Chapter 1
Introduction to Applied Demography

Abstract This Chapter presents an overview of the field of demography and the place of applied demography within the broader context. It traces the development of applied demography as a sub-discipline and reviews the factors that have created growing interest in and demand for the application of demographic concepts, techniques and data inside and outside of academia.

1.1 Introduction

"Demography" comes from the Greek and means "describing people"—"demo" for people and "graphy" to write about a particular topic. Also referred to as population studies demography seeks to analyze human populations and profile them in terms of their salient characteristics and the dynamic processes that influence these characteristics.

Demography as a distinct field of study has a relatively short history. The term "demography" was coined in 1855 by Achille Guillard (2010) when he published *Elements de Statistique Humaine ou Demographie Comparee.* He combined the Greek words *demos* and *graphein* to create the discipline's name. To Guillard, the focus of demography was the mathematical knowledge of populations, their general movements, and their physical, civil, intellectual and moral state. His interest in population size and distribution, demographic processes and population structure of a population foretold modern demography.

"Demography" comes from the Greek words for people (demos) and writing about (graphe) and refers to the science of describing populations.

While it is appropriate to say that demographers are interested in the characteristics of populations, they are not interested in every characteristic. There is a certain set of attributes that are the focus of demographic analysis. Demographers are interested in characteristics that are relevant within a social and cultural context.

R. K. Thomas, *Concepts, Methods and Practical Applications in Applied Demography*, https://doi.org/10.1007/978-3-319-65439-3_1

Thus, demographers study biosocial traits such as age, sex and race and sociocultural traits such as marital status, education, income, occupation and even religion. While age, sex and race may be thought of as physical attributes, each involves a significant social dimension and are thus classified as "biosocial".

Demographers do not focus on the attributes of individuals but on the characteristics of groups of people. While every individual might be considered to possess a "demographic profile", the interest of demographers is on the attributes of aggregates—a community, a state or a nation. There are situations in which a subset of a population may be the object of study, such as cohorts of child-bearing age women, senior citizens, or African-Americans, but it is still the aggregate characteristics of the group that are of significance. There will be significant variation within any group in terms of its attributes. Members of any population may exhibit a range of values for any attribute (e.g., income) so it is the "average" characteristics of the population that are of interest to the demographer.

Demography is by definition an *applied* discipline. While this text makes occasional references to demographic theory, most of the material is devoted to the study of the concepts, methods and data used in the application of demography to real-world problems. A frequent question asked of demographers when they present the facts is: This is interesting but what can you do with it? Like all disciplines, there is a basic science dimension to demography, what we might call science for science's sake. But, ultimately, most demographers use their knowledge to understand real world problems and, not just to understand them, but to help develop solutions for them. Demographers analyzing the changing age structure of the U.S. population, for example, have contributed important knowledge for addressing the challenges of funding the federal Social Security and Medicare programs. Demographers examining fertility trends have contributed to solutions for addressing such phenomena as high rates of births to unmarried women and teenagers.

In addition to proposing practical solutions to real-world problems, demographic data make an important contribution to policy setting. As in the case of Social Security and Medicare cited above, an understanding of demographic trends provides policy-makers with the background they need for establishing effective policies. There is essentially no sector of U.S. society that cannot benefit at the policy level from demographic input. Thus, education, economic development, transportation, disaster preparedness, and criminal justice, to name a few, are areas where demographic data can make a significant contribution to policy setting and program implementation.

1.2 Applied Demography

"Applied demography" involves the application of demographic theories, concepts, methods and data to the solution of practical "real world" problems. As noted by Murdock and Ellis (1991), applied demography focuses on pragmatic concerns of

interests to professionals whose training and experience lie largely outside the small community of professional demographers. This often means the application of demographic methods and materials to non-demographic factors and events.

> *"Applied demography" involves the application of demographic theories, concepts, methods and data to the solution of practical "real world" problems.*

Even earlier, Rives and Serow (1984) suggested some traits that might distinguish applied demography from not only general demography but other fields. They noted that the scientific goal of applied demography focuses on prediction as opposed to description and explanation, an emphasis on current and future events rather than the past, local versus national and international demographic phenomena, an emphasis on the *implications* of demographic events, and the use of demography for decision making in areas outside of demography.

Given there is not complete agreement as to what constitutes applied demography, perhaps the best approach would be to identify what applied demographers actually *do*. A simplified depiction of the way in which demography is applied is presented in Exhibit 1.1.

Exhibit 1.1: How Demography is Applied

Every scientific endeavor begins with data—i.e., the raw numbers that describe a population or phenomenon of some type. This would include, for example, the ages of every person in a defined population, the number of births each woman had in the population last year, or the citizenship status of all foreign-born residents. These raw data would essentially involve a list of numbers that do not mean much by themselves. These raw data must be converted into information that provides a description of the population in question. Thus, if we can calculate the median age for the population, the annual birth rate, or the proportion of foreign-born in the U.S. population, we now have some information that we can use. In this simplified example, having access to information allows demographers to contribute to policy making. If, for example, the median age is 40 the types of policies to be considered would be a lot different than if the median age were 18. Similarly, it makes a difference to policy makers if the fertility rate is 80 births per 1000 women of child-bearing age as opposed to 40. Finally, the proportion of foreign-born within a population—and their citizenship status—has all kinds of policy implications.

The term "policy" is used loosely here to refer any deliberations on the meaning of the statistics and any implications these statistics may have for the social, political or economic realms. An aging population, for example, raises questions about the ability of a population to replace itself and, indeed, the U.S. population is facing that dilemma today. A declining fertility rate also has implications for the same issue, in that the increasing median age of the population reflects among other things the fact that women are having fewer children. Finally, the proportion of the population that is foreign-born has implications for immigration policy, educational resources, and the job market. The significance of the foreign-born population even has implications for the population replacement situation in that recent immigrants typically exhibit higher fertility rates than the native-born.

The ultimate "application" comes at the action phase and, for these examples, actions may include developing health services for seniors (as opposed to children), introducing incentives for more births (or less, depending), and introducing English-as-a-second-language programs in public schools (or not). The impact of these actions informed by demographic analyses can be tracked over time to determine their implications for the populations in question and for the society as a whole.

1.3 Why Study Demography?

The study of demography is important for a number of reasons. For starters, nearly everything is connected to demography (Weeks, 2008). Demography describes our world—and description is the starting point for understanding the world and, ultimately, taking action to improve it. "Our world" could be any collection of people we choose to analyze—a social group, classroom, neighborhood, city, or the total world population for that matter.

The relevance of demography for an understanding of the world is reflected in the major issues making headlines in recent years:

- Increasing income inequality as the size of the middle class dwindles
- Conflict between different ethnic and religious factions in the Middle East
- The effects of climate change on various parts of the world
- The continuing issue of illegal immigration into the United States
- The unexpected election of Donald Trump as president of the United States.

These issues all have national and/or international implications—and all are directly or indirectly related to demography. In fact, there is virtually no social, economic or political issue that does not have its roots in the demographics of the population.

While the events above have captured the headlines, there are a number of other trends occurring within the U.S. population that are currently making headlines or reflect long-term changes in the social structure:

- The decline in the U.S. population below replacement levels
- The aging of the U.S. population (accompanied by growing "feminization")
- The increasing racial/ethnic diversity of the U.S. population
- The changing family structure of the U.S. population (now including same-sex marriages)
- The outsourcing of U.S. jobs to overseas workers
- Increasing death rates among some segments of the U.S. population.

These types of demographic trends have significant implications for U.S. society present and future. There is no social institution that is not impacted by these developments. The aging of the U.S. population by itself has ushered in an unprecedented period for a society that has always emphasized its youthfulness. The dramatic increase in the Hispanic population in the U.S. has wide-ranging implications for the economy, education, healthcare and the political system.

In view of developments like those above applied demography seeks to interpret the political and economic events whether at the local, national or international level. News headlines and the stories that accompany them are often complicated and difficult to decipher. However, many if not most news stories today have some type of demographic cause or consequence. We gain insights when we realize that headlines like: "Growing elderly population puts pressure on Medicare," "Aging baby-boomers threaten solvency of Social Security," or "Drop in birthrate could lead to population decline" reflect the operation of demographic processes. We can better understand both the obvious and not-so-obvious dimensions of the issue if we can apply demographic knowledge and techniques.

Applied demography provides a means of interpreting social, political and economic events at the local, national and international levels.

A case in point that has implications for each of these headlines is the oft-quoted misstatement that: Americans are living longer today. That statement is incorrect in that the length of time that a human being can live has not changed much throughout history. A more correct statement would be: More Americans are living long lives. While both of these developments would have an impact on programs for the elderly, the ultimate consequences of the respective developments would be different. The impact on society of aging is a function of many people living a long time rather than some people living a very long time.

While a good case can be made for the usefulness of applied demography as a means of interpreting and understanding social phenomena, the ultimate goal of any applied science is to effect change. Knowledge gained through the application of demographic concepts, techniques and data has some value in its own right, but the real payoff comes when this knowledge is used to solve a social problem and bring about positive change. In the cases of Medicare and Social Security cited above, demographic knowledge can offer insights into the issues at hand. For example,

does the growing Medicare population mean that this government program will eventually go bankrupt as the trend line might suggest? Knowledge drawn from health demography helps to shed some light on this as we realize that the major surge in Medicare enrollees for the foreseeable future will be baby-boomers. This generation is healthier than any previous generation of seniors, has more resources to maintain their health status longer, and can generally expect to remain healthy up into their 70 and 80s. While this doesn't mean that the surge in elderly Americans will not eventually affect Medicare's viability, the situation viewed in this light does not support a "doomsday" scenario.

By analyzing trends in the demographic behavior of society members, demographers can predict the future characteristics of the population.

While a number of major trends related to demographics are affecting the society as a whole, there is a personal dimension to this as well. As Weeks (2008) points out, the demographic foundation of our lives is deep and broad. Although demographers are interested in the characteristics and behavior of groups of people, the demographic attributes of our society affect nearly every aspect of our personal lives in one way or another. In fact, the types of personal decisions that we as individuals make have a cumulative effect on population trends. Some of the decisions that affect our daily lives are:

- The decision to get married (or not) and when
- The decision to have children (or not) and when
- The neighborhood in which we choose to live
- The type of occupation we pursue
- The educational level we aspire to
- The choice of political party to support
- The health-related behaviors in which we participate.

The cumulative effect of decisions such as these made by millions of Americans is a changing demographic profile. In fact, some demographers make a living projecting the future characteristics of populations based on what is known about that population's current demographic behavior. It would not be unusual, for example, for analysts to use demographic methods to predict how long members of a certain demographic group are going to live and, in fact, determine prospectively what diseases they are likely to die from, or for demographers to predict election results based on the demographic characteristics of likely voters. The bottom line is: Knowing the demographic characteristics of a population opens the door to an understanding of a wide variety of attributes of that population.

1.4 Who Uses Demography?

People in every aspect of society employ demographic data, often without being aware of it. Increasingly we hear people speak up the "demographics" of that consumer group or the fact that a certain "demographic" always votes for a certain political party. Even though public expressions about demographics are becoming more common, the widespread use of demographic data and methods is not widely appreciated.

Members of the business community, particularly those involved in marketing, pioneered the use of demographic data in the private sector. The application of demographics to business has become so widespread that virtually no business decision is made in the corporate boardroom today without considering the relevant demographics. Whether the decision involves identifying a target audience for a new product, determining the location for a new store, or designing a sales territory, the demographics of the population under question are a critical piece of the puzzle. This process does not just relate to major corporate decisions but affects us as individuals. The fact that we receive certain catalogues, certain types of junk mail, or certain telephone solicitations reflects the information that marketers have about our demographic attributes.

While the business community was the first to recognize the importance of demographics, this sector is far from the only user of such data. In every aspect of American life demographics have become increasingly important. The allocation of government services depends on an in-depth understanding of the characteristics of the population to be served. Indeed, the original intent of the census conducted by the federal government every ten years was for the apportionment of Congressional districts. Those who aspire to political office begin their campaigns with an assessment of the demographics of their prospective constituents. Those involved in urban planning and community development start with the demographics of the geographic area under consideration. The education system depends on an understanding of the number, location and characteristics of school-aged children, and the services provided by the healthcare system are a direct reflection of the characteristics of the patient population. The military must plan to accommodate the characteristics of potential inductees, and, clearly, today's American armed forces reflect the changing demographic character of our society with the inclusion of record numbers of women and members of various racial and ethnic groups.

While the business community was the first to apply demographics in the private sector, applications of demography to real-world problems are found in every sphere of society—government, education, criminal justice, healthcare, community development and numerous others.

In most of these examples, demographics are put to good use—good for the users and good for society. But there are cases where less well-intended individuals and organizations may use demographics for less than noble purposes. Much has been made of racial and ethnic profiling used by law enforcement agencies and championed by those who oppose immigration into this country. Certain groups may be discriminated against due to their demographic characteristics—their race or ethnicity, their poverty level, religion or language. Historically, individuals have been excluded from housing developments, social clubs and occupations due to their sex, race or cultural background. As with any aspect of the human condition, demographics can be used for good or ill.

When we examine *who* applies demography to real-world problems we find, not surprisingly, that many demographers themselves are included among this number. Applied demographers work in virtually every industry, from education to manufacturing to healthcare and at agencies in all levels of government. However, it is noteworthy that most of the people applying demography to concrete problems are *not* demographers. Long before applied demography was recognized as a separate discipline, people in government, business and other fields were regularly using demographics as part of their jobs. It is perhaps a testament to the value of applied demography to find people who are not demographers in virtually every industry employing demographics in their efforts to perform their jobs.

The significance of demography to U.S. industry can be seen in the extent to which those involved in the application of demography have been elevated to roles of importance within the corporate structure. While demographic analysis was at one time relegated to the back room as a low-level technical activity, in today's economy we find those in charge of demographic analysis—albeit usually not demographers per se—seated at the table in the corporate boardroom. It is safe to say that very few business decisions in any industry are made today without considering the demographics underlying the issues and/or the demographic implications of that decision.

1.5 Demographic Perspectives and Methods

An understanding of the "demographic perspective", the concepts that define the discipline, the methods used for demographic analysis, and the data utilized in these analyses is essential. The demographic perspective involves a way of seeing the world within a demographic context or through a "demographic lens". This unique manner of viewing the world provides a framework for interpreting social phenomena and a means of linking social groups to their environments. This perspective leads to a search for interrelationships between demographic variables and other variables associated with a population.

Although we often act of our own volition to make decisions that not only affect our lives but the demographic trends that affect our society, we must remember that the relationship between demographic behavior and societal traits is a "two-way

street". All of us were essentially born into a game that was already under way making each of us in a sense a "victim" of demographic trends. The rules were written long before we were born, so the type of education we aspire to (and our ability to achieve it), the type of job that we are able to obtain, the type of person we are likely to marry, and even the political party we are likely to support, are all reflections of the position within the social structure to which we were born. Indeed, it has now been pointed out by health demographers that the best predictor of our health is the ZIP Code in which we were born. While members of society are able to control their demographic futures to a certain extent, we are all constrained by the demographic parameters surrounding our position in society.

Applying demographics to the analysis of societal phenomena allows demographers to see society from a unique perspective, using a "demographic lens" to view the attributes that characterize any population.

At the same time, however, we are the "creators" of our demographic circumstances through our behavior and the decisions that we make contribute to demographic trends. Over the course of the past few decades the behaviors that we have exhibited as a population have had significant implications for the demographic attributes of American society. We have fewer (and later in life) marriages, we are having none or fewer (and later in life) babies, we continue to die from health conditions that are preventable, and we continue to migrate out of the Northeast and Midwest to the South and West. Thus, our behaviors affect the demographic attributes of our society.

Ultimately, through our individual behaviors we make our demographic bed and then have to lie in it. The society we have created through our behaviors then has implications for our lives. Some of the situations that we as Americans have created through our behavior include the following:

- Our birth rate has dropped below replacement levels
- We are getting steadily older as a society
- We have fewer "traditional" families
- We have a predominantly female population
- Poverty is being shifted from the inner-cities to the suburbs
- We are becoming less healthy as a population in many ways.

As we consider these trends, one of the things that becomes obvious is that societies are constantly undergoing change—some slower, some faster—but change is always occurring. Often change is a result of a traumatic event—a natural disaster, disease or war. In the U.S. we have experienced continuous change in our short history. Change has been such an important aspect of our lives that we actually consider change as an important attribute of our culture. We change jobs, houses, spouses and lifestyles with startling frequency. Change is readily accepted and generally encouraged to the point that it has become part of our cultural DNA.

The changes that have occurred in recent years have led to the setting of a number of demographic records (as illustrated by Exhibit 1.2).

Exhibit 1.2: Setting (Demographic) Records
The changes have occurred in U.S. society in recent years are so significant that we are constantly setting new records. Today, for example, the American population contains:

- The largest elderly population we have ever had (both numbers and percent)
- The greatest "excess" of women we have ever had
- The lowest marriage rate we have ever had
- The largest group of single adults we have ever had (both numbers and percent)
- The most births outside of marriage we have ever had
- The largest number of single-parent households we have ever had
- The most women working outside the home we have ever had
- The highest level of immigration (both legal and illegal) we have ever had.

As a result, our American "portrait" in the early 21st century looks much different than it did only a couple of decades ago.

Another way in which demography can be thought of as a "two-way street" is through the interaction of population attributes and demographic processes. The composition of a population has implications for the various demographic processes that occur while, at the same time, the current processes have consequences for the population's attributes. If we examine, for example, the racial and ethnic makeup of the U.S. population, we see that non-Hispanic whites are the numerically dominant racial/ethnic group in society—followed at a great distance by Hispanics and African-Americans. Currently, the U.S. population is exhibiting significant differences in fertility rates as a result of its population composition. The birth rate for the non-Hispanic white population is lower than average while the rate for African-Americans, Hispanics and certain other racial and ethnic groups is higher than average. These behaviors attributed to demographically different segments of the population are having a significant impact on fertility patterns. When these trends are extrapolated into the future we see that the operation of these processes will have major implications for the future composition of the U.S. population. Thus, by 2050 it is predicted that these high-fertility minority groups will constitute the majority of the population and non-Hispanic whites will constitute a numerical minority. Numerous other examples of the interdependence of demographic traits and demographic processes will be cited throughout this text.

One conclusion generated by looking at the population through "a demographic lens" is that virtually no demographic or social attribute is randomly distributed throughout society. When we look at developments seemingly unrelated to

demographic factors, we inevitably find a demographic undercurrent if not a direct causal effect. Examples ripped from the headlines related to such diverse issues as climate change, the international spread of AIDS, an increase in suicide among older Americans, the outsourcing of American jobs overseas, and bankrupt American cities all have an underlying demographic component. With the judicious application of demographic concepts, techniques and data, we can develop the demographic perspective required to clearly see the operation of these phenomena.

1.6 Major Topics in Demography

The sections that follow provide a foretaste of the topics that interest applied demographers. Each of these topics will be addressed in detail in subsequent chapters.

1.6.1 Population Size and Distribution

The first facts that a demographer looks for in a population are the number of people and their distribution. The size of the population is a key demographic variable and provides the framework for additional analysis. Equally important, however, is the distribution of that population across the geographic span of the area in question. In the U.S., for example, how are our 310 million residents distributed over the various states and among the various cities? To what extend is our population widely dispersed (e.g., in New Mexico) or tightly concentrated (e.g., in New York City)? These questions can be raised for any geographic or political unit, and patterns of population distribution have significant implications for the demographic profile of the area in question.

At the same time, the population's demographic makeup will contribute to the manner in which the population is distributed. Thus, in the U.S. we find American Indians (a racial group) primarily isolated on "reservations" in the western states, African-Americans often segregated within our urban areas, and senior citizens concentrated in popular retirement locales such as Florida and Arizona.

Demographers are not only interested in the current size and distribution of the population but in future conditions as well. For most practical purposes, it is important to develop an appreciation for the size and distribution of the population ten, twenty or even more years into the future. To this end, demographers have developed a variety of techniques for generating projections and forecasts of the size and distribution of the future populations.

1.6.2 Demographic Processes

Historically, demographers have emphasized the study of the major demographic processes—fertility, mortality and migration—and a significant portion of this book is devoted to these topics. Fertility, which refers to the process of reproduction and childbirth, is the primary way in which new members are added to a group. Thus, the number of births and the characteristics of those births are of particular interest to demographers. Mortality refers to the study of death and the characteristics surrounding the deaths within a particular society. This is the primary means through which people are subtracted from a group. The mortality characteristics of a particular society tell us a lot about that society. Migration—the process through which individuals, families and groups move from one place to another—is the third process to be considered. Migration can involve internal movement (e.g., within the U.S.) or international movement (i.e., from country to country). Obviously, migration can both add and subtract people from a society and, in today's world, migration often has more implications for society than fertility or mortality patterns.

One emerging process that will be considered to a lesser extent relates to the morbidity of a population. Morbidity refers to the health problems that characterize a population, and this topic is of increasing interest to students of demography. The fact that disease patterns are almost invariably linked to demographic attributes underscores the usefulness of demographic analysis in the study of epidemiology. The morbidity characteristics of a population have important linkages directly to mortality and indirectly to fertility; the demographically linked health disparities that exist have important social, economic and political implications.

The three key processes taken together are important in that they represent the components of population change. The size of a population is changed through a combination of births and in-migration adding members and deaths and out-migration subtracting members. As will be demonstrated later, the population in Time 2 is a result of the population in Time 1 plus births minus deaths plus/minus migration. Understandably, demographers pay a lot of attention on these processes due to their impact on the size and characteristics of any particular population.

Because demography is a dynamic science, an understanding of demographic trends is important. Changes in birth rates, death rates and patterns of migration are of major importance to demographers. They represent the moving parts of any population and not only provide a snapshot of where we are now but of where we as a people are going. These trends in turn offer an indication of the changes in the attributes of the population that can be expected to result.

1.6.3 Population Composition

Another major topic to be covered in this text is the demographic characteristics associated with human populations. These are the attributes that give a population

its "character". For our purposes demographic characteristics are divided into biosocial traits and sociocultural traits in order to profile a population in terms of its key demographic characteristics.

Biosocial characteristics are so called because they are attributes that are rooted in biology but also have a social dimension. These attributes include age, sex, race and ethnicity. While age and sex represent biological states, social attributes are ascribed to persons of different ages, and a social dimension (i.e., masculinity and femininity) is associated with the respective sexes. Race is not a scientific category but exists as a social construct, thus displaying both biological and social dimensions. Ethnicity refers to one's cultural heritage and does not represent a clearly biological state per se. However, to the extent that ethnic groups tend to interbreed and maintain a distinct gene pool, ethnicity is included in the biosocial category. Note that biosocial characteristics are ascribed at birth and are not amenable to change.

Sociocultural characteristics refer to traits exhibited by individuals that refer to their position or status in society. While biosocial traits are essentially ascribed at birth, sociocultural traits are typically acquired through the actions of the individual. Sociocultural traits are important not only because they indicate one's place in society, but because of their contribution to the morbidity patterns of the population. These traits include attributes such as marital status, income, occupation, education and even religion.

1.7 Settings for Applied Demographics

One way of defining applied demography is in terms of the areas to which demography is applied. The following paragraphs summarize areas where demographic concepts, techniques and data are commonly applied.

Business. Business executives, product developers, marketers and others use demographics to support consumer research, new product development, marketing and advertising, store placement and a variety of other purposes. A company desiring to market a new product would use demographics to determine the size of the market, the characteristics of potential customers, the location of potential customers, and the best way to reach the target audience.

Education. Education planners use demographics to plan for school construction, determine staffing requirements, plan school bus routes, and budget for the provision of educational services. School administrators contemplating the construction of an additional school would use demographics to determine how many current and future school-aged children there are, where they are located, and what their characteristics are (e.g., age, ethnicity). They would also use demographics to examine future birth rates and immigration patterns that might affect the demand for schools.

Politics. Politicians, political consultants and policy makers use demographics to draw up political districts, analyze voting patterns, plan political campaigns and

develop advocacy strategies, among other activities. A politician embarking on a political campaign would use demographics to profile the electorate in terms of its demographic attributes and voting patterns, determine the subset of potential voters to target, and develop a promotional strategy targeting potential voters. Demographic considerations underlie many of the programs formulated by policy makers.

Labor force development. Policy makers, government officials and education planners use demographics to calculate unemployment rates, monitor the growth/decline of various industries, predict the future demand for specific occupations, and project the future worker pool. A job training program would use demographics to profile the local workforce, determine employment/unemployment levels, identify the types of jobs needed in the local economy, and recommend job training initiatives that would equip the workforce to fill the available jobs.

Transportation planning. Transportation planners use demographics to predict the demand for roads/highways, plan for public transportation, perform cost-benefit analyses for new roads, and assess the impact of a transportation project on the community. A transportation planner conducting a study of existing public transportation to determine needed modifications would use demographics to profile the population currently using public transportation, identify additional potential users, determine current and future destinations for riders, and recommend changes in routes and schedules.

Community development. Community planners use demographics to predict the future demand for various types of housing, develop land use plans, plan public housing projects, project the level of homelessness, and determine the supply of affordable housing. A community development corporation might use demographics to assess the level of home ownership in the community, track housing sales, monitor foreclosure trends, and assess the mobility of community residents with the objective of encouraging housing stability within the community.

Social services. Social service agencies use demographics to identify vulnerable populations and profile demographically defined groups in need of social services, locate social service offices, develop welfare policies, and evaluate the effectiveness of social service programs. A government agency might use demographics to develop welfare policies, identifying the in-need population, determining this population's characteristics, examining the factors contributing to neediness, and structuring assistance programs to address these needs.

Healthcare. Health planners and administrators use demographics to identify medical service areas, determine the demand for health services, select locations for health facilities, measure disparities in health status and health services utilization, and develop marketing plans to promote health services and products. A health planner would use demographics to determine the size and characteristics of the population in a health service area, the types of health problems likely to affect this population, and the types of personnel, services and facilities required.

Criminal justice. Law enforcement officials use demographics to identify the characteristics of criminals and victims, identify high-crime areas, plan for correctional facilities, determine deployment patterns for police, and development

community crime prevention programs. Law enforcement officials may use demographics to determine their priorities for enforcement, identify the types of crime that are most serious and/or prevalent, determine the spatial distribution of these crimes, calculate the cost-benefit of focusing on certain crimes rather than others, and predict the consequences of various law enforcement initiatives.

Exhibit 1.3: Demography and Public Policy

As noted in the graphic earlier in the chapter, applied demographics plays an important role in the formulation of public policy. Demographics and demographers regularly make major contributions to public policy often in ways that are not particularly obvious. "Public policies" are authoritative decisions made by legislative, executive or judicial branches of government intended to direct or influence the actions, behaviors or decisions of others. While the federal system that governs the United States does not lend itself to overarching public policies, there are examples of the influence of demographics codified in federal legislation such as No Child Left Behind, the Voting Rights Act, laws governing immigration, and, recently, the Patient Protection and Affordable Care Act.

The opportunities for applying demographics to public policy issues are endless since there are virtually no activities related to public policy that do not have a demographic dimension. One has only to examine the issues that have made the headlines for the past few years to realize the areas in which applied demography might be employed. At the national level major issues have involved the solvency of Social Security and Medicare, the implementation of the Affordable Care Act, the rise in illegal immigration, increasing income inequality, declining fertility rates, and numerous other issues. At the international level there are issues surrounding the continued high fertility rates in sub-Saharan Africa, ethnic strife in Iraq and other countries, pollution in China, and the outsourcing of U.S. jobs overseas. In these cases and others there are opportunities for the application of demography's theories, concepts, methods and data to not only facilitate an understanding of the underlying issues but to contribute to informed policy setting.

Examples of current public policy questions that demographics can address include:

- What changes should be made in the Social Security program given the lack of young workers?
- What are the future implications of high levels of immigration by illegal aliens on society's institutions?
- What impact will the aging of baby boomers have on the demand for government-funded health services?
- What does the declining fertility rate in America portend for future population growth?

- What type of policies would contribute to faster recovery from the recent recession?
- What are the implications for society of a growing excess of women?

These issues only represent a sampling of the various ways in which demographics can contribute to public policy analysis and decision making, nor do they address the myriad opportunities for demographic input into policy setting at the state and local levels. Many of these issues will be revisited later in this book as various sectors of society are addressed in more detail.

1.8 Objectives of the Book

This text has been developed as an introduction to the field of applied demography for use by both undergraduate and graduate students. It should also be useful as a manual for professionals in a variety of fields. Its primary objectives are as follows:

(1) To present a survey of the field of demography and the concepts and methods utilized by demographers (and thereby provide a foundation for the exploration of the application of demographics in various contexts)
(2) To develop an appreciation of the various types of data utilized by demographers, along with methods for finding and interpreting population statistics
(3) To develop an appreciation of demographic analysis as a tool for addressing concrete problems related to the economy, the environment and public policy
(4) To provide examples of the application of demographic materials to other fields and one's personal life
(5) To provide insights into the relationship between demographics and social, economic and political issues
(6) To provide hands-on experience applying demographic methods to real-world problems.

1.9 Organization of the Book

This first chapter has presented an overview and introduction to the field of applied demography. Chapter 2 on the methods and materials of demography describes definitions, concepts and methodologies utilized by demographers in addressing applied problems. Chapter 3 extends this discussion to address the types of data (and their sources) utilized by applied demographers. With this background, the text addresses key areas of interest to demographers, including population size,

distribution and concentration (Chap. 4), population composition (Chap. 5), and demographic processes (Chaps. 6–8). Chapter 9 introduces the reader to population estimates, projections and forecasts, key techniques used in applying demographic methods to real-world problems. The following four chapters deal with the application of demographic methods to problems in selected "vertical industries", including business (Chap. 10), healthcare (Chap. 11), and politics (Chap. 12). Chapter 13 summarizes additional areas to which demographic concepts, techniques and data can be applied to real world problems. Chapters 3–13 include case studies and exercises providing hands-on examples of the application of demography to concrete problems.

References

Guillard, A. (2010). *Elements de Statistique Humaine ou Demographie Comparee*. Charleston, SC: Nabu Press.

Murdock, S., & Ellis, D. (1991). *Applied demography*. Boulder, CO: Westview Press.

Rives, N., & Serow, W. (1984). *Introduction to applied demography: Data sources and estimation techniques*. Beverly Hill: Sage Publications.

Weeks, J. R. (2008). *Population: An introduction to concepts and issues*. Redmont, CA: Thompson Wadsworth.

Additional Resources

Lundquist, J. H., Anderton, D. L., & Yaukey, D. (2014). *Demography: The study of human populations* (4th ed.). Long Grove, IL: Waveland Press.

Meade, M., & Emch, M. (2010). *Medical geography* (3rd ed.). New York: Guilford Press.

Murdock, S. H., & Swanson, D. (2008). *Applied Demography in the 21st Century: Selected Papers from the Biennial Conference on Applied Demography*. New York: Springer.

Poston, D. L., & Bouvier, L. F. (2010). *Population and society: An introduction to demography*. Cambridge, England: Cambridge University Press.

Shyrock, H. S. (2013). *The methods and materials of demography* (2nd ed.). Maryland Heights, MO: Academic Press.

Siegel, J. S. (2001). *Applied demography: Applications to business, government, law, and public policy*. Maryland Heights, MO: Academic Press.

Swanson, D. (Ed.). (2016). *Frontiers of applied demography*. New York: Springer.