

Strengthening the Scientific Foundation
for Policymaking to Meet the Challenges of
**Aging in Latin America
and the Caribbean**

Summary of a Workshop

Kevin Kinsella, *Rapporteur*

Steering Committee for the Workshop on Strengthening the
Scientific Foundation for Policymaking to Meet the Challenges
of Aging in Latin America and the Caribbean

Committee on Population
Division of Behavioral and Social Sciences and Education

The National Academies of
SCIENCES • ENGINEERING • MEDICINE

THE NATIONAL ACADEMIES PRESS
Washington, DC
www.nap.edu

THE NATIONAL ACADEMIES PRESS 500 Fifth Street, NW Washington, DC 20001

Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the views of the organizations or agencies that provided support for the project. This activity was supported by an unnumbered award from the Inter-American Development Bank and the National Institute on Aging of the National Institutes of Health through Contract No. HHSN26300046.

International Standard Book Number-13: 978-0-309-37804-8

International Standard Book Number-10: 0-309-37804-4

Additional copies of this report are available for sale from the National Academies Press, 500 Fifth Street, N.W., Keck 360, Washington, DC 20001; (800) 624-6242 or (202) 334-3313; Internet, <http://www.nap.edu/>.

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Printed in the United States of America

Suggested citation: National Academies of Sciences, Engineering, and Medicine. (2015). *Strengthening the Scientific Foundation for Policymaking to Meet the Challenges of Aging in Latin America and the Caribbean: Summary of a Workshop*, K. Kinsella, Rapporteur, Steering Committee for the Workshop on Strengthening the Scientific Foundation for Policymaking to Meet the Challenges of Aging in Latin America and the Caribbean. Committee on Population, Division of Behavioral and Social Sciences and Education. Washington, DC: The National Academies Press.

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Acknowledgments

This report summarizes the proceedings of a workshop convened in May 2015 to consider priorities for strengthening the scientific foundation for policymaking regarding population aging in Latin America and the Caribbean. The workshop was sponsored by the U.S. National Institute on Aging (NIA) and the Mexican National Academy of Medicine, with additional financial and/or logistical support provided by the University of Texas Medical Branch, the University of Michigan, the Inter-American Development Bank, and the Pan American Health Organization. The meeting was convened in Mexico City by the Mexican National Academy of Medicine.

The workshop was organized by an eight-member steering committee composed of experts in the fields of economics, demography, population health, and survey research. The committee provided indispensable guidance in developing the workshop agenda, securing expert presentations, and facilitating the conduct of the workshop. The committee would like to thank Enrique Graue Weichers, president of the Mexican National Academy of Medicine, and Eduardo Sojo Garza-Aldape, president of the Mexican National Institute of Statistics and Geography, for their remarks during the workshop's opening session. The committee also extends thanks to NIA staff member Georgeanne Patmios for her opening remarks and planning meeting input prior to the workshop; to Olivia Mitchell, University of Pennsylvania, for chairing a workshop session; and to Alberto Palloni, University of Wisconsin, for his prior involvement in and development of

this project. Although the steering committee members played a central role throughout, they did not actively participate in writing this summary.

The presentations during the workshop provided the basis for lively and informative discussions. We greatly appreciate the contributions of Emma Aguila, Cecilia Albala, Soham Al-Snih, David Bravo, Maria Teresa Calzada, Carlos Cano, Somnath Chatterji, Eileen Crimmins, Carmen Garcia-Peña, Luis Miguel Gutiérrez, Roberto Ham Chande, Maria Fernanda Lima-Costa, Rafael Lozano, Timothy Miller, Luis Rosero-Bixby, Paulo Saad, Rafael Samper-Ternent, James Smith, Florencia Torche, Cassio Turra, Victor Garcia Vilchis, and Rebeca Wong.

The steering committee acknowledges the work of the staff of several organizations in planning and executing the workshop. We are especially grateful to Angelica Carmona, Mexican National Institute of Geriatrics, for handling the myriad logistical arrangements and for ensuring a smooth meeting process. We thank Adrienne Mitchell, University of Texas Medical Branch; Linda Castagnola and Jenny Valencia, Pan American Health Organization; and Mary Cheatham and Catherine Liebowitz, University of Michigan, for assisting with travel arrangements. Within the U.S. National Academies of Sciences, Engineering, and Medicine (the Academies), we thank Thomas Plewes, director of the Committee on Population, who provided overall direction and guidance for the project. Mary Ghitelman provided invaluable assistance with many aspects of the project, including logistical details and report preparation. Kevin Kinsella assisted with organizing the steering committee and setting the agenda for the study and served as rapporteur for the workshop. Paula Whitacre edited the report, Kirsten Sampson Snyder orchestrated the review process, and Yvonne Wise managed the production process.

This workshop summary has been reviewed in draft form by individuals chosen for their diverse perspectives and technical expertise, in accordance with procedures approved by the Report Review Committee of the Academies. The purpose of this independent review is to provide candid and critical comments that assist the institution in making its report as sound as possible, and to ensure that the report meets institutional standards for objectivity, evidence, and responsiveness to the study charge. The review comments and draft manuscript remain confidential to protect the integrity of the deliberative process. We thank the following individuals for their review of this report: Soham Al Snih, Division of Rehabilitation Sciences, University of Texas Medical Branch, Galveston; Hiram Beltrán-Sánchez, Demography of Health and Aging, University of Wisconsin; William Dow,

School of Public Health, University of California, Berkeley; and Paulo Saad, El Centro Latinoamericano y Caribeño de Demografía (CELADE), División de Población de la Comisión Económica para América Latina y el Caribe (CEPAL).

Although the reviewers listed above provided many constructive comments and suggestions, they were not asked to endorse the content of the report, nor did they see the final draft of the report before its release. The review of this report was overseen by Mark D. Hayward, Population Research Center, University of Texas at Austin. Appointed by the Academies, he was responsible for making certain that an independent examination of this report was carried out in accordance with institutional procedures and that all review comments were carefully considered. Responsibility for the final content of the report rests entirely with the author and the institution.

David Weir and Rebeca Wong, *Cochairs*
Steering Committee for the Workshop on
Strengthening the Scientific Foundation
for Policymaking to Meet the Challenges of
Aging in Latin America and the Caribbean

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1

Introduction

Recent demographic trends in Latin America and the Caribbean (LAC) region will shape the growth and age composition of its populations for decades to come. The rapid mortality decline that began during the 1950s, and the more recent and even sharper reduction in fertility, will produce unusually high rates of growth of the older population, a large change in overall population age composition, and significant increases in the ratio of older to younger population. According to the most recent United Nations (2013) projections, the number of people aged 60 and older in LAC is expected to increase from 59 million in 2010 to 196 million in 2050, and the number of people aged 80 and older will increase from 8.6 million to more than 44 million during the same period. The proportion of population aged 60 and older is projected to increase from about 10 percent in 2010 to about 25 percent in 2050, and the median age will jump from 27.3 years in 2010 to 40.6 years in 2050 (medium variant projection). The rate of growth of the population aged 60 and older is accelerating. It has been estimated that in countries with the fastest aging, this will increase from about .015 per year to .045 per year between 2000 and 2025 (Palloni et al., 2002). Growth rates of this magnitude will generate a population dynamic with no precedent in human population history. Indeed, while many high-income countries in Western Europe and North America experienced population aging gradually over a period of 50–100 years, many LAC countries will navigate through an equivalent demographic landscape in a severely contracted interval of 20–30 years (Kinsella and He, 2009).

These trends are taking place in a dynamic environment: (1) LAC countries are experiencing high levels of poverty and inequality with large fractions of the older population living in precarious conditions; (2) regimes of health services and medical care are experiencing upheavals that may threaten existing levels of access and quality of medical care; (3) although cohorts of individuals who attain their 60th birthday after the year 2000 benefited from survival gains in the post-1950 period, their early experiences could make them vulnerable to higher levels of chronic conditions and disability; (4) most LAC countries are experiencing an increase in chronic diseases while continuing to have high rates of infectious conditions; and (5) social security programs, and social safety nets more generally, are being replaced by fully or partially privatized systems that often provide only limited coverage to low-income earners and the more disadvantaged members of a population. (For an overview of these and other trends, see Population Reference Bureau, 2014; Cotlear, 2011; Jackson et al., 2009.)

The forgoing suggests that the aging process in LAC offers unique opportunities to understand mechanisms regulating health and mortality, those implicated in intrafamily transfers and support, and the individual and aggregate effects of changes in intergenerational transfers. There is a need for studying the relationship among demographic aging, individual behavior and well-being, and societal responses, as well as a need for identifying methodologies and technologies to collect, organize, and analyze information designed to inform policy. It also is important to recognize national (and subnational) diversity in the aging process throughout the LAC region; for example, the demographic landscape in Cuba and Uruguay is very different from that in Guatemala.

A broad study and data collection strategy concerning aging, individual well-being and behavior, and societal responses might focus on:

1. Trends and determinants of health, disability, and mortality; evaluation of the effects of early-life experiences, diet, and sedentary behaviors on obesity, diabetes, and cardiovascular disease; and the prevalence and determinants of cognitive deterioration, including the most salient social differentials;
2. Labor market participation of older populations; past labor force history and choices; retirement decisions; and differentials by social class and region of residence;
3. Health care systems, health care access, and health care quality; and differential experiences with health care systems according

- to health and disability status, family organization, residential arrangements, and locality;
4. Pension system diversity across LAC; histories and trajectories of system reforms, population coverage, benefits and returns; assessment of economic flows across age groups; and consumption patterns among older populations;
 5. Determinants and consequences of intrafamily and societal transfers; prevalence of and changes in family support systems, including coresidence; accommodation and diversification of family support strategies vis-à-vis a changing landscape of pension systems, labor markets, and health care, and dilution of traditional ideologies regarding family support.

Assessment of data needs, data collection, and data harmonization would involve such factors as multifaceted study designs, the inclusion of biomarkers and anthropometry, the use of vignettes to elicit information on health, methods for evaluating cognitive deterioration, and the relationship of health and wealth, focusing on the role of intrafamily transfers.

A workshop entitled “Strengthening the Scientific Foundation for Policymaking to Meet the Challenges of Aging in Latin America and the Caribbean” took place at the National Academy of Medicine in Mexico City, May 28–29, 2015. The purpose of the workshop was to present scientific research emphasizing what is unique about aging in LAC and what is similar to other processes around the world, to highlight the main areas where many experts believe knowledge of the aging process in LAC is insufficient and new research is required, and to consider data collection that will produce information for policymaking while being responsive to the needs of the research community for harmonized, highly comparable information. (See Box 1-1 for the project steering committee’s statement of task.) The workshop follows, in part, from a previous U.S. National Institute on Aging-supported study of aging in Asia (National Research Council, 2012).

The Mexico City workshop afforded participants an opportunity to think about strategies for articulating data collection and research in the region so that country-based teams can reap the benefits from being part of a larger enterprise while simultaneously maintaining their own individuality and responding to particular needs of each country. To a large extent, the workshop was focused on the collection and production of household microdata as found in the global family of Health and Retirement Study (HRS)-type surveys (see Chapter 2), rather than on improving other types

BOX 1-1
Steering Committee's Statement of Task

The National Research Council will appoint a steering committee of international experts to plan and conduct a public workshop on the process of rapid aging in Latin America and the Caribbean (LAC) region. The workshop will feature presentations and discussions of the main areas where knowledge is insufficient and new research is required, will consider scientific research emphasizing what is unique about aging in LAC and what is similar to other processes around the world, and will review a data collection strategy that is cognizant of the uniqueness of the LAC aging process while being responsive to the needs of the research community for harmonized, highly comparable information. The workshop participants will be selected and invited by the steering committee in cooperation with international nongovernmental organizations and national academies of science in various Latin American countries. The workshop will be held in a country in Latin America. A workshop summary report prepared by a rapporteur will be published by the National Academies Press.

of survey, macroeconomic, or administrative data such as vital statistics systems that could serve as complements to HRS-type data for studying aging in LAC.

There were six topical sessions and a roundtable conducted by members of the project steering committee and invited speakers. Each of the following chapters is dedicated to one of these workshop components. Sets of slide presentations made during the workshop are available at http://sites.nationalacademies.org/DBASSE/CPOP/DBASSE_166698 [August 2015].

This report was prepared by a rapporteur as a factual summary of what occurred at the workshop. The steering committee's role was limited to planning and convening the workshop. The workshop agenda can be found in the Appendix at the end of this report. The views contained in the report are those of individual workshop participants and do not necessarily represent the views of other workshop participants, the steering committee, the U.S. National Academies, or the other organizations involved in funding the workshop.

2

Aging in Latin America and the Caribbean in Global Perspective

Following a series of opening remarks, the initial substantive session of the workshop sought to provide some international perspective around the question of aging in Latin America and the Caribbean (LAC), and to set the stage for subsequent sessions. The session chair, David Weir, University of Michigan, remarked that aging can be thought of as relating to individuals. Everyone ages; no one can avoid it. “We can ask someone else where do you get the glasses to help you to read? What medicine do you like for your back? Where do you put your money to save for retirement?” he commented. “Population aging, however, is a little more complicated.” Countries can age or they can grow younger. Every country’s age pyramid reflects its own history of fertility, of migration, and perhaps of war or other conflict. Just as individuals age in a world of other aging individuals, Latin America is aging in a world of other regions and countries that are also aging, he said. Scientific advances in other countries offer information of value to the region and, similarly, LAC experiences can shed light on problems being faced elsewhere in the world. The advantages of comparability of joint research efforts, Weir noted, are quite great in this field.

HEALTH AND HEALTH CARE CHALLENGES WITH POPULATION AGING

Eileen Crimmins, University of Southern California, framed her remarks by saying that aging is a challenge, but in some ways, it is a triumph and a positive trend. She said that if the workshop participants had been together 50 or 60 years ago, they would have been bemoaning the very high fertility and the very young age distribution of populations. However, many countries achieved what they wanted to do, which was to reduce fertility. With reduced fertility comes an aging population. According to Crimmins, this success of the last century has provided a challenge of this century: to change institutions and understanding in such a way to adjust to the fact that populations are aging and will continue to do so.

Crimmins noted that aging is highly related to health and health care because age is related to health. It is a biological fact that everyone ages, even if they age in different ways in different places because of different environments. The change seen across the world in the last century is that not only are populations older, but also the diseases and conditions from which people suffer and die have changed markedly. Chronic conditions are now the major causes of death. Infectious conditions have been substantially reduced. Infant mortality was a major problem, but it has been substantially reduced in much of the world. Today, societies need to deal with adult mortality and with the fact of increased life expectancy at the oldest ages, she stated.

There are many new challenges in health and health care, some stemming from changes in health-related behaviors and life circumstances, Crimmins explained. Some populations have lived with the burden of both infectious and chronic disease. Societies previously did not have to confront issues of cognitive impairment because the prevalence was not as high as it is now with substantially older populations. This requires adjustments in medical care and monitoring, she noted. Health systems need to switch their approach to disease treatment, with much more emphasis on prevention of and care for chronic conditions. Long-term treatment of people who survive with disease is the more prominent part of medical care in an aging society, which is very different from what was experienced many years ago.

Crimmins then described an international network of researchers that has grown out of ongoing international studies. This is a scholarly group where cooperation is the mode, with the goal of helping everyone move their studies forward. One important focus of this group is understanding

the morbidity process in older populations. This process involves biological risk factors that may lead to disease conditions, which in turn may lead to frailty, functioning loss and disability, and ultimately to death. Researchers need to disentangle these aspects of health. “We need to be able to measure them to understand their importance,” she said, “and to better understand links from one dimension of morbidity to another.”

Crimmins presented a four-country comparison of hypertensive states to illustrate the value of using data from surveys that contain both questions asked of people and measurement of biological indicators. The data come from longitudinal studies in China, Indonesia, Japan, and the United States. She contrasted people who have no hypertension, people who have controlled hypertension (by drugs), people who have undiagnosed hypertension (i.e., who need to be treated but are not being treated), and people who have uncontrolled hypertension (even though they may know they have hypertension). In this example, the least healthy populations in terms of the prevalence of hypertension appear to be in the United States and Japan. Japan has the most undiagnosed hypertension, which she characterized as surprising given that Japan is the world’s longest-lived country. She said the United States looks relatively very good in terms of controlled hypertension, which she attributed to the U.S. health care system emphasis on diagnosis and drug prescription. There is a significant reservoir of undiagnosed hypertension in China and Indonesia, which have very low levels of medical intervention for hypertension.

She then presented data from the Mexican Family Life Study showing that in the Mexican population as a whole, the proportion with undiagnosed hypertension is very high (Beltrán-Sánchez et al., 2011). The percentage undiagnosed is above 80 at ages 20–39, then declines as people get older, presumably because that is when they might be expected to have hypertension. She showed an overall index of cardiovascular risk that suggests that Mexico has undergone a physiological revolution and now has worse cardiovascular risk than does the United States (Beltrán-Sánchez and Crimmins, 2013). She also presented information from an eight-society comparison of the prevalence of overweight and of measured high systolic blood pressure, suggesting that as societies modernize, weight gain patterns are not the same across countries. Culture influences how weight changes as countries become wealthier. Percentages overweight in Asian countries with relatively high incomes have increased but are nowhere near the levels seen in the United States and Mexico. She also noted that hypertension is highly related to past cultural practices and genetics. Hypertension does not vary

around the world with development in the same way as high cholesterol and weight.

Crimmins then discussed the value that longitudinal studies have relative to cross-sectional studies. Cross-sectional studies provide a snapshot of the prevalence of health problems, but these could have occurred at any time in someone's life. They do not necessarily reflect current conditions. Understanding the meaning of the prevalence of a condition requires knowing changes in process; for example, heart disease prevalence can increase because the risk has increased or because people have been treated and survive longer. Researchers need longitudinal studies that have a time component to understand transitions (e.g., from biological risk to disease, from disease to death) both in individuals and in populations. Data from these studies provide the basis for future health and health care decisions. They allow the linking of many factors—childhood, current socioeconomic status, psychological, and health interventions—and permit differentiation of the role of one factor versus another. They also allow researchers and policymakers to pinpoint the geographic areas, the social groups, and the demographic groups where change is most needed and can most effectively occur. An important factor that should not be overlooked, she said, is that differences across countries can provide valuable insights into the situation in one particular country.

DATA NEEDS FOR AGING IN LATIN AMERICA

Victor Garcia, Instituto Nacional de Estadística y Geografía in Mexico, provided additional context for the workshop by highlighting data on global aging from the United Nations. He noted that the world population aged 60 and older numbers around 895 million, accounting for 12.2 percent of the world population. In Latin America and the Caribbean, there are an estimated 71 million people aged 60 and older, representing 11.2 percent of the population. The percentage 60+ is highest in the Caribbean (13.2 percent), compared with 11.7 percent in South America and 9.6 percent in Central America.

One important fact is that the world's older population is growing much faster than the total population. The number of people over age 60 is growing at a rate of 3 percent per year while the population growth rate of people under age 60 is less than 1 percent. Figure 2-1 compares projected growth rates for 0–59 and 60-and-older populations in six world regions for the period 2015–2020. The growth rate of the older population is higher

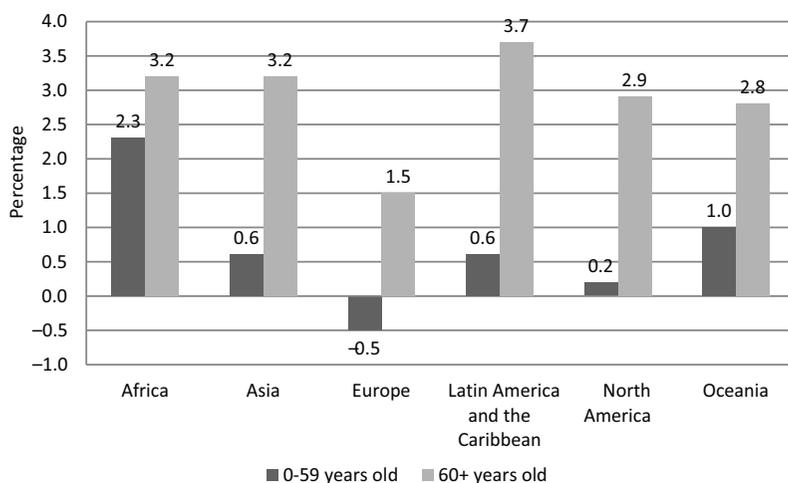


FIGURE 2-1 Regional growth rates of the 0–59 and 60-and-older populations, 2015–2020.

SOURCE: Adapted from Garcia Vilchis (2015) based on data from United Nations (2013).

in each region, and the highest regional growth rate of the 60-and-older population is occurring in the LAC region. At these rates of growth, the 60-and-older LAC population would double in fewer than 20 years, while a doubling of the under-60 LAC population would take about 115 years.

Garcia explained that not only is life expectancy at birth increasing worldwide, but also life expectancy at age 60 is rising. In the LAC region as a whole, people who live to age 60 can expect to live another 21 years on average.

Garcia recounted that the 2002 Madrid International Plan of Action on Ageing¹ developed a series of goals, which he summarized as follows: (1) to empower males and females so that they reach old age with better health and well-being; (2) to enhance the inclusion and participation of older people in society; (3) to allow older people to more effectively contribute to their communities and to the development of their societies; and (4) to constantly improve the care and support provided to older people who need

¹For more information, see <http://undesadspd.org/Ageing/Resources/MadridInternationalPlanofActiononAgeing.aspx> [August 2015].

them. Achieving these goals, he said, requires the preparation of policies, plans, and programs. This warrants information on older populations above and beyond mere numbers of people.

García then outlined some of the major data gaps confronting many countries in the LAC region with regard to older populations. While population censuses and some surveys provide good estimates of labor force participation, there is little available information about the assets of older people and their entitlement-program participation. In the health arena, there is very little information about chronic conditions from the usual health information sources, and much more and better information is needed about a variety of chronic diseases, functional capacity, depression, self-perceived health states, lifestyle habits, surgeries, out-of-pocket expenses, and the use of medications, assistive devices, and health services. He pointed to the potential usefulness of surveys of time use for information on care services that people request and receive, and to specific studies having to do with national transfer accounts, intergenerational transfers, and production and consumption throughout life.

He highlighted a manual of 110 quality-of-life indicators during old age (Comisión Económica para América Latina y el Caribe, 2006), produced as a result of recommendations from the 2002 Madrid International Plan of Action on Ageing. The indicators are grouped into five topics: demographic, economic, health and well-being, social environment, and physical environment. While this compilation is valuable in and of itself, García noted that many topics are covered superficially or not at all. He cited migration and cognitive assessments as prime examples, and noted that little use is made of administrative records.

According to García, the region requires special surveys on the population aged 60 and older in order to keep pace with the rapid aging of populations and to understand cause-and-effect relationships. Echoing the remarks of Crimmins, he stressed the need for longitudinal surveys that facilitate analyses of health trajectories, disability, cognition and depression, and income and consumption; as of today, such national-level surveys exist only in Brazil, Costa Rica, and Mexico. He also argued for shorter periodicity in such studies, and attention to collection of information on expectations, historical recollections, and migration histories.

THE HEALTH AND RETIREMENT STUDY (HRS) GLOBAL NETWORK—OPPORTUNITIES FOR LATIN AMERICA AND THE CARIBBEAN

James Smith of RAND talked about a particular model of an aging survey, the Health and Retirement Study (HRS),² which has now been established in more than 30 countries. To highlight the underlying importance of this type of study, he noted that one way economists like to think about aging is in terms of support ratios. Support ratios involve the number of people in the working-age population earning income, income that can be used to support people who are over age 65. Using United Nations data, Smith showed that in Mexico, in 2000, there were 8 people aged 25–64 for every person aged 65 and older. In 2050, the ratio is projected to be 2.5 to 1. He presented similar data for other countries in the LAC region and in Asia, noting that future ratios will be extremely low across the board. One thing known, he said, is that there is nothing that can change this trend; this is future reality around the world. What countries need to do is think about how to provide assistance to older people in terms of income and health care, he stated.

Smith described the beginnings of the HRS in the United States. The study began in 1992 as a nationally representative longitudinal survey of roughly 20,000 people aged 51 and older designed to produce public use data. It was funded primarily by a government agency, the National Institute on Aging. A primary intent was to understand how individuals transition into retirement and also transition into diseases. Important features of the study include a 2-year periodicity of interviews, the incorporation of links to administrative records regarding health and pensions, and the addition of new birth cohorts over time to replenish the study population. The central motivating idea is that health, work, income, and family are all domains of people's lives that interact with each other. People's health cannot be understood without an understanding of their economic situation. Health will reflect their economic situation and their economic situation will affect their health. While this sounds like obvious common sense, Smith said, the fact is that most social surveys are not structured or designed to measure these varied elements and their important interactions.

Many countries around the world have recognized the value of a multidisciplinary, longitudinal HRS-type survey. Smith briefly described the

²For more information, see <http://hrsonline.isr.umich.edu/> [August 2015].

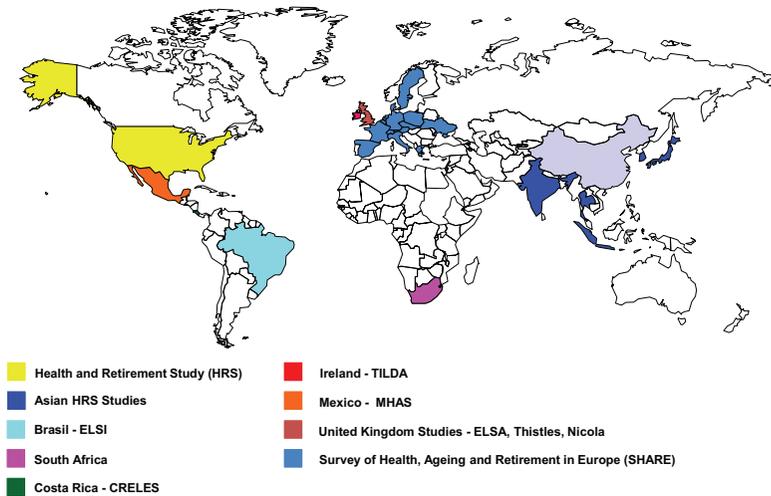


FIGURE 2-2 Countries with HRS-type studies, 2015.

SOURCE: Adapted from Smith (2015).

international expansion of such surveys, noting that Mexico was the first country to adopt (in 2002) the HRS model. The English Longitudinal Study of Ageing³ began in 2003, followed shortly by the multinational Survey of Health, Ageing and Retirement in Europe⁴ (SHARE) project in continental Europe that now includes 19 countries. HRS-type surveys are now underway in Ireland, South Korea, Indonesia, Japan, India, China, and Brazil (see Figure 2-2). The surveys are nationally representative with sample sizes typically between 10,000 and 20,000 people, with a much larger (50,000) sample drawn in India. Cohabiting partners of survey respondents are also interviewed. The age coverage of the sample begins at age 45 in some countries, where the onset of illness may begin earlier than in Europe or the United States. Survey periodicity is 2 years.

Every country in the HRS network has committed to putting its data in the public domain, not only for the residents of that country but also for scholars around the world. Smith emphasized that this is a non-negotiable

³For more information, see <http://www.elsa-project.ac.uk/> [August 2015].

⁴For more information, see <http://www.share-project.org/> [August 2015].

condition for being part of this network. In some countries, he observed, this is a big departure from the normal way science is done.

The aim of the network is to have comparable datasets, but the network researchers believe that no country should strictly copy the U.S. HRS. Smith explained that, in many ways, this would be bad science; for example, the ways in which economic resources are measured in China can be very different than how they are measured in the United States. Data collection in any country should reflect the policies and reality of that country. Further, there has been a good deal of scientific innovation at the country level. The English study pioneered new health measurement far beyond what the U.S. study was doing at the time, bringing biomarkers into the platform. Ireland has made important contributions to disability measurement.

Most if not all country studies are now collecting genetic samples and incorporating performance tests, he said, and links to pension and health records are common aspects of these studies. Realizing that outcomes in older age may result from experiences earlier in life, many surveys have now added a retrospective life history, not only about the important events in respondents' lives, but also about important events that happened in the countries they were living in (e.g., for SHARE respondents, the importance of World War II).

3

Health Status, Disability, and Mortality

MORTALITY TRENDS AND DIFFERENTIALS IN COSTA RICA

The initial presentation in this workshop session was by Luis Rosero-Bixby, Universidad de Costa Rica and University of California, Berkeley, who reported results from the Costa Rican Study of Longevity Healthy Aging (CRELES), which started more than 10 years ago.¹ Rosero-Bixby focused on one aspect of this study, the mortality results, with other aspects of the study discussed later in the workshop (see Chapter 8 of this report).

Prior to CRELES, some estimates and analyses suggested that Costa Rica had achieved exceptional longevity, with average life expectancy at birth as high as 80 years. In international comparison, remaining life expectancy at age 90 among males was seen to be highest, and one of the highest among females. However, these estimates were not accepted by all demographers and were thought to be the result of poor data quality, Rosero-Bixby explained. One of the motivations for CRELES was to validate data from the official death registry in Costa Rica and achieve more precise estimates of mortality at older ages and very advanced ages.

CRELES started as a follow-up of a sample from the 2000 census of Costa Rica. It is a probabilistic sample comprising about 8,000 people aged 55 and older. Follow-up of this sample has continued to date, and around half of the population has died. Within the 8,000 people sampled,

¹See <http://www.creles.berkeley.edu> [August 2015].

researchers selected a subsample of around 3,000 individuals in order to do a nested in-depth panel study. CRELES included interviews and collection of biological specimens, venous blood, and urine, as well as physical and mental exams of participants that were done in their homes. Mortality data in this study were obtained from two sources. One source was follow-up visits in the field, and the other was computerized records from the national registry of deaths. This follow-up continued to 2014 and there were 566 reported deaths in the field and about 1,200 deaths identified as part of the death registry. A factor that facilitates this analysis is the national ID card issued to all Costa Rican residents, with a unique number that permits researchers to match the reported and registered years of birth, and to weed out or adjust inconsistencies.

The initial findings of CRELES focused on evaluation of age reporting in the 2000 census. According to Rosero-Bixby, the quality of age reporting was excellent up to age 85, after which there was the well-known phenomenon of age exaggeration (e.g., among people reporting an age of 100 years old or older, only 70 percent were in fact 100 years old or older).

The next set of findings helped determine whether there was an underreporting of deaths in the country. Of the 566 deaths recorded during the field visits, all except five cases were also found in the death registry. This was a very valuable contribution of the study showing that the death registry in Costa Rica was nearly 100 percent complete and that corresponding estimates of age-specific mortality rates were correct. Rosero-Bixby noted that the same could not be said about the thoroughness of the number of deaths that were recorded in the CRELES field visits. There was a 10 percent underreporting of deaths in the field, which is to say that deaths that were found in the registry were reported/recorded in the field as lost to follow-up. This is something to be considered in longitudinal studies and can only be detected if there is a double follow-up, both in the field visits and in the death registry.

He then presented a comparison of mortality rates by age during the period 2005–2010, comparing estimates from CRELES, the Costa Rican vital statistics system, Japan, and the United States. In terms of life expectancy, CRELES data yield a life expectancy at age 65 of 18.4 years for males, very similar to the estimate from vital statistics and to the figure for Japan, and 1 year higher than for the United States. For females, the Costa Rican and U.S. figures were in the 20.1–20.7 year range, while the estimate for Japan was considerably higher (23.6 years).

The most important results from CRELES, according to Rosero-Bixby,

were surprises. The analysis of age-adjusted mortality rates by socioeconomic status (education, wealth, region of residence) revealed that, among males, those with the least education had lower mortality. For both men and women, mortality rates were higher in the wealthier and more-developed metropolitan areas than in rural areas. The trends for wealth were not clear, and Rosero-Bixby concluded that there was an absence of economic effects.

The CRELES analysis also modeled the predictive value of a set of 20 biomarkers and concluded that biomarkers do not have much relationship with mortality. The traditional demographic indicators of age and sex explain about 44 percent of everything that is predictable or that can be explained about mortality in older adults, and the addition of biomarkers in the model increased this level to only 55 percent. The strongest predictors of mortality among older adults were performance tests, including pulmonary flow, grip strength, and timed walking distance.

Rosero-Bixby summed up by saying that longitudinal study has been useful to validating adult mortality estimates and the accuracy of the death registry in Costa Rica. CRELES has confirmed the exceptional longevity of older Costa Ricans, particularly men. It has indicated that there are no socioeconomic gradients in mortality rates, and that adding biomarkers represented a marginal contribution to understanding mortality at older ages.

TRAJECTORIES OF HEALTH FROM THE MEXICAN HEALTH AND AGING STUDY

Rebeca Wong, University of Texas Medical Branch, spoke about health trajectories from the Mexican Health and Aging Study (MHAS).² By way of background, she noted that discussions began in 1999 with regard to conducting a longitudinal prospective study similar to the Health and Retirement Study (HRS) in the United States. Data collection for the first round of MHAS began in 2001, with a sample of 15,100 people. This cohort was born in 1951 or earlier and was aged 50 and older at the time of the survey. Wave 2 of the survey was in 2003, by which time there had been 540 deaths among the beginning sample.

There was a pause in MHAS survey activity until 2012, when researchers went back to see the same respondents as in 2003. In 2012, the study added a new sample cohort of people born between 1952 and 1962, in order to again have representation of people aged 50 and older. This new cohort

²For more information, see <http://www.mhasweb.org/> [August 2015].

of around 6,000 people was added to those Wave 1 and 2 respondents who continued to be alive. By 2012, 2,742 previous MHAS respondents were deceased, bringing the accumulated sample mortality to approximately 3,200 people. A fourth wave of the study will commence in October 2015.

Wong explained that MHAS is a multi-theme study, very similar to the HRS, but adapted to the Mexican context. A unique characteristic of MHAS is its emphasis on migration to the United States. Data show that among men aged 50 and older living in Mexico, 14 percent were at some time migrants to the United States. She said the scientific community is very interested in studying the long-term effect of this migration.

Having three study waves allowed researchers to undertake trajectory studies, Wong said. She presented survival data for the period 2001–2012 showing that the risk of death is threefold higher for those who have both chronic and infectious conditions at the beginning of this period, compared to those who only had a chronic disease (Gonzalez-Gonzalez et al., 2015).

She pointed to a recent study (Kumar et al., 2015) that looked at the effect of obesity on the incidence of mortality and disability in Mexicans aged 50 years and older. The lowest hazard ratio of dying occurs among those with a body mass index (BMI) of 25.4, compared to higher or lower levels of BMI. Hence this level of BMI represents a protective effect, she said. Looking at hazard ratios for disability as a function of BMI, the lowest hazard ratio of having limitations in activities of daily living occurs at a BMI of 26.

Another study (Sáenz and Wong, in press) examined the risk of disability onset by education. As Wong explained, the study starts with people who had no disability in 2001, and estimates the chance that they developed a disability throughout an 11-year period. The risk of activities-of-daily-living disability onset over 11 years is three times higher for those with no education compared to those with 7 or more years of education, controlling for socioeconomic and health factors. Hence there is a very significant education gradient in the onset of disability. Based on these and other data, Wong presented information on predicted disability, by age and education, as an illustration of the value of longitudinal data for future health planning.

The discussion then turned to the importance of obesity and diabetes in Mexico. According to the Mexican National Health and Nutrition Survey, in 2012 the prevalence of diabetes was 41 percent among Mexicans aged 65 and older. The proportion of this age group overweight was 40 percent, the proportion obese was 30 percent, and the proportion with abdominal obesity was 82 percent. Using data from a recent study of the

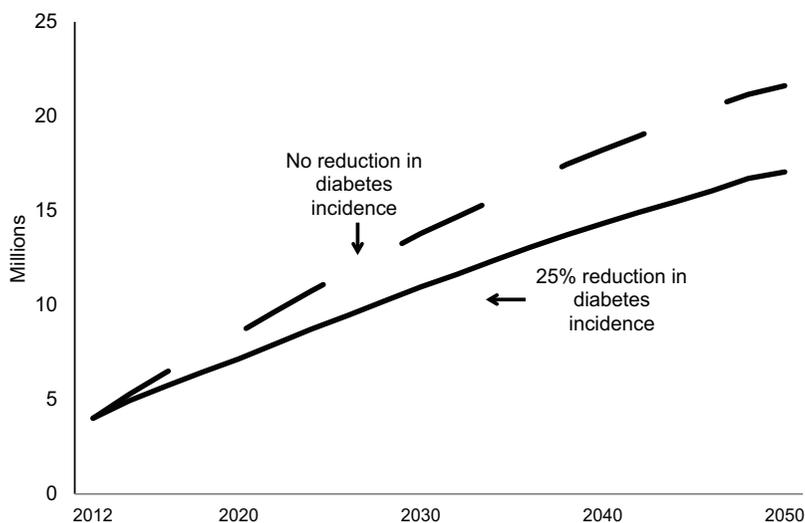


FIGURE 3-1 Projected prevalence of diabetes at ages 50 and older in the Mexican population under two incidence scenarios, 2012–2050.

SOURCE: Adapted from preliminary data presented by Wong (2015).

incidence of diabetes based on MHAS data (Palloni et al., 2015), Wong noted that the risk of diabetes increases as BMI increases. The risk of having a new case of diabetes by 2012 is 2.6 higher and 1.8 times higher for obese and overweight individuals, respectively, relative to those who had normal weight in 2001.

The usefulness of these data is illustrated in Figure 3-1, which integrates population projections with data on people’s current behavior that has been observed in the MHAS, using a microsimulation model (the Future Elderly Model) developed at RAND and the University of Southern California.³ Researchers created two scenarios, one with no reduction in diabetes incidence and one with a 25 percent reduction in diabetes incidence. Starting from an estimated prevalence of 19 percent in 2012, the scenarios suggest a rise in prevalence to 42 percent and 32 percent, respectively, by the year

³Further information on the FEM may be found at <http://roybal.healthpolicy.usc.edu/projects/fem.html> [August 2015].

2050. When combined with projected population numbers, these scenarios suggest that the number of diabetics in the older (50+) population will rise from 4.0 million in 2012 to 21.6 million by 2050 in scenario 1, compared with a projected growth to 17.1 million in scenario 2, a difference of 4.6 million people. These are preliminary results from an ongoing study.

Wong concluded that the MHAS and the broader family of similar surveys have the analytical power for studies of health transitions. Policymakers and decisionmakers may use these data in order to study health and mortality transitions, and to project future needs. The availability of longitudinal data represents the engine that is moving the generation of information. Without such data, she said, researchers would not be able to pursue these lines of research. She also mentioned, in response to a participant question, that another benefit of longitudinal studies is the ability to add modules of questions to a particular survey wave, questions that investigate a specific topic such as the activities and well-being of caregivers of older adults.

HEALTH INEQUALITIES AND THE DESIGN OF THE ELSI-BRAZIL STUDY

Maria Fernandez Lima-Costa, Oswaldo Cruz Foundation, focused on social inequalities in health in Brazil, and on a new longitudinal survey recently under way, the Brazilian Longitudinal Study of Ageing and Wellbeing (ELSI-Brazil). She presented some background information on Brazil, the only Portuguese-speaking nation in the LAC region. She noted that national survey work in Brazil can be hampered by the size of the country and the remoteness of some areas. Older people in Brazil depend heavily on public systems for support, and 85 percent of people aged 60 and older receive either contributory or noncontributory public pensions. Seven in 10 older Brazilians use the Unified Public Health system.

In spite of improvements in social inequality over the past two decades, as measured by a declining Gini index, Brazil still has one of the highest levels of income inequality in the world. According to Lima-Costa, the magnitude of income-related disparities in health has not decreased in the last decade, despite reduced disparities in the use of health services. She presented nationally representative data for 1998 and 2008 showing that those in the poorest income quintile are more than 2.5 times more likely to report poor health than are those in the highest income quintile. Smaller but still-large differences were also seen with regard to mobility limitations and disability in activities of daily living (ADL). The key temporal point

is that the differences between the highest and lowest income quintiles did not change substantially in the 10-year period (Lima-Costa et al., 2012b).

She then presented a comparison of socioeconomic inequalities in health in older adults in Brazil and the United Kingdom, work that was based on 2008 data from the Brazilian National Household Survey and the English Longitudinal Study of Ageing (Lima-Costa et al., 2012a). In general, older (aged 50+) Brazilians were less healthy, and for some conditions much less healthy, than their English counterparts. This was particularly true with regard to having limitation in two or more ADLs (36 percent in Brazil versus 23 percent in the United Kingdom). Data from these surveys were used to predict probabilities of having two or more limitations (mobility and/or ADL), by educational level and age. The probabilities rise by age for each educational category in each country, and there is a social gradient in each country such that people with lower levels of education have more disability than do those with higher levels of education. Lima-Costa noted that the probability curve for the highest-educated Brazilians was similar to that for the least-educated people in the United Kingdom and mentioned that further work is under way to determine if this is due to biological or environmental factors.

She then described a very recent study that addresses what she called the myth of racial democracy in Brazil. Brazil is a mixed country in terms of ancestry, with large representations of European, African, and Native American backgrounds. Data from the Bambui-Epigen Cohort Study of Aging⁴ permit the analysis of individual genomic data, which are not prone to misspecification bias due to respondent misstatement. The upshot of the findings is that people with high levels of measured African and Native American ancestry were much more likely than people of European ancestry to have low educational level, relatively low household income, and poor health.

Lima-Costa went on to describe a new national-level survey entitled the Brazilian Longitudinal Study of Aging and Wellbeing.⁵ This effort is based on methodology used in the HRS and the English Longitudinal Study of Ageing and includes topics of interest to the Brazilian government, which is providing complete funding for the study. Included in the study are extended modules on physical functioning; formal and informal caregivers;

⁴See http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0102-311X2011001500002 [August 2015].

⁵See <http://elsi.cpqrr.ficruz.br> [August 2015].

the use of health services and health expenditures; and elements of the social and physical environment (e.g., violence, mobility, and discrimination). The study has a nationally representative sample of approximately 10,000 Brazilians aged 50 and older in 7,500 households in 70 municipalities. There are separate individual and household questionnaires, and individuals will undergo physical tests for blood pressure, anthropometry (weight, height, and waist and hip circumferences), grip strength, walking speed, and balance. Plans are to obtain blood samples from about half the sample, for DNA banking. Baseline data collection will occur in 2015–2016, and follow-up waves are expected to occur in 2017–2018 and 2019–2020, with sample refreshment in the later round.

COGNITIVE AGING

Carlos Cano, Universidad Javeriana in Bogota, described work that he and his colleagues have done in Colombia with regard to assessing dementia and cognitive functioning in older adults. He began by noting several kinds of changes in cognitive function associated with age (e.g., language use, executive function, and word recall) and stressed that measuring these functions in population studies is difficult because they tend to be measured with “soft” variables. It is much easier, he said, to obtain a relatively objective measure such as BMI than to measure concepts such as mild cognitive impairment or moderate versus severe dementia.

Cano presented data from a 2013 meta-analysis of data on the standardized prevalence of dementia in the 60-and-older population in different parts of the world (Prince et al., 2013). The regional prevalence estimate for Latin America, about 8.5 percent, is the highest of all regional estimates, but not very different from some other regions. A question arises, however, about the methodology underlying such estimates, he noted.

Cano then described research done as part of the Survey of Health and Wellbeing of Older Adults in Bogota.⁶ This was a cross-sectional survey of the population aged 60 and older undertaken in 2012 that included a cognitive functioning component with a number of standard measures and instruments such as subjective memory loss, an abbreviated Mini-Mental state examination, the Montreal Cognitive Assessment (MoCa), and the Yesavage geriatric depression scale. The instruments were adjusted to the

⁶For more information, see http://www.almageriatria.info/pdf_files/mexico_2013/Experiencias%20a%20partir%20de%20la%20Encuesta%20SABE.pdf [August 2015].

context of Colombia: for example, a biographic component was included to consider the life history of people in the 25 years prior to the survey and to gauge the bias of forgetfulness. Such a component was thought to be important in the context of a country that has experienced internal conflict dating back 50 years, with related rural-to-urban migration.

This was a study of 2,000 individuals, and Cano's analytic focus was on education. He noted that 70 percent of the Colombian population has less than 5 years of education, similar to many countries of the region. The MoCa and Mini-Mental scores showed a clear gradient by level of education that is consistent with other studies. However, the mean values of these scores were very low, 17.3 and 15.3, respectively. The cutoff point for cognitive impairment in the MoCa is between 24 and 25. At face value, the scores from the Mini-Mental exam implied that 92 percent of the sample with 5 or fewer years of education had dementia. This seemed an unlikely result, and was contrary to the researchers' impressions of the study population.

The results led the Colombian research team to consider different approaches to assess cognitive function. One approach focused on the six items of the Mini-Mental instrument that assessed only memory. The team found that years of schooling were unrelated to the scores for this subset of items. This suggests the usefulness of a different cultural approach to measurement, and that people with low levels of education nonetheless may have a well-preserved memory, or at least the same memory function as for other education groups. Cano then described the initial stages of work, motivated in part by collaboration with Mexican researchers, that seek to develop algorithms that identify the prevalence of dementia using cutoff points by education combined with indicators of functionality (e.g., instrumental activities of daily living) and perhaps other domains of cognitive function. The goal is to identify potential intervention points that will be useful for policy development, he noted.

4

Health Care Systems, Access, and Quality

BUILDING THE EVIDENCE BASE FOR HEALTH REFORM

Rafael Lozano, Mexico National Academy of Medicine and Institute for Health Metrics and Evaluation, spoke of his experience over many years of attempting to build an evidence base for health care reform in Mexico. The main focus of any system reform, he said, should be to improve system performance, which entails an assessment of its performance in terms of efficiency, access, and quality (understanding the causes of unsatisfactory outcomes). At the same time, he said, one should not focus only on technical aspects but also take into account political and ethical dimensions of reform.

In the context of an aging population, Lozano noted several forces that may be at work. Providing health is becoming increasingly expensive, largely as a result of more technology. Populations are increasingly well educated, and people expect more for the taxes that they pay. However, a government's payment capability for the technology that it uses often is limited. And, he commented, there is skepticism having to do with the fact that people want change but also wish to continue doing things in the same way (see Roberts et al., 2008). He mentioned that for health system planners to address efficiency, quality, and access, they need a "command center" with five buttons that may be pushed at different times and in different combinations in order to have an effect on society. He identified these five buttons as funding, payment, organization, regulation, and behavior.

A major question facing any national health system and potential reform is how to respond to current population health needs with the health system that now exists. Drawing on work done in the context of the Global Burden of Diseases, Injuries and Risk Factors Study (GBD), a comprehensive and ongoing effort to measure epidemiological levels and trends worldwide,¹ Lozano mentioned several health trends seen in many countries, and the reasons why current health systems have difficulty addressing these trends. One is the demographic transition that is shifting the disease burden from children to adults. This leads to a larger fraction of disease burden stemming from chronic health conditions. The corresponding disability transition is shifting the burden of disease to conditions that cause disability. And a risk transition is shifting the major risk factors from those of poverty to those associated with lifestyle. Health systems, however, may not be well equipped to deal with these trends, Lozano stated. Systems often have been designed to respond to acute episodes or acute diseases. They have been successful in treating infectious but not chronic conditions. Systems are organized to provide care but are not well organized to retain staff who provide the care. There is little incentive in public systems to provide follow-up care, he said, and the dominant focus is on curing diagnostics rather than being patient-centered.

Lozano presented preliminary results from a recent update of the GBD study that demonstrate how the disease burden is shifting in Latin America and the Caribbean (LAC). Disease burden is measured in disability adjusted life years (DALY), which is the sum of the number of years lost due to early death. Because of the success of prevention and treatment at younger ages, the share of overall disease burden at ages 0–14 changed from 42 percent in 1990 to 18 percent in 2013. At the other end of the spectrum, the share increased from 25 to 42 percent for people aged 50 and older. He showed the enormous global heterogeneity in the share of disease burden at age 60 and older; in Japan, 70 percent of the total disease burden is found in this age group, compared with 5–10 percent in many other countries.

In addition to looking at cause-of-death and DALY rankings, Lozano considered a method of analysis that attributes DALY to risk factors. He posed a question about the burden of disease attributed to factors such as poor diet or a high prevalence of hypertension. He said his analysis suggests that when all dietary problems are considered, they represent the largest

¹For more detailed information about the data sources and methods of GBD, see <http://www.healthdata.org/gbd> [August 2015].

share of the disease burden for the population aged 70 and older in the LAC region. High blood pressure and high-fasting blood glucose also are major problems in the region.

These various measures of health care needs are important for building the health evidence base, but Lozano stressed that another important focus is to determine how those needs translate into equivalents in human resources. For example, he posed, does a system have enough cardiologists, and are they properly distributed? He concluded by stating that Mexico (and other countries) needs to emphasize three notions in a vision of the health system: chronicity, continuity, and comorbidity. First is the notion of chronicity, in that disease burdens are increasingly chronic and treatment should be as well. More people need life-long treatment. The second notion is that of continuity. This does not just mean referral and counter-referral, he said, but continuity of information throughout the health information system, especially to address the third and perhaps most challenging notion, that of comorbidity. The set of conditions that a patient has must be addressed, as opposed to treating problems one by one. Being able to manage comorbid conditions requires team work, which means that health systems must work to strengthen their managerial and incentive components.

DEPRESSION AND HEALTH CARE SERVICES

The workshop focus then shifted to a consideration of late-life depression and health care utilization. Carmen Garcia-Peña, Mexican National Institute of Geriatrics, stated that depression is one of the most prevalent mental disorders in older adults, and one with different pathways: etiological, neurobiological, behavioral, and psychological. It is a complex phenomenon characterized by frequent relapses and a chronic clinical course. It can occur in a wide spectrum that ranges from subclinical depression to severe forms of major depression, and may be accompanied by multiple affective and somatic symptoms. She highlighted various consequences of depression, including increased physical symptoms of other conditions; decreased adherence to pharmacological treatment; an association with adverse behaviors; high direct costs in terms of treatment, health service utilization, disability, and loss of function; increased mortality; and an association with cognitive impairment.

She discussed a conceptual framework of stress vulnerability, depression, and health outcomes based on work by Kinser and Lyon (2014), noting that stress vulnerability may stem from chronic or acute burdens

(e.g., life events, current or past illnesses), the biological environment (e.g., inherited, epigenetic vulnerability, temperament), and the psychosocial environment (e.g., socioeconomic status, childhood events, lifestyle, intellect). Resulting depression may be related to both physiological factors (e.g., hypothalamic-pituitary axis dysfunction, neurobiological and immune alterations, inflammation, telomerase activity) and psychobehavioral factors (e.g., sense of control, connectedness, victimization, and coping behaviors). Health outcomes often include recurrent psychiatric symptoms (stress, anxiety, depressive symptoms, dysthymia), morbidity in the form of chronic disease, frailty, sarcopenia, and mortality.

Garcia-Peña then discussed a meta-analysis (Luppa et al., 2012) of the prevalence of depression in older people, using the dimension of diagnosis, which is the one typically used in surveys. All the reference studies were done in European countries, Canada, or the United States. There were widely varying prevalence rates, from 10 percent up to 40 percent. Garcia-Peña does not believe that these reported levels necessarily reflect if a country has more or less depression; rather, they speak about methodological problems with the measurement of depression (as mentioned by Carlos Cano in a previous workshop session). She then showed a compilation of studies in LAC that have, at least in part, addressed depression, with a similar wide range in estimates.

In addition to cross-national and cross-study issues with measuring depression, Garcia-Peña also noted that depression can differ qualitatively by age, especially between adolescents and older adults. For example, a study in Mexico City (Sanchez-Garcia et al., 2014) showed that issues relating to suicidal ideation are more salient for teenagers and young adults, while symptoms having to do with anhedonia (loss of the capacity to experience pleasure) and psychomotor agitation have a greater weight or greater impact on the elderly. Data from another study (Perez-Zepeda et al., 2013) indicate that depression in adulthood has to do with beliefs about depression; for example, considering that depression is normal, it is part of aging, that depression is not a disease, that depression lasts forever, there is nothing the person can do about it, and she or he just has to get used to being depressed. In this study of 2,322 adults (mean age of 73) with depressive symptoms, only 25 percent sought medical help. Of that 25 percent, only 80 percent received some kind of help, and fewer than one-third of the help-seekers received effective care.

Garcia-Peña presented data from the 2012 Mexico National Survey of Health and Nutrition showing an increase with age in the number of

survey respondents with undiagnosed health problems (more than 20 percent aged 60 and older). Having symptoms without a diagnosis is almost certainly a sign of depression, she said. An important point, she added, is how to relate depression to health service use. Garcia-Peña presented data that compared patients with and without significant depressive symptoms, adjusted by severe recent morbidity. For both depressive-symptom categories, rates of health care usage were higher in the presence of recent severe morbidity. Health care utilization was seen to be 15–35 percent higher among depressed patients compared to the nondepressed, even with similar morbidity levels.

She concluded with a discussion of the major challenges regarding depression and health system use. There are help-seeking barriers imposed by doctors related to limited training for pharmacological or nonpharmacological treatment, as well as stigma and prejudice on the part of health personnel workers who often tell patients that it is normal to be depressed in older age. There is considerable inertia, particularly in public health systems, with regard to dispelling false beliefs about preventing depression. She stressed the importance of having pharmacological and nonpharmacological treatments for depression available at the level of primary care, which is the first point of contact for many patients, and not just in specialized care. She also mentioned the need to assess interventions at different levels within health systems, and to better consider the links between morbidity and depression.

ORAL HEALTH IN COLOMBIA

Maria Teresa Calzada, University del Valle, Colombia, highlighted the importance of recognizing the topic of oral health, noting that nondental health care professionals are sometimes the first ones that older people visit for something that is happening in the mouth. Oral health is not only related to things that happen in the mouth structure but also affects different areas of older people's lives, such as nutrition, socialization, performing different functions, and expressing affection, she said.

She described some previous work on oral health in Colombia, highlighting the circa-2000 SABE survey conducted in seven Latin American and Caribbean nations.² The oral health component of SABE included questions on the presence or absence of teeth, the use of a dental prosthe-

²See <http://www.icpsr.umich.edu/icpsrweb/RCMD/studies/3546> [August 2015].

sis, and the self-perception of oral health-related quality of life based on a Geriatric Oral Health Assessment Index.³ The latter involves three dimensions: physical function (eating, speaking, swallowing); social function (concerns about appearance, effects on social interaction); and pain and discomfort involving the capacity to eat.

She then described the most recent efforts in Colombia, one of which is the Fourth National Oral Health Study (En SABE 4), which was completed in 2014 but for which data are not yet available. This study of more than 20,000 individuals includes 3,490 people aged 45–79. En SABE 4 includes a clinical exam (by a dentist), a questionnaire, and a qualitative component. A second effort is the oral health component of a larger study called the Survey of Health and Wellbeing in Colombia 2015, which is part of the National System for Health Population Studies and Surveys. This system comprises 11 different surveys with common and complementary goals, using a master sample that provides national representativeness. The oral health component intends to collect data on the presence or absence of teeth, reconstructed teeth, oral hygiene and care, salivation, medications, dental-related spending, and information on the nexus of oral health and quality of life. The latter involves a new translation, cultural adaptation, and validation of the Geriatric Oral Health Assessment Index.

ADAPTING HEALTH CARE SYSTEMS TO SERVE THE NEEDS OF THE FRAIL ELDERLY

Luis Miguel Gutiérrez, Mexico National Institute of Geriatrics, spoke about health care systems and frailty. He stated the reality of aging populations means that one of the great challenges facing health care and system reform is trying to maintain people outside the hospital system without neglecting or undermining their health care. People are living longer, many with one or more long-term medical conditions, and for a significant number, advancing age brings frailty. The complexity of this problem has been recognized, he said, and while policies and guidance for the care of older people are now being developed, the challenge is to turn the rhetoric of personalized geriatric care into the reality of everyday care. Actions can be taken at different levels of the system to deal with this issue, but the

³See <http://www.adelaide.edu.au/arc poh/downloads/publications/reports/miscellaneous/measuring-oral-health-and-quality-of-life.pdf> [August 2015].

responsibility for quality of care and outcomes is located at the operational level of health provider teams.

Gutiérrez cited a report from the United Kingdom (Oliver et al., 2014) and noted that the UK issues in primary care and preventive measures currently are in many ways similar to those of the Mexican context. The report underscores the need for whole-system changes in order to deliver the right care at the right time, and in the right place, to meet older people's health needs, care preferences, and goals. This entails a simultaneous shift toward prevention and proactive care, and a consideration of older people's preferences and values that enables them to be active participants in, and not only beneficiaries of, the actions of the system.

He presented data showing that frailty among elders is common in Mexico (>25 percent), that more than 1 in 3 people (35 percent) aged 60 and older fall each year, and that there is considerable underdiagnosis of dementia (with an estimated annual incidence rate of 25/1000 among elders). Although increasing attention is now being paid to sarcopenia, osteoporosis, and cognitive impairment, he said that older people affected by these conditions receive suboptimal care compared to younger people with the same conditions. Two other conditions that are underrecognized and deserving of greater care, he said, are false incontinence and dementia (for information on dementia, see Mejia-Arango and Gutiérrez, 2011).

An important step for the health care system, according to Gutiérrez, is the development of a catalog of observed conditions in older age and a corresponding risk stratification system. The discussion should not be about general health programs for older people, he said, but rather, about programs relevant to the functional categories of the older population. A risk-stratification approach can better suggest actions geared toward the solution of specific problems, he stated. With regard to frailty and hospitalization, he mentioned a number of measures that can be taken to avoid readmissions in the short term and to enhance people's possibilities for staying at home. These include targeted comprehensive geriatric assessments, liaison and in-reach services involving multiple hospitals wards, minimization of common adverse effects of hospitalization (e.g., infections and falls), immediate discharge planning from the time of admission, inclusion of caregivers in discharge plans, focusing on person-centered dignified care, developing post-discharge remote assessment and support, and ensuring communication for the continuity of care.

With regard to long-term care, Gutiérrez stated that long-term institutions cannot be developed in Mexico as fast as desired. Long-term care

services must be developed at the community level, including the capacity for systematic global geriatric assessments in long-term care settings and training and support for care staff. And, he asserted, the therapeutic approach has to change. It cannot have the same face of intervention used in the conventional hospital setting. Another needed change, he said, involves issues surrounding end-of-life choices and care. He noted that older people receive poor-quality care toward the end of life, and are often discharged from hospitals without support because they have obtained what is deemed to be the “maximal benefit attained” from hospital care. They are rarely involved in discussions about their options and hence are unlikely to die where they choose. He said there is a clear need for advance care planning, dissemination of information about advance directives, better development of palliative care services, and programs that support end-of-life homecare rather than hospital care.

Gutiérrez concluded that, for all these things to happen, a formula must be developed that will integrate medical services with social services at the community level. He pointed to a report of the Mexico National Institute of Geriatrics (2013) that summarized an evidence-based action proposal to reform the health system from the perspective of the needs of older people.

5

Labor Market Participation/Retirement

THE LONGITUDINAL STUDY OF SOCIAL PROTECTION IN CHILE

This workshop session considered information on the nexus of work, retirement, and social protection for older people in Latin America. David Bravo, Pontificia Universidad Católica de Chile, began by describing the Survey of Social Protection (EPS) in Chile, a longitudinal study that has been conducted since 2002.¹ The EPS is the longest-running panel study ever fielded in Chile. It is a nationally representative survey of individuals 18 years and older, with a sample size of approximately 20,000 people. Four waves of the survey have been conducted to date, with a fifth wave to take place in 2015. The survey has a face-to-face interview that lasts about 1 hour.

Bravo explained that the origin of the EPS survey stemmed from a public policy question. In 1981, Chile underwent a major reform of its pension system, and an individual-capitalization system was established. For bureaucratic and other reasons, it was difficult to determine how the new system was functioning. Individuals could have information about their own retirement accounts, their savings, and other items, but the gov-

¹For an overview of and data from this study, see http://www.previsionsocial.gob.cl/subprev/?page_id=7185 [August 2015].

ernment did not have access to this information. For fiscal planning and projection purposes, national-level information was very poor.

At the same time, policymakers in government ministries began to ask about broader topics, such as the relationship between health and pensions and the relationship between family and pensions. It became clear that to answer questions about pension-system trends, better information was needed about mortality risks, numbers of survivors, health, and disability. Teams of academics proposed and developed a longitudinal survey that would help the government with answers to these questions, and the Ministry of Labor and Social Provision funded the survey.

In addition to basic information on individuals and household members, the survey collects information on work history, family income, health, education, family history, financial knowledge, and other topics. Survey data have been linked to data from administrative registries, and a refresher sample of respondents is planned for 2015.

Bravo reported that EPS information has been widely used for academic purposes both within Chile and abroad. Within the country, the survey has had an important impact in terms of further pension-system reform. In 2006, Chilean President Michelle Bachelet established a commission charged with evaluating the pension system. Some of the major questions that the commission considered involved the density of effective contributions; the extent to which workers meet the essential requirements for pension receipt; perceptions of pension contributions as a type of tax; the impact of financial shocks on the labor market and social protection; the characteristics of independent workers and the self-employed (most of whom do not participate in the pension system); and the effect of chronic diseases or catastrophic diseases on the system contribution patterns.

Using data from the EPS, the commission suggested various system reforms, many of which were enacted into law in 2008. The survey played an important role in the design of reform from the standpoint of both diagnosis and assessment. Since 2006, the treasury and budget departments have used an actuarial model that relies on the longitudinal EPS data. And EPS data are now being linked with data from the national death registry in order to analyze mortality and survival by socioeconomic stratum.

Bravo presented data from the EPS showing that pension system contribution patterns were quite different for men and women. The data suggest that, regardless of gender, many people have paid too much or too little into their retirement accounts, which Bravo attributed to a lack of knowledge about the pension system. There is also a general lack of under-

standing about the pension industry and how pension fund administrators compete amongst themselves.

In conclusion, Bravo stated a need to (1) incorporate biomarkers into survey research to better understand the interactions between health and aging; (2) improve linkages to administrative data; and (3) consider the establishment of an HRS-type survey in light of the growth of the older population in Chile.

NONCONTRIBUTORY PENSIONS

Emma Aguila, University of Southern California, described a randomized controlled trial and related research to evaluate the impact of a non-contributory pension program on the older population in the Mexican state of Yucatan. She began by noting that Mexico does not provide universal coverage of social security benefits. Forty-two percent of the labor force is in the formal sector, which includes public and private sector employees as well as self-employed people who choose to contribute to the system. These individuals receive, at retirement, social security and health care benefits. Most workers, 58 percent of the labor force, are in the informal sector. These are workers in noncompliant small firms and self-employed workers who choose not to contribute to the social security system. Upon retirement, these individuals may receive noncontributory pension benefits that are of smaller amounts than social security benefits; they also receive health care provided by the government. Aguila mentioned that most developing countries have a high proportion of their labor force in the informal sector, and that at least 20 countries around the world have implemented noncontributory pension programs. Studies have shown that these types of programs reduce poverty and inequality (see, e.g., Barrientos, 2003; United Nations Department of Economic and Social Affairs, 2007; Asian Development Bank, 2012).

She explained the thrust of this research project was to design and implement a noncontributory pension program in Yucatan for adults aged 70 years and older. The main goal was to evaluate the impact of this noncontributory pension program on the health, nutrition, and well-being of recipients. A secondary goal was to analyze different implementation designs, for example, the method of payment, cash versus debit card, and differences in the frequency of payment.

Aguila explained that an important aspect of this study is that it was experimental, in contrast to previous experiences in other countries. In

South Africa and Brazil, for instance, most studies of the noncontributory pension schemes compared beneficiaries with nonbeneficiaries; if claiming benefits were a choice, this would introduce sample selection problems in those studies. Also, the development of noncontributory pension programs in other countries has not been accompanied by surveys that evaluate the programs, so countries typically try to use data from household surveys (if available) that focus on the household level rather than the beneficiary level. The Yucatan project also affords an opportunity to disentangle the causality between socioeconomic status and health, she explained. The project involves a cash transfer of 550 pesos per month, equivalent to \$78 U.S. at purchasing power parity. This is exogenous income to the recipient, and researchers can study the effect of income on health.

The research team conducted three experiments. The first began in 2008 and involved two towns: in the town of Valladolid, all age-eligible individuals 70 years and older were identified and received a pension, while all age-eligible people in the town of Motul were identified but were not provided with a pension, thus establishing a control group. The second experiment began in 2009 as a pure randomized controlled trial in the city of Merida, with treatment and control individuals within a given area. The third experiment began in 2010, also in Merida, and varied the proportion of treatment and control individuals within areal clusters such that researchers could conduct more in-depth analysis and identify potential spillover effects.

The research teams, working with government entities in Yucatan, built two government programs, one to disburse the pension and another to evaluate the impact of the program (Aguila et al., 2014). In the evaluation program, there was a baseline survey for the treatment and control groups before the intervention, and the pension program was announced a month after fieldwork began, to avoid announcement effects. In-person follow-up surveys were conducted approximately every 6 months, which included collection of biomarkers and anthropometric measurements. To date, interviews have been conducted in 16,195 households. Many survey questions were adapted from the Mexican Health and Aging Study and Health and Retirement Study described earlier in the workshop (see Chapter 3). Also included was a community-level survey of prices conducted in 1,987 grocery stores and other establishments, to determine potential effects of living in areas with different levels of poverty and price structures for goods (e.g., medicines).

Aguila summarized the main results that were observed 6 months

after implementation of the program. They included an increase in food availability and reduction in the incidence of hunger spells, a 22 percent increase in health care utilization as measured by doctor visits, and a one-third increase in medication access measured by reports of not being able to afford medicines. In terms of health outcomes, there were highly significant improvements in cognitive abilities (immediate and delayed recall), measured improvements in lung function, and a 10 percent reduction in anemia (Aguila et al., 2015). In terms of family transfers, there was some crowding-out effect of family transfers; data suggest that money flows from children and family members to those receiving the noncontributory pension declined by half. Another important result has to do with the implementation of the program, in terms of the frequency of pension payments. Researchers found differences in behavior between those who receive monthly versus bi-monthly payments (the latter are the federal government norm). While a 2-month disbursement is more cost-effective from an administrative standpoint, the salutary effects of pension receipt mentioned above were generally enhanced among those receiving a more frequent payment. There is evidence that people have difficulty smoothing their consumption between pay cycles, both with regard to food consumption and health care usage.

There was also some indication that people receiving the noncontributory pension were more likely than those in the control group to stop working. One workshop participant suggested that it would be very useful to further investigate the interaction between employment and the noncontributory pension, particularly in light of what is known about the importance of work for individual identity, network formation and strengthening, and receipt of health benefits. Aguila agreed and mentioned that one next step is to analyze the type of work that individuals aged 70 and older are engaged in, most of which is in the informal sector and often of a sporadic nature.

PENSION SYSTEMS IN LATIN AMERICA

Roberto Ham Chande, Colegio de la Frontera Norte, focused on what he called “a great need to renew the Latin American pension system, particularly in Mexico.” In his view, the major underlying topic of the entire workshop has to do with interpreting old age as a dependency. He said he believes that old age should be defined as a state of dependence, especially in terms of economic security. Economic security can be achieved through

a promise of future support by family, by children, or by the state. One of these promises can be a pension, i.e., an agreed-upon form of support, legally validated, accepted without reluctance, and claimed with a full sense of entitlement. A widespread but misleading belief, he said, is that personal savings are the means of allowing people to purchase the goods and services needed during aging and retirement.

Policies to promote these promises have been discussed during the workshop. However, Ham Chande noted, established policies often do not deal with what is currently happening. Rather, they deal with what will come, with the hope that whatever will come will be better. For this reason, marketing is needed about what old people really need during their retirement, based on data and projections. He divided needs into four parts. The first involves necessities of daily living (food, housing, clothing). The second is health care, including clinical care, medications, therapy, exams, and hospitalization. The third is long-term care, which may be provided by families but may also involve assisted living arrangements and nursing homes. The fourth is family and social life, including a focus on social networks and entertainment. By far, health and long-term care are going to be the most expensive.

In Ham Chande's opinion, the focus should move beyond the monetary aspect of future needs. Referencing an historic paper by Dawson (1912), Ham Chande noted that there is a fundamental fallacy in the notion that people are supported in old age from their savings. Another focus must be on the distributional aspects of economic, political, and social systems, and on notions of the proper distribution of goods and services, including among older individuals. He noted that this has been a theme in the literature beginning more than 100 years ago, and continuing to the present (see, e.g., Barr and Diamond, 2006; Lee and Mason, 2011).

Ham Chande presented several of his thoughts about pension systems in Latin America. The first is that pensions with a defined benefit represent a burden that is impossible to pay as now structured. This is partly due to population aging and increased life expectancy, and less so to corruption within social security institutions. Another aspect, in his view, is that pensions have become public debt because of labor unions, which have created a series of privileges that cannot be paid anymore. The same fundamental economics underlie a pay-as-you-go tax system and funded private savings, he asserted; all pensions systems, funded or unfunded, involve a transfer of resources from workers to retirees. It is also the case that administrative costs of pension system management are eroding rates of return, with a high risk

to individuals who are often unaware of these costs. Hence the transition toward individual, defined-contribution pension systems may not provide an adequate retirement for large numbers of workers.

Investing in government bonds, said Ham Chande, is equivalent to pay-as-you-go, but with higher administration costs. Retirees who try to sell assets to a smaller next generation will realize relatively low prices. This is because longevity and retirement risks actually reside in, and are determined by, the economy. The only way that funded systems can do better than pay-as-you-go systems is by creating a greater gross domestic product, he said. In his view, the best way to assure the future of social security is by investing in youth, health, and education.

One primary task that nations need to undertake is to review actuarial, economic, and social estimates and reconsider their sustainability. Countries must bear in mind that health care costs are going to grow exponentially, and may well be more expensive than pension costs. Ham Chande suggested more attention to econometric models and to use of the “demographic dividend” framework for understanding intergenerational transfers (Crespo et al., 2014). Countries should exploit the first demographic dividend by taking care of young populations so that they can form the social and economic infrastructure that guarantees transfers to aging populations; this becomes the second demographic dividend.

According to Ham Chande, another important task, and the most formidable, is to more openly discuss the critical conflict of vested interests within LAC societies. The privilege associated with some union-related pensions is an obvious topic, and Ham Chande suggested seminars and fora on this subject. Another topic he identified is how to refocus financial systems’ emphasis on speculation toward investment in infrastructure, to help realize the potential of demographic dividends.

6

Family and Social Transfers

FERTILITY DECLINE AND CHANGING LIVING ARRANGEMENTS

Paulo Saad, United Nations (UN) Economic Commission for Latin America and the Caribbean, offered his thoughts on the relevance of the study of living arrangements of older people in Latin America and the Caribbean (LAC). He illustrated his considerations with information from a previous UN study on the living arrangements of older people around the world and presented preliminary results from a just-begun study on recent trends of living arrangements of older people in the region.

The initial question he posed is why the study of living arrangements of older people is particularly relevant in LAC. In the first place, he said, informal support plays a very important role in the well-being of older people wherever the provision of adequate formal support is absent or deficient, as in most countries of the region. And coresidence is usually a very important element in this intrafamily support transfer system. A second point he made is the increasing need for support of older people because of the aging of the population; not only do more people survive to older age, but those who survive tend to live longer.

At the same time, he said, several factors tend to constrain the ability of families to provide support to older members. One is the increasing labor force participation of women. Women have traditionally been the main providers of support for the older family members, but many women now

have less time for doing this because they are participating much more in the labor force. A second point is lower fertility and the decreasing number of children, which decreases the options for coresidence for older people. There is also increasing mobility of the younger generation, such that children are moving away from parents and older relatives, which also decreases the possibility of coresidence.

In studying living arrangements, it is important to consider three main elements, according to Saad. One is the consequence of different living arrangements for the well-being of older people. Some arrangements may provide older people more assistance with activities of daily living (ADL), for instance. Other arrangements might increase the flow of direct support (money, goods, services) to older people and/or give them more satisfaction with life in general. The second element is the determinants of these living arrangements, especially in order to inform public policy to better address the consequence of different living arrangements. The third element has to do with classification: how to choose a small set of meaningful categories of living arrangements from a potentially large set of choices.

Saad explained that a given living arrangement is the result of a balance between preferences, not only of older people—whether they prefer to live alone or prefer to live with their children—but also the preferences of other family members. There are also cultural influences on these preferences. An older person living alone, for instance, may be seen as a sign of abandonment by children. These preferences are constrained by other factors, including kin size and composition, physical feasibility of living independently, and financial feasibility. He then noted the importance, for classification purposes, of understanding the relationship between an older person and other members of a family and/or household. Often, a researcher only has information from general surveys and censuses that show an older person's relationship to the head of household. If the older person is the head of a household, classification is straightforward. But for those older people who are not heads of household, there will be uncertainty as to the real living arrangement of this person. Ideally, information about the relationship of an older person to each member of a given household would be available, but this information must come from a specialized survey.

Saad presented data from a comprehensive UN study of more than 100 countries worldwide, based largely on census data (United Nations Department of Economic and Social Affairs, 2005). He showed that there were large differences in living arrangement patterns between developed and developing regions. For example, three-quarters of older (age 60+) people in

developing regions lived with a child(ren) or a grandchild, compared with one-quarter of older people in more developed regions. Coresidence of older people with children is lower in Latin America than in Asia and Africa, but much higher than in Europe. In all regions of the world, older women are more likely than older men to live alone. But if looking only at unmarried older people, men are more likely than women to live alone, because most older men are still married and most older women are unmarried. In all regions of the world, there is an increased likelihood over time for older people to live alone.

Looking at economic and social differentials for the entire set of countries in the UN study, Saad noted that in countries with very low levels of development, coresidence with children is associated with higher social and economic status of the older person. Among countries at moderate levels of development, this association tends to disappear or even reverse; living with children starts being associated with lower social and economic status. One conclusion is that, in the poorest countries, older people living alone tend to be an especially disadvantaged group. A second finding, Saad said, was that among unmarried older people, although lower levels of socioeconomic and physical vulnerability increased the probability of living alone, coresidence substantially increased the probability of receiving support with ADL for those in need of such support. Among married older people, neither coresidence nor the number of children affect the probability of receiving assistance with ADL, which means that the spouse is the primary provider of support in the case of married older people.

Saad concluded by mentioning a new study that seeks to update the earlier UN effort using 2010-round census data and focusing primarily on LAC, which will afford a look at trends over time. He also mentioned several preliminary results from a multivariate analysis: higher age first increases and then decreases the probability of independent living for older people; for unmarried older people, the probability of living alone is higher among men; for married older people, the probability of living with spouse only is higher among women; and higher educational level increases the probability of independent living (i.e., alone or with spouse only).

SOCIAL MOBILITY ACROSS GENERATIONS IN LATIN AMERICA

Florencia Torche, New York University, tackled the subject of inter-generational mobility, which is defined as the association between parents'

well-being and adult children's well-being. A high association means very little mobility, a situation determined by the accidents of birth and by what parents had or did not have. In this light, the concept of mobility is said to capture equality of opportunity. An immobile society is a society that does not give equal opportunity to its members, she stated. As such, mobility is likely related to inequality, and there are several channels that induce this association.

First, Torche said, inequality implies high returns to schooling, so that people with high education have higher incomes. High inequality also implies less progressive investment in the human capital of the next generation, preventing mobility. Inequality strengthens the political influence of the elite, the wealthy, thereby potentially reducing the scope for redistribution. Inequality also induces residential segregation. Based on these pathways (and there may be many others), she said one might hypothesize that high inequality will result in very limited mobility opportunity. If that is the case, noted Torche, then Latin America, which is highly unequal, should feature very little mobility.

To address this hypothesis, Torche presented a series of stylized facts. The first is that Latin America is the most unequal region of the world and has been since records have been kept from the mid-20th century. On average, Latin America has much higher Gini indices than Asia, the developed nations, Africa, and Eastern Europe and Central Asia (Gasparini and Lustig, 2011). Secondly, Latin America is particular not only because of the level but also the pattern of inequality. The top 10 percent of the income distribution receives about half of the income in the region, compared with about one-third in the rest of the world (Bourguignon and Morrisson, 2002). Inequality by definition is related to concentration, but the Latin American case is extreme. She said a third and more positive fact is that inequality, again based on the Gini index, has declined slightly in the recent past as a result of educational expansion and progressive government transfers such as *Oportunidades* in Mexico and *Bolsa Familia* in Brazil (Lopez-Calva and Lustig, 2010).

Torche explained that researchers who study mobility essentially have used three sources of data. The first is the longitudinal panel survey that includes information on more than one generation. The second is administrative data, administrative records that match parents with their adult children. The third is cross-sectional surveys of adult respondents in which those adults report retrospective information about their parents. Unfortunately for analysis in the LAC region, only the third option is presently

available, and acceptable retrospective data generally are limited to Argentina, Brazil, Chile, and Mexico.

Returning to the question of the level of intergenerational mobility in Latin America, Torche said that the answer depends on the measures used. Using occupational class, the intergenerational association in Latin American countries is seen to be as low or lower than in advanced industrial countries, meaning that there is no less and perhaps more mobility. Looking at economic mobility, however, the association between parent's earnings and adult children's earnings appears much greater in Brazil and Chile than in the more industrialized world. The same is true with regard to educational mobility—looking at the association between parents' schooling and adult children's schooling, the intergenerational association (the opposite of mobility) is much higher in Latin America than in the rest of the world (Hertz et al., 2007). In terms of the pattern of mobility, she presented transition matrices by earnings quintiles for Brazil and Chile, which suggest that the pattern of economic mobility is similar to the pattern of inequality—*income concentration at the top, as well as strong intergenerational immobility in the top income quintile.*

Torche then raised the issue of how people understand mobility. She said that scholarly research tends to look at the association between parents and children net of any economic growth across generations. In other words, if everyone is doing better or everyone is doing worse from one generation to the next, this is removed from the picture. But what people perceive in their lives is change that includes the economic cycle. She presented data from a study in Mexico that indicate that even among people whose relative economic standing deteriorated compared to their parents' relative standing, 40 percent said they had moved upwards and 50 percent said they were the same, because they benefitted from overall economic growth.

To summarize, Torche noted that available data suggest there is much less economic mobility, educational mobility, and equality of opportunity in Latin America than elsewhere, but that the number of LAC countries with good mobility data is small. She explained that every Latin American country now has at least one household survey that is nationally representative or almost so. Therefore, it would be possible to add a small module with retrospective questions about parents in those surveys, she suggested. A modest set of questions could enable the construction of indices of economic well-being for the parental and current generations that would enhance the analysis of mobility throughout the region. She said it will also be important to move from bivariate intergenerational associations to

the more important question of how mobility works; that is, the processes involved when socioeconomic well-being is transmitted or not transmitted across generations.

Finally, she stressed that education in Latin America is by far, and more so than in other parts of the world, the most relevant factor explaining intergenerational mobility (Torche, 2014). This is both good and bad news, according to Torche. The good news is that education is highly amenable to policy intervention; there is widespread support for increasing and equalizing educational opportunity. The bad news is that advantage is reproduced across generations in Latin America through education. Wealthy parents can afford more and better education for their children, and education in turn pays off in the labor market. The strong mediating role of education creates a situation of “inherited meritocracy,” intergenerational persistence that is legitimized and naturalized by educational attainment, she said. This situation emerges from the strong barriers that disadvantaged families in Latin America face with regard to accessing both quantity and quality of education. It is a meritocracy because people do well based on their education, but it is inherited because education depends on the family of origin. This has been documented in Latin America, and highlights the importance of moving from a bivariate perspective to one that better explains how socioeconomic advantage is replicated across generations.

RAPID SOCIAL CHANGES AND IMPLICATIONS FOR AGING

Cassio Turra, Federal University of Minas Gerais, focused his remarks on the empowerment of older people in Brazil during the preceding decades. He began with some institutional and demographic context for Brazil, noting that Brazil is a very large country with a large population, a large economy, and high levels of inequality that have persisted for many years. There is great racial and regional diversity. Brazil is characterized by very rapid demographic transition and other transitions—educational transition, labor market transition, and the expansion and consolidation of social welfare programs—which are under way at the same time.

He presented data on two of the most important indicators of demographic transition, infant mortality and fertility. The infant mortality rate declined by a factor of about 10 over the last 50 years, faster than in China and Mexico. The decline in infant mortality was followed by a decline in the total fertility rate, which was also very fast, the rate plunging from more than 6 children per women in 1960 to 1.9 in 2010, and the decline

continues. These trends have consequences for population aging, family size, and family structure. At the same time, there was a large increase in the proportion of women in the labor force. In terms of education, he said that Brazil was late in making investments in education; in 1960, half of the adult female population (ages 30–69) had no schooling.

In the late 1980s, Brazil was ending a military government and preparing a new constitution. Part of the motivation for the new constitution was to build a large social welfare program, and Brazil undertook simultaneous investments in education, in social security, and in health care. There were sharp increases in some program coverage rates between 1988 and 1991, particularly in noncontributory programs. This was a challenge, Turra said, because Brazil was spending money on the old and the young at the same time. This was in contrast to many developing countries that invested first in children, then in economic expansion and improved productivity, and then consolidation of social security programs. As to why Brazil expanded social security protection to all older people at once, Turra explained that at least part of the rationale was a “social inequality” argument. Looking at the 1930 birth cohort (i.e., people who were turning age 60 when the new constitution was written), 70 percent had lived in childhood poverty, the female labor force participation rate for this cohort was about 20 percent, and the average educational level was about 4 years of schooling. Therefore, there was a high probability of being poor at older ages in 1988, and the decision was made to provide a minimum benefit to all elders.

With regard to outcomes stemming from policy changes, the expansion of social security coverage to all older people had a large period effect on poverty rates. Turra explained that there were sharp declines in poverty after 1988 for six birth cohorts of older Brazilians (born between 1901 and 1932). There were also declines in poverty rates among children, but these were based more on cohort and intergenerational effects. In terms of income inequality, the demographic transition and expansion of benefits among older people resulted in a greater concentration of older Brazilians in higher income deciles. Echoing Saad’s earlier remarks, Turra noted an increasing prevalence of older people living alone or in one-generation households between 1970 and 2010, which is related to the expansion of social security and probably indicates that older people have increasing autonomy within households. He also reported that there has been increasing financial independence among older people living in multigenerational households; those who live in multigenerational households now hold a larger share of household income. There is a need, said Turra, to do analyses

on the consumption side of the equation, which is important because older people spend a good deal on health services.

In conclusion, he reiterated that Brazil is in the midst of dramatic demographic and institutional change, and the challenge is how to keep social progress occurring with a growing proportion of the population aged 60 and older. Old-age support systems (social security, health, and long-term care) must take into account population aging and smaller family size. The definition of “aged” needs to change over time; in his opinion, part of Brazil’s fiscal solution involves having a minimum age of retirement that is flexible and can be increased in response to longevity increases. He noted that this has been very difficult to implement in Brazil, because Brazilians retire at a relatively early age. He mentioned the importance of rethinking issues surrounding fertility levels and international migration. Consideration needs to be given to the level of public transfers to older people, which may be too high to encourage savings. To better assess these and other issues, Brazil needs more longitudinal data, he said, and an integration of different source of data: administrative records, other linked data, longitudinal studies, repeated cross-sections, and census data.

NATIONAL TRANSFER ACCOUNTS

Timothy Miller, United Nations Economic Commission for Latin America and the Caribbean, added a different twist to the workshop discussion, shifting the focus from aging populations to aging economies. He noted that economies can also grow old, and defined an aged economy as one in which consumption by older people exceeds that of children, meaning that more resources are going to elders than to children. Using this metric, he pointed out that there were no aged economies in the world until the late 1990s, when Japan set the pace. By 2010, 18 other countries were in this category, and the number is expected to reach 77 aged economies by 2040. This is a new phenomenon that will eventually come to dominate the world, and one about which there is little historical information.

One of the best inventions that economists created in the last century, said Miller, was the construct called national accounts, which produce estimates of gross domestic product (GDP) and other indicators. This concept has been broadened to what are called national transfer accounts (NTA). NTA do two things. The first is to measure the age distribution of economic activity, for example, labor earnings by age. The second is to measure the transfer of resources between population age groups within a national

economy, and whether that transfer is occurring through the government, through financial markets, or through families. Thus, while national accounts address relationships between economic sectors, NTA address relationships between population groups (young and old, men and women, etc.). The NTA concept has been expanded to include (1) national time transfer accounts, because when looking at the distribution of resources and economic activity, time must be taken into account and not just spending; and (2) national inequality accounts (e.g., a focus on rich and poor).

To recap, Miller said that national accounts focused on a very important problem of the previous century, the problem of growth. NTA can also be used to look at growth, but one of the main motivations behind NTA is to look at distributions. The main themes are population aging, inequality, and sustainability. NTA are based on household surveys, administrative data, and the national accounts themselves. More than just an analytical framework, he explained, there is also an NTA network of researchers with more than 100 investigators in 46 countries.¹ NTA methodology and results may be found in a United Nations manual (United Nations Department of Economic and Social Affairs, 2013).

Miller then presented summary data for economic lifecycle by age. Figure 6-1 shows information for an average of 23 countries. The dashed line is consumption, which rises during the younger ages and is rather flat after age 20. The solid line represents the average labor earnings profile. The “problem” for societies is identified by the two gray zones, the two periods of economic dependency. The core problem is how economies and countries finance consumption during these two periods of early and late life. A period of dependency in young life and a period in old life are characteristic of human societies, whether industrialized or agrarian. Societies need to solve the problem using a balancing equation, which can be thought of as a simple accounting framework. On the one side is consumption: goods consumed, savings, taxes paid, and family transfers provided. On the other side of the balancing equation are labor earnings, asset income, public transfers received, and family transfers received. Support of consumption can only occur through these four channels. Each society will adopt a different combination of these four channels to satisfy consumption needs.

To illustrate, Miller contrasted the roles of labor income, family transfers, public transfers, and private assets in supporting consumption in Japan, Mexico, and Sweden. In Mexico, families are the primary supporter

¹The NTA project website is <http://www.ntaccounts.org/web/nta/show/> [August 2015].

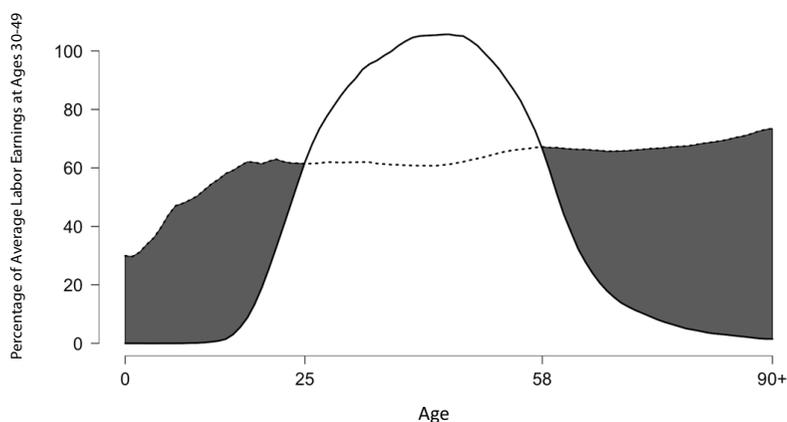


FIGURE 6-1 Lifecycle deficit in youth and old age.

NOTE: Average of data for 23 national transfer account countries, circa 2000.

SOURCE: Lee and Mason (2011).

of youth (ages 0–19) consumption, with some role for public transfers and some role for labor income coming from older youth. At the other end of the spectrum, older people on average give more resources to family than they receive from family. This is a common pattern around the world, seen also in India, Indonesia, Philippines, and South Africa. In Mexico, the dominant form of family transfers is assets, and older Mexicans are using up their assets in retirement. In Japan, the government takes a more active role in supporting youth, and there is greater reliance on public transfers and less on assets. This also is common to Chile, Costa Rica, Germany, and Peru. In Sweden, the government plays as large a role as does the family in terms of support to children. Raising children in Sweden is a very cooperative endeavor, and older age consumption in Sweden is characterized by the dominance of public transfers. Older Swedes use relatively few of their assets in retirement.

Miller noted that one global pattern is that as net public transfers to older people rise, net public transfers to youth also tend to rise. There are, of course, numerous outliers, such as Brazil in the 1990s with very high transfers to older ages (as Turra discussed earlier). Miller also noted that consumption differences within countries are as great as differences between countries, and that intranational analyses are important. He concluded with some data on rising health care expenditures related to population aging and

growing incomes. Contrasting rich and poor countries, he noted that patterns of health expenditure at younger ages were quite similar, but that there was an enormous difference at older ages. Over time, health expenditures in poorer countries are likely to increase because there will be more people in older age groups and countries will become wealthier. Miller suggested that the world will see a continuing transition away from economies in which 20–30 percent of GDP is devoted to food to economies in which 20–30 percent of GDP is devoted to health care.

7

Resilience and Aspects of Well-Being in Older Age

RESILIENCE AND AGING

Rafael Samper-Ternent, Universidad Javeriana Colombia, highlighted a gap in the aging research paradigm related to the recovery process among older people who face a disastrous disease or adverse event. If comparable older adults are exposed to the same stressor, he queried, why do some recover while others do not? Why do some older adults with low socioeconomic status (SES) fare better after an adverse event than older adults with higher SES? For clinicians it is very clear, and for researchers it is becoming clearer, that the process of recovering is essential to the aging process, he said. However, the aging literature is rather sparse on the topics of resilience and recovery. Most information comes from models and cross-sectional studies that talk about resilience.

Samper-Ternent said in his opinion, there is no clear line between resilience and recovery in older people. Some researchers and models have attempted to include recovery as an important part of the aging process. A basic biological model focuses on the recovery side after people have a disease and receive treatment but does not go into depth as to how to measure recovery and how this affects the aging process. He mentioned other efforts that focus on successful or healthy aging (Rowe and Kahn, 1998; World Health Organization initiatives on aging and lifecourse)¹ and older

¹See <http://www.who.int/ageing/en/> [August 2015].

models of the disablement process (e.g., Verbrugge and Jette, 1994) that have implications and uses in the areas of rehabilitation and functionality.

In the last 5 years, he said, there has been a new emphasis on the term “resilience” and on factors that drive or hinder recovery. Samper-Ternent noted that resilience is not a new term, having been used since World War I to describe children exposed to traumatic events but who then do well at older ages, as well as older people and the psychological factors associated with good quality of life in spite of disease and adverse events. He offered a definition of resilience as “the process of negotiating, managing and adapting to significant sources of stress or trauma. Assets and resources within the individual, their life and environment facilitate this capacity for adaptation and ‘bouncing back’ in the face of adversity” (Windle, 2011). In order to operationalize resilience, he said, there must be a major risk or adversity that carries a significant threat for the development of a poor outcome, and the impact (on functionality, cognition, and/or quality of life) has to be measured. It should be the case that adverse outcomes are not experienced; there should be maintenance of normal development or functioning, such as physical or mental health, or better-than-expected development or functioning, in the face of adversity. This is often referred to as positive adaptation. And there should be measurement or observation of supportive aspects within people’s lives and environments that facilitate the capacity for adaptation to adversity.

The analysis of resilience should proceed from different angles, he explained. Geriatricians use a geriatric assessment that has four components: medical or physical; functional; mental, which has a cognitive and psychological component; and social. According to Samper-Ternent, it is clear that to study the topic of resilience requires longitudinal data. He described initial work using such data from the Health and Retirement Study (2002–2004) in the United States and the Mexican Health and Aging Study (2001–2003). The 2-year survey periodicity allowed researchers the opportunity to observe the recovery process from heart attack, falls, and widowhood. Widowhood is not strictly reversible, but this variable was included as an event that the widow/widower can recover from on the basis of psychological characteristics and a good support network. Researchers used comparable variables from the two studies to measure four domains: physical health, functional status, mental status, and social status.

Resilience was measured in terms of the change between two points in time for all four domains. He explained this involved creating scores for the four domains and undertaking a validation process. Researchers found

that people who were less resilient (lower scores for each of the domains) were more likely to die and more likely to report poorer health. They found, overall, resilience scores were higher for Americans than for Mexicans. However, analysis by domain suggested a more complex story. At baseline, older adults in the United States were in worse condition in the health domain than older adults in Mexico, older Mexicans had more functional impairments, older U.S. adults had worse social status, and mental status was the same in both populations.

This study also considered those factors that promote or help a person to be resilient, those that put people more at risk, and differences in these factors across the two countries. Samper-Ternent described several additional avenues of investigation stemming from the observation that the factors that promote resilience are different in the United States and Mexico. One might ask, he said, about the role of social structure, the size and type of the family, urban/rural residence, labor force participation, and alcohol use. He mentioned the study results have been somewhat controversial, given that there have been no such precedent studies and no clear understanding of how to measure certain topics. He suggested this work might best be seen as a proposal of how to conduct and refine further research. He concluded that resilience is a useful concept in understanding adverse events suffered by older adults in a more comprehensive way, and that research on resilience is beginning to pick up momentum (see, e.g., Stephens et al., 2015; Smith and Hollinger-Smith, 2015). Transnational studies allow for the understanding of aging pathways in different contexts, and will help change the paradigm of aging and aging research away from a focus mainly on disease, disability, and mortality and more toward the positive aspects of the aging process.

NUTRITION AND AGING

Cecilia Albala, Universidad de Chile, spoke about aspects of nutrition and aging in Chile, summarizing data obtained through a longitudinal study begun in Santiago in 1999 and through other projects. Looking first at healthy life expectancy (i.e., life expectancy without functional limitations), she showed people with higher SES have higher survival probabilities and better health conditions, especially for women. In terms of nutrition, she focused primarily on changes in body composition. It is well known, she pointed out, that aging is associated with increased chronic disease, decline of cognitive function, and decline of the immune function, but aging also

is closely related to changes in body composition. Foremost among these are the redistribution of adipose tissue, loss of muscle mass, and loss of bone mass.

Data from the 2010 National Health Survey suggest most older adults in Chile are overweight. Using the standard body mass index (BMI) categories, only about one-fourth are of normal or low weight, with 43 percent in the overweight category and 31 percent in the obese category. With regard to abdominal obesity, more than half of the older (60+) population has abdominal obesity as measured by waist circumference. At age 80 and older, the percentage remains in excess of 45 percent. In light of these numbers, and knowing that there is a redistribution of adipose tissue with age, Albala questioned why the World Health Organization cutoff points to define obesity are still used, and whether these are the optimal cutoff points. Studies have shown waist circumference is an excellent indicator of central adiposity and could be as good as the BMI index for predicting mortality in the older adult (see Donini et al., 2012). On the basis of such studies, the Chilean Ministry of Health has adopted nonstandard cutoff points to define low weight, normal weight, and obesity. She also described studies that have sought to validate and/or redefine optimal cutoff points for BMI using measures such as metabolic syndrome and waist circumference, and reported that a BMI level of 27–28 was where the major health risk started.

Albala talked next about muscle mass, citing dynamometry (the measurement of force or power) data that show that muscle strength is positively related to BMI in both men and women. Studies of mortality and dynamometry found men and women below the 25th muscle strength percentile have lower survival chances.

Sarcopenia is the generalized loss of muscle mass, with loss of quality and skeletal strength, and is associated with mobility disorders, a higher risk of falls and fractures, a decreased capability for daily activities, loss of independence, and higher mortality. Albala said few studies in Latin America can assess the prevalence of sarcopenia, due in part to a lack of agreement on how to diagnose it. A Chilean study, using a validated algorithm proposed by researchers in the European Union, demonstrated that the prevalence of sarcopenia increases with age, reaching 40 percent among those aged 80 and older, and is higher in men than in women (Lera et al., 2015). Multivariate analyses showed that older people who were overweight were relatively protected from sarcopenia, and those who were obese were even more so.

A third major problem with regard to body composition and nutrition is the loss of bone mass. Osteoporosis is a decrease of bone mass with dete-

rioration of the bone micro-architecture, which produces increased fragility and susceptibility to fractures, notably hip fractures. According to Albala, osteoporosis is responsible for a large and increasing share of disease burden worldwide, and its prevention has become a priority in public health. In Chile, the average hospitalization for hip fracture is 14 days, compared with 5.6 days for all hospitalizations.

Osteoporosis is higher in women than men for biological reasons, she explained. At 80 years of age, 44 percent of Chilean women have osteoporosis compared with 15 percent of men. As seen in Figure 7-1, when data on osteoporosis and osteopenia (a lesser degree of osteoporosis) are combined, half of all older adults in Chile are affected (Albala, 2015).

Of increasing concern to health practitioners is the combination of having osteoporosis plus sarcopenia at an older age, which raises the odds of fracture by a factor of 2.2.

In conclusion, Albala reiterated that although obesity is prevalent in Chile, it is associated with relatively good muscle mass. Sarcopenia and osteoporosis are frequent conditions and very severe in terms of consequences. These conditions can be delayed or perhaps even reversed with

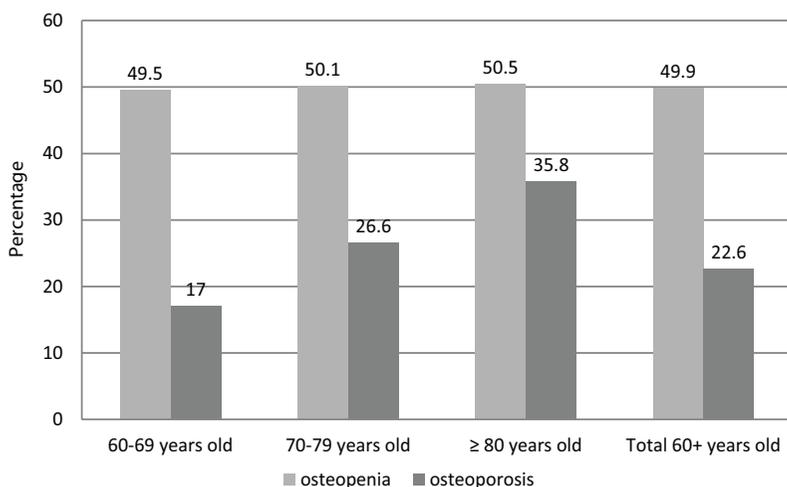


FIGURE 7-1 Prevalence of osteoporosis and osteopenia among older age groups in Chile, circa 2010.

SOURCE: Adapted from Albala (2015).

proper nutrition and exercise throughout the life cycle; early detection is fundamental. She stressed the value of longitudinal studies in being able to validate instruments that allow the study of a series of pathologies, syndromes, and conditions that are essential to health in older adults.

BIOMARKERS AND UNDIAGNOSED DISEASE

Soham Al-Snih, University of Texas Medical Branch, spoke about biomarkers and undiagnosed diseases. She described biomarkers as a broad category of objective indicators of medical states observed from outside an individual, measures that are accurate and reproducible. Many terms have been used to describe measurements of disease and treatment, such as biological markers, biomarkers, surrogate markers, surrogate end points, and intermediate end points. In 1998, the U.S. National Institutes of Health spearheaded an expert-group effort to unify the definition of a biomarker. The result was the definition of a biomarker as a clinical endpoint, a characteristic that is objectively measured and evaluated as an indicator of normal biological processes, pathogenic processes, or pharmacological responses to a therapeutic intervention.

Biomarkers have applications in disease detection and the monitoring of health status. They are used as diagnostic tools for the identification of patients with a disease or abnormal condition (e.g., elevated blood glucose concentration for the diagnosis of diabetes mellitus) and as tools for the staging of disease (e.g., antigens or receptors to measure the extent of tumor cell proliferation and metastasis). Biomarkers can also be used as prognosis indicators of disease (e.g., anatomic measurement of tumor shrinkage of certain cancers) and to predict and monitor clinical responses to an intervention, (e.g., blood cholesterol concentration for the determination of the risk of heart disease).

Al-Snih described the characteristics of an ideal biomarker as being (1) safe and easy to measure, (2) cost efficient in terms of follow-up, (3) modifiable with treatment, and (4) consistent across gender and race/ethnic groups. The characteristics of a good biomarker when studying aging include the prediction of physiological, cognitive, and physical functions, independent of chronological age; testability without being harmful to subjects (e.g., blood tests and imaging techniques); and the capacity to work in laboratory animals as well as in humans.

The use of biomarkers has advantages and disadvantages, she said. The advantages include objective assessments, precise measurements, reliability,

and validity. Biomarker data tend to be less biased than information from questionnaires and can sometimes be used to study disease mechanisms and the homogeneity of disease risk. On the negative side, the timing of biomarker testing is critical, analysis costs can be high, and laboratory errors are a concern. It can be difficult to establish normal ranges for some biomarkers, and there are potential problems related to the storage of sample and sample longevity. There also are ethical issues surrounding the collection and use of biomarker data.

She mentioned several biomarkers of aging commonly used in laboratory investigations and epidemiologic research (for example, interleukin-6, C-reactive protein, gait speed), and noted many of the studies that have been described during the workshop have incorporated biomarker collection to varying degrees.

Al-Snih then used the example of diabetes to illustrate the use of biomarkers. She underscored the health importance of diabetes with estimates from the International Diabetes Federation (2014) suggesting that 39 million people in North America and the Caribbean are living with the disease, of whom an estimated 27.1 percent have undiagnosed diabetes. Figures for the Central and Southern America region are 25 million and 27.4 percent, respectively.

There are several markers used to diagnose diabetes, including hemoglobin A1C, plasma glucose, oral glucose tolerance, and random plasma glucose. Focusing on Mexico, Al-Snih stated the 2006 Mexican National Health and Nutrition Survey found 5.2 percent of respondents with undiagnosed diabetes, based on fasting plasma glucose levels. She then described the collection of biomarkers in a subsample of people aged 50 and older in the Mexican Health and Aging Study. Using a method known as AC1 Now-NGSP certified, researchers found that the percentage of undiagnosed diabetes was 23.3 percent among respondents who had a hemoglobin A1C level above 6.5. The analysis identified two factors especially associated with lower risk of undiagnosed diabetes: physical activity and residence in a high-migration state. Higher risk was associated with both overall obesity and abdominal obesity.

8

Opportunities to Generate Evidence on Older Adults and Move the Research Agenda Forward

Several presenters revisited the studies discussed during the workshop, with an eye toward lessons learned and how other studies might benefit from previous experiences.

Thinking back to the origins of the Mexican Health and Aging Study (MHAS) in 1999, Rebeca Wong said important beginning steps were to identify the key and unique scientific issues that needed to be addressed, and to plan for longitudinal national data and open data access for the scientific community. One unique element in MHAS, she said, was a focus on the migration of older adults to and from the United States, and the MHAS sample includes recent migrants, historical migrants who migrated 40 or 50 years ago, and individuals with family networks in the United States.

Having the right partners was crucial, she said, because field work in a longitudinal study requires the ability to follow individuals over time if they move to another part of a country or within a large city. Not every organization or company can do this. Fortunately for MHAS, the Instituto Nacional de Estadística, Geografía e Informática (INEGI) was one of the partners. MHAS had Dr. Beth Soldo from the University of Pennsylvania as a principal investigator during the study's first round and collaborated with researchers from other universities and with the National Geriatrics Institute. Now, with biomarkers in the survey, MHAS collaborates with the National Public Health Institute. Having proper partners for political support also is important, Wong noted.

As a longitudinal study proceeds, Wong continued, it is necessary to take care of data quality by investing in sample maintenance and follow-up response. This is not an easy task, she observed, but it can be accomplished by working with partners such as INEGI to develop strategies for re-contact. Another point is that no study has value if people do not use the resulting data. Study teams should make data available quickly after collection (in the case of MHAS, 9–12 months after a survey wave), facilitate data use, and assist with production and dissemination of publications and policy summaries.

Wong stressed the importance of recognizing major social changes that occur during a study's lifetime. Between MHAS rounds 2 and 3, reform and extension of public insurance in Mexico with the goal of reaching universal coverage took place, as did a financial crisis in the United States and the rest of the world. Mexican migration to the United States was greatly reduced, and she said MHAS must assess the impact of insurance reform and the impact of the financial crisis on older Mexicans and their families both in Mexico and the United States. One out of five Mexicans aged 50 and older has at least one son or daughter in the United States.

William Dow, University of California, Berkeley, provided more details on the Costa Rican Study of Longevity Healthy Aging (CRELES), funded by the Wellcome Trust and the U.S. National Institute on Aging. Dow's coprincipal CRELES investigator, Luis Rosero-Bixby, spoke earlier in the workshop (see Chapter 3) about the study's original goal of understanding the extraordinarily high longevity of older adults in Costa Rica.

Dow explained CRELES has two different cohorts. Rosero-Bixby spoke about data from the original cohort, which included individuals born before 1945 who were sampled from the 2000 Costa Rican Census and hence were aged 55 and older in 2000. This group, interviewed in 2005, 2007, and 2009, included an oversample at very old ages. Sample attrition was about 6 percent between waves, and there was approximately 10 percent mortality between waves. For each death, the study team interviewed family members to learn more about circumstances leading up to and surrounding the death.

The second CRELES cohort is called the CRELES Retirement Cohort, and includes individuals born between 1945 and 1955. They were interviewed in 2010 and 2012. Part of the rationale for selecting this cohort was to study retirement decisions. Dow noted a very rapid fertility decline in Costa Rica during the 1960s, in particular, and that the two CRELES

cohorts span much of this period. Combining data from the cohorts should allow researchers to understand some of the long-term effects of the fertility decline.

Given CRELES was originally focused on mortality and health, the study includes numerous objective health measures, he said. Among them are anthropometry, blood pressure measurement, and observed functioning (e.g., grip strength, spirometry, standing on one foot, bending and crouching, timed walk), many of the items discussed in the workshop discussion about biomarkers. The original CRELES cohort provided fasting blood samples in the baseline survey and in the 2007 follow-up, and an overnight urine sample in 2005. With the more recent retirement cohort, investigators mimicked the indicators that were collected in the U.S. Health and Retirement Study, using nonfasting venous blood to measure glycosylated hemoglobin for diabetes, total HDL cholesterol, and C-reactive protein. There also are DNA samples from these individuals that have been used to look at, for example, leukocyte telomere length.

Going forward, Dow said there are no plans for new survey waves. Current work is focused on several fronts: (1) harmonizing the CRELES data in the University of Southern California's Global Aging Data Repository with information from the many HRS-type studies from other countries; (2) integrating GIS-related data, such as a mapping of government health facilities (hospitals and clinics) and information from neighborhood questionnaires that were filled out by interviewers at the time of the interviews (CRELES also did a survey of clinics to measure clinic quality and related aspects); and (3) continuing to follow individuals in the death registry and developing links to other datasets. Linkages with civil registries allow researchers to follow changes in family structure over time, as well as new fertility events, address changes, and other changes. There is the potential to link to pension data, though this has not yet been done. With regard to mortality analysis, researchers also developed a database of 20,000 individuals aged 35 and older drawn from the 1984 Costa Rican census, and have been following them over time in the death registry. This is an example of the type of administrative data linkages that Dow encourages other studies to do in order to increase sample sizes for analyses.

Finally, he mentioned CRELES researchers have been working with environmental health sciences colleagues to use satellite data on weather and air quality, at the time of the surveys, in each of the small areas within the survey. Dow suggested other studies should consider the incorporation of such information.

Cesar de Oliveira spoke about two factors instrumental for the launch of the Brazilian Longitudinal Study of Aging and Wellbeing (ELSI-Brazil), described in Chapter 3. The first was the support of the Brazilian government through the Ministry of Health, which has provided full funding for the project. In any country, he noted, specific issues will be of particular importance. In the case of Brazil, assessment of public policies concerning older people (described by Cassio Turra during the workshop; see Chapter 6) are very important to the Ministry of Health. ELSI-Brazil has a special module addressing that topic. In other countries across Latin America and the Caribbean, said de Oliveira, the development of ELSI-Brazil-type studies might benefit from a focus on issues of country-specific importance.

The second factor, which has been mentioned in other sessions, is the role that the international community has played, particularly the close collaboration with researchers involved with the English Longitudinal Study of Ageing that helped define core survey modules and key variables. He suggested the experiences of MHAS and ELSI-Brazil would be of use for the development of new studies in other countries in Latin America and the Caribbean, particularly because most if not all countries share a history of social and health inequalities.

Somnath Chatterji, World Health Organization (WHO), spoke about the WHO experience in designing and fielding a multicountry study known as the Study on Ageing and Adult Health (SAGE).¹ One of WHO's core functions is the monitoring of health of trends and determinants, and WHO has been involved in the Global Burden of Disease study discussed during the workshop. Historically, however, WHO did not engage much in primary data collection. About 15 years ago, this began to change with the development of a large 70-country study called the World Health Survey that focused on various aspects of health and its determinants, largely in adult populations. At that point in time, a focus on aging was not central to what WHO was doing, and the importance of noncommunicable diseases in much of the world was not well recognized. Chatterji explained some aging experts around the world, notably Richard Suzman from the U.S. National Institute on Aging, began to question why there was not more attention given to older adults in this survey exercise. This served as the stimulus for WHO to think more specifically about older adults and the aging process.

¹See <http://www.who.int/healthinfo/sage/en/> [August 2015].

WHO developed its Study on Ageing and Adult Health based on oversamples of adults aged 50 and older in several countries that participated in the World Health Survey. WHO has partnered with the HRS-type surveys to look not only at health and its determinants, but also the relationship between health and well-being. WHO recognized the need, as James Smith mentioned in his workshop presentation (see Chapter 2), to understand the circumstances in which people live and grow old, and therefore incorporated aspects of household living conditions, economics, subjective well-being, and time use into SAGE.

Six nationally representative SAGE surveys have been conducted, in China, India, Russia, Mexico, Ghana, and South Africa. The surveys involve about 45,000 people aged 50 and older, with a comparative cohort between the ages of 18 and 49, and incorporate most of the variables discussed during this workshop, including household health examinations and the collection of biomarkers using dry blood spots. Going forward, Chatterji said, SAGE will also collect DNA. The second wave of SAGE currently is in the field, and wave three will begin 2 years later.

Chatterji said since SAGE was launched, there has been a recognition within WHO that aging and the health of older adults is an important component of the public health agenda. The organization will issue a World Report on Aging in 2015 and launch its Global Action and Strategy on Aging. These developments would not have happened, he stated, without the support of the HRS family. WHO, as an intergovernmental organization, is concerned not only with research, but also with the use of evidence in policy formation, and is now engaged in knowledge translation exercises involving SAGE data from Ghana and China.

David Bravo revisited the beginnings of the longitudinal Social Protection Study in Chile in 2002 and reiterated Rebeca Wong's points about the importance of academic support in the study's development stages and with data development. He stressed the importance of maintaining the study given its demonstrated impact on public policy and promise for future analyses. He said it will be important to better link study data with civil registry and administrative data, and to consider the potential value added from incorporating measures found in HRS-type surveys. While such measures would increase costs, in his view, it would be very useful to add the additional dimensions of family structure, intergenerational transfers, and biomarkers.

It is necessary, he said, for Chile to have a survey of people aged 50 and older that is harmonized with HRS-type surveys. At the same time, he said,

it is necessary to better utilize information from other longitudinal studies in Chile that are not so well known, such as the health study described by Cecilia Albala (Chapter 7), and to focus on linking databases and samples. Financing for these efforts, he said, should come from within the country, although there is a role for international agencies as well.

Maria Teresa Calzada presented further information on the SABE Colombia study she described earlier (see Chapter 4). SABE Colombia is a joint initiative between the Colombian Ministry of Health and Social Protection and the Universidad del Valle in conjunction with the National Consultancy Center, an entity that does field work. Design and planning began in 2013, and a study sample was identified in 2014 based on a master sample from the Ministry of Health and Social Protection, which was interested in a focus on adults aged 60 and older. The SABE sample includes nearly 31,000 older adults living in households.

The SABE Colombia instrument contains 404 questions organized into 12 thematic groups. The study includes anthropometric measurements and assessments of functionality and will collect biomarkers from a subsample of respondents. SABE results will be complemented by data from a second, smaller ($N = 1000$) survey of caregivers conducted by the Universidad del Valle, which includes 70 questions designed to study caregiver burden. The SABE design also includes a qualitative component based on focus group interviews.

Several databases will be developed and become part of the National System for Health Population Studies and Surveys. SABE data will be readily available to the scientific community through two platforms maintained by the Ministry of Health and Social Protection. One, called SISPRO, is a comprehensive system for social information. The second, called ROSS, contains digital health information. Plans also call for the establishment of a serum repository of SABE biomarker samples within the Colombian National Health Institute. Calzada suggested working together with the ELSI-Brazil team on ways to make biomarker information available to scientific research.

In response to a participant question regarding the extent to which data can be derived from sources other than population surveys, Dow noted vast amounts of clinical data and medical records increasingly are computerized. He said in the United States, the HRS has been able to link to the vast trove of Medicare claims data, thus greatly increasing analytical power and possibilities. This model could prove valuable in other countries if the bureaucratic obstacles can be overcome.

Responding to a question from Carlos Cano about the value of biomarkers given their collection costs and uncertain clinical relevance, Dow pointed to the data reported by Soham Al-Snih showing the high percentage of undiagnosed diabetes, and stated that it is crucial to have information that cannot or is not captured in clinical settings. He argued much of what biomarkers can do is to provide preclinical indications of disease in individuals, as well as population-level warnings of what might emerge in the future. Further, he said it often is imperative to have objective measures of health status rather than relying on people's self-reports, especially since the relationship between objective and subjective measures is seen to vary by socioeconomic status. Cecilia Albala said researchers should agree on a small set of key biomarkers to better influence public policy. She noted many studies measure C-reactive protein, but said this is not useful for policy.

Chatterji responded to participant comments suggesting that more emphasis should be given to improving the quality of data from existing health information systems. Chatterji said while it is important to improve current routine reporting systems, the fact is that fewer than one-third of WHO member countries are able to provide usable levels and causes of deaths. Waiting for present reporting systems to provide the necessary data for policymaking will be too late, he asserted. He stressed the need for more innovative methods of obtaining population health information, particularly surveys that can target behaviors and be linked to the growing quantity of information from other sources.

Enrique Vega, Pan American Health Organization, commented that the multinational SABE project in 1999–2000 represented a leap for the LAC region that at the time did not have a significant aging study. He said SABE spawned other national studies, including in Ecuador and Puerto Rico, that have not been mentioned during the workshop, and raised the profile of aging in the region. In 2009, the Americas was the first WHO region to develop an action plan on aging and health, and later in 2015 will become the first WHO region to approve, at the ministerial level, an action plan on dementia. He said many of the data and studies presented in the workshop have played a role in the development of public policy in the LAC region, and additional cross-national analyses are needed to move the policy process forward.

Several participants suggested the need to train students in how to use these increasingly complex data. Luis Rosero-Bixby agreed, noting most medically trained personnel in LAC do not have the corresponding training

and ability to use such data. Enrique Vega said politicians also need training in how to understand and interpret the results.

By way of conclusion, David Weir noted the purpose of the workshop was to discuss the needs for strengthening the scientific foundations for aging research, and the possibilities for doing so. Victor Garcia directly addressed the question of data needs, and Luis Miguel Gutiérrez gave a succinct picture of the complex lives of older people. Weir stated this complexity underlies the origins studies in the HRS network and explains why these studies employ a multidisciplinary approach to the assessment of older people's lives. He also referred to the opening session of the workshop, when Eduardo Sojo commented that it is not necessary to reinvent the wheel. The HRS network has many wheels, he said, and now many good research models. Both Rebeca Wong and Fernanda Lima-Costa talked about how their respective studies in Mexico and Brazil have benefitted from the experience of the international community, and how they are now in a position to benefit other researchers interested in pushing the agenda forward.

Weir said while it may seem difficult and expensive to initiate longitudinal studies, there may be rich cross-sectional studies in some countries that have already identified participants, know their ages, and could be used as a basis for longitudinal samples. He explained the English Longitudinal Study of Ageing began by recruiting participants from the already-established English National Health Survey. He also pointed to the potential role of the international research community in helping build support for new studies, which proved useful in Brazil, India, and China.

Wong noted a group of researchers who are engaged in longitudinal studies meet every 2 years in different countries to discuss their projects. The group often tackles hard questions, such as about biomarkers, shares histories and experiences, discusses technical issues, and learns from each other. This type of information exchange affords researchers the opportunity to correct mistakes and try new approaches, she observed.

Gutiérrez suggested an important next step is to think strategically about funding. In Mexico, he said, responsible parties in the Ministry of Health and elsewhere in the government now recognize and understand the salience of the aging process. Mexico has had a program for the care of the elderly for 15 years, but the program has not had its own financing; rather, it is funded by global financing for chronic disease. What is needed is to better connect the type of research presented in the workshop with the health and caregiving costs that countries will encounter as their populations age, he urged, as more effective cost projections and potential savings projections would help persuade governments to reallocate resources.

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Appendix A

WORKSHOP AGENDA

STRENGTHENING THE SCIENTIFIC FOUNDATION FOR POLICYMAKING TO MEET THE CHALLENGES OF AGING IN LATIN AMERICA AND THE CARIBBEAN

National Academy of Medicine, Mexico
National Academy of Sciences, U.S.
National Institute on Aging, U.S.
Pan American Health Organization
National Institute of Geriatrics, Mexico
University of Michigan, U.S.
University of Texas Medical Branch, U.S.
Inter-American Development Bank

May 28–29, 2015

National Academy of Medicine, Mexico City

Day One—May 28

8:30–9:00 am **REGISTRATION**

9:00–9:20 am

1. WELCOME AND OPENING REMARKS

Session chair: Rebeca Wong, *University of Texas Medical Branch,*

Workshop Cochair

- Enrique Graue Wiechers, *President, National Academy of Medicine, Mexico*
- Georgeanne Patmios, *National Institute on Aging, U.S.*
- Luis Miguel Gutiérrez, *National Academy of Medicine/National Institute of Geriatrics, Mexico*

- Eduardo Sojo Garza-Aldape, *President, National Institute of Statistics and Geography, Mexico*

9:30–11:00 am

2. AGING IN LATIN AMERICA IN GLOBAL PERSPECTIVE

Session chair: David Weir, *University of Michigan*, Workshop Cochair

- Pace of aging in Latin America and variation by socioeconomic status [15 min]—Jorge Bravo, *United Nations Population Division*¹
- Health and health care challenges with population aging [15 min]—Eileen Crimmins, *University of Southern California*
- Data needs for aging in Latin America [15 min]—Victor Garcia Vilchis, *Instituto Nacional de Estadística y Geografía, Mexico*
- The Health and Retirement Study (HRS) global network—Opportunities for Latin America and Caribbean [15 min]—James Smith, *RAND, U.S.*
- Discussion (15 min)

11:00–11:15 am **BREAK**

11:15 am–12:45 pm

3. HEALTH STATUS, DISABILITY, AND MORTALITY

Session chair: Eileen Crimmins, *University of Southern California*

- Mortality trends and differentials [15 min]—Luis Rosero-Bixby, *Universidad de Costa Rica and Costa Rica: Estudio de Longevidad y Envejecimiento Saludable (CRELES)*
- Trajectories of health from the Mexican Health and Aging Study (MHAS/ENASEM) [15 min]—Rebeca Wong, *University of Texas Medical Branch*
- Health inequalities and the design of the ELSI-Brazil study [15 min]—Maria Fernanda Lima-Costa, *Oswaldo Cruz Foundation and Estudo Longitudinal das Condições de Saúde e Bem-Estar da População Idosa (ELSI-Brazil)*
- Cognitive aging [15 min]—Carlos Cano, *Universidad Javeriana, Colombia*
- Discussion (15 min)

¹Dr. Bravo was unable to attend the workshop.

12:45–2:00 pm **LUNCH**

2:00–3:30 pm

4. HEALTH CARE SYSTEMS, ACCESS AND QUALITY

Session chair: William Dow, *University of California, Berkeley*

- Building the evidence base for health reform [15 min]—Rafael Lozano, *Institute for Health Metrics and Evaluation* and *National Academy of Medicine, Mexico*
- Depression and health care services [15 min]—Carmen Garcia-Peña, *Instituto Mexicano del Seguro Social* and *National Academy of Medicine, Mexico*
- Oral health in the Health, Well-Being and Aging Study (SABE) in Colombia [15 min]—Maria Teresa Calzada, *Universidad del Valle, Colombia*
- Adapting health care systems to serve the needs of the frail elderly [15 min]—Luis Miguel Gutiérrez, *National Academy of Medicine/ National Institute of Geriatrics, Mexico*
- Discussion (15 min)

3:30–3:45 pm **BREAK**

3:45–5:15 pm

5. LABOR MARKET PARTICIPATION/RETIREMENT

Session chair: Olivia Mitchell, *University of Pennsylvania*

- Retirement preparation in the Longitudinal Study of Social Protection [15 min]—David Bravo, *Pontificia Universidad Catolica de Chile*
- Noncontributory pensions [15 min]—Emma Aguila, *University of Southern California*
- Pension systems [15 min]—Roberto Ham Chande, *Colegio de la Frontera Norte, Mexico*
- Pensions in the Peru Survey of Health and Wellbeing of the Elderly [15 min]—Norma Vidal Añaños, *Ministry of Development and Social Inclusion, Peru*²
- Discussion (15 min)

²Dr. Vidal Añaños was unable to attend the workshop.

6:30 PM—DINNER (STEERING COMMITTEE AND INVITED SPEAKERS)*Day Two—MAY 29*8:30–9:00 am **REGISTRATION**

9:00–10:30 am

6. FAMILY AND SOCIAL TRANSFERSSession chair: Jere Behrman, *University of Pennsylvania*

- Fertility decline and changing living arrangements [15 min]—Paulo Saad, *United Nations Economic Commission for Latin America and the Caribbean*
- Social mobility across generations in Latin America [15 min]—Florescia Torche, *New York University*
- Rapid social changes and implications for aging [15 min]—Cassio Turra, *Federal University of Minas Gerais, Brazil*
- National Transfer Accounts [15 min]—Jim Miller, *United Nations Economic Commission for Latin America and the Caribbean*
- Discussion (15 min)

10:30–10:45 am **BREAK**

10:45–11:45 am

7. RESILIENCE AND ASPECTS OF WELL-BEING IN OLDER AGESession chair: Cesar de Oliveira, *University College London*

- Resilience and aging [15 min]—Rafael Samper-Ternent, *Universidad Javeriana, Colombia*
- Nutrition and aging [15 min]—Cecilia Albala, *Universidad de Chile*
- Biomarkers and undiagnosed disease [15 min]—Soham Al-Snih, *University of Texas Medical Branch*
- Discussion (15 min)

11:45 am–1:15 pm **LUNCH**

1:15–2:30 pm

8. ROUNDTABLE ON OPPORTUNITIES TO GENERATE EVIDENCE ON OLDER ADULTS

Session chair: Enrique Vega, *Pan American Health Organization*

- MHAS/ENASEM (Mexico) [5 min]–Rebeca Wong
- CRELES (Costa Rica) [5 min]–Will Dow
- ELSI (Brazil) [5 min]–Maria Fernanda Lima-Costa and/or Cesar de Oliveira
- The SAGE experience [5 min]–Somnath Chatterji, *World Health Organization*
- Social Protection Studies [5 min]–David Bravo
- SABE Colombia [5 min]–Maria Teresa Calzada
- Discussion (30 min)

2:30–3:00 pm

9. MOVING THE RESEARCH AGENDA FORWARD

Session chairs: David Weir, Rebeca Wong, Luis Miguel Gutiérrez

- Wrap-up and next steps

3:00 pm **ADJOURN**

