth, race, ethnicity, relationship, and housing tenure. Citing privacy concerns, the Canadian government also dropped the long form with its 2011 census, opting instead to perform a simple count of the population. In the Canadian case, the long form was replaced with a voluntary National Household Survey (NHS), which was designed to collect more detailed information on respondents.⁶ Due to its voluntary nature, the NHS will not be comparable to previous census data and will likely undercount the most vulnerable members of the population, including new immigrants and low-income households. Rather than collecting detailed information on their populations, governments are proposing that administrative data, drawn from tax records or other government and public data sources, be used instead. The UK, for example, has announced that the 2021 census would likely be dropped and replaced by administrative data. Still within the UK, a number of different data sources including the National Health Service (NHS), electoral role, Driving and Licensing Agency, school census, birth and death registrations, and Revenue and Customs (i.e., taxation) could all be used as sources of data.⁷ In addition,

commercially available surveys could also be used as data sources. However, in the move to use administrative data, questions regarding its representativeness, quality, and what exactly would be collected (and by whom) remain unknown.

THE AMERICAN COMMUNITY SURVEY

More detailed demographic information will be based on the ACS, which is perhaps the best known and one of the largest examples of a representative data source.⁸ Meant to replace the information typically collected on the census long form, the ACS provides current and up-to-date population estimates, along with estimates of demographic, economic, social, and housing characteristics of the US population at various levels of geography.⁹ While it is not designed to count the population, it does provide an estimate of what the population looks like each year through the use of statistical sampling, surveying approximately one in forty households each year, with addresses selected at random and representing other addresses in the community (figure 2F.1).

For large geographies such as states or large metropolitan areas, population estimates will be released on a yearly basis. Given the sample size involved, population estimates for smaller geographies will be based on rolling averages. For small areas with a population less than twenty thousand, population estimates will be based on five-year averages. Areas with a population of twenty thousand to sixty-five thousand will be based on three-year averages¹⁰ with these rolling averages updated yearly. Similarly, population characteristics may pose problems for the release of the data, and releases may be forced to the five-year cycle. For instance, in areas with small

ethnic or racial groups, the numbers may be too small to release yearly.

The ACS provides a number of advantages over the census long form, with the most significant advantage being the timeliness of the data. For instance, ACS data means that population counts are updated on a yearly basis for large metropolitan areas (up to five years for smaller metropolitan areas) rather than every ten years based on the census. In addition, migration is measured through a question asking place of residence one year ago. This means that migration researchers are able to accurately evaluate yearly migration data on an ongoing basis. In comparison, the census bases its migration question on place of residence five years prior to census day, meaning that the actual migration might have happened up to ten years before the data is released! Second, the ACS allows more up-to-date information on the characteristics of the population relative to the demographic event. For instance, the census measured sociodemographic and socioeconomic information at census day, but might be five years beyond the migration event and therefore outdated. In contrast, migration events and demographic or economic characteristics are more tightly matched in the ACS, so that the person moving for educational reasons will be more closely correlated with the migration event itself. Third,

the ACS eliminates the gap in migration data. That is, migration data based on census returns has only been available for the second half of the decade, so that migrations in the first five years of each decade are missed. With the ACS, migration is tracked every year.

For the population geographer interested in migration, the ACS also poses significant new analytical questions and problems.¹¹ For instance, by comparing place of residence on census day and five years prior, the old long form provided a consistent definition and timeframe of migration. The ACS, however, compares place of residence on the day the form is completed relative to where the respondent lived a year earlier. In this way, the window for migration (one year) is significantly less than with the long form (five years), and the timing of the migration is variable from one respondent to the next. So two respondents in the same community may complete the ACS at two very different times in the same calendar year, and the relative timing of their migrations could reflect vastly different economic opportunities. In addition, comparison of migration totals from the two sources will be problematic, since the number of migrants recorded over a five-year interval is considerably less than five times the one-year number,¹² and the two totals cannot be easily reconciled.¹³

Person 1

(Person 1 is the person living or staying here in whose name this house or apartment is owned, being bought, or rented. If there is no such person, start with the name of any adult living or staying here.)

1 What is Person 1's name?
 Last Name (Please print) First Name MI

2 How is this person related to Person 1? Mark (X) ONE box.
☐ Person 1
☐ Husband or wife
☐ Biological son or daughter
☐ Adopted son or daughter
☐ Stepson or stepdaughter
☐ Brother or sister
☐ Father or mother
☐ Grandchild
☐ Parent-in-law
☐ Son-in-law or daughter-in-law
☐ Other relative
☐ Roomer or boarder
☐ Housemate or roommate
☐ Unmarried partner
☐ Foster child
☐ Other nonrelative

3 What is Person 1's sex? Mark (X) ONE box.
☐ Male ☐ Female

4 What is Person 1's age and what is Person 1's date of birth?
 Please report babies as age 0 when the child is less than 1 year old.
 Print numbers in boxes.
 Age (in years) Month Day Year of birth

NOTE: Please answer BOTH Question 5 about Hispanic origin and Question 6 about race. For this survey, Hispanic origins are not races.

5 Is Person 1 of Hispanic, Latino, or Spanish origin?
☐ No, not of Hispanic, Latino, or Spanish origin
☐ Yes, Mexican, Mexican Am., Chicano
☐ Yes, Puerto Rican
☐ Yes, Cuban
☐ Yes, another Hispanic, Latino, or Spanish origin - Print origin, for example, Argentinian, Colombian, Dominican, Nicaraguan, Salvadoran, Spaniard, and so on.

6 What is Person 1's race? Mark (X) one or more boxes.
☐ White
☐ Black, African Am., or Negro
☐ American Indian or Alaska Native - Print name of enrolled or principal tribe
☐ Asian Indian ☐ Chinese ☐ Filipino ☐ Other Asian - Print race, for example, Hmong, Laotian, Thai, Pakistani, Cambodian, and so on.
☐ Japanese ☐ Korean ☐ Vietnamese ☐ Native Hawaiian ☐ Guamanian or Chamorro ☐ Samoan ☐ Other Pacific Islander - Print race, for example, Fijian, Tongan, and so on.
☐ Some other race - Print race

Person 2

1 What is Person 2's name?
 Last Name (Please print) First Name MI

2 How is this person related to Person 1? Mark (X) ONE box.
☐ Husband or wife
☐ Biological son or daughter
☐ Adopted son or daughter
☐ Stepson or stepdaughter
☐ Brother or sister
☐ Father or mother
☐ Grandchild
☐ Parent-in-law
☐ Son-in-law or daughter-in-law
☐ Other relative
☐ Roomer or boarder
☐ Housemate or roommate
☐ Unmarried partner
☐ Foster child
☐ Other nonrelative

3 What is Person 2's sex? Mark (X) ONE box.
☐ Male ☐ Female

4 What is Person 2's age and what is Person 2's date of birth?
 Please report babies as age 0 when the child is less than 1 year old.
 Print numbers in boxes.
 Age (in years) Month Day Year of birth

NOTE: Please answer BOTH Question 5 about Hispanic origin and Question 6 about race. For this survey, Hispanic origins are not races.

5 Is Person 2 of Hispanic, Latino, or Spanish origin?
☐ No, not of Hispanic, Latino, or Spanish origin
☐ Yes, Mexican, Mexican Am., Chicano
☐ Yes, Puerto Rican
☐ Yes, Cuban
☐ Yes, another Hispanic, Latino, or Spanish origin - Print origin, for example, Argentinian, Colombian, Dominican, Nicaraguan, Salvadoran, Spaniard, and so on.

6 What is Person 2's race? Mark (X) one or more boxes.
☐ White
☐ Black, African Am., or Negro
☐ American Indian or Alaska Native - Print name of enrolled or principal tribe
☐ Asian Indian ☐ Chinese ☐ Filipino ☐ Other Asian - Print race, for example, Hmong, Laotian, Thai, Pakistani, Cambodian, and so on.
☐ Japanese ☐ Korean ☐ Vietnamese ☐ Native Hawaiian ☐ Guamanian or Chamorro ☐ Samoan ☐ Other Pacific Islander - Print race, for example, Fijian, Tongan, and so on.
☐ Some other race - Print race

Figure 2F.1a The 2008 ACS Questionnaire

Source: US Census Bureau.

Housing

Please answer the following questions about the house, apartment, or mobile home at the address on the mailing label.

1 Which best describes this building? Include all apartments, flats, etc., even if vacant.

☐ A mobile home
☐ A one-family house detached from any other house
☐ A one-family house attached to one or more houses
☐ A building with 2 apartments
☐ A building with 3 or 4 apartments
☐ A building with 5 to 9 apartments
☐ A building with 10 to 19 apartments
☐ A building with 20 to 49 apartments
☐ A building with 50 or more apartments
☐ Boat, RV, van, etc.

2 About when was this building first built?

☐ 2000 or later - Specify year:
☐ 1990 to 1999
☐ 1980 to 1989
☐ 1970 to 1979
☐ 1960 to 1969
☐ 1950 to 1959
☐ 1940 to 1949
☐ 1939 or earlier

3 When did PERSON 1 (listed on page 2) move into this house, apartment, or mobile home?

Month: Year:

Answer questions 4 - 6 if this is a HOUSE OR A MOBILE HOME; otherwise, SKIP to question 7a.

4 How many acres is this house or mobile home on?

☐ Less than 1 acre - SKIP to question 6
☐ 1 to 9.9 acres
☐ 10 or more acres

5 IN THE PAST 12 MONTHS, what were the actual sales of all agricultural products from this property?

☐ None
☐ \$1 to \$999
☐ \$1,000 to \$2,499
☐ \$2,500 to \$4,999
☐ \$5,000 to \$9,999
☐ \$10,000 or more

6 Is there a business (such as a store or barber shop) or a medical office on this property?

☐ Yes
☐ No

7 a. How many separate rooms are in this house, apartment, or mobile home? Rooms must be separated by built-in archways or walls that extend out at least 6 inches and go from floor to ceiling.

+ INCLUDE bedrooms, kitchens, etc.
 + EXCLUDE bathrooms, porches, balconies, foyers, halls, or unfinished basements.

Number of rooms:

b. How many of these rooms are bedrooms? Count as bedrooms those rooms you would list if this house, apartment, or mobile home were for sale or rent. If this is an efficiency/studio apartment, print "0".

Number of bedrooms:

8 Does this house, apartment, or mobile home have -

	Yes	No
a. hot and cold running water?	<input type="checkbox"/>	<input type="checkbox"/>
b. a flush toilet?	<input type="checkbox"/>	<input type="checkbox"/>
c. a bathtub or shower?	<input type="checkbox"/>	<input type="checkbox"/>
d. a sink with a faucet?	<input type="checkbox"/>	<input type="checkbox"/>
e. a stove or range?	<input type="checkbox"/>	<input type="checkbox"/>
f. a refrigerator?	<input type="checkbox"/>	<input type="checkbox"/>
g. telephone service from which you can both make and receive calls? Include cell phone.	<input type="checkbox"/>	<input type="checkbox"/>

9 How many automobiles, vans, and trucks of one-ton capacity or less are kept at home for use by members of this household?

☐ None
☐ 1
☐ 2
☐ 3
☐ 4
☐ 5
☐ 6 or more

10 Which FUEL is used MOST for heating this house, apartment, or mobile home?

☐ Gas: from underground pipes serving the neighborhood
☐ Gas: bottled, tank, or LP
☐ Electricity
☐ Fuel oil, kerosene, etc.
☐ Coal or coke
☐ Wood
☐ Solar energy
☐ Other fuel
☐ No fuel used

Figure 2F.1b The 2008 ACS Questionnaire

Source: US Census Bureau.

METHODS, MEASURES, AND TOOLS: WORKING WITH DATA

Good research should always be based on properly devised research questions that address gaps in the literature and are guided by appropriate theoretical foundations. At the same time, theoretical perspectives, methods, and data are also key to good research. While good data can help inform results, it does not guarantee “good” results. Likewise, researchers must use the appropriate methods to uncover what the data illustrates. Again, however, the choice of the research method or tool can alter results, even to the point of biasing outcomes and conclusions! In short, while we can use the analogy of “garbage in equals garbage out” (by substituting data/methods for garbage), we could have good data (methods) but still get garbage results if we haven’t used it properly or haven’t used the appropriate method.

THEORETICAL PERSPECTIVES

Regardless of the type of question to be addressed, theory is critical to providing a context for interpreting results and defining methods. If we take the example of migration, each individual migrant has his or her own reasons for migration, ranging from poverty and employment opportunities to amenities and health, with explanations encapsulated in various migration theories.¹ For instance, the human capital theory describes migration as an individual choice, with migrants treated as rational actors and able to look at various options, including origin and destination, wage rates, job security, and so on, while also accounting for the costs of migration. Alternatively, the *structural* perspective defines movement based

on the social, economic, and political structures that shape people’s lives, so that migrations are often forced.²

COLLECTING AND OPERATIONALIZING THE DATA

Following the research statement, one of the first tasks is to collect the appropriate data, a task that can be as complex as the actual use of the data. If a researcher is interested in a fairly specific segment of the population, such as young adults who are just leaving college, data collection may simply involve turning to existing data sources such as the census, downloading the data, and then defining the appropriate sample (i.e., by age). While the census is an easy data source to turn to, gathering data for the census is a complex task in itself. For instance, the 2000 census provided employment for some 860,000 temporary workers and was billed as “the largest peacetime mobilization of resources and personnel.”³ Preparations for the 2020 census have already begun and are divided into three phases: (1) research and testing in 2012 to 2014; (2) operational development and systems testing in 2015 to 2018; and (3) readiness testing, execution, and closeout in 2019 to 2023. The ultimate goal is to conduct the 2020 census at a lower cost than the 2010 census, while simultaneously enhancing the quality.⁴ To do this, fundamental changes must be made to reach the increasingly diverse American population, including gathering information using the Internet, reusing administrative data, and redesigning software to reduce staff time.⁵

For others, data must be collected through primary means such as surveys or interviews. If the latter, the sample must be identified and recruited (which individuals are asked to complete the survey and what is the sample structure—is it random? Snowball?, etc.)⁶ and then asked to complete the interview, survey, or whatever data collection tool is being used. Typically, if the researcher wants results that are generalizable, then the sample must be random and representative of the population of interest. In other cases, the researcher may want to oversample particular communities or groups to ensure adequate information, while randomness may not be an issue in other cases. Collected data must then be entered or transcribed and checked for entry errors. If it is quantitative data, it should also be checked for its representativeness of the population, which is usually done by comparing sample characteristics such as age and gender, along with such attributes as education and income, to known population values, such as those drawn from a census.

After this, we are nearly ready to start working with the data. So how do we operationalize the data and what analytical methods are best? If we are examining population movement, how we define population movement is critical and depends on the research questions as well as the data. For instance, the international migration/immigration literature distinguishes *temporary immigrations*, such as short-term relocations; *transnationalism*; or *permanent immigration*. Likewise, the domestic migration literature also distinguishes between seasonal moves, such as the seasonal movement of “snow birds” between colder and warmer climates, and local moves (i.e., city), regional moves (i.e., county), or moves between states/provinces. Other issues, including the length of interval over which

movement is captured (critical for looking at temporary migration); the size, shape, and characteristics of the receiving and sending regions; and the composition of the sample population, affect the analysis. As such, researchers must clearly define the population of interest.

METHODS

Research methods need to be defined, with researchers able to choose between a variety of different methods, selecting that which is best for their data. Qualitative data, for example, demand qualitative techniques, including the coding and interpretation of common themes or issues in the data,⁷ with this analysis embedded within appropriate theoretical perspectives. For example, Strauss and Corbin suggest proceeding through open, axial, and selective coding.⁸ Open and axial coding involve line-by-line coding of the data (microanalysis). During open coding, the data is examined and initial themes and concepts are generated. This process involves reading through each interview line by line looking for themes and concepts. Axial coding reexamines the themes and concepts identified within open coding by identifying their interrelationships (i.e., the networks and hierarchies that exist among and between them). Axial coding results in the development of an array of interrelationships between the various themes identified during open coding. In the final stage, selective coding is used to integrate and refine the categories and subcategories identified through open and axial coding. This requires the identification of central categories that represent the main theme of the research, which is defined as one that “has the ability to pull the other categories together to form an explanatory whole.”⁹

These central categories form the larger theoretical framework.

For the quantitative geographer, a series of tools are also available. Descriptive statistics, for example, including the calculation of means, standard deviations, or basic cross-tabulations, characterize the data and allow its exploration. Such descriptive analyses also provide a way to ensure that the sample is representative of the population of interest. While this stage is less crucial when using data files such as those from the US Census Bureau or Statistics Canada, which are representative of the population, it is key

for researchers using data they have collected themselves. Following the initial description of the data, the analyst may turn to other methods and techniques, including inferential and multivariate statistics. Geographic information systems and spatial analytical techniques, including mapping of data, understanding geographic trends in the data, and searching for clustering or hot spots, are also widely used. All bring statistical significance to the analysis and allow a better understanding of the data. Many of these techniques are discussed elsewhere in this text.

Chapter Three

Population Distribution and Composition

Population Distribution

Population Composition

Conclusion

Study Questions

Focus: The Changing Face of the US Population

Focus: Aging in China

Methods, Measures, and Tools: Life Tables

THERE IS IMMENSE VARIATION in the distribution and composition of societies, whether measured by age, ethnicity, race, or where people live, with the composition of a population playing a major role in guiding decisions about the provision of government and other services. Not surprisingly, population geographers are frequently called upon to describe the related concepts of population distribution and composition. Population distribution refers to the geographic pattern of the location of a population, including its density and where it lives, whereas population composition refers to the characteristics of the population in a given area.¹ This chapter explores the related topics of population distribution and composition. Its “Focus” sections look at the changing face of the population of the United States along with aging in China, while the “Methods, Measures, and Tools” section introduces the concept of life tables, a mathematical way of describing the shape and structure of a population.

POPULATION DISTRIBUTION

At a global and even national scale, populations are distributed unevenly. Large parts of the globe, including the North and South poles and deserts, are sparsely populated, providing harsh living conditions and few options for their

inhabitants in terms of livelihood and survival. Other areas, including agriculturally productive areas, are densely populated. Even in the United States, large parts of the interior plains are comparatively sparsely populated, with the population overwhelmingly located along the western and eastern seabords and Gulf Coast.

Geographers have a number of tools at their disposal to describe the observed distribution of a population. The most common representation of a population is the population size for a given geographic area (such as the state of Illinois), or the proportion of a population living in an area (the proportion of the US population that lives in the state of Illinois). Importantly, we need to clearly identify the population and area that we are trying to describe (see chapter 2). Most commonly, the population will be contained within some political unit, such as a census tract, neighborhood, city, state, or nation, so that reliable and meaningful statistics are available and referenced to a particular point in time. We may also be interested in defining a particular subpopulation, such as the number of African Americans or immigrants in a particular geographic area. While important enough on its own, the simple count tells us little about its geographic distribution or its composition. For greater information, we turn to other measures.

Population Density

A common measure of population distribution is *population density*, an expression of the degree to which a population is clustered within a given area j , expressed as

$$D_j = P_j / A_j$$

where P_j is the population (count) in area j and A_j is the geographic area of interest, usually defined as miles or kilometers squared. Clearly, this measure is a rough guide to how dense a population is. If we were to calculate the population density for Canada, for instance, we would arrive at a density of 3.5 people per square kilometer, giving it one of the lowest population densities in the world. However, the density of Canada's population varies dramatically, with the majority of Canada's population living within approximately two hundred kilometers of the US border, while parts of Canada's largest city—Toronto—have population densities in excess of one thousand per square kilometer.² As such, density is an incomplete measure of population distribution and reflects a number of physical factors, such as the availability of resources and suitability of climate, as well as human factors, such as social and economic resources. Nevertheless, density is commonly used to compare population distribution across countries or regions. Applying this measure at the global scale reveals striking contrasts in the population density of the

world's countries. Relative to Canada, the density of the United States is over ten times higher (32 people per square kilometer) (see figure 3.1), China's population density is 139, and Hong Kong has a population density of 6,403 per square kilometer.³

Maps

In addition to measures of population density, maps are frequently used to represent the distribution of a population, including dot and choropleth maps (figure 3.2). Dot maps, for instance, may be used to represent the distribution of a population. Typically, one dot is equated with the location of one person or a group of people across space. Choropleth maps, like figure 3.1, may also be used, with regions such as states or counties shaded relative to their population density (or other population attribute). In both cases, choices of scale, symbols, and other design issues, as well as the actual placement of dots, are important considerations when constructing the map.⁴

POPULATION COMPOSITION

In addition to the distribution of a population, population geographers are interested in its composition or characteristics. For instance, the composition of the population in a given city will be different from that of its surrounding rural area. Likewise, the composition of a suburban population will likely differ from that of the inner city, or differ from suburb to suburb. For this reason, the composition of a population is intrinsically linked to its distribution, a feature that is dependent on geography.

Population Pyramids

Population pyramids provide the analyst with a way of describing the sex and age composition of a population. Expressed graphically, the age of the population is placed on the vertical axis and the share (or number) of the population along the horizontal axis, with males typically shown on the left and females on the right. Typically (although not exclusively), five-year age groups are used in their construction, with an open-ended age group (i.e., eighty-plus) for the oldest segment of the population.

Construction and observation of the pyramid reveals a number of features of a population. First, age pyramids are generally wider on the bottom than on the top, an outcome of increasing mortality with increasing age and a characteristic of above-replacement fertility. Second, the base of the pyramid is typically wider for males than it is for females, reflecting the sex ratio at birth (see

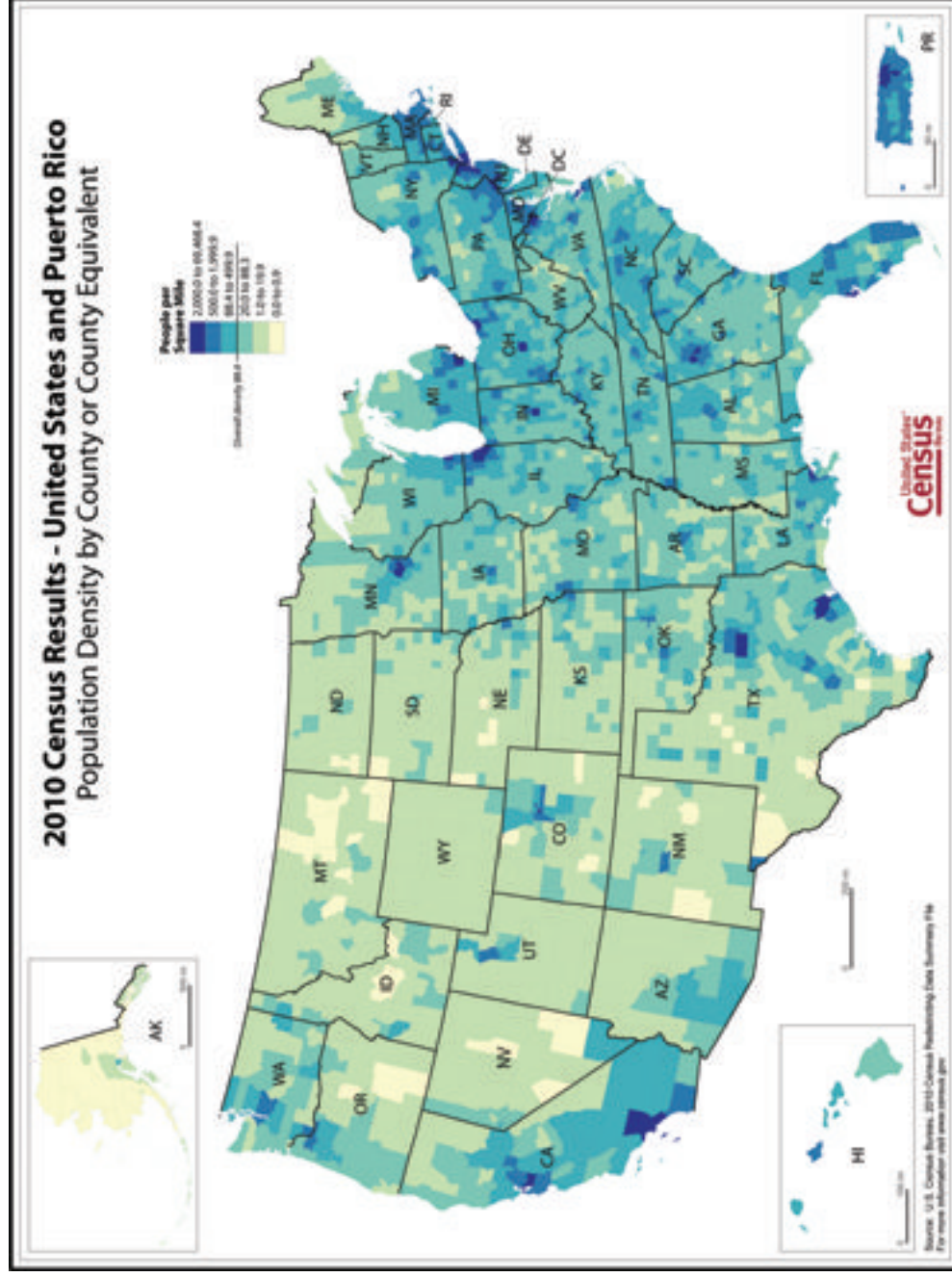


Figure 3.1 United States Population Density by County, 2010

Source: Data derived from the US Census Bureau.

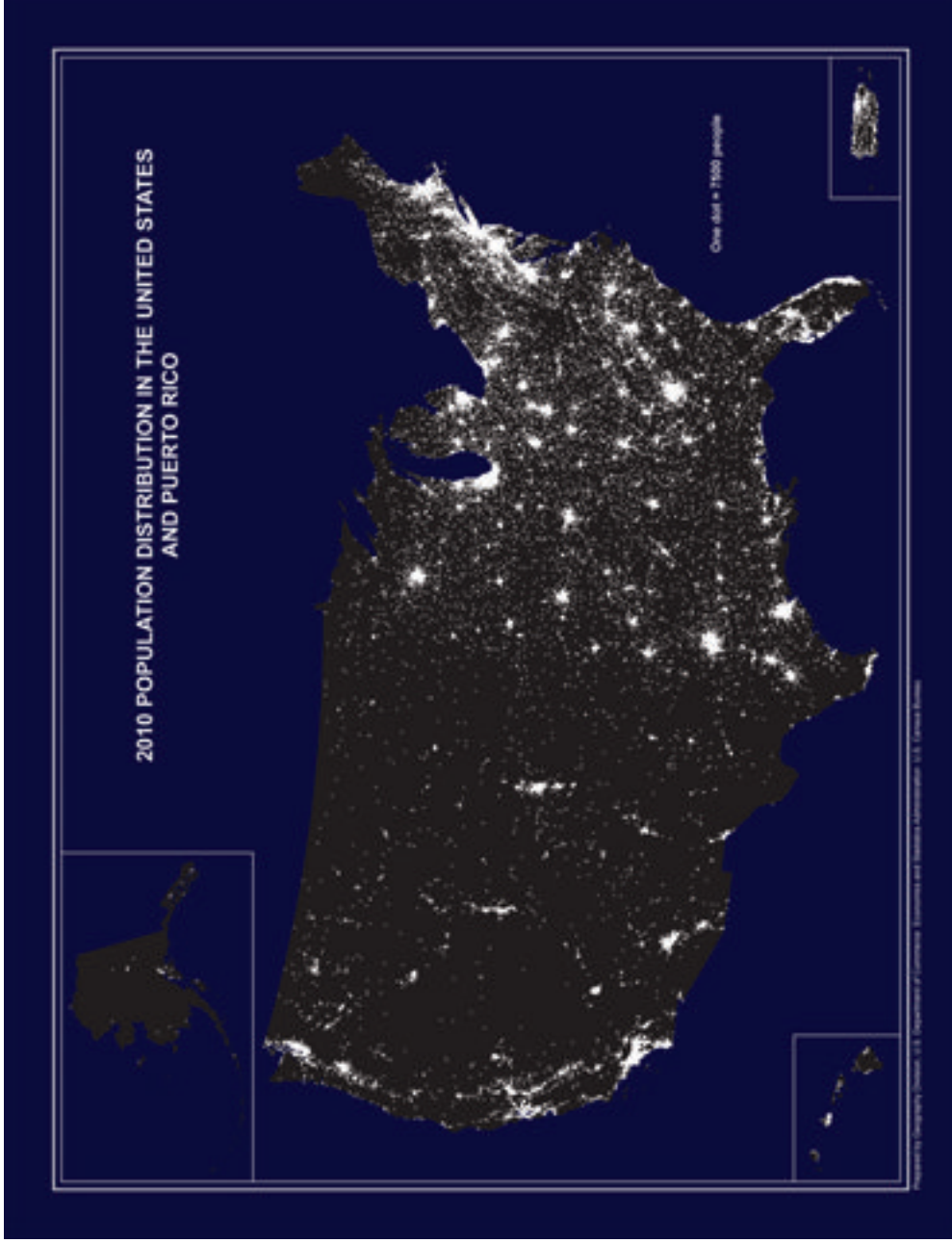


Figure 3.2 2010 Population Distribution in the United States

Source: US Census Bureau.

figure 3.3). Conversely, the upper portion of the pyramid favors females, reflecting differences in mortality and life expectancy between males and females, with females having greater life expectancies. Third, observation of population pyramids over a period of time can reveal changing population composition. For instance, observation of the population pyramid for the United States in 2005 reveals an age structure that is nearly pyramidal: increasing age is associated with a decreasing share of the population (figure 3.3a). The projected pyramid for 2025 suggests a more rectangular age structure in the US (figure 3.3b), reflecting the aging of the baby boomers (individuals born 1946–1964), increased life expectancy, and declining fertility levels. Together, these mean smaller numbers among the youngest age groups and an increasing proportion of elderly.

The shape of population pyramids may also reflect the impact of war or disease. In some parts of sub-Saharan Africa, HIV/AIDS has dramatically altered population pyramids due to declines in life expectancy and an increase in death rates. Consequently, the traditional population pyramid, with a wide base of young and tapering with increasing age was restructured at the height of the AIDS epidemic and was better characterized as a population “chimney” in countries that have high HIV prevalence rates (figure 3.4). As AIDS “hollowed out” the young adult population, it generated a base that was less broad with fewer young children. With fewer women reaching and surpassing their child-bearing years and with women having fewer children, the most dramatic

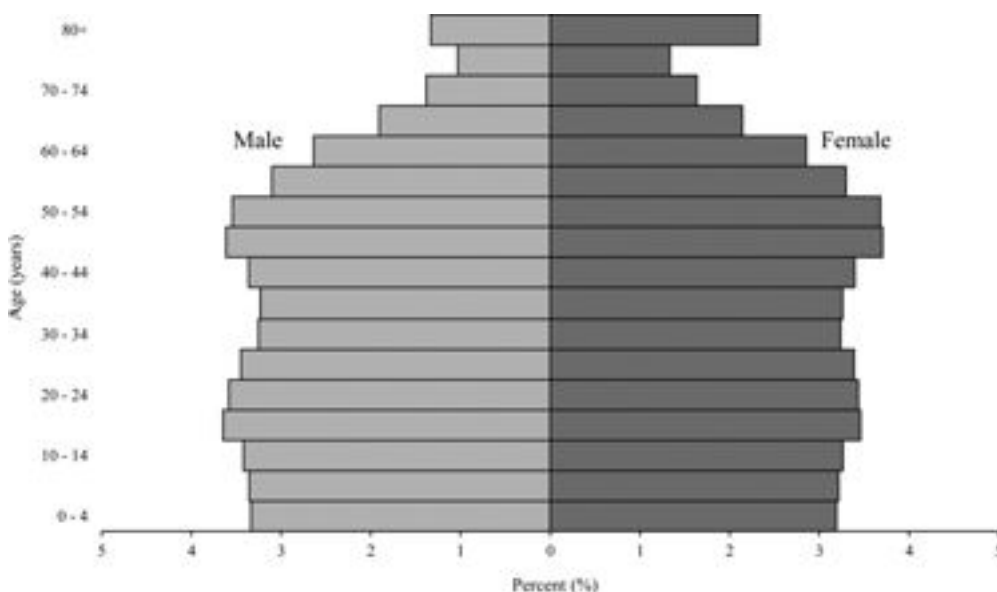


Figure 3.3a United States Age Pyramid, 2010

Source: Data derived from the US Census Bureau.

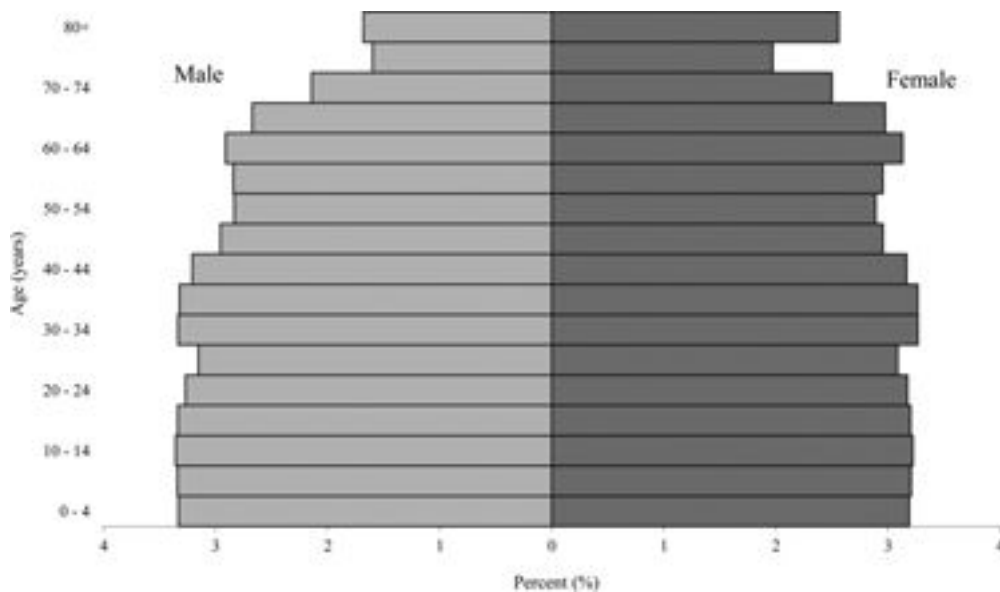


Figure 3.3b United States Age Pyramid, 2025

Source: Data derived from the US Census Bureau.

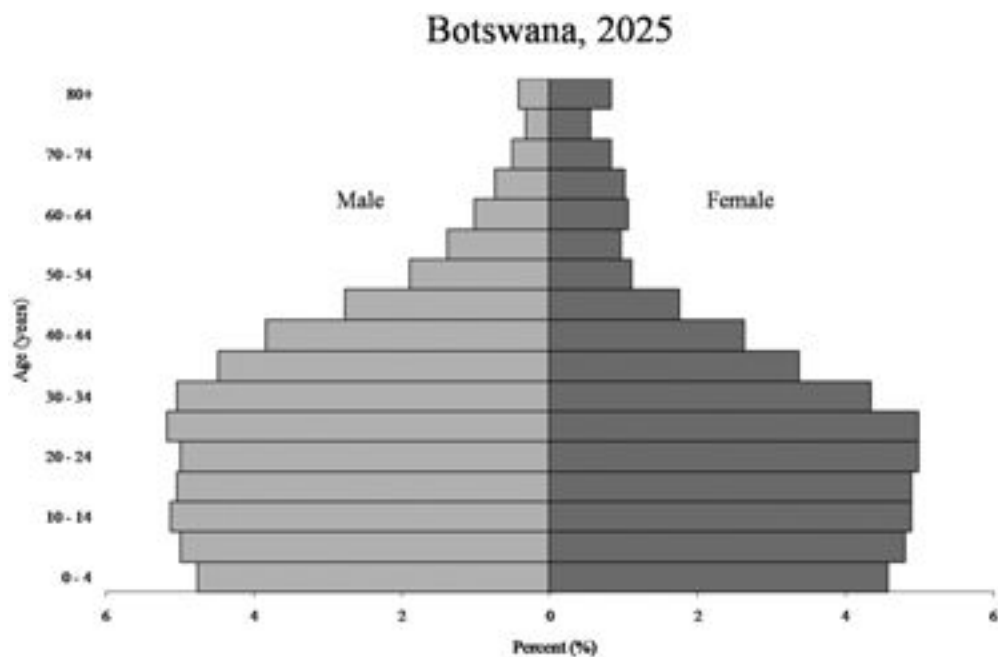


Figure 3.4 Projected Population Structure with AIDS, Botswana 2025: The AIDS “Chimney”

Source: US Census Bureau, IDB, 2008.

changes occurred when young adults who were infected with HIV in their adolescence die, substantially shrinking the adult population, particularly the population in their twenties and thirties.

Sex Ratios

The *sex ratio* of a population is defined as the number of males per 100 females. Values greater than 100 imply more males than females, with the opposite true for values less than 100. Typically, sex ratios at the national scale are somewhat less than 100. However, this obscures variations by age. At birth, males usually outnumber females, with a sex ratio of approximately 105 (105 boys for every 100 girls). This difference is quickly lost with increasing age, as males have shorter life expectancies such that the sex ratio swings in favor of females in the older age groups and results in national sex ratios being less than 100. Based on the 2010 US census, the sex ratio for the young aged zero through fourteen was 105, and for those sixty-five and over it was just 76.⁵

Beyond natural biological effects that influence the sex ratio across age groups, five other effects may alter the sex ratio across space or over time. First, and occurring at smaller geographic scales, migration may have an important impact, particularly if males are more prone to migration than females. The net effect may be to lower the adult sex ratio in sending regions (i.e., places men are migrating out of, leaving women behind) and to increase the ratio in the destination places. Resource and “boom” towns have often been associated with high sex ratios. Additionally, historic immigration patterns have also favored males, with men first establishing themselves in the host country before bringing a spouse and family over. Second, environmental effects may have an effect on sex ratios at birth. Although still poorly understood and debatable, exposure to environmental contaminants, including endocrine disruptors, which are found in a variety of chemicals; PCBs; and dioxins, may alter the live-birth sex ratio, or the ratio of boys to girls that survive childbirth.⁶ Third, there may be genetic/biological reasons for variations in the sex ratio at birth. There is, for example, a greater possibility of male conception at the beginning and the end of the ovulation cycle (where the probability of spontaneous abortion is greatest).⁷ Sex ratios have also been linked to mother’s age, with older women more likely to have girls. As women delay marriage and childbearing, more females may be born.⁸ Fourth, in societies that value male children but small family sizes, women may opt for ultrasounds to determine the sex of their children, practice infanticide if the child is female, or underreport female births. Reports of this practice are common from China, where the official one-child policy restricts family sizes. In places, the sex ratio approaches 120, while the live-birth sex ratio is approximately 135.⁹ It is interesting to note that the preference for male children among some Asian cultures has been transplanted

to the United States, with the sex ratio increasing to 1.17 (rather than the usual 1.05) if the first child was a girl in families of Chinese, Korean, and Indian descent. If the first two children were boys, the ratio increased to approximately 1.5,¹⁰ indicating a much greater preference for boys.¹¹ Similar trends have been shown in Canada, where sex ratios for second and third children are 1.19 and 1.90, respectively, in families of Indian descent, and 1.39 for third children in families of Chinese, Korean, or Vietnamese descent.¹² Finally, sex ratios appear to vary by latitude, independent of cultural or economic factors.¹³ Ratios in latitudes close to the equator were more equitable—50.7 percent boys in Africa—and are the highest in Europe and Asian countries (51.4 percent boys). Of all of these factors, however, identifying the contribution of any one single variable is extremely difficult.

Population (Median) Age

Population geographers and others are frequently asked to describe the age of a population. Is it young or old, and how best to describe this? As a measure of the average age of a population, *median age* (meaning half the population is younger and half is older) is commonly used. In 2010, the median age of the US population was 37.2 years, the highest it had ever been. Between 2000 and 2010, the median age had increased by nearly two years, reflecting the aging of baby boomers born between 1946 and 1964. Median age continues to increase and it is expected to approach 39.0 years by 2025.¹⁴ California has one of the country's youngest populations, with a median age of 35.2 years. New York State, on the other hand, is relatively old, with a median age of 38.0 years. Many of the northeastern states have relatively older populations, with Maine having the oldest population (42.7 years). These older ages are reflective of the out-migration of younger age groups, while states in the South and West have generally younger populations given the in-migration of the young. Interestingly, Florida has a relatively old population (40.7 years), reflecting its role as a retirement destination.

Dependency Ratios

In addition to the median age of a population, we can identify the proportion that is young or old within a population, such as the proportion of a population that is dependent (typically aged fifteen years or less), the labor force-aged population (fifteen to sixty-four years), and the older population (aged sixty-five-plus). More specifically, *dependency ratios* capture the age distribution of the population relative to the labor force-aged population. Generally, the “dependent population,” either aged zero to fifteen or sixty-five and over, is contrasted with individuals aged fifteen to sixty-four and who can “support”

either young or old dependents. When there are more working-age adults relative to children and the old, the labor force age group has a lower dependency burden: fewer people to support with the same income and assets. Parents, for example, provide most of the financial support for their children, including housing, clothing, and education. At the same time, taxes paid by workers pay for programs and support health and social-welfare programs and education, with the young and old relatively dependent on these.

Three dependency ratios are commonly used. The first, the *young dependency ratio* (YDR), refers to the relative size of young dependents to the labor force population, defined as follows.

$$YDR = (P_{0-14} / P_{15-64}) * 100$$

Likewise, the *old dependency ratio* (ODR) is defined as follows.

$$ODR = (P_{65+} / P_{15-64}) * 100$$

The *total dependency ratio* (TDR) is defined as follows.

$$TDR = ((P_{0-14} + P_{65+}) / P_{15-64}) * 100$$

In all of these examples, P_{x-y} refers to the population aged x – y (i.e., zero through fourteen).

We can use the United States to illustrate this measure (see table 3.1). Between 1996 and 2025, the young dependency ratio is expected to stay relatively constant (approximately 0.30). Reflecting the slow aging of the US population and the aging of baby boomers into retirement, the old dependency ratio is expected to increase from 0.19 in 1996 to 0.29 by 2025. This means that while there were approximately four workers for each older person in 1996, this

Table 3.1. Dependency Ratios, United States, 1990–2025

Year	Young (<15) Dependency Ratio	Old (65+) Dependency Ratio	Total Dependency Ratio
1990	0.33	0.19	0.52
1996	0.33	0.19	0.53
2000	0.32	0.19	0.51
2005	0.31	0.19	0.49
2010	0.30	0.19	0.49
2015	0.31	0.22	0.53
2020	0.32	0.26	0.57
2025	0.32	0.29	0.61

Source: Based on data derived from the US Census Bureau.

will drop to three workers by 2025, with potential implications for taxation and welfare support.

Despite their widespread use and intuitive meaning, the use of dependency ratios can be problematic, particularly when linked to policy. In part, the measure would be more reflective of economic reality if the young dependent age group was defined as zero through nineteen and the labor force as those aged twenty to sixty-four, given the reality that relatively few fifteen- to nineteen-year-olds are working full time in most developed countries. The definition for the old dependency ratio also implies, for example, that all people over age sixty-five are in some sense dependent on the population of working age, given the use of payroll taxes to support health and social-welfare programs. For this reason, changes in the old dependency ratio are assumed to have a greater effect on government spending and the economy. However, “dependency” does not suddenly change with age. In fact, there is a growing tendency for many youth to remain financially dependent on their parents for a longer period of time than was seen even in the 1980s.¹⁵ It is not uncommon, for example, to find children in their twenties still living with parents and either active in the labor force or still in school, reflecting changing economic realities of increased student debt and fewer employment opportunities after graduation. Similarly, many of those over sixty-five remain active in the labor force and make important economic contributions. Concurrently, there are individuals in the labor force age group that have withdrawn from the labor force for reasons including health. For this reason, we must interpret dependency ratios with caution.¹⁶

CONCLUSION

The distribution and composition of a population often lies at the heart of describing that population, reflecting such things as its age and gender structure both visually and numerically, with knowledge of its age structure and sex structure acting as building blocks in terms of understanding the population and the provision of services. Governments will, for instance, gauge the provision of services based on the age of the population, so that areas with a larger proportion of older adults will receive the necessary level of services. The rise of GIS and related spatial analysis techniques has also provided new venues for looking at the distribution of a population. Indeed, the popularity of GIS and new analytical tools has meant that more people understand why “geography matters” when it comes to population issues.¹⁷

Multiple processes, including fertility choices, migration, and mortality, can affect population structure and composition. Declines in mortality, for instance, increase the proportion of older adults and also shift the gender balance in favor of females. Fertility tends to have significant changes on a population’s composition, with decreasing fertility associated with population aging.

Migration will also redistribute a population and its characteristics, with the potential for significant short-term impacts, as it tends to be age- and sex-selective, typically selecting younger adults while favoring one gender over another in some situations. Thus, analysts need to be aware of the potential effects of these processes on a population, particularly if longer-run trends are desired. However, we save the discussion of these impacts for elsewhere in this book.

STUDY QUESTIONS

1. Construct population pyramids for a selected country. What does the shape of the pyramid tell you about the composition of its population? What are the implications of this population structure for the future of the country?
2. Using data from the Population Reference Bureau or a similar data source, describe the population composition of a selected country from (a) the developed world and (b) the developing world.
3. Using GIS and data from the US Census Bureau, map population indicators at the county or state level and discuss.
4. Using data from <http://www.who.int/countries/en/#M>, select a country, and then select “Life tables.” Using the age-specific death rate, calculate: (1) the probability of dying between ages x and $x + n$, (2) the number of people left alive at age x , (3) the number of people dying between ages x and $x + n$, and (4) the expectation of life at age x . Hint: All answers are included in the data.

FOCUS: THE CHANGING FACE OF THE US POPULATION¹

Over its history, the size, composition, and distribution of the US population has changed significantly. Historically, the distribution of the country’s population followed western expansion and the annexation of new territory such as the Louisiana Purchase in 1803, the Mexican Cession in 1848, and the Texas Annexation in 1845. Exploration, land, resources, and new frontiers attracted new immigrants as well as Americans to settling in these new territories and slowly shifted the distribution of the population westward, a process that continues to this day. The westward drift of the US population has been captured through the use of

population centroids,² which represent the geographic center of the population. Starting on the east coast in the late 1700s, it has slowly but consistently drifted west and south over time. By 1890, it was located in southeast Indiana, and moved west of the Mississippi by 1990 and into Texas County, Missouri, by 2010 (figure 3F.1). The distribution of the US population can also be captured through population density. Historically, population density was just 1.8 persons per square kilometer in 1790 and 8.3 per square kilometer by 1900.³ By 2010, the country’s population density had increased to 33.7 people per square kilometer.⁴ The

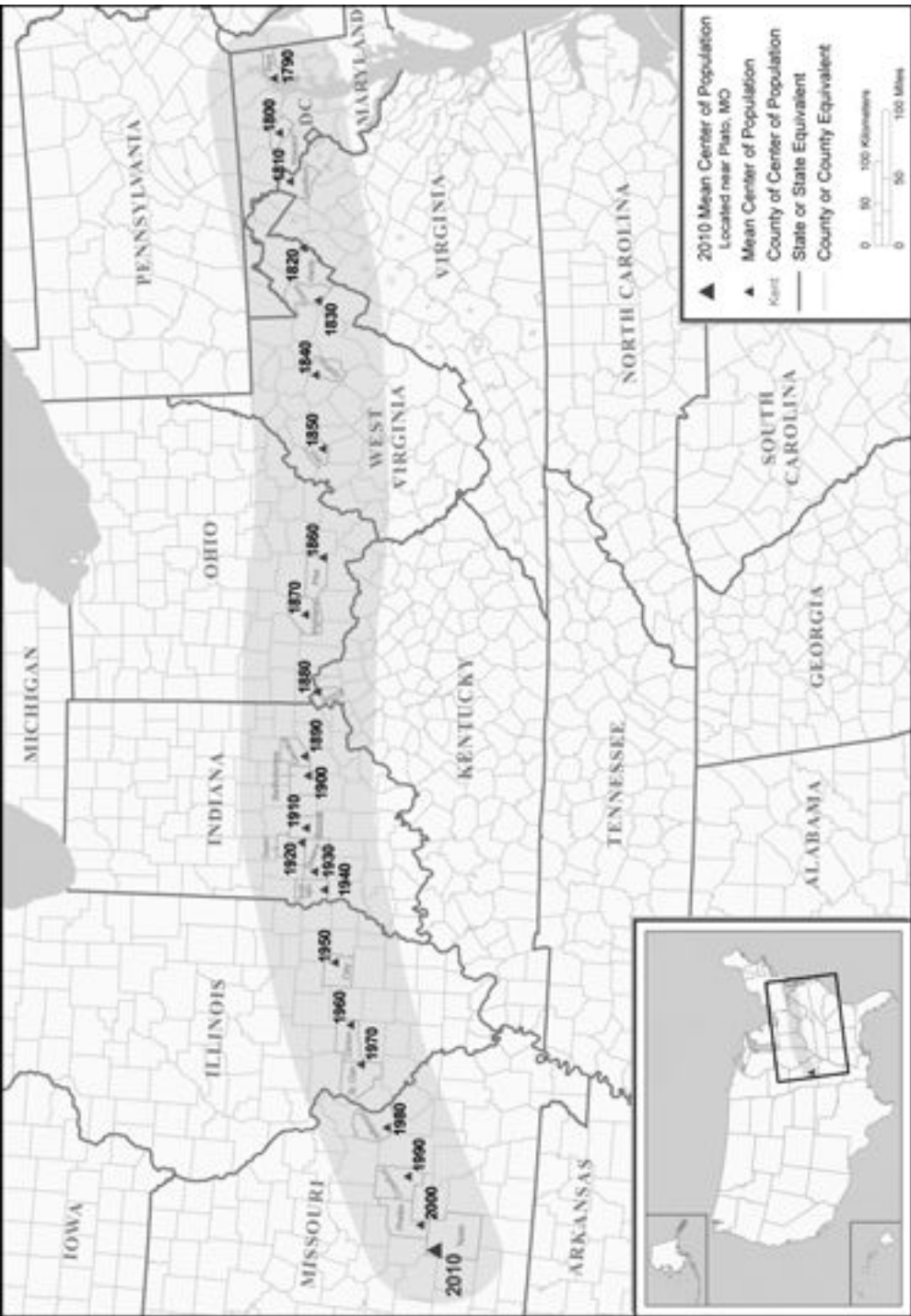


Figure 3F.1 Mean Center of Population for the United States, 1790 to 2010

Source: US Census Bureau.

District of Colombia is the most densely populated area, with 3,806 people per square kilometer. Wyoming is the least dense state in the continental United States, with just 2.24 persons per square kilometer.

The nation's changing population composition can be measured by shifts in its age profile, reflected in such measures as median age, population pyramids, and dependency ratios. Again based on the 2010 census, the median US age was 37.2 years,⁵ up from 35.3 years in 2000. The jump in the median age largely reflects the aging of the baby boom cohort, although the aging of this cohort has not yet influenced the dependency ratios, with both the young (0–17 years) and old (65+ years) dependency ratios relatively consistent between 2000 and 2010 (around 0.4 and 0.2 for the young and old, respectively). That is, for example, there are about five people in the labor force supporting each older adult. However, this is a significant departure from what it was in 1900, when the old dependency ratio was 0.07 (reflecting shorter life spans and higher fertility), while the young dependency ratio has consistently drifted downward as fertility has decreased.⁶ As the baby boom cohort ages further into retirement, however, the old dependency ratio will start to increase. By 2030, the last of the baby boomers will have turned sixty-five, and over 20 percent of Americans will be over sixty-five, compared with just 13 percent today.⁷

Not surprisingly, the distribution of the nation's older population varies across the country.⁸ Florida had the largest proportion (17.3 percent) of older (sixty-five and older) people in 2010 (median age equals 40.7 years), reflecting its attractiveness to retirees. States in the Great Plains and some northeastern states such as Rhode Island, Pennsylvania, and West Virginia also have comparatively large proportions of older people. In contrast, many of the western

and southeastern states have relatively smaller proportions of the old. States with some of the youngest populations include Utah, Colorado, and Texas.

The changing ethnic and racial composition of the country perhaps reveals the most fundamental and far-reaching changes occurring in the nation. Originally shaped by historical immigration flows from western Europe and the slave trade, the composition of the United States was long defined by its white and black roots. This began to change in the 1960s with the liberalization of the country's immigration policies, which increased immigration flows from Asia and other "nontraditional" origin areas. The number of new entrants has also increased, totaling over one million new arrivals per year early in the new century. Over the 1990s, legal and illegal immigration flows from Latin America, and particularly Mexico, altered the country's ethnic composition, making ethnic and racial minorities the majority population (compared to non-Hispanic whites) in both California and Texas.

Based on the 2010 census, 12.9 percent of the country's population is foreign-born. Although this is less than historical standards (15 percent in 1910), the proportion of foreign-born could surpass the historical high by 2025 and may reach as high as 20 percent by 2050. The largest proportion (53.1 percent) is from Latin America, and particularly Mexico. Asians represent 28.2 percent of the foreign-born, with major origin countries including China, India, and Pakistan. Europeans represent just 12.1 percent of all foreign-born in the country.⁹ In comparison, Europeans represented 74.5 percent of all foreign-born in 1960.¹⁰ The country's ethnic composition has also been altered far beyond the usual immigrant magnets of cities like New York or Los Angeles. Reflecting a changing distribution within the United States, recent arrivals have filtered across

the country, so much so that suburban and rural America is dealing with immigration issues seemingly overnight.¹¹

So significant is the impact of the foreign-born on the composition of the American population that the Census Bureau predicts that ethnic and racial minority groups will represent the majority of the population by the early 2040s. By that time, Americans identifying themselves as Hispanic, black, Asian, American Indian, Native Hawaiian, and Pacific Islander will outnumber non-Hispanic whites.¹² By 2050, projections suggest that non-Hispanic whites will represent just 46 percent of the population, down from 64 percent in 2010. The main reasons for this, as noted elsewhere, are the significantly higher levels of fertility among these minority groups and the number of immigrants entering the United States. Individuals are also changing how they identify themselves, with more identifying themselves as multiracial. In short, the future US population will appear much more diverse than it currently does. In 2011, 48.1 percent of individuals living in Los Angeles identified as being of Hispanic or Latino origin, a 2.6 percent point increase from 2000.

Finally, there are significant compositional differences between native-born Americans and the foreign-born. For instance, over 80 percent of the foreign-born were aged eighteen to sixty-four in 2010, compared to 60 percent of natives. Similarly, only 7 percent of the foreign-born were eighteen years old or less, compared to 27 percent among the native-born. This gives the population pyramid of the foreign-born a shape similar to a football, with a small proportion in the younger and older age groups, and the majority in the labor force ages. In large part, this reflects immigration policy, with most

immigrants arriving as younger adults. However, if we consider the US population in terms of ethnicity or race, as opposed to immigrant and native-born, the picture changes again. Given that fertility rates tend to be higher among minority groups than non-Hispanic whites, these differences are shaping the future ethnic and racial makeup of the United States. For instance, between 1990 and 2000, the population under eighteen had the largest gain since the 1950s, with minorities accounting for most of this growth. Since 2000, there have been minimal gains in this age group.¹³

The aging of the US population will have profound social, demographic, economic, and political effects.¹⁴ Given that most entitlement programs directed toward the old, including Social Security and Medicare, are funded through the earnings of individuals in the labor force, the shift in the old age dependency is of concern. Is, for example, a declining labor force able to support a growing older population? Based on some estimates, the Social Security Trust Fund will be insolvent by 2037, and Medicare expenditures are projected to exceed Social Security by 2030, an outcome that is largely driven by the increased numbers of people drawing on Medicare along with the rising use and costs associated with health care services.¹⁵ Given that these programs are not sustainable over the long run in their current form, governments have reconsidered eligibility for these programs (such as changing the eligibility for Social Security benefits from age sixty-five to sixty-seven) and encouraging people to work beyond the traditional retirement age of sixty-five more generally. Beyond use of formal health care facilities, many individuals rely on family for support, yet low fertility rates among baby boomers mean that there are fewer children to care for parents, providing further challenges.

FOCUS: AGING IN CHINA

China has long been concerned with its rapid population growth, resulting in its one-child policy that restricted couples to having one child (see chapter 10). The resulting decline in fertility (now 1.5) and increased life expectancy (seventy-five years) has resulted in rapid aging of the country's population, with the median population age increasing from 19.7 years in 1970 to 34.5 in 2010 (only 2.5 years younger than the US population). In contrast to the US, China has a proportionally smaller older population (9 percent). As the population continues to age, the proportion in the labor force is expected to decline, corresponding to a projected increase in the proportion of older dependents (aged sixty-five and older) to 24 percent by 2050,¹ meaning that China faces an equally challenging demographic future, but will be forced to meet the challenges of an aging population in a much shorter time as compared to other nations.

China's aging population has corresponded to an increase in the prevalence of chronic disease and disability within its

population. The government has moved to implement a number of health initiatives, including the promotion of healthy and active living policies, strategies for long-term care, and chronic disease prevention and control.² But meeting the health and long-term care needs of this growing elderly population will result in soaring health care costs—and with a shrinking working-age population to help pay the bill. Indeed, paying for these future health care needs will pose a challenge to the Chinese government, and it is unclear whether the country will be able to afford the health costs associated with an aging population despite its rapid economic growth over the past decades. Further complicating the health care picture is the provision of informal health care, which has traditionally been the responsibility of women, and particularly daughters-in-law. Recent trends that have witnessed increased female labor-force participation and a shift in the sex ratio favoring males will consequently pose further challenges to informal provision of long-term care in the future.³

METHODS, MEASURES, AND TOOLS: LIFE TABLES

Demographers often rely on life tables as a way of summarizing mortality and life expectancy within a population. Essentially, information contained in the tables represents the probability of surviving from one age to another and the life expectancy for a person aged x . Table 3MMT.1 illustrates a basic life table for the United

States (both sexes, 2009),¹ which can be interpreted as a summary of the mortality experiences of a cohort of individuals born at time t . The initial size of the cohort, l_0 , known as the *radix*, is often set to one hundred thousand. Two assumptions are key to the life table. First, rates of age-specific mortality will not change over the lifetime of

members of the cohort. Second, as the cohort ages, individuals will die according to the specified death rates. The individual columns in the table are defined as follows.

${}_hM_x$	the observed age-specific mortality for individuals ages x to $x + h$
${}_hq_z$	the probability that an individual aged x will die before reaching age $x + h$
l_x	the number of individuals in the cohort surviving to age x
${}_hd_x$	the number of individuals in the cohort dying between ages x and $x + h$
${}_hL_x$	the number of person-years lived by the l_x individuals between ages x and $x + h$
T_x	the cumulative number of person-years lived by the cohort beyond age x
e_x	the life expectancy (in years) for the person surviving to age x

Each hypothetical cohort is subjected to an age-specific mortality rate (${}_hM_x$), beginning from birth. For each age group, the value of q is derived from M , and then d is derived.

We start with the derivation of the age-specific death rates as follows.

$${}_hM_x = {}_hD_x / {}_hP_x$$

The numerator, ${}_hD_x$, is the observed age-specific deaths. The denominator, ${}_hP_x$, is the observed age-specific population, which is typically defined as the midyear population. These mortality rates can be used to define the probability of dying, ${}_hq_z$, which is defined as follows.

$${}_hq_x = \frac{{}_hM_x {}_hP_x}{{}_hP_x + (h/2){}_hM_x {}_hP_x}$$

This essentially indicates that the probability of not surviving to the next age group x

+ h is related to the number of deaths in that cohort relative to those alive at age x , assuming, of course, that deaths are distributed equally across the time period. Using data from table 3MMT.1, the probability that an American aged forty does not survive to age forty-five is 0.01071.

Within each cohort, a given number of individuals (${}_hd_x$) die, so that the given number of individuals reaching a particular age x is reduced as the cohorts age. The number of deaths can be determined as

$${}_hd_x = l_x {}_hq_x$$

or the number of individuals reaching age x (l_x) multiplied by the probability of dying before age $x + h$. This also means that the number of individuals surviving until the beginning of the next age group ($x + h$) is equal to the following formula.

$$l_{x+h} = l_x - {}_hd_x$$

Returning to our example based on table 3MMT.1, the number of deaths (${}_hd_x$) occurring in the forty to forty-five cohort is 1,035. Since 96,621 members survive to age forty, the number surviving to age forty-five is $96,621 - 1,035 = 95,586$.

The number of person-years lived by the cohort over h years is defined as follows.

$$L_x = \frac{h(l_x + l_{x+h})}{2}$$

That is, L_x is a function of the number of persons alive at the midpoint of the age group $(l_x + l_{x+h})/2$ and the number of years in the cohort, h , assuming that deaths are distributed equally over the age group. For the forty to forty-five cohort example, the number of person-years lived is $5 \times (96,621 - 95,586)/2 = 480,518$.

Next, the cumulative number of person-years lived by the cohort beyond age x (T_x) is found by adding ${}_hL_x$ from x to the last group,

Table 3MMT.1. Life Table: United States, 2009, Both Sexes

Age	${}_hM_x$	${}_hQ_x$	l_x	${}_hd_x$	${}_hL_x$	T_x	e_x
<1	0.00672	0.00668	100000	668	99,399	7,851,033	78.5
1–4	0.00028	0.00111	99332	110	397,065	7,751,634	78.0
5–9	0.00013	0.00066	99222	66	495,947	7,354,569	74.1
10–14	0.00017	0.00083	99157	82	495,578	6,858,622	69.2
15–19	0.00060	0.00301	99074	298	494,627	6,363,044	64.2
20–24	0.00094	0.00471	98776	465	492,718	5,868,417	59.4
25–29	0.00097	0.00481	98311	473	490,371	5,375,699	54.7
30–34	0.00108	0.00539	97838	528	487,869	4,885,328	49.9
35–39	0.00142	0.00708	97310	689	484,828	4,397,459	45.2
40–44	0.00215	0.01071	96621	1,035	480,518	3,912,631	40.5
45–49	0.00330	0.01637	95586	1,565	474,017	3,432,113	35.9
50–54	0.00495	0.02444	94021	2,298	464,360	2,958,096	31.5
55–59	0.00708	0.03480	91723	3,192	450,637	2,493,736	27.2
60–64	0.01045	0.05091	88531	4,507	431,389	2,043,099	23.1
65–69	0.01598	0.07682	84024	6,455	403,984	1,611,710	19.2
70–74	0.02443	0.11513	77569	8,930	365,520	1,207,726	15.6
75–79	0.03847	0.17547	68639	12,044	313,083	842,206	12.3
80–84	0.06271	0.27107	56595	15,341	244,620	529,123	9.3
85–89	0.10134	0.40427	41253	16,677	164,573	284,503	6.9
90–94	0.16284	0.54698	24576	13,443	82,552	119,930	4.9
95–99	0.26171	0.68296	11133	7,604	29,054	37,379	3.4
100+	0.42400	1	3530	3,530	8,325	8,325	2.4

Source: “WHO Life Tables for WHO Member States,” http://www.who.int/healthinfo/statistics/mortality_life_tables/en/ (accessed 18 July 2012).

$${}_hT_x = \sum_{i=x}^z {}_hL_i$$

where z is the oldest cohort in the life table. The number of person-years remaining to be lived beyond age forty-five for the example cohort is 3,432,113.

Finally, the remaining life expectancy for those individuals currently aged x (e_x), is calculated by dividing the number of person-years lived beyond age x by the number of persons reaching age x .

$$e_x = \frac{{}_hT_x}{l_x}$$

Therefore, the expectation of years to live for an American reaching age 45 is 35.9

years (3,432,163 / 95,586), equal to an expected age of 80.9.

There are three exceptions to the above noted calculations. First, deaths for infants are more likely to occur in the first half of the year than in the second. Consequently, children less than one year old are typically tabulated separately. One method to estimate this is defined as follows.

$$L_0 = \frac{l_0 + l_1}{2}$$

Following this, and since the age group zero to one has already been estimated, $h-4$ should be used (rather than $h-5$, assuming the age interval is equal to five years)

for the calculation of L for the age group one to four.

Second, the last age group is open-ended. In this case, q is allowed to equal 1.0, since everyone reaching this age group must die in it.

$${}_x d_z = l_z$$

Finally, the number of person-years lived by individuals in the oldest age group also needs to be adjusted. In this case, demographers assume that the age-specific mortality rates in this oldest age cohort are equal to those observed in some theoretical “stationary” population (m_z), which is an unchanging population arrived at by adding l_o births to the population each year. Given that $M_z = m_z$, we can derive as follows.

$$L_z = \left(\frac{d_z}{M_z} \right)$$

USE OF LIFE TABLES

Far from being a set of abstract calculations, life tables are commonly used within the insurance industry to set insurance premiums and are typically further disaggregated by age (i.e., single-year age groups) and gender, given survival differences between males and females (with females typically surviving longer). They can also be used to determine survival ratios. For example, the proportion of forty- to forty-five-year-old Americans who reach their forty-fifth birthday is defined as follows.

$$\frac{{}_5 l_{45}}{L_{45}} = \frac{5(95,586)}{480,518} = 0.9946$$

Chapter Four

Fertility

Fertility Patterns

What Determines Fertility?

Fertility Levels: Too High or Too Low?

Africa's Fertility Transition?

Women's Reproductive Health

Conclusion

Study Questions

Focus: Contrasting Fertility Rates and Choices in North America and Uganda

Methods, Measures, and Tools: Measuring Fertility

AT ITS MOST BASIC, population size and growth is determined by the combined effects of fertility, or the ability of a society to reproduce itself, and mortality, or death. Worldwide, large variations in fertility rates are observed, with some of the highest rates observed in sub-Saharan Africa and some of the lowest rates in Eastern Europe, where several countries are faced with population decline.¹ Clearly, there is a large variation in fertility behavior, with fertility determined by both biological and social components. This chapter begins with an examination of fertility patterns. It then discusses the determinants of population fertility and the evolution of fertility trends. The “Focus” section contrasts fertility rates in North America and Uganda, and the “Methods, Measures, and Tools” section explores the various measures of fertility.

FERTILITY PATTERNS

The past two hundred years have witnessed a tremendous change in fertility patterns across the globe. The question for us is what determines fertility rates, why have they changed (decreased) over time in some places and not in others, and why are they typically slow to change? The demographic transition theory

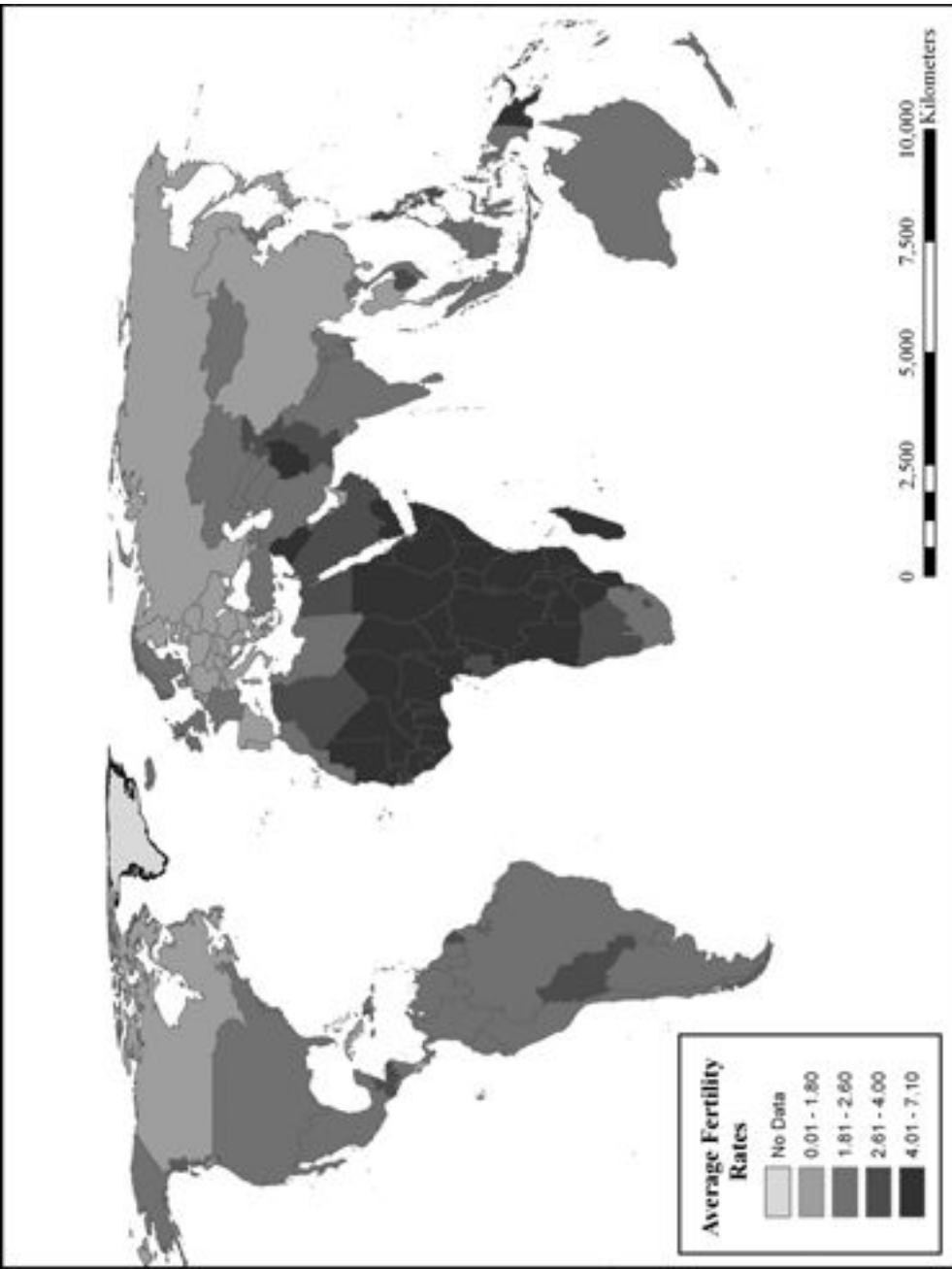


Figure 4.1 Total Fertility Rates, 2012

Source: Derived from *World Population Data Sheet* (Washington, DC: Population Reference Bureau, 2012), www.prb.org.

has frequently been used as a template to mark the shift from high to low mortality and fertility, along with the consequent population explosion as life expectancy and mortality rates are improved. This shift in fertility regimes occurred throughout much of North America and Europe in the nineteenth and early twentieth centuries. In North America, fertility rates had already declined to 3.5 by 1900, down from rates in excess of 5 in the first half of the 1800s.² The transition to modern fertility patterns, marked by stable and slow population growth, was essentially completed by the 1930s. In other countries, the transition occurred much later, with many developing countries not experiencing mortality declines until the 1950s, while others have yet to experience substantial declines in fertility. While providing a pattern of fertility decline, the demographic transition theory does not provide us with the reasons for fertility decline.

From the perspective of the developed world, one of the most important demographic events in recent history was the *baby boom*, which presented a departure from the long-term trend of declining fertility. Generally referring to those born between 1946 and 1964, it affected the United States, Canada, and other nations involved in World War II, although the demographic impacts tended to be greatest in North America. Although the baby boom was demographically important, with that generation's numbers impacting the provision of education in the 1950s and 1960s, career and leisure pursuits as individuals entered the labor force, and now retirement, social welfare programs, and health care as the baby boom generation ages into retirement within the next decade,³ it was a short-term phenomenon. Instead of representing a sea change in fertility behavior, it only temporarily boosted fertility levels. Over the longer term, fertility rates continued a decline that was first noticed decades earlier.

WHAT DETERMINES FERTILITY?

Characteristic of preindustrial societies, survival in prerevolutionary Russia was difficult. Life expectancy was just over thirty years. Infant death rates might have reached upward of 30 percent of all live births, and 50 percent of all children died by the age of five. In response to such high death rates, families were large, with family structure reinforced by cultural practices, including early marriage before the age of twenty, and any form of birth control was a criminal offense.⁴ To remain single was a disgrace, and divorce was a sin. Within forty years of the Russian Revolution, fertility rates had declined to levels comparable with most Western societies.

While social, economic, and environmental considerations demanded large families in prerevolutionary Russia, the Hutterites, a devoutly religious group

found in the United States and Canada, value large families, with an average size of eleven children recorded in the early 1900s.⁵ Even at its peak, the fertility of this group fell far below the biological maximum, defined by *fecundity*, or the physiological ability of individuals to have children. What are less evident are the social dimensions that work to keep fertility below its maximum level, including the roles of economic issues, the government, and other institutions in altering fertility behavior. Similarly, cultural values regarding family size and the social roles of men and women alter fertility and the timing of fertility reduction. In many African states, for example, women enter into sexual unions at younger ages and contraceptive use remains low, but families average six or seven children, far below the biological maximum. Cultural practices, including breast-feeding or abstinence from intercourse after birth and indigenous birth control techniques, help to keep fertility below its maximum.

We can look at the experiences of the Hutterites, Russia, and other countries in order to generalize the determinants of fertility. While “distal” and “proximate” determinants of fertility can be identified,⁶ demographer John Bongaarts identifies four variables that explain nearly all the variation in fertility levels across populations.⁷ These include the proportion married or in a sexual union, the proportion using contraceptives, the proportion of women who are infertile, and the incidence of abortion. First, in all societies, marriage has clearly been an institution that has promoted fertility. The longer a woman waits to enter a sexual union, the lower the fertility rate. Conversely, where women marry at a young age, fertility rates tend to be higher due to the increased exposure to risk of pregnancy and longer periods over which pregnancy could occur. Cultural values and practices relating to sexual activity, childbearing outside of marriage or union, and contraceptive use will have an impact upon fertility decisions as well. In the past, the age at entry into marriage and the age at entry into a sexual union were the same, but the increasing availability of modern birth control techniques and acceptance of premarital intercourse has meant that this is no longer the case. Celibacy and abstinence (either voluntary or involuntary [i.e., because of impotence]), along with frequency of intercourse within a union, will either eliminate or alter the risk of pregnancy.

Second, contraceptive use and abortion are the key determinants of fertility in most developed countries. The “reproductive revolution,” signaled by the availability and development of modern and effective family-planning methods such as the birth control pill, made it easier to avoid pregnancy. Increased access to methods of birth control and the desire to limit family size helped fertility reductions, and, when they are used in developing countries, fertility decline has been much more rapid than the decline developed countries experienced during their fertility transition. Despite the reproductive revolution, contraceptive use varies dramatically over space and echoes variations in fertility

levels. Among women who are in sexual unions and of reproductive age who use modern contraceptives in the United States and Canada, for example, the rate of modern contraceptive usage is over 70 percent.⁸ Somewhat lower levels of use are observed in Europe, particularly in Eastern Europe where contraceptive use rates are 58 percent, reflecting historically lower levels of contraceptive availability and acceptance and higher abortion rates.

In the developing world, contraceptive use lags behind usage rates found elsewhere, but family-planning programs have had a strong influence on fertility by raising the awareness of means or the need for contraception and control. Contraceptive use is lower in Asia, Latin America, and Africa as well, with less than 10 percent in some areas of the latter using modern birth control methods. Instead, the regulation of fertility largely lies with traditional methods (i.e., withdrawal or abstinence), and the low incidence of contraceptive use is attributed to religious beliefs or societal values. Various governments have also decried the use of birth control methods as an unwanted intrusion of lax Western morals, even in the face of the HIV/AIDS epidemic, with the risk of transmission reduced through condom use.⁹ When and how birth control is practiced also varies. Women in developed countries tend to start using birth control in their late teens or early twenties to delay childbearing and, following the birth of a child, to achieve desired spacing. In the developing world, contraception use frequently starts *after* the desired family size is achieved.

Third, abortion is one of the most common forms of modern birth control in the world and is assumed to be an important reason for low birth rates in much of the developed world.¹⁰ Legal in much of the world, including Canada, the United States, much of Europe, China, India, and Russia, some of the highest reported rates of abortion are found in Eastern Europe (43 per 1,000 women between 2003 and 2008) and Asia (ranging from 26 per 1,000 in South Central and Western Asia to 36 per 1,000 in Southeastern Asia),¹¹ where access to abortion is easier than access to contraceptive devices.¹² China, a country that typically had high abortion rates, has seen rates decline in recent years, although anecdotal evidence suggests rates of illegal abortion are high.

Beyond abortion, sex selection is frequently performed, enabling families to “select” male children over females, with the Population Reference Bureau estimating that some 1.5 million girls are “missing” at birth.¹³ Globally, several countries have sex ratios equal to or greater than 110, including China (118), India (110), Azerbaijan (117), and Armenia (115), which undoubtedly means that sex ratios are substantially higher in some subnational regions. This observed preference for male children reflects culturally rooted preferences—sons typically are expected to help support the family, to provide care for aging parents, and to inherit the farm or business, while the fact that daughters would have no rights of inheritance means that sons are an economic necessity.

Simultaneously, decreasing family sizes (i.e., reductions in the TFR) either through legislation (such as China's one-child policy) or by personal choice has meant that there is greater need to have at least one son. As such, the availability of modern imaging technologies like ultrasounds provides an inexpensive way for families to select their children, with female fetuses aborted in favor of a male child. Although not technically used for sex selection in countries including Canada and the US, there is sufficient anecdotal evidence pointing to their use in these cases, with sex ratios skewed among some immigrant communities.¹⁴

Finally, the inability to conceive is associated with voluntary or involuntary fecundity. Breast-feeding, for instance, reduces (but does not eliminate) the likelihood of pregnancy for as long as twenty-one months following childbirth.¹⁵ With modernization, breast-feeding has tended to decline, which may be of particular concern within the developing world, where, in the absence of other birth control techniques, fertility may increase. Sterilization also provides a method for lowering fertility, although this is a more popular procedure in developed countries, where it is generally used to prevent further pregnancies after a desired family size has been achieved.

Together, these four variables explain nearly all variations in fertility, with the importance of each determinant depending on the cultural, economic, health, and social factors within a population. In many African societies, babies are breast-fed until age two or three, and women may be expected to abstain from intercourse for up to two years after birth, both of which increase spacing between births. Although Bongaarts provides insight into the key determinants of fertility, questions remain as to what determines the social forces that mold fertility choices. Why, for instance, would marriage be delayed? Why would contraceptive use increase? How do the cultural values attached to children change?

To answer these questions, we must turn to theories of fertility transition over time and space.¹⁶ These may be roughly distinguished by microeconomic interpretations, characterized by Easterlin's "supply and demand" framework,¹⁷ and the "diffusion-innovation" perspective, proposed by a number of authors.¹⁸ Both frameworks find their roots within the demographic transition theory (see chapter 1), which ascribes declines in fertility to societal changes related to industrialization and urbanization. In the face of declining mortality and improved economic opportunities, the demographic transition theory implies that people will eventually realize that more children will survive into their reproductive years than can be afforded, resulting in a decline in fertility that preceded modern birth control methods. Urbanization and industrialization therefore set the stage for declines in fertility, such as in pre-twentieth-century Europe and North America, creating a way of life that made it more expensive

to raise children.¹⁹ Rather than using children to augment household income, children were to be “invested” in through such means as educational opportunities.

The linkages among urbanization, industrialization, and fertility (see also chapter 9) within the demographic transition theory were, however, criticized, especially within the context of the developing world, where the correlation between development and fertility is weak. Several countries in Asia (i.e., Bangladesh) and Latin America (i.e., Haiti) remain poor and underdeveloped and have low levels of urbanization, but are also experiencing fertility decline. In other words, development and economic security is not a sufficient condition to cause fertility to decrease. Building upon the demographic transition theory are the neoclassical theories of fertility decline. Easterlin’s classic supply-demand framework defines fertility choice as the outcome of a rational calculation of the costs and benefits associated with fertility behavior, contextualized relative to cultural and household expectations. Families try to maintain a balance between the potential supply of children and the demand for surviving children. Where death rates are high, high fertility ensures the survival of some of the children to an economically active age, and there is no incentive to control fertility. The response to high mortality reflects children as a source of security and labor, a preference for a son, or a desire to “replenish” the population. In effect, children may be likened to pension plans, contributing to production and income within the household or the care of elders, making large families a necessity and an investment in future security.

If, on the other hand, supply exceeds demand, fertility regulation becomes important. The decision to control fertility is then based upon the financial and social costs of raising a child, as more children are being produced and surviving into their reproductive years. Casting fertility behavior as an economic choice means that children are, in many ways, seen as luxury items and subject to both time and investment. Investment is represented by the *direct costs* of education, clothing, food, and so forth as well as *opportunity costs*, representing foregone investments and purchases of other consumer goods. Parents are then faced with a trade-off between quality and quantity. In the developed world, quality is emphasized, with resources concentrated on a relatively small number of children. Children in the developed world are not expected to contribute to the economic well-being of the household, or to support parents in their old age. Instead, they represent large direct costs associated with education, clothing, and food, along with indirect or opportunity costs of having children at a time when the same dollar value could be spent on other consumer goods and demands for leisure time.

Criticism of neoclassical determinants of fertility behavior has led social scientists to link changes in fertility behavior to the diffusion of ideas across

space.²⁰ As with any process, diffusion of social norms or new ideas varies spatially, with the timing of the fertility transition hinging upon the diffusion of social norms and new ideas, including birth control techniques. In the past, the preference for small families diffused out of urban areas, from high- to low-income groups, and from country to country. Although important, diffusion is not a spatially smooth process. For instance, poor or inadequate transportation or communication infrastructure, especially evident in rural, agricultural, and poor regions of the world, creates barriers that alter or slow the diffusion of new ideas or norms. Religious ideology remains a persuasive force, limiting the success of family-planning programs and the promotion of birth control methods. Cultural practices may likewise preclude the use of contraceptive devices, such as the condom, which is viewed as interference during sexual intercourse in some cultures.

The uptake of new ideas or norms also depends upon the individual. If new ideas such as birth control are to be accepted, individuals must feel that they exert some power or control over life events.²¹ In societies where women lack control and power, fertility rates tend to remain high. The key, therefore, is to produce greater equity between males and females, which is accomplished vis-à-vis improvements in educational attainment, occupational status, or income opportunities. Improved education status and paid employment have reduced fertility, with a near-universal relationship between improved educational levels among women and decreased fertility. Women with better levels of education also tend to have a higher uptake of family planning, tend to wait longer between pregnancies, and stop childbearing at an earlier age than those who are less educated. Even a secondary-level education has been associated with a one-third to one-half reduction in the number of children born relative to women with no education.²²

There is an even stronger relationship between women's education and child health, with higher educational attainment linked to healthier and better-nourished children, which in itself promotes a reduction in fertility. Although the exact relationship is unclear, completion of education may delay entry into marriage and expands employment options, suggesting that women delay fertility in order to earn an income. Employment also exposes women to new ideas, behaviors, and influences outside of the family. However, gender equity in employment is vital: if employment does not translate to power and does not enable women to make decisions regarding health care, contraception, the timing of children, and so forth, then declines in fertility are unlikely to occur.²³

FERTILITY LEVELS: TOO HIGH OR TOO LOW?

When discussing fertility levels, we tend to focus on the fertility rate and the idea of "replacement fertility." After all, this gives us the sense of whether or

not a population is able to replace itself over time. Demographers refer to a TFR of 2.1 as replacement fertility, or the number of children needed to exactly replace their parents' generation, accounting for premature death. Yet these averages tend to hide regional variations in fertility rates, such as the difference in fertility between Hispanics and white non-Hispanics in the United States, or between the French-speaking Quebecois and the larger Canadian population. Moreover, the replacement level is not necessarily consistent: in the developing world, the TFR required for replacement ranges from 2.5 to 3.3 because of higher mortality rates.²⁴ It is, incidentally, worth noting that there is relatively little separating population growth from population decline. Taking a TFR of 2.1 as replacement fertility, fertility rates in excess of 2.1 will result in population growth. Conversely, rates less than replacement will result in population decline! Both sides of replacement fertility also bring their own troubles.

Implications of High Fertility

By this point, the implications of high fertility should be fairly self-evident. Fertility rates in excess of the replacement level mean an increasing population, and it is certain that the world's population will continue to grow for the foreseeable future. Continued population growth poses deep problems for many nations, particularly where governments are fiscally strained, state institutions are weak, and health and educational systems are poor. In some cases, the strain of population growth is already showing as governments are unable to maintain investment in public infrastructure, including health care and education. In many cases, high population growth erodes economic growth, deepens poverty, and counters other achievements in social sectors.²⁵ Population growth and, ultimately, the absolute size of the population will continue to pose challenges to societies and their governments as they deal with growing scarcities of land and water, raising the potential for conflict.

Implications of Declining Fertility

While birth rates remain high in much of the world, an increasing number of countries are dealing with below-replacement fertility.²⁶ Low birth rates and a slowing or decreasing population growth rate have their own set of problems. Although the anticipated consequences of an aging society are still unclear, the PRB concluded that low fertility is a serious problem, having more disadvantages than advantages and making it a politically unsustainable position.²⁷ From a demographic perspective, low fertility results in an increasing proportion of elderly. In Canada, the elderly population (aged sixty-five-plus) represented just 7.8 percent of the population in 1951, growing to 14 percent in 2012. Current projections place the elderly population between 23 and 25 percent of the total

population by 2036, altering the age distribution of the population from its typical pyramidal shape, dominated by a young population, to a rectangular one, characterized by a proportionately larger elderly population.²⁸ Although having the highest TFR in the Western world, the United States has seen similar increases in its share of the elderly population, representing just 4.1 percent of the population in 1900, 13 percent in 2012, and projected to grow to nearly 20 percent by 2030.²⁹ In Europe, the elderly already represent greater than 15 percent of the population in several countries, including Sweden (19 percent), the United Kingdom (17 percent), and Belgium (17 percent), with continued growth ensured.

Economists have tended to assume that the marketplace will be able to react to population change. If children are scarce, they will become more valuable, and the system will correct itself, either by finding substitutes for children (unlikely!) or by placing greater value upon children, achieved through various incentive programs. Yet the recession of 2008–2009 suggested that this was not the case, with economic opportunities the real driver of fertility, many families postponed having children as the recession built and fear of losing jobs or income grew. Moreover, some analysts were wondering if the recession would create a new mindset that it was either work or family, not both, although the full impact on fertility will not be felt for some time.³⁰ It is also unclear what the economic effects of low or negative population growth would be.³¹ Ester Boserup, a Danish economist, promoted the idea that population growth triggered economic development.³² Over the long run, countries with growing populations would be more likely to post strong economic growth than a stationary or declining population. It has generally been assumed, for example, that population growth provides an economic stimulus: the growing population needs services and goods, with their purchases driving economic growth. Conversely, declining population growth rates imply slower economic growth with individuals buying less and saving more, a notion that most developed societies have adopted. Although simplistic, we can draw an analogy with the housing market—given declining population and a shrinking market, why would individuals invest in a home knowing that there will be fewer buyers (and therefore lower prices) in coming years? Similarly, the economic recession of 2009 was deepened, in large part, by a reluctance of individuals to buy in the face of soaring unemployment.

With an aging population, the costs of providing services to it will be carried by a smaller labor force. The negative economic impacts associated with low or negative population growth may be associated with greater inequalities within society. There is little doubt that countries with an aging population will face an increased burden of supporting the elderly, placing pressure on social-welfare programs. Countries with low fertility rates will have a smaller labor force with

which to support the elderly population and may face severe labor shortages that threaten the economic livelihood or stability of the country.³³ The changing age structure of the population therefore raises questions regarding the provision of income security for the aged, housing, transportation, and other services, highlighted by recent debates regarding the crisis (and reform) of Social Security in the United States. Health care provision is of particular concern, since the elderly, and particularly those older than seventy-five, consume a disproportionate share of medical services. Concurrently, the welfare of children may suffer as funds are diverted to meet the needs of the elderly population. Countries in both the developed and developing world have begun to react to population aging. Several, including Canada, the United States, the United Kingdom, and Australia, have raised the age at which individuals are eligible for state-funded pension plans, and others have abolished mandatory retirement ages. Others have begun to change their health and pension systems to prepare for an aging population, although continued economic weakness following the 2008 recession has slowed changes.³⁴

The largest negative consequences of low or negative population growth may, in fact, be political rather than economic.³⁵ Internally, countries may face a “graying of politics,” as political and economic concerns increasingly represent those of older generations at the expense of the young. While offsetting declining fertility, immigration into a country may create tensions between immigrants and native-born over such things as employment opportunities. Internationally, a shrinking population has been associated with demographic marginalization. A “population implosion” may infringe upon the very essence of nationality, with governments fearing that a declining population will threaten the ability of a country to defend itself. Even national identity is at stake, with national influence dependent upon the vitality and size of a population.

Overall, the negative economic impacts of an aging population are expected to be minimal. Instead, an aging population may be associated with higher savings rates, greater expertise, less unemployment, and higher innovation, although educational costs for retraining and continuing education of an older labor force are likely to increase. Likewise, low or negative population growth should not influence rates of technological change, consumption, or investment, although the distribution of these impacts across regions or age groups is unlikely to be equal, as is the case with the consumption of medical care.³⁶

AFRICA’S FERTILITY TRANSITION?

Since the 1950s and the beginning of the population explosion in the developing world, demographers and governments alike have searched for indications

that the characteristic high fertility levels found in the developing world would decrease. While fertility rates have declined as expected in most instances, they have stalled in others, such that population growth will continue for the next few decades, fueled by population momentum associated with the young age structure, increased life expectancies, and above-replacement fertility. The multidimensional factors associated with fertility decline, which are further complicated by national and international policies, make it difficult to ascertain whether all countries will complete some form of fertility transition. Pressure within segments of China's population to have more than the allotted one child shows a continuing desire to have larger families, and the problems associated with a rapidly aging population may force the government to relax its fertility policy. Fertility rates continue to remain above replacement in many other regions. Despite early successes in reducing fertility in Bangladesh, which saw fertility rates drop from over 6.0 children per woman in the early 1970s to 2.3 in 2012, fertility rates have remained relatively unchanged over the past twenty years. Similarly, Egypt's birth rate has remained approximately equal to or greater than 3.0 since 1993, and it is uncertain whether it will be further reduced.³⁷

After observing fertility transitions in Asia and Latin America, all eyes have focused upon Africa, where fertility rates remain stubbornly high, and most African nations (notably in sub-Saharan Africa) have made little progress toward the fertility transition.³⁸ In short, much of Africa is still waiting for the fertility transition. Africa is arguably faced with the most pressing fertility concerns: some fifty years after mortality levels were dramatically reduced in the developing world, Africa's TFR remains high at 4.7, while sub-Saharan Africa still has fertility rates in excess of 5.0. Fertility rates this high, corresponding to an annual increase of 2.5 percent, enable the population to grow rapidly. While population growth is expected to slow and there is emerging evidence that fertility rates will ultimately decline, the population of Africa will, under current conditions, double before 2050. In sub-Saharan Africa, only fourteen countries appear to have entered a period of transition in fertility behavior, which could be characterized by higher contraceptive use, longer life expectancies, and a declining fertility rate, although HIV/AIDS threatens this success. Fertility reduction remains a distant goal for the majority of sub-Saharan countries.

Although most observers expect fertility rates to ultimately decline in African states, the question remains as to when large-scale reductions will occur, how far rates will drop, and how long it will take to achieve significant reductions. Like explanations for fertility decline, the answers to these questions are also multidimensional. First, although contraceptive use is increasing, it is used more for control of the spacing of children³⁹ or after desired family size is

achieved, rather than as a form of fertility control to limit family size. Just 26 percent of married women use some form of modern birth control in many African nations, which compares with 73 percent in North America. Based on a study in three French-speaking West African countries, there was a high level of awareness of contraceptives, but use of contraceptives was low among married women and higher among unmarried women who were sexually active.⁴⁰

Second, childhood mortality remains high in many African nations. As we have already noted, mortality rates have decreased within Africa, but perhaps not sufficiently to initiate fertility decline. The general rule is that life expectancy at birth must be greater than fifty years for fertility levels to decrease. This has only been recently achieved in some African states, while in others (particularly sub-Saharan states), life expectancy hovers near or remains below the fifty-year mark. Third, the HIV/AIDS crisis has impacted life expectancy in many sub-Saharan nations (see discussion of the demographic implications of HIV/AIDS in chapter 5). Although there is no evidence that fertility choices have been affected, declines in life expectancy were noted. For example, it was estimated that life expectancies in Zimbabwe were twenty-one years lower in the late 1990s and early 2000s than they would have been without AIDS (see chapter 5).⁴¹ Fourth, gender equity is a distant goal in many societies. Women remain marginalized, literacy rates remain low, and rapid population growth and economic crises in the 1980s and 1990s prevented many countries from expanding educational opportunities to meet the growing population. Too frequently, the consequence is poor reproductive health. Health care systems are also casualties of high rates of population growth and stagnant economies that have limited development, modernization, and investment in basic health care services. Many systems are poorly funded or in ruin, preventing access to the most basic of health services at times when both mother and child are in need.

In the past, policy options have offered little hope of reducing fertility levels in Africa,⁴² evidenced by the experiences of the United Nations and other international groups that have worked since the 1950s to address population growth issues. This is not to imply that progress in reducing fertility has not been (or is not) possible, merely that the implementation of successful family-planning programs is challenging, recognizing that there are particular needs to target the underprivileged and those in rural areas through the provision of family planning, the encouragement of gender equality, education, and economic development. In general, countries that have invested in health and family planning have slower population growth and greater economic development than those countries that have not made such investments. Many African governments have recognized the intimate link between population and development, and have promoted programs that would reduce fertility levels, but have frequently lacked the financial ability to fully implement programs. Alternatively,

they have not sufficiently involved all stakeholders, including religious leaders and men, who would work to ensure success by altering social, political, and economic forces influencing fertility choices that prove slow to change. Ensuring that fertility rates are reduced in Africa will provide an ongoing challenge.

WOMEN'S REPRODUCTIVE HEALTH

Underlying many fertility decisions, and ultimately their outcome, is women's reproductive health, which includes safe motherhood, HIV/AIDS, adolescent reproductive health, and family planning. Clearly, these are not mutually exclusive concerns, although they are more often than not developing world concerns. Maternal mortality, for example, is greatest in Africa (590 maternal deaths per 100,000 live births), with some countries experiencing rates in excess of 1,000. In comparison, maternal mortality is only 12 in Canada, 24 in the United States, and 8 in western Europe.⁴³ Morbidity associated with poor reproductive outcomes is also significant.⁴⁴

Not surprisingly, maternal mortality is associated with the absence of good medical care before, during, and after delivery. For instance, a majority of births in sub-Saharan Africa are not attended by skilled health personnel, and antenatal care is frequently lacking and sought out only when there is a complaint.⁴⁵ Equally problematic, there is frequently a lack of awareness about the importance of, and need for, medical care during pregnancy. Maternal mortality is compounded by gender roles and social and economic conditions within individual societies. For example, cost and accessibility of reproductive health care providers may limit use, particularly in rural areas where trained providers are few, access to information is either limited or difficult, and the population simply lacks the funds for appropriate care.⁴⁶ Similarly, while women may prefer to seek female health care providers, few may be available and husbands may be the ones who decide whether to seek care. As a consequence, males must also be included in reproductive health discussions. Complications from illegal and unsafe abortions are also a major cause of maternal death or morbidity, and one that is common in areas where access to safe abortion is limited or illegal. In Nicaragua, complications from unsafe abortions have been identified as one of the leading causes of hospitalization among women, and upward of 8 percent of maternal deaths may be linked to complications associated with unsafe abortions.⁴⁷

Adolescents are perhaps at greatest risk for negative reproductive health outcomes, given their potential exposure to sexually transmitted diseases, unintended pregnancies, and complications from pregnancy and childbirth.⁴⁸ Worldwide, more adolescent girls die from pregnancy-related causes than any

other cause, and maternal mortality is four times as high for women younger than seventeen years. In part, their poor reproductive health reflects an inability to address adolescent reproductive needs and early marriage, as well as lack of knowledge or experience in terms of family planning. Female genital cutting, or the removal of all or part of a young girl's external genitalia, remains a major reproductive health issue in some African and Middle Eastern countries and can lead to infertility and other health complications.⁴⁹

In large part, improvements in female reproductive health reflect increased access to trained health care providers and education, including family planning, which contributes to both maternal and infant health by reducing the number of unintended pregnancies. As noted earlier in this chapter, the use of contraceptive devices varies widely. There is, however, a relationship between family-planning programs and the practice of some form of family planning, whether that is contraception use or some other method to limit and space pregnancies. In Iran, which introduced family-planning programs in the 1980s, 59 percent of married women practice modern family planning. Correspondingly, rates tend to be lower in countries with newer or more limited family-planning programs. At the same time, unmet need for contraceptive devices—which includes such diverse issues as fear of contraception's side effects, disapproval by husband or family, religious objections, and difficulties in obtaining contraceptives—limits the success of family-planning programs. Unmet needs are typically highest among poor and uneducated women.⁵⁰

CONCLUSION

While generally declining, fertility rates vary at the global and local scales. Although low fertility is implicitly desired, resulting in slower or negative population growth, there is little agreement on what constitutes a desirable rate of population growth. Is it sufficient to simply replace the current generation? Can societies with below-replacement fertility, such as many European countries, survive politically and grow economically? What are the political, economic, and social implications of below-replacement fertility? In such countries, governments may actively promote fertility through pronatalist policies, typically by providing financial incentives to couples. Yet how can governments speak of needing to increase fertility when there is an abundance of it elsewhere that could be used to augment growth in the developed world through immigration? Elsewhere, countries with rapid population growth will attempt to reduce fertility and slow population growth, with China's experiment at fertility control being the most widely known (see chapter 10, "Focus").

STUDY QUESTIONS

1. Outline one reason why some governments want to control fertility.
2. Over the years, many countries have introduced policies to control (either promote or reduce) fertility. Select a country and explore its fertility programs.
3. Using birth data from the US National Vital Statistics System (<http://www.cdc.gov/nchs/births.htm>), graph fertility rates by race and year. What differences are observed?
4. Using birth data from the US National Vital Statistics System (<http://www.cdc.gov/nchs/births.htm>), graph fertility rates by state. Are there differences in the graphed rates? What might account for these differences?

FOCUS: CONTRASTING FERTILITY RATES AND CHOICES IN NORTH AMERICA AND UGANDA

When we compare the fertility choices and rates between the developed and developing world, large differences in both are typically exposed.¹ These contrasts can be highlighted by looking at two cases—North America and Uganda.

THE NORTH AMERICAN EXPERIENCE

While fertility rates over the past century have fluctuated, they have generally declined. In 1900, the fertility rate was approximately 3.5. As the nation moved into the depression of the 1930s and World War II, fertility rates dropped. Post World War II, this picture changed dramatically with the baby boom. In the United States, the TFR peaked at 3.58 in 1957, up from 2.19 immediately after the war. By the mid-1960s, fertility rates had once again dropped to levels similar to those observed prior to the baby boom, with fertility rates continuing to drift slowly downward. By the 1970s, the TFR stood at approximately 1.7. After the 1970s, fertility moved upward slightly toward 2.0 children per woman in the 1980s and

1990s, and reached 2.1 in 2001, giving the United States one of the highest total fertility rates in the developed world. Most recently, birth rates in the United States fell from 2.12 in 2007 to 2.01 in 2009 and 1.9 in 2012, largely due to the recession, echoing similar fluctuations in fertility associated with economic cycles.²

The United States and Canada share a similar demographic profile and history, with Canada also experiencing declining fertility from 1900 through the Depression and wars, followed by the postwar baby boom. In Canada, the TFR reached a slightly higher level (3.9) and peaked slightly later (1959) before dropping below the replacement level of 2.1 by 1972. Surprisingly, the decline was led by the French-speaking province of Quebec, where the role of the Catholic church in society was assumed to ensure that fertility rates would remain higher than those observed elsewhere in Canada. In more recent years, Canada's fertility experience has diverged from that of the United States. As of 2012, its fertility rate was 1.7, somewhat lower than that observed in the United States. Despite sharing

similar social changes, such as reduced marriage rates, increased average ages for marriage, and increased educational levels, Canada's fertility experience has tended to follow more closely that of Europe.³ The important difference may lie in Canada's immigrant population, which given immigration policy, tends to be highly educated, implying lower levels of fertility.

In both the United States and Canada, the baby boom reflected the pent-up demand for children following World War II and the Depression, along with rising incomes and expectations and earlier marriages. Likewise, the drop in fertility in both countries was associated with several factors.⁴ First, couples were increasingly delaying marriage as women placed greater emphasis on education and the development of their own careers over development of families. This was also closely related to income potential: higher education meant increasing income opportunities. Consequently, staying at home to raise a family meant income foregone. Second, the 1960s marked the sexual revolution and the increased availability and acceptance of contraception, and particularly the contraceptive pill. Together, these made planning and spacing of pregnancies easier, or ensured that a pregnancy would not occur altogether. Third, an economic interpretation has also been applied to explain declining fertility, given the "demographic squeeze" due to the baby boom generation. As these children aged first into school, then post-secondary education, and finally the labor market, male wages fell at the same time as more women entered the market, in part to compensate for declining wages and as an expression of their own career interests and educational attainment. As a result, marriage and families were postponed.

As already noted, US fertility is higher than most developed countries, and is even

higher than some countries in the developing world. Various reasons for this difference have been put forward.⁵ In large part, its relatively high fertility rate has been attributed to its ethnic diversity, with minority groups having higher fertility than native-born white Americans.⁶ For instance, the TFR for non-Hispanic whites is 1.8. In contrast, Asian Americans had a TFR of 1.7, blacks 2.0, and the TFR was 2.4 among Hispanics. For Hispanics, fertility rates are likely higher for reasons including lower educational attainment and cultures and religions that promote larger families. Although fertility rates among foreign-born Hispanics are much higher than among their native-born counterparts, Hispanic fertility rates are likely to decline toward those of native-born Americans over successive generations.⁷ Second, differences in the cost of childbearing have been suggested: generally higher costs for housing and other commodities in Europe, for example, increase the costs of raising a family and therefore result in lower fertility levels.

THE UGANDAN EXPERIENCE

Having one of the highest levels of fertility in Africa (the 2012 TFR was 6.2) and a rapidly growing population, Uganda presents a strikingly different picture, reflecting its stage in the demographic transition. Over the past fifty years, the fertility rate changed little, and actually increased slightly during the 1970s and 1980s.⁸ As a consequence, the country's population is young, with a stunning 48 percent below the age of fifteen. This young population has yet to move into its reproductive years, meaning that Uganda's population is projected to grow to 52.3 million by 2025, up from 35.6 million in 2012,⁹ and fertility rates are expected to remain high.¹⁰

In large part, Uganda's high fertility reflects a continuation of social trends and the need for large families in order to diversify income opportunities and help the household. In short, fertility has not yet adjusted to increased life expectancy and reduced mortality within the population. War and political and economic turmoil have also helped to ensure that fertility remains high. At the same time, the PRB reports a huge unmet demand for contraception, suggesting that there is a desire to decrease fertility levels by either avoiding pregnancy or through better spacing of pregnancies.¹¹ That is, there is a demand for contraception,

but it is not readily available or affordable. Indeed, only 30 percent of married women aged fifteen to forty-nine use some method of birth control, while only 26 percent use a modern method. The PRB, however, estimates that 37 percent of married women in the same fifteen to forty-nine age group would prefer to use contraception but cannot access it. In addition, unmet needs may reflect a lack of awareness of modern contraception techniques, social and cultural constraints that limit a woman's ability to control birth decisions, and fears of side effects or that use of birth control could be seen as a sign of promiscuity.¹²

METHODS, MEASURES, AND TOOLS: MEASURING FERTILITY

The basic notion of measuring fertility is understanding how the size of a population can be determined by birth choices. The fertility of a population is measured in various ways, the most common of which are presented here. Fertility measures are broadly divided into two types. *Period* data refers to a particular time period (i.e., calendar year or some other period of time) and is essentially a cross-section or snapshot of fertility at a particular point in time. Conversely, *cohort* measures follow a group of women over time, describing how their fertility choices and behavior vary over the period. Data used to measure fertility are drawn from a variety of sources. Commonly, governments will collect birth data and compile it along with other so-called vital statistics. While comparing fertility is facilitated by age standardization, it can also be complicated due to variations in the quality and quantity of collected data: the better the data, the more accurate the conclusion.

In 2011, a total of 4,265,555 births were registered in the United States. The crude birth rate was 13.1 and the total fertility rate was 2.0.¹ Although we have discussed the meaning of the TFR, how else can we measure fertility? Perhaps the most basic measure of fertility is the *crude birth rate* (CBR), defined by

$$CBR = 1,000 \left(\frac{B}{p} \right)$$

where B is the number of annual births and p is the midyear population at risk of giving birth (i.e., women in their reproductive years). While simple to calculate and providing a quick measure of the contribution of fertility to population change, the crude birth rate does not account for the age and sex structure of a population, and therefore does not allow comparison across populations or regions. That is, women from regions with the same crude birth rate may in

fact have very different propensities to have children. Consequently, the *age-specific fertility rate* (ASFR, ${}_hF_x$) is commonly used, defined as

$${}_hF_x = 1,000 \left(\frac{{}_hB_x}{{}_hP_x^f} \right)$$

where ${}_hB_x$ is the number of live births to women aged x to $x + h$ during the year, and ${}_hP_x^f$ is the midyear population of females aged x to $x + h$, and h is the width of the cohort, typically defined as five years and corresponding to population data that is commonly available in data files such as the census.

The TFR measures the expected total number of children that a woman will have over her reproductive career, assuming (1) survival at least through the childbearing ages and (2) that children will be born according to the age-specific rates as women age. This measure is commonly used in describing fertility patterns and in comparing the rates of fertility across different regions and is a better measure of fertility than the crude birth rate because it is independent of the age structure of the population. It is defined by the following formula.

$$TFR = h \sum_x {}_hF_x$$

The TFR is calculated by summing all of the age-specific fertility rates (F_x) over all reproductive age groups and then multiplying the result by the width of the age group used (h).

While the TFR can be used to gauge whether a population is growing or declining due to fertility, the *gross reproduction rate* (GRR) provides the expected number of female children a woman will have, relative to age-specific rates and assuming survival through the reproductive years. In this way, the GRR provides an alternate measure of whether a population is replacing itself and

is defined by multiplying the TFR by the percentage of births that are female. GRR values close to 1.0 represent one female exactly replacing herself, so the population growth rate will be equal to 0. Values less than 1.0 indicate that the next generation of women will not replace themselves, while the current generation will more than replace themselves if the GRR is greater than 1.0.

Finally, the *net reproduction rate* (NRR) is a more precise indicator of whether a population will grow or decline over time by accounting for the fact that not all females will survive to childbearing ages, which is an underlying assumption of the GRR. The NRR defines the number of daughters born to a woman if she were subject to prevailing age-specific fertility and mortality rates in the given year. The NRR is defined as the following formula.

$$NRR = \frac{W}{l_0} \sum_x {}_hF_x {}_hL_x$$

In essence, this is the gross reproduction rate multiplied by the proportion of female babies surviving to the midpoint of the age interval, which can be derived from a life table. If the calculated NRR is equal to 1.0, each generation of women is exactly replacing itself. If it is greater than 1.0, the population will grow, while a value less than 1 is the converse (shrinking), and 0 indicates that the current generation will not be replaced.

Cohort measures of fertility include *completed fertility*, which measures the total number of births to a cohort of women. Alternatively, *fertility intentions* provide an estimate of the number of children a woman intends to have over her reproductive years. However, fertility intentions can be altered by changing preferences or economic situations, which may increase or decrease the number of desired children.

Chapter Five

Mortality

Mortality Transitions

Differences in Mortality

Infectious and Parasitic Diseases (IPDs)

HIV/AIDS

Conclusion: The Future of Mortality

Study Questions

*Focus: Mortality Differences—The United States,
Mexico, and Zimbabwe*

Methods, Measures, and Tools: Measuring Mortality

THE DECLINE IN MORTALITY RATES from their historically high levels initiated the demographic transition. In much of Europe and North America, declines in mortality were apparent shortly after the onset of the Industrial Revolution. These improvements to human survival and longer life spans resulted in rapid population growth, aided by modernization and advances in sanitation and nutrition, with Europe's population more than doubling between 1800 and 1900.¹ By the first half of the twentieth century, developed countries had completed their mortality transition, characterized by long life expectancies, low infant death rates, and slow population growth rates. In the developing world, the initiation of mortality declines in the postwar era during the second half of the twentieth century brought rapid population growth. Here, the pace of mortality decline tended to be much more rapid than that experienced in the developed world, assisted by the importation of modern medicines, health care, immunizations, and improved nutrition and sanitation.

This chapter explores mortality differences and the related subject of morbidity, or illness within populations. It begins by discussing the mortality transition, or the decline in mortality rates, and the epidemiological transition. It then explores differences in the rates and causes of mortality between black and white Americans and increasing mortality in Russia. The chapter also discusses the significance of infectious and parasitic diseases and their reemergence before focusing on HIV/AIDS and its impact on population mortality.

The “Focus” section contrasts the mortality experiences of the United States, Zimbabwe, and Mexico, and the “Measures, Methods, and Tools” section defines the common measures of mortality.

MORTALITY TRANSITIONS

For much of human history, the average person could probably expect to live only twenty to thirty years. Infant mortality rates were high, and approximately half of all deaths occurred before age five, usually associated with poor nutrition or infanticide. With advances in agriculture and the domestication of animals, humans were able to establish year-round settlements. Infectious diseases such as bubonic plague found a new home in human settlements and became the prevalent cause of death, as denser populations and relatively poor sanitation allowed infectious diseases to thrive. Trade between settlements transported illness and disease across space.² The nineteenth and twentieth centuries saw improvements in housing, sanitation, and nutrition, allowing mortality to decrease and life expectancy in Europe and North America to increase to forty years.

The poor health standards and living conditions observed in American, Canadian, and British cities during the Industrial Revolution gave rise to new public health initiatives. This intervention was spearheaded by the elite not out of goodness but out of fear that their own health and, perhaps more importantly, their profits hinged upon the conditions of the working poor.³ Although infectious diseases, including tuberculosis, bronchitis, pneumonia, influenza, and measles, remained the main cause of death, their incidence declined with environmental improvements, such as improved living conditions, and occurred long before medical intervention was widely available.⁴ However, some diseases, such as diphtheria, did not respond to societal improvements, declining only when large-scale immunization programs began. In fact, it wasn't until the 1950s that a decline in mortality, particularly among the older population, could be associated with the application of low-cost public health programs. Since then, improvements to life expectancy within developed countries have generally been attributed to advances in medical and biological sciences as opposed to general economic improvements or public health. The mortality transition also results in a shift in the ages when the majority of deaths occur. In countries at the beginning of the transition, younger age groups are at greater risk of dying, since children are particularly susceptible to many infectious diseases. Even now, approximately 40 percent of deaths in the developing world occur among children less than five years old. In the developed world, most deaths occur among the elderly, with less than 2 percent of deaths occurring among those less than twenty years old.

Despite improvements in indicators such as life expectancy or infant mortality within the past fifty years, widespread variations remain, even in the developed world (figure 5.1). As of 2012, life expectancy in the developed world averaged seventy-eight years, being slightly longer for women (eighty-one) than men (seventy-five). In the developing world, life expectancies are lower, averaging sixty-eight years in the less developed world (including China) and fifty-eight in the least developed world.⁵ Improvements have been slower in sub-Saharan Africa than in any other region,⁶ with average life expectancies of just fifty-five years, compared to seventy-nine years in North America, seventy-four years in Latin America, and seventy years in Asia. At sixty-seven deaths per one thousand births, infant mortality rates are similarly higher in sub-Saharan Africa. In comparison, infant mortality rates are only five per one thousand in the developed world.

Omran's Epidemiological Transition

Abdel Omran's epidemiological transition provides a useful framework for looking at these temporal trends in mortality,⁷ echoing the decline in mortality set out in the demographic transition theory. However, Omran's theory asserts that modernization not only brings about reductions in overall mortality levels and

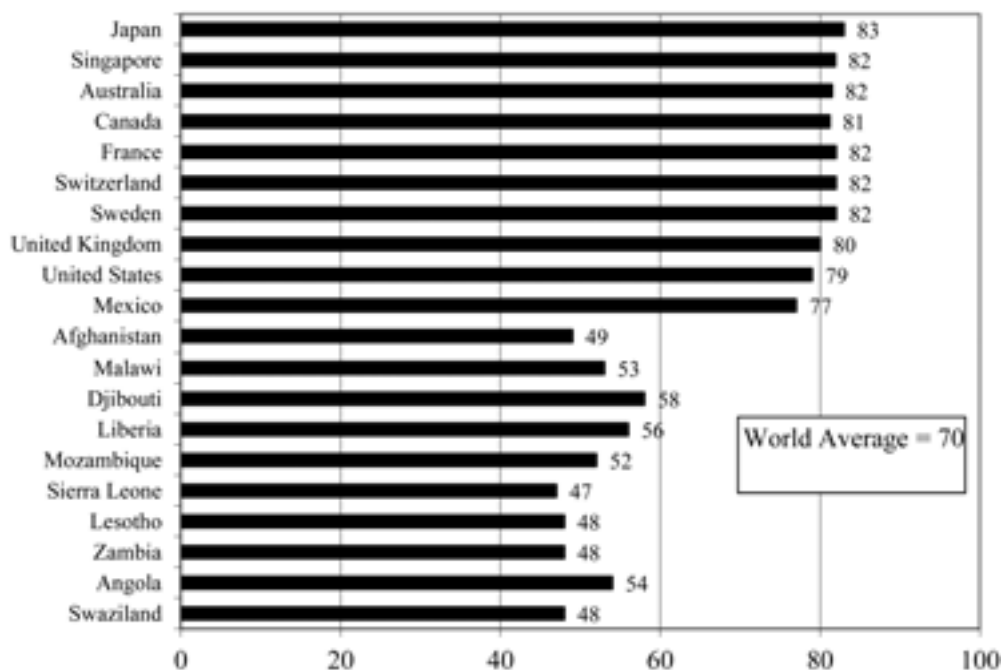


Figure 5.1 Life Expectancy in Selected Countries, 2011

Source: WHO, <http://www.who.int/countries/en/#M>.

the timing of death, but also results in a shift in the major causes of death from infectious and contagious diseases to chronic, degenerative disorders. As recently as the mid-eighteenth century, tuberculosis, cholera, diarrhea, and pneumonia-influenza were the leading causes of death throughout the world. Through much of the latter half of the twentieth century, resources were marshaled to control infectious and parasitic diseases. By the late 1990s, only pneumonia and influenza remained among the top ten causes of premature death within the developed world. Instead, chronic noncommunicable and degenerative diseases such as cancer, diabetes, and liver, cardiovascular, or neurological diseases have replaced infectious diseases as the leading causes of death in the developed world. As the incidences of disease and premature death were reduced, individuals were able to enjoy longer life expectancies.

Countries occupy different stages in this transition and progress through it at different rates. Unlike in the developed world, where socioeconomic improvements resulted in declining mortality over a span of decades, most developing countries have moved quickly through the epidemiological transition, directly benefiting from the transfer of public health knowledge and medical technology and medicines from the developed world. This has meant that the developing world has experienced a much more rapid decline in mortality levels than that experienced in the developed world.

DIFFERENCES IN MORTALITY

The past one hundred years have seen remarkable improvements in life expectancy and infant mortality. Reductions were particularly dramatic in developing countries when countries gained the ability to treat or eradicate infectious diseases such as malaria, smallpox, and yellow fever and where improvements in basic health status had immediate effects. Despite improvements in indicators such as life expectancy or infant mortality, mortality rates vary across the globe and by age, sex, sociodemographic status, race, ethnicity, and location, with the developed world characterized by lower death rates than elsewhere. Yet, in summarizing worldwide variations in mortality measures, we tend to make two assumptions. First, we assume that health indicators will constantly improve. We have come to expect improvements in life expectancy as medical science continues to make discoveries and as the population is increasingly taught to make positive lifestyle choices (i.e., maintaining physical fitness or not smoking) that will extend or protect life. Second, we generally assume that poor indicators of health are only found in the developing world. In other words, we assume that the Western, developed world has the advantage of an accessible and developed health system that ensures population health. Yet neither of

these assumptions is correct, as the following two examples illustrate. These health and mortality differentials are particularly problematic, not because they represent populations that require large-scale intervention and have little access to health care, but for the exact opposite reasons. That is, in the presence of a large health care infrastructure, poor mortality experiences within segments of the population seem to be a paradox, yet they are common.

Race and Ethnicity: The Case of the United States

Americans have access to some of the best health care in the world, and their health care system consumes a significantly higher proportion of America's gross domestic product (GDP) than other developed countries.⁸ A casual observer might, therefore, expect the United States to have the lowest infant mortality rate or the highest life expectancy. In fact, with a 2012 infant mortality rate (IMR) of 6.0⁹ and a life expectancy of seventy-nine years from birth, health indicators within the United States are rather poor by Western standards. In some cases, health indicators are more akin to those found in the developing world than the developed world, with the US infant mortality rate higher than that found in forty-eight countries, including Cuba and Hungary, placing American indicators closer to the bottom of the developed world's list than the top.

In large part, the poor performance of American mortality indicators reflects the poor health status and mortality conditions of its minority populations,¹⁰ with large differences by race and ethnicity.¹¹ Generally speaking, minority groups have higher rates of infant mortality, while whites, along with Asians, Pacific Islanders, Central and South Americans, Mexicans, and Cubans have the lowest. Disparities are particularly noticeable between African Americans and non-Hispanic whites. The 2011 IMR for non-Hispanic whites was 5.05.¹² In comparison, the IMR for blacks was 11.42. In part, increases in preterm birth and preterm-related causes of death are major factors associated with the high IMR in the country.

Similarly, despite dramatic improvements in life expectancies since 1900 (from approximately 33 years to 75.3 years in 2012), black life expectancies remain shorter than those of white Americans (79 years),¹³ with the gap in life expectancy between blacks and whites growing over the past fifty years.¹⁴ African American mortality rates are higher than those observed within the white population at every age except the very oldest, and African Americans have higher rates of death relative to whites from almost every major cause, especially for heart disease, cancer, HIV/AIDS, and homicide. The increased risk of death is magnified among young African American males, where homicide is the leading cause of death, while white men are more likely to die in accidents

(table 5.1). Young blacks are also several times more likely to die from AIDS than whites.

Smaller geographic scales show these same racial disparities. Infant mortality rates among blacks are more than two times those observed among whites, with some of the highest rates observed in the southern states.¹⁵ Within the state of Illinois, the 2009 IMR (6.9) was worse than the national average. This value, however, reflects a white (2009) IMR of just 5.4, and an IMR of 14.0 among African Americans,¹⁶ a rate that is higher than Azerbaijan (11)! At an even smaller geographic scale, the 2004 IMR within the city of Chicago was 14.7 among African Americans, but just 4.6 among whites.

While the disparities in mortality experiences of black and white Americans are startling, they reflect the continued marginalization of blacks within American society, measured by inequalities in education, economic status, or occupation. Despite improvements in their overall economic and social status from the 1930s onward and legislation that has reduced the social and economic gulf between the two groups, the gap remains substantial. For instance, median household income in 2011 was \$50,502, yet for blacks, the median income was only \$33,223.¹⁷ Minority children suffer disproportionately from economic deprivation, with the proportion of children in poverty among blacks approximately three times that of white children in 2011.¹⁸ Differences in mortality by race remain even after comparing individuals with similar levels of income and education.

The prevalence of poor mortality outcomes is also linked to the structure of the American health care system. The lower socioeconomic position of blacks makes the affordability of private medical insurance less likely. While public health programs such as Medicare or Medicaid are available for the poor or elderly, these programs are limited and means-tested. For the remainder, it has become too expensive to pay for private health insurance, and an estimated 48.6 million Americans had no insurance in 2011.¹⁹ Among blacks, over 19.5 percent did not have health insurance, compared to 14.9 percent among whites, and rates of noninsurance for black children (10.2 percent) were almost double those observed for white children (6.8 percent) in 2011. Regardless of race, lack of health insurance typically means that individuals forgo medical treatment, rely upon social service agencies for assistance, or utilize emergency room services, where the cost of medical attention is significantly greater.

Concurrently, the health system provides fewer services and clinics in poor areas.²⁰ Physicians, clinics, and institutions locate in areas with higher financial returns, and inner-city areas have fewer services. The number of public hospitals that provided care for the poor declined from 1,778 in 1980 to 1,197 in 1999, victims of hospital closures, acquisitions, or mergers.²¹ Inner-city areas have difficulty in recruiting doctors and frequently depend upon federal programs such as the National Health Services Corps, created in 1970 to provide

Table 5.1. Leading Causes of Death: Black and White Males Aged 25–34 in the United States, 2009

Rank	Black males			White males		
	Cause of death ^a	Number	Rate	Cause of death	Number	Rate
—	All causes	6,238	213.2	All causes	21,780	130.0
1	Assault (homicide)	2,045	69.9	Accidents (unintentional injuries)	8,930	53.3
2	Accidents (unintentional injuries)	1,230	42.0	Intentional self-harm (suicide)	3,715	22.2
3	Diseases of the heart	583	19.9	Diseases of the heart	1,466	8.7
4	Intentional self-harm (suicide)	382	13.1	Malignant neoplasms	1,423	8.7
5	HIV disease	347	11.9	Assault (homicide)	1,334	8.0
6	Malignant neoplasms	286	9.8	Influenza and pneumonia	335	2.0
7	Diabetes mellitus	110	3.8	Chronic liver disease and cirrhosis	249	1.5
8	Cerebrovascular diseases	80	2.7	Diabetes mellitus	228	1.4
9	Influenza and pneumonia	64	2.2	HIV disease	203	1.2
10	Anemias	61	2.1	Cerebrovascular diseases	203	1.2
—	All other causes	1,050	35.9	All other causes	3,694	22.0

Source: United States, *National Vital Statistics Report* 61, no. 7 (2012): white males 25–34 on p. 28; black males 25–34 on p. 34.

^a Based on International Classification of Diseases, Tenth Revision.

basic care to inner-city neighborhoods. Not surprisingly, therefore, where people live matters in terms of health, reflective of the “context-composition” discussion found within the health geography literature.²² African Americans are, for instance, more likely to live in areas that have poor or limited health care services, and are therefore more likely to experience poor health.²³

Mortality in Russia: Reductions in Mortality Improvements

Despite the mortality transition and its expected improvements, it is not necessarily a one-way street. That is, mortality can, in some cases, increase, reversing decades of improvement, with Russia providing an example.²⁴ As recently as 1900, Russian life expectancy was only slightly greater than thirty years, reduced by infant mortality rates that most likely reached three hundred per one thousand and a child mortality rate of up to 50 percent.²⁵ Within a relatively short period of time, the former Soviet Union had successfully reduced mortality and increased life expectancy within its population, with rates in the early 1960s comparable to those found in the United States and elsewhere in the developed world. Despite these dramatic improvements in health in the postrevolutionary period, the Soviet Union could not keep pace with the West with respect to basic health outcomes from the 1960s onward. As life expectancy and infant mortality continued to improve in the West, they deteriorated in the former Soviet Union. By the 1990s, observers of Russia’s demographic system noted that male life expectancy had dropped from sixty-five years in 1987 to fifty-seven in 1994. Similarly, female life expectancy dropped by more than three years to an average of seventy-one years.²⁶ Although there is some disagreement about what caused the declines in mortality, most placed this decline within the context of the breakup of the Soviet Union in 1989 and the corresponding economic and social turmoil, along with inadequate health services, lack of prescription medicine, alcohol abuse, and high smoking prevalence.

Russia’s mortality experiences run counter to typical expectations, demonstrating that mortality decline and the epidemiological transition are not unidirectional. While the exact causes of the deterioration of health outcomes are unknown and debated, they reflect a much longer process dating back over thirty years to the Soviet era. Infant mortality in the Soviet Union was always relatively high, but research in the 1970s by Davis and Feshbach noted infant mortality rates had started to diverge from Western experiences.²⁷ While infant mortality rates continued to decline in the West, rates in the former Soviet Union stabilized at approximately twenty-five, and then increased to over thirty by the mid-1970s. At about the same time, the Soviet Union stopped publishing detailed mortality statistics, a point that speaks for itself.²⁸ Davis and Feshbach

attribute the increase in the infant mortality rate to social, economic, and medical reasons, including increased smoking and drinking among mothers, poor maternal nutrition and health, inadequate health care during pregnancy, and unsanitary conditions in hospitals. They also noticed strong regional differences in mortality, with the rise in infant mortality led by Central Asian republics, including Uzbekistan and Kazakhstan, along with the Caucasian republics of Georgia and Armenia.

The declining life expectancy among Russian men in the 1990s was not new either, but instead reflected longer-term trends, with Soviet indices worsening relative to the West as early as the 1970s. After a temporary improvement in life expectancies in the 1980s, which was attributed to an aggressive anti-alcohol campaign under then-president Mikhail Gorbachev, the gap between the Soviet Union and the West continued to grow through the 1990s. As with infant mortality, a portion of the widening gap was the result of increasing life expectancy in the West. But the gap also reflected deeper institutional problems within the Soviet Union itself, including inadequate health services and the general neglect of the Soviet and Russian health care system. Alcohol abuse and high rates of cardiovascular disease and injury also contributed to declining life expectancy.

Although male life expectancy had rebounded to sixty-six years by 2001, it dipped again in subsequent years, and was just sixty-three years in 2012. Russia's infant mortality rate has continued to drop, moving from 16 in 2001 to 7.5 in 2012. Still, it remains to be seen whether these measures will improve in the near future. The democratically nascent Russia continues to grapple with economic and social reform, and its health care system remains in a state of crisis. Russia must first catch up to the levels of infant mortality and life expectancy that were observed in the 1960s before approaching Western levels. In the meantime, political uncertainty and stalled economic reforms mean that its health institutions remain underfunded and social and economic conditions remain poor, neither of which is conducive for improvements to life expectancy.

INFECTIOUS AND PARASITIC DISEASES (IPDs)

Infectious and parasitic diseases encompass a range of diseases, including cholera, HIV/AIDS, and tuberculosis, to name a few. With the advent and widespread use of powerful antibiotics in the mid-twentieth century, science and the medical community thought that many IPDs were controllable and ultimately could be eliminated as serious causes of death. The control of measles, mumps, polio, and other common childhood diseases further solidified the

impression that modern medicine would overcome diseases that had been a scourge to humans for centuries.

In the postwar era, huge financial resources were committed to the eradication of infectious and parasitic diseases. Most notable among these programs was the eradication of smallpox, an infectious disease that had mortality rates in excess of thirty percent and was the leading cause of death in Europe in the 1800s. Its successful defeat in the 1970s through a global immunization program seemed to confirm that infectious diseases could be controlled through large-scale public health initiatives. Another major program targeted malaria, a health problem that has plagued humanity throughout history. The drainage of swamps and the control of mosquitoes, the “vectors” that carry malaria, through the application of the pesticide dichlorodiphenyltrichloroethane (DDT), resulted in dramatic reductions in the number of new cases.

The (Re)emergence of Infectious and Parasitic Diseases

Successes, such as the eradication of malaria, proved to be temporary, and the past two decades have seen a reemergence of IPDs as major threats to societal health.²⁹ After 1963, commitment to malaria programs waned and the disease returned, worse than before. Long-term use of DDT had given birth to DDT-resistant mosquitoes, not to mention DDT’s own deadly legacy linked to cancer and environmental effects. Concurrently, inadequate treatment regimes, poor drug supplies, and the misuse of drugs contributed to the rise of drug-resistant malaria.³⁰ Despite worldwide attempts to control malaria, the disease is as prevalent today as it was at the start of the campaign.³¹ Similarly, and despite the success of inoculation programs, many children remain at risk for other infectious diseases, and IPDs remain the leading cause of death in the developing world. Measles remains one of the five leading causes of death in children under five years.³² Although the prevalence of measles has been reduced remarkably within the past decade, it continues to account for a large number of preventable deaths (an estimated 535,300 deaths worldwide in 2000, decreasing to 139,300 in 2010).³³ Worldwide, IPDs represent upward of 54 percent of all deaths among children, while over 60 percent of deaths in Africa can be attributed to IPDs.

The reemergence of malaria should have served as a warning that complacency in the fight against infectious diseases was not an option and indicated that diseases could emerge or reemerge as the causal microbe evolved into a more infectious form or as new pathways to infection appeared. The rise of new IPDs, including Ebola, a usually deadly disease for which there is no known cure; multidrug-resistant tuberculosis, malaria, and meningitis; and new forms of cholera, has further shaken our complacency in science’s ability to control infectious disease.

A variety of factors have been responsible for the reemergence of IPDs. One reason that infectious diseases cause a larger percentage of deaths in areas such as sub-Saharan Africa is purely demographic. The proportion of the population surviving into older ages, where the risk of death from chronic degenerative diseases is greater, is small in many parts of the developing world. Instead, young populations, widespread poverty, malnutrition, and inadequate public health care systems contribute to the high death toll, even though a majority of existing IPDs can be prevented through immunization, safe drinking water, proper food storage, safe-sex practices, and personal hygiene. Changes to the natural environment have also contributed to IPDs' reemergence. Human-induced changes can cause genetic changes in organisms or the vectors that transmit diseases (e.g., as in the case of DDT-resistant mosquitoes). Further, the misuse of antibiotics has contributed to the rise of drug-resistant forms of malaria and tuberculosis, and HIV/AIDS has resulted in an increase in tuberculosis and pneumonia. Agricultural practices affect the environment within which microbes live and spread, and social, economic, and political conditions have facilitated their return and spread. Population movement has long been an important avenue for the spread of disease. Historically, the bubonic plague was brought to Europe from Asia, and European explorers brought smallpox to North America and Oceania, decimating the indigenous populations, who had no resistance to the disease. Settlement and urbanization have concentrated populations and allowed the sustained presence of diseases that were formerly epidemic in small areas or for short periods. Cholera, nearly nonexistent in rural areas, quickly rose to epidemic proportions with urbanization as people were brought together and the risk of contagion was escalated in crowded and unsanitary conditions. Today, rapid urbanization in the developing world repeats this process as migrants settle in crowded and inadequate conditions.

The twenty-first century brings with it new challenges in the control of IPDs. For instance, the surge in IPDs has been due to a breakdown in the provision of public health, with civil strife a prime cause, as it disrupts the distribution of needed drugs and food. Rapid population growth and urbanization have meant that governments have not been able to provide adequate or basic health care or infrastructure such as clean water. Perhaps more worrisome is the speed and ease of transference of disease. The rapidity of movement across countries through jet travel poses additional challenges to the control of IPDs, with airplanes offering a highly effective means of transportation for disease, with the potential to spread illness and disease across the world in a matter of hours.

Additionally, there are an increasing number of cases in which individuals or societies reject immunization. In North America and elsewhere in the developed world, rejection may be based upon religious grounds or (unfounded) fears that immunization is linked to increased incidence of childhood autism.³⁴

Elsewhere, the failure to immunize and thus protect children from preventable IPDs is based on religious grounds. In Nigeria, for example, the government in the northern state of Kano stopped immunizing children against polio in 2004 amid fears and claims by religious leaders that the vaccine made girls infertile.³⁵ Polio is a disease that is spread through human feces and can result in paralysis in one in two hundred people. Instead of hoping to eradicate polio, the World Health Organization was fighting to contain the virus, which had spread quickly to countries including Sudan, Benin, Botswana, Chad, Ghana, Togo, the Ivory Coast, Cameroon, and the Central African Republic. In these cases, the spread of the virus was likely due to the relatively porous borders in the region, while air travel has likely resulted in its spread to countries including Afghanistan, Indonesia, Egypt, Niger, Nigeria, and Pakistan.

HIV/AIDS

The human immunodeficiency virus (HIV), the virus that causes AIDS (acquired immunodeficiency syndrome), altered mortality patterns and life expectancies globally, and perhaps best summarizes the potential for the emergence of new infectious diseases and their devastating effects. Although new research has pushed back the biological origins of the disease to between 1884 and 1924,³⁶ with evidence of HIV found in tissue samples from 1959,³⁷ it only attracted medical attention in 1981 when it was identified among gay men in the United States. Commonly thought to have emerged somewhere in central Africa and present-day Congo, it most likely evolved from the infection of African bush hunters with the simian immunodeficiency virus. With little interaction and population mobility, it potentially survived for decades within the human population, albeit at very low levels and within a spatially confined area. French colonialism allowed the disease to spread throughout the region, during which health care workers frequently used unsterilized needles to treat tropical diseases in the 1930s.³⁸ Additionally, construction camps brought together prostitutes and laborers from across Africa, creating an ideal situation to allow the virus to start to spread between people through sexual contact. Civil war in the Congo in the early 1960s further facilitated its movement into the larger population, carried by soldiers and aided by refugee movements and famine. Ultimately, it would spread across the globe and emerge as a major public health concern and a leading cause of death throughout the world within a generation.

In 2011, 2.5 million were newly infected with the virus, 1.7 million people worldwide died of AIDS, and 34 million people were living with HIV/AIDS.³⁹ Despite the magnitude of the epidemic, its scale has changed, with fewer new

infections (in 2007, 2.7 million people were newly infected), fewer people dying of AIDS (in 2007, 2 million people died of AIDS), and more living with HIV/AIDS (33 million were living with HIV/AIDS in 2007), all of which reflect greater awareness along with advances in its treatment and management. Other aspects of the epidemic have not changed. Most HIV cases (95 percent) are still found in the developing world, where the scale of the epidemic has profound economic, social, demographic, and political implications. It is just as important, however, to realize that the epidemic is far from over, with the Centers for Disease Control and Prevention (CDC) reporting in 2011 that HIV/AIDS was spreading faster in the United States than had been thought, with over 50,000 people newly infected with HIV. African Americans were disproportionately more likely to be infected, with black women nearly fifteen times as likely to be infected as white women and Hispanic women four times as likely to be infected as white women. At the same time, black men are six times more likely to be infected than white men, and approximately three times more likely than Hispanic men.⁴⁰

Spatial Variations in HIV/AIDS in Africa

The challenges posed by HIV/AIDS vary from place to place but are perhaps felt most acutely within sub-Saharan Africa, where AIDS remains the leading cause of death (table 5.2). In 2011, sub-Saharan Africa accounted for 71 percent of new infections and currently represents over 69 percent of the world's total cases.⁴¹ Although infection rates are high in the region, the prevalence of HIV/AIDS is unequal, meaning it is inaccurate to speak of a single African epidemic. While initially centered in the countries of central and eastern Africa, the epidemic has exploded in southern Africa, while prevalence rates remain steady at 5 percent or less in many West African states, and East Africa has seen some modest declines in HIV prevalence among pregnant women in urban areas (figure 5.2).⁴²

The epidemic peaks in southern Africa, where 22.8 percent of all female adults (aged fifteen to forty-nine) and 13.6 percent of adult males in Swaziland and 29.2 percent of women in Botswana are infected. Growing from just 1 percent in the early 1990s, the prevalence rate in South Africa is now over 17 percent among adults, giving the country the dubious distinction of having more people infected with HIV than any other country. National adult HIV prevalence also exceeded 15 percent in Lesotho, Namibia, Zambia, and Zimbabwe.

These spatial variations in HIV/AIDS prevalence are likely rooted in a complex web of behavioral, social, and biological factors that interact with the continent's varied economic, social, and political systems.⁴³ The exact reasons for the spatial variation remain unclear, however, and a number of theories have

Table 5.2. Regional HIV/AIDS Statistics and Features, 2011

<i>Region</i>	<i>Epidemic started</i>	<i>People living with HIV/AIDS</i>	<i>New infections, 2011</i>	<i>Adult prevalence rate^a (%)</i>	<i>% of HIV positive adults who are women</i>	<i>Main mode(s) of transmission^b</i>
Sub-Saharan Africa	Late 70s–Early 80s	23.5 million	1.8 million	4.9	57	Hetero
North Africa and Middle East	Late 80s	300,000	37,000	0.2	48	Hetero IDU
South and Southeast Asia	Late 80s	4.0 million	280,000	0.3	28	Hetero IDU
East Asia	Late 80s	830,000	89,000	0.1	22	IDU Hetero MSM
Latin America	Late 70s–Early 80s	1.4 million	83,000	0.4	35	MSM IDU Hetero
Caribbean	Late 70s–Early 80s	230,000	13,000	1.0	49	Hetero MSM
Eastern Europe and Central Asia	Early 90s	1.4 million	140,000	1.0	34	IDU
Western and Central Europe	Late 70s–Early 80s	900,000	30,000	0.2	26	MSM IDU
North America	Late 70s–Early 80s	1.4 million	51,000	0.6	25	MSM IDU Hetero
Oceania	Late 70s–Early 80s	53,000	2,900	0.3	20	MSM
Total		34 million	2.5 million	0.8	48	

Source: Based on data derived from the United Nations Program on HIV/AIDS (UNAIDS), www.unaids.org.

^a The percentage of adults (fifteen to forty-nine years of age) living with HIV/AIDS in 2011.

^b Hetero (heterosexual transmission), IDU (transmission through injecting drug use), and MSM (sexual transmission among men who have sex with men).

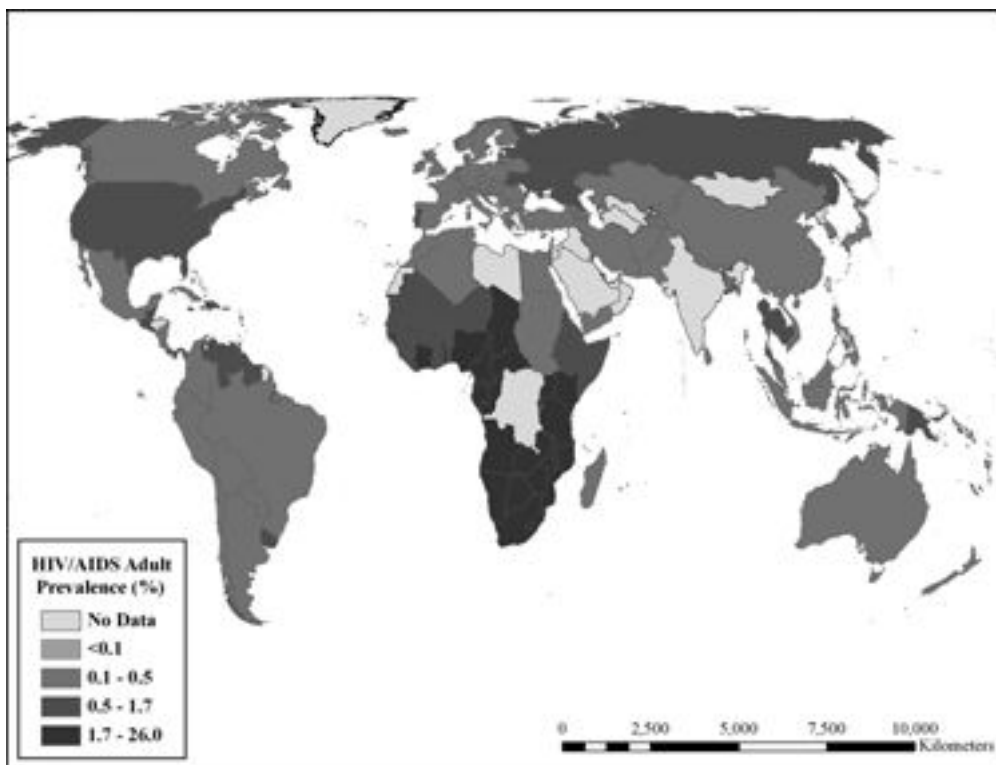


Figure 5.2 HIV Prevalence Rates, 2011

Source: Data derived from UNAIDS, www.unaids.org.

been advanced.⁴⁴ One possibility lies in the patterns of sexual activity or networking within sub-Saharan Africa that promote heterosexual infection. Premarital and extramarital intercourse, age at first intercourse, number of partners, polygamy, the low status of women, wife inheritance, and use/frequency of contact with prostitutes have been implicated as practices that increase the risk of infection. While there are elements of truth to the networking theory, it is important to place it within the proper social, cultural, and political context of sub-Saharan Africa, rather than creating an ethnocentric version that portrays African societies as sexually promiscuous.⁴⁵ A second theory relates to the increased prevalence of other sexually transmitted diseases in sub-Saharan Africa, with sexually transmitted diseases resulting in lesions to the skin, allowing easier infection. A third suggests that the presence of other infections such as malaria or tuberculosis can increase the amount of HIV in the blood, thereby increasing the ability to infect a partner.

While there are successful models for controlling HIV/AIDS within the African continent and reductions in prevalence rates have been noted, many sub-Saharan countries were slow to adopt HIV/AIDS-awareness programs or to simply recognize the existence of the virus. The discussion of sex or sexuality was

taboo in many societies, and HIV/AIDS carried a stigma that governments and individuals alike tried to avoid, denying it as a problem and failing to invest in public education. Countries lost time in introducing measures to contain HIV because the disease and its significance were not fully understood, or governments denied that it was occurring. The Kenyan government, along with other governments in the region, denied that AIDS existed in the early and mid-1980s and rejected condom use. As recently as 1999, the South African president Thabo Mbeki questioned whether HIV causes AIDS.⁴⁶ For years afterward, the country lagged the world in dealing with HIV/AIDS by not providing antiretroviral medicines to its population, with one study estimating that the government could have prevented the premature deaths of some 365,000 people if it had provided the necessary drugs.⁴⁷ Although South Africa slowly recognized the significance of the disease and moved to provide AIDS drugs to its population, progress was slow. Economic disparities, poor health systems, and drug shortages further hampered HIV/AIDS control.⁴⁸ In many countries, access to condoms, anti-AIDS drugs, and health care facilities were (or still are) limited for economic, political, or cultural reasons, and many countries continue to lack sufficient screening facilities, drugs, and health care workers. Throughout the developing world, only a small proportion of pregnant women are given drugs that would prevent the transmission of the virus to their child, meaning that approximately nine hundred children are born each day with the AIDS virus.⁴⁹ Many unknowingly carry the virus and infect others, with one estimate suggesting that upward of 90 percent of the infected population are unknowing carriers.⁵⁰

Demographic, Social, and Economic Implications of the AIDS Crisis in Africa

Sub-Saharan Africa is a region coping with the cumulative impact of HIV/AIDS, where the disease has probably lasted longer than elsewhere in the developing world since it is thought to have originated there. Here, HIV threatens to destroy decades of progress measured by health and economic indicators, as well as generating personal suffering and hardship. In 2011, it was estimated that 1.8 million sub-Saharanans were newly infected with HIV, although this represents a significant drop from 3.8 million new infections in 2000.

Demographic Implications

At the height of the epidemic, and before drugs were widely available, HIV/AIDS extracted a terrible toll on the population structure of many African countries, with the most obvious outcome being increased mortality. Already high relative to the developed world, mortality rates rose higher in countries that were affected by AIDS than they would have if AIDS did not exist. Consequently, the traditional population pyramid, which has a wide base representing

the young and tapers to represent increasing ages, was restructured and characterized as a population “chimney” in countries that had high HIV/AIDS prevalence rates (see chapter 3), as AIDS “hollowed out” the young adult population, as the most dramatic changes occurred with the death of young adults infected with the virus, and shrunk the adult population. Given higher mortality, the AIDS epidemic also altered population growth rates, with population projections at one time suggesting that several African countries would experience negative rates of natural increase this century. The effect of the HIV/AIDS epidemic can also be seen in the change in life expectancy across Africa. We would typically expect to see increasing life expectancy associated with improvements to diet and health. AIDS, however, changed the equation. Turning once again to those countries hardest hit by HIV/AIDS, life expectancy at birth declined in multiple countries before recovering somewhat by 2025 (figure 5.3). In Botswana, for instance, life expectancies peaked at approximately sixty-four years before declining to less than forty-seven years in 2000–2005.

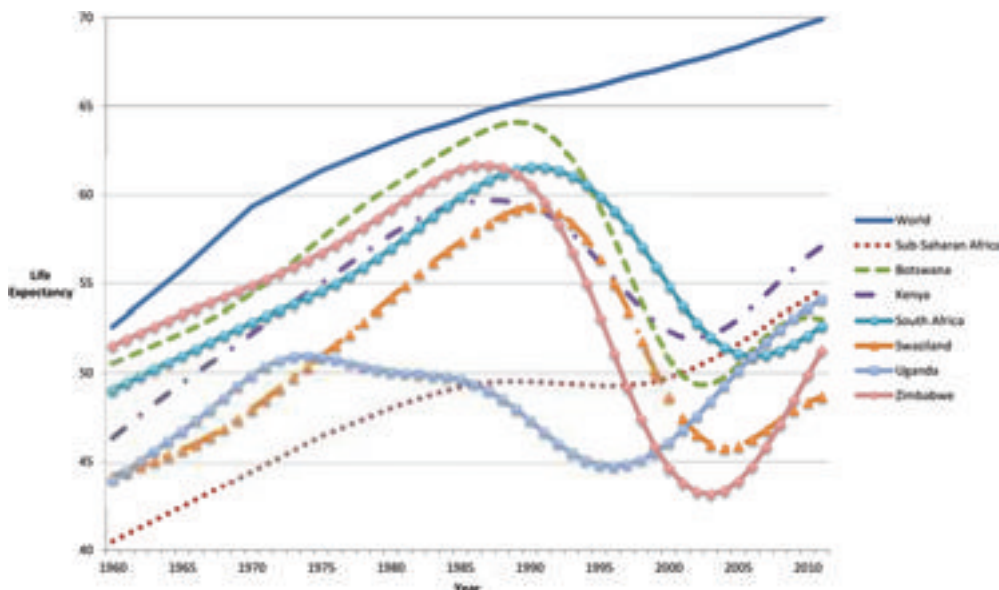


Figure 5.3 The Effect of HIV/AIDS on Life Expectancy in Sub-Saharan Africa, 1960–2012

Source: World Bank, <http://data.worldbank.org/indicator/SP.DYN.LE00.IN/countries/1W>.

Social Implications

The effect of HIV/AIDS reaches into almost every corner of daily life and affects individuals, family units, and societies. In countries worst affected by the epidemic, HIV occurred against a backdrop of deteriorating public services,

poor employment, and poverty, all of which work to reduce coping ability. Existing evidence suggests that households bear a large part of the burden, with differences in the ability to cope based upon wealth and income.⁵¹ In poor households, the death of an adult member reduces money for food, with poor households receiving little financial help from family and friends. Many other households are unable to cope with the death of a family member or the burden of care that is associated with either sickness or death. Socially, fear and shame are still frequently associated with the disease, hindering prevention and care while potentially exposing others to the virus. Death of just one parent also disrupts life and economic abilities. Even if they are not infected, the responsibility for care of children lies with women. With widows lacking property and inheritance rights in many African countries, the epidemic compounds the burden placed upon AIDS widows, who are faced with the loss of their economic livelihood. Oftentimes, children are left with a future that only reflects what the streets can offer.

Although AIDS tends to kill proportionately more young or middle-aged persons who were infected in adolescence, its effect on the very young is startling and has created a cohort of AIDS orphans. In sub-Saharan Africa, it is estimated that nearly twelve million children are AIDS orphans.⁵² Orphaned children face a variety of social and economic challenges. Economically, the large number of orphans increases the burden of communities and governments to provide food, shelter, health care, or schooling. Young orphans are rarely able to cope with agricultural tasks, leading to crop failure and the death of livestock. Socially, AIDS orphans may be burdened by the psychological damage of seeing a parent die. Immediately relevant is the question of who raises the orphaned child. Grandparents or extended family members are frequently called upon to raise him or her, but this occurs at the same time that they had expected to have a reduced role in the family. Instead, they are forced into the parenting role once again, including the need to provide economic security. However, the increased number of orphans has altered the ability and willingness of families and communities to help and the task threatens to outstrip the capacity of the extended-family system. For those lacking an extended family, street gangs provide an alternate “family,” but one that exposes them to violence and anti-social behavior, as well as sexually transmitted infections (STIs) or HIV as they exchange sex for food and money. Although the number of orphans is large, this represents only a portion of the children who are affected by HIV. Millions more are living with parents who are ill, becoming primary caregivers for their parents or siblings.⁵³ Like orphans, they are more likely to drop out of school, more likely to suffer from malnutrition, and may be compelled to work.

Economic Implications

HIV/AIDS also threatens the economic stability of countries through a variety of routes by straining already fragile health care systems, decreasing the quality

and quantity of labor, reducing economic output, and decreasing the amount of disposable income. The epidemic has increased the demand for health care, along with the costs of providing care and drugs and maintaining and improving infrastructure. In order to deal with the epidemic, countries have generally placed a larger share of domestic spending on HIV/AIDS, but this tends to draw expenditures away from other needs. Training and the staffing of health centers pose additional hardships, particularly because of AIDS-related illnesses or the death of health care workers from AIDS. Concurrently, non-AIDS patients are frequently crowded out of health care facilities, and tuberculosis is emerging as the leading cause of death among those infected with HIV.⁵⁴

From an educational standpoint, the epidemic threatens the coverage and quality of education. As teachers die from AIDS, African countries will be faced with a teacher shortage, class sizes are likely to increase, and governments are faced with the costs of training replacement teachers over the longer term. Failure to do so or to meet the demand for teachers will result in a population that lacks the skills needed to fully participate within the economy. Moreover, education may not be reaching those who need it the most. This includes orphaned children, who may be forced to drop out of school to earn a wage or work on the family farm or because they can no longer afford school fees. In turn, there is an increased likelihood of infection, with Joint United Nations Programme on HIV/AIDS (UNAIDS) studies demonstrating that those with lower levels of education were more likely to engage in casual, unprotected sex.⁵⁵ On a larger scale, HIV/AIDS is stripping the ability of sub-Saharan countries to build for the future, robbing them of the ability to generate and supply what Homer-Dixon calls “ingenuity,” and threatening their very survival.⁵⁶

The impact of AIDS is also felt within the labor force, where it reduces the number of workers and degrades the quality or productivity of work at the same time that it undermines education and the ability of the system to provide the needed skills. Responsible for a large burden of sickness, HIV/AIDS leads to increased absenteeism from work, medical costs, and higher costs for training of new workers. Faced with high prevalence rates and lower productivity, companies may outsource their labor requirements. Alternatively, companies may reduce their investment in areas with high HIV prevalence. Either way, the cost of caring for sick workers is shifted from the company to households or governments and undermines the economic security of workers.

While it is difficult to measure the economic impact of HIV/AIDS, there is growing evidence that as HIV prevalence increases, the growth of national income, measured by GDP, falls.⁵⁷ Among countries with prevalence rates greater than 20 percent, GDP growth may be reduced by as much as 2 percent per year. In South Africa, UNAIDS estimates that the overall economic growth in the coming decade may be 0.3 to 0.4 percent per year lower than it would

be without AIDS. What this means is that household income will be reduced at the same time that countries spend more on the care of AIDS patients or orphans, and AIDS will alter the distribution of income, with the number of households in poverty expected to increase while poor households will see a drop in income. In South Africa and Zambia, it is estimated that household income is reduced by 60 to 80 percent in AIDS-affected households, most of which were already poor households, due to coping with AIDS-related illnesses. While the large pool of unemployed may replace unskilled workers, the impact of HIV/AIDS on the education of future workers will likely mean a shortage of skilled workers. Investment, which promotes long-term economic growth, will suffer as money is diverted into health care expenditures.

CONCLUSION: THE FUTURE OF MORTALITY

Changes to the mortality experiences of populations were one of the most significant events of the twentieth century. Unlike the previous century, the twenty-first century will likely see less dramatic changes to life expectancy within the developed world. Similarly, the developing world will likely see some change, although the degree of change and direction is unclear. It is, in fact, likely that life expectancy will *decrease* in parts of the developing world as infectious diseases, including HIV/AIDS, continue to take their toll. As we look ahead over the coming decades, five nonexclusive issues relating to the mortality and morbidity experiences of populations can be raised: including the implications associated with aging societies, the threats to mortality gains posed by urbanization, the renewed threat of infectious and parasitic diseases, the impact of increasing obesity levels, and the provision of health services and other programs to improve population health.

First, the twentieth century witnessed remarkable improvements in life expectancy, with a concurrent increase in life expectancy after age sixty-five. Advances in medical technology have meant that an increasing number are surviving into old age, but it is among the “old elderly,” variously referred to as those greater than seventy-five, eighty, or even eighty-five years, that the largest increases in morbidity (sickness) are observed. Therefore, are improvements to life expectancy a double-edged sword? For example, what are the implications of aging Western societies in terms of increased morbidity, service provision, and support of a growing elderly population? Has this increase come at the expense of an increasing number of years of morbidity? Readers can consult PRB’s online discussion.⁵⁸

Second, emerging health concerns may place many urban residents at a disadvantage with respect to mortality experiences in the near future. Urban

health advantages hide the huge disparity between the urban poor and their wealthy counterparts, particularly in the developing world, where mortality experiences are frequently far worse in poor urban areas as compared to rural areas.⁵⁹ In one study in Bangladesh, for example, infant death rates varied from 95 to 152 per 1000 in urban areas, higher than both middle-class urban areas (32) and rural Bangladesh.⁶⁰ Continued in-migration from rural areas and increasing population density may push mortality and morbidity higher in urban areas. Many cities in the developing world have also grown faster than their infrastructure, leaving large proportions of their populations without adequate and safe water or sanitation, allowing diseases associated with poverty to increase in urban areas. Given these trends, the traditional advantage of urban areas is likely to be diminished in the future.

Third, infectious and parasitic diseases remain a threat to health. In the developed world, there is a need for action to avoid epidemics associated with the importation of disease. Despite safety nets that are designed to prevent diseases from entry, such as the health screening of immigrants, the system is not foolproof, and infectious diseases can spread quickly, as witnessed by the rapid and global spread of the swine flu virus (H1N1) in 2009. Systems and procedures must be in place if epidemics are to be avoided. The developing world faces its own set of problems. Among these, the poor living conditions associated with rapid urbanization and poverty in many developing-world cities create an ideal breeding ground for disease. Throughout 2008 and 2009, Zimbabwe faced a cholera epidemic, a preventable water-borne bacterial illness that causes severe diarrhea, vomiting, and dehydration and can lead to death in a matter of days if not treated. Attributed to the collapse of its health system and the breakdown of its water treatment system following years of economic crisis and government mismanagement, it was estimated that at least 3,623 people died in a six-month span, and over 76,000 were infected.⁶¹ All of these deaths were preventable.

Fourth, some commentators have openly wondered if increasing obesity levels that are widely observed in the United States and elsewhere will ultimately mean that the current generation of youth will actually have shorter life spans than their parents, a conclusion that at least one study supports.⁶² With obesity closely linked to increased cardiovascular disease, diabetes, and other health complications, this remains a real possibility.

Finally, improvements in life expectancy and infant mortality can hardly be removed from the provision of health care and related services. Falling mortality and increased life expectancy is associated with increased costs of maintaining healthy lives. While populations are living longer, there has also been an extension in the expected number of years without disabilities and in good self-reported health, meaning that disability has been shifted toward older age,

along with its associated health costs.⁶³ However, healthy life expectancy, which is the number of years that a person aged x can expect to live in good health (while accounting for morbidity, health status, and age-specific mortality), has not increased at the same pace as life expectancy.⁶⁴ In other words, people will spend a greater number of years in poor health before death. The challenge for societies will be to ensure that their populations remain healthy while restraining health care costs.

While some authors⁶⁵ have called for a medically driven response to the problems of IPDs and other health threats via the development of new vaccines, antibiotics, and improved laboratories, these methods carry a high price and may be years in research and development, and their applicability in the developing world is limited if drug companies do not make the drugs available. If expensive medical programs and intervention cannot provide the assurance of basic population health, other directions must instead be pursued. As a starting point, improvements to life expectancy must be achieved through a renewed commitment to public health programs and basic health care, providing a frontline defense against IPDs, maternal health problems, and other health concerns.

The provision of basic health care to meet the needs of the population is only one piece of the health puzzle, being insufficient on its own to ameliorate or remove inequalities in morbidity or mortality. Instead, it is increasingly realized that the broader determinants of health, including education, sanitation and nutrition, lifestyle options (i.e., smoking, drinking, and drug use behavior), housing conditions, and personal power, impact directly upon health and mortality experiences.⁶⁶ The determinants of health reflect living and working conditions, including the distribution of income, education level, power, instead of individual factors (behavioral risk factors or genetics) that influence the risk for illness or disease. In the United States, the Centers for Disease Control defines social determinants of health as “life-enhancing resources, such as food supply, housing, economic and social relationships, transportation, education, and health care, whose distribution across populations effectively determines length and quality of life,” including access to care and resources such as food, insurance coverage, income, housing, and transportation.⁶⁷ The distributions of these determinants often reflect, or are shaped by, public policies, such as policies that promote more equitable access to health services or redistribute income across populations.

Where we have already observed the differences in mortality by gender, there is ample evidence supporting the other determinants of health. For instance, health inequalities in the United States are related to socioeconomic conditions, with life expectancies increasing for individuals with higher levels of education, but no change in life expectancy (between 1981 and 2000) for those

with low levels of education.⁶⁸ Similar differences in life expectancy are seen with respect to income, with increasing income associated with longer life expectancy. Employment also has a significant effect on health, with paid work providing social contacts, a sense of identity and purpose.⁶⁹ The social environment and social contacts are also important, with the more social contacts people have, the lower their mortality. Conversely, limited emotional support (from friends or family) and low social participation are both associated with increased mortality. Race is also an important factor, with a growing gap in life expectancy between blacks and whites in the United States. Despite its universal health care system, low-income Canadians are more likely to die earlier and to suffer more illnesses than Canadians with higher incomes, regardless of age, sex, race, or place of residence.

Despite the importance of these factors and their contribution to health, governments have been relatively slow to address disparities.⁷⁰ Clearly, however, investments in public infrastructure to provide clean drinking water, sanitation, appropriate housing, public education, or other programs, let alone the provision of basic health care services within the developing world, are limited. While needed, such a broad response to health conditions and mortality experiences is likely to be constrained by budgets and inadequate resources. Attempts at broad responses are further constrained by population growth and political agendas that shape economic assistance, with growth frequently slowing the attainment of these goals in low-income countries and creating a young population that places large demands upon costly educational, social, and health services. Solutions will not come easily or inexpensively.

STUDY QUESTIONS

1. Similar to figure 5.3, and using data from <http://data.worldbank.org/indicator/SP.DYN.LE00.IN/countries/1W>, graph the life expectancy for a selected country.
2. Selecting a country from the less developed world, identify the top ten causes of death. Where might this country be placed in terms of the epidemiological transition? How does it compare to a country in the least developed world?
3. Using mortality data from the US National Vital Statistics System (<http://www.cdc.gov/nchs/deaths.htm>), graph mortality rates by race and year. What patterns are observed?

FOCUS: MORTALITY DIFFERENCES—THE UNITED STATES, MEXICO, AND ZIMBABWE

Although we all must die, differences in mortality rates are found in numerous places and for different reasons. The mortality transition can be illustrated by a comparison of mortality data across countries. In this case, we will contrast Mexico, Zimbabwe, and the United States. Graphing the age-specific death rates of males and females (figure 5F.1), the observed J-shaped function is a characteristic that is found in all countries and populations. The standard age pattern is characterized by differences between males and females and by death rates that are comparatively high in the first year of life, decline through childhood and adolescence, and then increase into old age. Among women, lower death rates are shown from birth onward. This sex differential is typically greatest for young adults,

with the death rates of fifteen- to twenty-four-year-old males approximately three times that of females in the same age group, a difference that is largely attributed to the increased risk of HIV/AIDS, suicide, accidents, or homicides among young males. Moreover, despite overall gains in life expectancy over the past thirty years, fifteen- to twenty-four-year-old males have actually experienced increasing mortality,¹ even though most deaths in this group are preventable.

Across all the ages, observed mortality rates in Zimbabwe exceed those found in Mexico or the United States, while the United States has a slight advantage (in terms of lower mortality rates) over Mexico. Differences in cause-specific mortality regimes are illustrated in table 5F.1. Values in

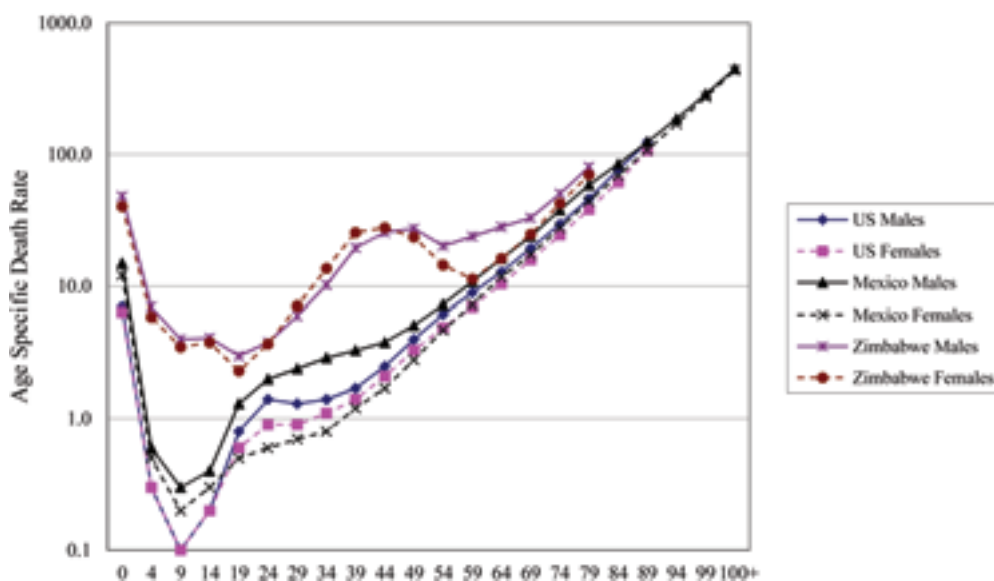


Figure 5F.1 Age-Specific Death Rates: United States, Mexico, and Zimbabwe, 2010

Source: Data derived from WHO, <http://www.who.int/countries/en/#M>.

this table represent the age-standardized death rates (per 100,000) by cause, with age standardization enabling comparison of the importance of death rates across countries while accounting for different population structures. With the lowest all-cause age-standardized death rate (543.5), the United States has clearly passed through the epidemiological transition. Major causes of death include cancers, including breast, colon, and lung cancers, as well as heart or cerebrovascular diseases and road traffic accidents.

With a high all-cause death rate (1,950) and HIV/AIDS as the leading cause of death, Zimbabwe represents a counterexample to that of the United States and has yet to enter the mortality transition. Reflective of many countries in the developing world, infectious and parasitic diseases including diarrhea, tuberculosis, and measles rank within the top ten causes of death. A lack of health care providers, impoverished health care systems, and war are responsible for the high mortality rates. Clearly, many of these causes of death are easily preventable. In many ways, after years of economic erosion and the decimation of its health care system, Zimbabwe is worse off as compared to other developing countries.

Mexico is in the midst of its mortality transition: mortality rates have fallen over

the past four decades, but the age-specific death rate remains higher than observed in the United States. Missing are infectious or parasitic diseases. Instead, mortality is increasingly characterized by the growth of noncommunicable diseases such as heart and cerebrovascular diseases, diabetes, and high blood pressure and accident rates. However, socioeconomic inequalities in Mexican society have led to inequities in access to basic health services. The poorer southern states have the highest disease prevalence and mortality rates for preventable causes and have the highest concentration of rural and indigenous populations.

While death rates give a quick illustration of an individual's risk of dying, demographers typically prefer the complementary measures of life expectancy (the average duration of life beyond age x) or the IMR (the number of deaths of infants less than one year of age divided by the number of births). Both measures provide descriptions of the mortality experiences of a population and a society's quality of life. In 2012, the US IMR was 6.0, and individuals could expect to live seventy-nine years. In Zimbabwe, the IMR was 57, and individuals could expect to live forty-eight years from birth. Finally, the IMR in Mexico was 15, with a life expectancy of seventy-seven.

Table 5F.1. Top Ten All Ages Causes of Death: United States, Mexico, and Zimbabwe, 2008

	# (thousands)	%	ASDR ^a
United States			
All causes	2,458	100	504.9
Ischemic heart disease	446	18	80.5
Alzheimer's and other dementias	173	7	24.8
Trachea, bronchus, lung cancers	165	7	35.4
Cerebrovascular disease	147	6	25.4
Chronic obstructive pulmonary disease	131	5	24.3
Colon and rectum cancers	63	3	12.6
Hypertensive heart disease	62	3	11.4
Lower respiratory infections	58	2	9.7
Nephritis and nephrosis	51	2	9.2
Breast cancer	47	2	10.2
Mexico			
All causes	564	100	616.8
Ischemic heart disease	77	14	87.7
Cerebrovascular disease	34	6	38.8
Cirrhosis of the liver	28	5	31.9
Chronic obstructive pulmonary disease	23	4	26.0
Violence	20	4	18.2
Hypertensive heart disease	18	3	20.1
Lower respiratory infection	17	3	17.6
Road traffic accidents	14	2	13.1
Nephritis and nephrosis	14	2	15.1
Other unintentional injuries	14	2	13.9
Zimbabwe			
All causes	183	100	2,247.3
Lower respiratory infections	8	4	92.5
Cerebrovascular disease	6	3	107.8
Ischemic heart disease	5	3	90.0
Prematurity and low birth rate	4	2	21.8
Birth asphyxia and birth trauma	3	2	15.6
Measles	3	2	13.8
Neonatal infections and other conditions	2	1	10.5
Road traffic accidents	2	1	19.3
Violence	2	1	16.9
Chronic obstructive pulmonary disease	2	1	31.1

Source: Based on World Health Organization (WHO) data, <http://www.who.int/countries/en/>.

^a Age-specific death rate.

METHODS, MEASURES, AND TOOLS: MEASURING MORTALITY

In 2011, a total of 2,513,171 deaths were registered in the United States, translating to a crude death rate of 806.6 deaths per 100,000 and an age-adjusted death rate of 740.6 deaths per 100,000.¹ What do these different measures mean and which is a better representation of mortality in a society? As with fertility, a number of different measures may be used to describe mortality. As before, the quantity and quality of information available determine the detail and accuracy of mortality measures, with data compiled as vital statistics measures. The simplest measure, largely given the limited information required and the ease of calculation, is the *crude death rate* (CDR):

$$CDR = \left(\frac{D}{P} \right) * 1,000$$

where D is the total number of deaths recorded in a year, and P is the population at risk of dying. Typically, the midyear population is used for the denominator.

Like the crude birth rate, however, the main problem is that it does not take account of the age and sex structure of a population in the likelihood of death. This means that a comparison of the CDR across countries is problematic given different age distributions and variations in mortality between genders. Therefore, if we were to contrast two equal-sized populations, but with one having a larger proportion of older individuals, its crude death rate would be higher, but this is not necessarily indicative of a greater risk of death.

We therefore turn to the *age-specific death rate* (ASDR), which accounts for age and sex composition of the population:

$$ASDR = \left(\frac{D_{t,t+5}}{P_{t,t+5}} \right) * 100,000$$

The ASDR measures the number of deaths for people in a specific age group (usually

measured in five-year age groups, t to $t + 5$) divided by the average number of people in that same age group. This measure assumes that death is recorded by age and gender and that accurate knowledge of the population by age and gender is also known.

Measures of infant mortality are also commonly used to describe death rates in the first years of life. Given that a large number of deaths within the first year of life are directly associated with childbirth, the infant mortality rate (IMR) is defined as:

$$IMR = \left(\frac{D}{B} \right) * 1,000$$

or the number of deaths to infants aged less than one year relative to 1,000 live births. As discussed elsewhere in this book, there is considerable variation in infant mortality throughout the world. A comparable measure defines mortality within the first five years of life. Known as the *child mortality rate* (CMR), it reflects the impact of undernourishment, war, or early childhood disease and is defined as the number of deaths to children under five relative to the population aged five and less that is at risk of dying. Even now, approximately 40 percent of deaths in the developing world occur among children less than five years old.

The *standardized mortality rate* (SMR) is the ratio of the number of deaths observed in a specified population to the number that would be expected if that population had the same mortality rate as the standard population, where the standard population is arbitrarily chosen (i.e., a specific region or time period). The SMR is often used to compare outcomes in two or more groups.

The *cause-specific death rate* is the rate of death from specific causes, such as cancer, heart attack, or stroke. Like the measures presented so far, cause-specific death rates would contrast the number of deaths due to a particular outcome (i.e., lung cancer) relative to the population at risk of dying, and should also be adjusted for age and gender differences. However, accuracy can be a problem in some situations, particularly where cause of death is not accurately recorded or determined.

Finally, we may sometimes express mortality differences in terms of *life expectancy*, or the average number of years beyond age x an individual can expect to live under current mortality levels. Life expectancy is usually referenced from birth, but as we saw in the discussion of life tables in chapter 3, it can be expressed from any age. *Life span* also refers to the longest period over which a person may live.

Chapter Six

Internal Migration

Defining Migration

Why Do People Migrate?

Theories of Internal Migration

Migrant Selectivity and Migrant Characteristics

The Migration Process

Conclusion

Study Questions

Focus: Contemporary Internal Population Movement in the United States

Methods, Measures, and Tools: Measuring Migration

THE UNITED STATES, Australia, New Zealand, and Canada display some of the highest levels of population mobility observed in the world. In each of these countries, around one in every five people change their place of residence every year, almost double the rate of movement typically observed in many European countries. This high mobility has been attributed to a variety of factors, including peripatetic traditions inherited from immigrant forebears, the relatively open nature of land, and the housing markets in these countries. Historically, internal movement was related to the opening of new frontiers (i.e., the westward expansion of Canada and the United States) or the discovery of gold and the ensuing gold rushes. More recently, population movement is associated with economic conditions; the attraction of amenities, as in the American Sun Belt; and employment opportunities.

Of all the demographic processes, it is perhaps migration and immigration (covered in the next chapter) that have gained the most attention from geographers. In large part, this likely reflects the intrinsic nature of population movement: by moving from an origin to a destination, space is involved, and we can ask questions about the motivation for migration, the impact migration has on sending and receiving regions, who moves, and so forth. At the same time, measuring and defining the movement of population is much trickier than measuring fertility or mortality, given issues associated with both space and time

that are discussed below. The following chapter explores migration by focusing on its definition and measurement and alternate theories of migration. The “Focus” section considers contemporary internal migration in the United States, and the “Methods, Measures, and Tools” section discusses the various measures of migration.

DEFINING MIGRATION

As with fertility and mortality, researchers attempt to quantify and measure the movement of a population. However, the statistical representation of migration is somewhat more problematic: mortality, for example, is a given and measurable event. Likewise, fertility is measurable. Population mobility is somewhat trickier. When, for example, has an individual migrated? Is it when they purchase a new house down the street or across the country? Likewise, does the relocation need to be permanent, or can it be a temporary one? If temporary, how long should the absence be?

To define migration events, we need to consider the impact of our definition of space (i.e., boundaries and size) and the time interval over which migration is measured and differentiate between migrants and migrations before we can quantify movements. We start by distinguishing between the number of migrants and the number of migrations. The number of migrants refers to the number of individuals who have made one or more migrations during a specified interval, while the number of migrations counts the total number of recorded movements. This distinction is important, as some individuals will move more than once during a specific time interval, so the number of migrations is typically greater than the number of migrants.¹

Geography and Migration

Simply defined, migration involves a change of usual residence by a person, family, or household. However, this definition does not account for spatial scale (i.e., the distance of the move), making it useful to distinguish the type of move by geographical scale. *Residential mobility* typically refers to short-distance (within city or labor market) residential relocations. These moves are often associated with changing housing preferences and needs and do not necessarily involve changing jobs. *Internal migration* generally involves a permanent relocation crossing an internal political boundary (i.e., state boundaries) that results in the migrant changing labor markets.² Finally, *international migration* involves moves that cross international borders and is typically highly restricted. These broad distinctions have dominated migration research for the past four decades.

Similarly, the size, shape, and characteristics of the spatial units that migration occurs in or across will influence the number of observed migrants. That is, use of alternate spatial units, such as counties, states, or regions, will alter the count of migrants (along with the reason for migration). In general, the larger the spatial unit, the fewer migrants will be counted moving in or out of that region. For this reason, we see fewer individuals making long-distance migrations as compared to local, residential moves. For instance, based on the 2010 census, 11.6 million people moved between the four census regions (Northeast, Midwest, South, and West), including a net in-migration to the West, which gained 12,048 individuals.³ During the same 1995–2000 interval, over 22 million moved between states. An even larger number made more local moves, with 65.4 million moving within the same county, and another 25.3 million moving between counties but within the same state.⁴ The state of California, meanwhile, lost over 755,000 individuals during the same period. Likewise, what is comparatively a long-distance migration from Northern California to Southern California would not be counted as a between-state (interstate) migration. The same distance migration on the East Coast would cross multiple state lines.

Time and Migration

The timing and duration of a migration is also an integral part of its definition. Over what interval of time should migration be measured? *Seasonal or temporary* migrations, for instance, are short-term relocations, such as moves made by students or seasonal workers, but both the US and Canadian censuses only identify migrants as individuals who have changed their usual place of residence. Time intervals that are too short risk capturing short-term, temporary relocations, including students moving to attend university or relocations associated with short-term work reassignments or vacations. While important and worthy of study in their own right, these temporary moves add noise and confusion to the system when a person is interested in permanent relocations. Conversely, too long of a time interval will end up missing migrants, particularly those who migrate and then either “return” to their origin region or make a second, “onward” migration to a different destination.⁵

Many geographers and migration researchers (at least in the United States, Canada, Australia, and western Europe) rely on the census to define migrations and migrants, while population geographers in Scandinavian countries are more likely to use the registration systems that track individuals and households over time. From 1940 until 2000, when the American Community Survey (ACS) was introduced, the US census has, for example, asked respondents their usual place of residence on census day and place of residence five years prior.⁶ Together, these two points in time enable the analyst to define a migrant. That

is, if the respondent indicated one location on census day and a different one five years prior, and these two locations are different counties, then the person was defined as a migrant. In many ways, this five-year migration question has become the “standard” way of defining migration, and other countries, including Canada and Australia, use similar metrics to define population migration.⁷

While the five-year migration question may be standard, it is inexact. For instance, by virtue of its definition, it measures a single move, say between 1995 and 2000, and therefore misses multiple moves over the period. With Americans some of the most mobile people in the world, making on average ten migrations over their lifetimes, the timing of moves may be significant. Specifically, the five-year migration question may miss return (i.e., migrations that return an individual to some defined starting point) and onward (subsequent migrations to a destination other than the origin) migrations.⁸ In short, the five-year migration question tends to underestimate migration flows within a population. The census also missed moves in the first five years of the decade (i.e., 1990–1995 for the 2000 census), a problem if significant events might have altered migration choices and numbers. However, the transition to the ACS prior to the 2010 census effectively eliminated this problem.

Although most migration studies typically rely on census data that is collected based on a change in residential location within a five-year interval, an additional consideration when calculating migration measures is the length of the period over which they are measured. For instance, assuming we are using census data that measures migration over a five-year period (as the US census did before the ACS was introduced), the number of migrants recorded over a five-year interval is considerably less than five times the one-year number.⁹ Moreover, we can’t simply multiply the number of migrants captured in a one-year window by five, meaning that the reconciliation of one- and five-year data is not straightforward. Finally, the move to record mobility and migrations through the new ACS will raise new questions and issues with respect to the measurement and definition of mobility, since the ACS measures migration over a one-year time interval and compares place of residence on the day the form is completed relative to where the respondent lived a year earlier (see “Focus,” chapter 2).

WHY DO PEOPLE MIGRATE?

While population geographers are interested in the counts, flows, and directions of migrants, they are also interested in asking why people migrate. After all, migration is a fundamentally social or economic phenomenon, and the reasons for migration will vary from person to person, household to household,

and over time and across geographic regions, meaning that the reasons for a local move will likely differ from the reasons for longer, interstate relocations.¹⁰ Some will move, for example, for a new job or in the hope of a new job, and others will move for housing issues, while yet others will move for amenity-, health-, or care-related reasons.

We can get a sense of the reasons for migration from table 6.1. Based on the 2011–2012 Current Population Survey (CPS), the most important reason for moving was the desire for a new or better home/apartment, representing over one-third of all moves in the year. Other housing reasons were the second most important reason (32.3 percent), followed by the desire for cheaper housing (20.3 percent). Other reasons, including moves associated with health needs or relocation for education, were proportionately less important. Clearly, however, age is also closely associated with reasons for migration. Among the young, aged twenty to twenty-four, nearly 6 percent of all moves were associated with attending or leaving college. For the old, health reasons were much more important motivators (4.7 percent). Most surveys do not ask, however, why individuals (or households) migrate. Thus, it is frequently left to the analyst to infer the reasons why individuals migrate. Information relating to the origin and destination of a migrant can, for example, be combined with other information from census or other data files, including age, gender, employment status, marital status, and so on, along with broader measures such as labor-market effects or amenities. When information is combined with multivariate methods, we can infer reasons for population movement.

This is still incomplete, and migration must be contextualized or viewed relative to a migration theory that allows us to interpret or understand the motivations for migration. The current “state of the art” of migration theory actually

Table 6.1. Reasons for Move by Age (Percent), 2011–2012

<i>Reason for move</i>	<i>Total</i>	<i>20–24</i>	<i>30–44</i>	<i>65+</i>
Wanted new or better home/apartment	35.8	30.0	39.3	21.6
Wanted better neighborhood/less crime	7.6	4.9	8.0	5.6
Wanted cheaper housing	20.3	18.9	18.5	20.8
Other housing reason	32.3	37.5	30.4	43.8
To attend or leave college	1.2	6.0	0.2	—
Change of climate	0.1	0.3	0.08	—
Health reasons	0.6	0.3	0.7	4.7
Natural disaster	0.3	0.08	0.5	0.7
Other reason	2.0	2.1	2.2	2.8

Source: Data derived from US Census Bureau, Current Population Survey (CPS), *Geographical Mobility*, 2011–2012.

represents more than a century of analysis, with much of the basis for modern migration theory stemming from the work of Ravenstein,¹¹ who provided the first insights into its determinants. Premised on individuals' desire to better themselves, Ravenstein described the spatial, population, and economic determinants of migration. Among the more important generalizations, Ravenstein concluded that migration occurred in a "stepwise" manner (i.e., movement from farm to hamlet, hamlet to village, village to town, with moves continuing into progressively larger centers), that each migration stream tended to have a compensating counterstream, that the majority of migrations are short-distance, and that the major cause of migration was economic. These often-quoted generalizations have stood the test of time and have formed the basis of scientific discussion and theoretical development over the years.

Everet Lee advanced and updated Ravenstein's ideas,¹² creating a framework for migration analysis that involves the "pull" effects of the destination, the "push" effects of the origin, intervening opportunities, and personal characteristics. For example, high unemployment rates in the origin would constitute a "push" factor and high wages in the destination would "pull" (attract) migrants. Between each potential origin and destination was a set of intervening opportunities, the most important being distance. These intervening opportunities could, for example, direct the migrant to another destination or decrease the likelihood of migration by imposing costs to the move. Finally, a set of personal factors, such as age, level of education, marital status, and occupation, were allowed to influence migration. Like Ravenstein's work, Lee's conceptualization of migration has informed and generated much empirical work.

Wilbur Zelinsky hypothesized the "mobility transition."¹³ Similar to the demographic transition, Zelinsky argued that the patterns of internal migration in a country would shift over time as the country developed. In the earliest stages of development, rural-to-rural movements, including frontier expansion, would predominate. Later, and with industrialization, rural-to-urban movements would prevail, as individuals moved to cities in search of employment. Finally, urban-to-urban movements would dominate as the economic system matured.

While the migration theories put forward by Ravenstein, Zelinsky, Lee, and others have shaped migration research, more formal theories have been advanced and developed within economics, sociology, and geography. Naturally, the emphases of these disciplines have differed, with economists tending to emphasize the economic influences upon migration, sociologists interested in the validity of economic rationality and individual behavior, and geographers focusing upon the role of space.

THEORIES OF INTERNAL MIGRATION

Despite the regularities and correlations observed in migration flows, and the occasional expressed reason for migration, students of migration need a more theoretical understanding of migration flows. Because of the diversity of the migration literature, it is convenient to differentiate between *macroadjustment* theories and *microbehavioral* theories of migration, a distinction that conditions the way that migration is modeled with respect to the wider operations of housing, labor markets, and social relations. Macro theory, on the one hand, has typically been concerned with the analysis and explanation of flows, focusing upon the relationship between migrations and objectively defined macroeconomic variables, such as wages or employment. Microbehavioral theory, on the other hand, has focused upon broad topics, including human capital explanations of migration, residential mobility, and return and onward flows, while also considering influences that prompt migration and the choice of a destination.

Macroeconomic Theories of Migration

Interregional migration was initially viewed as a response to wage differentials, formally expressed by the so-called macroadjustment model.¹⁴ Drawing upon neoclassical economics, the macroadjustment model argued that labor migrates in response to interregional wage differentials, moving from low- to high-wage regions.¹⁵ As it does, labor supply will decrease in low-wage areas due to out-migration, forcing wages to rise. On the other hand, increasing labor supply in high-wage regions will force wage rates to be lowered until rates are equal across space. Empirical results have confirmed that individuals are more likely to choose destinations with higher wage rates.¹⁶

The macroadjustment model has, however, been subject to a number of criticisms. Foremost among these is the assumption that labor will move from low- to high-wage regions, allowing wage levels to equalize across the system. This assumes, of course, that there are no barriers to migration. However, perfect mobility is rare. At its simplest, distance is still a barrier to movement, imposing the physical costs of movement along with potential psychological costs associated with, for example, family separation. Market conditions such as worker recognition and accreditation requirements, and social-welfare programs, including unemployment insurance, may prevent migration (or, at a minimum, delay the need to migrate). At the same time, incomplete information on the part of potential migrants (i.e., not knowing all possible alternatives) and “stickiness” in the labor and wage market (i.e., associated with labor unions or minimum-wage requirements), complicate or impede the free movement of individuals.¹⁷

Second, while wages are undoubtedly important in motivating migration, it is unclear whether regional wage levels move toward equilibrium through migration. That is, the persistent regional income disparities in highly mobile countries such as the United States suggest that the consequences of migration have little to do with the regional equalization rates prescribed in the macroadjustment model. Other market effects—such as the role of labor unions or minimum-wage laws—likely keep wages stable. Several studies have challenged the assumption that migration is an equilibrating process, finding that migration instead leads to increased social and economic polarization, more reflective of a process of cumulative causation.¹⁸

Third, the existence of other variables and personal factors, which have been observed to have significant effects upon the migration decision, suggests that the macroadjustment model is too simplistic in its reliance upon wages. By way of an example, an important variable missing from the macroadjustment model is unemployment, a problem underscored by experiences during the Depression of the 1930s. During this time, positive net migration to rural areas was observed despite the fact that wage rates in urban areas remained considerably higher than those in rural areas, a situation that the wage-differential approach could not explain. The population movements during this time were, however, due to the severe unemployment in urban areas, suggesting the effect of unemployment upon migration decisions. When applied to the current migration system, higher unemployment in a region should generate higher levels of out-migration, while in-migration should be negatively related to unemployment levels.¹⁹

Finally, the operationalization of the macroadjustment model has typically relied upon the use of either net migration flows (the number of in-migrants minus the number of out-migrants from a region) or the net migration rate (obtained by dividing the volume of net migration by the population of that region). However, the use of net migrants (or rates) is problematic, since there are no “net migrants” in the real world.²⁰ Moreover, net migration rates are not appropriately defined, relying on a denominator that does not express the population “at risk” of migrating. This misspecification confounds movement propensities with relative population stock levels, hides regularities in the age pattern of mobility, and leads to misspecified explanatory variables. Consequently, models based upon the macroadjustment framework should rely upon gross migration streams or rates (i.e., number of in- or out-migrants or migration rates based upon an appropriately specified at-risk population).

Expanding Macroeconomic Theory

In overcoming these problems, macro theory has been expanded to include a variety of effects hypothesized to influence migration.²¹ Environmental considerations are, for example, important in the migration decision, evidenced by the

growth of Sun Belt states in postindustrial America. Amenities such as a warm climate or scenic areas offering recreational outlets such as skiing and hiking have become increasingly important in explaining the attraction of the American and Canadian West Coasts (i.e., California, Washington, Oregon, British Columbia) and interior states such as Arizona and Colorado. All of these areas reflect the increasing desire by an affluent population to reside in these areas, the ability of employers to locate in these areas, and the increasing ease of communication and transportation that has “shrunk” distance.

Linguistic, ethnic, and racial differences have also been recognized for their role in generating and directing internal migration flows. In Canada, for example, there is a well-known dichotomy between the migration propensities of French and English Canadians, with French Canadians less likely to out-migrate from Quebec (Canada’s French-speaking province) and more likely to return to it than their English-speaking counterparts. In the United States, race has long been observed to influence migration patterns, with African Americans having different internal migration patterns than their white counterparts.²²

Microbehavioral Approaches

Microbehavioral approaches to migration differ in three important ways from the macro models discussed above. First, micro theoretical approaches represent an alternative view of migration and the decision-making process, typically replacing economic rationality with satisficing behavior, such that individuals evaluate only a subset of the possible alternatives. Second, the microtheoretic tradition has focused on the migration sequences and decisions of individuals using data from residential histories, publicly released census files, or longitudinal data sets, while macro approaches have commonly (although not exclusively) focused upon aggregate migration data. Third, micro theories have typically distinguished between the decision to move, the destination choice, and the interrelation between the change of residence and other changes in the status of the migrant (i.e., socioeconomic mobility or housing).

Empirically, micro approaches offer two additional advantages. First, they allow the specification of migration measures for individuals with particular characteristics (i.e., the out-migration of the unemployed) that tend to be less misleading than similar measures based upon aggregate data (i.e., the out-migration rate from a high-unemployment area). For example, it is easier to reveal the push effect of unemployment using behavioral models than the macroadjustment model. Second, in assessing the effect of a key factor (i.e., level of education) on migration behavior, micro approaches offer greater flexibility in controlling for the effects of other factors (i.e., ethnic background, age) and therefore typically yield less biased results.

The Human Capital Theory of Migration

At the interregional scale, the human capital theory defines migration as an investment in human capital,²³ or changes to the stock of skills and knowledge embodied in an individual, whereby the costs of migration are balanced against future expected returns measured by lifetime earnings. That is, if benefits exceed costs, then the individual will migrate, with the individual choosing to migrate to the location that offers the greatest returns. Both benefits and costs could be monetary (i.e., the dollar cost of moving) or psychic (i.e., the psychological costs of moving away from family and friends). Consequently, human capital theory offers several advantages over the wage-differential approach. Importantly, it does not cast migration as a purely economic decision. While economics and income opportunities figure prominently in the decision to move, other nonwage effects are brought to bear upon the decision. Second, it offers a concise explanation of why migration rates are observed to decline with age, acknowledging that the psychic costs of migration tend to increase with age. Moreover, younger individuals have longer periods within which to capture the benefits (expected income) of migration than their older counterparts. Third, spatial dimensions are incorporated within the theory, with the cost of moving related to distance. Finally, the model both reflects a microeconomic approach and can be aggregated to look at migration flows by sections of the population.

Although human capital theory provides a number of theoretical advantages over macroadjustment theories and has been widely applied and expanded within migration research, it too is not without its shortcomings. First, it assumes perfect information, both on the part of the potential migrant as well as on the part of the modeler, both of which are unrealistic expectations. Instead, information acquisition is associated with costs (i.e., time and effort to collect) and is variable over space, meaning it is variable in its quality and quantity from one individual to another. Second, the theory assumes that the migrant (or modeler) can estimate lifetime earnings at alternate destinations, a task that is difficult regardless of the perspective. This difficulty has commonly led to the replacement of lifetime earnings by current income, decreasing the model's attractiveness and applicability.

The Job-Search Model of Migration

As an alternative microapproach, the job-search model captures the movement of labor across space,²⁴ distinguishing between *speculative migrations*, which are undertaken in the hope of finding suitable employment at the destination, and *contracted migrations*, which are undertaken after having secured employment. For job searchers, potential returns are typically greatest in urban labor markets, underscoring the continued population movement into large metropolitan areas (immigration or movement "up the urban hierarchy" from smaller

to larger urban areas). Contract migration may be the more common form of movement, particularly over longer distances, minimizing the risks of migration through the securing of employment beforehand.

Residential Mobility and Life-Cycle Theory

The application of microbehavioral models to residential mobility was largely driven by a lack of specificity derived from aggregate analyses, with one of the central theoretical issues underpinning residential mobility theory reflecting the distinction between the decision to move and destination choice. In this context, mobility allows residential needs to be adjusted in response to changing life-cycle needs or other requirements. Rossi's "life-cycle" theory²⁵ proposed that life-cycle changes, such as leaving the parental home for education or first job, marriage, the growth of the family, and declining health, would drive residential relocation decisions through changing housing requirements (typically space), with each change in the life-cycle "stage" prompting relocation. The search process is undertaken once the decision to move has been made, and reflects needs, social aspirations, income, and the role of institutions, including real-estate agents and banks. At small spatial scales, therefore, migration interacts with the housing career of the migrants.²⁶ In addition, characteristics of the household (i.e., age, sex, marital status, household status), individual housing units (i.e., size, structure, availability), and wider characteristics of the origin and destination areas (i.e., neighborhood structure, ethnic/racial structure, housing availability) were hypothesized to influence relocation decisions.

Yet life-cycle theory cannot account for all residential moves. Several authors have argued that large proportions (perhaps up to 25 percent) of residential moves are "forced" rather than "voluntary."²⁷ Further limiting the decisions of individuals or households are the constraints imposed by a variety of institutional forces, including the effects of racism or discrimination, tenure choice, housing supply, and the role of specific agents (such as real-estate agents), who may limit housing options as they steer potential buyers to (or away from) particular locations. For the poor, residential options may be particularly constrained, with the poor having fewer options in terms of location, the availability or quality of housing stock, and its cost. Life-cycle theory is also less relevant in North American society, where "traditional" nuclear households are becoming less common. Instead, alternative family arrangements, including single-parent families, dual-income households, alternative lifestyle households, "empty nesters," or singles, are increasingly dominating the social makeup of societies (composing greater than 50 percent of all households), with each group having its own housing needs and preferences. We can no longer assume a homogenous population.

Behavioral theory and models have also been applied to the analysis of elderly migration. Although the distinction between the decision to move and destination choice remains, the factors driving the migration process generally differ from what has been considered in the above theories. The reason is simple: most elderly have quit the labor market and are thus less sensitive to the changes in the market than others. Consequently, the decision to migrate is strongly influenced by a set of personal resources, such as health and income.²⁸ Older individuals who are healthier are more likely to move to high-amenity areas, while even older individuals (aged seventy-five-plus) are more dependent and may move to seek help either from family members or institutions. Likewise, the destination pattern of elderly migrants is quantitatively different from that of the general population, focusing upon high-amenity areas like British Columbia in Canada and Florida or Arizona in the United States.²⁹ For assistance-seeking migrants, the search space is generally more limited than that of the general population, constrained by the location of family or other assistance providers such as nursing or chronic-care homes.

Alternative Models

Discontent with traditional economic-based theories and the continued reliance upon census products or other published data has led to calls to revise existing approaches to migration in terms of theory, models, and data sources.³⁰ McHugh notes, for instance, that migration is about people, their connections to multiple places, and “people living in the moment while looking backward from where they came from and forward to an uncertain future” (1997, 15).³¹ Over the past decade, there have been increasing calls (and action) for a richer examination of the spatial and temporal aspects of migration than has commonly been achieved. The census, for example, represents a snapshot of the population at a specific point in time, and yet we assert some connectivity between space, time, and individuals based on a few questions relating to mobility. Place of residence at two points in time does not capture the complexity of migration, the nature of which is emerging (for example) in the new transnational migration literature³² or in McHugh’s work³³ associated with seasonal snowbirds in Arizona.

The reconceptualization of migration has meant that it is not seen as just an economic event performed by economically rational individuals but as an event that is “culturally produced, culturally expressed and cultural in effect.”³⁴ As such, chronic mobility may, for example, reflect dwindling place ties, rootlessness, or a sense of adventure, rather than economic rationality. Migration also reflects past, current, and future states of affairs, such as current income, employment status, and family situation or anticipated changes in employment, income, or health. Yet these concepts are frequently missing from much of the migration literature. The true reason for migration may therefore lie buried

within the migration event, being invisible to the researcher relying on cross-sectional or longitudinal data and econometric tools. This reconceptualization is seen in numerous areas associated with migration research. Alejandro Portes and his colleagues,³⁵ for instance, have pursued ethnographic studies of immigrant communities and their adjustment in US society. The literature on transnational migration has also approached migration issues through ethnographic and survey techniques.

MIGRANT SELECTIVITY AND MIGRANT CHARACTERISTICS

Despite the high mobility rates observed in the United States and other countries, not everyone moves. In fact, migration is highly selective, meaning that different individuals, defined by their sociodemographic or socioeconomic characteristics, will be more or less likely to migrate over their life spans. Consequently, migration rates will differ by personal characteristics such as age, race, income, housing tenure, education, and marital status. Perhaps the most important determinant of migration is age, with the young consistently more likely to migrate than older individuals, an outcome observed regardless of location, time, or geographic scale (figure 6.1). The likelihood of migration is somewhat more complicated than this. For instance, the very young (typically defined as less than fifteen years old) are considered to be “tied” migrants, following their parents as they relocate. Even still, the very young (and their parents) are more likely to migrate as compared to families with young teenagers, reflecting both their parents’ declining likelihood to relocate as well as parental desire to minimize disruptions to school and friend networks as their children grow.

Migration rates increase dramatically as individuals age into the late teens and through the twenties. Close to one-third of twenty- to twenty-nine-year-

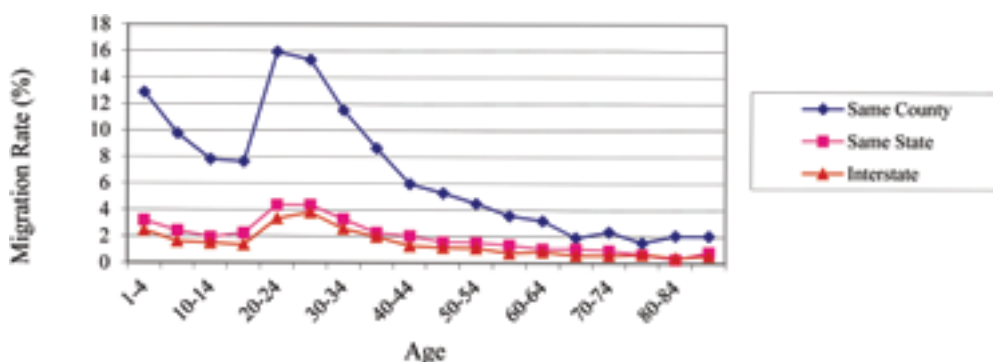


Figure 6.1 Age Schedule of Migration (Percent): United States, 2011–2012

Source: Data derived from US Census Bureau, CPS, *Geographical Mobility*, 2011–2012.

olds move each year, reflecting movements out of the parental home into their own residences, moves to or from college, or moves related to employment. Following this, migration rates generally decline toward retirement as it becomes more difficult and costly to relocate (both physically and emotionally) as families grow and as individuals and families have built up a network of friends and other assets, such as a house or property, in their locations. Oftentimes we see a small increase in migration rates around retirement, reflecting the desire to be closer to amenities, while final late-life migrations are often associated with health issues, bringing individuals closer to family for care or into institutions. Many of the reasons for changing migration propensities by age can be attributed to *life-cycle changes*, notions made popular by Rossi.³⁶ Sjaastad's³⁷ human capital theory also helps to explain differing migration rates by age, with young adults having a longer career time to recoup the costs of moving than older individuals.

Beyond age and life-cycle events, other factors are also closely and consistently associated with migration selectivity (table 6.2). We observe, for instance, that more educated individuals are more likely to migrate, based on the reasoning that they are better able to collect, synthesize, and interpret information on alternate locations. Likewise, the better educated may have more options open

Table 6.2. Migration Rates (Percent) by Selected Demographic Characteristics: United States, 2011–2012

	<i>Migrant</i>	<i>Same county</i>	<i>Same state</i>	<i>Interstate</i>
Educational status (age 25 +)				
Not a high school graduate	11.5	8.2	1.7	1.1
High school graduate	9.3	6.2	1.8	1.1
Some college	10.3	6.6	2.2	1.4
Bachelor's degree	10.0	5.6	2.0	1.8
Professional or graduate degree	8.9	4.2	1.7	2.4
Marital status (age 14 +)				
Married, spouse present	7.8	4.5	1.6	1.4
Married, spouse absent	20.1	11.3	2.9	3.4
Divorced/separated/widowed	11.5	7.7	2.3	1.3
Never married	16.6	11.0	3.0	2.1
Home tenure				
Owner	4.7	2.9	1.1	0.7
Renter	26.7	17.5	4.6	3.7

Source: Data derived from US Census Bureau, CPS, *Geographical Mobility*, 2011–2012.

to them and are therefore more likely to engage in longer-distance migrations. Levels of long-distance migration also tend to increase as income or occupational status increases, and renters are more likely to migrate as compared to home owners, particularly over short distances, such as within-county moves.

We can also identify demographic factors, including gender, marital status, and the presence of children, as correlates of migrant selectivity. In most developed countries, men and women have virtually the same rates of migration, reflecting gender equality. In many developing nations and in terms of international migration, however, men frequently have higher rates of migration as they move in search of employment, while women remain at home to care for family. Typically, individuals who are single (and also younger) are more likely to migrate, especially over longer distances, as they are not “tied” to others in the same household. Married couples, on the other hand, are often less likely to migrate, as relocation is often associated with career disruption for at least one of the partners.³⁸ In a similar way, families with dependent children are less likely to relocate, given disruptions to school and social networks.

THE MIGRATION PROCESS

Migration and relocation can represent a response to multiple factors that do not affect everyone in the same way, witnessed by migrant selectivity of, for example, young adults. Still left unanswered is what generates the desire to move. Conceptually, we can think of the process as having at least three steps, with the first representing the decision to migrate, the second the decision of where to migrate to (destination), and the third being the decision to actually migrate. Of course, these processes could be occurring simultaneously. Alternatively, only the destination search is important, such as for those whose jobs have been relocated. However, for modeling and theoretical reasons, the literature often distinguishes between the three steps.

Given our earlier distinction between types of moves (i.e., residential mobility versus internal migration), the motivations for these types of migrations will also differ. Residential mobility, for example, is closely allied with changes in the demand for housing services. Disparities between housing needs and expectations, such as the need for more room as a family grows or downsizing as household units shrink, may give rise to “residential stress.” Beyond some threshold, residential stress exceeds inertia (the forces keeping an individual or family in place), and the search for a new residence begins.³⁹

Clearly, life-cycle theory could not account for all residential moves, with a large proportion (perhaps up to 25 percent) of residential moves “forced” rather than “voluntary.”⁴⁰ Further limiting the decisions of individuals or households

are the constraints imposed by a variety of institutional forces, including racism or discrimination, tenure choice (own or rent), housing supply (number, cost, and type of housing), and the role of specific agents (such as real-estate agents), all of which may limit housing options. Residential options may be particularly constrained among the poor and groups that are discriminated against, with both having fewer options in terms of location, the availability or quality of housing stock, and housing cost. In housing markets that are heavily controlled by local or national agencies, on the other hand, there are likely to be significant differences both in the operation of housing markets and in terms of residential choice. Individuals or households in such situations may have few residential options, decreasing the likelihood of movement. For longer moves, the decision to move is often based on economic conditions—poor job prospects and high unemployment in the origin may, for instance, trigger a migration. Amenities, particularly for older individuals, may also be important, as households migrate to escape colder climates.

The search process is undertaken once the decision to move has been made. For longer-distance migrations, individuals will search locations that may offer more amenities or better income and employment opportunities. At the same time, all moves involve a local scale, or the neighborhood location where the household ultimately settles. At this local scale, the search process reflects needs, economic opportunities, social aspirations, income, and the role of institutions, including real-estate agents and banks. At small spatial scales, therefore, migration interacts with the housing career of the migrants.⁴¹ In addition, characteristics of the household (i.e., age, sex, marital status, household status), individual housing units (i.e., size, structure, availability), and wider characteristics of the origin and destination areas (i.e., neighborhood structure, ethnic/racial structure, housing availability) influence destination choice. Finally, the actual decision to move is made. In some cases, the search process may not reveal a suitable destination or option, and the move is called off. In many other cases, the economic, housing, social, or lifestyle benefits are greater than the costs, and the move is made.

CONCLUSION

Despite different migration theories, most researchers agree that individuals or households migrate to improve their situation, with the various migration theories stressing different aspects (i.e., economic, social, environmental) of this commonality. In reality, much of the literature has actually tended to augment the distinction between micro and macro approaches, a problem that may, in part, be due to the different perspectives that the various disciplines bring to the table. The strong disciplinary focus has remained, although there

has been considerable cross-disciplinary fertilization in recent years, as well as a greater embrace of qualitative methods in considering population issues. Despite the profusion of migration research, relatively few dramatic theoretical advances have been recorded in the past two decades. Instead, greater emphasis has been placed upon a more analytic/policy-oriented approach, meaning that many of the theoretical (or methodological) additions have built upon existing theories. Consequently, theoretical development in the past two decades has been incremental in nature. By and large, the availability of data (i.e., new longitudinal files and increased accessibility to public-use files such as the Public Use Microdata Sample) has been more important in influencing empirical and theoretical research over this period. For example, theoretical advancements associated with return migration, whereby an individual returns to an earlier region of residence, related to life cycle or employment have been enabled by improved data availability.⁴²

STUDY QUESTIONS

1. The text noted that the United States has some of the highest rates of internal mobility in the world. Internal migration statistics can be found online for a number of other countries through their statistical agencies. Compare US internal migration rates with those of other countries. Does the size of the spatial unit matter in determining migration?
2. Using the data presented in table 6F.1, calculate the demographic effectiveness and stream effectiveness. Compare results to data from 2006–2007 (below).
3. Using the data presented in table 6F.1, calculate the in- and out-migration rates for each of the four US regions.
4. For your home state (or region of a country) and using statistics from your domestic statistical agency (e.g., US Census Bureau, UK National Statistics), determine the flows of migrants into and out of your selected region. Can you find evidence that these flows have changed (e.g., increased, decreased) over the past years?

FOCUS: CONTEMPORARY INTERNAL POPULATION MOVEMENT IN THE UNITED STATES

The US population has long been regarded as one of the most mobile populations in the developed world. In large part, the willingness to move and relocate over long distances, both for short-term periods as

well as permanent relocations, is arguably entrenched in the US psyche; associated first with frontier expansion and exploration, then movement into urban areas, and more recently movement to rural and

semirural locations. To a large extent, population movement in the United States followed the stages of Zelinsky's mobility transition theory, echoing the nation's historical and economic development. The opening of the American West, for example, prompted large-scale relocation from the eastern seaboard. Later, the Great Depression of the 1930s was associated with movement out of the American plains and westward into California. Resource discovery and development, such as California's gold rush and the development of the oil industry in Texas, spurred further population movement. Over the past three decades, the bulk of population movement has been between urban areas and from central cities to the suburbs.

Knowledge of population movement was aided by the introduction on the 1940 census of a migration question asking respondents where they lived five years ago. Since World War II, population movement has been dominated by four large themes. First, preferences for warmer climates and amenities prompted movement to the Sun Belt. At the same time, changing economic conditions, characterized by the decline of American manufacturing in the northeast United States and the emergence of the so-called Rust Belt and the coincident rise of industry in the South, prompted population movement into the Sun Belt. Second, rural areas continued to lose population, especially in the rural Midwest, upper Great Plains, and the Mississippi Delta.¹ Third, suburbanization, or the movement from towns and cities to the rural-urban fringe, gathered momentum immediately after the war, prompted interest in short-distance migrations, and had far-reaching impacts on the structure of American cities. Fourth, "counterurbanization" emerged during the 1970s, signaling a shift in net migration toward nonmetropolitan areas, movement

that was in stark contrast to the long-standing movement up the urban hierarchy and toward larger metropolitan areas. While this appeared to decrease in importance in the 1980s, urban-to-rural movements reappeared in the 1990s and early 2000s.

Results from both the 2010 census and the ongoing Current Population Survey reveal changing patterns and mobility within America. Consistent with long-term changes, migration and mobility rates have continued to decline (see figure 6F.1), with the percentage of people changing residence between 2010 and 2011 was the lowest ever observed (with records starting in 1948). Although young adults in their twenties remain the most mobile segment of the population as they move for education- or employment-related reasons, the penchant for mobility among Americans seems to be declining. In the 1980s, approximately 20 percent of Americans moved in the preceding year. Long-term analysis shows that the frequency of longer distance moves (anything across county lines) has declined over the past forty years, with the proportion falling to 13 percent by the 2000s.² In large part, this reflects increased female participation in the labor force, which decreases the ability to make long-distance moves among households. In addition, the aging of the population decreases mobility rates as well, with older individuals and households less likely to migrate long distances.

Migration and mobility continue to reshape the distribution of the population. Continuing a decades-old movement, the Northeast and Midwest continued to lose population through the millennium, and migrants continued to move to the southern states, a process that had started with deindustrialization.³ At a regional scale, both the Northeast and West lost migrants between 2011 and 2012, with the Northeast losing 186,000. The South continued to be

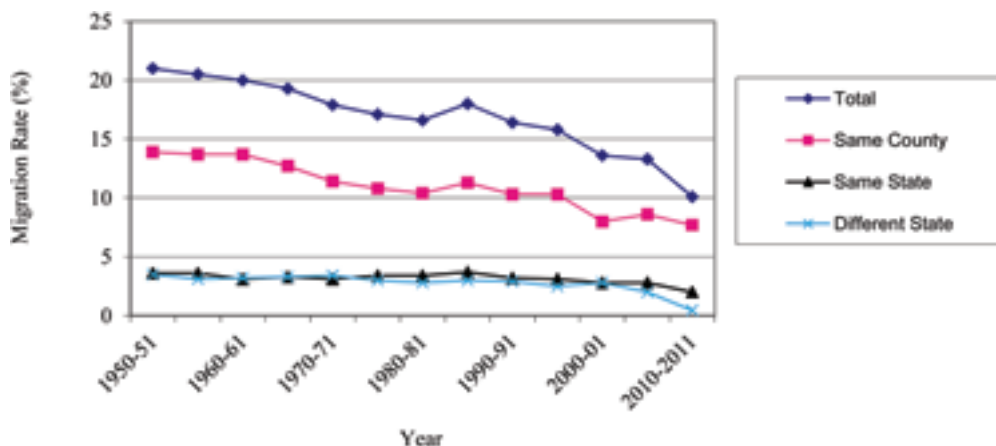


Figure 6F.1 Mobility Rates by Type of Movement: United States, 1950/1951–2010/2011

Source: Data derived from the US Census Bureau, based on CPS data.

the primary destination for migrants, with a net in-migration of 368,000 over 2011–2012 (table 6F.1).

The country’s population is also being redistributed across the metropolitan hierarchy. Based on the 2000 census, Plane noted that the largest “mega-metropolitan” areas (populations greater than 2.5 million) gained from other large metropolitan areas, while they lost population to the very bottom of the urban-rural hierarchy, namely

“micropolitan” (metropolitan places with populations between 10,000 and 49,999, in addition to being associated with an urban core) and nonurban counties.⁴ In large part, the movement down the urban hierarchy and toward smaller urban areas or even some selected rural areas represents the continuation of the counterurbanization trend first noted in the 1970s, along with location preferences, amenities, and population aging. Between 2000 and 2010, much

Table 6F.1. Interregional Migration Flows (in Thousands): United States, 2010–2011

Destination in 2011	Region of residence in 2010				
	Northeast	Midwest	South	West	Total
Northeast	–186	98	314	134	546
Midwest	112	27	399	248	759
South	480	522	368	496	1498
West	140	268	417	–53	825
Total	732	888	1130	878	3628

Source: Data derived from the US Census Bureau based on ACS data.

Note: Bold cells represent net gain/loss for the period. Over the 2010–2011 period, approximately 3,628,000 Americans relocated.

of the country's population growth occurred in metropolitan (10.8 percent, greater than the national average of 9.7 percent) or micropolitan areas (5.9 percent), reversing net losses from previous census periods. Growth of the metropolitan areas varied in part by size, with metropolitan areas having a population of 2.5 million to 5.0 million growing the fastest (13.6 percent).⁵ The nation's largest metropolitan areas grew at approximately half that rate. Echoing the broad regional trends, the fastest growing metropolitan areas were typically in the South or West.

Earlier findings based on the 2000 census revealed some preference for migration to the outlying regions of large metropolitan areas, and in particular those either closer to urban areas or those that have amenities, as advances in telecommunications and transportation have enabled preferences for living in smaller areas that are close to urban areas.⁶ For instance, migrants from large cities such as Los Angeles, New York, Chicago, and San Francisco have relocated to counties more than forty miles away from the city core, bypassing suburban areas that are closer to the center and the inner city.⁷ Yet it is unclear whether these migration patterns—and particularly the preference for moving further and further from the city center—would be sustained. The *New York Times* suggested that the increasing cost of fuel threatened to slow migration away from cities.⁸ While an excess housing supply and the credit crunch of 2008 compounded the problem and make it difficult to identify the exact reason for housing price changes and differences, housing prices beyond the urban core fell in value faster than those within. However, anecdotal evidence suggested that the rising cost of energy is the primary reason home prices have fallen, particularly in the outer suburbs. The outcome may be

increased preference for inner-city locations, the exact opposite of what had happened for the preceding decades. Although the lingering effects of the recessions continued to cloud analyses, results from the 2010 census seemed to reinforce the preference for downtown living, with the Census Bureau reporting that many of the largest cities in the country experienced a growth of their downtown populations, particularly among young labor force members.⁹

Despite the above discussion of movement down the urban hierarchy, it is important to realize that the growth of these rural and micropolitan areas is selective. For remote rural America, including much of the Great Plains and the rural Midwest, population loss associated with migration has essentially continued unabated since the Depression. Population loss in these rural areas can be attributed to the loss of employment, lack of services such as schooling, poverty, and in some cases a lack of amenities such as warmer winters or recreational opportunities.¹⁰ Exceptions to this rule are those areas that have benefitted from the explosion of oil exploration and production associated with “fracking,” a process using a mix of chemicals and water to reach previously inaccessible resources. Fargo, North Dakota, grew at a rate of 16.5 percent between 2000 and 2010 (in comparison, the state grew at just 4.7 percent), while Williston, in the western part of the state and the heart of the oil boom there, grew at an astounding rate of 17.6 percent, which is in stark contrast to other communities in the state, which saw further population decline.¹¹ Such rapid population growth comes with costs, including increased crime, limited housing options, and expensive housing.

The recession of 2008 also impacted migration flows in the country. Just prior to the recession, 13.2 percent of Americans moved in the preceding year, a proportion that dropped to 11.9 percent in 2008 before

recovering somewhat to 12.5 percent in 2009.¹² For some, the drop in the proportion moving reflected the relative unavailability of jobs across the country—moving to find a job was not an option. For homeowners with negative equity (i.e., owing more on their home than it is worth), options were

even further restricted, and they were likely to relocate for new employment opportunities.¹³ The effect of the recession was also noted in the Current Population Survey, with 1.2 percent of respondents indicating that their move was due to foreclosure/eviction in 2010–2011.¹⁴

METHODS, MEASURES, AND TOOLS: MEASURING MIGRATION

Measuring migration is not necessarily straightforward, and the migration researcher must account for time and space when counting migrations. Nevertheless, a number of tools or measures are available that allow us to quantify migration flows. Between 1995 and 2000,¹ some 22 million people moved between states, or more than 7 percent of the nation's population. Of these, about 1.4 million people moved into California. During the same period, over 2.2 million people moved out of the state, meaning a net population loss through migration of 755,536 and a gross migration of nearly 3.7 million. When expressed as a rate (per one thousand), California's in-migration was 47.1, its out-migration was 71.7, and the resulting net migration was -24.6 , meaning that it lost 24.6 people through migration for every one thousand individuals living there in 1995. Nationally, the in- and out-migration rates were 45.7 for the period.

MIGRATION PROPENSITY

A basic measure of migration is the *migration propensity* (p_{ij}), which shows the relative proportion of the population beginning the period in one region (i) who are found in other regions by the end of the period, defined as

$$p_{ij} = \frac{m_{ij}}{P_i}$$

where P_i is the population of the origin (starting) region at time $t-1$ (i.e., the beginning of the census interval), and m_{ij} is the number of migrants moving from i to each destination j .

GROSS MIGRATION FLOWS AND RATES

Oftentimes, population geographers are interested in the propensities of a population to leave (enter) a particular destination (origin) regardless of where they migrate to or from. When relying on the census, migrants and migrations are defined based on place of residence at the start of the census interval (five years prior to census day) and compared with place of residence at the time of the census. Once defined, the number of out-migrants leaving an origin (O_i), the number of in-migrants entering a destination (I_j), or the number moving between two points (M_{ij}) can be counted. For instance, the number of out-migrants from region i (O_i) can be defined as the following formula.

$$O_i = \sum_{j \neq i} m_{ij}$$

In the same way, gross in-migration to region i (I_i) is determined by adding up all its in-migration flows.

While the number of migrants may be instructive, it can also be misleading. Large regions, such as states like Texas or California, will both produce a large number of migrants given their population size and also attract a large number of migrants, while smaller regions or states will experience the opposite. Migration rates are therefore typically constructed based upon the population *at risk* of migrating. For instance, the *out-migration rate* (OR_i) from region i is defined as

$$OR_i = (O_i / P_i) * 1000$$

where O_i is the number of out-migrants from region i , and P_i is the population of region i .

Similarly, the *in-migration rate* (IR_j) to region j is defined as

$$IR_j = (I_j / P_j) * 1000$$

where I_j is the number of in-migrants to region j , and P_j is the population of region j . Strictly speaking, this specification does not accurately capture the population at risk of migrating to region j . Instead, it defines the at-risk population as the population of the destination region.² But if they are already residing in j , they can't in-migrate to j ! A more precise definition of the in-migration rate would be

$$IR_j = (I_j / \sum_{k \neq j} P_k) * 1000$$

where the denominator represents the population of the entire system excepting region j .

NET MIGRATION FLOWS AND RATES

Frequently, population geographers will want to know the overall effect of migration

on a region's population. Did it, for example, grow or decline (and by how many) due to migration over a period? This can be determined by *net migration* (N_i), which is defined as the difference between the number of in-migrants and the number of out-migrants to/from region i .

$$N_i = I_i - O_i$$

The *net migration rate* is defined similarly as the difference between the in- and out-migration rates. While useful for ascertaining overall population effects, the use of net migration in most cases is problematic, as it essentially represents a constructed figure and not an actual migrant.³ As such, it is not commonly used when modeling migration.

MIGRATION EFFECTIVENESS

Migration researchers may also be interested in the relative proportion of arriving and departing migrants. *Migration effectiveness*⁴ (E_i) is defined as the ratio between net migration (in-migration – out-migration) and gross migration (in-migration + out-migration) flows.

$$E_i = 100 \left(\frac{I_i - O_i}{I_i + O_i} \right)$$

E_i tells the percentage of “turnover” that results in population change and does not depend on the population size of the region in question. Large values (as opposed to those close to zero) are defined as more “effective,” in that migration flows are more one-way. A related measure is *stream effectiveness*, which captures movement between two particular regions.

$$e_{ij} = 100 \left(\frac{m_{ij} - m_{ji}}{m_{ij} + m_{ji}} \right)$$

Chapter Seven

International Migration Flows

Immigrants and Transnational Migrants

Major International Flows

Theories of Immigration

The Impacts of Immigration

Immigration Policy

Transnational Migrants

Conclusion

Study Questions

Focus: The “Immigration Gap”

***Methods, Measures, and Tools: Counting Immigrants,
Illegal Immigrants, and Emigrants***

MIGRATION HAS BECOME increasingly important as a vehicle for population change, with three dominant themes, namely, internal and rural-to-urban migration, international labor migration (legal and illegal), and refugee flows. Out of all the possible population movements, international migration perhaps generates the greatest political, economic, and demographic interest owing to the large numbers of individuals that cross international borders.¹ In 2010 alone, it was estimated that there were 214 million international migrants, or 3.1 percent of the world’s population. Of these, over 120 million immigrated to developed countries, representing a doubling of flows between 1985 and 2005.² The balance of yearly international flows are between developing countries.³

Fundamentally, immigration is an economic process motivated by a combination of “push” factors in the origin, including poor employment prospects, large populations, and low wages. The major sending regions are in Asia, North Africa, and Latin America, while both the developing world and developed

world are important destinations. This chapter explores the theories and drivers of international migration along with concepts of transnational migrants before considering policy and illegal immigration in the context of the United States. The “Focus” section explores the so-called gap in US immigration policy, and the “Methods, Measures, and Tools” section discusses how international flows may be measured.

MAJOR INTERNATIONAL FLOWS

In the past, immigration was an important component of nation building in the United States, Canada, Australia, and New Zealand, and indeed it remains a “myth” within many of these countries. The enduring and near-mythical status attained by places like Ellis Island in New York, Canada’s Pier 21 in Halifax, or Australia’s settlement by ex-convicts is an important component of each nation’s development and psyche. Countries have also encouraged labor recruitment through programs such as the Bracero Program, which recruited Mexican laborers for work in the United States, or Germany’s “guest-worker” program, which was created to supply German industry with low-cost labor. In both cases, the respective governments found that these temporary migrations institutionalized and encouraged long-term and permanent migrations, with businesses continuing to be dependent on immigrant workers.

We can make broad distinctions among international flows between developed-world countries, between the developing and developed world, and between developing-world countries. Of these three sets of flows, that between developed countries tends to be dominated by professionals: people who are able to move with relative ease between countries and whose skills are in demand in the destination countries. Flows between developed countries account for relatively few international movements given immigration policies in receiving countries that impose restrictions on international moves. International migration from the developing to the developed world is also tightly controlled, with importing countries often placing a yearly limit on the number of entrants and a preference on highly skilled or educated entrants, as well as allowing entry under humanitarian or family reunification guidelines. Principal receiving countries include the United States, Canada, Australia, Russia,⁴ and countries in western Europe and Scandinavia, where higher wages and increased opportunities serve as immigrant “pulls,” while sending countries include a long list of origins. In the United States, over 1.062 million immigrants received permanent residency in 2011,⁵ with major immigrant origins including China (83,603), Colombia (22,130), Cuba (36,261), the Dominican Republic (46,063), El Salvador (18,477), and Guatemala (10,795). International movement between developing countries is a third major flow. Although

somewhat less restrictive, movement between countries in the developing world is still often controlled by the receiving country, with most flows characterized by laborers.

THEORIES OF IMMIGRATION

As articulated by Douglas Massey and colleagues, immigration is a complex demographic and economic process,⁶ with a number of theories advanced to explain international migration. We can typically distinguish between those factors that initiate international migration and those that perpetuate immigration. Notwithstanding the diversity of these theories, no single theoretical viewpoint captures all the nuances of international population movements. In part, this is because national policies have created and influenced immigration flows, either intentionally or unintentionally. Consequently, immigration must be set within the broader context of national policies that promote or impede it.

Similar to internal migration, *neoclassical economic theory* focuses on macro-level factors such as employment opportunities.⁷ Essentially, this theory argues that international migration occurs because of imbalances in the supply and demand for labor, with the theory arguing that wages will be higher in countries experiencing a growing economy and scarcity of labor as compared to slower-growth economies. Because of the difference in wage rates, individuals will immigrate in search of higher wages. Doing so will increase the labor pool in the high-wage country, and as supply increases, wages will drop. For immigrant-sending countries, the decrease in the pool of labor will push wages up. Ultimately, the theory argues that wages will equalize between the two countries as the labor pools are changed. Similar to the faults noted in the discussion of internal migration, international migration is not free but restricted by immigration law and policy. For sending countries, the absolute size of the change in the labor market due to emigration is small, with no apparent impact on wages for those remaining.

The *new economics of migration theory* expands the discussion of macro determinants of migration to include such things as the volatility of local agricultural markets, access to credit, and remittances.⁸ In this case, emigration is the result of household decision making, with emigration allowing diversification of income sources. That is, international migration reflects family choice to spread the risks of migration. Oftentimes, the family will pay the travel expenses of the migrant in exchange for the migrant sending money home, diversifying income sources for the family.

The *dual-labor market theory* argues that international migration is determined by the labor needs of economies in the destination cities or countries,

focusing on shortages in the labor markets of receiving countries and high- and low-status positions, with immigrants frequently filling low-status (and low-income) job positions.⁹ The theory argues that the employment market can be subdivided into two sectors: the primary sector, which employs the highly educated and supports them with high wages, and the secondary labor market, which is characterized by low wages, unstable working conditions, and limited advancement. Frequently, secondary-sector positions are filled by the young or racial and ethnic minority groups. However, with slowing fertility rates and legislation that has created greater equity in the workplace for all groups, shortages have emerged, which are filled by immigrants from the developing world.

The *world systems theory* suggests that the main cause of emigration is globalization. With globalization, the world has divided into a set of developed and developing countries, with developing countries dependent on the developed world for investment and economic growth. The search for land, materials, and labor as developed countries invest in the developing world results in changes to production and pushes the unskilled out of jobs and off the land in the developing world, forcing international migration. The theory also proposes that flows will tend to be country-specific, with the developing world sending immigrants to the developed-world countries with whom they have the greatest contact, often the outcome of colonial ties.

Among the theories that discuss the perpetuation of international migrations is *social network theory*. Social network theory focuses on individual decisions, linking immigrants with family, friends, and the larger immigrant community between the origin and destination countries. In this way, continued immigration is promoted, as individuals in the destination are able to relay information back home regarding job opportunities while also providing links to accommodation and a broader community within which to interact. By doing so, the linkages and immigrant organizations decrease the costs of immigration (both physical and psychological) and increase the potential success of international migration.

Myrdal's *cumulative causation theory* argues that immigration alters the social context in which individual immigration decisions are made and makes further international migrations more likely.¹⁰ In the destination country, the entry of immigrants into particular occupations may reinforce the demand for other immigrants to fill similar jobs. More generally, immigrants send income and knowledge of job opportunities and housing home, perpetuating immigrant flows from an origin to a destination. Income remittances in particular are important. Remittances act as an income stream for the sending family and may further encourage international migration to increase and diversify income sources.

Finally, *institutional theory* suggests that ongoing international migration is the result of informal and illegal migration and organizations that facilitate or

promote migration. Various institutions or groups may facilitate international migration by providing services, including securing housing or jobs. Illegal immigration may also be promoted as organizations smuggle people across borders.

THE IMPACTS OF IMMIGRATION

The United States has long defined itself as being a nation of immigrants, with immigrants arriving in search of economic opportunity, political or religious freedom, or to reunite with their families. Despite the long history of immigration, public attention has increasingly focused on the size, origins, and implications of large-scale immigration.¹¹ Over the past fifty years, polling has charted increasing opposition to immigrants within the United States. Ongoing and emerging debates reflect associated concerns: How will immigrants assimilate or incorporate themselves within the host society? How will the larger society be changed?

Discussions of the costs and benefits of immigration reflect a long-running debate found within most countries that receive a large number of immigrants, with answers cutting across economic, social, fiscal, and demographic perspectives.¹² Undoubtedly, public awareness is higher in those locations that are primary magnets for immigrants, including California, New York, Illinois, Florida, and New Jersey. But concerns with the impacts and number of immigrants are not limited to these areas. Recent reports, including the 2000 US census and the American Community Survey (ACS), indicate that the foreign-born are increasingly found in areas that have not been traditional destinations for immigrants.¹³ States such as Iowa that could hardly be described as immigrant magnets are now counting larger foreign-born populations, with the new arrivals frequently filling low-paying or unskilled positions, and their presence forcing communities to deal with issues of immigration and assimilation that had previously been unheard of in small-town America.

Economic Impacts

Economically, the bulk of evidence indicates that immigration has a rather minimal but positive impact on well-being.¹⁴ Immigration most directly benefits the immigrants themselves, making them financially better off in their host country relative to their origin, even though they tend to earn less on average than the native-born in their host country and are predominately found in low-paying, low-skilled positions within the workforce. Domestically, immigrants increase the supply of labor, boost production and demand for goods, and have

commonly been regarded as a potent short-term policy tool, allowing skill shortages in the labor force to be alleviated quickly. Although the economy as a whole may gain, immigration may also create losers, including the less skilled native-born, who may compete directly with immigrants in the job market and who may see wages fall. Again, however, the available evidence suggests that immigration has only a small negative impact upon the wage and labor opportunities of the native-born. In the formal sector, minimum-wage laws, unions, and low unemployment rates have ensured “wage stickiness,” although workers in the informal economy or in regions that receive large numbers of immigrants may be somewhat more disadvantaged.

Fiscally, the debate on whether immigrants pay more in taxes than they receive in benefits is contentious and complex. In an analysis of the impacts of immigration on US society, the National Research Council (NRC)¹⁵ found that immigrant-headed households make small positive contributions to federal tax revenues.¹⁶ At the state and local levels, the picture is less clear, with net fiscal burdens reported in immigrant-receiving states such as New Jersey and California. In other words, the NRC calculated that immigrants receive more in services than they pay in taxes in these two states. However, the increased burden is explained by the fact that both states are important immigrant destinations with large numbers of immigrants. In turn, immigrant households tend to have a greater number of school-age children and therefore receive more transfers. Likewise, immigrant households tend to have lower incomes and less property, so they consequently pay lower taxes. Over generations, however, descendants of immigrants may contribute far more in taxes than their parents received. Fiscal burdens may be particularly acute at the local scale. In Phoenix, Arizona, the burgeoning Hispanic population, many of whom are believed to be illegal, has exerted pressures on institutions such as local school boards, hospitals, and libraries, even as their presence has been acknowledged to sustain the state economy.¹⁷ If the state or federal government does not reimburse local costs, the burden would fall to local taxpayers, a situation in which it is easy to imagine increased calls for immigration control.

Long-term projections of the fiscal costs and benefits of immigration reveal that they balance over the lifetime of immigrant residency. Immigrants, like the native-born, pose greater burdens during childhood and old age, owing to the costs of education and health care. During their labor force years, they tend to make a net fiscal contribution. Fiscal burden also varies by origin and education, with European and North American immigrants making a net fiscal contribution. On the other hand, immigrants from Central and South America create a fiscal burden owing to lower incomes, lower levels of education, and more school-age children than other households. Importantly, it must be realized that education and service provision to the poorly educated or low-income

native-born pose similar fiscal burdens. In other words, the question of fiscal burden is not just an “immigrant” issue.

Of course, the discussion so far has focused on the economic impacts for receiving countries. But what about those countries that send immigrants? As an outcome of globalization, international migration provides labor, with workers pushed out of their home countries by a lack of economic opportunities and pulled by opportunities elsewhere. As an economic lifeline, money is often sent home to family and used for consumption and new housing. These remittances to developing countries have grown in economic importance, with international migrants sending home an estimated \$401 billion in 2012, nearly quadruple the amount sent home in 2000. India (\$69 billion), China (\$60 billion), the Philippines (\$24 billion), and Mexico (\$23 billion) are the leading beneficiaries of these capital flows.¹⁸ Unofficially, the dollar value is probably much larger when money is sent home directly with family or friends or through unregulated transfer agents. In relative terms, small countries benefit the most, with some increasing their national incomes by more than 20 percent. Egypt, for example, receives more from money sent home from its migrant laborers than it does from ships transiting the Suez Canal.¹⁹ The United States is the largest remittance source (estimated at \$51.6 billion being sent out of the country in 2011),²⁰ with the balance of the developed world, along with oil-producing countries, the other main sources for these remittances.

Demographic Impacts

Demographically, immigration has frequently been touted as a cure to an aging population. As noted earlier, most developed countries have entered a period of below-replacement fertility. Economic development associated with urbanization, industrialization, economic uncertainty, and the welfare state has translated into a reduced need or desire for children. The result is an increasing proportion of elderly and a decreasing share of the population aged fifteen years and younger. In effect, we are seeing a fundamental change in the age distribution of the population away from the traditional “pyramidal” structure, with a large share of the population concentrated in the younger age groups, toward a “rectangular” age structure with a more even distribution of the population across ages (see discussion of population pyramids in chapter 3). In response, immigration could be used to offset the demographic implications of an aging population if young immigrants were targeted as the most desirable entrants.

Clearly, immigration has a profound impact on the demographic structure of the United States, with immigration a significant contributor in the country’s population growth, which is expected to total 438 million by 2050.²¹ Moreover, the relatively high fertility levels in the United States reflect higher fertility among minority groups, particularly Hispanics.²² Most studies, including those

of the NRC, have found that immigration merely postpones or alleviates the onset of an aging population, although it is likely that immigration has allowed the United States to maintain relatively high fertility levels. In part, family reunification offsets the desired demographic effects as young adults sponsor their parents. Moreover, the dynamics of demographic change now underway within the developed world imply that the population will continue to statistically age in the coming decades.

The most visible impact of immigration will be changes to the cultural, racial, or ethnic composition of receiving countries as immigrants account for an increasing share of population, issues that most developed countries are already grappling with. Between 2000 and 2010, about one-third of the growth of population in the United States was due to immigration, with nearly 40 million foreign-born.²³ Over the longer term, the share of non-Hispanic whites is projected to decline from 67 percent to 47 percent by 2050, while the shares of Hispanics and Asians will grow, reflecting both immigration and higher fertility levels within these groups.²⁴ Socially, opposition to immigration has frequently focused on the perceived cultural and racial differences between immigrants and the native-born, but this raises debates associated with whether the receiving country has one culture or many. In Europe or Canada, the answer to this question is simple but reflects near-polar ends of the spectrum. Most European states—despite membership within the European Union—see their borders encompassing a single nationality, hence the concern with increasing numbers of foreigners and their “dilution” of national identity. Canada, on the other hand, is a multicultural society, an agenda that has been fostered and actively promoted by the federal government for the past thirty years. In the United States, the answer is less clear but no less important. The unified vision of the “melting pot” contrasts with the reality of immigration. Immigration to the United States may have altered impressions of culture, but it does not necessarily suppress the cultural identity of immigrants, making the United States a *de facto* multicultural society as well. Even among groups that have been long-term residents of the United States, such as Germans or Scandinavians, their cultural heritage is embraced, and the identity of these groups has left lingering impressions upon the cultural and economic landscape.²⁵

IMMIGRATION POLICY

The demographic realities of low fertility and an aging population mean that European countries are faced with a labor force crisis. Given the difficulties and limitations associated with fertility policies as discussed in chapter 4, increased immigration may be the only option for meeting Europe’s employment requirements, but it is fraught with political, social, and cultural problems. Increased

nativism in Europe and the United States, along with the emergence of anti-immigrant violence and right-wing political parties that have cultivated a fear of foreigners, serve as a warning bell. In response, Europe has moved to limit immigration, but attempts to restrict it have often led to increased “backdoor” immigration through family reunification policies, illegal immigration, or seasonal-worker admission. The failure to control immigration means that European societies must be prepared to transform themselves into immigrant destinations, something that most states are unwilling to do at this time. In part, doing so raises questions regarding the integration of immigrants into the social, economic, and political structures of the host nations. The problem for all of these states is that they must define who “belongs” within their borders. In Europe, immigration has not provided a foundation as it has in North America, and the cultural shift involved in moving from labor exporter to labor importer is huge. Consequently, immigration debates are part of the much broader debate of national identity that pervades the economic, social, political, and cultural aspects of a society.

Traditional countries of immigration, such as the United States, Canada, and Australia, cannot sit idle and hope that the emergent storms over immigration and national identity will pass them by. Fueled by shifts in immigration sources, policies, and rights in the past three decades, welfare reform in the late 1990s, California’s Proposition 187 (barring immigrants from various social and medical services), Arizona’s Proposition 200 (barring illegal immigrants from voting or seeking public assistance), cases of increased nativism, illegal immigration control, and the Balkanization debate provide evidence of the potential for public concern with legal and illegal immigration alike. Up until the 1960s, immigration to the United States and Canada was shaped by white Anglo-Saxon images of society. Liberalization of immigration policies during the 1960s broadened the scope of immigration but injected new racial and ethnic tensions into the debate, even as they were defined as white-versus-black differences. But such debates cannot be cast in a “black versus white” or an “us versus them” context. In both Canada and the United States, there is a growing population that identifies with a mixed racial or ethnic heritage, and intermarriage between racial or ethnic groups is increasing. In the 2000 US census, for example, Americans could choose to identify themselves by more than one race, and responses pointed to an increasingly diverse population. Selling immigration’s humanitarian dimension is an alternative option, albeit one that is unlikely to meet with widespread success.

The recent history of European immigration policies and the pressure of domestic and international changes suggest that there is relatively little room for states to maneuver immigration policy. Countries might pursue economic development in origin countries, a policy that the European Union is pursuing

in North Africa and which is roughly equivalent to the maquiladoras that line the Mexico–US border. Over the short term, however, the economic restructuring generated by such policies may actually increase immigration as redundant workers search for employment. As a second option, states are increasingly reliant upon the removal of political rights among immigrants, flying in the face of decades of advances. Most nations, including France, Germany, and the United States, are now advancing a mix of agendas that remove or reduce access to welfare services, including education and health care; reduce employment options; and implement programs meant to block the integration of immigrants and discourage permanent settlement. Public agencies in Germany must, for example, report information on illegal immigrants to the Foreigners' Office, which must then initiate deportation under German law.²⁶ In the Netherlands, illegal immigrants have been excluded from welfare, social housing, education, and most health care services since 1998.²⁷

Recent policy shifts in the United States highlight this trend. In order to regain control of its borders, the United States has moved to restrict access and, in doing so, has realized that this requires a rollback of civil and human rights for noncitizens. Legislation, including welfare reform, the E-Verify program, and California's Proposition 187 (see later in this chapter), either removed or proposed to remove rights and protections given to US immigrants.

Removal of the right to work is particularly problematic. Unless the right to work is withdrawn, curtailing the rights of immigrants is unlikely to reduce immigration, since there is little evidence that demonstrates that the provision of social services is an important reason for movement. Instead, employment and income are the main determinants: as long as countries demand low-cost labor, immigration will continue. As the native-born shun low-paying, manual-labor positions, there is a demand for inexpensive and illegal labor. Moreover, removing the right to work is hardly a deterrent, given the role of the underground economy, options for self-employment, and illegal immigration in the developed world. It is estimated, for example, that 50 to 80 percent of US farm workers are illegal immigrants.²⁸

Given the experiences of the United States and other countries, closing the doors to immigrants is unlikely to stem the flow given the strength of pull and push factors in both origin and destination areas. Realizing that state control over immigration is limited and incomplete, labor unions have, in the past, voiced *support* for more open and moderate immigration policies.²⁹ Fearing that immigrants would compete with the native-born for employment and reduce wages, unions have traditionally sought to limit immigrant numbers, making the current involvement of unions in the immigration debate a seemingly strange bedfellow. In recent years, however, unions in Europe and America have supported liberalized immigration policies and courted immigrant workers

as a way of protecting workers and labor standards for all. In the United States, the American Federation of Labor and Congress of Industrial Organizations (AFL-CIO) withdrew their support for employer sanctions and called for an amnesty of illegal immigrants in February 2000, a call that was repeated in the spring of 2009 as discussions moved forward on President Obama's proposed revamping of US immigration law.³⁰ Similarly, one proposal that would benefit the agricultural sector would increase the number of seasonal workers in the United States from forty thousand to two hundred and fifty thousand per year, a measure that has been supported by some unions since these workers would be represented by unions.³¹ In Los Angeles, unions have focused their organization efforts on immigrant workers, allowing them to add members faster than anywhere else in the United States.³² Promoting moderate labor immigration is seen as one way to protect workers, ensure a safe work environment, reduce illegal immigration, and maintain union strength at a time of dwindling membership.

A Short History of US Immigration Policy

For much of the first century of its existence, US immigration was largely unrestricted, and it wasn't until 1875 that the Supreme Court ruled that the federal government had authority over immigration.³³ Over subsequent years, the number of immigrants entering the country gradually increased, reaching a peak in the decade immediately before World War I (figure 7.1). While both the Depression of the 1930s and World War II reduced the number of immigrants entering the country on a yearly basis, numbers increased in the postwar era, surpassing one million entrants in the early 1990s as well as after 2000.

In large part, the variations in immigrant numbers over the years represent both changing economic conditions and changing immigration policy. The years between 1875 and 1920 witnessed increasing regulation of entry into the United States, with regulations excluding those with criminal records, diseases, or unacceptable moral standards; anarchists; and particular groups based on origin or nationality. The 1882 Chinese Exclusion Act represented the first of several acts that restricted Asian immigration, with the Japanese excluded in 1907 and all Asians excluded in 1917. During the 1920s, national quotas were established that favored northern and western Europeans in an effort to maintain the racial and ethnic mixture in the United States. The Emergency Immigration Act of 1921 was the first to place quantitative restrictions on immigration, with annual immigration from a country limited to 3 percent of the number of foreign-born from that country that resided in the United States in 1910, when northern and western Europeans dominated the country. In effect, the law shifted immigrant origins away from regions that were not

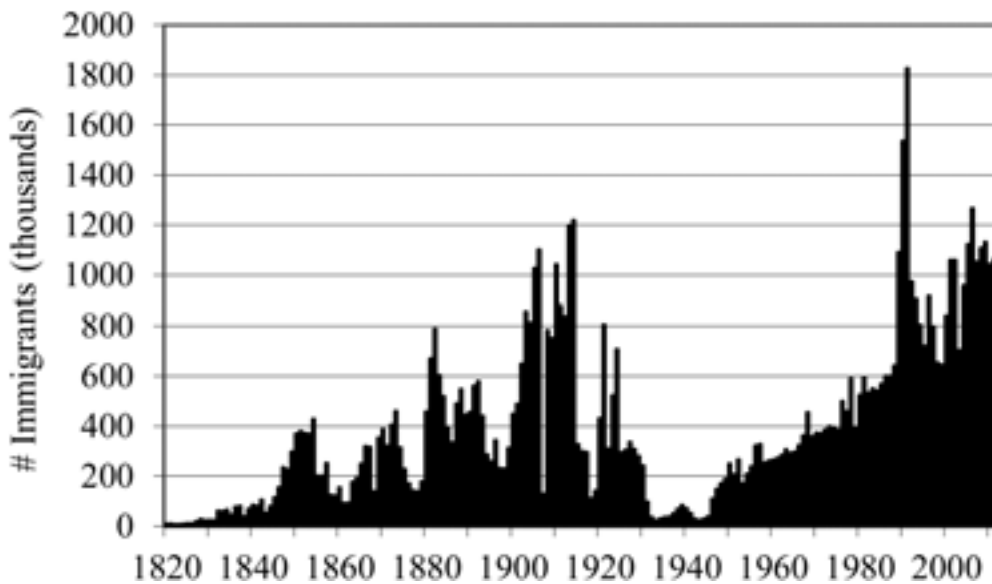


Figure 7.1 Persons Obtaining Legal Permanent Resident Status, 1820–2011
Source: Based on 2011 *Yearbook of Immigration Statistics*, Office of Immigration Statistics.

favored, including southern and eastern Europe, emphasizing instead an Anglo-Saxon immigration agenda. Interestingly, the quotas did not place restrictions on immigrants from the Western Hemisphere. Canadians were seen as no different from the existing American population stock, and immigration from Central and South America was not deemed a problem. In subsequent years, quotas were made increasingly tight, altering either the percentage or pushing back the base year, further reducing the number of immigrants allowed entry. But when restrictions were imposed on immigration, illegal immigrants were created. In response, Congress established the US Border Patrol in 1924, charged initially with apprehending illegal entrants.

The blatantly racist restrictions within American immigration policy were not removed until 1952 with the passage of the Immigration and Nationality Act. The act introduced a preference system for those with needed skills. For the first time, limits were placed on the number of immigrants from the Western Hemisphere and a preference system was set in place, with priority given to family members of American citizens and permanent residents as well as those with needed job skills. The quota system was finally lifted in the 1965 revisions to the Immigration and Nationality Act and was replaced with hemispheric limits, having a significant impact upon the nature of American society. Although it was unintended, the family preference category dramatically shifted immigration away from traditional origins such as Europe toward new origins in Central and South America and Asia. Prior to 1965, Europeans represented

the majority of immigrants arriving in the United States, but this group represented just 11.5 percent in 2007. Instead, approximately 39 percent of all immigrants were from the Americas in 2012. While Mexico remains the single largest origin (146,406 or 14.2 percent),³⁴ net migration between the two countries has declined to near zero, reflecting the lingering impact of the recession in the US, improved economic conditions in Mexico, and a smaller cohort of young labor force entrants looking for work.³⁵ Totalling 41.6 percent of all immigrant arrivals, Asians were the largest origin group. Minor adjustments were made to the Immigration and Nationality Act through the 1970s, 1980s, and 1990s, a period marked by an increasing awareness of the scope of illegal immigration. Although family reunification remained a significant component, the act increased the number of immigrants admitted on a yearly basis and expanded the number of visas given on economic grounds to 140,000 per fiscal year (tables 7.1 and 7.2).³⁶

In framing US immigration policy, US legislators have attempted to balance competing economic, social, and humanitarian goals. It is, for example, argued that a large illegal immigrant workforce is not beneficial for the United States. But competing interests have led to policy gridlock, a fragmented policy agenda, and unanticipated consequences, resulting in an emerging gap between the *goals* of national immigration policy and the *results* of those policies.³⁷ In her analysis of US immigration, Kitty Calavita argues that historical and current policies are best summarized as a triad of opposites between employers and workers, between an economy that needs unskilled workers and a political class that is unwilling to confront the conflicts this creates, and between human rights and border control.³⁸

Illegal Immigration

Most developed countries have instituted restrictions and barriers to immigration and recast immigration as a national security issue. But if a country tries to close the door to immigration, will it succeed? Experiences from Europe and the United States, including the 1986 Immigration Reform and Control Act (IRCA) and recent clampdowns on illegal border crossings, suggest not. In fact, restricting legal immigration may only serve to increase illegal immigration or other backdoor immigration through family reunification programs or seasonal-worker admission.

Beyond policy, enforcement also bears upon the presence and number of illegals within a country. Given the robust economic conditions and low unemployment rates of the late 1990s in the United States, reports suggested that the then–Immigration and Naturalization Service (INS) was not pursuing or prosecuting illegal aliens once inside the United States. Since 9/11, concerns with terrorism have led the Department of Homeland Security to focus on

Table 7.1. Class of Admission of Legal Immigrants to the United States, Fiscal Years 2009–2011

	2009		2010		2011	
	Number	%	Number	%	Number	%
Total, all immigrants	1,130,818		1,042,625		1,062,040	
New arrivals	463,042	41.0	476,049	45.7	481,948	45.4
Adjustments	667,776	59.0	566,576	54.3	580,092	54.6
Preference immigrants	888,316	78.6	839,346	80.5	827,428	77.9
Family-sponsored immigrants	211,859	18.7	214,589	20.6	234,931	22.1
Unmarried sons/daughters of US citizens	23,965	2.1	26,998	2.6	27,299	2.6
Spouses of alien residents	98,567	8.7	92,088	8.8	108,618	10.2
Married sons/daughters of US citizens	25,930	2.3	32,817	3.1	27,704	2.6
Siblings of US citizens	63,397	5.6	62,686	6.0	71,310	6.7
Employment-based immigrants	140,903	12.5	148,343	14.2	139,339	13.1
Priority workers	40,924	3.6	41,055	3.9	25,251	2.4
Professionals with advanced degrees	45,552	4.0	53,946	5.2	66,831	6.3
Skilled workers, professionals, other workers	40,398	3.6	39,762	3.8	37,216	3.5
Special immigrants	10,341	0.9	11,100	1.1	6,701	0.6
Employment creation	3,688	0.3	2,480	0.2	3,340	0.3
Diversity	47,879	4.2	49,763	4.8	50,103	4.7
Immediate relatives of US citizens	535,554	47.36	476,414	45.7	453,158	42.7
Spouses	317,129	28.0	271,909	26.1	258,320	24.3
Children	98,270	8.7	88,297	8.5	80,311	7.6
Parents	120,155	10.6	116,208	11.1	114,527	10.8
Refugees	118,834	10.5	92,741	8.9	113,045	10.6
Asylees	58,532	5.2	43,550	4.2	55,415	5.2
Other immigrants	17,255	1.5	17,255	1.7	16,049	1.5

Source: 2011 Yearbook of Immigration Statistics, table 6.

Table 7.2. Immigrants Admitted to the United States by Selected Country of Birth, Top Ten Origins, Fiscal Years 2009–2011

Rank	2009			2010			2011		
	Country	Number	%	Country	Number	%	Country	Number	%
—	All Countries	1,130,818	100.0	All Countries	1,042,625	100.0	All Countries	1,062,040	100.0
1	Mexico	164,920	14.6	Mexico	139,120	13.3	Mexico	143,446	13.5
2	China	64,238	5.7	China	70,863	6.8	China	87,016	8.2
3	Philippines	60,029	5.3	India	69,162	6.6	India	69,013	6.5
4	India	57,304	5.1	Philippines	58,173	5.6	Philippines	57,011	5.4
5	Dominican Rep.	49,414	4.4	Dominican Rep.	53,870	5.2	Dominican Rep.	46,109	4.3
6	Cuba	38,954	3.4	Cuba	33,573	3.2	Cuba	36,452	3.4
7	Vietnam	29,234	2.6	Vietnam	30,632	2.9	Vietnam	34,157	3.2
8	Colombia	27,849	2.5	Haiti	22,582	2.2	S. Korea	22,824	2.1
9	S. Korea	25,859	2.3	Colombia	22,406	2.1	Colombia	22,635	2.1
10	Haiti	24,280	2.1	S. Korea	22,227	2.1	Haiti	22,111	2.1

Source: 2011 Yearbook of Immigration Statistics, table 3d.

restrictions to entry into the United States and to increasingly crack down on illegal residents in the country through a series of high-profile raids on businesses.³⁹ The Immigration and Customs Enforcement (ICE) branch of Homeland Security highlights their successes on the Internet.⁴⁰

Policy Responses to Illegal Immigration

Ultimately, the imbalance between policy goals and realities may engender greater hostility toward immigrants, placing increased pressure on the government to restrict immigration. In 1986, for example, 1,615,854 illegal aliens were apprehended along the US–Mexico border, and aliens were brazenly entering the country by running directly past immigration agents at border crossings (figure 7.2). Such images provoked fears that the United States had lost control of its borders, and calls for tighter restrictions intensified.

Searching for ways to control immigration and responding to public concerns, legislators at both the national and state levels have moved to restrict immigrant access to welfare and social benefits (seen in California’s Proposition 187, Arizona’s Proposition 200, and welfare reform in 1996) and to make



Figure 7.2 Caution: A Roadside Sign in San Diego

This sign warns motorists on busy Interstate 5 of the potential for people, including women and children, to be on the highway, posted in response to illegal immigrants entering the United States in this area and escaping custody.

Source: Author’s photo.

entry more difficult, exemplified by increased border patrol measures. Revisions to welfare in 1996 placed immigration concerns within a national forum. Officially known as the Personal Responsibility and Work Reconciliation Act, the law fundamentally altered welfare provision in the United States by cutting money to welfare programs, giving states greater control over spending, and enacting work and duration restrictions on programs. Although its impact upon the native-born was just as significant, welfare reform directly targeted immigrants and their use of programs. Revisions barred most legal immigrants from receiving Supplemental Security Income (SSI) and food stamps, two programs where immigrants received proportionately more benefits than the native-born.⁴¹ At the time, it was estimated that upward of five hundred thousand aliens lost their eligibility for SSI. An additional one million were estimated to lose their eligibility to receive food stamps. Aliens legally admitted to the United States after August 22, 1996 (the date revisions took effect), were also barred from federal means-tested programs during their first five years of residency. States were also eligible to bar qualified aliens from receiving Temporary Assistance for Needy Families (TANF),⁴² Medicaid, and Title XX social services that funded, among other programs, childcare and elderly services. Although objecting to provisions restricting eligibility for public benefits, President Clinton signed the bill. In subsequent years, several directives and new bills worked to soften the impact of the restrictions upon immigrants, and many state governments provided additional funding to services.

At the state level, California, arguably the first state to invoke restrictionist immigration policies,⁴³ passed Proposition 187,⁴⁴ which removed public funding from all illegal immigrants, polarized immigration viewpoints within the state, and pushed local immigration concerns into the national and international spotlight. Propelled by the real and perceived costs posed by illegal immigrants, including welfare (ab)use, criminal activities, and employment costs, California lawmakers attempted to curb the tide of illegal immigration into the state and encourage some illegal immigrants who were already resident to leave. Proposition 187 was designed to exclude illegal immigrants from schools and colleges, deny nonemergency health care to illegal aliens, require the police to verify the legal immigrant status of all people arrested, and require teachers and health care workers to report illegal aliens to the INS. While its provisions did not affect legal immigrants within the state, it nonetheless created an atmosphere in which all people of color, both legal and illegal, became suspect. Internationally, both Mexico and El Salvador expressed concern with Proposition 187, citing human rights violations. More realistically, both were likely concerned with the potential negative economic effects associated with a large number of returning workers.

Passed in November 1994 with 59 percent of the public vote, Proposition 187 received broad-based support throughout the state and revealed the depth

of frustration among California's voters with illegal immigration. Shortly afterward, a federal court ruled Proposition 187 to be unconstitutional, citing the fact that immigration was a federal, not state, matter and that federal law requires free public education to all children. The widespread support for Proposition 187 had considerable ethnic and spatial variation, stressing the complexity of the immigration debate and providing insight into public reaction to immigration and anti-immigrant sentiments.⁴⁵ Ethnic divisions in voting patterns followed expected divisions, with 63 percent of white non-Hispanics voting in support of the proposition. Greater support was found among middle- or upper-income white and Republican voters, expressing a simple anti-immigrant sentiment. African Americans and Asians were moderately likely to support the measure, voting 56 and 57 percent in favor, respectively, while only 31 percent of Hispanics supported Proposition 187. Analysis of the vote at the local scale shows additional variations, with greater support among Hispanic neighborhoods with higher socioeconomic status, suggesting a desire to control illegal immigration and mirroring white, non-Hispanic sentiments. Even in inner-city Hispanic communities, there was a surprising degree of support for the measure.

William Clark, a professor of geography at the University of California, suggested that voter response to Proposition 187 could not be defined simply as nativist or racist reactions, but instead reflected local responses to immigration. Recalling the findings of the NRC, Californians were forced to deal with the real and perceived consequences of immigration locally, where potentially significant (and costly) fiscal effects were more likely to occur.⁴⁶ Thus, Proposition 187 may simply have been a reaction to high immigration levels in the late 1980s, local fiscal implications, and the recession of 1990–1991, which seemingly increased the cost of service provision for state and local governments. Clark also suggested that the voting behavior placed California's concerns at odds with the national role of the United States as a receiver of immigrants, along with businesses' desire for low-cost labor.⁴⁷ A darker implication is raised by George Sanchez, who argued that Proposition 187 presented immigrants as scapegoats for California's economic problems in the early 1990s.⁴⁸

California is not alone in its concern over illegal immigrants and their fiscal consequences, as states have increasingly moved to control immigration, which largely reflects the inability of the federal government to overhaul immigration policy, despite repeated attempts in 2006, 2007, and 2010. Instead, states have used their own legislative pieces to deter illegal immigration, which partially draw upon the national E-Verify program requiring all licensed businesses to confirm that new employees are legally authorized to work in the United States. For businesses that continue to hire illegals, the program imposes sanctions on employers.⁴⁹ In 2010 alone, state legislatures passed nearly 350 pieces of

legislation related to immigration, a number that included twenty-seven laws related to the employment of immigrants.⁵⁰ Various state governments (mostly southern states) have, for example, moved to exclude illegal immigrants from labor markets and welfare or other public programs, along with apprehending and deporting them.⁵¹ Arizona passed Proposition 200 in the 2004 elections, which barred illegal immigrants from voting or seeking public assistance for state and local benefits that were not federally mandated. Even municipalities have enacted restrictionist immigration policies.⁵² Prince William County, a suburb of Washington, DC, enacted laws similar to Propositions 187 or 200 that aim to limit immigration in the face of large demographic change, including the denial of benefits to individuals who can't prove residency and requiring police to check the immigration status of people who are arrested.

Such restrictionist policies have had an effect on illegal immigration. States with the greatest legislative control have tended to experience greater declines in the size of their illegal populations, exemplified by the impact of the Legal Arizona's Workers Act of 2008, which required employers to validate workers status through the national E-Verify program. As a result of the program, the number of illegal immigrants in the state declined by an estimated 17 percent between 2008 and 2009.⁵³ At the same time, it pushed other illegal workers into informal jobs and self-employment.

Perhaps the greatest impact on the number of illegal entrants to the United States has not been policy and enforcement tools but the global recession that started in late 2007. Growth of the illegal population in the United States (and other countries) slowed with the start of the recession, and evidence suggests that the number of illegal immigrants entering the United States dropped dramatically as the recession took hold,⁵⁴ continuing through 2011.⁵⁵ Concurrently, illegal residents already in the United States tended to "stay put," preferring to ride the recession out by searching for employment in the United States for two broad reasons. First, while the recession severely reduced employment options in the United States, it was also affecting opportunities in their origin countries. Second, individuals would likely not want to risk the dangers of future border crossings given increased border security and the likelihood of apprehension.

The US Border Patrol

Ultimately, the "first line of defense" against illegal entry falls to the US Border Patrol, which works within the Citizenship and Immigration Services (USCIS) to detect and prevent the smuggling or entry of illegal aliens into the United States. In response to increasing concerns with the numbers of illegal immigrants entering the country, the Border Patrol increased the scope of its operations beginning in 1994 along the southern border with Mexico, the primary

entry point from Central and South America. A series of operations, including Operation Gatekeeper in San Diego, Operation Hold-the-Line in El Paso, and Operation Safeguard in Tucson, were meant to control the border in each of these areas by cutting off avenues of illegal entry (figure 7.3). Most operations included a variety of interventions, such as new fencing and use of new technology such as infrared scopes, underground sensors, and computer tracking of illegal entrants to deter illegal entry. By USCIS measures, these programs have been highly successful, reducing the number of apprehensions from over 450,000 in 1994 to 284,000 in 1997 and 44,247 in 2011 within the San Diego sector alone.⁵⁶ Programs in other sectors reported similar “successes” (table 7.3), with the number of apprehensions declining from 556,032 in 2009 to 340,252 in 2011.⁵⁷

While there is likely little doubt that the downward trend in the number of yearly apprehensions reflects fewer people trying to cross the border illegally, the programs have not been without their critics. While reducing the number of crossing attempts at key locations such as San Diego or El Paso, the deterrence effect of increased surveillance and capture has diverted the streams of



Figure 7.3 The US–Mexico Border

The fence separating the United States and Mexico in San Diego. Would-be illegal immigrants are on the Mexico side, waiting for nightfall, when they will attempt to enter the United States.

Source: Author's photo.

Table 7.3. Yearly Border Patrol Apprehensions, Fiscal Years 2005–2011

<i>Border Patrol Sector</i>	<i>2005</i>	<i>2006</i>	<i>2007</i>	<i>2008</i>	<i>2009</i>	<i>2010</i>	<i>2011</i>
All Southwest							
San Diego, CA	1,171,462	1,071,979	858,737	705,022	540,851	447,731	327,577
El Centro, CA	126,915	142,110	152,464	162,392	118,712	68,565	42,447
Yuma, CA	55,790	61,457	55,882	40,962	33,520	32,562	30,191
Tucson, AZ	138,430	118,532	37,994	8,363	6,952	7,116	5,833
El Paso, TX	439,105	392,101	378,332	317,709	241,667	212,202	123,285
Marfa, TX	122,691	122,264	75,464	30,310	14,998	12,251	10,345
Del Rio, TX	10,536	7,520	5,537	5,390	6,357	5,288	4,036
Laredo, TX	68,504	42,630	22,919	20,761	17,082	14,694	16,144
Rio Grande Valley, TX	75,330	74,845	56,716	43,659	40,571	35,287	36,053
	134,161	110,520	73,429	75,476	60,992	59,766	59,243
All Other Sectors							
Blaine, WA	17,569	17,117	18,066	18,818	15,181	15,651	12,675
Buffalo, NY	1,000	809	749	951	844	673	591
Detroit, MI	406	1,518	2,190	3,338	2,672	2,422	2,114
Grand Forks, ND	1,793	1,282	902	961	1,157	1,669	1,531
Havre, MT	754	517	500	542	472	543	468
Houlton, ME	948	567	486	427	283	290	270
Miami, FL	233	175	95	81	60	56	41
New Orleans, LA	7,243	6,033	7,121	6,020	4,429	4,651	4,401
Ramey, PR	1,358	3,053	4,018	4,303	3,527	3,171	1,509
Spokane, WA	1,619	1,435	548	572	418	398	642
Swanton, VT	279	184	338	340	277	356	293
	1,936	1,544	1,119	1,283	1,042	1,422	815
Total	1,189,031	1,089,096	876,803	723,840	556,032	463,382	340,252

Source: 2011 Yearbook of Immigration Statistics, table 35.

illegal aliens to areas that have not received the same degree of attention from the Border Patrol.⁵⁸ Operation Hold-the-Line at El Paso, Texas, for instance, succeeded in reducing local border crossings (i.e., local domestic workers who traveled short distances) but failed to deter long-distance illegal labor migration. Instead, crossings were diverted to Arizona or elsewhere along the border, where the number of apprehensions increased.⁵⁹ The problem is also indirectly seen in the Border Safety Initiative (BSI), a binational program begun in 1998 between the United States and Mexico. With increasing risk of apprehension in traditionally high-traffic areas, illegal entry has shifted to hazardous areas such as deserts or mountains, where the number of deaths among illegal entrants rose from 44 in 1999 to 252 in 2010, the largest toll to date, even as the number of total apprehensions declined.⁶⁰ Meant to reduce injuries and fatalities along the southwest border, one of the primary aims of the BSI has been public education with respect to the risks associated with illegal crossings, especially as illegals who are little prepared for the hardships of these locations are forced to cross in remote areas.

In placing additional resources along its borders (including the northern border with Canada) and proposing other policies aimed at controlling illegal immigration, the US government was effectively recasting the immigration debate as a national security issue. These concerns have become dominant themes within the immigration debate. Following the terrorist attacks of September 11, 2001, the potential threat to national security by immigration was further solidified as immigration and border issues were consolidated under the Department of Homeland Security. At the same time, a coherent and sustainable solution to illegal immigration remains elusive, with the number of illegal immigrants in the United States estimated to be 11.5 million as of 2011.⁶¹

TRANSNATIONAL MIGRANTS

Although international migration for economic reasons is well entrenched, a relatively new form of international movement is reflected in transnationalism.⁶² Transnationalism can be broadly defined as a process by which immigrants create and maintain social, economic, and political relations through activities linking the origin and destination. This type of international movement highlights the complexity of international migrations and makes transnational migrants inherently different from other immigrants in that while they settle and become incorporated into their new place of residence they simultaneously maintain connections through a variety of social, economic, or political linkages outside the host country and most likely their country of origin. At the international scale, transnational migrants, such as businesspeople who work

in one country while their partners and children live in another country, are increasingly common, reflecting economic and personal needs. Oftentimes, residency is determined by life-cycle stage, with transnationals often choosing to live in one country for economic opportunity during prime working years and residing elsewhere for educational purposes or retirement.⁶³ More generally, transnational migrants tend to be skilled workers. So-called astronaut families, where either one or both parents reside primarily in one country while their children remain in another, can be considered a distinctive form of transnationalism.⁶⁴ In both cases, their relative transience between countries makes it difficult to arrive at reliable estimates of the true magnitude of transnationalism.

CONCLUSION

Both forms of international migration—legal and illegal—are the major determinants of population distribution between countries. Countries are slowly awakening to the realization that immigration policy is truly problematic. Whichever way they turn—either to restrict immigration or to promote particular components of immigration—is not guaranteed to achieve the desired results. Attempts to decrease immigrant flows have proven largely unsuccessful in the face of economic restructuring and globalization. Increasing immigration is problematic in its own way, threatening ethnic, racial, or social stability while creating a cadre of low-paid workers that would reduce wages and compete for positions with the native-born. Opening the doors may represent a slippery slope that governments would not be able to back away from, with immigration further spiraling beyond their control. Both measures carry the risk of mixed messages that condone immigration on the one hand while reducing it on the other. Ultimately, the future shape of immigration policy is unclear.

STUDY QUESTIONS

1. Using the DHS's *Yearbook of Immigration Statistics* ("Persons Obtaining Legal Permanent Resident Status by Region and Selected Country of Last Residence: Fiscal Years 1820 to 2012"), find out how immigration has changed from a selected country over the years.
2. Using the DHS's *Yearbook of Immigration Statistics* ("Persons Obtaining Legal Permanent Resident Status by State or Territory of Residence: Fiscal Years 2003 to 2012"), graph the number and proportion of immigrants settling in selected states.
3. The United States has experienced multiple waves of immigration. Selecting any period, describe the characteristics of immigration into the country, including

number of immigrants, where new arrivals settled, major source countries, and immigration policy for your selected time period.

4. Using data from the United Nations World Population Prospects (<http://esa.un.org/wpp/Excel-Data/migration.htm>) and selecting a country in the developing world, graph net migration numbers. What patterns emerge?
5. Similar to figure 5F.1 and using data from <http://www.who.int/countries/en/#M>, graph the age-specific death rate for a selected country. What does the graph tell you? *Note:* Select “Life tables” and graph age-specific death rates by time.
6. Many people have migrated from less developed countries to developed countries. Select one country and identify the social and economic factors driving this migration.

FOCUS: THE “IMMIGRATION GAP”

Over the past hundred years, most governments have attempted to control the movement of populations into and out of their countries, and state governments have written and rewritten immigration law throughout the later half of the 1900s to reflect emerging economic and demographic needs as well as the reality of the civil rights movement. The United States (and other developed countries) tightly control who enters through various measures including numeric limits on the number of entrants per year and skill qualifications. While many policies appeared to succeed at first, states have found it increasingly difficult to control immigration since the 1980s, with large amounts of illegal immigration. For instance, the number of illegal residents in the United States is estimated to be 11.5 million as of 2011,¹ although the number of people entering the country illegally each year has dropped significantly since 2008, partially reflecting increased attention to border security since 9/11 as well as changing economic conditions in the US and Mexico.²

Despite their best attempts to impose tighter entry restrictions and other controls,³ labor-importing states are faced with an immigration control crisis, defined by Wayne Cornelius and his colleagues as the “gap” between immigration control policies and their outcomes. While governments desire to control immigration, the reality is that they have less confidence in their ability to control immigration now than fifteen to twenty years ago. The gap between immigration policy and reality is aided and abetted by three concurrent factors.⁴

First, various domestic factors have limited the state’s ability to control its borders. For example, programs such as Germany’s guest-worker program or the Bracero Program in the United States were meant to be short-term, with workers cycling in and out of the country as needed. The very existence of such programs, however, legitimized and concretized the movement of workers across international borders, connected regions, and created pathways for future immigrants by spreading information about jobs and receiving areas. Existing immigrant communities within the receiving

regions have served as anchors for new arrivals, cushioning the stress of relocation. When states have attempted to restrict immigration, these networks maintain flows through illegal immigration and family reunification. Likewise, policies meant to close the border have created permanent residents from temporary workers. Concerned with labor shortages, employers maintained their existing pool of immigrant workers. Workers, on the other hand, feared that they would not be able to return should they leave their host countries. Instead, they remained. Both France and Germany have, at different points in time, declared their borders closed to further immigration, only to see the number of foreign-born increase through family reunification clauses or other “backdoor” immigration routes, including illegal immigration. Similarly, US domestic policies have failed to deter illegal immigration. Nowhere is this inability of policy to deter illegal immigration better illustrated than through the Immigration Reform and Control Act of 1986 (IRCA), which sought exemptions for California’s agricultural growers to continue to use undocumented workers at the same time that other employers were required to verify the employment eligibility of workers.

Second, a number of factors from outside the state have contributed to the gap between policy and reality, including globalization and economic restructuring. Globalization opens economies to greater trade and capital flows and increases demands for cheap labor within industrialized countries. Stopping or controlling immigration

becomes increasingly hard because of the underlying demand for inexpensive labor. With globalization, employers have shown an increasing insensitivity toward economic fluctuations. That is, employer demand for cheap labor remains strong even in conditions of relatively high unemployment, and employers have been successful in recruiting workers and co-opting state policies for their benefit. Concurrently, population growth and economic restructuring within labor exporting countries promote economic and social disparities and create a ready pool of labor that encourages emigration. A second exogenous factor is that advances in communications and transportation technology are increasingly accessible to immigrants, aiding the expansion of international migration networks and sustained immigration flows.

Third, the rise of liberalism and the extension of human rights to foreigners within developed countries have further legitimized their position within host countries, hampering state efforts to control immigration. Policies aimed at protecting rights have helped immigrants get into countries (e.g., asylum) as well as remain within the host country. Canada, for instance, has had problems in the administration of its refugee policy,⁵ and Germany’s generous asylum policies were seen as a quick and easy way to gain entry. Although some of the rights acquired by the foreign-born in the 1960s and 1970s have been lost through new legislation, they remain a barrier to immigration control.

METHODS, MEASURES, AND TOOLS: COUNTING IMMIGRANTS, ILLEGAL IMMIGRANTS, AND EMIGRANTS

Many of the measures that were introduced in the previous chapter to measure and quantify internal migration can also be used to quantify immigration. Typically, international movements are simply identified by the number of people moving from a country (emigrants), into a country (immigrants), net immigrants (the difference between immigrants and emigrants), or the number moving between two specific countries. We can also speak of the *immigration rate* (usually defined as the number of immigrants relative to the population of the receiving country), *emigration rate* (the number of emigrants relative to the population of the sending country), and so forth. Given security and national policy concerns, governments in the developed world have a good count of *legal* immigration into a country at any one point in time, along with information such as the origin country, year of arrival, demographic measures of the immigrant (i.e., age, education, family structure), and immigrant type (such as whether they are refugees, or are entering the country to be reunified with a family member, to go to school, or to work).

The problem, however, is that while most countries, and particularly those in the developed world, keep track of the number of immigrants entering the country for permanent residency, relatively little is known about the number of illegal immigrants and the number of emigrants from a country. Such is the task of trying to count these individuals, often under very difficult conditions.

COUNTING EMIGRANTS

Estimating the number of emigrants from a country represents the complexity of the

task: Which individuals are truly leaving the country? What is the duration that they need to be away or the reason they emigrated before being defined as emigrants? The number of emigrants is frequently estimated based on a “residual” method, which defines the number of emigrants as the residual after accounting for the total population resident in a country on census day along with births, deaths, and immigration over a particular interval of time. Very simply, the number of emigrants over the period between t and h can be defined as the following formula.

$$\begin{aligned} \text{Emigrants } (t, t + h) = & \text{total population} \\ & (t - h) + \text{births } (t, t + h) + \text{immigrants} \\ & (t, t + h) - \text{deaths } (t, t + h) \end{aligned}$$

In other words, the known number of immigrants and births over a period $t + h$ is added to the enumerated population at some point in the past (t) minus deaths over the same period.

More complex estimates of the number of emigrants can also be made. Statistics Canada, for example, provides quarterly estimates of the country’s population, a component of which is an estimation of the number of emigrants. These estimates are based on a number of sources, including data from the Office of Immigration Statistics, the US Department of Homeland Security (DHS), and Canadian social welfare programs. The first two sources are used to estimate emigration to the United States, while Canadian social welfare data provides an estimate of emigration to other countries (a major destination for Canadian emigrants) based on withdrawals from the program. Still, a number of further adjustments

need to be made, given that there are typically delays in reporting and receiving data files and not everyone is covered by the social welfare data that is used.

COUNTING ILLEGAL IMMIGRANTS

Given that the total number of illegal immigrants in the United States is assumed to be greater than ten million, with impacts on service provision and labor supply and policies, the federal government is keen to have a robust estimate of their numbers. Arriving at firm estimates of the number of illegal immigrants is, however, difficult, given the reluctance of illegal immigrants to answer surveys and identify themselves, fearful that they may be deported. In the United States, Jeffrey Passel has used a variation of the residual method noted above to estimate the number of illegal immigrants.¹ First, the legally resident foreign-born population is estimated based on admissions

from the DHS as well as data on refugees admitted and asylum granted. After allowing for legal temporary migrants and for legal immigrants missed in the census or Current Population Survey (CPS), an estimate of the illegal population is derived by subtracting the estimated legal population from the census or CPS figure for the total foreign-born population. This initial estimate of the number of unauthorized migrants counted is then inflated for omissions. In a similar way, estimates based on the US experience suggest that greater than 30 percent of new immigrant adults granted residence in 1996 had previously illegally entered the United States, with some of these working illegally during their stay in the country.² While it is reassuring to see that these entrants ultimately legalized their status, it also highlights the “immigration gap” discussed elsewhere in this chapter.

Chapter Eight

Refugees and Internally Displaced Persons

Defining Refugees

Alternatives for Refugees: No Easy Way Home

Internally Displaced Persons

The Future of Refugees and IDPs

Conclusion

Study Questions

Focus: The United States—Welcoming Refugees?

Methods, Measures, and Tools: Counting Refugees and IDPs

RATHER THAN FOCUSING on the individual generators of refugees and displaced persons, and how or why they were generated, this chapter focuses on the implications and options of displaced populations. The chapter begins by exploring the alternatives available to deal with refugee populations, including their return to the country of nationality, settlement in the country of asylum, or resettlement to a third country. It then considers the internally displaced population, the most rapidly growing segment of displaced peoples. It concludes with a discussion of emerging issues and trends with respect to the displaced population. The “Focus” section looks at US refugee policy, and the “Methods, Measures, and Tools” section considers how refugees and internally displaced persons (IDPs) are counted.

DEFINING REFUGEES

As a subset of migration flows, refugees and displaced persons represent a growing population. Defined by the 1951 United Nations Convention Relating to the Status of Refugees and the 1967 Protocol Relating to the Status of Refugees,¹ refugees (and asylees²) are persons outside of their country who are

unable to return owing to fear of persecution for reasons of race, religion, nationality, or membership of a particular social group or political opinion.³ In 2010, more than sixty-five countries produced uprooted populations. According to the United Nations High Commissioner for Refugees (UNHCR),⁴ the leading coordinator and protector of these people, estimates placed the total number of refugees at approximately 10.55 million in 2010 (see table 8.1), along with asylees, internally displaced persons, and other individuals of concern.⁵ Major refugee-generating countries included Afghanistan, the Sudan, Burundi, Democratic Republic of the Congo, former Palestine, Somalia, Angola, Vietnam, and Iraq.

Despite the legal definition within UN documents, who is or is not a refugee has significant implications with respect to the degree of support and protection an individual receives along with the priority given to the long-term resolution of his or her status. The fundamental right that refugee status confers is that refugees will not be returned to their country of origin against their will.

Table 8.1. Refugees and Internally Displaced Persons by Major Source Countries, 2010

<i>Internally displaced persons</i>			<i>Refugees</i>		
<i>Rank</i>	<i>Country</i>	<i>Number</i>	<i>Rank</i>	<i>Country</i>	<i>Number</i>
1	Colombia	3,672,054	1	Afghanistan	3,054,709
2	Dem. Rep. of the Congo	1,721,382	2	Iraq	1,683,575
3	Sudan	1,548,000	3	Somalia	770,148
4	Somalia	1,463,780	4	Dem. Rep. of the Congo	476,693
5	Iraq	1,343,568	5	Sudan	379,067
6	Pakistan	952,035	6	Vietnam	338,698
7	Azerbaijan	592,860	7	Myanmar	215,644
8	Côte d'Ivoire	514,515	8	Eritrea	205,458
9	Afghanistan	351,907	9	China	184,602
10	Kenya	300,000	10	Serbia	182,955
11	Sri Lanka	273,772	11	Central African Rep.	162,755
12	Georgia	235,705	12	Various	160,678
13	Serbia	228,442	13	Turkey	146,793
14	Yemen	220,994	14	Sri Lanka	141,063
15	Central African Rep.	192,529	15	Angola	134,858
16	Burundi	157,167	16	Rwanda	114,836
17	Philippines	139,509	17	Colombia	113,233
18	Chad	131,000	18	Russian Federation	108,261
19	Uganda	125,598	19	Palestine	93,299
20	Bosnia and Herzegovina	113,365	20	Western Sahara	90,415

Source: UNHCR, 2010 *Statistical Yearbook*, table 2, www.unhcr.org (accessed 10 January 2013).

Legally, this is known as non-refoulement, and nations that ratify the Convention and Protocol are obligated not to expel individuals without due process. Defining individuals as refugees also obligates the host country to provide medical care, schooling, and basic civil rights that are enjoyed by other legal immigrants. In cases of large-scale refugee flows, the international community or agencies such as the UNHCR may fill gaps in the care of refugees.

Given the economic and political obligations associated with refugees, governments may dispute refugee claims to avoid these responsibilities.⁶ The United States and other countries do not, for example, accord refugee status to so-called environmental refugees (individuals who are physically displaced from their homes and livelihoods by the effects of climate change) or to economic refugees. In both cases, these restrictions are largely out of fear within the developed world that this would open a floodgate of refugees into a system that is already strained by the existing number of political refugees. In essence, for example, recognizing economic refugees would legalize Mexican immigration into the United States, as entrants would simply need to claim economic refugee status to gain legal entry. Proving the legitimacy of a refugee claim is difficult, especially when clouded by ideological, social, or economic concerns. The United States, for example, has been accused of having a double standard. With its acceptance of Mariel Cubans in the early 1980s, most of whom did not meet the international definition of refugee status, the US government was accused of altering its definition of political refugees for political expediency. At roughly the same time, it denied entry to Haitians who claimed political asylum, with the government defining them as voluntary and economic migrants, even with evidence of political persecution by the Haitian government. Likewise, the question of what defines “fear” may not, for example, be a sharply defined fear of individual persecution. Instead, it may be fear of being caught in the cross fire, which has little to do with individual traits. This is not meant to belittle the fear of the individual, since this fear is no less real. Consequently, the definition of refugee generally extends beyond persecuted individuals to whole groups of people fleeing danger.

With the end of the Cold War between the East and West, the nature of conflict has changed from large-scale confrontations backed by superpowers to smaller, internal struggles. Old alliances have been disrupted and totalitarian regimes that had kept the social order have been toppled. The former Yugoslavia is a case in point as Serbian leadership struggled to maintain control of Yugoslavia in the face of unilateral declarations of independence by Slovenia and Croatia in 1991. Later, in its wars in Bosnia and Kosovo, it would attempt to carve out a “greater Serbia.” In the process, an estimated 863,000 refugees were generated during the Bosnian conflict in the early 1990s, and an additional 900,000 were generated in Kosovo in 1999. Similar situations have

occurred elsewhere, including the thousands of Afghan refugees who fled the country to neighboring Pakistan to avoid conflict between pro- and anti-Taliban forces. Afghanistan was the largest producer of refugees in 2010, with approximately 3.05 million persons. Syria's civil war, which started in 2011, has produced some 1.7 million registered refugees (as of July 2013) and over 4 million internally displaced individuals.⁷ In Africa, decades of political turmoil following the end of the colonial era continue to generate a seemingly endless list of conflicts and refugees, including in Sudan, Burundi, Eritrea, Angola, and the Democratic Republic of the Congo.

ALTERNATIVES FOR REFUGEES: NO EASY WAY HOME

Once refugees are outside their home country, the international community is faced with three broad alternatives in assisting the refugee population, including voluntary repatriation, settlement in the country of first asylum, or resettlement in a third country.⁸ Of these, voluntary return to the home country is the ideal solution, particularly for the refugee. It is perhaps also the most difficult of the three alternatives, since a minimum requirement for return is the resolution of the problem that created the refugee flow in the first place. Additional material and financial support for the refugees may also be needed until they can reestablish their livelihoods after their return. Despite its difficulties, voluntary repatriations have succeeded, the most recent being the ongoing return of Afghanis in the post-Taliban era. However, their return and continued security have depended heavily upon assistance from nongovernmental organizations such as the Red Cross, donations and support from other nations, and the continued presence of security forces.

Permanent settlement outside of the home country, typically referred to as country of first asylum, is a poor second alternative. But it is also frequently the only practical one. The welcome that a country extends to refugees depends upon a complex set of considerations, including economic strength, political stability of the host government, and compatibility of refugees with the host society. Given that many countries of first asylum are in the developing world, most have difficulties meeting the needs of refugees. Even provision of basic needs, including water, sanitation, food, and shelter, may prove difficult given poor infrastructure or the lack of financial resources to deal with the refugee population. By necessity, host governments are forced to put their native-born populations first. Any attempts to do otherwise may increase tensions between the native-born populations and the refugees. As such, most countries rely heavily on organizations such as the Red Cross or UNHCR to provide assistance in meeting the basic needs of the refugees in the short term.

Support of refugees is not necessarily a short-term effort. Over the longer term, refugee populations may continue to require external support, and they may or may not be fully incorporated into their host countries, a problem that is exemplified by Palestinians.⁹ Spread throughout Jordan, Lebanon, and Syria, along with the West Bank and Gaza Strip in Israel, Palestinians became refugees when they fled Israel in 1948 (when the state of Israel was established) or later during the 1967 Six-Day War between Israel and its neighbors. The United Nations, through its Relief and Works Agency (UNRWA), provides education, health, and relief and social services to Palestinians. With the exception of Jordan, where more than half of the population is Palestinian, the admission and integration of Palestinians by other Arab countries have been less than enthusiastic, largely out of fear by the host governments that removal of the refugee label would destroy chances of recreating a Palestinian state.

In other cases, the presence of refugees may inflame tensions between countries or ethnic groups. In Lebanon, the delicate balance between Muslims and Christians has prevented Palestinian refugees from naturalization for fear that the political balance would be upset. In other cases, fighters or militia members often use refugee camps as a base, promoting instability within the refugee camp as well as externally to the camp, as in the case of Rwandan refugee camps in Zaire. These refugee camps became the base for rebel Hutu fighters, who conducted border raids into Tutsi-dominated Rwanda during that country's conflict in the 1990s.¹⁰ Complicating matters, soldiers, who were often guilty of genocide within Rwanda at the start of the crisis, frequently controlled food and other supplies within the camps, and the UNHCR was accused of feeding and protecting those accused of genocide. Their safety within the refugee camps was hardly guaranteed. Later, in the face of a relatively powerless UNHCR, the predominately Hutu refugees became the target of Tutsi rebels within Zaire, who would eventually overthrow the Zairian government of Mobutu Sese Seko and establish the Democratic Republic of Congo, furthering the bloodshed.

Racially or ethnically heterogeneous societies face further pressures, where an influx of refugees may upset the existing delicate balance between groups. In the 1999 Kosovo conflict, for example, approximately one million ethnic Albanians sought refuge in the neighboring countries of Albania, Macedonia, and Montenegro.¹¹ In an already politically unstable region, the sheer number of refugees endangered the political stability of Kosovo's neighbors and threatened to embroil the region in a larger civil war.¹² Albania, for example, is the poorest country within Europe, with a weak political system that was already reeling from internal conflict and anarchy following the collapse of its government in 1997. Refugees were arriving in a remote and economically undeveloped part of the country, and its financial and economic ability to cope with

the influx was limited.¹³ In Macedonia, where ethnic Albanians represented 25 percent of the population, it was feared that a large influx of Kosovar Albanians, estimated at 239,000, would radicalize Macedonian nationalism and Albanian separatism, upsetting the existing ethnic balance and increasing the likelihood of an expanded regional war. These were not minimal concerns. With an estimated ethnic Albanian population of 506,000, the Macedonian Albanian population was inflated by approximately 50 percent. Since Macedonia's emergence as an independent state in 1992, internal conflict between ethnic Albanians and Macedonians (Slavs) had threatened the state's existence on numerous occasions. Although most refugees eventually returned to Kosovo and the conflict did not expand during 1999, this fear seemed to come to fruition in the spring of 2001 as Kosovar Albanians fought with Macedonian security forces for control of the Albanian-dominated areas in Macedonia.

The strain associated with Kosovar refugees was felt elsewhere in western Europe.¹⁴ Although Germany, France, and Italy were all concerned with the number and location of refugees, Germany was perhaps the most vocal, openly expressing its belief that refugees should stay in the Balkans and out of northern or western Europe. This clearly meant that poor neighboring states would have to deal with refugees, but it also demonstrated the ability of the Kosovo conflict to destabilize and politically charge the European continent. However, the fear of western European countries also reflects European concerns with state identity and the influx of foreigners discussed in the previous chapter, with European countries becoming increasingly concerned with the social, economic, and political implications of large numbers of foreigners.

According to the UNHCR, some 108,000 refugees were resettled in 2010 globally, with the major countries of resettlement including the United States, which accepted approximately 71,400 individuals. Canada, Australia, and Sweden were also major resettlement regions (resettling 12,100, 8,500, and 1,800 refugees in 2010, respectively), but the total number of refugees resettled within any one year is small relative to the total number of refugees. Although there was a dramatic fall in the number of new refugees, some 850,000 individuals were newly registered as refugees in 2010 alone, relocating from countries including Liberia, the Democratic Republic of Congo, Burundi, Somalia, and the Central African Republic.¹⁵ In other words, less than 1 percent of the refugee population was relocated to a third country in 2010. Remaining refugees were far less fortunate, experiencing life in desolate refugee camps, threatened by violence, and frequently marginalized by the host society. Even among those who are resettled, however, life is not easy. Refugees must adjust to their host country and frequently suffer from depression or post-traumatic stress disorder in the months immediately after arrival.

In contrast to those who legally immigrate for economic opportunities or family reunification, refugees are often the least successful of all entrants, frequently entering the host country with a poor or variable set of skills relative to

other legal immigrants. Over a longer term, as has been the case with Cuban Marielitos or Southeast Asian refugees, most refugees become legal permanent residents within their host countries. Although technically no longer labeled as refugees, this raises interesting questions and possibilities. For example, do former refugees attain similar benchmarks or levels of adjustment in the host country relative to legal immigrants or other refugees? In what direction do they assimilate? What is the time frame for assimilation and adjustment to the host country?

Existing evidence suggests that refugees continue to have divergent experiences after arrival, reflecting differences including the endowed human capital that refugees bring with them and their period of arrival (i.e., economic conditions in the resettlement country or whether they were among the first to flee, a group typically characterized by higher socioeconomic status). By definition, the refugee population is characterized by a broader diversity of human capital (i.e., skills or education) than the immigrant population, who typically self-select themselves into the immigration process (i.e., the better educated or those with more skills are more likely to immigrate) and who are screened by the host country. Among refugees, the endowed human capital or skills that these groups bring with them will influence the adjustment process, allowing the possibility of more rapid socioeconomic advancement among those with higher skills. Among Southeast Asian refugees, for example, differences in the adaptation of Sino-Vietnamese and ethnic Vietnamese refugees have been noted,¹⁶ with the Vietnamese tending to be more economically integrated than other Southeast Asian refugees despite similar lengths of residency within the United States.¹⁷ An emerging Vietnamese business class contrasts with other Southeast Asian refugees, best reflected by the Laotian population, who have lower rates of business ownership and are more likely to be dependent upon public assistance programs and on minimum-wage labor.¹⁸

Yet the process of adjustment into the host society is something that is only partially dependent upon the abilities and experiences that refugees bring with them.¹⁹ Instead, broader issues contextualize their opportunities and relative success or failure within the host country. Refugees often lack the networks and ties in the destination that can help with locating jobs or accommodations, making them more likely to require state assistance during the transition period. This poses a fiscal burden to the host country. In recent decades, government policies have played a key role in the admittance of refugees, with public assistance available to refugees that is not available to other legal immigrants. But the availability of public aid may interact with other characteristics that potentially lead to different outcomes. Dependence upon government or other sources for assistance may prove beneficial or slow refugees' adaptation into the host society.²⁰ National or ethnic origin and the level of public and

private reception also influence the postarrival success of refugee groups. Hungarians have successfully adapted to the United States and Canada, but their success was dependent not only on their skills, but also on the fact that they were white and fleeing a Communist country at the height of the Cold War. Although Mariel Cubans have fared relatively well, assisted by an already economically and politically strong Cuban community, differences between “white” and “black” Cubans have been noted.²¹ Even recent arrivals are forced to conform to American expectations (and stereotypes) of race and its consequences for social mixing, residential location, and employment opportunities. Together, this is suggestive of a complex and unequal process that transforms “refugees” into “immigrants” and ultimately naturalized citizens of the host country.

INTERNALLY DISPLACED PERSONS

The growing number of conflicts and the evolving political landscape have also increased the number of refugees and IDPs. Unlike refugees, IDPs are unable to leave their country of nationality and typically cannot avail themselves upon international agencies for protection and assistance. Many are trapped in war zones, unable to cross international borders into safer areas. It is estimated that 14.7 million individuals were internally displaced in 2010,²² the fallout of civil strife and ethnic unrest or disasters, and found in countries including Syria, Sudan, Colombia, Democratic Republic of the Congo, Iraq, Chad, Bosnia, Afghanistan, Lebanon, and Georgia. In Sudan alone, two decades of war between the Islamic government of the north and the Christian south have produced over 1.2 million displaced individuals, and civil war in Syria has produced an estimated 4 million internally displaced individuals.²³ Because IDPs tend to fall through the cracks of international recognition and assistance, the United Nations has engaged the debate on who should be responsible for their care, a difficult situation given the importance associated with state sovereignty.

Internally displaced persons are often faced with an insecure future. They may be confronted with an ongoing internal conflict or without a safe place to stay, and domestic governments may view them as enemies of the state or as enemy sympathizers. Internally displaced persons are not protected by international refugee laws and have little access to international assistance, typically falling between the cracks of current humanitarian laws. In part, this reflects Western interests and the ability of certain conflicts to “grab the headlines,” including conflicts that threaten the national security of developed countries or are defined as “interesting.” In other cases, there is only indifference toward

long-running disputes. Three of the world's most protracted conflicts—Sudan, Angola, and Colombia—are largely internal conflicts that are mostly ignored by the Western media.

The failure to protect internally displaced persons is much more than just an awareness of the events but reflects the current viewpoint that state sovereignty is sacrosanct, making it extremely difficult to work with a displaced population in the country that was responsible for its displacement. Can the United Nations and international law, for instance, override issues of state sovereignty to provide humanitarian assistance? This issue was grappled with in both Bosnia and Kosovo during the 1990s, but no long-term resolution was made. Although assistance was ultimately provided in these cases, many other low-profile or long-term crises, such as the conflict in the Darfur district of Sudan, do not have this benefit. Instead, donor money or assistance is directed toward visible refugee crises. Nongovernmental organizations and other aid groups have had some success, but still reach only a small segment of the total displaced population. The UNHCR has increasingly become involved in assisting IDPs but still deals with only a small proportion of the total displaced population, and it will only intervene when asked by the UN Secretary General and given consent by the state or parties involved.

Changing political circumstances, independent and sovereign states versus a rebel army, and control of territory complicate the provision of assistance. In response to the growing numbers of internally displaced persons, the United Nations has established a set of guiding principles to protect displaced populations.²⁴ These guiding principles call for the protection of a person's basic rights, outline the responsibilities of the state, and provide the individual with the right to leave a state. Although ignored by most governments with displaced populations, the principles have gained some acceptance, paving the way for increased involvement by organizations such as the UNHCR and the United States Committee for Refugees and Immigrants (USCRI).

THE FUTURE OF REFUGEES AND IDPs

With a growing world population, conflict will become increasingly common, spurred by ideology, land, and the control of resources, ultimately leading to greater population displacement (see discussion, for example, in chapter 11). Widespread poverty also provides a fertile breeding ground for tensions that can erupt in violence. Together, the ongoing potential for political instability means that it is unlikely that the total number of displaced persons (refugees, asylees, and IDPs) will decrease soon. In response to increasing the relatively unrestricted flow of asylum seekers, countries will increasingly move to close

their borders at a time when greater access is needed. In the United States, Canada, and other countries of resettlement, the overseas admission of refugees has traditionally been built upon a humanitarian basis. Given the events of September 11, 2001, however, receiving countries such as Canada or the United States revisited domestic refugee policies, restricting refugee admissions and tightening the screening process of refugee claimants. Over the short term, this meant a decrease in the number of refugee admissions to both countries, although refugee numbers increased in the following years.

In Europe, the asylum crisis in the 1990s led to a streamlining and harmonization of procedures and policies across the European Union, reflecting an increasing reluctance to offer refugee status. The reduction of benefits given to asylees, the imposition of a narrow definition of UN Convention refugees, and binding third-country policies have ultimately led to a partial closing of the doors. While the European Union has mounted a response to asylum seekers that maintains the spirit of the 1951 UN Convention, each country wants to take as few refugees as possible while attempting to shift the problem elsewhere. The variable and low recognition of refugee claims (i.e., confirming that a person is indeed a refugee under UNHCR guidelines) raises troubling questions, pointing to different standards of treatment for those seeking refugee status, and could further erode public support for refugees. Rather than being viewed with compassion, asylum applicants could be perceived by public opinion as abusers of the system. For instance, the UNHCR notes:

the recognition rate for Iraqi asylum-seekers in Greece shows zero while in Germany roughly two thirds of Iraqis were recognized as refugees. In the United Kingdom, on the other hand, only 15 per cent of all substantive decisions related to Iraqi asylum claims resulted in refugee status.²⁵

New measures to screen refugees (and immigrants) and tighten asylum laws were also introduced following the September 11 terrorist attacks in the United States. In an effort to increase border security, both Canada and the United States have moved to harmonize immigration and refugee requirements by implementing the Safe Third Country Agreement on January 1, 2005. Under this agreement, certain asylum seekers in Canada and the United States are required to make their refugee claim in the country where they were last present, meaning that asylum seekers arriving in Canada at the land border from the United States will not be eligible to have their refugee claim determined in Canada. Similarly, the agreement allows the United States to return to Canada asylum seekers attempting to enter the United States from Canada.²⁶ However, critics argue that the law is more about security, that it will lead to increased illegal entry and will decrease the flow of legitimate refugees. Statistics would

tend to bear this argument out. Before the implementation of the Canada-US agreement, approximately twelve thousand to thirteen thousand refugees to Canada came through the United States annually.²⁷ Over the first three months of 2005, the number of individuals seeking asylum in Canada had fallen by as much as 40 percent compared to the same period a year before.²⁸ Similar safe third country asylum laws have been implemented in Europe. Yet there is no clear consensus on what constitutes a “safe” country. Should countries such as Romania be declared “safe” when their democracies are young and still fragile?

If Europe, Canada, and the United States are unable to implement generous asylum practices, how can poorer countries be expected to allow large numbers of refugees entry? Many smaller states have refused to acknowledge refugees, fearful of the economic, political, and social implications of doing so. At the height of the Kosovo crisis, Macedonia closed its doors to refugees and physically removed others. In short, in backing away from refugee resettlement, the developed world is setting a dangerous and shortsighted precedent, one that the developing world has simply followed. Instead, governments have increasingly relied upon aid organizations and nongovernmental organizations to safeguard the rights of refugees and IDPs. It is incumbent upon the richer developed world to do more, rather than their fair share, in providing assistance. The challenge lies in states finding the balance between protecting their own interests and allowing for the legitimate claims of refugees, something that is difficult in itself.

The reluctance of developing countries to accept refugees must be partially attributed to the failure of the developed world to accept greater numbers of refugees, along with a hesitancy to become involved in humanitarian issues. Fears associated with a large influx of asylum seekers have host countries concerned with the control of their national borders, as they have grown fearful of the economic, political, and social instability that frequently accompanies large refugee flows. Compassion for refugee claimants has turned to fatigue, underlain by a feeling that refugees are simply abusing the system. The difficulty of distinguishing bona fide refugees from economic, voluntary migrants, superimposed upon national political, social, and economic concerns, clouds the picture. Refugee flows have therefore been redefined as a national security threat to the receiving country, with many countries looking to impose greater restrictions on asylum seekers and tighter refugee policies that include detention and interdiction.

Attempts to restrict asylum may, of course, be only partially successful. Like the attempts to restrict legal immigration discussed in the previous chapter, closing the doors to refugee movements may only serve to increase illegal entry. Already, European governments have a poor record of removing individuals who were not granted asylum. Instead, they slip into the underground economy.

Refugees may also increasingly turn to smugglers as a means of reaching safety. Reports of refugees trying to get into England via the Channel Tunnel (smuggling themselves onto trucks or under trains and risking death by crushing, electrocution, or exposure) or traveling by sea to Canada and the United States in boats that are barely ocean-worthy point to the desperation of these people. Once reaching a safe haven, their ordeal is hardly over, with most struggling for years in poor working conditions to repay smugglers under threats of violence to themselves or family members. Others are lured into prostitution. One estimate placed human smuggling as a \$7 billion (US) annual business linked to the arms trade, drugs, prostitution, and child abuse.²⁹ Most governments in the developed world are trying to address problems associated with human smuggling, a growing phenomenon that preys upon the impoverished and desperate in the developing world. Both Canada and the United States are considering new legislation to slow the flow, including stiff penalties and life in prison for traffickers. But these policies also victimize the victims. Policies allowing detention mean that many would-be asylees are held for months pending a refugee hearing.

Closing the doors to refugee movements may also simply shift the refugee problem to one of dealing with an internally displaced population. If settlement in a second or third country is barred, then the number of internally displaced people must increase. So, while it may appear that the number of refugees has decreased (as the evidence to date would suggest), individuals are simply redefined as internally displaced. Their lack of protection under international law and lack of access to resources magnify the problem.

The forced displacement of individuals is not only the result of political instability but can perpetuate instability as well. As is the cases of Kosovar Albanians in Albania and Macedonia or Palestinian refugees in Lebanon and other Arab countries, the presence of refugees may upset the political and ethnic balance within a state or strain a state's abilities to meet the obligations of a refugee population. Radicalism caused by population imbalances may result in members calling for the separation of the state or increased nationalism that further oppresses the minority group. In Israel, the peace process is complicated by Palestinian and Jewish demographics. The Palestinian population, which at 3.7 million is the world's largest refugee population, is characterized by high fertility in contrast to the relatively low rates of fertility and population growth among Israeli Jews.³⁰ The scattered Palestinian population and their right to return complicates the peace process. Israel opposes the Palestinians' return because of the democratic implications, while the existing infrastructure in Gaza and the West Bank would be heavily taxed if Palestinian refugees were to return.

Environmental Refugees

The concept of environmental refugees, or people who have been physically displaced from their homes and livelihoods by the effects of climate change, is a relatively new one. Environmental refugees may be found in places where the environment has been degraded: Changing precipitation patterns and increased drought in already arid areas, rising sea levels that inundate low coastal areas and islands, and increased frequency of severe weather may generate tens of thousands of these environmental refugees.³¹ In Africa, projections suggest that reduced precipitation will result in increased risk of desertification of large portions of the continent, including the Sahelian, Sudanese, and Guinean deserts. Their continued growth will force population displacement, resulting in upward of 135 million people displaced according to United Nations Food and Agricultural Organization projections.³² The resulting movement of environmental refugees into neighbouring countries will likely strain existing infrastructures and social relations. More broadly, the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) predicted the displacement of hundreds of millions of people due to climate change by 2080.³³ Most movements would be out of areas of high environmental risk, such as areas afflicted by drought or prone to flooding due to sea level rise. Yet, rather than searching for more secure locations that are more resilient to the effects of climate change (i.e., developed countries), most moves are expected to be short distance and within a country, with migration of people into places of greater environmental risk and placing additional stress on local resources.³⁴

The scale and duration of displacement owing to environmental change will vary, ranging from temporary moves and short-term displacements to longer-term migrations, depending on the scale of the event,³⁵ with the difference in migration responses linked to the cause or type of environmental event.³⁶ Cyclones, for example, can produce short-term displacement. While short-term, the number and frequency of extreme weather events is expected to increase as a result of climate change, with displaced populations requiring assistance (i.e., food, water, shelter) regardless of the length of time they are actually displaced. Rising sea levels, on the other hand, will result in long-term displacement that will unfold over a number of years or decades, raising questions around the long-term accommodation of individuals that are displaced.

CONCLUSION

Given ongoing political, ethnic, and religious conflicts across the globe, refugees and IDPs will remain a fixture of international population movements. The

prospect of climate change adding a new groups of refugees—the environmental refugee—raises additional questions around the ability of countries, governments, and the global community to support displaced individuals. While the term is widely used, environmental refugees are not officially recognized by governments or the UNHCR, meaning that their formal legal status is unclear. Regardless, the literature has increasingly referenced this group, and governments must move to formally recognize environmental refugees, with organizations including the New Economics Foundation arguing that international law should “grant refugee status to people driven from [their] homes by a lost or ruined environment.”³⁷ The reality is, however, that governments will not move quickly in this respect.

STUDY QUESTIONS

1. Using data from the *US Yearbook of Immigration Statistics*, graph the flows from major refugee sources into the United States for the past twenty years. Can you link the origin of the flows to political issues in the home country?
2. Using a recent refugee-generating country (i.e., Syria, Iraq, Sudan, Bosnia), identify the reason that the refugee flow was generated, where refugees initially settled, the number of refugees, the difficulty faced in providing basic necessities for the refugees, and their current status (i.e., do they remain in their country of settlement, have they returned, or have they been relocated to another country?).

FOCUS: THE UNITED STATES—WELCOMING REFUGEES?

Although relocation of refugees to a third country is a difficult and less-than-ideal option, the United States has a long history of admitting refugees for permanent resettlement,¹ including the resettlement of European refugees in the immediate post–World War II years, along with Hungarian refugees in 1956.² From over 200,000 refugee admissions in 1980, the number admitted on a yearly basis has declined over the last three decades (figure 8F.1), with a noticeable drop immediately after the 9/11 terrorist attacks. In 2001, for instance, nearly 69,000

refugees were admitted, a number that dropped to fewer than 27,000 the following year. These shifts reflected increased screening of applications, a decrease in the number of applications for refugee status, and a decreased approval rate, dropping from a 77 percent approval in 2000 to just 49 percent in 2001. By 2002, approval rates had increased to 60 percent, although the approved ceiling of 70,000 was not approached. Since then, the number of refugees admitted has climbed slightly, with the United States resettling 71,400 refugees

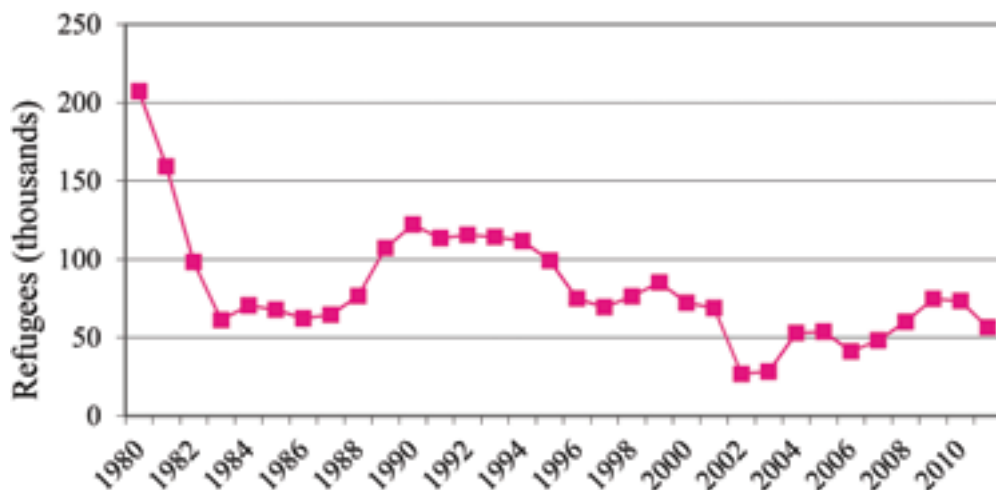


Figure 8F.1 Refugee Admissions to the United States, 1980–2011
 The impact of tightened security restrictions immediately after 9/11 is noticeable.
Source: Department of Homeland Security, *2011 Yearbook of Immigration Statistics*.

in 2010, more than all other countries combined (table 8F.1).

Despite this, the evolution of US refugee policy was relatively slow, with ad hoc policies for refugee admission often adopted throughout much of the postwar era. The admission of Hungarian refugees came at the height of the Cold War, and the United States viewed the admission of this group as a foreign-policy tool to control Communism. Later, the absorption of some 132,000 Cuban refugees by the United States following the Cuban Revolution in 1959 reflected the same foreign-policy agenda.

In fact, it was not until the 1960s that refugee legislation was codified in the United States.³ The 1965 Immigration and Nationality Act formalized US refugee policy by establishing that 6 percent of all immigrants (the so-called seventh preference category) could enter as refugees *if* they satisfied certain conditions. These included (1) departure from a Communist country or the Middle East; (2) that their departure

was caused by fear of persecution on account of race, religion, or opinion; (3) that they had departed in flight; and (4) that they were unwilling or unable to return. In essence, the United States had adopted the United Nations definition of a refugee, but attached geographical and ideological caveats. It finally recognized the United Nations convention in 1968 but did not amend its immigration and refugee statutes to reflect its new obligations.

Only in 1980 did the United States pass the Refugee Act and fully ratify the UN convention, regularizing refugee admissions and institutionalizing resettlement assistance. Still, the act failed to change the political considerations underlying refugee admission and selection, and the refugee system remains highly politicized even now. Each year, the president and Congress determine the number of authorized admissions (the 2010 ceiling was seventy-six thousand) broken down by major origin region. The president and Congress also define who is of special humanitarian concern

Table 8F.1. US Refugee Arrivals by Top Ten Origins, Fiscal Years 2009–2011

Rank	2009			2010			2011		
	Country	Number	%	Country	Number	%	Country	Number	%
—	All Countries	74,602	100.0	All Countries	73,293	100.0	All countries	56,384	100.0
1	Iraq	18,838	25.3	Iraq	18,016	24.6	Burma	16,972	30.1
2	Burma	18,202	24.4	Burma	16,693	22.8	Bhutan	14,999	26.6
3	Bhutan	13,452	18.0	Bhutan	12,363	16.9	Iraq	9,388	16.7
4	Iran	5,381	7.2	Somalia	4,884	6.7	Somalia	3,161	5.6
5	Cuba	4,800	6.4	Cuba	4,818	6.6	Cuba	2,920	5.2
6	Somalia	4,189	5.6	Iran	3,543	4.8	Eritrea	2,032	3.6
7	Eritrea	1,571	2.1	Dem. Rep. of the Congo	3,174	4.3	Iran	2,032	3.6
8	Vietnam	1,486	2.0	Eritrea	2,570	3.5	Dem. Rep. of the Congo	977	1.7
9	Dem. Rep. of the Congo	1,135	1.5	Unknown	136	0.001	Ethiopia	560	0.009
10	Burundi	762	1.0	Vietnam	79	0.001	Afghanistan	428	0.008
11	Other	4,781	6.4	Othe	r5,303	7.2	Other	2,910	5.2

Source: 2011 Yearbook of Immigration Statistics, table 14.

to the United States. This definition may be manipulated to bar entry to those from countries friendly to the United States, even in the face of observed persecution, as has been the case with Haitian entrants. Some critics have gone as far as suggesting that refugee flows from the former Soviet Union and its satellite states were more about family reunification in the 1990s than they were about the immigrants being true refugees. At the same time, needy refugees in Africa were overlooked, although there has been improvement in recent years.⁴ Out of the 71,400 refugees admitted in 2010, approximately one-sixth sourced from Africa, including Somalia, Sudan, Ethiopia, and Liberia (table 8F.1). This proportion declined in 2011, with the largest proportion (71.9 percent) sourcing from Asia.⁵

While the United States accepted refugees specifically chosen for resettlement in the post-World War II era, it did not deal with large numbers of asylum seekers until the last two decades of the twentieth century, forcing reform of the refugee systems. In the United States, the 1980 Refugee Act provided a statutory asylum policy. Importantly, the asylum provision did not establish a limit on the number of aliens who could apply or be granted asylum in a year, meaning that any alien who arrives in the United States could request asylum, allowing the individual to remain within the country until the review is completed and entitling him or her to benefits.

The number of asylee cases is relatively small, with nearly 41,000 admissions in 2011. Major origins include China, Columbia, and Haiti (table 8F.2). Asylum cases are heard before an asylum officer who determines the validity of the claim.⁶ Like the resettlement of refugees, political considerations appear to influence the granting of asylum, emphasizing control of the border rather than protection of individual rights,

even though State Department involvement in asylum cases was supposedly reduced in the 1990 revisions to the Refugee Act,⁷ with regional variations in approval rates remaining in 1998. On average, 28 percent of asylum cases were approved in 2011. Not surprisingly, there was large regional variation in the rates of approval, and rates of approval were well below average in many Central American countries.⁸ For example, out of all initial asylum applications, the 2011 approval rate was just 8.6 percent for Guatemala. In contrast, approval rates were generally higher among many Asian, North African, and Eastern European states. Refusal of asylum could result in detention and deportation.

US law also provides for a number of “refugee-like” situations, giving the government and president latitude for allowing entry or residency in a number of situations, but also underscoring the differential and ambiguous responses by the government to Haitian and Cuban entrants. Haitians, most of whom arrived by sea and claimed political asylum, were defined by the government as economic migrants searching for a way to leave the poorest country in the Western Hemisphere.⁹ Yet, despite ample evidence of persecution by the Haitian government, the US government refused entry to most Haitians so as not to undermine the Haitian regime. Fearing a large and uncontrollable influx of Haitian refugees should the door appear to be opened, the US government has also vigorously pursued a policy of interdiction on the high seas, with detainees returned to Haiti. Differentiating between political and economic refugees is often difficult, and the situation is compounded when ideological considerations cloud definitions.

Arriving shortly after the 1980 Refugee Act was signed, the Mariel Cubans had a decidedly different reception, and only a

Table 8F.2. US Asylees by Country of Nationality, Fiscal Years 2009–2011

<i>Country</i>	<i>2009</i>	<i>2010</i>	<i>2011</i>
China	2,710	2,882	3,901
Ethiopia	701	679	571
Colombia	637	358	325
Haiti	59	6666	822
Iraq	544	276	261
Nepal	493	408	426
Venezuela	393	467	902
Russia	364	389	469
Guatemala	349	298	285
Egypt	308	315	754
All others	4,823	4,442	4,762
Total	11,921	11,187	13,484

Source: 2011 Yearbook of Immigration Statistics, table 17.

minority met the conventional requirements of asylum.¹⁰ Rather than processing the Marielitos under the new system, the US government bypassed the Refugee Act and “paroled” Cubans directly into the United States. Eventually, the government regularized their status, allowing them to become immigrants in 1986.¹¹ The United States has also used a number of devices, including extended voluntary departure (EVD) and temporary protected status (TPS), to grant “safe haven” to groups in the United States in situations where a return to their country of nationality would be dangerous owing to political or other reasons, including natural disasters. The TPS statute provides aliens with employment authorization but does not convey residency status.¹² Decisions to provide these measures have typically been based upon humanitarian grounds and have been extended to the Chinese following the Tiananmen Square massacre in 1989 and to Hondurans and Salvadorans following the devastating earthquakes in those countries in the late 1990s.

The United States has moved to tighten its refugee and asylees process and insulate itself from becoming the primary destination for asylum applicants. The 1980 Refugee Act did not limit the number of aliens who could apply for or be granted asylum in any year, making it an unknown quantity in immigration. Although the United States has long used measures such as interdiction and detention to deter the arrival of asylum seekers, the Illegal Immigration Reform and Immigrant Responsibility Act of 1996 directly responded to the perceived abuse of the asylum system.¹³ Persons entering the United States without documentation or with false identification were subject to immediate detention and could be deported. If asylum was requested, a screening process determined the credibility of their claim and whether the full asylum process should be initiated. Nor has the act been without its critics. With critics pointing to the policy of interdiction and detainment, the system has been accused of mistreating those it is meant to protect.

METHODS, MEASURES, AND TOOLS: COUNTING REFUGEES AND IDPs

While receiving countries such as the United States will know the number of refugees that enter the country in any given year, counting the displaced population is an inexact science, and one that needs to be refined.¹ The UNHCR and the US Committee for Refugees and Immigrants (USCRI) figures illustrate this problem, with the UNHCR estimating the refugee population at some 10.55 million, while the USCRI estimate is 14 million. The UNHCR, for instance, counts “persons of concern” or refugees, asylum seekers, returned refugees, internally displaced persons, and stateless persons.² It does not count the over four million Palestinian refugees who fall under the mandate of the United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA). On the other hand, the USCRI counts include individuals recognized as refugees as well as asylum seekers and others who have more general forms of protection.³

Estimating the size of the refugee and displaced populations is difficult for several reasons. First, not all countries apply the same definition of who a refugee is, even if

they have signed the 1951 Convention Relating to the Status of Refugees. In particular, many developed countries have made the asylum procedure increasingly complex, or individuals may apply for asylum in several countries to increase their chance of gaining entry. Either way, it is difficult to count the number of cases. Similarly, statistics are often hampered by the conditions and events generating flows, with differences in the quality and regularity of data. Further, refugees may not stop in designated camps, but may filter into the larger population. Counting internally displaced individuals can be even more complex, as the UNHCR and other aid organizations may have no or limited access to populations inside a country. Mobility or transience of this population increases the difficulty, particularly during war or conflict situations.

Yet demographic data and estimates of the size of the displaced population are relied upon by aid organizations to determine the amount and type of food, shelter, or other assistance needed. Detailed estimates of the age and sex distribution of the population would provide detailed information relating to the need, for example, for immunization or prenatal care.

Chapter Nine

Urbanization

Defining Urban and Urbanization

A Brief History of Urbanization

The Growth of Modern Cities

Implications of Urban Growth

Conclusion

Study Questions

Focus: Planning for Growth

Methods, Measures, and Tools: Defining “Urban” across Countries

ACCOMPANYING THE WORLD'S population growth has been an explosion in the size and number of urban areas. As of 2012, 51 percent of the world's population lived in urban areas. While the developing world lags the developed world in the proportion urbanized (46 percent to 75 percent, respectively, and only 28 percent urbanized in the least developed countries; see figure 9.1), the urban population in the developing world is expected to grow rapidly in the coming decades, with upward of 67 percent of the world's population living in urban areas by 2030.¹ In addition to the proportion of a population that lives in urban areas, we can also speak of the rate of urbanization, or how quickly urbanization is occurring. Based on data from 2012, the rate of urbanization in the developed world was just 0.81 percent, reflecting the already highly urbanized population and the relatively small share living in a rural area. In the developing world, the rate of urbanization was 2.65 percent. Placing urban growth in another perspective, the number of cities in the developing world with populations in excess of one million will jump from 345 in 2000 to 480 by 2015, with the growth of urban areas driven by natural increase,² net rural-to-urban migration, and urban reclassification as cities are redefined from smaller units. This chapter explores concepts of urbanization, including its definition, growth and change in urban centers, and how cities can plan for growth. The “Focus” section considers how urban growth can be planned for, and the “Methods, Measures, and Tools” section explores alternate definitions of urbanism.

DEFINING URBAN AND URBANIZATION

Simply speaking, we can define urban as any place that is nonrural, while urbanization is the process that transforms a population from rural to urban. In essence, urbanization represents a fundamental reorganization of human society, moving it away from a rural, agrarian-based society to one based around nonagricultural activities. While this definition of urban is a somewhat facile and fuzzy one, it implies the spatial concentration of a population that is organized around nonagricultural production. What we are really speaking of, however, are places where the population size exceeds some defined threshold or density (see this chapter's "Methods, Measures, and Tools" discussion of how urban areas are defined). More specifically, we can think of urbanization as a form of social and political organization. Definitions of what constitutes urban typically also include the notion that urban areas are centers of technological change and innovation and have a spatial concentration of power and economic activity.

A BRIEF HISTORY OF URBANIZATION

Although cities have now existed for thousands of years, the form, function, and characteristics of early cities differ dramatically from our modern cities. The following provides a brief discussion of the evolution of cities.

Early Cities through the Middle Ages

We can trace urbanization back to the emergence of early settlements associated with agriculture. While far from urban as we would define it (and perhaps better defined as "protourban"), early urbanization dates from 3500–3000 BC in the so-called Fertile Crescent of modern-day Iraq and Iran and the valleys of the Tigris and Euphrates rivers, where food surpluses and production allowed settlement in villages and increased population densities. By 2500 BC, cities had appeared in the Indus Valley and China (approximately 1800 BC). By modern standards, these early cities were relatively small, both numerically and proportionately. Ancient Rome, for instance, has been estimated to be home to about 500,000, but other cities, such as Athens, would most likely have been much smaller. In both cases, the majority of people likely lived as subsistence farmers in the countryside.

While a combination of events and processes likely generated city growth in ancient societies, three broad explanations for the emergence of these early urban areas have been put forward. First, *surplus theory* argues that cities arose

after agricultural surpluses appeared. Locations that allowed agricultural production and irrigation—such as the Indus Valley or the Fertile Crescent—contributed to agricultural surpluses, which in turn freed labor from the land and allowed it to specialize in other tasks, including governance, manufacturing, or religion. These nonagricultural workers grouped together, forming the first cities. Second, *the city as a public good* suggests that urban growth is the outcome of religion or some other government service, such as security, that resulted in people grouping together. Many cities in the ancient world were organized in such a way to express the role of a god (or gods) and to project the image of a controlling religion on daily life. Similarly, cities could develop for security or military purposes, where the security of a population becomes a public good provided by the government. In essence, therefore, cities evolved as fortresses and refuges. Third, *the city as center for exchange and trade* defines the emergence of cities as centers of trade. In this case, cities developed first, with rural development occurring later as a consequence of city growth and to feed the city population. Regardless of the actual origin, early cities likely would have relied upon in-migration to sustain their population, as deaths likely exceeded births. They also relied on a large population living outside of the city to feed the city's population and to provide residents with goods. Many of the early cities collapsed due to wars, disease, or the collapse of empires, with their populations returning to their rural roots.

The Medieval City

Early in the medieval period, cities and towns were nearly nonexistent. Instead, early medieval Europe was mainly composed of feudal kingdoms, although a few small towns existed as university centers or served defensive or administrative needs. The majority of the population lived in rural areas and engaged in subsistence agricultural production, and cities grew slowly. Emergent trading of food and other basic commodities established towns as merchant capitalist centers, although the proportion of the total urbanized population remained small, as did the towns themselves. Between the fifteenth and seventeenth centuries, merchant capitalism grew and transformed the basic function of cities to one of commerce. Urban development was further spurred by the scientific revolution and the beginnings of colonial exploration, which exploited colonial possessions and transferred riches to European centers, enabling cities that controlled trade to grow the fastest. European exploration and colonization of new lands, including Africa and the Americas, cemented the role of cities as places of commerce, trade, and political power. Ultimately, European colonialism would give rise to further urbanization in the world's peripheral regions, transferring Europe's urban patterns around the globe. These new cities were either associated with existing settlements, such as Delhi and Mexico City, or

in new locations that served the needs of the colonial powers for administration or defensive positions. Such cities included Mumbai, Hong Kong, and Nairobi.

The Industrial Revolution and the Modern Era

Despite the growth of merchant capitalism, cities were still small. For example, the share of England's population that lived in London is thought to have increased by only eight percentage points (from 2 to 10 percent) between 1600 and 1800, yet London was the largest city in Europe in 1800, with a population of just slightly less than one million.³ It was only with the Industrial Revolution and the growth of the British Empire that London experienced rapid population growth. Other estimates suggest that as recently as 1800, less than 5 percent of the world's population lived in urban areas. This would change quickly as the Industrial Revolution came to dominate and drive settlement patterns, first in Europe and then throughout the world. As economies slowly transformed, with increasing production inside the city, cities started to dominate their hinterlands, strengthening their economic and political position.

Starting in the United Kingdom in the late 1700s, the Industrial Revolution had tremendous implications for human settlement patterns, the outcome of critical changes in methods of production, the reduction of the labor force required for agriculture through mechanization, the implementation of industrial methods, and the expansion of trade. With the Industrial Revolution, agricultural production was increasingly mechanized, meaning that fewer people were required to work the land. Instead, employment opportunities in manufacturing, which were typically located in urban areas, led to the emergence of the first modern cities in England. Industry, and the Industrial Revolution, was largely dependent on cities for transport, labor, and infrastructure, and new opportunities and wages drew migrants into cities. Even with changing production and industrialization, however, cities continued to grow at a relatively slow rate. The majority of the population continued to live in rural areas, and mortality in the new cities remained high, meaning cities were not yet able to sustain their growth through natural increase.

As industrialization spread outward from the United Kingdom, so did the concept of cities. But it was not until the nineteenth century that modern urbanization really took off. Increasing industrialization created demand for labor in urban areas, and declining mortality rates allowed populations to grow quickly. Even in the United States, the process of urbanization was slow until 1820, when just 7 percent of the American population lived in urban areas, before accelerating through the rest of the nineteenth century. Rates of urbanization slowed again during the Depression of the 1930s and World War II before increasing in the 1950s and onward. Worldwide, cities continued to grow as they cemented their economic base as centers of commerce and trade,

enabled by a large supply of labor for growing manufacturing and production. At the same time that their economic power grew, so did their political power, enabling control over larger populations and areas.

The economic and political roles of cities continue today, but in different ways. Early on, cities provided jobs in the new manufacturing industries, and laborers who were no longer needed in rural areas took on these roles. The industrial base of cities in the United Kingdom, including Glasgow, Manchester, Birmingham, and Sheffield, grew as industry required more and more workers. In large part, the concentration of both industry and workers created efficiencies of scale, reducing costs and increasing profits for manufacturing, and the large pool of labor in cities made it easy for employers to find workers.

In today's postindustrial and globalized world, the role and function of cities continues to change and evolve, while they remain centers and magnets for population settlement. In the developing world, cities combine both industrialization and commercial activities. In the developed world, most cities have lost their traditional industrial base and have transitioned to service economies, providing diverse employment opportunities in banking and finance, health care, and the knowledge economy. Increasingly, these cities are also seen as centers of culture and arts and home to the so-called creative class,⁴ which has become a rallying point for city growth and promotion. In both the developed and developing world, cities offer consumption and social opportunities that are not available elsewhere, while providing economies of scale and agglomeration economies⁵ that support their continued economic development and attract immigrants. Cities also offer agglomeration economies, resulting from the geographic concentration of economic activities in general or specific industrial economies. These benefits are facilitated by such things as the transfer of knowledge across industries, the sharing of public goods and infrastructure, better labor matching between workers and employees, diversified employment opportunities, and the development of related suppliers and buyers. In short, cities continue to attract and retain people because of their "bright lights."

THE GROWTH OF MODERN CITIES

Modern cities have three main growth mechanisms: natural increase (the excess of births over deaths), net in-migration, and international migration. Throughout much of the history of urban areas, urban populations experienced higher mortality than their rural counterparts, with dense populations and limited sanitation facilitating the spread of diseases such as cholera or the plague, while the excess labor in rural areas meant that cities relied upon in-migration to sustain their population. More recently, death rates have been lower in cities

than in rural areas, owing to the availability of clean water, sanitation, and health care provision. Consequently, urban growth has been fueled by immigration and large natural increases among the urban population, echoing the demographic transition theory, particularly in the developing world, where birth rates remain high.

Like today, in-migrants were drawn to early cities for jobs. As early as 1889, Ravenstein noticed movement out of rural areas and into cities (see also chapters 6 and 7).⁶ Movement “up the urban hierarchy” has therefore promoted city growth. Writing in 1885 in regard to the United Kingdom, Ravenstein commented that:

the great body of our migrants only proceed a short distance. . . . It is the natural outcome of this movement of migration that . . . [t]he inhabitants of the country immediately surrounding a town of rapid growth, flock into it; the gaps thus left in the rural population are filled up by migrants from more remote districts, until the attractive force of one of our rapidly growing cities makes its influence felt, step by step, to the remote corner of the kingdom.⁷

In other words, movement was “stepwise” up the hierarchy into progressively larger centers, promoting the growth of the largest cities.

Zelinsky’s hypothesis of mobility transition⁸ updates much of Ravenstein’s theories of migration and adds new dimensions in line with more recent population mobility. From the perspective of urban growth and change, Zelinsky argues that internal migration patterns will shift according to a country’s economic development. Rural-to-urban migration will, for example, be associated with industrialization. Later, as economies and their urban systems develop, migration will shift to be dominated primarily by urban-to-urban migration, with movement up the hierarchy into larger urban centers. Ultimately, in most developed countries, migration will shift to movements down the urban hierarchy and into smaller urban areas or rural areas.

While seemingly exclusive events, there is also much overlap between natural increase, internal migration, and international migration in promoting urban growth. Likewise, immigration directly adds to the population count of some of the largest urban areas, such as New York, Chicago, or Los Angeles. In fact, many of the largest cities in the United States, including New York, Chicago, and Los Angeles, rely almost exclusively on immigration to sustain and grow their populations, as large parts of the population have migrated out of the city toward suburban or peri-urban locations. Immigrants, on the other hand, are attracted to urban areas. Moreover, the presence of ethnic enclaves and communities, particularly in main immigrant-receiving cities such as New York, Los Angeles, or London, reinforce this attraction while aiding the economic, social, and cultural integration of new arrivals. Likewise, domestic,

internal migration remains an important component of the growth or decline of urban areas. As already noted, historically higher mortality levels in cities meant that they relied upon movement from rural to urban areas to sustain their populations as excess labor moved to cities in search of employment.

The Current State of Urbanization

Perhaps the most significant moment in the history of urbanization occurred in 2008, when it was estimated that half of the world's population lived in urban areas. Considering that less than 30 percent lived in an urban area just fifty years earlier, the growth of the world's urban population in such a short period of time is impressive. Yet world regions differ greatly in their levels of urbanization, with the following discussion offering broad observations of the state of urbanization in the developed and developing world.

The Developed World

The developed world is essentially fully urbanized, with very low rates of urbanization (0.81 percent). If we were to apply Zelinsky's mobility transition theory, the United States and many other developed countries would have largely passed through it. Long gone are the days of frontier or rural-to-urban movement. Although the developed world is already highly urbanized, urban areas continue to transform and grow, characterized by three broad trends. First, consistent with Zelinsky's mobility hypothesis, *urban-to-urban migration* is the primary force, shifting the population between urban areas, rather than from rural to urban areas, meaning that migration between urban areas is the most significant source of population change.

Second, the 1970s revealed a very different pattern of population movement, with nonmetropolitan areas growing at the expense of metropolitan areas. In essence, the phenomenon of *counterurbanization*—or the decline in growth rates of some of the largest urban centers and increased growth rates of rural, nonmetropolitan areas—runs counter to decades of both rural-to-urban population movements and suburbanization. Shifting employment, amenities, and retirement contributed to this population movement, with counterurbanization first observed in the 1970s and again in the late 1990s. Observed in multiple developed countries, it led some to speculate that this was a new, postmodern dimension of the mobility transition.

Third, most developed countries experienced some degree of *decentralization*, or the movement of people and jobs away from central cities toward suburbs and peri-urban areas, or those areas at the urban-rural fringe. Attributed to numerous social, political, and economic factors, including racial tensions, better education and recreational facilities, improved highways (accessibility),

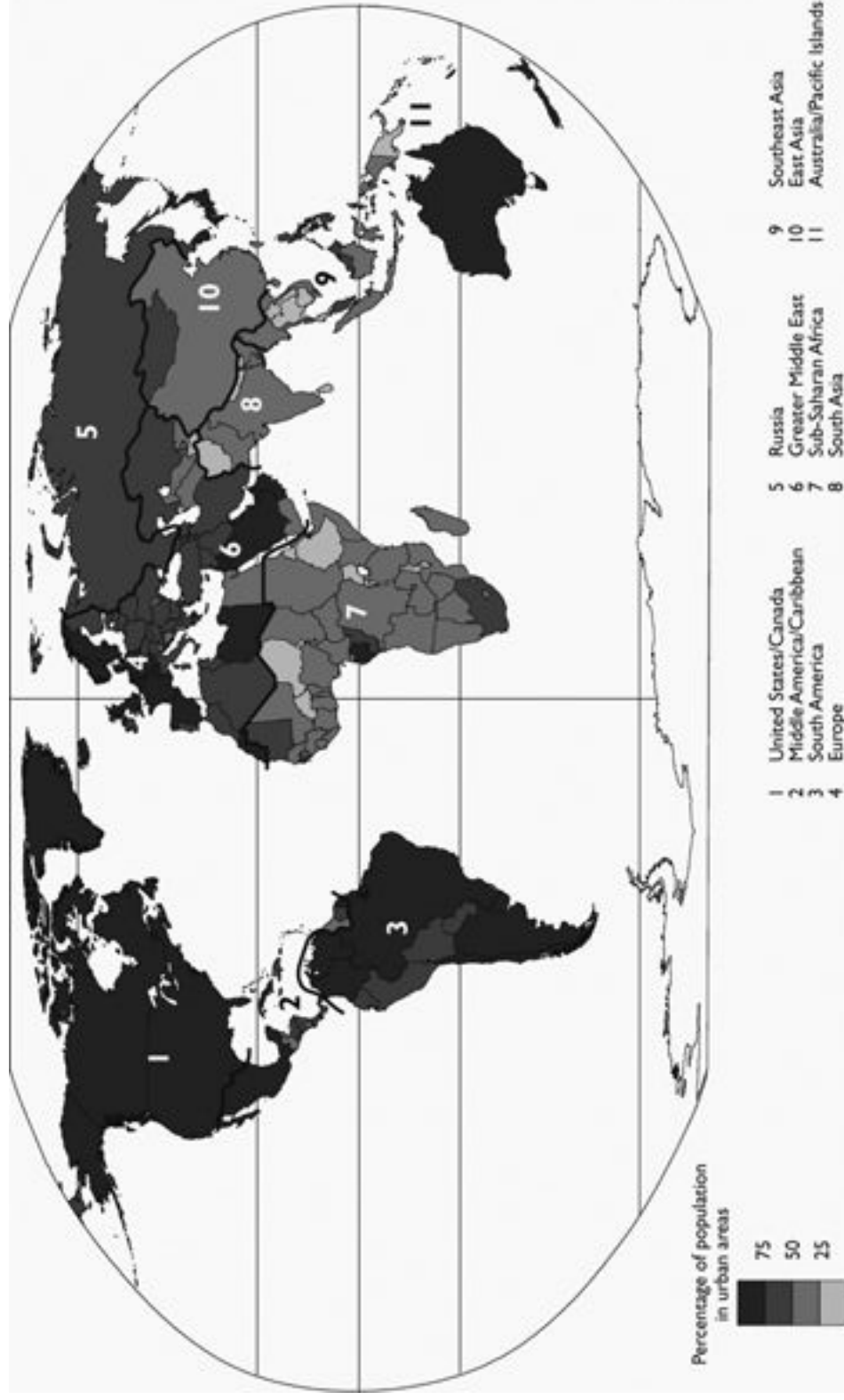


Figure 9.1 World Urbanization by Country, 2005

Source: Brunn et al., *Cities of the World* (2008), figure 1.3. Reproduced with permission.

and lower home costs, decentralization has made most cities less dense but more spread out. While low gas prices and long-distance commuting have enabled decentralization, the new reality of higher gas prices may alter location choices, with residential patterns returning to greater population densities and closer to employment locations.

The Developing World

While the proportion of the population living in urban areas in the developing world is much less than in the developed world, the process of urbanization is rapidly reshaping urban areas' appearance. As in the developed world, urbanization trends in the developing world can be summarized by four main points. First, urban areas in the developing world will see *continued rapid growth*. The large and rapidly growing populations of many developing countries mean that there is large potential for continued urban growth, both in terms of people moving into cities (in-migration) as well as natural growth (the excess of births over deaths) of cities.

Second, *population concentration* will continue, with the population of developing countries increasingly concentrated in large cities of one million or more residents. At the same time, megacities of ten million or more will become increasingly important and numerous as migrants are attracted to these large cities in search of employment and opportunities.

Third, the developing world will be home to a *diversity of urban areas*. That is, urbanization and urban change in the developing world defies broad generalizations. In more developed regions and in Latin America and the Caribbean, over 78 percent of the population is urban, whereas in Africa and Asia, less than 45 percent of the population is urban. India, for example, which has some of the world's largest cities, is still just 31 percent urbanized, and China's pace of urbanization is rapid as it moves toward a market economy. With approximately 30 percent of its population living in urban areas in 1985, China's urban growth has been spectacular. Although constrained for years by its Hukou system, which restricted internal migration in China (see chapter 10), China's rate of urbanization has skyrocketed, with 49 percent living in urban areas by 2012. Recognizing the urban demand, China has also moved to establish over two hundred new cities. Elsewhere in Asia, in countries including Bangladesh, India, and Pakistan, cities are faced with almost unparalleled challenges. In India, for example, the population is approximately 70 percent rural, yet by 2030 the urban population of India is expected to exceed 605 million (India is currently home to a population over one billion). Many cities in the least developed world lack investment, and countries are dominated by a large "primate" city, or a city that is disproportionately larger than other cities within the urban hierarchy, rather than a network of cities.

Fourth, characterized by poor infrastructure and faced with an influx of people from rural areas, urbanization in much of the developing world has led to unplanned settlements and squatter settlements, growing regional inequities, insufficient urban infrastructure, poor health, and the degradation of resources. Rapid urbanization has often meant that governments have not been able to provide adequate or basic health care or infrastructure such as clean water, and mortality rates are frequently far worse in poor urban as compared to rural areas.⁹ In one study in Bangladesh, for example, infant death rates varied from 95 to 152 per 1,000 in urban areas, higher than both middle-class urban areas (32 per 1,000) and rural Bangladesh.¹⁰ Continued in-migration from rural areas and increasing population density may push mortality and morbidity higher in urban areas.

Megapolitan Cities

Megapolitan cities reflect the growth or merging of different cities into one large city or network of cities, such that divisions between urban areas are seamless. In the United States, this is characterized by the Boston–New York–Philadelphia–Baltimore–Washington urban area (the so-called BosNYWash region). Other megapolitan areas include the Midwest’s Chicago–Gary–Milwaukee area, Southern California’s Los Angeles–San Diego area, and Northern California’s San Francisco–San Jose–Sacramento region.¹¹ As of 2003, megapolitan areas in the United States represented more than two-thirds of total US population—nearly 200 million people—but contained less than a fifth of the land area in the lower forty-eight states.¹² Although the term *megapolitan*, at least in the US case, does not fit with any urban definitions currently used by the US Census Bureau (see discussion in chapter 8’s “Methods, Measures, and Tools”), these megapolitan areas cover a vast but integrated area connected by transportation networks, commuting flows, and some shared history.

Beyond the geographic reality that these cities are proximate to each other, the megapolitan concept realizes that modern cities are better viewed not in isolation as centers of a restricted area only, but rather as parts of “city-systems,” as participants in urban networks revolving in widening orbits.¹³ Therefore, it is increasingly argued that the economic role of one city extends far beyond its metropolitan boundaries, to potentially influence world affairs. Few would argue, for example, that the New York region does not influence the world economy, given its core financial sector, a realization that was particularly dramatic in the financial meltdown and credit crisis of 2008.

Megacities

Despite the fact that over 51 percent of the world’s population lives in an urban area, most are living in small towns or villages, and just 37 percent reside in

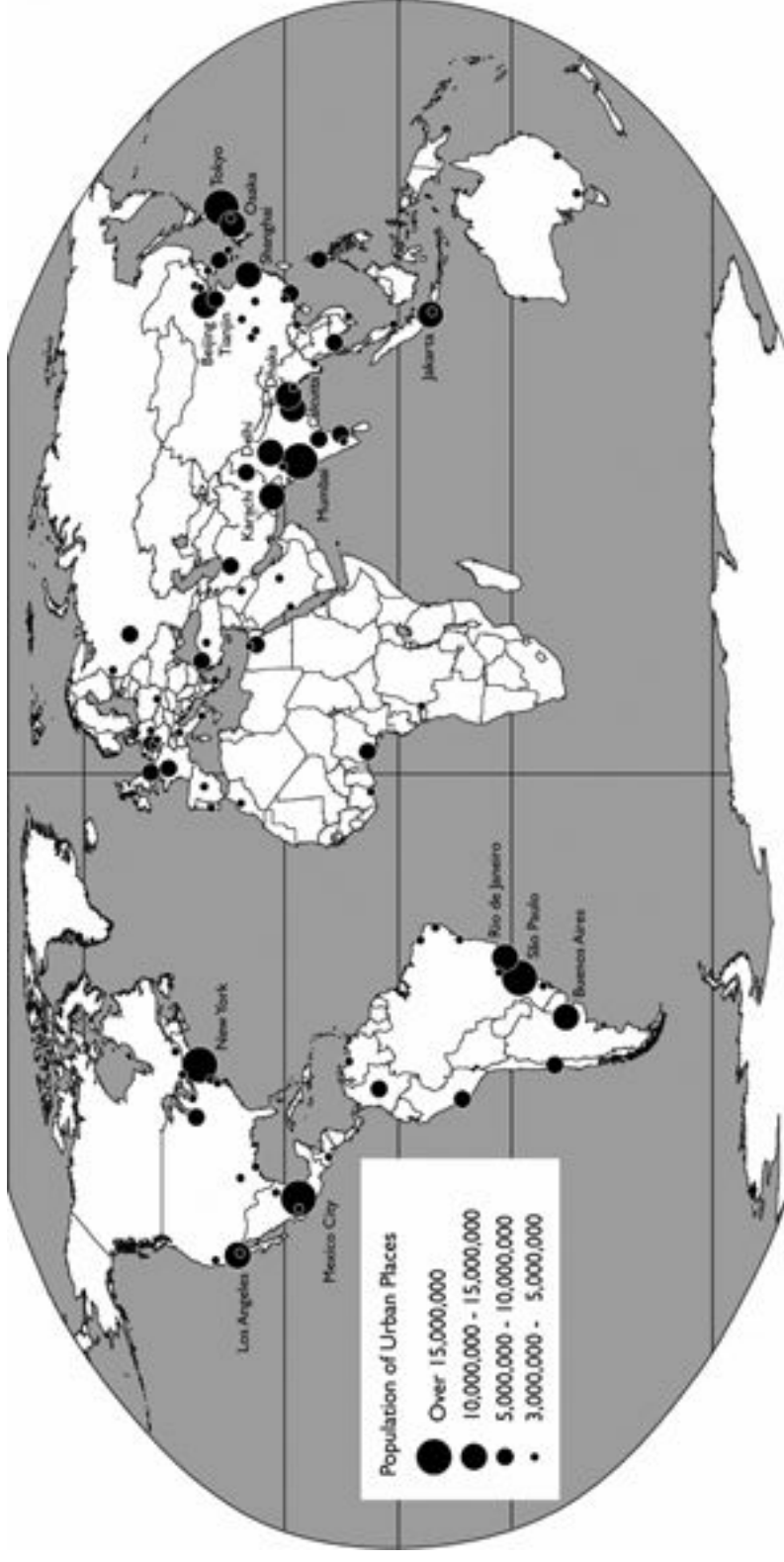


Figure 9.2 Major Cities of the World, 2005

Source: Brunn et al., *Cities of the World* (2008), figure 1.1. Reproduced with permission.

cities of at least one million people. Although home to a relatively small proportion of the world's population (8 percent), the number of *megacities*, or cities with populations in excess of ten million, has grown from eight in 1985 to twenty-one in 2011,¹⁴ with the number projected to grow to at least twenty-two by 2015. The largest cities in the world are growing rapidly in size, and increasingly, many are found in the developing world (table 9.1). Indeed, in 1950 the three largest cities were in developed countries, with New York being the largest city in the world with a population of about twelve million. London and Tokyo were close behind, and Paris, Moscow, and Chicago were also in the top ten. By 2010, both Tokyo (37.1 million) and New York–Newark (20.5 million) remain in the list of top ten cities, but the other top ten megacities are located in the developing world. Two of these ten-million-plus cities are in India: Delhi and Mumbai (see figure 9.2). The growth of these megacities is related to the same reasons and processes we saw with urbanization, including their economic attraction or the prospects of jobs and employment. Additionally, a rapidly expanding population base, driven by in-migration from rural areas and smaller settlements, along with higher rates of natural increase, ensures their growth.

While there is, as of yet, no apparent limit to the size of cities before they produce more negative externalities and costs than benefits, and we can point to the ability of cities such as New York, London, or Tokyo to function, these cities are in the developed world. The majority of the new megacities will be in the developing world, and it is unknown whether the cities themselves or their states will be able to provide sufficient infrastructure and employment opportunities for the burgeoning urban population. More likely, the new megacities

Table 9.1. The Ten Largest Urban Agglomerations, 1950 and 2025

1950		2025	
<i>Agglomeration</i>	<i>Population (millions)</i>	<i>Agglomeration</i>	<i>Population (millions)</i>
New York–Newark, USA	12.3	Tokyo, Japan	38.7
Tokyo, Japan	11.3	Delhi, India	32.9
London, UK	8.4	Shanghai, China	28.4
Shanghai, China	6.1	Mumbai, India	26.6
Paris, France	5.4	Mexico City, Mexico	24.6
Moscow, Russia	5.4	New York–Newark, USA	23.6
Buenos Aires, Argentina	5.1	Sao Paulo, Brazil	23.2
Chicago, USA	4.9	Dhaka, Bangladesh	22.9
Kolkata, India	4.5	Beijing, China	22.6
Beijing, China	4.3	Karachi, Pakistan	20.2

Source: *United Nations World Urbanization Prospects: The 2011 Revision*.

will be characterized by high levels of poverty, poor living conditions, inequality, poor health, and few employment opportunities.

IMPLICATIONS OF URBAN GROWTH

In the developing world, urban migrants are typically from rural areas, driven by the large gap in the standard of living along with poor rural conditions caused by environmental degradation and a skewed distribution of resources favoring the elite. With rural-to-urban migration fueling much of the growth of urban areas in the developing world, governments may not be able to cope with rapid population growth and the provision of services, including health care and education,¹⁵ irrespective of the size of the city. Conflict is a possible outcome. For example, with poverty remaining one of the most pressing issues in urban areas, migration could breed economic frustration, given insufficient employment opportunities and unfulfilled expectations. Perhaps as many as 42 percent (if not more) of the world's urban population can currently be classified as living below the poverty level, with urban poverty increasing in much of the developing world. In 1970, for example, urban areas contained just 36 percent of Latin America's poor. By 1990, the proportion had jumped to 60 percent. By 2025, the World Bank estimates that the majority of the world's population will be living in poverty.¹⁶ Migrants may also have problems adjusting to urban areas. Seeking entry into groups for support and friendship in their new surroundings, they could easily be recruited into groups that espouse violence. Since many of the migrants are young men, generating a much larger demand for education and jobs, they are easily mobilized for political ends.

CONCLUSION

With the urban population expected to grow dramatically in the coming decades, the implications associated with the growth of large urban areas are enormous. Problems, including poverty, pollution, crime, class tensions, and transportation, will be on a scale never before seen. The situation is frequently worse in cities that have been strained by rapid population growth, little investment, and government ineptitude.¹⁷ Infrastructure systems, such as water, roads, or electricity, have decayed as governments have been unable to keep up with the demand posed by continued in-migration from rural areas and smaller centers. The magnitude of urban growth in the developing world has generated an intense and ongoing debate about whether the developing world can accommodate the anticipated growth of cities and whether there is a potential for conflict in areas with few resources and slow economic growth.¹⁸ Optimists

claim good governance, proper management, and investment can overcome population constraints, although these are often missing in the developing world. Others are more concerned. Higher mortality, low standards of living, the poor living environment, depletion of resources, and increasing poverty and inequality are symptomatic of urban problems, all of which could weaken the state.

STUDY QUESTIONS

1. Selecting one megacity from the developed world and one megacity from the developing world, graph the population of the two cities over time. What trends are visible?
2. The City of Detroit declared bankruptcy in July 2013. Document its population change since 1950. What are the implications for a large, metropolitan city in declaring bankruptcy?

FOCUS: PLANNING FOR GROWTH

The growth of urban areas has often meant the construction of new infrastructure on the peripheries of cities (urban sprawl). While expensive in its own way, with sprawl straining the resources of cities and taxpayers alike, this has also meant the abandonment of older, inner-city areas. Sprawl, for instance, increases the need to drive while decreasing open space. Sprawl also means that tax money subsidizes new developments through the provision of water and sewer lines, schools, and police and fire protection, costs that are not fully offset by the taxes paid by the new users. Consequently, the continued growth of urban areas, and particularly large urban areas or megapolitan areas in the developed world, has increased the recognition of the need for planning to deal with the adverse effects of population growth, including urban sprawl, traffic gridlock, and the loss of agricultural areas.

Recent discussions of how best to plan urban growth in North America are frequently presented as “smart growth” policies.¹ With the intention of creating sustainable communities, smart growth aims to preserve open space while allowing for population growth through better transportation and increased population density by making efficient use of land and resources. Smart growth policies include ten planning principles, such as increased walkability, mixed-income communities, mixed land uses (i.e., residential and commercial), and compact neighborhoods. Emphasizing infill development and increased population, smart growth is, in part, meant to recreate the self-contained neighborhood of pre-World War II towns and cities, where the downtown, housing, schools, and employment are within walking distance. But it is also far more than just a modern spin on our image of small-town life, recognizing

that community building happens on different scales. At the regional scale, smart growth addresses the issues of urban expansion, public transportation, farmland preservation, and environmental protection. At the local, neighborhood scale, smart growth addresses the issues of livability, community character, transportation, and housing choices.

In short, smart growth aims to reduce urban sprawl, manage growth, create livable communities, promote economic growth, and protect the environment. While there can be little argument over the need for “smart growth” (as opposed to the potential opposite), there is clearly a range of policy options and ultimately outcomes that result from these guiding principles. That is, developers, planners, politicians, and government agencies are able to interpret the principles as they see fit or select only components of the smart growth agenda. Nonetheless, the principles have also been widely implemented and have gained increased attention, with the following discussion outlining two examples.

URBAN GROWTH BOUNDARIES: PORTLAND, OREGON

Urban growth boundaries (UGBs) represent one way of delimiting where an urban area stops and a rural area starts. The primary reason for UGBs is to reduce sprawl and to conserve farmland and open space, both of which are achieved by limiting development to a specific region. Cities that have adopted UGBs include Seattle, Washington; Boulder, Colorado; Lancaster County, Pennsylvania; and Minneapolis–St. Paul, Minnesota. Portland, Oregon, is perhaps the best-known example and is frequently cited for its success in controlling urban sprawl through the implementation of UGBs in the

early 1970s through the use of a mix of redevelopment, transportation, and land-use policies. As early as 1973,² the Oregon legislature adopted land-use planning laws, requiring each city and county in the state to have a long-range plan addressing population growth, with perhaps the most significant component being the identification of UGBs. While boundaries were not meant to be static, their expansion was based on need. Planning documents also called for the protection of natural resources.

Like the rest of the state, the city of Portland needed to identify its urban growth boundary, a process that involved Washington, Multnomah, and Clackamas Counties, twenty-four cities, and more than sixty special service districts. At the same time, it needed to provide for future population and industrial growth. Once defined, the boundary protected rural areas from population sprawl. Inside the urban growth boundary, land is used for housing, business, roads, parks, and other urban needs or systems. Urban development within the growth boundary has effectively resulted in the more efficient use of urban land through housing infill (i.e., developing vacant lots), increased density (i.e., increasing the housing density on a given lot), redevelopment of the downtown core, and increased public transportation.

GREENBELTS: SOUTHERN ONTARIO'S GREATER GOLDEN HORSESHOE AREA

With a population expected to exceed twelve million by 2031³ and as an economically important region, the Ontario provincial government recognized the need for “big picture” planning for the Greater Golden Horseshoe (GGH). The GGH represents an area that includes the Toronto metropolitan area, stretching west through

Hamilton to Niagara Falls, east to include Oshawa, and north toward the city of Barrie. The need for planning was recognized in the related Greenbelt Plan and Places to Grow legislative pieces (Government of Ontario, 2005, 2006).⁴

The greenbelt legislation created an agriculturally protected area around Toronto, while providing for a diverse range of economic and social activities associated with rural communities, agriculture, tourism, recreation, and resource uses. The greenbelt also protected environmentally sensitive areas in the province. Concurrently, Places to Grow provided a strategy to “maximize benefits of growth,” allowing communities to grow in a “complete” way by offering a mix of places to live, work, shop, and play. The plans identify where urbanization should and should *not* occur by directing growth to existing urban areas through intensification and by providing permanent protection to portions of the agricultural land encircling Toronto. Development was redirected from the urban edge to existing urban areas, with new suburbs required to be built at densities that could support and create complete “live/work” areas. Finally, through focusing of growth within existing urban areas, the legislation facilitated increased use of public transit over the private car.

IMPLICATIONS

While the need for planning to overcome issues of population growth and urban sprawl is straightforward, the reality of implementation is far different. Not surprisingly, smart growth seems to mean different things to different people, meaning there is often disagreement between various interest groups as to what it comprises. On the one hand, public agencies, including numerous municipal jurisdictions and local

government agencies such as education districts, park and recreation districts, water districts, and other agencies, each represent their own interests. On the other hand, private groups, including land developers, construction, and the real estate industry, represent another set of needs and issues, meaning that bringing these diverse groups together and reaching a consensus on planning issues is difficult and time consuming.

Both the Portland, Oregon, and Ontario examples include elements of smart growth policies. Regardless of whether smart growth policies, defined urban growth boundaries, or the provision of greenbelt space or other planning tools are used, there are both positive and negative implications. Urban growth boundaries and greenbelt policies have, for example, increased population density (or are designed to increase density) and created mixed-use or mixed-income housing, arguably creating more friendly and vibrant communities. This is perhaps most apparent in city centers, where older, rundown centers have been revitalized as locations for housing, shopping, and business. Reductions in automobile dependence, pollution, and traffic levels have also been attributed to their introduction, particularly when public transit is promoted as a viable alternative.

On the other hand, the success of these policies in curbing urban sprawl is difficult to measure because it is not known what a city would have looked like without it—how would the city of Portland of today differ if UGBs had not been created? In many cases, development simply “leapfrogs” the boundary or greenbelt, increasing development pressure on communities outside of the greenbelt or UGB and creating urban sprawl beyond the boundaries. In Ontario, developers were already looking at locations

beyond the greenbelt for new housing development even before the greenbelt legislation had been passed. In Portland, research concludes that the UGB has not slowed the pace of suburbanization or reduced automobile use.⁵ In addition, significant urban development has occurred in neighboring counties, suggesting that Portland's UGB has simply diverted growth outside of Portland itself. Detractors have also

voiced concern with the increased population density while noting the inflation of housing prices inside the UGB, given that land is essentially rationed and the housing supply is limited as population densities increase. Low-income households may be doubly disadvantaged, resulting in increased rental costs or increased commuting costs as they are priced out of the local housing market.⁶

METHODS, MEASURES, AND TOOLS: DEFINING "URBAN" ACROSS COUNTRIES

While the concept of an urban area is relatively straightforward, its definition is not, with different governments using different definitions of what constitutes "urban."¹ Definitions range from population centers of one hundred or more dwellings, to only the population living in national and provincial capitals, to statistical definitions based on minimum population thresholds or population densities. In Australia, urban areas are defined as population clusters of one thousand or more people and with a density of two hundred or more persons per square kilometer. In Italy, urban areas are defined as having populations in excess of ten thousand, while other European countries define urbanized areas on the basis of urban-type land use. Statistics Canada defines urban areas (UA) as population concentrations of one thousand people with a density of at least four hundred persons per square kilometer based on past census counts. All territory outside of a UA is considered rural. Statistics Canada also distinguishes urban areas based on population size. For example, census areas (CAs) are urban areas where the population count of the urban

core is at least ten thousand. In addition, census metropolitan areas (CMAs) are those urban areas consisting of one or more adjacent municipalities situated around a major urban core. A CMA must have a total population of at least one hundred thousand, of which fifty thousand or more live in the urban core, and CMAs include cities such as Toronto, Vancouver, and Calgary. At the time of the 2011 census, Statistics Canada recognized thirty-three CMAs. In less developed countries, various combinations of land use and population density are applied, as well as requirements that a majority of the population is not engaged in agriculture or fishing.

For the 2000 census, the US Census Bureau defined an urban area as the population located within an urbanized area (UA) or an urban cluster (UC), where UA and UC boundaries are defined to encompass densely settled territory, which consists of:

- core census block groups or blocks that have a population density of at least one thousand people per square mile and

- surrounding census blocks that have an overall density of at least five hundred people per square mile.²

It further distinguished urban areas based on population size between metropolitan and micropolitan statistical areas (metro and micro areas), which are geographic entities used for statistical reporting. A metro area contains a core urban area of fifty thousand or more population, and a micro area contains an urban core of at least ten thousand (but less than fifty thousand). Each metro or micro area consists of one or more counties and includes the counties containing the core urban area as well as any adjacent counties that have a high degree of social and economic integration (as measured by commuting to work) with the urban core.

Beyond distinctions of urban and rural, the US Census Bureau recognizes that American development patterns vary by spatial scale and has thus created a scale of cities. Defined by the Office of Management and Budget (OMB), the term *core-based statistical area* (CBSA) refers to both

metropolitan and micropolitan statistical areas. Metropolitan statistical areas must have at least one urbanized area of fifty thousand or more inhabitants. Micropolitan areas must have at least one urban cluster with a population between ten thousand and fifty thousand. In both cases, the largest city is designated the “principal city.”

The various ways to define an urban area raises two important points. First, the various definitions make comparisons of urbanization levels across countries difficult. Consequently, the Population Reference Bureau uses the percentage of the total population living in areas defined as urban by that country in its annual *World Population Data Sheet* in order to provide comparability. Second, the different urban definitions highlight the fact that urbanization is a relative phenomenon: in countries that are sparsely settled or have small populations, the threshold for defining an urban area is typically smaller, while densely populated countries use alternate definitions.

Chapter Ten

Population Policies

Immigration Policy

Internal Migration

Fertility Policies

Economic Policy as Population Policies

*The Role of the International Community: Conflicting
Messages*

Conclusion

Study Questions

Focus: Population Planning in Selected Regions

***Methods, Measures, and Tools: Pass or Fail? Evaluating
Population Policies***

GOVERNMENTS AROUND THE WORLD have expressed an interest in (and oftentimes need for) controlling the size, distribution, and composition of their populations. Some governments may approach population policy from the need of reducing fertility levels, while others will wish to increase fertility levels. Other countries attempt to control the quantity and quality of immigrants entering the country, or control the “quality” of immigrants by legislating selective immigration policies. Most developed countries already employ various population policies, albeit in various forms and to various degrees of success. For governments that wish to control populations,¹ policy levers can be used to target death rates, fertility rates, internal migration, and immigration. A fifth dimension—economic policy—may also have implications for population structure and size. Immigration, internal migration, and fertility policies offer the most direct levers for governments to pursue population policy. Rather than death policies, governments focus instead on health and health care provision and healthy aging, with the intent of enabling older individuals to lead more active and productive lives for a longer period of time before requiring care or institutionalization. As a general rule, life expectancies in the developed world have increased over the decades, reflecting these policies.

This chapter explores population policy options, stressing both their successes and failures. In particular, it looks at fertility policy, immigration policy, and internal migration policy. The “Focus” section highlights China’s controversial one-child policy, and the “Methods, Measures, and Tools” section evaluates the success of population policies.

IMMIGRATION POLICY

Immigration can produce significant long-term population growth even in countries where fertility rates are equal to or have dropped below replacement level.² In the United States, immigration accounted for one third of the nation’s population growth between 1990 and 2010, a proportion that is expected to increase in the coming years.³ However, immigration plays a much larger role in population growth when the children of immigrants are accounted for, particularly in the United States, where the large Hispanic immigrant population tends to have fertility rates significantly higher than native-born Americans. Indeed, projections indicate that immigrants and their children will account for 87 percent of the nation’s population growth between 2005 and 2050, changing the ethnic and racial composition of the country.⁴ In Canada, immigration already accounts for over 50 percent of the nation’s population growth, and it is predicted to be the sole source of population growth by midcentury.⁵ However, immigrant fertility rates in Canada are more or less equivalent to those of the broader population as compared to the United States, meaning that Canada (and other developed countries that receive large numbers of immigrants) does not reap as much of a second generation as the United States does.

Given that fertility levels in the developed world are expected to remain low, and that there is also relatively little change expected in terms of mortality rates, immigration becomes the central component of population change, and immigration policy is the *de facto* population policy in Canada, the United States, and many other developed countries. Of the potential policy options, immigration policy provides an almost immediate and direct impact on a population through such actions as defining the number of immigrants allowed entrance in any given year, the source countries for immigrants, and immigrants’ qualifications.

In particular, immigration has a large impact on the size of the working labor force, an important fact for economists and demographers alike as they look to who will pay for social-welfare programs in the future as the working population declines. In the United States, immigration, and high fertility levels among immigrants, is a significant contributor of population growth. Canada has also used immigration to directly increase its population, with immigration accounting for approximately 70 percent of labor force growth. Canadian policy has

targeted “economic” or “skilled” immigrants over the past decades, who bring with them specific tools needed within the Canadian economy. In Europe, the region has not been seen in the past as a major destination for immigrants (although short-term work programs are the exception), and current immigration numbers are insufficient to reverse population decline, while further increases in immigration levels may result in ethnic confrontation.⁶ Governments choosing to increase immigration levels do so with greater risk, and several countries, including France and Germany, have witnessed anti-immigrant demonstrations in recent years. Most European countries have imposed strict immigration policies, and some have actively encouraged their foreign-born populations to leave.

Although immigration can be used to support a nation’s demographic and economic growth, it can be a very poor tool for defining population policy. Governments may, for example, change immigration targets in response to various needs, whether immigration is restricted owing to national security issues, such as those visible as a result of the terrorist attacks in New York City in September 2001. Likewise, governments may move to restrict immigration flows in response to economic downturns. European governments have, for example, expressed greater concerns over immigration in the face of declining economics and the lingering recession along with the opportunities for individuals from poorer member countries to have unrestricted access to labor markets across Europe.⁷ In response, some governments have imposed new measures restricting immigration and access to labor markets including movement of labor between European Union member states, such as the introduction of quotas for work permits by Switzerland to limit the number of migrants, the reintroduction of border controls by Denmark (a requirement that was dropped among members of the EU), and a requirement by Spain for Romanian immigrants to have work contracts before entry, all of which are counter to the notion of free movement of labor within the EU. In short, immigration policy is a tool that governments can use to easily restrict the movement of labor across space.

Immigration policies have also exposed the difference between desired and actual outcomes—the so-called immigration gap that was presented in chapter 7. The United States is faced with a large gap between the realities of controlling immigration and politics, caught between the desire by employers for cheap labor and US-born workers whose livelihoods are threatened. These contradictions inherent in US policy can be observed in the Bracero Program (1942–1964) of contract labor importation, which legitimized migrations between Mexico and the United States. In legitimizing immigration, it created long-term connections between the two countries and essentially condoned illegal immigration. The 1986 Immigration Reform and Control Act (IRCA) further

exemplified these contradictions. Meant to solve the problem of illegal immigration, employer sanctions were put in place for those who hired undocumented workers. At the same time, IRCA immediately provided exemptions for California's agricultural growers to continue to use undocumented workers under the Special Agricultural Workers (SAW) program. Immigration control was further undermined when IRCA failed to require employers to check the veracity of legal documents. IRCA also provided amnesty for illegal aliens, allowing them to apply for legal status if they had been resident in the United States prior to January 1, 1982. While nearly three million immigrants were legalized, the amnesty program did not meet its goal of reducing illegal immigration over the long run. Instead, apprehensions of illegals entering the country skyrocketed within three years, and it was clear that others were rushing to fill the need for illegal labor. Subsequent studies demonstrated that the law did not provide a substantial deterrent to illegal immigration.⁸

Some two decades after IRCA, the US government continues to debate immigration reform.⁹ The Fair and Secure Immigration Reform proposal, tabled in January 2004 by former president Bush, proposed turning illegal workers into guest workers, with incentives to return home at the end of the employment certificate. A corresponding Democratic bill would have allowed illegal workers to become legal immigrants, while the Agricultural Job Opportunity, Benefits, and Security Act (AgJOBS) bill debated in congress in spring 2005 would have applied only to agricultural workers, allowing workers meeting specific criteria to apply for temporary legal status. Early discussion around President Obama's push for immigration reform has also included pathways to legalize illegal immigrants while restricting the number of temporary workers to what is required by the US economy, measures that are endorsed by major labor unions.¹⁰ The common denominators linking Obama's proposals with earlier reform attempts are the creation of additional networks that link immigrants within the US and Mexican labor markets and additional illegal entry. Moreover, attempts to reform immigration policy have failed.

INTERNAL MIGRATION

In most countries in the developed world, internal population mobility is unconstrained. Indeed, the United States, Australia, Canada, and other countries are liberal democracies that permit and often encourage the free movement of their populations, with individuals free to migrate in search of economic advantage or other personal choices and settle in the location of their choice. The exceptions have included the forced relocation of First Nations groups onto nontraditional reserves as the country expanded and European

settlers expropriated the land for their own use or the relocation of communities faced with natural disaster. In some developing countries, however, internal migration is either enforced or restricted through government policies. Indonesia's transmigration policy, for example, was a long-standing government program that relocated Indonesians from the island of Java to less populated areas by offering economic and land incentives. But the forced relocation also sparked violent confrontations between Christians and Muslims in 2000 and 2001, two groups that had long-term settlement patterns that were largely exclusive of each other but that were forced together through government relocation policies.¹¹ On the other hand, China followed a path that could be described as restrained urbanization. Fearing an influx of rural peasants to its largest cities, China vigorously attempted to control internal migration through the Hukou system, which conferred "citizenship" to the locality of the mother. Citizenship conferred specific local benefits—access to health care, free public education, legal housing, and better access to jobs—that noncitizens were not eligible for. Under the system, individuals were broadly categorized as rural or urban workers. A worker seeking to move from the country to urban areas to take up nonagricultural work would have to apply through the relevant bureaucracies, and the number of workers allowed to migrate was tightly controlled.

Persons could change their citizenship one of three ways. First, permanent relocations were sanctioned through legal citizenship changes. Between the early 1980s and late 1990s, China authorized some eighteen million citizenship changes a year, most of which involved rural-to-urban relocations. Second, individuals could temporarily relocate by holding a "visa," although it did not confer citizenship benefits in the temporary location. Third, individuals could migrate illegally but were then unable to access local services such as health care and were subject to deportation back to their region of citizenship. Despite the risks and the lack of access to services, it is estimated that tens of thousands illegally migrated to China's urban areas in search of jobs.

Although restrictions on internal migration limited the growth of China's largest cities,¹² they did not succeed at curbing rural-to-urban migration. Instead, corruption and economic necessity drove "illegal" internal migration, despite a degree of social control that is unknown in most societies. Moreover, migrants were not necessarily the poorest of urban residents, and policies that restrict rural-to-urban migration are typically ineffective and hurt the poor.¹³ Restraints imposed on population movement have also contributed to increasing social and economic inequality and the development of urban slums in China's cities, with migrants often living in dorms or urban villages characterized by poor living conditions. Since the late 1990s, the Hukou system has slowly been relaxed as China has reformed its economy, encouraging rural-to-urban migration and ensuring legal employment for migrants. Even still, access

to some services is restricted and based on citizenship, with ongoing concerns that the system has tempered China's economic growth.

FERTILITY POLICIES

Fertility Reduction: Antinatalist Policies

As we have already seen, fertility levels vary dramatically across the globe, ranging from very low fertility in much of the developed world and in particular Europe to very high fertility in portions of the developing world, including sub-Saharan Africa. While these differences partially reflect a developed world/developing world divide, this is only part of the picture. Many countries in the developing world already have comparatively low fertility rates. While China's low fertility rate (1.5) has been artificially engineered through state control (see "Focus" section), fertility rates in other countries, such as South Korea or Taiwan, have declined largely on their own and beyond the scope of government intervention.

Fertility choices are generally perceived to be a personal, private affair. Indeed, the United Nations has affirmed the right of couples to determine the number and spacing of children. Despite this, most governments are, at least indirectly, interested in fertility rates, as these are harbingers of long-term population growth or decline, and many countries attempt to influence fertility decisions. For example, in countries where governments deem fertility too high, such as India, programs encourage lower fertility rates through family-planning programs that educate men and women on the benefits of smaller families and increase accessibility to and use of contraceptive devices. More stringent fertility programs, including China's one-child policy, have also been implemented in order to reduce fertility.

Although reductions in fertility have occurred, many governments, including Saudi Arabia, India, Sri Lanka, Pakistan, Niger, and Peru, still view their population growth rate as being too high. There has been growing recognition since the 1980s of the need to control population growth within developing countries, despite the complexity of trying to do so. In response, programs to reduce population growth rates by controlling fertility behavior have been enacted, ranging from laissez-faire to invasive. In the former case, India had initially hoped that generally improving economic prospects would ultimately lead to lower fertility levels, although changes to fertility behavior were not noted. Economic incentives to reduce the number of children or emphasize quality-of-life aspects associated with fewer children have also been promoted, but with limited effect.

More coercive and invasive programs have included sterilization. With mounting frustration over the failure of family-planning programs and economic development policies to bring about a decline in fertility, the Indian

government instituted an enforced sterilization program in 1976. Officially, there was no coercion to participate in the program, but the fact that government employees needed to produce two candidates for sterilization, wide-scale bribery, and a series of disincentives, including the denial of licenses, essentially meant that sterilization was indeed forced upon the population. Although some twenty-two million individuals were sterilized, most were older males who had already achieved their desired family size, meaning that the program was once again ineffective in reducing total fertility.

More recently, the government has spoken of “reproductive health and rights” that are meant to ensure fertility choices are individual choices free from coercion. Yet the reality is less clear, with a “two-child norm” promoted by the government flying in the face of reproductive rights and choices. Despite claims that contraception choices are made available through programs that are meant to deliver contraception options, poor and illiterate women are often targeted for tubal ligation (sterilization), without knowing the full implications of the process. Coercion to complete sterilization is also common, with health outreach workers typically paid to recruit women for sterilization even as their primary role is to educate the population on birth control options. For the health outreach workers, failure to meet targets is often met with fines or loss of their job, an outcome that few can afford. Families with more than two children are denied access to school bursaries and meal programs, clean water programs, and even the right to run for political office, while a law under consideration by the Indian government would deny access to subsidized food. Conversely, the government has introduced incentives to encourage sterilization: new washing machines and other household goods were regularly made available to those who were sterilized or promoted sterilization.¹⁴

Despite a nod to reproductive health rights, the implications of India’s fertility policies are far from benign. First, millions of women are “missing” across India, an outcome that is partially attributable to the two-child norm policy. The desire for male children that would support a family and inherit land remains strong, particularly when infant and child mortality remains high. The strong desire for male children has led to infanticide of female daughters. In some regions of India, the sex ratio is alarmingly high (110.6),¹⁵ with one territory located in Western India (Daman and Diu) having a sex ratio of 162 based on the 2011 Indian census.¹⁶ Second, the push for sterilization has resulted in young women having their first and second child quickly, rather than delaying pregnancy or extending the time between pregnancies. Early pregnancies effectively ensure population growth continues through population momentum by having more young adults that wish to reproduce. Third, many sterilizations—an invasive surgical procedure—are often done in less than ideal situations, and infections and complications are the norm.

Somewhere between these two extremes lies the provision of family-planning programs. The uptake of such programs can often depend on the willingness of a population to use such services or its government to provide family-planning services to reduce fertility. The added benefit of such programs has been to educate individuals on the risk of sexually transmitted diseases, including HIV/AIDS. Although contraceptive use is increasing worldwide, in the developing world it is used more for control of the spacing of children or after desired family size is achieved, rather than to limit family size. In addition, only 25 percent of married women in their reproductive years use some form of modern birth control in many African nations, which compares with 73 percent in North America. Oftentimes, however, the use of contraception is discouraged by political, cultural, or religious beliefs. In other cases, condom use could jeopardize relationships, implying potential contact with HIV or engagement in sexually risky behavior. Not surprisingly, therefore, fertility reduction programs have met with varying levels of success and more often than not have reflected the outcome of changing societal beliefs rather than of a specific program.

Fertility Promotion: Pronatalist Policies

While many countries are faced with overpopulation and rapid population growth, a handful of countries are faced with the opposite problem, too few births, an outcome of the long-term trend toward lower fertility rates. Beginning in the 1970s, the total fertility rate (TFR) fell below replacement levels (2.1) in many industrialized countries. Lower fertility rates have meant slowing population growth in some countries, such as Canada and Australia, while in other countries, including Ukraine, Russia, Germany, and Hungary, population decline has already started, meaning that deaths outnumber births. The elderly already represent greater than 15 percent of the population in several European countries, including Sweden (19 percent), the United Kingdom (17 percent), and Belgium (17 percent), with continued growth of the older adult population ensured. Europe's population will no longer increase naturally after 2015, with population growth instead coming from immigration. Assuming immigration remains at its current level, Europe's population will start to shrink by the middle of the century, a situation that is echoed in Canada. Although having the highest TFR in the Western world, the United States has seen increases in its share of the elderly population too, growing from just 4.1 percent of the population in 1900 to 12.4 percent in 2000 and projected to grow to nearly 20 percent by 2030.¹⁷ Even in China, where the government has long been concerned with rapid population growth, concerns have turned to an aging population and its support. Anxiety over a declining population, an expanding elderly population, and a smaller labor force that is expected to support the elderly has prompted concerns regarding the survival of social programs and a loss of economic or

political power, leading governments to explore ways in which fertility may be promoted. In both cases, other policies, such as access to legal abortion, child tax credits, or day-care services, indirectly influence fertility behavior.

Within most Western nations, the decline in birth rates below replacement levels has been linked to deep societal and economic changes.¹⁸ Promotion of gender equity has meant that women have become increasingly educated and more likely to participate in the labor force. Increased employment and career aspirations have provided greater financial autonomy, contributing to declines in fertility as women seek careers outside their homes. Rising consumer aspirations further reinforce the opportunity costs of children, even as fears of unemployment, downsizing, and the uncertain future of the welfare state temper future economic prospects. Together, these effects have prompted many to either delay childbirth or to reduce the desired family size, challenging many long-held assumptions about the timing of marriage and children.

Though it is seemingly paradoxical, low birth rates and a slowing or decreasing population growth rate have their own set of problems. Although the consequences of an aging society are still unclear, many commentators have concluded that low fertility is a serious problem, having more disadvantages than advantages, making it a politically unsustainable position.¹⁹ Fearful of “demographic suicide” and the economic implications of an aging population, many countries have adopted pronatalist policies intended to either promote fertility directly or ease the opportunity costs of children, with the hope that fertility rates will increase. Faced with slowing or declining population growth rates since the 1970s, Eastern European countries have the longest history of pronatalist policies.²⁰ Policies typically addressed the issue through a combination of financial incentives and restriction to contraception and abortion services. Meant to ease the opportunity costs of children, financial benefits commonly include paid maternity and paternity leave, free or reduced-cost childcare, and tax breaks for large families. Most of these programs are not advertised as fertility policy by explicitly targeting a desired number of children. Instead, policies are presented as antipoverty, prowoman, or profamily measures and are meant to influence socioeconomic conditions related to fertility decisions. Some countries, such as France and Australia, pay women for children. In France, the government pays women some \$1,500 per month for each additional child. In Australia, falling fertility rates (TFR reached a low of 1.73 in 2001) prompted the government to pay families who have children a \$3,000 bonus. Since then, the TFR has increased to 1.9 (2012), although critics suggest that it either represents a change in the timing of fertility (but no real increase in the number of desired children) or the “echo” of a large early 1970s cohort that are just now having children.²¹

While the jury remains out, these pronatalist policies seem to work. A 2008 PRB report, for example, noted significant upward movement of the TFR in

countries including Sweden and Russia.²² Russia's TFR had dropped to 1.2 by the late 1990s. Following the introduction of generous payment to parents having a second child (approximately \$9,600), fertility rates increased to 1.44 by 2007. In 2012, it was 1.6, according to the PRB. Spain and Bulgaria also experienced increased fertility rates. However, other European countries that also deployed pronatalist policies did not see any appreciable change in their fertility rates.

Asia's Missing Women

While societies struggle with fertility rates and have invoked policies to limit fertility, the desire to have a male child to fulfill personal and societal expectations remains so strong that couples have increasingly turned to sex selection to ensure that they have a male child.²³ Recalling that the natural sex ratio at birth is 105 males to 100 females, the sex ratios in India and China are much higher, with "official" ratios of 1.094 and 1.133, respectively, although there is evidence that the national ratio is much higher,²⁴ meaning that the sex ratio is highly skewed toward males. The net result, according to at least one calculation, is an estimated 163 million women "missing" in Asia alone.²⁵

Often driven by low fertility policies, sex selection is aided by the increasing use of ultrasound to determine the sex of the unborn child along with access to abortion. While the preference and selection of males is seen throughout much of Asia, sex selection has appeared in North America and portions of Eastern Europe, and there is anecdotal evidence that it is occurring in North America as well.²⁶ Regardless of location, the dominance of males has social implications. Beyond the ethical implications associated with sex selection, a male-dominated society results in a "marriage squeeze," where it is difficult for men to find a spouse of their age. Ultimately, they may marry a younger woman, forcing younger men to compete for partners not just with their cohort but also with an older cohort of males. Alternatively, women become commodities to their families, sold off to the highest suitor. Second, regions with a higher ratio of males report higher crime rates and greater violence, both between men and against women.

ECONOMIC POLICY AS POPULATION POLICIES

National or regional economic policies often have a population component or impact on population policies along with population structure. In the United States, policymakers and business leaders are concerned with the slowing growth of the labor force as baby boomers age, with growth slowing from 2.6

percent per year during the 1970s as baby boomers entered the labor force to 1.6 percent per year in the 1980s and 1.2 percent in the 1990s. Between 2015 and 2025, the labor force is projected to grow by just 0.2 percent as the baby-boom generation retires.²⁷ Additionally, there are concerns that as baby boomers retire labor productivity will drop as more experienced workers are replaced by people with fewer years on the job.

Fearful of aging populations, declining labor force size and experience, and the support of their older populations, many governments in the developed world have moved to adjust labor force participation rates. For instance, governments have abolished mandatory retirement ages, have reduced or delayed retirement benefits, or now actively encourage labor force participation among the old. For instance, with the delay of Social Security benefits to age sixty-seven (from sixty-five) and the abolishment of mandatory retirement in the United States, labor force participation for those over fifty-five has increased since 1995. Other countries have enacted similar legislation and observed similar results. The hope is that the older population—individuals that society has typically defined as “retired”—will remain active in the labor force and largely self-supportive, while also paying into tax and pension funds. While the number that elect to delay retirement from the typical age of sixty-five (or earlier) remains small, the proportion is growing, with many baby boomers expecting to remain employed beyond the typical retirement age.²⁸

Other programs, including those that promote gender equity or reading and literacy among women, are also closely associated with changing fertility preferences, with increased educational opportunities for women linked to lower fertility. Clearly, health care provision is also an economic policy. In general, countries that have invested in health and family planning have slower population growth rates and greater economic development than those countries that have not made such investments. However, health care systems are also casualties of high rates of population growth and stagnant economies that have limited development, modernization, and investment in basic health care services. Many systems are poorly funded or in ruin, preventing access to the most basic of health services.

THE ROLE OF THE INTERNATIONAL COMMUNITY: CONFLICTING MESSAGES

Early Efforts: 1950s–1970s

Although we like to think that reproductive choices are personal, states and their governments will often take either an active or accidental role in promoting fertility. Growing concern within developed countries with rapid population growth in the post–World War II era prompted international institutions and

governments to try to influence fertility policies.²⁹ At first, the developing world was slow to respond to programs promoting fertility reduction, arguing instead that economic development was the best contraceptive. Population policies were also viewed as an infringement upon state sovereignty from former colonial or imperial powers. With stagnating economies, high child mortality, and an increasing realization that women wanted to limit their own fertility, governments in the developing world increasingly warmed to the idea that population growth should be slowed. The United Nations became the driving force through its sponsorship of the first meeting on global population in 1954. Other UN organizations, including the WHO and the United Nations Children's Fund (UNICEF), have incorporated reproductive health into their programs and under the auspices of the United Nations Population Fund (UNFPA).

The US government has taken a more independent approach, preferring to direct its money through its own Agency for International Development (USAID), reflecting its own concerns and policy goals.³⁰ Largely driven by security concerns that saw rapid population growth as a threat to US security via trade, political conflict, immigration, or damage to the environment, USAID has been the largest single donor to family-planning programs. Initially, programs emphasized family-planning practices or specific demographic targets but grew by the 1970s to provide contraceptive information and related health services to support child and maternal health. Critics have long argued that the programs were too narrowly focused, failing to respect religious beliefs or making insufficient investments in social and economic opportunities. Most notably, abortion opponents criticized US involvement in family-planning programs because of their belief that such programs promote abortion. In fact, US law has prohibited the use of such funds to pay for abortion services since the 1970s.

Shifting Priorities: 1980s–Present

The 1980s saw a significant shift in US population policy under the Reagan administration. Supported by economic optimists, including Julian Simon, who argued that world population growth was “good,” the administration declared at the 1984 International Conference on Population in Mexico City that population growth actually had a *neutral* effect upon economic development. Reflecting its connections with the religious right, the Reagan administration also opposed the use of funds for abortion services, withdrawing all financial support from any organization that provided such services even when using their own money to provide legal abortions. At the same time the United States was reversing its position on population growth, developing countries had largely stepped back from their earlier opposition to family-planning programs. Instead, the benefits of small families and the need to slow population growth were promoted. Despite

US opposition, the 1984 conference ultimately supported family-planning initiatives and urged governments to make such services available.

After taking office in 1993, the Clinton administration waived funding restrictions set in place by the previous Republican administrations and increased funding to family-planning programs. Eight years later, the Bush-Cheney administration reinstated restrictions to family-planning programs within days of taking office,³¹ returning to restrictions imposed at the time of the Mexico City conference, while President Obama reversed the restrictions again.³²

The so-called global gag rule that was enforced during the Bush administration denied US funding to private overseas organizations if they used other (non-US) monies to provide abortion services or if they lobbied for changes to the abortion law in their own country.³³ Unfortunately, such restrictions actually undermined the success of family-planning programs. Ultimately, the global gag rule undermined family-planning's objective of preventing unwanted pregnancies and improving maternal and child health. In fact, the ubiquity of abortion suggests that there is a large unmet need for family-planning programs that can prevent the use of abortion services by providing counseling or other options.³⁴ In cases where legal abortion is not an alternative, women may choose illegal abortions, increasing the risk of death or injury when faced with an unwanted pregnancy. Family-planning programs can also reduce fertility levels by helping with birth spacing, improving the odds of survival of mother and child, preventing unsafe abortions, and reducing the incidence of sexually transmitted diseases, including HIV. Studies have clearly shown that as use of family-planning methods increases, abortion rates decrease, and that increased funding of family-planning programs reduces abortion.³⁵

Leading up to the fifth UN conference on population, held in Cairo in 1994, discussions once again centered on the relationship between population growth and development. Despite the success of family-planning programs in the developing world, critics of these programs viewed them as an invasion of personal liberties. Instead, it was argued that family-planning programs should be better integrated into a broader view of health, and that women's well-being should be of paramount importance. Responding to the critics, the conference redefined views of population growth and how to address it, linking population growth to sustainable development. Rather than focusing primarily on national interests, the conference promoted investment in human development, particularly the status of women. Family planning was to be integrated into a broader health agenda, including pre- and postnatal care, sexually transmitted diseases, and cancer screening. Infant, child, and maternal mortality and the alleviation of poverty were to be targeted, and universal access to family-planning services and primary school education and increased access by girls and women to

higher education were promoted. However, abortion was not promoted as a method of family planning, clearly recognizing the diverse legal, moral, and religious viewpoints on abortion within different countries.

Reviews of the 1994 conference were mixed. Many countries had articulated and implemented new population policies along with reproductive health programs. However, funding shortfalls by donor countries, including the United States and other developed countries, limited the reach and effectiveness of programs. The success of the Cairo conference must also be evaluated within the context of broader health reforms and economic liberalization. Many developing countries had already started to change their policies and institutions, promoting a broader health agenda that incorporated reproductive health and gender equity. For example, the World Health Organization's Health for All by 2000 (HFA 2000) program was an early promoter of societal health.³⁶ Initiated in 1977, HFA 2000 emphasized the promotion and protection of health realized through the provision of primary health care that stressed comprehensive basic services for all rather than sophisticated curative medical care for a few. Primary health care thus became WHO's basic strategy for health improvement, notable for its concern with factors supporting health, including water supplies, sanitation, education, and food supply, along with programs promoting child and maternal health and family planning. A particular emphasis was placed upon the health and education of children, adolescents, and women within the developing world. There is increasing recognition that childhood health is linked to health in later life. Consequently, improving early childhood nutrition and greater access to immunizations, better hygiene, improved education opportunities, and safe water supplies have been promoted. Among women, for whom gender differences are often reinforced by societal or cultural norms, programs have targeted equity issues, working to narrow gaps in literacy, education, and income opportunities.

CONCLUSION

Population policy is clouded by a multitude of factors, including religion, social expectations, economic needs, and personal decisions. Despite China's one-child policy, for instance, pressure within segments of China's population to have more than one child shows a continuing desire to have larger families, and the problems associated with a rapidly aging population have forced the government to relax its fertility policy in some cases. In India, despite a half-century of promoting fertility reductions, rates remain relatively high, with a TFR of 2.5.

Not surprisingly, population policy, and particularly fertility policy, whether meant to promote population growth or decline, is difficult to facilitate and has

achieved varying degrees of success. Among the set of policy levers that can be used to control population change, immigration policy has had the most direct effect by controlling who and how many can enter a country. Immigration has been assumed to be an important source of population growth, although it is also potentially associated with problems of immigrant adaptation, ethnic and racial divides, and national security issues. Incentives to increase or decrease fertility are also widespread but have met with mixed success. China's success with fertility reduction is largely due to its one-child policy. While it reduced the country's fertility rate, the reduction has largely occurred because of the state's tight control over the population. The one-child policy has also come with costs that are increasingly visible, including the preponderance of male births and the dramatically smaller working cohort that must support China's older population. Other cases of fertility control, such as India, have been far less successful. Likewise, fertility promotion has only been partially successful. Partially because of this limited success or other problems, countries have also explored alternatives to fertility promotion by looking at other policy alternatives, including delayed retirement to keep individuals within the labor force or delaying the start of welfare programs, as the United States has done.

STUDY QUESTIONS

1. Does your country (or selected country) have formal or informal population policies? How might your country informally promote population growth (or decline)?
2. How might social welfare programs such as maternity leave, subsidized day care, tax incentives, or early childhood education be seen as policies that promote population change?
3. For a selected country, examine how its immigration policies have changed over the past decade. Has it allowed more or fewer immigrants? What has prompted changes (if any) to its immigration policies?

FOCUS: POPULATION PLANNING IN SELECTED REGIONS

CHINA'S ONE-CHILD POLICY

Identified as one of the most successful, albeit controversial, fertility control programs, China's one-child policy has received considerable lay and academic attention.¹

Initially, China's government viewed family planning and fertility reduction programs as suspect, assuming instead that socialism would ensure the equitable distribution of resources across society. By the late 1960s, however, China's leadership recognized the

limits to growth and the need for population control. With a TFR in excess of 7.0, rapid population growth was acknowledged to hinder attempts to improve the economy and raise the standard of living. Beginning in 1979, the Chinese government advocated its one-child program, with the goal of stabilizing the population at 1.2 billion, accomplished through a combination of social pressures including propaganda, local political activism and coercion, increased availability of contraception and family-planning resources, and a series of economic incentives and disincentives. For those committing to the program, cash bonuses were paid, with one-child families given preference in school admission, housing, and job applications in urban areas. In rural areas, the program was altered slightly so that families would receive the same food rations as a two-child family and the same-sized plot for private cultivation as a two-child family. Disincentives to large families were also employed, requiring families having more than one child to repay all benefits received.

By the late 1990s, China's total fertility rate had dropped below replacement, and is currently 1.5. The apparent "success" of the program seemingly follows from the ability of the Chinese government to exert control over the population to limit births, a recognized feature of China's Communist society. The program's success could also be attributed to the promotion of personal and national economic benefits and the program's link to broader health issues, which together engendered the desire for smaller families within the Chinese population.

Yet even though fertility rates declined and population growth slowed, the program has not been without its critics. Internally, a

significant proportion of the Chinese population resisted the one-child policy, reflecting deeper cultural issues or economic necessity and the importance placed on the birth of male children. Although higher financial incentives were also attached to the birth of daughters among couples who endorsed the one-child policy and the government's allowance of more than one child in some rural areas, the prospect of a one-child family meant that approximately 50 percent of families would not have a son. Poverty further reinforced the importance and contribution of male children to family welfare. As a result, couples frequently opted to disregard the one-child policy in their efforts to have a son and have also turned to prenatal scans and abortion to prevent the birth of unwanted daughters, leading to an imbalance in the number of boys relative to girls and the "missing girls" phenomenon.² Nationally, the sex ratio is 118,³ while in some parts of China, there are approximately 135 boys born for every 100 girls. The typical difference (the "sex ratio") is 105 boys for every 100 girls, raising fears of the potential for social unrest as males are unable to find partners. Equally disturbing, reports of female infanticide and abuse of women who give birth to girls are not uncommon,⁴ and it was suggested that the set of disincentives for higher-order births deterred women from seeking appropriate prenatal and pregnancy-related care, increasing the risk of death for mother and child.⁵

The true success of the program has also been questioned since declines in fertility can be traced to the 1960s. Fertility decline was furthered in the 1970s with government policies of delayed marriage, longer spacing between births, and fewer children, so that by the early 1980s the TFR had already dropped below 3.0. In other words, the decline in fertility levels would appear to have

been well established by the mid-1970s. Far from inducing fertility decline, the one-child program may therefore have simply enhanced the motivation for smaller families, codifying family size as a national goal through the provision of a set of incentives and disincentives.

Continued economic liberalization will likely promote small families in the coming years as the direct and opportunity costs of children are realized, particularly in urban areas. Conversely, economic liberalization may also *promote* fertility among the poor as a means of ensuring their economic success in an economy that is increasingly separated into the rich and the poor, leading observers to question whether the low rates of fertility can be maintained over the longer term. Even now, with a population of 1.35 billion in 2012, the original target population of 1.2 billion has been exceeded,

owing to demographic momentum and the young age of the population. The government has already loosened its restrictions on early marriages and has relaxed its one-child policy, permitting two children in certain circumstances, suggesting that a substantial demand for larger families may remain within the population, particularly in rural areas where economic liberalization has increased pressure for children as a means of family support and production.

The Chinese have also recognized that the rapid reduction in fertility levels in just twenty-five years has resulted in a young population (aged fifteen years and less) that is substantially smaller than previous generations, creating a heavy burden of old-age dependency. Like many countries in the developed world, the Chinese government is trying to cope with an aging population

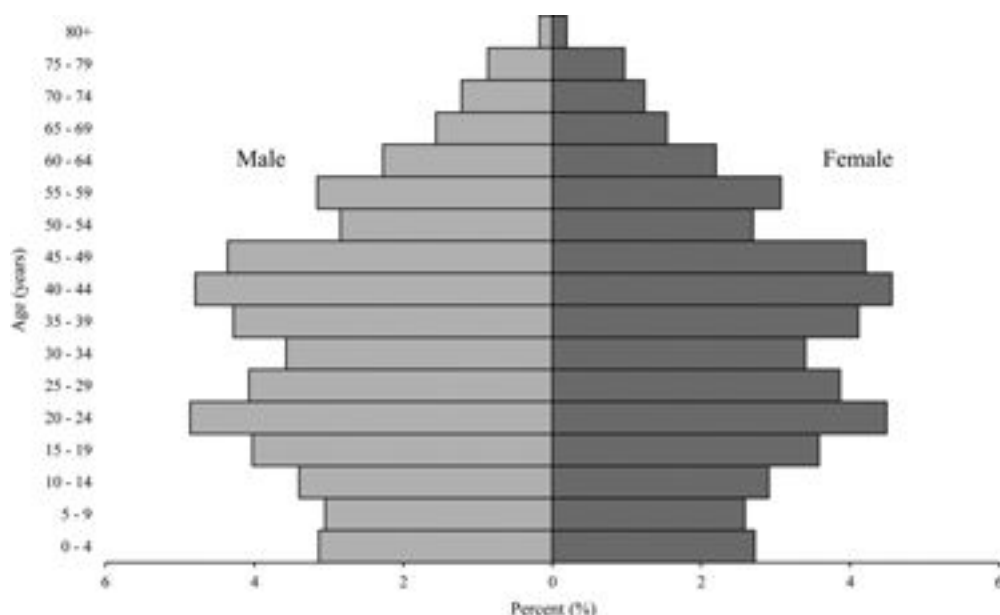


Figure 10F.1 China's Age Pyramid, 2005

Note the larger proportion of young males and the population bulge as the labor force ages, with implications for the support of this aging population.

Source: US Census Bureau, IDB.

and a shrinking labor force that supports the elderly.⁶ Moreover, the erosion of traditional family structures means that children no longer care for their elderly parents, posing additional problems, making a further relaxation of the one-child policy to meet the problem of an aging population possible. At the same time, the Chinese government reaffirmed and codified the one-child policy in 2002, while also criminalizing coercive enforcement measures.⁷ However, it is also a misconception that China has its population under control. Large-scale population movements from rural to urban areas have led to growing regional inequities, insufficient urban infrastructure, degradation of resources, and the potential for urban conflict given its Hukou system (see earlier in this chapter).

PROMOTING FERTILITY IN QUEBEC, CANADA

Quebec, Canada's French-speaking province, provides an example of regional concerns associated with fertility and population size. Historically, birth rates within the province were higher than the Canadian average, as Quebecers resisted the adoption of contraception and fertility changes. Even in the late 1950s at the peak of the baby boom, Quebec's TFR was in excess of 4.0 children, giving the province one of the highest fertility rates in the industrialized world. The delayed uptake of newer fertility norms and contraceptive techniques reflected the control of the Roman Catholic Church and its traditional stance against contraception. In Quebec's case, the church also encouraged large families as a "demographic investment" that ensured the survival of French Canada within the Canadian Confederation.⁸

Quebec's demographic advantage was lost in the 1960s. The liberalization of the

church and rapid emancipation of women contributed to declining fertility rates, enabling them to drop below the Canadian average. By the mid-1980s, Quebec had one of the lowest rates of fertility in the world at that time (1.37),⁹ and its share of the Canadian population dropped from 32.3 percent at the time of confederation in 1867 to 24 percent in 2001. Responding to this apparent crisis, Quebec's Commission de la Culture reported in 1985 that the province needed to take action to counter demographic trends that threatened the province's existence as a "distinct society," an issue that has dominated provincial politics since its foundation. The commission and other commentators pointed out that the demographic situation threatened the political strength of the province and its cultural sovereignty, in addition to the problems of providing for an aging population. Robert Bourassa, then premier of Quebec, echoed the concerns of the commission by declaring that increasing birth rates was the most important challenge for Quebec.¹⁰ In response, Quebec initiated a series of pro-fertility programs, including more generous tax deductions for children, higher family allowances, longer parental work leaves, and more day-care opportunities. Beginning in 1988, the Quebec government also offered baby bonuses based upon family size, with five hundred dollars for the first child, one thousand dollars for the second, and six thousand dollars for the third and subsequent children, along with extended maternity leaves and family allowances. Revisions to this policy in subsequent years raised the bonuses slightly,¹¹ while an overhaul of the system in 1997 refocused allowances based on the number of children under eighteen years and household income, increased maternity leave benefits, and provided highly subsidized day care.¹²

Overall, the success of these policies has been limited. Statistics Canada, for example, identified a slight recovery in Quebec's fertility rates in the years following the introduction of pronatalist policies, with TFR reaching 1.6 in 1996 but dropping again to

1.5 in 1997 and remaining slightly below the Canadian average in 2000 with a TFR of 1.4.¹³ By 2010, the TFR had reached 1.7, the highest rate in more than a decade.¹⁴ Whether these "higher" fertility rates remain is yet to be seen.

METHODS, MEASURES, AND TOOLS: PASS OR FAIL? EVALUATING POPULATION POLICIES

As evidenced by the discussion elsewhere in this chapter, population policies have offered mixed results at best. For instance, India's multiyear struggle to reduce fertility levels through various family-planning programs and incentives has been problematic and piecemeal. Critics have charged that Indian programs have been inconsistent and have typically lacked direction, with demographic targets tied to oscillating rewards and disincentives. The program has also failed to offer more flexible birth control methods such as the pill or intrauterine devices (IUDs). Instead, it focused upon sterilization in a country that has historically low use of contraception. Other contraceptive techniques still represent only a small proportion of contraceptive use within India. India's lack of success runs deeper than inconsistent or narrow policy objectives by failing to account for the broader social context within which reproduction occurs, including the role of women, the interrelationship among classes, and the political consequences of fertility policies.

The failure of fertility reduction programs like India's is not unique, but is witnessed across the world and is more reflective of changing governments and their priorities than anything else. Even China's relative "success" in reducing fertility levels and

constraining population growth must be viewed in the context of the dramatic and rapid shift in its age structure, which is rapidly becoming heavily skewed toward older generations, and the surplus of male births. Both problems may create social unrest and economic hardship in the coming years. More broadly, inconsistency in the application of family-planning programs, undesired outcomes, or the failure to provide a range of contraception, for example, are seen elsewhere. Programs cannot be one-size-fits-all and transplanted from place to place without recognition of differing morals and attitudes toward sex and contraception, as is the case in Africa. Instead, the reality is that different programs will likely need to be adopted for different locations and preferences.

Pronatalist policies and programs also have mixed outcomes.¹ Evidence suggests that the effects of pronatalist policies are short-lived and only moderately successful. Over the short term, fertility rates frequently increase, but the longer-term impact is less successful. If anything, most observers believe that incentives merely accelerate or alter the timing of the first birth, rather than changing the desired family size by increasing the number of "higher-order births" (i.e., second, third, or higher born children).

Over the longer term, the relationship between financial incentives and other attitudinal factors related to fertility is difficult to measure and is unknown. Demographic factors, such as fewer women in their child-bearing years, mean that total births are likely to remain low. Restrictions on access to abortion services also have a short-term effect on fertility as couples quickly adjust their own practices or resort to illegal abortion.

The success of immigration policies is also variable, where the inconsistent application or setting of immigration targets and admissions can result in fluctuating patterns and numbers over time. To complicate matters, changing global economic conditions or options can alter immigrant numbers. At the same time, efforts to curb immigration have often led to increased illegal “backdoor” immigration. Countries are

slowly awakening to the realization that immigration policy is problematic. Whichever way they turn—either to restrict immigration or promote particular components of immigration—is not guaranteed to achieve the desired results. Attempts to decrease immigrant flows have proven largely unsuccessful in the face of economic restructuring and globalization. Increasing immigration is problematic in its own way, threatening ethnic, racial, or social instability while creating a cadre of low-paid workers that would reduce wages and compete for positions with the native-born. Opening the doors may represent a slippery slope that governments would not be able to back away from, with immigration further spiraling beyond control. Both measures carry the risk of mixed messages that condone immigration on the one hand while reducing it on the other. Ultimately, the future shape of immigration policy is unclear.

Chapter Eleven

Population Growth

Linking to Economic Development, Resource Scarcity, and Food Security

Thomas Malthus and “Essay on the Principle of Population”
Setting the Stage: The Debate and Current Perspectives
Linking to Economic Development, Resource Scarcity, and
Food Security
Conclusion: The Potential for Conflict?
Study Questions
Focus: Resource Conflict
Methods, Measures, and Tools: What Have Geographers
Contributed to the Debate?

THE CONTINUED GROWTH of the human population is inevitable. Even if the demographic transition results in lower fertility and growth rates, population momentum will ensure a global population of 8.082 billion by 2025, bringing with it potentially significant societal and economic consequences. One question that remains, however, is whether a growing population has positive or negative implications for economic development, resource consumption, and food security, the topics of this chapter. The chapter begins by considering the work of Thomas Malthus, the eighteenth-century writer who first linked population and food resources. Following Malthus, the opposing approaches of Karl Marx and Friedrich Engels are introduced before examining links between population growth, economic development, resource scarcity, and food security. The chapter concludes with a discussion of the potential for conflict and instability. The “Focus” section considers population growth and the potential for conflict over scarce resources, and the “Methods, Measures, and Tools” section looks at the contributions of geographers to these areas of discussion.

THOMAS MALTHUS AND ‘‘ESSAY ON THE PRINCIPLE OF POPULATION’’

Demographers and others struggle with the question of whether the world can feed itself. In the 1960s, Paul Ehrlich’s *The Population Bomb* alerted the public to the population crisis, bringing with it a sense of urgency.¹ But Ehrlich’s warnings were not new, with the population-food (resource) debate having a long history, dating to Thomas Malthus’s 1798 “Essay on the Principle of Population” and later writings by Karl Marx and Friedrich Engels. Writing during a period of poor harvests and food shortages, Malthus argued that food supply would increase in a linear fashion (1, 2, 3 . . .), while population would increase geometrically (2, 4, 8 . . .).² Ultimately, population would exceed agricultural output, unless population growth was somehow “checked.” Historically, Malthus argued that so-called positive checks, including famine, plague, and war, decreased the population. Alternatively, population growth could be controlled through “preventative checks,” with individuals imposing their own limits on reproduction. With Malthus holding out little hope that humanity would be able to control its sexual and reproductive needs, he forecast a dismal future of population decline and widespread poverty. In opposition to Malthus, Marx and Engels argued that people were poor because economies and societies were organized in such a way that they did not have the opportunity to be anything else but poor. Influenced by the social and economic conditions of Europe during the Industrial Revolution, they promoted social and political change (often through revolution) and believed that a just and equitable distribution of resources aided by technology would allow unlimited population growth.

SETTING THE STAGE: THE DEBATE AND CURRENT PERSPECTIVES

Malthus’s dire predictions remain a focal point of the debate over population growth, and the ability to feed the world’s population remains an important question.³ Time has proven the basic perspectives of Malthusian and Marxian theories both right and wrong—our mere presence on this planet points to the failings of Malthus’s core thesis. While fertility has been reduced largely through personal choices as standards of living rose and new ideas filtered through society, technology, the green revolution (the application of fertilizers and pesticides to increase crop yields), and biotechnology have allowed the world to accommodate a population far larger than Malthus ever saw possible. Agricultural production has grown tremendously, allowing per capita food supplies to increase despite continued population growth. Marx’s position, on the

other hand, seems vindicated in China. With a population in excess of 1.3 billion, China has proven that it can provide the basic needs of a large and rapidly growing population. At the same time, it has recognized that there are limits to growth, as it moved to reduce fertility through its one-child policy.

Even now, however, the Food and Agricultural Organization of the United Nations (UNFAO) estimates that over 870 million people were malnourished in 2010–2012.⁴ While the majority of these were found in the developing world, many (16 million according to 2012 statistics) are also found in the developed world.⁵ Millions more consume sufficient calories but fail to get the necessary proteins. Consequently, the world continues to grapple with the basic question of whether it can feed itself, both now and in the years to come. At the same time as agricultural production has increased, degradation of cropland through erosion, desertification, salinization, and urbanization have reduced the amount of land available for agriculture.⁶ Created by poor farming practices, deforestation, and the use of ecologically marginal land, erosion can decrease average yields by reducing the soil's ability to retain moisture, by carrying away nutrients, and by degrading its physical qualities. Likewise, the salinization of cropland, whereby soils become increasingly salty because of saltwater infiltration, means the soil is unable to support agriculture. The expected impacts of climate change and the unequal distribution of food owing to distributional difficulties, conflicts, or politics within and among countries compound the problem.⁷ With the world's population growing at a rate of 1.2 percent per year, questions as to whether the earth can feed and sustain such a large population continue to be raised.⁸

Growing from the initial Malthusian/Marxian distinctions within the literature, three perspectives continue to underlie the current debate and influence public policy and commentary.⁹ Pointing to growing carbon dioxide concentrations, the declining health of oceans, reductions in biodiversity, and degradation of land, *neo-Malthusians* argue that finite resources place strict limits on the growth of the human population and consumption.¹⁰ If limits are exceeded, social breakdown occurs.¹¹ Recent food riots, caused by limited supplies and rapidly increasing costs, may be seen as a harbinger of future events, particularly as climate change redraws the agriculture map by reducing harvests.

Economic optimists, characterized by Julian Simon, see few limits to population growth and prosperity, provided the economic system and market mechanisms work correctly.¹² Following their reasoning, few societies face strict limits to growth or consumption, with optimists pointing to improvements in human health, life expectancy, and increasing food production to support their position. Finally, the *distributionist* viewpoint, which is favored by Marxists, focuses upon inequalities in the distribution of wealth and power within a society, and argues that the poor distribution of resources, poverty, and inequality are the causes, not consequences, of population growth and resource depletion.

While the neo-Malthusian, economic optimist, and distributionist perspectives are still identifiable within the literature, the debate has essentially become two-sided, with neo-Malthusians on one side and optimists on the other. Each argument contains grains of truth, but neither conveys the entire story. So, what went wrong and where do we currently stand? First, returning to the neo-Malthusian perspective, empirical and anecdotal evidence has failed to support the assumption that population growth is limited by resource barriers. In very general terms, the human population has grown beyond most of the barriers that were assumed by neo-Malthusians. Over the past two centuries, agricultural technology and capital have increased agricultural productivity tremendously, allowing agricultural output to increase. Similarly, neo-Malthusians forecasted energy shortfalls, predicting that energy prices would grow over fivefold between 1973 (the first oil crisis) and 2000. While the 1990s and early-to-mid-2000s marked a period of relatively inexpensive energy, prices skyrocketed in 2007 and early 2008 amid concerns of declining reserves, the inability to find new reserves of oil and gas, and rapidly increasing use of energy within the developing world, especially China and India, only to fall with the onset of the recession.

Economic optimists have been much better in explaining the ability of the world to adapt to these apparent barriers. For them, the operation of economic institutions, and particularly free markets, is key. Properly functioning institutions can facilitate conservation, substitution, innovation, and global trade of goods. Induced innovation theory argues that changes in endowments of land or labor, for example, are reflected in market price signals.¹³ Through their ability to generate profit, markets induce innovations and stimulate technological innovations that loosen or remove constraints to population growth, and price changes encourage people to tap new resources or to substitute. Ester Boserup, for example, showed that scarcity of cropland stimulates greater labor specialization, increased productivity, and changes in agricultural practices.¹⁴ Likewise, new lands may be opened to agriculture, conservation may be stimulated, or resource substitution may promote the increased use of fertilizers to increase agricultural output. Similarly, scarcities of nonrenewable resources can be overcome through resource substitution, conservation, improved production efficiencies, and enhanced resource extraction technologies. Economic optimists also argue that population growth has a key advantage in that it produces more geniuses, providing society with the means to resolve scarcities. For Julian Simon, resources are only limited by humanity's ability to invent. Thus, innovation and technical fixes allow societies to move beyond constraints to growth. Resource scarcity and degradation are therefore not due to population growth or increased consumption, but are instead due to market failure.

Like the neo-Malthusian perspective, however, the optimist framework is also flawed. A larger population does not, for instance, necessarily mean more

discoveries or more Einsteins, but perhaps only that more people make the same discovery. Instead, the supply of scientists and other thinkers is constrained by the level and accessibility of education, limited capital, poor and incompetent bureaucracies, corruption, and weak governments. The brain drain from developing countries and into the developed world may have an especially pernicious effect, as the developed world's immigration policies are tailored to accept the educated and those with skills. This institutionalized brain drain poses further and long-term difficulties for the developing world in terms of maintaining human capital and its ability to generate, retain, and utilize the highly educated members of its populations, which will be necessary to solve impending problems.

Moreover, optimists' arguments rest on the free operation of the market, an assumption that is stretched in many cases. Free markets are far from universal. Even in America, the quintessential free-market economy, regulations at various government levels (state, national, and international) interfere with its free operation. In the developing world, the markets frequently become murkier. Institutional limitations, including market failure associated with unclear common property rights and inappropriate pricing for scarce resources (i.e., undervalued resources) limit the creation or substitution of alternatives. In addition, institutional biases may be present within markets, such that there is a tendency for institutions to favor some actors over others, leading to the marginalization of segments of the population. Consequently, a key caveat of the optimist viewpoint is the *quality* of institutions, policies, and technologies that are inherent within a society. Together, these effects, which are in turn modified by cultural, historical, and ecological factors, have direct bearing upon the ability to respond to resource scarcity. If markets are not able to identify or effectively incorporate the costs of scarcity so that resources or goods are undervalued, resources will be exploited and solutions to scarcity will not be forthcoming. Relatedly, it is unlikely that population growth can promote increases in agricultural output that will keep pace with population growth rates in Africa and parts of Asia.

For the most part, the debate between these three groups has stopped here, a debate that Homer-Dixon characterizes as sterile and with relatively little advancement.¹⁵ Science, however, has better revealed the complexity and interconnectivity of ecological systems, with implications for the population. In the past, the earth's environmental systems were regarded as stable and resilient to our tampering. Instead, there is mounting evidence drawn from observation of ocean currents, ozone depletion, and fish stocks that environmental systems are not stable given human actions. What was previously considered slow or incremental changes to systems might be better described as nonlinear, with systems rapidly changing their character when some threshold is exceeded,

making chaos and anarchy better descriptors of environmental systems.¹⁶ There is increasing consensus that humanity—via population growth—is taxing the earth’s resources to such a degree that complete ecosystems are disappearing. Global warming and the loss of biodiversity may, at some point, cascade to produce dramatic changes that humanity is ill prepared to deal with.

LINKING TO ECONOMIC DEVELOPMENT, RESOURCE SCARCITY, AND FOOD SECURITY

In the coming decades, population growth, rising per capita resource consumption, greater food demand, and inequalities in resource access guarantee that scarcities of renewable resources will become an issue. If population growth is taxing ecosystems, what is the prognosis for economic development, food security, and resources?

Population Growth and Economic Development

As the economies of the developing world, and particularly the poorest sub-Saharan countries, started to stagnate in the 1980s, social scientists scrambled to unearth the linkages between rapid growth and economic development.¹⁷ After all, foreign investment and aid had poured into the developing world for years, and yet there was little to show for it. Instead, per capita incomes had declined and an increasing proportion of the population lived in poverty. At the heart of the debate is the question of whether population growth favors economic development or hinders it, with the available data supporting a number of interpretations. On the surface, it is readily apparent that the richest countries are also those with slow population growth characterized by low rates of fertility and low mortality levels, while some of the poorest countries have high rates of population growth. The relationship is, however, not perfect, with oil-producing countries in the Middle East having high population growth (the fertility rate in Saudi Arabia and other Gulf states remains in excess of 2.1) as well as strong economic growth. The opposite is also true, with low population and low economic growth rates.

Muddying the waters are countering arguments that population growth promotes economic development. Recalling Boserup’s argument (presented in chapter 9),¹⁸ optimists have long asserted that population growth promotes economic development, assuming that it is a motivating force in the adaptation of societies, including the uptake or innovation of new technologies or economic reforms. The notion that population growth is in fact good for economic growth is well grounded. In Europe and North America, population growth and declining mortality levels are thought to have stimulated economic development and

the Industrial Revolution. However, a different perspective is seen in the developing world. Building upon a much lower standard of living than Europe or the Americas at similar stages in their economic development, and having far greater rates of population growth, this group of countries is not, on average, following the lead of developed countries. In fact, they are slipping further into economic crisis, enhanced by the HIV/AIDS epidemic and its social and economic ramifications along with recessionary pressures.

Although the linkage between population and economic development is complex, emerging evidence reinforces the *negative* linkage between rapid population growth and economic development. The US National Research Council reinforced population's negative effect on economic growth, concluding that rapid population growth damages economic growth.¹⁹ For economic development to occur, capital must be invested in such things as education, health, or infrastructure, a difficult proposition in much of the world, where poverty impedes the ability for governments and individuals to invest. For economies to grow, the level of capital investment must also grow, with higher rates of population growth necessitating higher rates of capital investment. Following a Malthusian line of reasoning, if the population growth rate exceeds the investment rate, countries will be trapped in poverty, unable to invest in themselves and provide the needed infrastructure. Although economic growth would occur under these situations, population growth is so high that economic growth is distributed throughout a larger population, meaning that individuals will receive a smaller proportional share.

This negative linkage can be viewed through a number of relationships linking rapid population growth and high fertility to economic growth.²⁰ First, rapid population growth tends to dampen the growth of per capita GDP, a relationship that first appeared in the 1980s and appears strongest among the poorest countries.²¹ The growth of GDP can be limited by high young dependency rates, reflective of high fertility rates. With a young population profile, the attendant costs associated with health and education for children are high, reducing household savings and increasing government expenditures. In turn, the growth of GDP is reduced, with the investment providing only long-term economic payoffs.²² The impact on economic growth is also seen in the creation of new jobs. In countries with rapid population growth, labor markets are frequently unable to provide sufficient employment opportunities for the young, leading to underemployment or unemployment. This negative relationship has continued, ensuring that inequalities between the developed and developing world remain and providing little hope for their rapid amelioration.

Second, population growth and high fertility tend to aggravate poverty and promote its institutionalization from one generation to the next. In particular, population growth will likely reduce or slow wage growth among the least

skilled and lowest-income groups. India, for example, has accommodated high population growth, but economic development policies have favored or improved the status of only 15 to 20 percent of the population. The poor in India have paid the highest price. Much of India's public education system, which is predominantly attended by lower socioeconomic classes, is underfunded and inadequate. The poor are progressively marginalized and increasingly unable to participate in the economy because of poor health, lack of nutrition, or illiteracy.²³ In addition, a cadre of low-skilled, low-wage workers may slow the adoption of more efficient technologies.

Third, high fertility inhibits household savings, forcing household expenditure on basic goods and services for a larger number of people while savings or expenditures upon education are postponed or neglected. Conversely, declining population growth and fewer children mean that households are able to invest in education and place more of their earnings in savings, a necessary condition for economic growth. The economic literature has, for example, largely attributed the growth of Asian economies such as South Korea during the 1980s to increased household saving rates as fertility dropped and incomes grew.²⁴ As families saved more, domestic savings increased and were both invested within the country and exported elsewhere.

Fourth, following Easterlin's reasoning, higher fertility rates mean that parents have less to invest in each child than those with smaller families. Similarly, children from larger families have less schooling on average than their counterparts from smaller families. In countries with rapid population growth, there is increased pressure placed on education and health care, requiring increased financial commitments. Unless rapid growth of government revenues is also occurring or governments are willing to shift spending priorities, expenditures on education and health are depressed.²⁵ Again, evidence in support of this can be drawn from Asia. In South Korea, decreasing fertility levels and young dependency rates meant that the government was able to quadruple real per-student educational expenditure between 1970 and 1989, even as it spent an approximately equivalent proportion of its national budget on education. If South Korea's share of school-aged children had grown as fast as Kenya's during the same period, it would have needed to spend more than double what it did.²⁶

Finally, population growth threatens resources by placing increased pressure upon them, whether resource use is associated with increased per capita consumption (i.e., through increasing incomes and demand) or through increasing demand generated by a growing population, even if per capita demand remains the same. Forest products, fisheries, cropland, and freshwater resources are all vulnerable to human-induced pressures.

Rapid population growth and high fertility seemingly have the greatest negative impact in the poorest countries where national institutions are weak.²⁷ In

these cases, population growth reinforces a downward economic spiral, reflective of several sub-Saharan countries with high fertility rates and lower average per capita incomes today than two decades ago.²⁸ Poorly developed markets and ineffectual government programs and leadership fail to protect, invest in, or build the basic infrastructure that is needed. Without strong institutions to assist national programs associated with education, fertility and family planning, or infrastructure development, rapid population growth will decrease the supply of ingenuity, exacerbating resource scarcity and environmental degradation. In turn, failure to invest in infrastructure and the degradation of assets can cripple institutions and markets. Moreover, governments in developing countries often lack the financial or political ability to invest in institutions that will promote labor force development.

Population Growth and Resource Scarcity

The debate over the relationship between population growth and resources parallels that over population and economic development, pitting neo-Malthusians against economic optimists, with both groups claiming evidence to support their position. One point seems intuitive: the collective impact of seven billion people on the Earth's ecosystems, measured through resource use, consumption, or pollution, is tremendous. Whether the current rate of resource consumption is sustainable is unknown, but it is suspected that current consumption patterns and human impacts are not sustainable over the long run. Already, many regions are faced with scarcities of cropland, water, and forests.

In his 1999 book, Homer-Dixon identified three sources of resource scarcity: supply-induced, demand-induced, and structural scarcity. Supply-induced scarcities occur when resources are depleted in quantity or have become degraded, perhaps through overexploitation or pollution. Demand-induced scarcity occurs when population growth and changes in consumption patterns boost the demand for a resource. Such scarcities occur only when a resource is rivalrous, meaning that its use by one economic actor reduces its availability for others, with examples including fisheries, water, or forests. Structural scarcity occurs when there is an imbalance in the distribution of the resource or in power and wealth within a society, such that certain groups get a proportionately larger share of the resource. If a resource is excludable (i.e., cropland), such that its use can be restricted or blocked through property rights or other institutions, some groups may be prevented from accessing the resource.

Not surprisingly, population growth is a key factor driving all three types of resource scarcity. Rather than operating independently, each of these sources of scarcity may interact and reinforce one another, either through *resource capture* or *ecological marginalization*.²⁹ Resource capture occurs when a scarce resource forces actors (i.e., governments or ethnic groups) to assert control

over resources through legislation or other means. Poverty, desperation, and a lack of environmental knowledge to protect resources magnify the problem.

Whether the discussion is global or national, it is not just a question of feeding a large population, but also the tasks of providing health care, education, and infrastructure while finding employment and increasing the standard of living over the longer term in a sustainable fashion. Population growth also influences such diverse issues as increased energy consumption, global warming, ozone depletion, deforestation, loss of cropland, loss of biodiversity, and shrinking freshwater resources. Together, the requirements of a growing population may only be met by extracting a huge toll upon limited resources, which may only cripple future sustainability, a situation that is compounded by unequal access to resources and the marginalization of populations.

Population Growth and Food Security

Resource scarcity is closely linked with food security. It is questionable whether some countries, such as China, Egypt, and India, have the resources and economic ability to sustain their populations indefinitely, even if population growth was to cease immediately. Writing for the World Watch Institute in 1995, Lester Brown questioned the ability of China to feed itself in the coming decades.³⁰ Drawing from the experiences of other Asian countries, Brown forecasted a combination of rising standards of living and movement “up the food chain” from staples to more complex diets including animal proteins. Ultimately, increased food consumption, loss of cropland to urbanization, and declining water resources, among other factors, would mean that China would not be able to feed itself. The inability to domestically grow a sufficient food supply would force China to turn to world markets to purchase the necessary grains and other foodstuffs. The problem lies in its expected demand for grains, which Brown projected to exceed total world output, driving up prices globally and weakening the ability of smaller, poorer countries to purchase their requirements. Climate change will exacerbate food-supply issues by impacting crop production, food security and availability, and crop distribution.³¹ With the shifting precipitation patterns and decreased crop yields that are expected with climate change, many developing countries will become increasingly dependent on food imports. At the same time, pressure to cultivate marginal land or use unsustainable cultivation practices may lead to increased land degradation.

Food and resource scarcity is particularly problematic in the developing world, which is heavily reliant upon local resources for day-to-day survival. Already, many developing countries face a bleak future resulting from large-scale demographic, environmental, economic, and societal stresses.³² The links between food supply and demand are complex,³³ with food supply affected by land and water constraints, lack of investment in agriculture, trade, weather,

and lack of access to fertilizer and irrigation. Food demand, on the other hand, is affected by such factors as rising energy prices, population growth, globalization of food markets, changing diets, and the use of cropland for biofuel production. Beginning in 2000, food prices started to rise sharply, with some of the greatest price increases associated with the food crisis of 2007–2008, which saw the price of wheat and corn triple between 2005 and 2008, while rice rose fivefold.³⁴ Price increases reflected poor crops in parts of the developing world, the rapid increase in food demand, and a decline in the food supply:³⁵ fuel prices increased, droughts reduced harvests, and cropland was shifted from food to biofuel production. The result: not enough food, with the world's poorest being the most vulnerable. The UNFAO estimated that escalating food prices increased the number of malnourished by seventy-five million at the time,³⁶ with food riots in Haiti, Indonesia, the Ivory Coast, Thailand, and other countries.³⁷ The world recession of 2009–2012 further destabilized countries, with the United Nations estimating that twenty-seven nations were approaching instability with the loss of food security. Food aid from donor countries collapsed as the recession took hold, food prices remained high despite declines in fuel costs, investment in agriculture plummeted, and people in the developing world suddenly had less money to purchase food with as they too lost jobs or remittances from family members working in other countries.

Two broad processes pose concerns for global food security in the future. First, climate change could further jeopardize food crops and security as precipitation patterns are shifted and temperatures increase. The result, if not corrected, could be spreading violence and anarchy, perhaps making the riots of 2008 the opening paragraph for future unrest in the developing world. On its own, climate change is estimated to increase the number of malnourished by between 40 and 170 million globally. Even slight increases in temperature are expected to reduce crop yields, particularly in tropical latitudes, including sub-Saharan Africa.³⁸ Agricultural land may be lost due to decreased precipitation and desertification, reducing food production. Compounding the problem are the generally lower intensity of agriculture and reduced availability of capital for agriculture in the developed world and limited funds to import increasingly expensive staple foods. In Africa, climate change could depress grain production by 2 to 3 percent by 2030,³⁹ while the UNFAO estimates that India could lose 18 percent of its total grain production. Poor and small-scale subsistence farmers will be especially vulnerable to income or food supply disruptions due to climate change given their limited capacity to adapt to a changing climate. Consequently, countries will become more dependent on imported food supplies or be forced to cultivate marginal land or use unsustainable cultivation practices, increasing the likelihood of land degradation.

Second, population growth means more mouths to feed. World population surpassed seven billion in 2012, and the demand for food is expected to double

by 2020, with about 20 percent of this increase attributed to population growth.⁴⁰ Compounding the problem are issues of land fragmentation (smaller farms that are not sustainable); the use of marginal lands for agricultural production in many areas of the developing world; increased urbanization, which is associated with the loss of agricultural lands; increased energy costs, which increase the cost of fertilizers and pesticides as well as increasing the demand for biofuels, which results in land shifted from agricultural production to bio-fuel production; and changes in food consumption practices, including the addition of more meat to traditional diets.

CONCLUSION: THE POTENTIAL FOR CONFLICT?

In his 1994 article “The Coming Anarchy,” journalist Robert Kaplan painted a dire prediction of the world’s future.⁴¹ Robbed of their economic power by globalization, poor leadership, and environmental decay, peripheral states would disintegrate into smaller units defined by ethnicity or culture and ruled by warlords and private armies. Kaplan held out Africa and its seemingly endless list of war-ravaged countries as symbolizing the decay of the current world order, having already succumbed to environmental and demographic distress, leading to the breakdown of traditional civil government. Kaplan argued that violence and conflict have become the norm in many of these locations.

While perhaps sensationalized, the basic question within Kaplan’s article is whether resource scarcity can prompt conflict. A short answer would be yes, with conflict potentially arising from scarcities and disputes over cropland, water, forests, or other resources. As we have seen, these are underlain by population issues. Resource scarcity may lead to harmful social effects, including constrained economic or agricultural production, migration, segmentation of society along ethnic or religious lines, and the disintegration of societal institutions, all of which can lead to conflict.⁴² Effects are often causally linked, oftentimes with some feedback measure that tends to reinforce the initial negative consequences, such that resource capture arising from scarcity may induce further environmental degradation or greater scarcity of the resource.

Although the effects of resource scarcity are still poorly understood, there is a strong possibility and a growing body of evidence that they will affect social stability and ultimately underlie conflict, such as the food riots of 2008. While this is an intuitive assumption, questions remain as to what the exact relationship is and how it works. How, for example, does resource scarcity contribute to conflict? Most likely, it is through a complex set of interactions. Given that population growth will continue in the coming decades, and that scarcities of

renewable resources caused by climate change, depletion, or degradation are relatively certain to occur, it is reasonable to assume that supply, demand, or structural scarcities could result in negative social effects, including reduced agricultural and economic output, migration and displacement, social segmentation, and institutional disruption. In turn, each of these could independently or collaboratively induce conflict.⁴³ In addition, resource scarcity can produce resource capture when actors seek to change the distribution of resources in their favor owing to a decline in the quality or quantity of a resource, leading to the ecological marginalization of weak groups. Both processes further environmental degradation, reinforce poverty, and increase the potential for conflict as groups seek to control resources or address imbalances in the distribution of resources.

The not-so-trivial question that both neo-Malthusians and economic optimists consider is whether the world can provide sufficient food, water, and other resources in the face of continuing population growth. Intuitively, we can find relationships between population growth, resource use, and environmental scarcity. For example, in regions where population growth is high, resources such as food, fuel, and water are often scarce, and the risk of environmental degradation is increased. But this is not a perfect relationship. In fact, understanding the linkages between population growth, environment, and resources is sketchy at best.⁴⁴ However, even if the most alarmist predictions are discounted, there is consensus that population growth slows economic growth and multiplies the damage created by other problems. That is, it is difficult not to conclude that population growth exacerbates land degradation: resource depletion promotes violence and conflict and places pressure upon institutions and governments. This is not to say that population growth is solely responsible for these problems. Environmental degradation, for example, is a function not just of the number of people but of how much and what they consume and how that consumption damages the environment. Nevertheless, population growth is an issue.

What of the broader resource and economic issues? Can the same logic be extended to include the impact of a growing population and increasing consumption upon other resources? Are current levels of resource consumption sustainable? The emerging consensus is that rapid population growth and high young dependency ratios relative to the size of the labor force reduce economic growth by increasing poverty and underemployment, weakening investment in human and physical assets (i.e., education, institutions, family planning, household savings) and decreasing and degrading resources. Worse, rapid population growth and poor economic growth appear to be self-reinforcing, making it exceedingly difficult for countries to pull themselves out of this downward spiral, given the lack of well-developed institutions in many of the poorest countries.

Finally, the developed world is not immune to the consequences of environmental scarcity, feeling the impact of induced migration from developing countries. Internal conflict or the disintegration of most any country would most likely produce large flows of displaced persons and migrants, potentially reinforcing environmental degradation and social segmentation. Much of the migration from rural Mexico or Haiti into the United States, Chinese immigration into North America, and migrations from North Africa into Europe can be attributed to resource scarcity in a broadly defined way. Many of these undocumented migrants are poor who are leaving behind economically or ecologically marginal areas. With few options in their homelands, they seek a new future elsewhere. For receiving countries, immigration alters the population composition of the country, and immigrants are most likely settling in urban areas. As discussed in chapter 7, governments are forced to react, limiting immigration or quelling anti-immigrant sentiments within the larger society. Similarly, the disintegration or political/economic destabilization of states would surely have implications for regional security and trade patterns, and ultimately the developed world. Countries and their governments may be precluded from effectively negotiating agreements, or may be completely excluded by the international community.

STUDY QUESTIONS

1. How does a country's level of development affect its environmental quality and food supply?
2. Drawing equally from the developed world, the less developed world, and the least developed world, select thirty countries and graph gross national income per capita (a measure of income; data available through the Population Reference Bureau's Population Data Sheet) and (1) population and (2) total fertility rate. What trends (if any) do you see, and what are their implications?

FOCUS: RESOURCE CONFLICT

In the past, national and international conflicts have frequently been predicated upon the territorial ambitions of governments and the concept of a nation-state.¹ In the twenty-first century, the nature of conflict is likely to represent the new realities of resource scarcity and population growth, a

potential that is greatest where local institutions are weak, population growth is the greatest, and resources are the scarcest. Consequently, the number of conflicts linked to resource scarcity is likely to increase in the coming decades, with the developing world being at greatest risk.

Having greater dependency upon local resources for economic and agricultural production and prosperity, frequently lacking the financial resources to buffer themselves from the negative effects of resource scarcity, and having fragile institutions, they are also less able to adapt.

If the emergence of resource scarcity potentially leads to conflict, what types of conflict are most likely to occur? Homer-Dixon² convincingly argued that population or resource scarcity issues will increasingly underlie conflicts in the coming years. In particular, he argued that disputes directly related to environmental degradation, ethnic conflicts due to migration and population displacement caused by environmental scarcities, and civil disorder and conflict caused by environmental scarcity that affects economic productivity and livelihood would be the most common in the developing world, where environmental scarcities would interact with and be contextualized by existing economic, cultural, political, or social factors, perhaps even reinforcing conflict and the decline of institutions.

RESOURCES AND CONFLICT

In their simplest case, resource conflicts are easily understood within the traditional paradigms of territory, power, and interstate relations, as states or other actors have commonly moved to secure nonrenewable resources such as oil. Conflicts related to oil include civil wars in Sudan and Angola and Iraq's invasion of Kuwait in 1990, which was partially based upon Iraq's desire to control major oil fields in the region.³ With projections that known world oil supplies are likely to peak within the next twenty years, oil is likely to remain the "prize," a resource that is fought over in the coming years.⁴

Resource capture, whereby the decreasing quality or quantity of a resource interacts with population growth and increasing consumption and encourages groups to control a resource through trade or military conquest, can also be extended to renewable resources (i.e., resources that can be harvested and used up to some threshold without threatening their long-term viability) such as cropland, forests, or fresh water.⁵ Scarcities of some of these resources are increasing rapidly in places, leading to their potential seizure through military or other means, marginalizing groups and increasing resource scarcity or degradation.

Water may ultimately prove to be a key resource, critical for the survival of individuals as well as the state. While water is a renewable resource, its increasing scarcity, reduced not only through consumption but degraded through pollution and salinization and further compromised by climate change, threatens the livelihood and security of states, with the shortage defined as "water vulnerability."⁶ But rather than directly causing conflict, water scarcity tends to limit economic development, promote resource capture, or lead to social segmentation, which in turn produces violence. Moreover, its transnational character, with rivers or underground aquifers crossing state borders, means that the use and actions of one country affect neighboring states. Various observers, including the United Nations,⁷ have not missed the strategic importance of water. In 1995, the World Bank cautioned that wars in the coming century would be fought over water,⁸ a statement that echoed a much earlier prediction by Jordan's King Hussein, who declared that only water issues could incite a war between Jordan and Israel. Years earlier, Egypt's former president Anwar Sadat indicated that he was prepared to use force

if Ethiopia blocked or reduced Egypt's access to waters from the Nile, while Ethiopia chided Egypt for placing water from the Nile on the negotiating table during peace negotiations between Egypt and Israel in 1976.⁹ At other times, water in the Middle East has been described as being more valuable than the oil pumped out of the ground. Still, conflict over scarce water resources is only valid in a limited number of circumstances where the downstream country is dependent on the water and the upstream country restricts its flow. Similarly, conflict is only likely to occur when the water supply is essentially finite (i.e., limited renewal), as it is in many Middle East countries, so that an increasing population means a decreasing per capita supply.

Despite the constraints of downstream and upstream geography, there are multiple examples of water's ability to induce conflict. When water resources and the relationship between states are contextualized by differences in religion and historical animosities, such as between Israel and its Arab neighbors or between Turkey and Syria, the potential for conflict between states is further increased (figure 11F.1). Water resources may have promoted Israel's military campaigns in south Lebanon. When Israel moved to create a security zone to protect its northern boundary, its invasion of southern Lebanon in 1982 placed the waters of the Litani River within Israel's borders for the duration of the occupation, echoing repeated calls dating from as early as 1919 for the Litani River to form the northern border of the Jewish state.¹⁰ Likewise, water has colored relations between Egypt, which is dependent upon the Nile River for fresh water, and its upstream neighbor Ethiopia, with talk of war over water use commonly heard between the two countries. For decades, water allocation from the Nile had been based on a 1920s

colonial-era agreement that allocated all of the water to Sudan and Egypt, while all other states along the Nile received none. Construction of the new dam by Ethiopia (started in 2011) threatens Egypt's water supply, along with a new potential agreement on water use that would effectively shut Egypt out of control over the Nile, further strained relations between the two countries, with talk of armed conflict once again making headlines.¹¹ Relations between Turkey, Syria, and Iraq have also been strained over control and access to the Euphrates and Tigris Rivers, with Turkey's Great Anatolia Project, a massive complex of dams and irrigation systems in eastern Turkey, promising to significantly reduce the flow of the Euphrates when it is completed. What water does reach Syria will be contaminated with runoff laden with fertilizer, pesticides, and salts. Syria is already short of water, and its population growth (2.0 percent, with a 2025 population of 26.5 million) complicates its need for water. Although Syria is wracked by civil war and weak relative to Turkey and therefore does not pose a likely military threat as a provoked downstream neighbor, these two countries have already exchanged threats over water resources. Syria has also allegedly sanctioned Kurdish guerillas fighting the Turkish government over control of eastern Turkey for the creation of a Kurdish state, in the same area as the Great Anatolia Project.¹²

Elsewhere, water has been linked to conflict. In Africa, South Africa's support of a coup in Lesotho in 1986 has been linked to its desire to divert water out of Lesotho and into South Africa.¹³ Also in Africa, the Senegal, Zambezi, and Niger Rivers all flow through several countries, with the Senegal River the focus of conflict between Mauritania and Senegal. In the Lake Chad basin in North Africa, geophysicists have warned of



Figure 11F.1 Israel and Neighboring States

Source: Maps.com.

the shrinkage of Lake Chad.¹⁴ Since the 1960s, it has shrunk by 95 percent, with irrigation and drought the major causes. The loss of water in a region with a growing population of over 750,000, even as the diminished water supply threatens fish stocks and crops, could result in increased

tensions between the four countries (Nigeria, Niger, Cameroon, and Chad) that utilize the lake's water. Finally, there are disputes over water rights in the former Soviet republics of Uzbekistan, Turkmenistan, Kazakhstan, Tajikistan, and Kyrgyzstan, which compete for the limited resources of the

Amu and Syr Rivers. Under the former Soviet Union, the government dammed and diverted the rivers, turning what was literally an arid desert into a huge cotton-growing region.¹⁵ Since the end of the Soviet Union, competing rivalries between the five countries, capitalism, and waste have all but destroyed the system, leading to water shortages and increasing salinization of cropland, while the Aral Sea is literally choked of waters that might replenish it.

CONCLUSIONS

The combined effects of population growth and resulting resource scarcity may mean that the world will witness an increase in conflict at various spatial scales, which may be underlain by issues pertaining to resource scarcity and population growth. Moreover, the speed and regularity with which resource conflicts will occur will increase in the future as resources become increasingly scarce and as populations grow. Developing countries dependent upon local resources but lacking the ability to mitigate scarcities are likely to be affected sooner, facing more regular, more

complex, and more severe problems arising from environmental scarcities. If they do not have the abilities, measured by ingenuity or finances, to overcome these problems, scarcities can overwhelm the country and further erode its ability to overcome the scarcity.

While large-scale conflict is possible, environmental scarcity will likely generate chronic, diffuse violence, with conflicts increasingly at local or subnational scales. As a consequence of globalization, governments may be helpless in the face of environmental stress, escalating poverty and disease and social friction. For peripheral countries, which are already faced with few economic prospects, population growth, disease, and environmental stress, the future is bleak, and conflict will undoubtedly arise between groups over access to scarce resources. With the poorest countries weakened by globalization that has tended to bypass many of them and the increased power of warlords, crime gangs, drug cartels, or guerrilla groups, future conflict may be “borderless,” failing to conform to existing notions of interstate or intrastate conflict, with influence exerted not by a state, but instead by ethnic groups or clans.¹⁶

METHODS, MEASURES, AND TOOLS: WHAT HAVE GEOGRAPHERS CONTRIBUTED TO THE DEBATE?

Throughout the book, geography and the geographical perspective have underlain the discussion. In many instances, geographers and the geographical perspective have made important contributions in areas, including market location and analysis, medical/health geography, land-use

planning, environmental issues, and analytical techniques commonly used by geographers. The contributions of population geographers have been noted in the introduction and throughout the book, particularly those contributions related to population mobility, while geographers

have spent less time working with mortality and fertility. Geographers have also contributed to debates, including climate change (i.e., through the Intergovernmental Panel on Climate Change [IPCC]), water and other resources, food supply and security, international relations, and terrorism. While far from exhaustive, the following represents a sampling of the contributions made by geographers that relate to themes within this book.¹

POLITICAL GEOGRAPHY AND INTERNATIONAL RELATIONS

Harm de Blij argues in his book *Why Geography Matters: Three Challenges Facing America*² that “geographic literacy is a matter of national security” and that

Geographic knowledge constitutes a serious, perhaps critical, disadvantage in an increasingly competitive world. Geographic insights can be crucial in addressing geopolitical problems; they are needed also in decision making in spheres ranging from the cultural to economic.³

It’s not surprising that geographers have long engaged such debates, given the inherently geographical nature of many of the problems identified by de Blij and others. Both Poulson (1995)⁴ and Glassner (1996)⁵ provide an overview of political geography and international relations. Some twenty geographers explored various issues, including socialism, capitalism, and problems of population growth and international migration, in *The Geographies of Global Change*.⁶ Other geographers, including Cutter, Richardson, and Wilbanks (2003),⁷ have explored the links between geography and terrorism, using geographical tools to prevent and prepare for terrorist attacks while also considering how terrorists mobilize

across space and why terrorism develops in particular locations. Stump (2000)⁸ explored religious fundamentalism as a phenomenon that has spread rapidly in recent decades, along with the social and cultural implications for societies.

POPULATION HEALTH AND HEALTH GEOGRAPHY

Population health has not escaped the interest of geographers, with work by Gatrell and Elliott⁹ and Meade et al.¹⁰ Spatial diffusion of disease is closely linked with epidemiology and has formed a cornerstone of work in this area. Later, the role of place was increasingly recognized. Work by Kearns and Gesler (1998),¹¹ for example, developed the importance of place as a determinant of health, an idea that now underpins much of the work in the subdiscipline, including that by Williams and Eyles.¹² Likewise, geographers, including authors such as Gould (1993)¹³ and Kalipeni and Oppong (1996),¹⁴ have made important contributions to the HIV/AIDS discussion and the understanding of patterns of disease transmission. Advances in visualization tools and methods, particularly GIS and spatial analysis, have contributed to this area, but the use of qualitative methods demonstrates the nuances of health geographies.¹⁵

RESOURCE ISSUES

Resource production and use raises multiple issues, including those related to conflict, sustainability, location, and climate change. As such, research in this area often cuts across geographical dimensions, incorporating physical, human, and environmental branches of the field. A large body of

geographical work has built around land and resource use, including water resources, which intersect both physical and human geography. Insight and solutions require knowledge of the hydrologic cycle as well as the relationship between human impacts and the cycle. Amery and Wolf (2000), for instance, have discussed Middle East water resources and links to conflict.¹⁶ Discussion of water resources at other geographic scales, including within the United States, is also of importance and interest, including water laws and groundwater depletion, water rights, and water management, particularly in the Great Plains.¹⁷ The relationship between population growth and energy use, and its link to global climate change, has also attracted the attention of geographers, including that of physical geographers and earth scientists.

AGRICULTURE AND FOOD SUPPLY

A dominating issue throughout the geographic (and other) literature is that of the relationship between population and food supply. Food production might continue to grow faster than the population, and the world will likely be able to feed a much larger population, but the question is how many can the world really feed? It may yet have difficulty feeding its population. Not surprisingly, much of the recent geographical work has also focused on population growth and transformation of agriculture, land tenure, resource conflict, and environmental issues. Turner et al. (1993),¹⁸ for instance, explored the relationship between population growth and agricultural transformation in Africa, concluding that while population growth has spurred change, it also reflects differences in the environment, land tenure systems, technology, and politics. Another geographer, Vaclav Smil, has

explored the ability to feed the world's population. Based on data from the mid-1990s, he concluded that there was more than enough food to feed the world's population based on a daily caloric intake equivalent to that of the average North American. However, Smil also cautioned that the carrying capacity of the earth had already been exceeded, if all six billion were fed a diet similar to that of an average American, particularly given the emphasis on meat proteins in the average American diet.¹⁹ Fortunately, many in the developed world tend to be overfed, the Western diet is wasteful, and there are global inefficiencies in the way food is produced, distributed, and consumed. By correcting these inefficiencies and altering the diet, for example by decreasing or removing animal proteins (which tend to be less efficient users of agricultural resources), Smil estimated that a population of 8.4 billion could be supported, with no new land required for cultivation and no new technologies that dramatically increase agricultural output. Increasing the daily caloric intake would reduce the final population size the earth could support.

Evan Fraser has further updated the discussion around food security, including exploring options toward solving food security issues.²⁰ Like others, Fraser notes that changing diets, growing populations, climate change, limited clean water, and high energy prices will make feeding the planet more difficult in the coming years. As a research chair in global human security, Fraser extends the discussion to consider concepts including science and technology of food production, food distribution systems, local food systems, and regulation as the components that can be leveraged to feed a growing world.

THEORY

A discussion of the contributions to the field of population geography would not be complete without recognizing the role of theory. For much of its history, population geography has been rooted in positivistic frameworks and emphasized data and methods, reflecting the impact of formal demography on the field. Empirical work and data have dominated theory formation, meaning that research, and consequently theoretical advances, has tended to concentrate in data-rich areas, with the

implication that theory formation has been disadvantaged.

Recent discussions have, however, attempted to move the theoretical basis of population geography, so that it has, for example, engaged social geography, as witnessed by authors including Graham, Bailey, and Halfacree and Boyle.²¹ Critical population geography, such as Tyner's 2009 *War, Violence, and Population: Making the Body Count*,²² will also influence the field of population geography and future work. Moreover, the book connects fertility, migration, and mortality with war and conflict.

Conclusion

Doing Population Geography

Marketing

Population Projections: Health Care, Education, and

Transportation

Political Planning

Conclusion

AS OF 2012, WORLD POPULATION was approximately 7.1 billion and continued to grow at a rate of 1.2 percent. Theoretically, this allows the world's population to double in slightly more than fifty years, meaning that the world's demographic situation remains critical by almost any measure. This book has sought to provide an overview of population geography tools and methods by exploring the major demographic issues that the world now faces. It has discussed current knowledge and emerging themes and issues and how they are interrelated: how population affects resources and environmental degradation, how population growth may be related to conflict, the implications of low fertility and an aging society, the impact of HIV/AIDS, and relationships between fertility and population change. But it is also unlikely that anyone will commonly use the techniques discussed here, at least immediately. Instead, most will wait until they enter the labor force to apply some of the knowledge learned here. Even then, it is unlikely that you will be employed as a "population geographer" and hired just because of your knowledge of population techniques.

So where (and how) can the tools of population geography be applied? That is, how do you "do" population geography? Perhaps the most immediate way is through knowledge of population issues. While this may sound somewhat self-serving, it is important for individuals to know how population interfaces with issues, including resource use, conflict, climate change, and general population dynamics. In essence, you have become informed consumers of population

knowledge and better able to participate in conversations relating to population. Domestically, issues such as population aging and immigration will continue to mold political discussions including social security, education, and training, and it is important to have a grasp of some of the basic demographic foundations of these issues.

Rather than being hired as a “population geographer” following graduation, it is more than likely that you will be hired in business, local government, education, or some related field. In fact, it is probably extremely rare to see a job ad that screams “Wanted: One Population Geographer!” But, as a population geographer, you would bring two important qualities to the table. First, you bring your knowledge of population issues and their relationships with related disciplines, including economics, finance, marketing, and policy. Second, your geographic background would enable analysis of problems from a geographic perspective, recognizing the importance of space and geographic relationships.

Population geography also meshes with social and cultural geography, transportation studies, economic geography, and health geography, along with other studies and disciplines. It is, for example, difficult to look at the changing social geography of our cities without considering the population trends that are at work in transforming them. Are, for example, immigrants moving in? Are the native-born staying or moving on? What are the settlement patterns and fertility practices of new immigrants? Do some areas of a city have, on average, older populations, which mean that services may need to be aligned differently than in areas with a comparatively young population? Clearly, such questions also impinge on the economic and political functioning of the city. The following discusses a few of the “real-world” applications using the basics of population geography.

MARKETING

Perhaps one of the most interesting and influential uses of population information is found in marketing, where knowledge of population structures is more than just useful: it could mean the success or failure of a product line or company. For example, the successful pitch of a new product or service that is geared toward teenagers would not find traction in a retirement community. That is, knowledge of population structure, including its sociodemographic and socioeconomic composition, allows companies to target their products toward those most likely to purchase them. Similarly, segmentation of a market refers to the packaging or promotion of a product directly toward specific groups, including the use of advertising or products in particular languages (i.e., Spanish for a Hispanic population).

Marketing of goods and services through population targeting and market segmentation could be accomplished with basic demographic and economic data available from the US Census Bureau and related sources, such as the Bureau of Labor Statistics or the *Statistical Abstract of the United States* (with most of these resources available through the Internet). Information on population descriptors such as age, births, gender, race or ethnic status, and income enable targeting of products given that individuals have different needs and tastes across these dimensions. Small-scale information, including at the scale of the neighborhood, provides more fine-grained analysis of the local population, although such information is not often freely available and must be purchased.

A widely used demographic tool is Potential Rating Index for Zip Markets (PRIZM) (Claritas Corporation), a tool that divides the nation based on shared demographic traits, lifestyle preferences, and consumer behaviors.¹ That is, it works from the principle that people with similar lifestyles tend to live near each other. PRIZM divides the country up into sixty-six lifestyle groups (based on 2008 segmentation), describing each neighborhood in the United States to enable marketing to specific groups. For example, a component of the well-known 90210 zip code (Beverly Hills, California) includes the “blue blood estates.” This segment is described as older, wealthy families with children living in multimillion-dollar homes with manicured lawns. Many of those living here hold advanced professional degrees or are in management and have a median household income (2010) of \$145,915,² representing some of the wealthiest of US households. Other neighborhoods in the same 90210 zip code include “money and brains,” “movers and shakers,” and the “young digerati.” Elsewhere in the nation, neighborhoods may be characterized as “Asian affluence” or “tools and trucks.”

POPULATION PROJECTIONS: HEALTH CARE, EDUCATION, AND TRANSPORTATION

Earlier on, the “Methods, Measures, and Tools” discussion in chapter 1 focused on population projection techniques. Increasingly, such tools are found in a variety of applications. Marketers may want, for example, to know what the demographics of an area will be like ten, twenty, or thirty years down the road, so that companies can start planning for changing demographics. Similarly, financial planners may want to know the age and gender structure of future populations, with the corresponding implications for savings rates and consumption of goods and services. Population projections are also required in education and health care planning. How, for instance, can health care planners decide on the location of a new hospital or clinic? How can educators and

boards of education respond to local demographic change? Can they close or open new schools? Where do they locate new schools? How are new schools to be paid for?

Regardless of perspective or background, the key issue turns on population structure and aging. Aging populations, for example, mean greater demand on health care facilities and greater time spent in care, while the overall number of students engaged in school decreases. Likewise, older populations will have different marketing and financial needs than younger ones. But, while population aging is a national phenomenon, not all areas or neighborhoods will experience population aging and decline. Instead, population aging and growth will be irregular over local areas, with new suburban areas concentrating growth and older areas more likely to be associated with older populations.

In all cases, the key questions are therefore based on knowledge of the underlying demographic structure and its future dimensions. Clearly, school board planners do not want to spend large amounts of money to build a new school in an area that cannot support its current or future use. Consequently, school boards will use projections and surveys to see where population growth is occurring to derive enrollment projections. Faced with a smaller cohort of young, college/university administrators have looked to university participation rates and population change to highlight if particular groups or regions are underrepresented in the nation's postsecondary education system. Likewise, the health care industry is unlikely to invest in new maternity facilities in locations with aging populations and low birth rates, while urban and transportation planners may need to project the population to evaluate future transportation and housing scenarios.

Population projection therefore offers a way to look into the future, enabling urban planners and others to make informed decisions about their future plans. For instance, as part of the Places to Grow legislation (see chapter 9, "Focus"), local municipalities were required by the Ontario provincial government to project their urban populations under different planning assumptions, such as increased population density at particular locations in the city. In another case, concerns with aging populations have led to the analysis of what aging populations mean for transportation sustainability. Recent research provides evidence suggesting that as people age they become more dependent on the automobile.³ This suggests that in the coming decades there will be a significant increase in both the number and the percentage of older drivers in urban areas. Despite these observations, the relationship between the aging population and the sustainability of the transportation system has not been fully addressed.

As part of a large project looking at the relationship between population aging and transportation needs in Hamilton, Ontario, the future age structure and distribution of Hamilton's population at the census tract scale needed to

be modeled.⁴ For example, given internal migration in and out of a metropolitan area, population aging, and declining births, where would the old be concentrated in the future, and what would the relationship to services and transportation look like? The authors proposed a demographic model based on the Rogers model, but applied it to small areas (census tracts) by adjusting migration data that was typically available only at more aggregate levels. While not all population projection models are as complex as this was, they will become increasingly valuable as the need for small-area data increases.

POLITICAL PLANNING

Another demonstration of the use of population geography lies in political planning. As noted earlier, the US census is used to determine how membership in the House of Representatives (and state legislatures) should be apportioned (i.e., the number of representatives each state has). Both US congressional and state legislative districts must be drawn so residents have fair representation, necessitating geographically detailed data.⁵ The need for careful analysis is even greater in the age of the Internet: beginning with reapportionment after the 1990 census, individuals participated in the discussion like never before, with the availability of demographic data giving individuals and groups the opportunity to comment on reapportionment and to present their own plans.

CONCLUSION

Aspects of population geography and demography also underlie broad, lay-based discussions. In Canada, David Foot's 1996 book *Boom, Bust, and Echo: How to Profit from the Coming Demographic Shift*⁶ grounded the discussion of Canada's changing demographics and what they would mean for such things as finance, property values, marketing, and urban planning. More recently, Richard Florida linked population trends, and specifically human capital (as a measure of the level of education or creativity in a population),⁷ with city growth and economic performance. Underlying many of his assumptions and work was that migration flows cause variations in human capital across geographic space, although the impact of internal migration is tempered by the role of international migration and a city's ability to generate human capital among its own population, all of which vary by geographic scale.⁸ In the Canadian context, immigration was a key supplier of new human capital for the largest metropolitan areas, while domestic migration was much more important at the local scale.

The point of this discussion is that knowledge of population geography underlies so many of the debates and policies in today's world. Moreover, the rapidly increasing availability of population and geographic data in the United States and other countries, along with the computational abilities and analytical techniques to work with the data, has meant an explosion in the area of population geography or more formal demography. Businesses, governments, educators, and nongovernment organizations all put population to work so that they can better understand current and future trends.

Notes

POPULATION GEOGRAPHY: AN INTRODUCTION

1. *World Population Data Sheet* (Washington DC: Population Reference Bureau, 2012), www.prb.org. Unless otherwise noted, population statistics throughout this text are drawn from this source.

2. Following UN classification, the developed world includes Europe, North America, Australia, Japan, and New Zealand. The developing world includes all countries and regions outside the developed world.

3. Kathleen Newland, "Refugees: The New International Politics of Displacement," in *Perspectives on Population*, ed. Scott W. Menard and Elizabeth W. Moen (New York: Oxford University Press, 1987), 314–21.

4. See the United Nations High Commissioner for Refugees website, www.unhcr.org (accessed 6 May 2013).

5. Of course, people were doing "population geography" well before this time, and the field of demography has also existed for a much longer time period.

6. Patricia Gober and James A. Tyner, "Population Geography," in *Geography in America at the Dawn of the Twenty-first Century*, ed. Gary L. Gaile and Cort J. Willmott (Oxford: Oxford University Press, 2005), 185–99.

7. The AAG (www.aag.org) is the national academic organization of geographers. This group holds annual meetings and publishes the *Annals of the AAG* and the *Professional Geographer*. The Population Specialty Group sits within the AAG and is a group of researchers interested in population studies. Trewartha's text is reprinted in Glen T. Trewartha, "A Case for Population Geography," *Annals of the Association of American Geographers* 43 (1953): 71–97.

8. David A. Plane, "The Post-Trewartha Boom: The Rise of Demographics and Applied Population Geography," *Population, Space, and Place* 10 (2004): 285–88.

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15. James P. Allen and Eugene Turner, "Spatial Patterns of Immigrant Assimilation," *Professional Geographer* 48, no. 2 (1996): 140–55.
16. Ellen Percy Kraly, "Emigration: Implications for US Immigration Policy Research," in *Mexico/US Migration Patterns*, Research Papers, ed. E. Loaza and S. Martin (Washington DC: Commission on Immigration Reform, 1997), 105–19; Kevin McHugh and Richard Mings, "The Circle of Migration: Attachment to Place in Aging," *Annals of the Association of American Geographers* 86 (1996): 530–50.
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31. See, for example, Hussein Amery and Aaron T. Wolf, *Water in the Middle East: A Geography of Conflict* (Austin: University of Texas Press, 2000).
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3. Gelbard, Haub, and Kent, "World Population." The PRB has a number of useful reports on population issues, most of which are available online at www.prb.org.

4. See UN, "World Population Projected to Reach 9.6 Billion by 2050 with Most Growth in Developing Regions, Especially Africa—Says UN," press release, 13 June 2013, http://esa.un.org/unpd/wpp/Documentation/pdf/WPP2012_Press_Release.pdf (accessed 9 July 2013).

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13. Phillip Longman, *The Empty Cradle: How Falling Birthrates Threaten World Prosperity* (New York: Basic Books, 2004). See also *World Population Ageing: 1950–2050* (New York: United Nations, 2002).

14. Carl Haub and O. P. Sharma, "India's Population Reality: Reconciling Change and Tradition," *Population Bulletin* 61, no. 3 (September 2006).
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18. Philip Martin and Gottfried Zurcher, "Managing Migration: The Global Challenge," *Population Bulletin* 63, no. 1 (March 2008).
19. Jason DeParle, "World Banker and His Cash Return Home," *New York Times*, 17 March 2008, A7.

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7. For additional discussion of the determinants of fertility, see chapter 4.
8. US Census Bureau, <http://www.census.gov/population/projections/>.
9. Mary M. Kent and Mark Mather, "What Drives U.S. Population Growth?," *Population Bulletin* 57, no. 4 (December 2002).
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12. Laura E. Hill and Hans P. Johnson, *Understanding the Future of Californians' Fertility: The Role of Immigrants* (San Francisco: Public Policy Institute of California, 2002).

Methods, Measures, and Tools: Graphical Representation

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2. Information on John Snow can be found at <http://www.ph.ucla.edu/epi/snow.html> (accessed 15 July 2013).
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5. A good discussion of design of color maps can be found at <http://www.personal.psu.edu/cab38/ColorBrewer/ColorBrewer.html> (accessed 13 July 2013).
6. Mark Monmonier, *How to Lie with Maps*, 2nd ed. (Chicago: University of Chicago Press, 1996).
7. Further information on GeoDa can be found at <http://geodacenter.asu.edu>. R is a freeware-based program. S-Plus information can be found at <http://www.insightful.com/products/splus/>. Other resources, including the Center for Spatially Integrated Social Sciences (CSISS, www.csiss.org/) or www.spatialanalysisonline.com, are also available.

Methods, Measures, and Tools: Population Estimates and Projections

1. Readers may also want to turn to the US Census Bureau, which also uses population estimation and projection (<http://www.census.gov/population/projections/>).
2. For a full discussion of these methods, see Andrei Rogers, *Regional Population Projection Models* (Beverly Hills, CA: Sage, 1995).
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CHAPTER 2: POPULATION DATA

1. In the 2000 census, the US Census Bureau employed 860,000 temporary workers. Census 2010 was field tested in 2003, 2004, 2005, and 2006, and a final "dress rehearsal" was held in 2008.
2. Frank A. Vitrano and Maryann M. Chapin, "Possible 2020 Census Designs and the Use of Administrative Records: What Is the Impact on Cost and Quality?," US Census Bureau, http://www.fcsbm.gov/12papers/Chapin_2012FCSM_III-A.pdf (accessed 22 May 2013). See also Robert Goldenkoff and David A. Powner, *2010 Census: Little Time Remains to Address Operational Challenges* (Washington, DC: US Government Accounting Office, 2009).
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CA: Sage, 2006); and James E. Burt, Gerald M. Barber, and David Rigby, *Elementary Statistics for Geographers*, 3rd ed. (New York: Guilford Press, 2009).

4. One excellent source that provides information on data sets is www.icpsr.org. Also, see the website documentation in this book for additional links to data sources.

5. Links to other national statistical agencies can be found at <http://www.census.gov/population/international/> (accessed 15 July 2013).

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8. See <http://ciesin.org/index.html> (accessed 15 July 2013).

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CONCLUSION: DOING POPULATION GEOGRAPHY

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Glossary of Key Terms and Acronyms

age pyramid: Representation of a population distributed by age and sex.

aging: An increase in the proportion of population in older age groups.

AIDS: Acquired immunodeficiency syndrome.

alien: A person resident in a country who has not acquired citizenship by naturalization.

antinatalist: Positions or policies that discourage fertility and childbearing. Disincentives may include reduced child benefits or other, more repressive options.

antiretroviral drugs: The class of drugs that are used to suppress the HIV virus, inhibiting the development of HIV into AIDS. Also known as the “triple cocktail.”

assimilation: The economic, social, cultural, and political processes of adjustment undergone by immigrants, transforming them into citizens of the host country.

asylees: Individuals forced out of their country of origin and seeking refuge in the new country in which they are living.

asylum: The act of seeking refuge and protection within a country.

baby boom: The rise in birth rates in many Western countries between 1946 and 1964.

bracero: Mexicans who were admitted legally into the United States for labor between 1942 and 1964.

BSI: Border Safety Initiative. Run by the Border Patrol to educate would-be illegal entrants of the dangers of crossing the border and to provide medical assistance if needed.

carrying capacity: The maximum number of organisms that can be theoretically supported in a habitat for an indefinite period of time; dependent upon the social, economic, political, and natural systems as well as upon the level of consumption.

CIC: Citizenship and Immigration Canada.

cohort: A group of individuals born in the same calendar year or group of years.

counterurbanization: The shift in net migration flows away from large metropolitan centers toward nonmetropolitan areas.

demographic transition (DTT): Process whereby a country moves from high to low mortality and fertility rates, accompanied by rapid population growth.

dependency ratio: The ratio of people of dependent age (zero to fourteen, sixty-five-plus) to the economically active population (fifteen to sixty-four). The young dependency ratio is the ratio of those aged zero to fourteen to those in the labor force and is usually associated with rapid population growth.

developed world: Following UN classification, the developed world includes Europe, North America, Australia, Japan, and New Zealand.

developing world: All countries and regions outside the developed world.

doubling time: The number of years it will take the population to double assuming a constant rate of natural increase.

ecological footprint: A measure of environmental sustainability, based upon past and present demands of the earth's natural resources.

ecological marginalization: The forced movement of individuals or groups into ecologically marginal areas.

economic optimists: Individuals who believe that population growth stimulates economic development.

emigrant: A person who leaves one country to settle in another.

epidemiological transition: Shifts in health and disease patterns as mortality moves from high to low rates.

FAO: United Nations Food and Agricultural Organization.

fecundity: The physiological ability of individuals to have children.

fertility: The ability to reproduce.

fertility transition: The shift from high to low fertility.

green revolution: The improvement in agricultural productivity in the 1940s and 1950s associated with new high-yield crop strains, fertilizer, irrigation, and pesticide use.

gross domestic product (GDP): The total value of goods and services produced by a country, not including international trade.

HIV: Human immunodeficiency virus, the virus that causes AIDS.

illegal migrants: Individuals entering a country without proper documentation or approval.

immigrant: A person who moves into a country where she or he is not a native to take up residence.

immigration gap: The differential between states' immigration policy and their outcomes.

infant mortality rate (IMR): Annual number of deaths of infants under one year of age per one thousand live births.

INS: US Immigration and Naturalization Service.

interdiction: The policy of stopping would-be refugee or asylee claimants before they enter a country and initiate the refugee claim process.

internally displaced persons (IDPs): Individuals or groups forced to flee homes to escape armed conflict, violence, human rights abuses, or disaster. Unlike refugees, they are not residing outside their country of nationality.

IRB: Immigration Review Board (Canada).

IRCA: Immigration Reform and Control Act (1986).

least developed countries: Defined by the United Nations, those countries where per capita income is less than \$900 (US) per year.

life expectancy: The average number of years beyond age x an individual can expect to live under current mortality levels. Usually expressed as life expectancy at birth.

lifespan: The longest period over which a person may live.

logical positivism: A school of philosophy that combines rationalism based on mathematical and logical constructs with empiricism (the idea that observational evidence is indispensable for knowledge of the world).

Malthusian: References the writings of Malthus, who believed that population grows geometrically but food supplies grow linearly, resulting in an inadequate food supply and population decline through famine, disease, or war (positive checks).

maquiladoras: Assembly plants employing Mexicans where parts are shipped to Mexico, assembled, and then re-exported for sale, allowing companies to benefit from the cheaper labor.

Marxist: Adherent to the theories of Karl Marx.

megacity: A city with a population over ten million.

morbidity: Sickness.

mortality (death) rate: The annual number of deaths per one thousand people. This rate is not age standardized to account for differential death rates across age groups.

natural increase: The birth rate minus the death rate, indicating the annual rate of population growth (without migration) expressed as a percentage.

neo-Malthusian: An individual who accepts Malthusian principles, but who believes birth control methods can be used to reduce population growth.

non-refoulement: The basic tenet of United Nations Refugee Convention that prohibits states from returning refugees against their will to their origin.

nonrenewable resources: Finite resources, such as oil or minerals.

overstayers: Individuals who enter a country legally, but who remain in the country after their permission to do so expires.

population explosion: The rapid growth of the world's population.

population momentum: The potential for population growth that is present within the age/sex structure of a population, even if fertility rates were to drop to replacement level.

prevalence: The number of people in a population sick with a disease at a particular time, regardless of when the illness began.

pronatalist: Policies that favor a high birth rate. May include tax incentives, cash bonuses for number of children born in excess of the first, day-care provision, or parental leaves.

Proposition 187: Legislation in California meant to limit access to education and health services among illegal immigrants, passed by a majority in 1994 but ruled unconstitutional by a federal judge.

quota system: US immigration policy that imposed quotas on the number of immigrants based upon a defined base (northern European) population.

refugees: Individuals or groups who, owing to well-founded fear of being persecuted for reasons of race, religion, nationality, membership in a particular group, or political opinion, are outside the country of nationality and are unable or unwilling to return.

renewable resource: Resources such as water, cropland, or forests that can be used indefinitely, provided a threshold of sustainability is not exceeded.

replacement fertility level: The fertility rate (2.1) that is required to exactly replace a generation, accounting for death before completion of childbearing years.

resource capture: Control of a scarce resource through the use of legislation or other means.

rivalrous resources: Resources that are used by one or more actors, which reduce their availability for others.

social segmentation: The division of society, typically along class, ethnic, or religious lines.

STDs: Sexually transmitted diseases, including syphilis, gonorrhea, or HIV.

sustainable development: The level of human activity that meets the needs of the present without compromising the ability of future generations to meet their own needs, subject to constraints.

TFR: Total fertility rate. The average number of children a woman would have assuming that current age-specific birth rates remain constant through the childbearing years (ages fifteen to forty-nine).

transmigrant: Refers to the relocation of individuals from one area to another. Typically refers to the relocation of Indonesians out of Java to other regions or Russians to other republics or satellite states.

UNAIDS: United Nations program on HIV/AIDS.

UNHCR: United Nations High Commissioner for Refugees.

UNICEF: United Nations Children's Fund.

urban: Describes a concentration of people in space whose livelihoods are organized around nonagricultural activities. Different countries will define the urban threshold differently.

USAID: United States Agency for International Development.

USCRI: United States Committee for Refugees and Immigrants.

WHO: World Health Organization.

ZPG: Zero population growth. The situation in which the population does not change in size from year to year.

Population Websites

Websites are current as of July 2013. Note that websites are not necessarily permanent, so the correct address cannot be guaranteed.

GENERAL

<http://www.population.com>

Population.com provides world news related to demography.

<http://esa.un.org/unpd/wpp/Documentation/publications.htm>

UN website that includes population prospects and projections by country.

<http://www.iom.int>

The International Organization for Migration (IOM) is an intergovernmental organization that promotes migration for economic development, the understanding of migration issues, and humanitarian programs to assist refugees and displaced persons. Among its publications, IOM publishes *International Migration*, a quarterly peer-reviewed journal.

<http://www.cis.org>

The Center for Immigration Studies (CIS) is a nonprofit organization devoted to research on and policy analysis of immigration. Site includes recent numbers, background reports, and news, reflecting a diversity of issues and opinions.

<http://www.populationinstitute.org>

The Population Institute provides information about population issues and promotes programs to reduce population growth.

<http://www.populationconnection.org>

Population Connection is an organization that has actively promoted a reduction in population growth. The website includes many topical links and information as well.

<http://www.npg.org>

Negative Population Growth (NPG) is an organization that educates the American public on the dangers of population growth. The website provides alternate perspectives to population issues, advocating a smaller US population and reduced immigration levels in order to create a sustainable future. The site provides links to like-minded organizations, such as Californians for a Sustainable Population, along with mainstream agencies or groups such as the US Citizenship and Immigration Services (USCIS).

<http://www.refugees.org>

The United States Committee for Refugees is a private organization that helps refugees. The site includes information on refugees and asylees throughout the world.

<http://www.acf.hhs.gov/programs/orr/>

This is the website of the US Office of Refugee Resettlement (ORR), providing information on refugee legislation and resettlement within the United States.

<http://www.popcouncil.org>

The Population Council is an international nonprofit organization devoted to biomedical, social science, and public health research related to population issues.

<http://www.psi.org>

Population Services International, a nonprofit organization, seeks to increase the availability of health and population control products and services in low-income areas of the world.

SOURCES OF DEMOGRAPHIC STATISTICS

<http://www.nhgis.org>

The National Historical GIS website (through the Minnesota Population Center) provides historical census data (from 1790 onward) along with shapefiles for each census.

<http://www.aecf.org>

The Annie E. Casey Foundation has worked to promote opportunities and environments for children and families in the United States. The website includes demographic data on children within the United States.

<http://www.prb.org>

This is the website for the Population Reference Bureau (PRB). It is a very useful site for both lay and academic interests in population issues, including data, information, publications, and other services relating to the United States and the world.

<http://www.ciesin.org>

The Center for International Earth Science Information Network (CIESIN) at Columbia University is a nonprofit, nongovernmental organization. The website includes detailed demographic information, including interactive mapping from the US Census Bureau, census data, and other data sources, including environmental information and social indicators of development.

<http://www.census.gov>

The home page for the US Census Bureau. It includes information on the 2010 census and downloadable information and data on the United States at a variety of spatial scales. It also contains links to international statistical agencies, such as those in Mexico, the United Kingdom, and Germany.

<http://www.census.gov/ipc/www/idb/>

The International Data Base (IDB) section of the US Census Bureau is particularly useful for demographic and socioeconomic data on other countries.

<http://www.statcan.ca/start.html>

This is the Statistics Canada home page. The site is available in both French and English, with information and data that are downloadable.

<http://www.cic.gc.ca>

Citizenship and Immigration Canada (CIC) maintains information on immigrant and refugee arrivals in Canada, along with current policy information and some historical records.

<http://www.dhs.gov/index.shtm>

The US Department of Homeland Security (DHS) website includes links to Border Patrol and Management, and recent statistics on the origins of immigrants, immigrant classes, and the settlement of arrivals, including the immigration yearbook.

<http://www.usaid.gov>

The United States Agency for International Development (USAID) website includes information on current programs, missions, and statistics.

<http://www.cdc.gov>

The Centers for Disease Control and Prevention (CDC) is the leading federal agency for prevention of disease and promotion of health. The site includes information on health topics and statistics for the United States and the world.

<http://www.cdc.gov/nchs>

The CDC provides links to the National Center for Health Statistics (NCHS), which includes vital statistics, including data on births, deaths, and marriages. Links to state health units are provided.

<http://www.worldbank.org>

The World Bank has a large amount of comparative world data, including population.

UNITED NATIONS

<http://www.unaids.org>

This website is operated by the United Nations and other health groups. It contains up-to-date information on the HIV/AIDS epidemic and links to other sources.

<http://www.who.int>

The home page for the World Health Organization (WHO), which monitors world health. Includes updates on world health and health initiatives, and the WHO Statistical Information System (WHOSIS) provides access to the latest world health data.

<http://www.unhcr.org>

Website for the United Nations High Commissioner for Refugees. Includes publications and up-to-date statistics.

<http://www.un.org/unrwa/>

This is the home page of the UN Relief and Works Agency for Palestine Refugees in the Near East.

<http://www.unicef.org>

United Nations Children's Fund website. Includes resources and statistics related to children's health.

<http://www.un.org/popin/>

The United Nations Population Information Network coordinates population information activities at a variety of scales. Resources include links to other sites as well as an electronic library.

<http://www.un.org/esa/population/>

The United Nations runs its own population division, responsible for providing current data on population and development.

<http://www.unfpa.org>

The United Nations Population Fund helps developing countries with population issues. The UNFPA website includes information on recent programs.

<http://www.fao.org>

The United Nations Food and Agricultural Organization's website includes information and statistics relating to nutrition, food, forestry, fisheries, and agriculture.

BIBLIOGRAPHIC DATABASES

<http://canada.metropolis.net>

This is the website for the Canadian Metropolis project, linking researchers who focus on immigration issues at institutions across Canada and throughout the world. The site has a digital library of papers produced by its associates, many of which are downloadable free of charge.

<http://www.popline.org/>

Billed as the world's largest online bibliographic database on population issues, POPLINE is based at Johns Hopkins University.

ACADEMIC SITES

<http://www.ccis-ucsd.org>

The Center for Comparative Immigration Studies at the University of California, San Diego, includes information on programs and research areas and links to other sites.

<http://www.cpc.unc.edu>

The Carolina Population Center is a community of scholars and professionals collaborating on interdisciplinary research and methods.

<http://www.psc.isr.umich.edu>

The Population Studies Center at the University of Michigan focuses on both domestic and international population issues.

<http://www.iussp.org>

The International Union for Scientific Study in Population promotes scientific studies of demography and population-related issues.

<http://www.uu.nl/uupublish/onderzoek/onderzoekcentra/ercomer/24638main.html>

The European Research Center on Migration and Ethnic Relations (ERCOMER) is a European research center that focuses on comparative migration analysis, ethnic relations, and ethnic conflict, based at the Utrecht University in the Netherlands.

<http://opr.princeton.edu/archive/>

The Office of Population Research websites offer links to demographic centers throughout the world, as well as links to other statistical resources and organizations.

<http://www.populationassociation.org>

The Population Association of America is a society of professionals working in the population field. Links include publications.

<http://gpem.uq.edu.au/image>

The Internal Migration Around the Globe (IMAGE) project investigates how internal migration varies globally by country.

<http://www.migrationinformation.org/datahub/index.cfm>

The Migration Policy Institute website includes US and international data on immigration.

SELECTED JOURNALS

Demography (the official journal of the Population Association of America)

<http://www.populationassociation.org/publications/demography/>

European Journal of Population

<http://www.springer.com/social+sciences/population+studies/journal/10680>

Journal of Ethnic and Migration Studies

<http://www.tandf.co.uk/journals/carfax/1369183X.html>

Journal of Population Research

<http://www.springer.com/social+sciences/population+studies/journal/12546>

Immigrants and Minorities

<http://www.tandf.co.uk/journals/titles/02619288.asp>

International Migration Review

<http://www.wiley.com/bw/journal.asp?ref=0197-9183>

Population and Environment

<http://www.springer.com/social+sciences/population+studies/journal/11111>

Population Bulletin

<http://www.prb.org>

Population Development Review

<http://ordering.onlinelibrary.wiley.com/subs.asp?ref=0098-7921>

Population Research and Policy Review

<http://www.springer.com/social+sciences/population+studies/journal/11113>

Population, Space, and Place

<http://www3.interscience.wiley.com/journal/106562735/home?CRETRY-1&SRETRY-0>

Population Studies

<http://www.lse.ac.uk/socialPolicy/researchcentresandgroups/PIC/populationStudies/Home.aspx>

Professional Geographer

Although not a population geography journal per se, it often carries population papers.

<http://www.aag.org>

Studies in Family Planning

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Index

- abortion, 66, 82–83, 92, 223–224; sex selection, 83–84, 224
- Afghanistan, 2, 110, 178, 180, 184, 192
- Africa, 1, 7, 22, 67, 189; conflict in, 180, 182, 246, 250; fertility, 20, 23, 82–83, 90–91; HIV/AIDS in, 64, 91–92, 110–118; mortality, 23, 91, 108; refugees, 178, 190, 193; sub-Saharan, 2, 17–18, 21, 49, 91, 101, 220, 245
- African Americans, 103–105, 111, 135, 166
- age pyramids. *See* population pyramids
- aging, 21, 25–26, 29, 155, 258; China, 17, 26, 74, 222; implications of, 26, 27, 87–89, 260; in United States, 31, 64, 68, 72–73
- AIDS. *See* HIV/AIDS
- aliens, illegal, 2, 5, 27, 51, 153–154, 157–159, 161–170, 172, 175, 187, 194, 217–218
- American Community Survey, 43, 52, 54–55, 129, 153
- antiretroviral drugs, 114
- assimilation, 5, 7, 41, 183. *See also* balkanization debate; nativism
- asylees. *See* refugees and asylees
- asylum, 173, 175, 177, 179–180, 185–187, 193–194. *See also* refugees and asylees
- baby boom, 7, 26, 31, 64, 67–68, 72–73, 81, 94–95, 224–225, 232
- balkanization debate, 27, 157
- Bangladesh, 24, 25, 85, 90, 119, 205–206
- birth control. *See* contraception
- Bongaarts, John, 82, 84
- Border Patrol, 160, 164, 167–170; Border Safety Initiative, 170
- Boserup, Ester, 88, 238, 240
- Botswana, 65, 110–111, 115
- Bracero Program, 150, 172, 217
- Brazil, 24, 208
- Canada, 43, 45, 60, 67, 83, 94, 261; aging, 26, 87, 89; legal immigration to, 27, 150, 156–157, 216; Quebec, 94, 232; refugees, 182, 186–187
- carrying capacity, 254
- census, 11–12, 36, 39, 42, 44–45, 49, 50–51, 56–57, 129–131, 144
- child mortality rate, 106, 125
- China, 17, 24, 25, 237, 244; aging in, 74; fertility, 20–22; food security, 244; Hukou system, 205, 219; one child policy, 17, 22, 26, 66, 84, 90, 229–232; sex selection, 83, 224
- Clark, William, 8, 166
- conflict, 7, 179–181, 184, 246–252
- contraception, 83, 93, 95–96, 221–222, 230, 233
- Cornelius, Wayne, 172
- counterurbanization, 144–145, 203
- Cuba, 103, 163; refugees, 2, 179, 183–184, 191, 193–194
- data: analytical packages, 12; quality, 48–49; presentation, 10, 13, 31–32; sources, 44–48; types, 11, 43
- death rates. *See* mortality
- demographic transition theory (DTT), 18, 19, 20–21, 29, 79, 84–85, 95, 99
- Department of Homeland Security, 47, 161, 170, 174
- dependency ratio, 67, 68, 69, 72, 247
- determinants of health, 120
- developed world, 17–18, 21, 25; fertility in, 23, 81, 83, 220; immigration, 26–27, 150, 152, 179, 187, 216; leading causes of death in, 102–104, 118–119; mortality transition, 101–102; urban growth, 18, 197, 201, 203
- developing world, 1, 20;

- conflict in, 245–249;
 fertility, 21, 83, 87, 89–91, 220; HIV/AIDS in, 113–118, 120; immi-
 gration, 149–150;
 infectious and parasitic
 diseases, 108–110, 123;
 leading causes of death in,
 102–104; mortality, 99,
 101, 118–119; population
 growth in, 17–18; urban,
 18, 119, 197, 201,
 205–206, 209
 doubling time, 17, 21
 DTT. *See* demographic tran-
 sition theory
- Easterlin, fertility transition
 theory, 84–85, 242
 ecological marginalization,
 243, 247
 economic development, 88,
 91, 144, 155, 157, 226,
 240–243, 249
 Egypt, 17, 25, 90, 155, 194,
 249–250
 elderly, 74, 87–89, 100, 104,
 118, 138, 155, 165, 222,
 232
 emigrants, 174–175
 environmental degradation, 1,
 8, 209, 243, 246–249, 257
 epidemiological transition,
 99, 101–102, 106, 123
 Europe: aging, 26, 88,
 222–223; fertility in, 81,
 83; immigration to, 27,
 150, 156–157, 217; popu-
 lation growth, 16–18, 23,
 29; refugee and asylee
 policy, 181–182,
 186–187; urban,
 199–201, 213
 E-verify program, 158,
 166–167
- fecundity, 82, 84
 fertility, 1, 3, 20–21, 25,
 29–31, 79, 94–96,
 241–243; Africa, 23,
 89–92; antinatalist
 policies, 220–222; China,
 17; determinants of,
 19–20, 81–86; Europe, 8,
 18, 23, 26, 29; family
 planning programs,
 225–228, 233–234; India,
 22–23, 220–221;
 measuring, 96–97;
 missing women, 224;
 pronatalist policies,
 222–224; Quebec,
 232–233; replacement
 level, 20, 87; total fertility
 rate, 12, 80
- Florida, Richard, 261
 food supply, 120, 228, 236,
 244–245, 254
 France, 18, 158, 173, 182,
 217, 223
- GDP, 103, 117, 241
 geographic information
 system, 6, 11, 13, 32, 51,
 69
 geography: journals, 4;
 perspective, 5–7; profes-
 sional organizations, 3;
 research themes, 4–8;
 spatial scale, 9–11
- Germany, 23; fertility, 29;
 guest-worker program,
 150, 172–173; immi-
 gration, 158, 217; refugees
 and asylees, 182, 186
 globalization, 26–27, 152,
 155, 173
 green revolution, 236
- Haiti, 85; refugees, 179, 193
 health, provision of, 74, 87,
 89, 91, 92, 100, 104, 109,
 114, 118, 120–121
 Hispanic, 31, 72–73, 95, 103,
 154–156, 166, 216
 HIV/AIDS, 2, 110–111, 112,
 113, 114, 222; in Africa,
 64, 111–114, 123; among
 African Americans, 111;
 drugs, antiretroviral, 114;
 implications of, 114, 115,
 116–118; orphans, 116;
 prevalence rates,
 110–111, 113; prevention,
 222; transmission of, 83,
 110–111, 112
- Homer-Dixon, Thomas, 117,
 239, 243, 249
 human capital theory of
 migration. *See* migration
- IDP. *See* internally displaced
 persons
- immigrant smuggling, 167,
 188
- immigration, 26–28, 89, 150,
 216–218, 234; Canadian
 policy, 217; economic and
 demographic impacts of,
 72–73, 153–156;
 European policy,
 156–157, 216; illegal,
 161–167; impact on popu-
 lation growth, 202, 222;
 measuring, 174–175;
 nativism, 157; statistics,
 45, 47; theory, 151–152;
 transnational, 170–171;
 US policy, 72, 158–161,
 186
- immigration gap, 172–173,
 175, 217
- Immigration Reform and
 Control Act (IRCA), 161,
 173, 217–218
- IMR. *See* infant mortality rate
- India, 17, 27, 29–30, 242;
 fertility, 22–23, 67, 72, 83,
 205, 208, 220–221, 233
 indigenous populations, 109,
 123
- infant mortality rate (IMR), 1,
 23, 100, 101, 103–104,
 106–107

- infectious and parasitic diseases (IPD), 102, 107–110, 119, 123
- ingenuity gap, 117, 243, 252
- interdiction, 187, 193–194
- internally displaced persons (IDP), 178, 184–188, 195
- international migration. *See* immigration
- IPD. *See* infectious and parasitic diseases
- IRCA. *See* Immigration Reform and Control Act
- Israel, 181, 249–250, 251
- Italy, 213
- labor force, 67, 69, 73, 117; growth, 27, 88, 223–225; immigration, 154, 156, 216; migration, 144, 146
- Lee, Everet, 132
- life expectancy, 2, 16, 20, 23, 64, 74, 100, 101, 118–121; with HIV/AIDS, 91, 115; Russia, 81, 106–107; United States, 103
- life span. *See* life expectancy
- life tables, 12, 74–77
- Malthus, Thomas, 235–236
- Malthusian perspective, 236–240, 243, 247. *See also* Marxist perspective
- maps, 13, 31–36, 61
- maquiladoras, 158
- Marxist perspective, 237–240
- Massey, Douglas, 151
- maternal health. *See* reproductive health
- median age, 67, 72
- megacities, 18, 205–208
- megapolitan, 206
- Mexico, 122, 123, 124, 155; emigrants from, 72, 161, 217
- Middle East, 240, 250, 254
- migration, 2, 4, 7–8; defining, 128–130; human capital theory of migration, 136; life-cycle, 137–138; measuring, 50–51, 147–148; mobility transition theory, 132, 144; models, 39; policy, 218–219; process, 141–142; rates, 145, 147–148; residential mobility, 131, 137–138; selectivity, 66, 139–141; theory, 132–139; United States, 143–147
- modifiable area unit problem (MAUP), 10, 32
- morbidity, 92, 118–121
- mortality, 1, 3; African American, 103–104; age-specific, 122, 125; causes, 122–123; impact of HIV/AIDS, 114–115; inequalities in, 102–107, 206; infant mortality rate, 1, 23, 100, 101, 103–104, 106–107; maternal, 92–93; measuring, 74–78, 125–126; transition, 19–20, 100–102
- nativism, response to immigration, 157
- natural increase, 20, 23, 26, 29; impact of HIV/AIDS, 115; urban, 201–202
- neo-Malthusians. *See* Malthusian perspective
- Palestinians, 181, 188
- population: centroid, 70, 71; composition, 61–69; defining, 42–43; distribution, 24, 59–61; growth, 15, 16, 17–18, 23, 25, 29–31; momentum, 25, 29, 90, 144, 221, 231; policy, 216–228; projection and estimates, 36–39; pyramids, 61, 64, 65
- population density, 60–61, 62, 70, 210, 212–213
- population geography, defined, 3
- population growth: Africa, 21; calculating, 37; consequences of, 87–89, 120; with HIV/AIDS, 114–115; policies, 216–228; rates of, 15, 16, 17–18, 20, 23–25, 29–30; urban, 19
- population pyramid, 61, 64–65, 155, 231
- pronatalist policies, 222–224, 233
- Proposition 187, 157–158, 164–167
- Proposition 200, 157, 164, 167
- Quebec, 135; fertility in, 94, 232
- Ravenstein, Ernest George, 9, 132, 202
- refugees and asylees, 2, 178, 185–187, 195; defined, 177–179; environmental, 189; Europe, 181–182; settlement of, 180–183; UN Convention, 177–178; United States, 190–194
- remittances, 27, 155, 245
- replacement fertility, 18, 61, 86–87, 93
- reproductive health, 92–93, 221, 226, 228
- residential mobility. *See* migration
- resources, 66, 144, 146; conflict over, 185, 246–252, 253–254; scarcity, 189, 243–244
- Russia, 18, 81–82, 106–107, 150, 224; Soviet Union, former, 106–107, 193, 251–252

- Sanchez, George, 166
 September 11, 170, 186, 217
 sex ratios, 61, 66–67, 83–84, 221, 224, 230
 Simon, Julian, 226, 237–238
 social segmentation, 247–249
 Soviet Union, former. *See* Russia
 Taliban, 180
 TFR. *See* fertility
 total fertility rate. *See* fertility
 transnationalism, 7, 57, 170–171
 Trewartha, Glenn T., 6
 Uganda, 23, 95–96
 UNAIDS, 113, 117
 UNHCR, 2, 178–186, 195
 UNICEF, 226
 United States: African Americans, 103–104, 106, 111; aging, 88–89; census, 12, 16, 50–52; cities, 211; Cuban refugees, 179, 184; fertility, 81, 94–95; illegal immigration, 161–170; leading cause of death in, 105, 122–123, 124; legal immigration, 150, 154, 158–159, 162, 173; migration in, 143–146; mortality, 103–104; population, 24, 26, 31, 60, 62, 67, 70–73; refugees, 186, 190, 191, 192–194
 urban: defining, 198, 213–214; planning for growth, 210–212
 urbanization: developed world, 203–204; developing world, 205–206; history of, 198–203; implications, 209, 212–213
 USAID, 226
 USCIS, 167–168
 USCRI, 185, 195
 vital registration, 45, 47, 49
 water, resources and scarcity, 237, 242–243; conflict over, 246–247, 249–250
 WHO, 47, 226, 228
 women: fertility, role in, 20, 29, 66, 82–84, 86, 91, 95; reproductive health, 92–93
 Yugoslavia, former republic, 179
 Zelinsky, Wilbur, 6, 132, 144, 202–203
 Zimbabwe, 91, 122–124

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