Chapter 1 : Understanding Populations by Chelsea Johnson on Prezi

the largest population that an environment can support at any given time limiting resource A resource that a population cannot live without and that occurs in quantities lower than the population would require to increase in size (wood, water, food, space, mates).

Data for current distribution from Schwartz and Woloshin, Page 50 Share Cite Suggested Citation: Understanding Population Health and Its Determinants. The National Academies Press. Intervening medically, for example, to decrease risk by lowering levels of obesity, as measured by BMI ultimately decreases the proportion of the population with the highest BMIs. However, use of such an intervention would be acceptable only in those whose medical risk was very high. Moreover, interventions in high-risk groups may have a limited effect on population outcomes because the greater proportion of those with moderate risk levels may ultimately translate into more chronic disease or other poor health outcomes. Because most people are in categories of moderately elevated risk as opposed to very high risk, this strategy offers the greatest benefit in terms of population-attributable risk, assuming that the intervention itself carries little or no risk. The hypothetical example shows what might occur if social policies or other population-wide measures were adopted to promote small decreases in weight in the general population. The committee embraces this kind of model of disease prevention in the case of policies such as seat belt regulation and the reduction of lead levels in gasoline. The final hypothetical model Figure 2â€"1c , although not discussed by Rose explicitly, illustrates a reduction in the distributions of those at highest and lowest risk with no change in the distribution of those with a mean level of risk. This model is appropriate for illustrating phenomena relating to inequality, where redistribution of some good e. One hypothetical example is the association between low income and poor health. In many cases, there is a curvilinear association between these goods and health outcomes, with decreased health gains experienced by those at the upper bounds of the distribution. For example, data on income suggest that there are large differences in the health gains achieved per dollar earned for those at the lower end of the income distribution and fewer differences in the health gains achieved per dollar earned for those at the upper end. Thus, the curvilinear association, if it were a causal one, would suggest that substantial gains in population-level health outcomes may be achieved by a redistribution of some resources without actual changes in the means. These graphs help to illustrate three different strategies for improving the health of the population. The nation has often endorsed the first strategy without a critical examination of the other two, especially the second one. The American public has grown accustomed to seeing differences in exposures to risk, both environmental and behavioral, and disparities in Page 51 Share Cite Suggested Citation: In some ways, conventional public health models e. Enormous gains in the control and eradication of infectious diseases rested upon a deep understanding of the ecology of specific agents and the power of environmental interventions rather than individual or behavioral interventions to control disease. For example, in areas where sanitation and water purification are poor, individual behaviors, such as hand washing and boiling of water, are emphasized to reduce the spread of disease. The last several decades of research have resulted in a deeper understanding not only of the physical dimensions of the environment that are toxic but also of a broad range of related conditions in the social environment that are factors in creating poor health. These social determinants challenge the discipline of public health to more fully incorporate them. Over the past decade, several models have been developed to illustrate the determinants of health and the ecological nature of health e. Many of these models have been developed in the United Kingdom, Canada, and Scandinavia, where population approaches have started to shape governmental and public health policies. The committee has built on the Dahlgren-Whitehead modelâ€"which also guided the Independent Inquiry into Inequalities in Health in the United Kingdomâ€"modifying it to reflect special issues of relevance in the United States see Figure 2â€"2. This figure serves as a useful heuristic to help us think about the multiple determinants of population health. Page 52 Share Cite Suggested Citation: Adapted from Dahlgren and Whitehead, The dotted lines between levels of the model denote interaction effects between and among the various levels of health determinants Worthman, Furthermore, the governmental sector needs to work in partnership with

nongovernmental sectors such as academia, the media, business, community-based organizations and communities themselves to create the intersectoral model of the public health system first alluded to in the Institute of Medicine IOM report and established in this report as critical to effective health action. Most models of health determinants identify macro-level conditions Page 53 Share Cite Suggested Citation: Macro-level or upstream determinants such as policies and societal norms and micro-level determinants such as sex or the virulence of a disease agent interact along complex and dynamic pathways to produce health at a population level. As mentioned above, exposures at the environmental level may have a greater influence on population health than individual vulnerabilities, although at an individual level, personal characteristics including genetic predispositions interact with the environment to produce disease. For instance, smoking is a complex biobehavioral activity with both significant genetic heritability and nongenetic, environmental influences, and many studies have shown an interaction between smoking and specific genes in determining the risk of developing cardiovascular disease and cancers. It is also important to note that developmental and historical conditions change over time at both a societal level e. In the pages that follow, the committee provides a concise discussion of the key determinants that constitute the ecology of health, including environmental and social determinants, and elaborates in more detail on the social influences on health. This decision was made in recognition of a longer history in studying the ways in which environment shapes population health. Improved water, food, and milk sanitation, reduced physical crowding, improved nutrition, and central heating with cleaner fuels were the developments most responsible for the great advances in public health achieved during the twentieth century. These advantages of a developed nation are taken for granted, but in fact, they could deteriorate without adequate support of the governmental public health infrastructure. Environmental health problems, historically local in their effects and short in duration, have changed dramatically within the last 25 years. Together, global warming, population growth, habitat destruction, loss of green space, and resource depletion have produced a widely acknowledged environmental crisis NRC, These long-term environmental problems are not amenable to quick technical fixes, and their resolution will require community and Page 54 Share Cite Suggested Citation: At the local and community levels, environmental issues are equally complex and are also related to a range of socioeconomic factors. A brief look at some of the evidence on environmental determinants of health may help shed some light on why health is not equally shared. The places in which people work and live have an enormous impact on their health. The characteristics of place include the social and economic environments, as well as the natural environment e. Environmental hazards in workplaces and communities may range from tobacco smoke to pesticides to toxic housing. Rural areas may present increased health risks from pesticides and other environmental exposures, whereas some environmental threats to health can occur because of urban living conditions. More than three-quarters of Americans live in urban areas Bureau of the Census, Although rural Americans experience certain health-related disadvantages e. The negative environmental aspects of urban living—toxic buildings, proximity to industrial parks, and a lack of parks or green spaces, among others—likely affect those who are already at an economic and social disadvantage because of the concentration of such negative aspects in specific pockets of poverty and deprivation Lawrence, ; Maantay, ; Williams and Collins, Urban dwellers may experience higher levels of air pollution, which is associated with higher levels of cardiovascular and respiratory disease Hoek et al. People who live in aging buildings and in crowded and unsanitary conditions may also experience increased levels of lead in their blood, as well as asthma and allergies Pertowski, ; Pew Environmental Health Commission, ; CDC, a. These examples illustrate some of the profound effects of the physical environment on health. The places where people live may expose them to harmful factors. Page 55 Share Cite Suggested Citation: A Case Study The case of methylmercury as an environmental pollutant illustrates the potentially dramatic effects of the physical environment on health. Environmental toxins are a specific form of environmental hazard, caused in most cases by industrial enterprises, and the adverse effects of such toxins on the nervous system have been well documented. High levels of exposure to certain environmental pollutants are known to cause acute effects including convulsions, paralysis, coma, and death. The effects of lead on health and development have been documented for decades, and policy action regarding leaded gasoline and lead-based paints has been taken, with positive effects on child health. However, there is

growing concern about emerging evidence that other ubiquitous pollutants such as polychlorinated biphenyls PCBs and mercury may cause behavioral problems and affect mood and social adjustment. The adverse impacts of exposure to these pollutants may be most profound during fetal development and early childhood. Amidst growing national concern about developmental disabilities, exposure to mercury in the environment represents an emerging and preventable environmental health threat. The National Research Council NRC report Toxicological Effects of Methylmercury NRC, examined the evidence of adverse health impacts resulting from exposure to mercury, focusing on consumption of seafood contaminated by releases to the environment. Fossil fuel combustion represents the major source of mercury released to the environment. The deposition of mercury on the land and in surface waters results in conversion to forms that accumulate in the food chain. This bioaccumulation can result in very high concentrations of mercury in some fish, which are the main source of exposure for the population. The developing brain is particularly sensitive to the adverse effects of mercury exposure. Prenatal exposures may interfere with the growth and development of neurons and cause irreversible damage to the nervous system. Infants whose mothers were exposed to high levels in poisoning episodes in Minamata, Japan, and in Iraq were born with severe disabilities, including mental retardation, cerebral palsy, blindness, and deafness EPA, ; NRC, More recently, epidemiological studies of lower-level exposure from maternal fish consumption have raised concerns about subtle neurodevelopmental deficits. The NRC report concluded that the evidence of developmental neurotoxic effects from mercury exposure is strong and called for revision of the Environmental Protection Agency EPA reference dose that provides public health guidance on acceptable population exposure levels. This conclusion was based on epidemiological studies of low-level chronic exposure from seafood consumption. The population at risk consists of women of childbearing age and their children. Based upon the available data on fish consumption, the NRC committee estimated that as many as 60, newborns may be at risk for adverse neurodevelopmental effects from in utero exposure to mercury. Currently, 40 states have issued fish consumption advisories to reduce exposure to mercury. EPA and the Food and Drug Administration FDA have also recently revised their guidance concerning consumption of fish species that have been shown to have high levels of mercury. Ultimately, the threat of mercury can be most effectively reduced through control of the sources of pollution. However, control of sources from the burning of fossil fuels may be decades away. In the meantime, prevention of adverse public health impacts from mercury will require a partnership among health care providers, public health agencies, and others. The example of methylmercury clearly illustrates the serious impact of just one environmental risk factor. Most states do not track environmental risk factors like pesticides and other hazards or most chronic diseases such as asthma and birth defects Pew Environmental Health Commission, A great deal about health determinants in the built and natural environments has been learned in recent decades, but much more is yet to be examined. Among the greatest advances in understanding the factors that shape population health over the last two decades, and clearly Page 57 Share Cite Suggested Citation: The evidence amassed strongly and consistently points to the importance of these conditions as significant determinants of population health. Additionally, we discuss the evidence related to a fifth condition that has been and that still is the subject of great interest as well as controversy: Socioeconomic Status and Health A strong and consistent finding of epidemiological research is that there are health differences among socioeconomic groups. Lower mortality, morbidity, and disability rates among socioeconomically advantaged people have been observed for hundreds of years; and in recent decades, these observations have been replicated using various indicators of socioeconomic status SES and multiple disease outcomes Syme and Berkman, ; Kaplan and Keil, SES is defined in terms of education, income, and occupation. Furthermore, educational differentials in mortality have increased in the United States over the past three decades, leading to a growing inequality, even though mortality rates have dropped for all groups Feldman et al. Although it may be measured as level of education or income, SES is a complex phenomenon often based on indicators of relationships to work occupational position or ranking , social class or status, and access to power. From a policy perspective as well as an etiological perspective, it is important to understand which of the components is criticalâ€"for instance, if education is found to be important, the policies that may be implemented would differ from the policies needed if income was found to be the most influential factor. In fact, most research has

not tested such competing hypotheses directly, so in the examples that follow, these have not been disaggregated, although the indicators used in each study are explicitly identified. Page 58 Share Cite Suggested Citation: Heart disease, the leading cause of death in the United States, provides a strong example of the association between SES and mortality. Research has documented the relationship between SES and cardiovascular disease NCHS, ; Kaplan and Keil, , and the British Whitehall longitudinal study of civil servants found that those in the lowest grades of employment were at the highest risk for heart disease Marmot et al. A striking finding that emerges from analyses of occupation- and area-based income measures is the graded and continuous nature of the association between socioeconomic position and mortality, with differences persisting well into the middle socioeconomic ranges Davey Smith et al.

Chapter 2 : Demographics: Understanding Populations

Understanding Populations Learn with flashcards, games, and more â€" for free.

ArcGIS includes many hundreds of demographic variables globally that are accessible as maps, reports, and raw data that you can use to enrich your own maps. GIS really matters here. The idea of data enrichment means that you can associate or append demographics to your local geography. This ability to combine your existing data with demographic variables specific to the problem being studied has opened a whole new avenue for everyone, not just consumer marketers, but epidemiologists, political scientists, sociologists, and any professional who wants to better understand a certain segment of the human population. Demographers want to understand populations not only currently, but into the future. How will a given population group change over time? The art of forecasting current-year estimates on the basis of the decennial US Census, for example, is something that is carefully conducted by the demographic experts at Esri. One end product of this work is manifested as Tapestry Segmentation, which comes to life in the app below. Available US demographic data includes: Updated Demographics Accurate current-year estimates and five-year projections for US demographics, including households, income, and housing. Tapestry Segmentation Detailed descriptions of residential neighborhoods, including demographics, lifestyle data, and economic factors divided into 67 segments. Consumer Spending Data about products and services consumers are buying. Includes apparel, food and beverage, entertainment, and household goods and services. Market Potential Includes thousands of items that consumers want. Retail Marketplace Direct comparison between retail sales and consumer spending by industry. Measures the gap between supply and demand. Provides sales, employee information, and industry classification. Includes name, total sales, and more. Crime Indexes Statistics about major categories of personal and property crime. Includes information about assault, burglary, and more. Traffic Counts Peak and low traffic volume of vehicles that cross a certain point or street location. Contains more than one million points. The Demographic and Statistics Atlas shows how population is changingâ€"growing in some parts of the United States, and shrinking in others. Available global data includes: Global Demographics Recent demographics about total population, family size, household income, education, marital status, household type, unemployment, and more. Global Spending Total amount spent and amount spent per capita for categories such as food, clothing, household, medical, electronics, and more. Learn more about demographic data from Esri. The twin goals of this book are to open your eyes to what is now possible with Web GIS, and then spur you into action by putting the technology and deep data resources in your hands. The book is available through Amazon.

Chapter 3 : Chapter 8: Understanding Populations - EcoZine

Below you find the classroom assignments and PPT's used for Chapter 8, Understanding Populations. You may use this website for access to PPT's, guided notes, and make up assignments.

Contact Understanding Population Projections: Assumptions Behind the Numbers Policymakers and program planners rely on population projections to assess future demand for resources such as food, water, and energy, as well as services such as health and education. Projections alert policymakers and planners to major trends that may affect social and economic development and help them craft appropriate policies and programs. Many governments periodically make population projections for their own countries. Census Bureau regularly prepare population projections for the world, regions, and individual countries. To develop these projections, demographers must make assumptions about future trends related to fertility, mortality, and migration. These assumptions, though based on research and expert opinions, are not certain. Population projections represent the future size of a population and the age and sex distribution if the assumptions used hold true. Many users of projections, however, may not be aware of exactly how they are made and do not consider the assumptions and limitations that underlie them. It is essential that users have a basic understanding of these assumptions and their plausibility before using them. Time also increases uncertainty: Projections over longer periods are less certain than short-term projections because of the compounding effects of inaccuracies in assumptions over time. This brief aims to improve understanding of population projections by highlighting some of the key assumptions on which they are based. The brief examines and discusses the population projections produced by UNPD hereafter referred to as UN projections as an example. To project future population, demographers make assumptions about how the current rates of births, deaths, and immigration and emigration will change in the future. Based on these assumptions, age- and sex-specific population increases or decreases over a future period are calculated and added to census results or an estimate of the population at the beginning of the period. Each set of projections produced by an organization or government is based on its own set of assumptions about fertility, mortality, and migration, and will likely differ from each other. Some groups, most notably the UNPD, identify uncertainty in projections by showing estimates of the likelihood that the future population size will fall within a certain range. The UNPD and others also develop multiple projections to reflect several possible scenarios of future levels of fertility and mortality. Fertility Fertility is expressed as the total fertility rate TFR , a measure of the number of children on average that a woman will have in her lifetime. More specifically, the TFR is a measure of how many children women would bear in their lives if the rate of childbearing in a given year remained unchanged across their lives. Of the three components, fertility often has the largest effect on future population size, especially in developing countries with high birth rates. Where fertility is high, demographers generally assume that fertility will follow a similar pattern of decline and eventually stabilize in every country at about two children per woman. One common misunderstanding about population projections is that when fertility declines to replacement level, the population will immediately stop growing. In previously high-fertility countries, however, population will continue to grow for many decades even after fertility reaches replacement level. Years of high fertility result in a young population age structure, which generates momentum for future population growth as the increasing number of young people begin having children of their own. Brazil, for example, had fertility decline to below-replacement level in the mids, but the UNPD projects its population to continue growing until mid-century. Not only does fertility decline affect population size, it also profoundly affects age distribution. Declines in fertility result in a growing proportion of elderly, now seen in most developed and many developing countries. In most developed countries, fertility is now below replacement level, often quite far below. The majority of developing countries, however, still have fertility above replacement level. In the least developed countries, women have on average more than four children. Additionally, fertility has remained high in most countries of sub-Saharan Africa, often declining slowly or not at all. As such, the fertility assumptions for this region tend to be less reliable. Future population size and age distribution for a country can vary substantially based on when a fertility decline begins, the pace of the decline, and whether the decline

continues all the way to replacement fertility or stalls at a higher level. Because of the possible discrepancy between assumptions and actual trends, the UNPD publishes multiple projections every two years with differing fertility assumptions, including Low, Medium, and High Fertility variants. The Medium Variant, most often cited among the series, assumes a growth in the use of family planning that will result in reductions in fertility in patterns similar to what occurred in other countries. Under these three variant scenarios, the assumed fertility in Kenya in , for example, would range from 2. Another common misunderstanding is that a path of fertility decline is more or less automatic and is continuous, as projections assume. Declines in fertility, however, often depend on increased investments in family planning services, health, and education—particularly for women and girls. Many countries that have not adequately invested in these areas have not experienced the fertility declines assumed in past projections and have had subsequent projections continuously revised upward. Over one-half of the countries in the Africa region, for example, had their UN population estimates for revised upward between the and revisions, increasing the total population projected for the region under the Medium Variant scenario by 8. In other cases, countries that have invested adequately have seen fertility decline more rapidly than originally assumed and population projections have been revised downward. Some users incorrectly assume that population levels stabilize in the final year for which a population is projected. For many years, the UNPD developed projections to the year and some users incorrectly interpreted the numbers to mean that world population growth under the Medium Variant would slow and stabilize in More recently the UNPD has developed population projections to , and while the uncertainty in the underlying assumptions grows over time, population growth for the world and in many countries continues well beyond In fact, in all of the current population projections except the Low Variant, world population continues to grow past Mortality Mortality is incorporated into projections by estimating death rates by age group and sex. Where mortality is relatively high and the resulting life expectancy at birth relatively low, changes in mortality play an important role in future population size. Where mortality is already low and life expectancy has risen, mortality has much less effect. Throughout developing countries, infant mortality has declined substantially over the last several decades; the general assumption underlying population projections for all countries is a continued decline in death rates and an increase in life expectancy. The HIV pandemic and its substantial impact on mortality in countries with high prevalence created the need to consider the future course of HIV infection and its treatment in mortality assumptions and population projections. In those countries with growing HIV epidemics during the s, death rate assumptions were revised upward in population projections. Despite the rise in mortality, population growth continued, albeit at a slower rate due to the impact of HIV. Recently, the UN projections show that life expectancies in the seriously affected countries of southern Africa are beginning to rise as a result of slowing the spread of HIV and improving the chances of survival among people living with HIV. Nonetheless, HIV will have a lasting impact on mortality for several decades: The extent to which HIV affects future mortality will depend on continued investments in both prevention and treatment of the disease. In fact, the UNPD assumes mortality from HIV will continue to decline due to improved access to antiretroviral therapy and fewer new infections. For many developed countries, low fertility combined with declining mortality among older adults is of considerable interest because of the impact on population aging. For example, the UN projections for many developed countries show the proportion of the population ages 65 and over rising as high as 30 percent to 40 percent by mid-century, an unprecedented development. Over 90 countries are projected to have life expectancy at age 65 reach 20 years or more by mid-century. Many people often wonder whether demographers incorporate other possible increases in mortality into projections, such as future conflict, natural disasters, or changing lifestyles like increases in obesity and lack of exercise. Because of the uncertainty about where conflict and natural disasters might occur, what the impacts might be, and how mortality rates might be affected, demographers do not incorporate such factors into projections. In the case of changing lifestyles, data on the impact on mortality are still largely unavailable or just emerging in most countries and are not yet included in projection assumptions. In general, demographers have not assumed other changes in mortality beyond declining infant mortality, the continued impact of HIV, and increased longevity. Migration International migration can be particularly unpredictable and difficult to incorporate into projection assumptions. Migration flows often result

from short-term changes in economic, social, political, or environmental factors that are difficult to anticipate. Moreover, for many countries, reliable information on the number of immigrants and emigrants is not available. Nonetheless, migration can have a significant effect on population change in specific countries and regions. For many years, the most common pattern of migration has been the movement of people from developing countries to developed countries and from poorer developed countries to wealthier ones. Populations of countries and regions with low fertility, where deaths exceed births, will decline without net migration gains. For example, international migration accounted for over one-half of the population growth in developed countries in the s. The movement of people between developing countries because of economic opportunities, environmental disasters, or political or civil unrest has also altered the demographic landscape. Migration assumptions often take into account the experience of countries with historically high immigration, such as the United States. Given its unpredictable nature, however, it is usually assumed that current migration levels will persist for a time and slowly decline. For example, the UNPD assumes that the current estimated annual flow of about 2. But national policies on immigration and the future economic appeal of developed countries could certainly change that figure in either direction. UNPD assumes net migration will eventually reach zero by in all countries. This highly unlikely scenario suggests how difficult it is to predict the levels of migration over such a long period. The accuracy of population projections depends primarily on the accuracy of the underlying assumptions. Demographers attempt to make the best assumptions possible based on the existing evidence and revise them as new information becomes available through various sources, such as national censuses, vital registrations, immigration statistics, and demographic surveys. Therefore, it is critical that policymakers and planners understand the assumptions behind different projection series. Understanding the causes of uncertainty in population projections and their implications for plans and policies that span different time horizons is essential for successful planning. It is also important that users reject the common misunderstandings about population projections, and instead understand that: Countries do not immediately stop growing when fertility reaches replacement level. Fertility does not decline automatically, as assumed in projections, without investments in areas such as family planning, health, and education of women and girls. Population levels do not necessarily stabilize in the final year for which a population is projected. Correctly understanding these critical points allows policymakers and planners to have a more realistic assessment of the impact of future population growth. At the same time, policymakers and planners can contribute to improving the accuracy of population projections by supporting national and international efforts to collect more accurate demographic data that would lead to more accurate assumptions, ultimately improving projections and increasing their value for policy and planning purposes. The Revision, Volume I:

Chapter 4 : Understanding where populations 50+? - Daily Crossword Puzzle Answers

Understanding and Using Population Projections Government policymakers and planners around the world use population projections to gauge future demand for food, water, energy, and services, and to forecast future demographic characteristics.

Support Growth or Decline: Peter Borsella for Random Samplings , the official blog of the U. The original article can be found here. There are three components of change: Populations grow or shrink depending on if they gain people faster than they lose them. Often times, natural change is positive, which means that more babies are being born than people are dying. Between and , Salt Lake City had around 19, births and 6, deaths. Since there were about 12, more births than deaths, Salt Lake City had a natural increase of about 12, people, making natural increase a key reason why its population grew over the year. Areas with aging populations often have natural decrease. Two states had natural decrease between and , Maine and West Virginia. Between and , Maine had more deaths than births and West Virginia had more deaths than births. Maps like these help visually tell the story of a community. Click on the map and zoom to your location to see this data for your area or visit our Map Room to create your own maps. Migration Migration is the movement of people from one area to another. When net migration is positive, a population has more people moving in than out. Regionally, the South gains the most net domestic migrants, with roughly , more people moving into southern states than leaving them between and Sometimes net domestic migration is negative, in which case more people are moving away than are moving in. The Chicago metro area in Illinois, Indiana, and Wisconsin lost about 80, people through migration between and , which is consistent with a long-standing pattern of negative net domestic migration for the metro area. Armed Forces, and U. Some areas, like the Miami metro area in Florida, grow in part due to net international migration. The Big Picture Analyzing the components of change is an enlightening way to understand how the U. Looking at counties across the country, we can identify clusters of counties that grow mainly due to migration and others that grow due to natural increase. Clusters seen in areas like Florida and Texas, which grew primarily due to net migration gain between and , are visible in Map 1. Other clusters shown in Map 1, such as those in California, Utah, and along the east coast from Virginia up to New York, grew over the same span of time in large part due to natural increase. Counties with shrinking populations are also clustered geographically. For many of these shrinking counties, net migration is the primary cause of population loss. How these counties can cluster together is shown in Map 2, where several areas along the Mississippi River Arkansas, Louisiana, and Mississippi had net migration loss between and States like Illinois, Kansas, New Mexico, and New York also had several counties that lost population due to net migration loss. Natural change and net migration both contribute to population change, sometimes with unexpected results. Frequently, natural change and net migration push a population in opposite directions, making it more difficult to determine whether a population is growing or shrinking. Los Angeles County, California—the largest county in the United States—experienced both natural increase and net migration loss between and As noted earlier, natural increase contributes to population growth, while net migration loss can cause a population to shrink. This can beg the question, how might a population change when subjected to seemingly contradictory components? The answer is that it depends. In the case of Los Angeles, the growth due to natural increase was much larger than the loss due to net migration, and the county saw a sizeable population increase. All across the United States, stories like the one playing out in Los Angeles exist, with each area having a unique combination of natural change and net migration that determines whether they grow or shrink from year to year. By looking at these basic components of population change, demographers gain insight into the complexities of how populations change over time. As illustrated in this blog, the balance between these components is unique in each area, while following general patterns across states or regions. This balance gives areas their own unique story as they change over time. Metro areas contain at least one urbanized area of 50, or more population, and consist of one or more whole counties or county equivalents. Some metro area titles are abbreviated in the text of the blog. The Census Bureau develops annual population estimates by measuring population change since the most recent census. The Census Bureau

uses births, deaths, administrative records and survey data to develop estimates of the U.

Note: Citations are based on reference standards. However, formatting rules can vary widely between applications and fields of interest or study. The specific requirements or preferences of your reviewing publisher, classroom teacher, institution or organization should be applied.

Contact Understanding and Using Population Projections Government policymakers and planners around the world use population projections to gauge future demand for food, water, energy, and services, and to forecast future demographic characteristics. Population projections can alert policymakers to major trends that may affect economic development and help policymakers craft policies that can be adapted for various projection scenarios. The National Research Council of the U. National Academy of Sciences NAS convened a panel of experts in to examine the assumptions, accuracy, and uncertainty related to the most widely used population projections and to recommend ways to improve these projections. After extensive review, the panel concluded in July that current world population projections to the year are based on sound scientific evidence and provide plausible forecasts of demographic trends for the world. The panel cautioned, however, that projections for specific countries, for certain population groups, or for longer periods in the future are less certain than global and shorter-range projections. Users of population projections need to understand the reliability and the limitations of projection series. Awareness of how projections are prepared and the possible sources of uncertainty in the numbers can help policymakers more effectively incorporate projections in their planning process. Who Makes Population Projections? Most national governments make population projections for their own countries. In addition, a few international organizations prepare population projections for the world, regions, and individual countries. Census Bureau issue revised global and national projections on a regular basis. The UN projections are the most widely used worldwide. Many national governments, international agencies, the media, researchers, and academic institutions rely on UN projections. World Bank projections generally are used for planning and for managing projects, while IIASA projections have been used primarily to assess various projection assumptions and methods. Each of these international organizations uses slightly different methodologies, makes varying assumptions about future demographic trends, and begins with slightly different estimates of current population size. Nevertheless, their results fall within a relatively small band for the next 50 years see Figure 1. Figure 1 World Population Projections to and Census Bureau, International Data Base, www. How Are Populations Projected? The population of a geographic area grows or declines through the interaction of three factors: To project population size at a future date, demographers make assumptions about levels of fertility and mortality and about how many people will move into or out of an area before that date. All of the major international agencies that project populations base their projections on current population estimates and assumptions about how fertility, mortality, and migration will change over time. Recent projection methodologies have focused on identifying uncertainty in projections â€" that is, on developing estimates of the probability that the future population size will fall within a certain range. Demographers try to measure the uncertainty of population projections by consulting other experts; analyzing errors in previous projections; and examining trends in fertility, mortality, and migration. How Accurate Are Projections? The accuracy of current population projections cannot be directly evaluated, but the success of previous global and country-level projections can be examined. Twelve times since the s, the UN has projected the world population size for the year All but one of these projections has been off by less than 4 percent. Projections for specific countries and age groups have not been as accurate, however. In general, projections of future population size tend to be more uncertain, or less accurate: For less developed countries than for more developed countries, partly because the former tend to have less reliable data on the current population size and birth and death rates; For smaller countries than larger ones, in part because analysts devote more attention to larger countries; For younger and older age groups than for middle age groups, because incorrect assumptions about fertility and mortality have a greater effect at older and younger ages; At the country level than at the regional or global level, because errors at the country level tend to cancel each other when aggregated to regions or to the world; and For longer periods more than two decades than shorter

periods, because of the compounding effects of incorrect assumptions over time. Which errors are most important? In short-term projections, inaccuracies in the population data at the beginning point of a projection are the most important source of error. For long-term projections, assumptions about future fertility, mortality, and migration trends have a greater effect on accuracy. Population change reflects the interplay of fertility, mortality, and migration, but in less developed regions, where fertility levels are high, fertility has the greatest effect on future population size. Years of high fertility produce a young population age structure, which generates momentum for future growth as these youth begin having their own families. Today, average fertility in less developed countries is 3. Fertility In the latter half of the 20th century, fertility fell nearly everywhere in the world, although not at the same pace see Figure 2. Based on evidence from the last half century, demographers and other researchers have formulated several theories about the likely path of fertility decline in more developed and less developed countries. Figure 2 Patterns of Fertility Decline: India, Argentina, and Thailand, â€" Note: Total fertility rate is the average total number of children a woman would have given current birth rates. Demographers generally assume that fertility will eventually stabilize at a specific level in every country, usually at replacement level. In most industrialized countries not including the United States , average fertility is now below the two-child-per-woman replacement level, and experts have been engaged in a spirited debate about whether fertility will continue to fall, level off, or rise again to stabilize at replacement level. Most countries, however, have above replacement-level fertility, and the UN has assumed that their fertility rates will decline to replacement level and remain constant thereafter. Although the s and s saw rapid fertility decline in a number of countries, most projection series show the pace of decline slowing as countries reach lower fertility levels. Demographers are less certain about the timing and extent of the decline. The various projection scenarios published by the UN and other agencies reflect different assumptions about future fertility decline see Figure 3. The TFR total fertility rate is the average total number of children a woman would have given current birth rates. United Nations, World Population Prospects: The Revision Mortality Continuing improvements in health and healthcare worldwide have prompted the UN to increase its assumptions of the ultimate limits of life expectancy each time it produced new population projections. Each time, demographers had underestimated gains in life expectancy. While these underestimates of life expectancy had little effect on overall population totals, they understated the future size of elderly populations and, accordingly, the looming challenges of population aging for retirement and social security programs. It has lowered the projected life expectancy for sub-Saharan Africa, in particular, where infection rates are above 2 percent of the population in 45 countries. In the nine most affected countries mostly in eastern and southern Africa , current UN estimates show that AIDS mortality lowers the projected population by nearly 18 percent compared to what it would have been without AIDS. Migration Future international migration is more difficult to project than fertility or mortality because migration flows often result from short-term changes in economic, social, or political factors that are hard to predict or quantify. Migration can have a significant effect, however, on population change in specific countries and regions: International migration accounted for nearly half of the population growth rate in more developed countries in the s, for example. Flows of refugees following political or civil unrest have also altered the demographic landscape in some less developed countries. No methods exist to predict sudden mass migrations generated by political, economic, or environmental crises. The best demographers can do is to revise their estimates as soon as new information is available. What Do Projected Trends Imply? Social, economic, and environmental changes, along with government policies, can influence future demographic trends â€" especially fertility levels â€" which ensure some uncertainty in population projections. Census Bureau pegs world population at 9. By , the differences in the central estimates of these institutions widen to a billion or more, and differences between the low and high scenarios span more than 10 billion â€" from 4 billion to 16 billion. The NAS panel recommended, among other things, that demographers develop new ways to characterize the uncertainty that is associated with any population forecast: Demographers should state the probability that future world population will be, for example, between 10 billion and 12 billion. These methodological refinements, along with continued improvements in the assumptions used to create projections, will make the projections more valuable for a wider range of users. When users are aware of the assumptions behind the estimates, they can

make informed judgments about the most likely scenario for a particular population. Policymakers and program planners can undertake several steps to make projections more useful for policy and planning purposes: This work has been funded by the U. Population Reference Bureau, Panel on Population Projections. John Bongaarts and Rodolfo A. National Academy Press, The Revision Highlights. Available online at www.

Chapter 6 : Understanding and Using Population Projections â€" Population Reference Bureau

A relationship in which one species benefits and the other speices is neither harmed nor helped is called _____.

Census night date Census count: Census night date Estimated resident population ERP: These estimates are considered final. These estimates are considered preliminary and are subject to ongoing revision. Final ERPs for the intercensal period are established after the next Census. Quarterly at the national, state and territory level Annually 30 June at the sub-state level Other counts available from the Census. Estimated working population The census count of the working population includes all people who were employed in the week prior to the Census. Responses to the census question concerning location of workplace are used to determine the number of people working in particular locations. Along with information on how these people travelled to work, these counts are important in planning for services for the daytime populations of employment locations and for transport planning. Number of families versus number of households A family is defined by the ABS as two or more people, with one person aged 15 years or more, who are related by blood, marriage registered or de facto , adoption or fostering or in a stepfamily relationship and who are usually resident in the same household. In contrast, a household is defined by the ABS as one person or two or more related or unrelated persons who usually live in the same private dwelling. The basis of a family then is either a couple relationship, a lone parentâ€"child relationship or other blood relationship. Thus it is possible for more than one family to live in the same household and for non-family members to be household members. A non-family household is either a lone-person household or a group household. All other households are made up of different family compositions. Number of visitors in an area People who are visiting Australia at the time of the Census are counted regardless of how long they have been in the country or how long they plan to stay. Since the Census, overseas visitors were those people who said they would be usually resident in Australia for less than one year. In earlier censuses, overseas visitors were those who said they would be usually resident in Australia for less than six months. The number of visitors from within Australia is separately identified in census data and a range of characteristics can be provided for these visitors. In contrast, the only data for overseas visitors are age, sex and marital status. Visit the Australian Bureau of Statistics website to obtain census counts or the latest estimated resident population figures. A detailed description of the concepts, sources and methods used by the ABS in the production of population estimates can be found in Population estimates: Concepts, sources and methods, ABS Additional information on population concepts can be found in Information paper: Population concepts, ABS Last reviewed 27 June

Through the production of annual population estimates, and the types of analysis provided here, demography continues to be an important, ongoing focus of study at the Census Bureau that contributes to our understanding of where we've been.

Assuring the health of the public, however, goes beyond focusing on the health status of individuals; it requires a population health approach. Given these issues, the committee believes that it is necessary to transform national health policy, which traditionally has been grounded in a concern for personal health services and biomedical research that benefits the individual. Such repositioning will affirm and expand existing commitments to reflect a broader perspective. Approaching health from a population perspective commits the nation to understanding and acting on the full array of factors that affect health. As has been outlined in the preceding pages, what is needed is the creation of an effective intersectoral public health system. This chapter describes the rationale behind a transformed approach to addressing population health problems. Personal health care is only one, and perhaps the least powerful, of several types of determinants of health, among which are also included genetic, behavioral, social, and environmental factors IOM, ; McGinnis et al. To modify these, the nation and the intersectoral public health system must identify and exploit the full potential of new options and strategies for health policy and action. Three realities are central to the development of effective population-based prevention strategies. First, disease risk is currently conceived of as a continuum rather than a dichotomy. There is no clear division between risk for disease and no risk for disease with regard to levels of blood pressure, cholesterol, alcohol consumption, tobacco consumption, physical activity, diet and weight, lead exposure, and other risk factors. In fact, recommended cutoff points for management or treatment of many of these risk factors have changed dramatically and in a downward direction over time e. This continuum of risk is also apparent for many social and environmental conditions as well e. Any population model of prevention should be built on the recognition that there are degrees of risk rather than just two extremes of exposure i. The second reality is that most often only a small percentage of any population is at the extremes of high or low risk. The majority of people fall in the middle of the distribution of risk. Rose , observed that exposure of a large number of people to a small risk can yield a more absolute number of cases of a condition than exposure of a small number of people to a high risk. This relationship argues for the development of strategies that focus on the modification of risk for the entire population rather than for specific high-risk individuals. In other words, such strategies would move the entire distribution of risk to lower levels to achieve maximal population gains. Thus, someone in the United States is more likely to die prematurely from a heart attack than someone living in Japan, because the population distribution of high cholesterol in the United States as a whole is higher than the distribution in Japan i. Applying the population perspective to a health measure means asking why a population has the existing distribution of a particular risk, in addition to asking why a particular individual got sick Rose, Because the majority of cases of illness arise within the bulk of the population outside the extremes of risk, prevention strategies must be applicable to a broad base of the population. American society experienced this approach to disease prevention and health promotion in the early twentieth century, when measures were taken to promote sanitation and food and water safety CDC, b , and in more recent policies on seat belt use, unleaded gasoline, vaccination, and water fluoridation, some of which are discussed later in this chapter. The committee recognizes that achieving the goal of improving population health requires balancing of the strategies aimed at shifting the distribution of risk with other approaches. The committee does, however, endorse a much wider examination, and ultimately the development, of new population-based strategies. Three graphs illustrate different models for risk reduction see Figure 2â€"1. Data for current distribution from Schwartz and Woloshin, These hypothetical models assume etiological links exist among all exposures and disease outcomes. Figure 2â€"1a shows the effects of an intervention aimed at reducing the risk of those in the highest-risk category. In this example, people with the highest body mass index BMI 1 are at in creased risk for cardiovascular heart disease and a plethora of chronic illnesses. Intervening medically, for example, to

decrease risk by lowering levels of obesity, as measured by BMI ultimately decreases the proportion of the population with the highest BMIs. However, use of such an intervention would be acceptable only in those whose medical risk was very high. Moreover, interventions in high-risk groups may have a limited effect on population outcomes because the greater proportion of those with moderate risk levels may ultimately translate into more chronic disease or other poor health outcomes. Because most people are in categories of moderately elevated risk as opposed to very high risk, this strategy offers the greatest benefit in terms of population-attributable risk, assuming that the intervention itself carries little or no risk. The hypothetical example shows what might occur if social policies or other population-wide measures were adopted to promote small decreases in weight in the general population. The committee embraces this kind of model of disease prevention in the case of policies such as seat belt regulation and the reduction of lead levels in gasoline. The final hypothetical model Figure 2â€"1c , although not discussed by Rose explicitly, illustrates a reduction in the distributions of those at highest and lowest risk with no change in the distribution of those with a mean level of risk. This model is appropriate for illustrating phenomena relating to inequality, where redistribution of some good e. One hypothetical example is the association between low income and poor health. In many cases, there is a curvilinear association between these goods and health outcomes, with decreased health gains experienced by those at the upper bounds of the distribution. For example, data on income suggest that there are large differences in the health gains achieved per dollar earned for those at the lower end of the income distribution and fewer differences in the health gains achieved per dollar earned for those at the upper end. Thus, the curvilinear association, if it were a causal one, would suggest that substantial gains in population-level health outcomes may be achieved by a redistribution of some resources without actual changes in the means. These graphs help to illustrate three different strategies for improving the health of the population. The nation has often endorsed the first strategy without a critical examination of the other two, especially the second one. The American public has grown accustomed to seeing differences in exposures to risk, both environmental and behavioral, and disparities in health outcomes. In some ways, conventional public health models e. Enormous gains in the control and eradication of infectious diseases rested upon a deep understanding of the ecology of specific agents and the power of environmental interventions rather than individual or behavioral interventions to control disease. For example, in areas where sanitation and water purification are poor, individual behaviors, such as hand washing and boiling of water, are emphasized to reduce the spread of disease. The last several decades of research have resulted in a deeper understanding not only of the physical dimensions of the environment that are toxic but also of a broad range of related conditions in the social environment that are factors in creating poor health. These social determinants challenge the discipline of public health to more fully incorporate them. Over the past decade, several models have been developed to illustrate the determinants of health and the ecological nature of health e. Many of these models have been developed in the United Kingdom, Canada, and Scandinavia, where population approaches have started to shape governmental and public health policies. The committee has built on the Dahlgren-Whitehead modelâ€"which also guided the Independent Inquiry into Inequalities in Health in the United Kingdomâ€"modifying it to reflect special issues of relevance in the United States see Figure 2â€"2. This figure serves as a useful heuristic to help us think about the multiple determinants of population health. Furthermore, the governmental sector needs to work in partnership with nongovernmental sectors such as academia, the media, business, community-based organizations and communities themselves to create the intersectoral model of the public health system first alluded to in the Institute of Medicine IOM report and established in this report as critical to effective health action. Adapted from Dahlgren and Whitehead, The dotted lines between levels of the model denote interaction effects between and among the various levels of health determinants Worthman, more Most models of health determinants identify macro-level conditions and policies social, economic, cultural, and environmental as potent forces in shaping midlevel working conditions, housing and proximate behavioral, biological determinants of health. Macro-level or upstream determinants such as policies and societal norms and micro-level determinants such as sex or the virulence of a disease agent interact along complex and dynamic pathways to produce health at a population level. As mentioned above, exposures at the environmental level may have a greater influence on population health than

individual vulnerabilities, although at an individual level, personal characteristics including genetic predispositions interact with the environment to produce disease. For instance, smoking is a complex biobehavioral activity with both significant genetic heritability and nongenetic, environmental influences, and many studies have shown an interaction between smoking and specific genes in determining the risk of developing cardiovascular disease and cancers. It is also important to note that developmental and historical conditions change over time at both a societal level e. In the pages that follow, the committee provides a concise discussion of the key determinants that constitute the ecology of health, including environmental and social determinants, and elaborates in more detail on the social influences on health. This decision was made in recognition of a longer history in studying the ways in which environment shapes population health. Improved water, food, and milk sanitation, reduced physical crowding, improved nutrition, and central heating with cleaner fuels were the developments most responsible for the great advances in public health achieved during the twentieth century. These advantages of a developed nation are taken for granted, but in fact, they could deteriorate without adequate support of the governmental public health infrastructure. Environmental health problems, historically local in their effects and short in duration, have changed dramatically within the last 25 years. Together, global warming, population growth, habitat destruction, loss of green space, and resource depletion have produced a widely acknowledged environmental crisis NRC, These long-term environmental problems are not amenable to quick technical fixes, and their resolution will require community and societal engagement. At the local and community levels, environmental issues are equally complex and are also related to a range of socioeconomic factors. A brief look at some of the evidence on environmental determinants of health may help shed some light on why health is not equally shared. The places in which people work and live have an enormous impact on their health. The characteristics of place include the social and economic environments, as well as the natural environment e. Environmental hazards in workplaces and communities may range from tobacco smoke to pesticides to toxic housing. Rural areas may present increased health risks from pesticides and other environmental exposures, whereas some environmental threats to health can occur because of urban living conditions. More than three-quarters of Americans live in urban areas Bureau of the Census, Although rural Americans experience certain health-related disadvantages e. The negative environmental aspects of urban livingâ€"toxic buildings, proximity to industrial parks, and a lack of parks or green spaces, among othersâ€"likely affect those who are already at an economic and social disadvantage because of the concentration of such negative aspects in specific pockets of poverty and deprivation Lawrence, ; Maantay, ; Williams and Collins, Urban dwellers may experience higher levels of air pollution, which is associated with higher levels of cardiovascular and respiratory disease Hoek et al. People who live in aging buildings and in crowded and unsanitary conditions may also experience increased levels of lead in their blood, as well as asthma and allergies Pertowski, ; Pew Environmental Health Commission, ; CDC, a. These examples illustrate some of the profound effects of the physical environment on health. The places where people live may expose them to harmful factors. A Case Study The case of methylmercury as an environmental pollutant illustrates the potentially dramatic effects of the physical environment on health. Environmental toxins are a specific form of environmental hazard, caused in most cases by industrial enterprises, and the adverse effects of such toxins on the nervous system have been well documented. High levels of exposure to certain environmental pollutants are known to cause acute effects including convulsions, paralysis, coma, and death. The effects of lead on health and development have been documented for decades, and policy action regarding leaded gasoline and lead-based paints has been taken, with positive effects on child health. However, there is growing concern about emerging evidence that other ubiquitous pollutants such as polychlorinated biphenyls PCBs and mercury may cause behavioral problems and affect mood and social adjustment. The adverse impacts of exposure to these pollutants may be most profound during fetal development and early childhood. Amidst growing national concern about developmental disabilities, exposure to mercury in the environment represents an emerging and preventable environmental health threat. The National Research Council NRC report Toxicological Effects of Methylmercury NRC, examined the evidence of adverse health impacts resulting from exposure to mercury, focusing on consumption of seafood contaminated by releases to the environment. Fossil fuel combustion represents the major source of mercury

released to the environment. The deposition of mercury on the land and in surface waters results in conversion to forms that accumulate in the food chain. This bioaccumulation can result in very high concentrations of mercury in some fish, which are the main source of exposure for the population. The developing brain is particularly sensitive to the adverse effects of mercury exposure. Prenatal exposures may interfere with the growth and development of neurons and cause irreversible damage to the nervous system. Infants whose mothers were exposed to high levels in poisoning episodes in Minamata, Japan, and in Iraq were born with severe disabilities, including mental retardation, cerebral palsy, blindness, and deafness EPA, ; NRC, More recently, epidemiological studies of lower-level exposure from maternal fish consumption have raised concerns about subtle neurodevelopmental deficits. The NRC report concluded that the evidence of developmental neurotoxic effects from mercury exposure is strong and called for revision of the Environmental Protection Agency EPA reference dose that provides public health guidance on acceptable population exposure levels. This conclusion was based on epidemiological studies of low-level chronic exposure from seafood consumption.

Holt McDougal Environmental Science Chapter 8: Understanding Populations Chapter Exam Instructions Choose your answers to the questions and click 'Next' to see the next set of questions.

Society and the Environment: Conserving Top Predators Successful reintroduction of wild wolves in the American West has led to significant changes in the ecosystem. Return of Wolves By the early s wolves had been virtually eliminated from most of their native range in the United States. They were hunted vigorously because they killed livestock. In Yellowstone National Park , wolves were hunted to extinction. When the wolves disappeared, populations of elkâ€"a favorite food of wolvesâ€"began to increase. As early as the s, environmental scientists were worried that elk overgrazing was harming the park. In , the first wolves were reintroduced into Yellowstone, and their populations have been increasing in the park and other areas of the American West. In Yellowstone, wolf populations grew to over animals, but subsequently declined to around Elk also changed their behavior to stay safer from wolves. The return of wolves to Yellowstone has triggered other changes in the ecosystem. Plant communities changed in response to less grazing from elk. For example, willow trees near rivers have increased. Willow is a tree beavers need to survive the winter, so populations of beavers have increased. The beavers have changed streams and ponds, creating habitat for many other species. Changes in ecosystems after the reintroduction of wolves have been so large that some scientists have suggested that predators should be reintroduced to more areas to improve ecosystem health. Ocean Predators While wolves are making a comeback on land, large predators in the ocean are in trouble. One example of ocean predators in trouble is sharks. Sharks are being overfished around the world, mainly to fill demand for shark fin soup. In many places, valuable fins are removed from the shark, and the rest of the body is thrown back into the sea. Tens of millions of sharks are killed each year. Unlike other fish, sharks take years before they can reproduce and they only have a few young each year. That means that they cannot survive heavy fishing. Should we worry about the disappearance of sharks? Recent studies say yes! Work in Western Australia by the Florida International University â€"led Shark Bay Ecosystem Research Project has shown that tiger sharks may be as important to ocean ecosystems as wolves are on land. By changing where and how marine herbivores like turtles and sea cows feed, tiger sharks protect seagrass. This seagrass is food and habitat for many species of fish and invertebrates, including many species people eat. Scientists also have found that having healthy shark populations is associated with healthy ecosystems in other parts of the world. The impact of tiger sharks on ocean ecosystems is a subject of study for the Shark Bay Ecosystem Research Project in Australia. People also have found out that living sharks are more valuable than dead sharks. Not only do living sharks help keep ecosystems healthy, but scuba divers will travel from all over the world to see them in their natural habitat. Some environmental scientists and conservation groups are now trying to convince governments that sharks should be protected and efforts be made to help their populations increase where they have been overfished. Good science and economics have caused some governments to listen. In some places, trade in shark fins is now illegal. In others, including the USA, sharks must be brought to shore with their fins attached. That means that fewer sharks can be caught on a single fishing trip. Also, species that are most in trouble are now protected in many areas. In other areas, shark sanctuaries have been created. Inside these sanctuaries, no sharks can be caught and killed. Palau created the first shark sanctuary in Since then, Honduras, The Bahamas, the Maldives, Tokelau, and the Republic of the Marshall Islands have set aside huge areas of ocean as shark sanctuaries. Environmental scientists are now studying how ocean ecosystems respond to the protection of sharks. Perhaps the same benefits seen on land with the return of wolves will occur in the oceans. Ongoing Challenges Even though things are looking up for wolves in North America and sharks in some places of the world, there are still major challenges. Throughout most of the world, predators on land are still in trouble. They are being killed because they eat livestock and their habitat is being destroyed. In the oceans, species of large sharks and other marine predators that may be among the most important to ecosystems can swim for thousands of miles. That means they often leave even large sanctuaries and can be caught in fisheries.

Chapter 9 : Growth or Decline: Understanding How Populations Change | Community Commons

Understanding and ultimately improving a population's health rest not only on understanding this population perspective but also on understanding the ecology of health and the interconnectedness of the biological, behavioral, physical, and socioenvironmental domains.