

Overview

Noncommunicable diseases (NCDs) are among the major health and development challenges of our time. Every year, about 41 million people die due to NCDs. This makes up about 74 percent of all deaths globally, the majority of which are in low- and middle-income countries (LMICs).¹ Countless more people live with NCDs every day. Yet, NCDs are largely treatable and preventable. The risk of developing NCDs and deaths from them can both be lowered with appropriate attention to prevention and treatment.

However, weak health systems and limited access to affordable care and information, especially in LMICs, contribute to lapses in seeking and receiving appropriate and timely care. While individual responsibility plays an important role in health maintenance, addressing NCDs requires a concerted effort on the part of societies as a whole to invest in better health and well-being of individuals across the life course, that is, in healthy longevity. Reduced NCDs can boost human capital especially when coupled with education, skills development, and labor market opportunities.

Strengthening and protecting human capital is essential for countries' overall welfare and to build inclusive, secure societies. Health, at both the individual and societal levels, is a key contributor to human well-being and a key objective of the development process, over and above its impact on outcomes such as productivity and growth. Prioritizing the health and well-being of individuals throughout their lives, from cradle to old age, not only improves health outcomes but also enhances other aspects of human capital—education, skills, and ability to participate in the labor market.

However, the links between human capital and better health through a reduced burden of NCDs across the life course—from childhood to adulthood—need to be more explicitly explored and articulated. Filling this analytic gap is a fundamental motivation for the Healthy Longevity Initiative (HLI).

This compendium is a compilation of 18 chapters, each exploring a different but related topic in the nexus of NCDs, human capital, and productivity. It is based on a series of analytical work taken up

by the World Bank to support the HLI—a collaborative effort between the World Bank, the University of Toronto, and key academic and development partners including the Harvard University and the University of Washington. The HLI presents one of a growing set of efforts to increase the urgency of policy response to NCDs across the world.

Chapter 1. Enhancing Human Capital and Boosting Productivity by Tackling Non-Communicable Diseases: Results of a Research Initiative

Chapter 1 summarizes the proceedings of a technical workshop as part of the project, 'Non-Communicable Diseases and Human Capital Research Initiative'. The project, which was the precursor to the HLI, was led by the World Bank Human Capital Project in partnership with the University of Toronto. It focused on the impact of NCDs on the global economic burden of disease and selected aspects of human capital such as educational outcomes, adult survival, and productivity. The main messages from this research are as follows:

- Rising NCD burdens threaten countries' human capital, a critical determinant of their economic success.
- By tackling NCDs with proven, cost-effective interventions, countries can reap substantial economic benefits, with some quick wins (within 1–5 years). Gains will come mainly from higher effective labor supply and improved productivity.
- Tackling NCDs in children and their caregivers may drive longer-term gains in human capital and productivity by improving children's educational outcomes.
- Firms across multiple industries could reap productivity benefits from action on NCDs.
- Strong, country-owned measurement systems are crucial for NCD success and human capital benefits.

1 WHO (World Health Organization). 2023. "Fact Sheet: Noncommunicable Diseases." <https://www.who.int/news-room/fact-sheets/detail/noncommunicable-diseases>.

The evidence presented supports ramping up investments in NCD prevention and control that have the potential for countries to bolster their human capital and higher productivity in relatively short time frames. Moreover, the growing appreciation of the importance of human capital creates a window of opportunity for collaboration between the World Bank, the World Health Organization (WHO), and other partners to help countries enhance their human capital by tackling NCDs. These themes are further developed across the chapters in the compendium.

Chapter 2. Towards a Framework for Impact Pathways between NCDs, Human Capital and Healthy Longevity, Economic and Wellbeing Outcomes

This chapter lays out the pathways between NCDs, human capital, and the end outcomes of healthy longevity, inclusive growth, and well-being. It summarizes the substantial literature on the impacts of health and longevity on growth, using macroeconomic, growth accounting, and microeconomic approaches.

Research shows that human capital accounts for almost two-thirds of global wealth and on average accounts for an increasing share of national wealth as countries grow richer. While there is debate on the extent and causality, analyses of macro-level impacts of NCDs point to a negative relationship between NCD prevalence and economic growth and conversely a positive contribution to growth from implementing a basic package of interventions for the ‘big four’ NCDs (cardiovascular diseases [CVDs], diabetes, respiratory diseases, and cancers) and mental health conditions. Moreover, the impact of increased longevity on human capital accumulation and growth differs according to the stage of demographic transition. There are three channels through which NCDs affect inclusive growth:

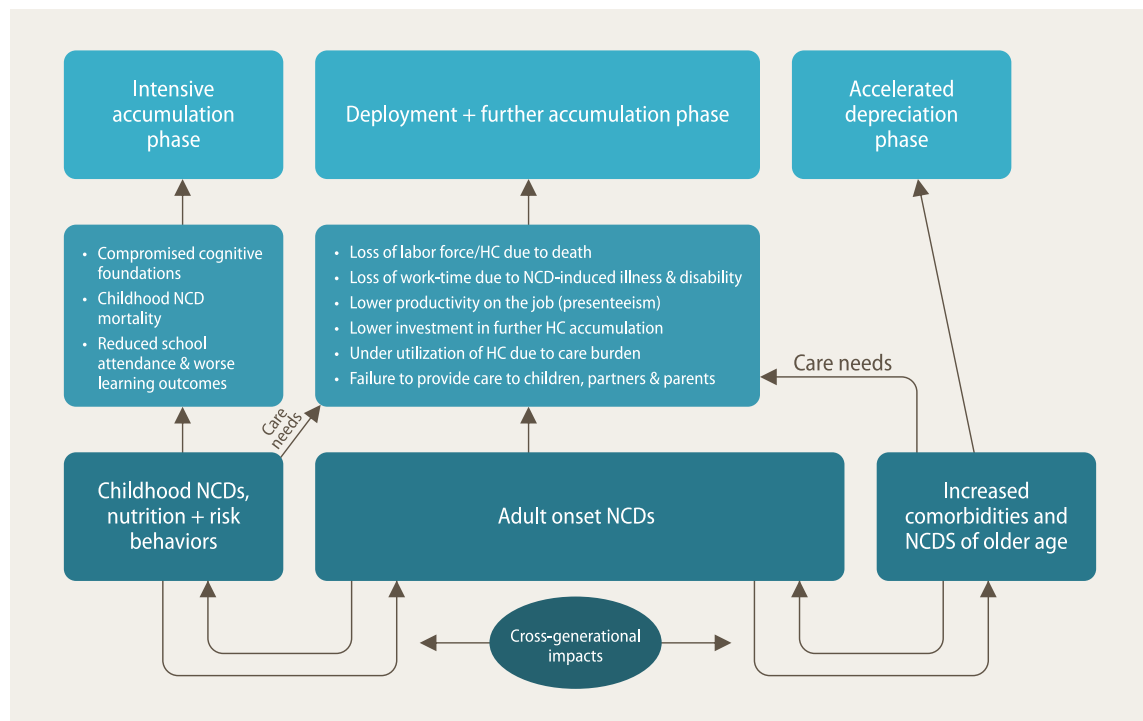
- **The macroeconomic/savings channel.** Despite much debate and the challenges related to accounting for non-health factors such as institutions and geography, a growing body of empirical work, including from developing countries, supports a negative relationship between NCD prevalence and economic growth.
- **The fiscal channel.** NCDs also have clear fiscal impacts on the expenditure and revenue sides. Higher NCD incidence increases the need for public spending on health care services and long-term care

(LTC), which can lead to budget deficits and crowding out of private sector investment. On the revenue side, to the extent that NCDs compromise workforce participation or productivity at work (from higher absenteeism), they will reduce revenues from labor income and corporate tax revenues.

- **The human capital channel.** Growing evidence suggests that the negative impacts of NCDs on human capital occur across the life course. NCDs compromise both the entire trajectory of human capital and returns to human capital: its formation and ongoing accumulation, its deployment in terms of both duration and productive use, and its protection and preservation in the face of shocks and late life decline.

The human capital channel can be further delineated across the life course (figure 1) specifically as follows:

- In early life, there is strong evidence that NCDs and poor nutrition compromise cognitive foundations, school attendance, and learning outcomes, all affecting labor market outcomes in adult life. There are also immediate effects from the growing burden of childhood NCD mortality and morbidity.
- During the stage of human capital deployment, NCDs can compromise returns to human capital and its further accumulation, and accelerate depreciation through several mechanisms: (a) total loss of labor supply as a result of premature mortality (over 40 percent of NCD deaths occur before age 70); (b) reduced returns to human capital from NCD-based morbidity and disability, for example, because of unemployment, early withdrawal, absenteeism, or ‘presenteeism’ (being at work but less productive); and (c) failure to invest in further accumulation of human capital over adult life, for example, due to reduction in on-the-job learning and behavioral impacts on subsequent efforts to accumulate human capital.
- In the later stages of life, NCDs accelerate the depreciation of human capital, and the NCDs of older parents contribute to the underutilization of human capital of their adult children in the labor market, particularly of women, due to care demands. There may be a ripple effect also to grandchildren to the extent that NCDs in older ages constrain the caring contributions of grandparents.

FIGURE 1 Impact Channels between NCDs and Inclusive Growth

Source: Original figure for this publication.
Note: HC = Human capital.

Health outcomes are also affected by key dimensions of equity such as poverty or wealth, gender, and overall well-being. For example, evidence points to a higher incidence of cancer, CVD, and multiple NCDs in households with lower socio-economic status (SES) in LMICs. Such households have a significantly higher prevalence of NCD risk factors such as tobacco and alcohol use, and poorer nutrition compared to households with higher SES. At the same time, differences in availability and coverage of financial protection and the cumulative effects of catastrophic health spending over the life course contribute to variations in outcomes. A growing body of evidence that uses the WHO's multidimensional quality-of-life measure also finds negative associations between a range of NCDs and quality of life, and that better health is strongly associated with higher levels of happiness.

While NCDs dominate the disease burden globally for both genders (accounting for two-thirds of female deaths annually), there are differences in the gender-specific patterns of NCD prevalence and risk factors. For example, male smoking rates (and tobacco-attributable deaths) are substantially higher than those in women globally, while women disproportionately suffer and die from Alzheimer's and other

dementias. Moreover, the burden of informal care for those with serious NCDs falls disproportionately on women—almost 50 percent of women outside the labor market in middle-income countries (MICs) and over 33 percent in low-income countries (LICs) cite unpaid care duties as the main reason for dropping out of the labor markets. Based on data from 53 countries across income levels, the International Labour Organization (ILO) estimates that women's unpaid care work would amount to 6.6 percent of global gross domestic product. These themes are explored further in chapters 8–11 in the compendium.

Consequently, policy responses to prevent and control NCDs also need to take a life course approach. Some of the major policy areas of interest include nutrition, public health, and health care services, where the economic and social returns to investments are high, and affordable packages of essential NCD interventions are available. While cost-effectiveness is a key consideration for developing countries in prioritizing within limited budgets, it is also important to integrate other considerations such as equity and financial protection, as well as feasibility of implementation given the diverse states of health systems. Outside of health, attention to taxation policies to reduce risky behaviors (most notably tobacco use) while rais-

ing revenue, policies and interventions that improve road safety, and expanding coverage of social security systems hold promise as policies to mitigate and manage NCDs and their social and economic impact.

Chapter 3. The Economic Value of Avoidable Mortality

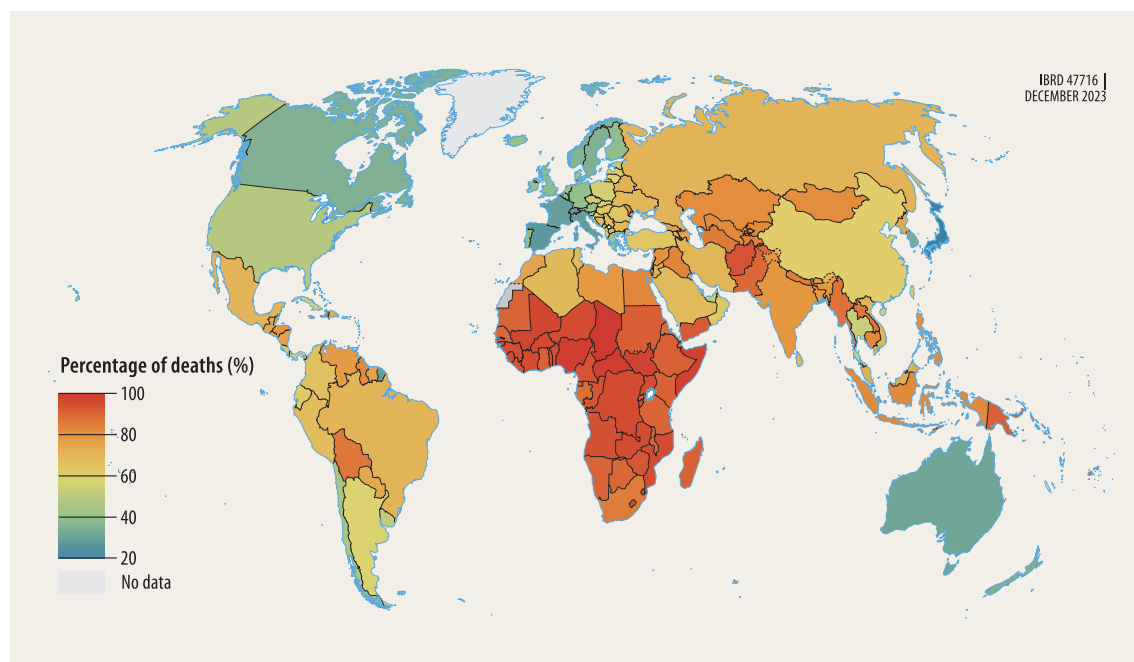
This chapter addresses an important question—what is the benefit of reducing mortality from NCDs? It estimates the economic value of avoidable mortality by world region, sex, and age, between 2000 and 2019, with projection to 2050. The chapter introduces two novel methods for defining and estimating the economic value of avoidable mortality.

First, a frontier approach is used to compute avoidable mortality by identifying the lowest observed or projected mortality rate. This is established as the frontier for each age group and year, with avoidable mortality defined as the difference between the frontier and current mortality levels for each country by age, sex, and year. Importantly, the frontier lowest rates are seen in many countries and not just in select high-income countries (HICs) like Japan and Repub-

lic of Korea. Second, the economic value of avoidable mortality in a given year is defined as the proportion of annual income one is willing to forego to live that year at the frontier survival probabilities. Then empirical estimates of the value per statistical life are calculated accounting for the effect of large risk changes by using a logarithmic function to model a nonlinear trade-off relationship between income and risk reduction.

Figure 2 presents the proportion of avoidable mortality globally for 2019. Results show that 69 percent, or 40 million deaths globally, were avoidable. HICs had the lowest (42 percent) and Sub-Saharan Africa had the highest (91 percent) levels of avoidable deaths (in part due to persisting high and avoidable burdens from malaria and other infections in the continent). Globally, more avoidable deaths occurred in older adults than children, adolescents, or younger adults. The economic value of avoidable mortality globally in 2019 was 23 percent of the annual income, with China having the lowest value at 19 percent and Sub-Saharan Africa having the highest value at 34 percent. The economic value is approximately 37 percent higher for males than females, reflecting the higher avoidable mortality rates of males.

FIGURE 2 Avoidable Mortality as a Percentage of Total Mortality, 2019



Source: Original figure for the HLI.

These findings have implications for policy and planning. They highlight the economic gains from reducing avoidable mortality in adults. As govern-

ments worldwide engage in policy dialogues on how and how much to invest in improving population health, this analysis provides supportive evidence

on the high economic value placed on improving health, even when considering resource constraints.

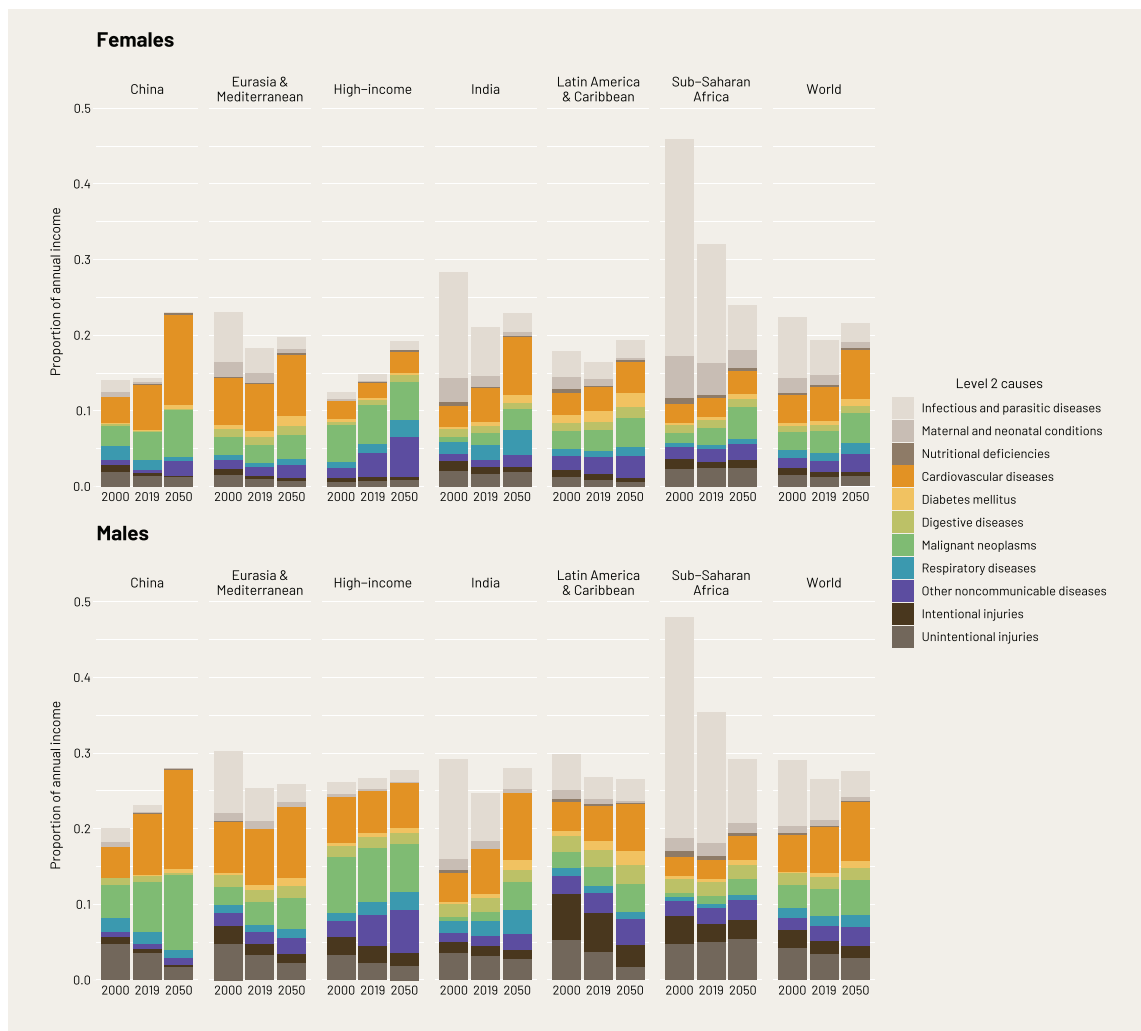
Chapter 4. The Economic Value Associated with Avoidable Mortality: A Systematic Assessment by Cause of Death across World Regions

Chapter 4 builds on the analysis in chapter 3 by estimating the economic value of avoidable mortality by major disease groups including key NCDs and injuries for six large world regions: China, India, HICs, Eurasia and the Mediterranean, Latin America and the Caribbean, and Sub-Saharan Africa.

Using data from the WHO’s Global Health Esti-

mates for 2000–2019 for an exhaustive set of 31 causes of death including major NCDs and injuries, the 2022 World Population Prospects population estimates, and the World Bank’s World Development Indicators, the chapter first quantifies avoidable mortality, that is, the difference between lowest-achieved mortality frontiers (the 10th percentile of age-specific mortality rates) and projected mortality trajectories, for each cause of death, for 2000–2050. The value of a statistical life approaches is applied to assign economic values to the estimates of avoidable mortality by cause of death, region, and calendar year. These economic values capture the percentage of income an individual would be willing to forego to live one year under the lowest possible mortality rate for a given cause of death.

FIGURE 3 Economic Values of Avoidable Mortality (as % of Annual Income) by Select Causes of Death, Region, and Sex for 2000, 2019, and 2050



Source: Original figure for the HLI.

Results show that the economic implications of controlling NCDs and injuries would be substantial, particularly for CVDs, cancers, and injuries, with some variations depending on the region and sex. The economic value associated with CVD avoidable mortality would be universally large for both females and males, with values spanning 2–8 percent of annual income (for 2019). For cancers, it would be large (for both males and females) in HICs and China, while for injuries, it would be substantial for males in Latin America and the Caribbean (intentional injuries) and males in Sub-Saharan Africa (unintentional injuries).

With rapidly aging populations, national health systems must set difficult priorities toward improving the healthy longevity of their populations. This chapter provides a systematic monetary assessment of the economic value associated with elevated NCD and injury mortality, globally and regionally, and derives an economic metric directly comparable to annual incomes (for example, gross national income), which can help countries in priority setting for the health sector as well as other sectors.

Chapter 5. Rates of Progress in Mortality Decline, 2000–2019

This chapter summarizes the data on global mortality decline and assesses the monetary cost of saving a life at different ages. Using interrupted time series, it analyzes the change in mortality rates from 2000–09 to 2010–19, by age and sex, and by country income level. Results show the following:

- Between 2000 and 2010, mortality rates declined significantly across all age groups irrespective of country income level, except among older men of ages 70–84 in LMICs.
- The rate of mortality decline in the first half of the study period (2000–09) was significantly faster for almost all country income levels than during the latter half, that is, 2010–19 for age cohorts under 70.
- For ages 70–84, the rate of decline was significantly faster during 2010–19 for men in LICs and for both men and women in MICs.

The chapter also presents data on the country-level performance on mortality decline. A further analysis of the rates of progress in cause-specific mortality, by country income level and age, from 2000 to 2019 using average annual rates of reduction (AARR)² shows the following:

- While childhood-cluster diseases (including whooping cough, diphtheria, measles, and tetanus) showed the fastest rate of decline in mortality in upper-middle-income countries (AARR of 9 percent for ages 0–14 years), progress on NCDs was much slower, with the fastest decline in respiratory diseases (AARR of 5 percent) among ages 50–69.
- The slowest progress was in tobacco-attributable cancers and breast cancer among those of ages 70 and older in LICs.
- Roughly 13.5 million deaths due to all causes could have been avoided (of which about 34 percent would have been under the age of 70) if efforts to address these had yielded similar rates of progress as observed for HIV/AIDS and tuberculosis during the same time period.

Finally, the chapter assesses the cost associated with saving a life using the concept of ‘critical income’, defined as ‘the income needed to achieve 80 percent of the global maximum life expectancy’. The analysis shows that the critical income for child survival fell from US\$1,452 to US\$800 (at 2017 purchasing power parity [PPP]) between 1992 and 2017, representing a decline of 46 percent. However, it remained relatively constant for adults of ages 15–49 but increased by 26 percent (from US\$914 to US\$1,180) for ages 50–69. At the country level, the critical income needed to save a life was the lowest for LICs and in Sub-Saharan Africa.

Technological change and policy attention through efforts such as the Millennium Development Goals have played an important role in improving survival among younger cohorts and reducing the cost of saving a life. Similar attention to addressing NCDs can yield further gains in reducing mortality and saving lives. This would require investments in research and development and global public goods, paired with expanded service deliv-

2 Calculated using standard WHO methodology.

ery, to 'bend the cost curve' for NCDs.

Chapter 6. Behavioral Aspects of Healthy Longevity

Chapter 6 examines the role of behavioral science as a policy tool for reducing NCDs. Addressing NCDs to achieve healthy longevity for an aging population has become central to global health policy goals. New policy tools are needed to effectively and efficiently tackle health and lifestyle behaviors and habits linked to the development of NCD risk factors. Behavioral science offers insights into psychological barriers, mental models, biases, and other factors that influence decision-making and habit formation. Applying these insights can support current policy efforts toward healthy longevity.

The chapter develops a framework to clarify relationships between NCD occurrence, detection, and management and behavioral determinants at the individual, community, and health systems levels, documenting frequently identified behavioral barriers at three key stages of patients' NCD trajectories. It identifies policy lessons from the behavioral science literature to address such barriers and, together with other policies, reduce NCD incidence and improve treatment effectiveness.

More and more health systems, at least in MICs and HICs, have started focusing on NCD prevention and treatment. However, providing information may not by itself be sufficient, because individuals may not act on that information due to a myriad of reasons ranging from their own assessment of the perceived need, distrust or dissatisfaction of the health system, social norms and behaviors of reference groups, and peer pressure. These obstacles can be exacerbated by system features such as complicated processes that can increase people's 'hassle perception' about engaging with the health system, health insurance, and related institutions and processes.

Behavioral interventions that aim to address the factors behind risky behaviors appear to support the reduction of NCD lifestyle risk factors. Traditional policy tools based on the rational subject model have been moderately effective in changing unhealthy behaviors. Insights from the behavioral sciences can complement these traditional tools, increasing their efficacy and impact. The behavioral science toolkit is large. No single policy tool can address the complexity of behavioral barriers across the whole journey toward healthy aging, nor should these be considered stand-alone interventions that

can operate independently of other services, health system resources, and other structural factors. Some important tools include the following:

- **Small financial incentives.** Financial incentives seem to promote healthy behaviors in the short term, but effects disappear when the incentives are removed. Combinations with other behavioral insights such as peer and framing effects tend to render lasting results.
- **Commitment contracts.** They have also been used to encourage other forward-looking behaviors such as weight loss or quitting smoking. However, results have been mixed.
- **Saliency and vividness.** They have also been found effective in highlighting the risks of unhealthy behaviors and inflecting those behaviors such as through advertising the negative effects of smoking.
- **Plan-making.** This can also make adherence more salient by focusing on the motivation factors and identifying obstacles and planning to address those that are under the individual's control. The technique has been shown to reduce drinking and smoking, improve healthy food consumption, increase physical activity, and support weight loss.
- **Reminders.** Electronic reminders are increasingly being used by the health system to address poor medication adherence and appointment attendance rates. They are especially helpful in the short run for medication adherence and have been shown to improve appointment attendance.
- **Choice architecture.** Choice architecture refers to the practice of influencing choice by 'organizing the context in which people make decisions' (Mikic 2020). Removing temptation from one's choice set or making the healthy and unhealthy options equally convenient has shown promising results for a range of behaviors, from improving healthy eating habits to suicide prevention.

While ongoing management of NCDs, mainly via medication adherence, is among the most cost-effective strategies for NCD control, policy tools to influence individual health-seeking behavior can support adherence by addressing barriers that

currently prevent individuals from entering and remaining in care, thereby improving the effectiveness of such interventions.

Chapter 7. Taxation of Harmful Products, including Tobacco, Alcohol, and Sugar-Sweetened Beverages (SSBs), and Related Topics

This chapter reviews the evidence on the effect that changes in prices and incomes have on the consumption of tobacco, alcohol, and SSBs, as a way of assessing the consumption impact of raising excise taxes. Key findings of the review include the following:

- The large and growing disease burden associated with health-damaging products poses challenges for health systems and sustainable development. Reducing the consumption of such products is key for a healthy longevity agenda.
- Taxation is one of most cost-effective tools to decrease consumption of tobacco and alcohol as well as SSBs. It is particularly effective in influencing early life consumption (for example, during adolescence or youth) that may have a permanent effect.
- Firms usually control the rate at which taxes are passed to prices, and there is consistent evidence that in most cases taxes are fully passed to prices (and often over-shifted, that is, the pass through to prices is greater than the taxes). Hence, taxes are effective at decreasing consumption.
- Excise taxes on harmful products increase economic efficiency, as they correct consumption-related externalities (that is, market prices without taxes do not reflect all costs borne by society) and internalities (that is, individuals' ignoring or not correctly considering harmful health effects to themselves when they consume these products). Hence, taxation increases individual and social welfare.
- When considering the costs to households of health care, foregone income, and premature mortality linked to the consumption of health-damaging products, taxes on these products are found to be progressive, as they save valuable resources in low-income households. Though taxation may have short-term negative financial consequenc-

es for low-income households, these are largely compensated by medium- and long-term financial benefits from better health even leaving aside the intrinsic value of better health.

- Negative effects of taxation on employment have been largely exaggerated in industry-friendly reports and mostly rest on narrow, single-market analyses. When general equilibrium approaches are considered, it is found that taxes do not destroy jobs. Often, they create jobs as fiscal revenues are spent on labor-intensive services. Similarly, the effect of tobacco taxation on illicit trade is overemphasized. Illicit trade depends on institutional weaknesses and regulatory deficiencies rather than the level of tobacco taxes.

In essence, reducing consumption of tobacco, alcohol, and SSBs and the burden of disease associated with them reduces health care costs, increases the social return on human capital, reduces human suffering, and lowers poverty, among other benefits. Taxation is one of the most cost-effective ways to reduce the consumption of harmful products and increase social welfare.

Chapter 8. Gender Gaps in Health and Well-Being of Older Adults: A Review of the Burden of NCDs and Barriers to Health Care for Women and Men

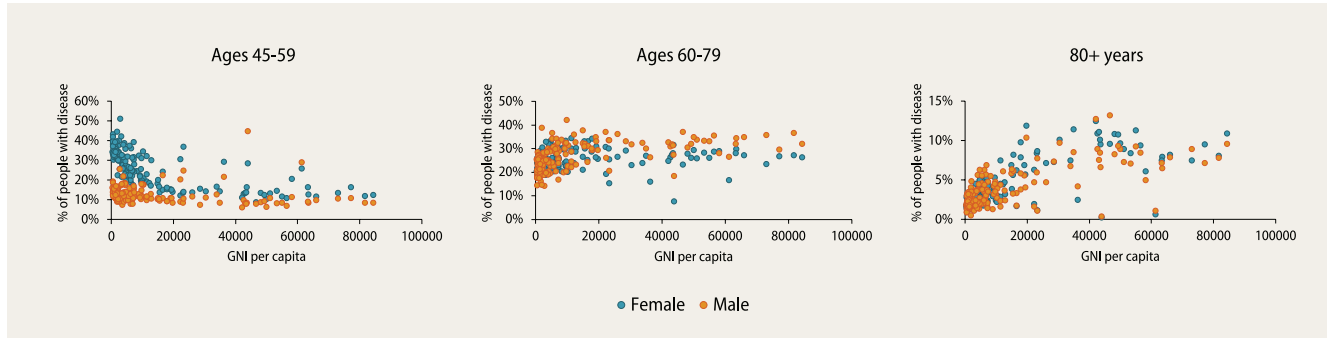
Chapter 8 examines the gender gaps in the health and well-being of older adults, focusing on the barriers in access to health care and LTC. It examines gender gaps in mortality, prevalence, and disability-adjusted life years (DALYs) for major NCDs and mental health using data from the Global Burden of Disease 2019 study for older adults in three age groups: 45–59, 60–79, and 80 and above, as well as country income data from the World Development Indicators. It also reviews the barriers to demand for health care for women (and men) particularly in LMICs and the challenges in providing health care and LTC from a gendered perspective, with special attention to caregivers, particularly women who provide informal care to older adults.

Data analysis for CVD and diabetes across countries shows that the burden of disease is similar for women and men ages 45–59, with some exceptions. For CVD, the burden of disease is higher for men in upper-middle and high income countries for ages 60–79, whereas for ages 80 and above, women

bear the greater burden. For diabetes, gender gaps begin to appear for ages 60–79, particularly LICs, and for 80 years and above, there is once again a greater burden of disease for women. Cancers present a more mixed picture with a higher prevalence

among women of ages 45–59 compared to men in the same age group. However, for older ages, the gender gap in cancer prevalence narrows in LICs but grows larger in upper-middle and high income countries, particularly affecting men of ages 60–79 (figure 4).

FIGURE 4 Prevalence of Cancers among Older Adults (%) by Sex and Gross National Income (GNI)



Source: Institute for Health Metrics and Evaluation (IHME) Global Burden of Disease (2020), World Development Indicators (2020).

Another key area of concern is mental health. Prevalence of depressive disorders is consistently higher for women compared to men for all age groups 45 and above, but mortality due to self-harm is higher among men for all age groups. The choice of method to inflict self-harm and not seeking help due to the stigma associated with mental illnesses are linked to these outcomes.

While aging signals the onset of NCDs for both women and men, their health outcomes vary. Several studies highlight higher male mortality at earlier ages due to heart disease or diabetes, particularly in HICs and MICs. On average, life expectancy at birth for women is about 5 years higher than that for men globally. However, in MICs the difference is generally about 8–10 years. Although women in these countries exhibit similar patterns of NCD prevalence, they tend to live longer and often with a lower quality of life. Women also go through menopause as they age, which takes a physical and mental toll and is linked to an increased risk of developing NCDs. Moreover, older women, especially in LICs with weaker health systems and limited financial protections, are more likely than men to have greater financial vulnerability and often limited mobility due to social norms—a direct consequence of gender gaps over the life course that affect women’s patterns of labor force participation, income opportunities, and decision-making power.

As populations age, the demand for LTC, which includes health care and assistance for performing

daily activities, grows. Evidence from aging economies, primarily high- or middle-income Organisation for Economic Co-operation and Development (OECD) countries, shows considerable diversity in the quality and accessibility of LTC services, influenced by governmental policies, social norms, and resource availability. These arrangements, encompassing family care, public institutions, private residences, and assisted-living environments, reflect different care needs.

Delivery of LTC services through the public or private sector has a significant effect on the cost of care. HICs often allocate health care costs through public funds, while LICs rely more on out-of-pocket (OOP) payments, exacerbating affordability challenges, particularly for women especially in the absence of robust social protection systems. For example, despite efforts to provide social protection for LTC across HICs, OOP expenses remain common, especially in countries that have lower national incomes and less comprehensive coverage.

While informal, family-based care may still be the norm in many LICs, not all families are able to provide appropriate support, and medical costs remain a barrier to care for the aging, particularly women. Such unmet LTC needs can have a catastrophic effect on the quality of life and chances of survival of older adults.

The increase in demand for LTC has implications for women’s employment as well. Evidence from aging economies has shown that women will

often reduce their working hours, drop out of the labor market temporarily, or retire early to provide elder care (explored further in chapters 9–11). The need for LTC also creates employment opportunities within this labor-intensive sector comprising both formal and informal caregivers. Here again women play a significant role, albeit associated with migratory labor, low wages, and stressful conditions contributing to high turnover rates, notably in regions like Europe.

The chapter points out key policy and programmatic areas for intervention to reduce gender gaps in health care and LTC for aging populations and caregivers.

Chapter 9. Gendered Responsibilities, Elderly Care, and Labor Supply: Evidence from Four Middle-Income Countries

Chapter 9 explores the relationship between providing care for older parents or parents-in-law and labor supply among middle-aged men and women of ages 40–59 in four countries: Colombia, Indonesia, Poland, and Arab Republic of Egypt.

Much of the responsibility for informal care is often shouldered by women. Time-use surveys from 64 countries show that 76 percent of the total time spent on unpaid care work is by women. This is three times more than that of men. Caregivers are also likely to be in their prime working years, which can affect their participation in the economy and income potential. According to one global estimate, 647 million working-age individuals are outside of the labor force due to family responsibilities and 606 million (94 percent) of them are women.

Across the four countries studied in this chapter, an examination of socioeconomic characteristics shows that less-educated women are more likely to provide care to an elderly parent, likely due to the greater opportunity cost of leaving high-paying jobs by other family members. Older women are more likely to provide care to their parents, but this relationship is not significant for men. Being married reduces the likelihood of providing parental care for both men and women. However, the number of children ages 0–18 is associated with an increase in the propensity of men providing parental care.

While in all four countries, men are more likely than women to live with their older parents, women bear the majority of the responsibility to provide care for their parents. In general, women are at least twice as likely as men to provide care to

their older parents. Indonesia has the largest proportion of women who provide LTC to their parents, while Poland has the smallest proportion of women providing such care. In addition, women in Indonesia spend a significantly longer time caring for their parents. On the other hand, in Colombia men spend a slightly longer time than women on care responsibilities for their parents.

In Colombia and Poland, both men and women who provide parental care are significantly less likely to be employed. In Indonesia, while there is no overall change in the extensive range of labor supply for either gender, there is a significant decline in formal employment among both men and women who provide care. However, while men transition from formal to informal employment when they provide care for their parents, women are more likely to drop out of the workforce.

Overall, the analysis finds that providing care to older parents is associated with significant reduction in the probability of employment, weekly hours worked, and annual earnings. This decline is significantly larger among women than men and among intensive caregivers, those who provide care for more than 10 hours per week. The analysis shows that LTC is associated with a 6 percentage point gender employment gap and a 32 percent gender earnings gap to women's disadvantage.

There is also substantial heterogeneity across the four countries, with the largest significant declines in employment in Poland and Colombia for both women and men. In Indonesia, men who provide care experience a large decline in work hours and annual earnings, driven by their transition to casual employment, while in Egypt, labor supply for men and women was not affected by the presence of disabled parents or parents-in-law in the household.

Although the evidence presented in this chapter is not causal, these results can contribute to future policy dialogue to reduce the gender imbalance in LTC burdens, particularly in rapidly aging regions where the gender gap in labor market participation is large.

Chapter 10. Health Care and LTC Needs in a Context of Rapid Population Aging

This chapter explores key challenges in health care and LTC as populations age and provides examples of how countries are responding to them. It was originally developed as a background report for the Independent Evaluation Group evaluation 'World

Bank Support to Aging Countries' and adapted for the HLL. The chapter focuses on developing countries that are aging fast and where anticipation and action are especially important. It documents health care experiences aimed at increasing coverage, adapting systems to new epidemiological profiles, focusing on the prevention of chronic diseases, and promoting healthy aging and discusses mental health policies, a comparatively overlooked area until recently.

The evidence presented highlights the slow and uneven progress in addressing LTC needs of functionally dependent older adults, particularly in developing countries. The scope and depth of the policies vary, and in some cases, little is known about their actual implementation. The role of the government in providing and regulating LTC services becomes crucial given changes in social norms and the lack of affordable and high-quality private services in many settings.

Addressing the gaps in LTC policies and programs is critical for meeting the growing care needs of older persons. There is a need for holistic strategies that focus on strengthening health care and LTC systems. This requires increasing coordination and integration between the social care and health care sectors, given the paramount importance of such integration both to achieve a continuum of care for the older person and to obtain efficiency gains. Strengthening primary and community care is key to achieving these goals while containing costs.

There is also a need for renewed focus on building capacity of human resources that work with older persons, both in the health care and the LTC sectors. This is a priority, given that skilled human resources are an important determinant of the quality of care that older people receive.

Besides being accessible and affordable, LTC services should be person-centered encouraging, whenever possible, the provision of home care services (aging in place). A person-centered model is crucial for adequate management of chronic diseases, given the high prevalence of comorbidities. For example, aging in place has been shown to provide the best results in terms of older people's mental and physical health and to be cost-effective for governments.

Finally, to solve the challenges brought by population aging, it is also important to take a life course approach. How people age is, to a large extent, determined by their health earlier in life and the choices they made when young. The range of policies should also promote healthy lifestyles, like physical activity and healthy eating, throughout the entire life course.

Chapter 11. Demand for and Supply of Long-Term Care for Older Persons in Low- and Middle-Income Countries

Chapter 11 examines the demand for and the current landscape of supply of LTC services in six MICs: China, India, Malaysia, Mexico, Poland, and Romania. With rapid population aging, especially in LMICs, over the next few decades, the currently predominant model of family-based elder care will not be sufficient to meet the escalating demand for LTC (which covers both medical care and nonmedical services and support for older adults).

The demand-side assessment is based on the analysis of individual-level data sets that are part of the International Network of Health and Retirement Studies focusing on the measurement of activities of daily living (ADL) and instrumental activities of daily life (IADL) among those 65 years and older. The supply-side evaluation is a synthesis of findings from a review of relevant literature for the past 22 years (2000–2022), which also covers other countries. It encompasses Asia (where data are available), Central and South America, Southern Europe and Middle East, and Sub-Saharan Africa.

The demand-side analysis finds differences across countries in terms of difficulty performing ADLs and IADLs. Individuals' SES and gender are correlated with difficulty in performing ADLs or IADLs. Overall lower education is associated with greater difficulty in performing ADLs with country variations. For example, in India, there is a 5–6 percentage point difference between those with secondary and lower or no education, while in Poland and Romania, the probability of having an ADL difficulty is about 10 percentage points lower for individuals with secondary education compared to those with a primary education.

In China, India, Malaysia, and Mexico, women were about 7–9 percentage points more likely than men to experience at least one ADL difficulty. In contrast, in Poland, men were 6 percentage points more likely than women to experience difficulty with an ADL.

Age stands out as one of the most important predictors of needing help with ADL or IADL. For example, those of ages 80 and over were more likely to experience difficulty with IADL in all countries compared to those of ages 65–79 years.

However, the availability of formal LTC is limited, and familial (or informal) care remains the primary form of care for older persons, albeit with

variations across regions and countries. In some countries, particularly in the Middle East, cultural norms emphasize familial care, particularly by women. Often there is a lack of regulatory frameworks and limited public funding. While private sector LTC services are increasing, these are generally expensive and clustered around urban areas.

The chapter recommends designing a hybrid system of informal and formal LTC services for LMICs; engaging the private sector in developing LTC services, markets, and delivery systems in LMICs; strengthening government stewardship for clear guidance on rules of engagement, quality assurance, and regulatory capacity; establishing a systematic approach to public LTC financing, ideally following a broad-based social insurance model to improve affordability of services; and, drawing on the experiences of HICs, considering multipronged strategies to build and strengthen the LTC workforce and to support family caregivers in LMICs.

There is no ideal LTC system that works in all countries, but policy makers in LMICs can learn from the LTC systems in HICs. The WHO recommends an integrated continuum of LTC framework that supports person-centered, primary health care-driven, and integrated delivery systems. The care continuum should also include palliative care and end-of-life care. At present, such integrated LTC service provision and delivery models largely remain a concept in most LMICs. Nevertheless, the growing knowledge base on international LTC research and cross-country learning can help countries innovate and adapt best practices.

Chapter 12. Exploring the Labour Market Outcomes of the Risk Factors for Non-communicable Diseases: A Systematic Review

Chapter 12 presents a review of the associations between labor market outcomes and major risk factors for NCDs (smoking and heavy alcohol consumption), key metabolic changes due to the risk factors (overweight and obesity, hypertension, and type 2 diabetes), and major depressive disorders. It also examines gender differences across these dimensions.

The chapter is based on a systematic review of cohort and longitudinal studies before July 2022 to establish causality between exposures and outcomes in peer-reviewed literature. The search parameters for resulted in 109 studies that were eligible for the review. All studies were published in

English. The majority (96 percent) of the studies were conducted in HICs with 63 percent from Europe and Central Asia.

High body-mass index (BMI) was the most frequently reported exposure (reported by 46 percent of the studies), while income was the most studied outcome (reported by 33 percent of studies). Of the studies, 77 percent reported significant ($p < 0.05$) adverse associations between the exposures and outcomes.

All of the studies included in this review that looked at plausible causal relationships between NCD risk factors and labor market outcomes were from HICs and UMICs (USA, northern European countries, and Republic of Korea). The main finding of these studies is that individuals with obesity, diabetes, hypertension, depressive disorders, excessive alcohol use, and cigarette use are more likely to have lower rates of employment, lower income, and higher rates of sickness absence and disability pension.

Chapter 13. Productive Longevity: What Can Work in Low- and Middle-Income Countries?

This chapter focuses on labor market characteristics and related policies that can address the key constraints to productive longevity in LMICs. By 2050, one in six persons globally will be at least 65 years of age, with nearly four out of five living in LMICs. Changing demographics with larger cohorts of older populations will likely require higher public and private expenditures for health care and LTC services. There is a need for policies that can sustain welfare levels and ensure that welfare is equitably distributed across generations and socioeconomic groups.

Labor market policies that help extend productive working lives and increase the labor force participation and productivity of older workers—‘productive longevity’—are part of this important agenda. Several stylized facts about older workers have a bearing on policy decisions:

- Old-age labor force participation is generally lower, the higher a country’s average income level. In the average LIC, more than half of the 65+ population is active in the labor market.
- Gender gaps among mature workers appear more important for MICs than HICs, with greater employment gaps and women’s earlier exit from the labor force. In LICs, gender gaps are smaller—the

poorer the country, the higher the chances that women will also work into old age.

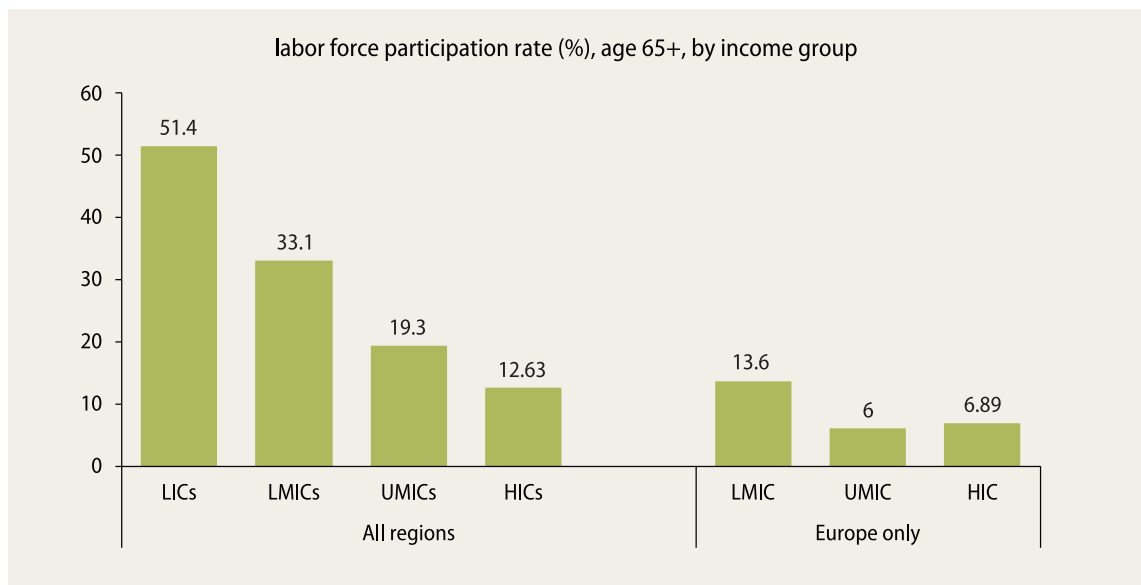
- Lacking social protection, many mature workers in LMICs continue working to secure their livelihoods.
- Better-off workers are also considering continuing working later in life, whether to top up retirement income or for other benefits, such as social connections.
- Old-age labor force participation and education interact differently across countries. While in HICs, people with higher education may remain in the work force, in LICs, those with higher education are more likely to retire early because they are less likely to be financially constrained.
- Globally, self-employment is more common among older workers than other age groups, with the highest rate of self-employment among the 55–64 age group.
- In advanced economies, the labor market partic-

ipation of older workers has increased in the past few decades. However, the COVID-19 pandemic has resulted in a significant withdrawal of older workers from the labor market.

- The changing nature of work may be contributing to more age-friendly jobs. Technology is enabling automation of many tasks, but it also raises the demand for skills that are (still) complementary to technology, such as creativity, problem solving, and socio-emotional competencies.

Policies that support older adults remaining healthy, skilled, and economically active have positive impacts across generations. The experience from HICs and some MICs shows that the cost of inadequate solutions can be substantial. Unsustainable pension systems or insufficient attention to skills development for older generations have long-term repercussions. Research on HICs also shows that opportunities for voluntary part-time paid work or volunteering activities can contribute to strengthening the physical and mental health at older ages, including for those over 80 years. LICs with less-developed systems can learn from these experiences.

FIGURE 5 Labor Force Participation Rate for Ages 65+, by Country Income Group



Source: Estimates based on Staudinger et al. 2016³.
Note: Refers to 2013 data.

3 Staudinger, U.M., et al. 2016. A Global View on the Effects of Work on Health in Later Life. *Gerontologist*, 56(S2): 281–292.

Given high informality and weak enforcement in LMICs, reforms in the formal sector policies, regulations, or taxation will only reach a small segment of workers compared to HICs. In such dual labor markets, policy reforms will also need to examine options to avert old-age poverty for those in informal markets. This would need to center on strengthening human capital with health interventions and strategic, demand-led skills development; supporting the businesses operated by mature workers; and providing social safety nets.

Even with constraints, countries can work to identify ‘win-win’ policies that benefit all generations. For example, providing LTC for the elderly and childcare, thus alleviating the care burden, can stimulate labor market participation and the move to more productive work in both older and younger workers, in particular women. Facilitating access to work, for example, with safer transportation systems, will have benefits for vulnerable groups in general. Looking in detail at how gender, skills, location, and other factors affect productive longevity in different settings will be essential to develop adequate policies.

This chapter presents a first attempt at highlighting policy areas and mapping out the associated evidence at an aggregate level. Productive longevity does not affect all groups similarly, and a more nuanced analysis is needed. More evidence is needed on what works for productive longevity. Most evidence for what works is based on HICs, which have faced aging pressures for a longer time. Even in these countries, however, there is scope for further research, es-

pecially as the evidence is often mixed, pointing to the challenges associated with this policy agenda.

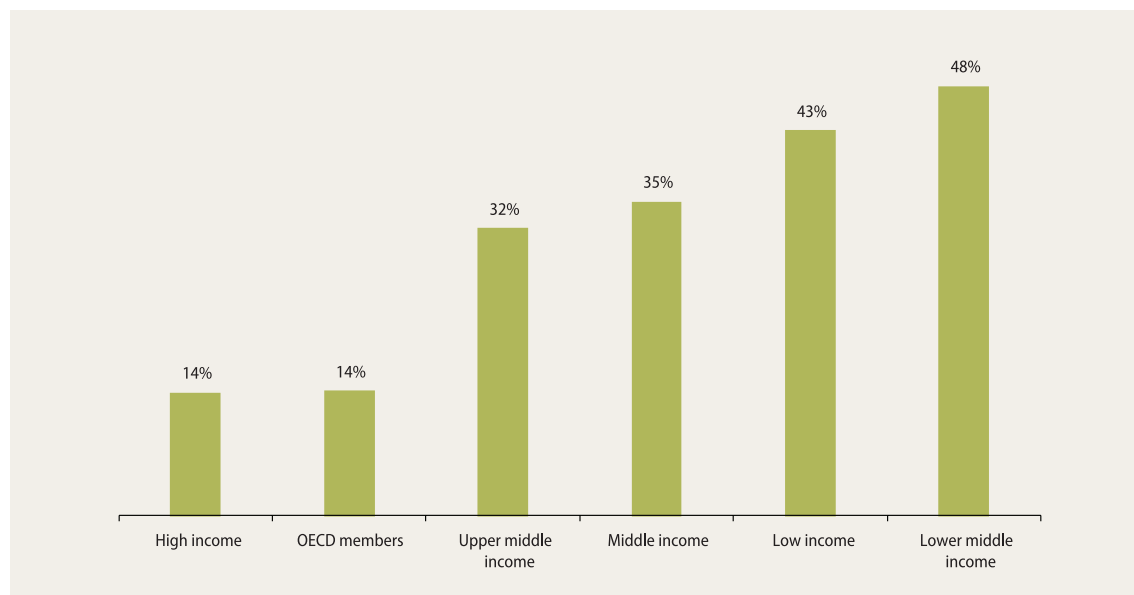
Chapter 14. Adequacy of Pensions and Access to Health Care: Maintaining Human Capital during Old Age

Chapter 14 discusses the adequacy of pensions for health care in old age, particularly for LMICs. Maintaining human capital during old age requires access to affordable quality health care as well as adequate pensions to provide financial coverage necessary to afford this care. Yet, there is a lack of adequate social protection in most countries, particularly for informal workers, who make up large proportions of working adults in LMICs.

An examination of OOP payments by households globally shows that (a) households with the elderly have 1.3 percentage points higher OOP payments health expenditure compared to households without the elderly; (b) lower-income households with the elderly have a 16 percent higher burden of OOP on average compared to higher-income households with the elderly; and (c) lower-income households are more likely to be pushed below the poverty line (US\$3.2 per day) due to OOP health spending (World Bank Atlas of Social Protection Indicators of Resilience and Equity [ASPIRE] data).

While overall OOP payments are the highest in LMICs (figure 6), impoverishment due to OOP spending occurs even in countries where the entire population is officially covered by a health insurance scheme or by national or subnational health services.

FIGURE 6 OOP Expenditure (% of Current Health Expenditure)



Even though countries with universal quality health care may be able to ensure a minimum standard of living for the elderly at a lower benefit level (which may not always be sufficient), in countries where the elderly face high OOP health expenses, pensions may need to be higher to achieve that same minimum living standard.

Determining what level of pensions is ‘adequate’, what constitutes a ‘minimum level of protection’, and who should be eligible are the biggest design challenges today. Constrained fiscal space, multiple competing development objectives, and the growing number of older people due to demographic aging generally means that developing countries would need to afford to provide either a lower benefit to a larger share of the elderly population or a higher benefit to a more limited share of the elderly population.

While there can be different approaches to improving coverage, many countries, including LICs, have introduced noncontributory mechanisms to cover the informal sector and the self-employed. However, this also has its limitations. Fiscal constraints will limit both the size of this kind of pension and the income and age to be eligible to receive the old-age benefit. Another major challenge is ensuring that programs remain affordable over time, given population aging and the potential for discretionary increases in the benefit amounts.

The chapter concludes that including the costs of access to quality health care in the definition of ‘adequate’ pensions does not necessarily imply that increased pensions are preferable to addressing the deficiencies of the health system. It may just reflect the additional financial needs pensioners will face if access to universal health care (UHC) of good quality is not granted. Improving this access is, no doubt, a more efficient and permanent solution, but it may take longer to implement.

Chapter 15. Priority Setting for NCD Control and Health System Investments

Chapter 15 focuses on prioritizing health interventions for NCD control. It builds on the work of the NCD Countdown Collaborators and shares a set of modified recommendations from the *Disease Con-*

trol Priorities Project, specifically, the third edition (DCP3), published between 2015 and 2018 (Jamison et al. 2018⁴). This chapter takes a broader view of NCDs than the Countdown report and considers any DCP3 intervention that can reduce NCD mortality, including surgical care and mental health care.

Priority setting starts with an assessment of cost-effectiveness. The following three additional criteria for identifying high-priority health sector interventions for NCDs are also considered: equity, financial risk protection, and implementation feasibility. Data show considerable variation in intervention cost-effectiveness across health systems and underscore the importance of local analysis.

Overall, the cost and impact of scaling up the package of recommended interventions to achieve 80 percent population coverage in all countries by 2050 or sooner are assessed. Implementing the package of high-priority interventions fully could avert up to 150 million deaths (or 2.2 billion DALYs) by 2050, at an incremental cost of US\$1.3 trillion. This translates to US\$9,300 per death averted or US\$620 per DALY averted.

These interventions represent a significant proportion of what health systems already do to address NCDs such as CVD primary prevention, diabetes management, and mental health care. Roughly half of the interventions would be very cost-effective in nearly all settings. Some of the surgical and mental health interventions would be on the borderline of being cost-effective in most settings, whereas others (for example, appendicitis management and chronic depression treatment) would be very cost-effective. For diabetes care, glycemic control by itself is not cost-effective, but when implemented with CVD prevention, it would be cost-effective. There are also several interventions ‘outside the health sector’ that are all incredibly cost-beneficial, with tobacco control yielding the highest returns.

However, most countries are nowhere near full implementation of these interventions. While the proposed package of interventions would be very cost-effective, the budgetary consequences would be considerable, with a larger ‘incremental cost’ as a share of the current health budget for LICs due to the need to build up currently weak health systems and underspending on health. The prioritization

4 Jamison, D.T., et al. 2018. “Universal Health Coverage and Intersectoral Action for Health: Key Messages from Disease Control Priorities, 3rd Edition.” *The Lancet* 391 (10125): 1108–20.

of interventions also provides a framework for sequencing them over time, and intersectoral policies and health interventions that are very cost-effective and can be delivered through primary health care platforms by nonphysician health workers should be scaled up as early as possible.

There are several important limitations of the analysis presented in this chapter including data availability, modelling assumptions about current coverage of interventions, and the effect of the COVID-19 pandemic on NCD incidence and mortality as well as health system resources in the medium term.

Yet, the proposed set of recommendations can help countries achieve significant reductions in NCD mortality, helping them achieve the Sustainable Development Goal (SDG) 3.4 target and post-SDG targets for NCDs. Implementing the HLI package of interventions has the potential to help countries reduce their avoidable mortality across all age groups to about halfway to the observed mortality rates in the best-performing countries. In addition to reducing adult mortality, these interventions could improve nonfatal outcomes by reducing the incidence of disease overall and by reducing the severity of chronic illness, especially for mental and substance use disorders. The recommendations could also help bring a necessary focus and fiscal discipline to national NCD strategies and plans and be used as benchmarks for future World Bank lending efforts to support NCD program development in lower-resource countries.

Chapter 16. Control of Non-Communicable Diseases for Enhanced Human Capital: The Case for Whole-of-Society Action

Chapter 16 makes the case for a whole-of-society (WoS) approach to address NCDs, in view of the two-way relationship of NCDs with certain economic sectors and makes recommendations for the way forward.

Building on the WHO's 5 × 5 framework of NCDs, which considers five sets of diseases and five risk factors,⁵ the chapter proposes a broader definition of NCDs, including 'any disease or disability that is not transmissible through infection.' This

encompasses endocrine disorders beyond diabetes, malnutrition (both under- and overnutrition), autoimmune diseases, chronic kidney disease, various occupational hazards, and injuries, both accidental and intentional. This definition strengthens the argument for a WoS approach, due to the importance of non-health sectors in the causation of and actions against these diseases.

A WoS approach is a comprehensive approach to planning, design, implementation, and monitoring of policies and programs that not only includes the 'whole-of-government' (WoG) but also non-state actors (for-profit and nonprofit), communities, households, and individuals. The WoS approach emphasizes engaging all branches of government (the judiciary, the legislature, and the executive) and political leaders from opposition parties, as the latter play a critical role in supporting or opposing government initiatives and their relative success.

Similarly, non-state actors have a key role in preventing, managing, and controlling NCDs, with the caveat that while there are strong benefits to public-private partnerships, bringing the private sector on board requires a clear-eyed approach on the part of governments, bearing in mind the risks emerging from the profit motive of commercial entities that diverge from public health interests (figure 7).

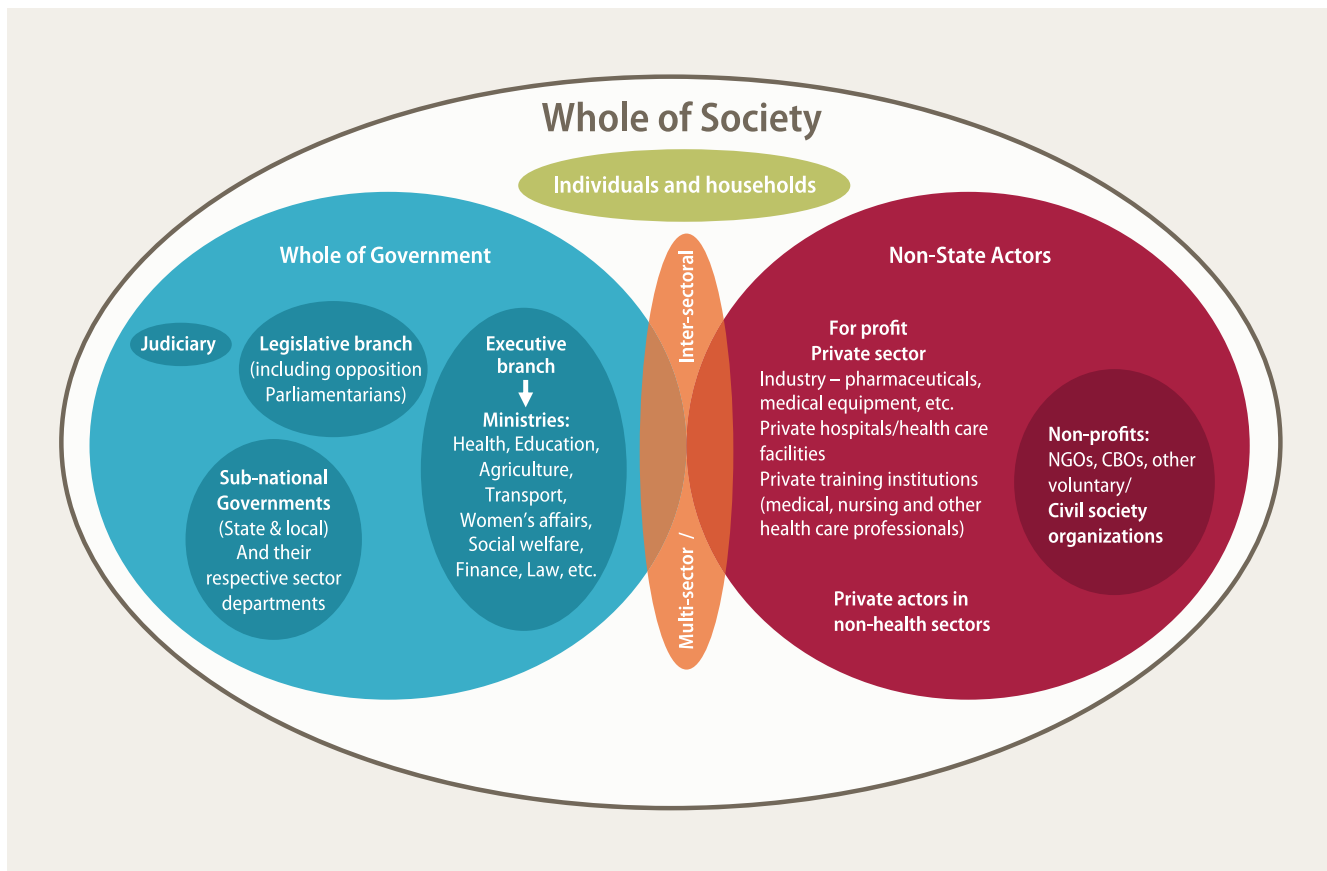
The chapter highlights several examples of innovative and mutually beneficial public-private partnerships for the prevention and control of NCDs though they are limited in scale and scope. It stresses the key role that the nonprofit private sector (nongovernmental and community-based organizations) can play, given these organizations' ubiquity in LMICs, notably the poorest, and their comparative advantage in community mobilization.

Given country experiences and lessons learned, the chapter presents 10 key recommendations (the 10 'Ts):

1. Involve key stakeholders from the outset, leveraging any congruence of interests, to build effective alliances for change.
2. Include non-state actors as appropriate and within a mutually agreeable policy, operational, and regulatory framework.

⁵ The five diseases are CVDs, diabetes mellitus, chronic respiratory diseases, cancers, and mental health, while the five risk factors include tobacco use, harmful use of alcohol, unhealthy diets, physical inactivity, and air pollution.

FIGURE 7 Components of a WoS Approach



Source: Original figure for this publication.

3. Identify clear roles and responsibilities for every sector and actor through consensus and with a clearly identified team lead.
4. Institutionalize mechanisms for coordination and cooperation.
5. Invest in human and other resources for better coordination and concertation.
6. Innovate continuously for successful and sustained implementation of a WoS approach to NCDs.
7. Information sharing through knowledge-exchange platforms, such as clearing houses and South-South platforms, is essential.
8. Incorporate lessons learned from global NCD experiences to rapidly integrate best practices and avoid repeating others' mistakes.
9. Interventions should be prioritized on burden-of-disease assessment, cost-effectiveness, and societal value choices.
10. Indicators of success and failure need to be monitored continuously for effective decision-making, with course corrections as necessary.

Chapter 17. HLI: A Performance Dashboard for Decision-Making in Low- and Middle-Income Countries

This chapter presents a framework for monitoring progress toward healthy longevity. A healthy longevity agenda offers an opportunity to promote and monitor progress toward human capital accumulation and preservation, health, and well-being across the life course.

One way for countries to measure this progress is through performance dashboards. Performance dashboards are data visualization tools that bring

together representations of indicators into a unified interface that allows stakeholders to monitor and assess performance and progress across selected dimensions. The healthy longevity dashboard is an ongoing effort to develop and refine a suite of indicators that bring together relevant data to measure and monitor country progress toward healthy longevity.

The chapter first offers a common framework for such a dashboard and presents three country case studies—Sierra Leone, India, and Colombia—that illustrate a range of possibilities for developing a country-specific but internationally comparable dashboard that considers differing data and information system contexts.

The common framework takes a life course approach and is grounded in the HLI conceptual framework (chapter 2). Indicators cover three key actions and ten related domains that map the dashboard to the HLI framework allowing for a holistic and comprehensive view of population health, while drawing attention to the multi-sectoral efforts needed to promote healthy longevity, inclusive growth, and well-being.

The three countries selected represent different contexts in terms of income level, epidemiological and demographic profiles, and different data infrastructure contexts. Sierra Leone's dashboard illustrates how countries with nascent data infrastructure can bring together available indicators based on key investments in healthy longevity and NCDs in a meaningful way. India presents a case where data are more readily available, including from international sources, driven by national policy objectives, and can be used for benchmarking. Colombia offers an example of how countries can leverage more extensive data sets across multiple sectors.

The chapter concludes with a discussion on what actions are needed to assist country stakeholders in producing, presenting, using, and institutionalizing a healthy longevity dashboard tailored to their unique demographic and epidemiological context and data infrastructure.

Chapter 18. Assessing Human Capital, Non-communicable Diseases, and Healthy Longevity in Low- and Middle-Income Countries: Healthy Longevity Dashboard and the Case for India

This chapter expands on the development of the HLI performance dashboard for LMICs using India as an example. The dashboard comprises internationally

comparable, country-level indicators from international institutions that can be mapped to the overarching HLI conceptual framework and across different stages of the life course. This approach supports the selection of indicators that reflect a given country's data infrastructure maturity while ensuring comparable and consistent conceptual underpinnings.

Dashboard indicators are categorized as either contextual or measuring healthy longevity. Contextual indicators provide crucial information on basic social, demographic, and economic characteristics of a country that enables policy makers and other dashboard users to correctly interpret the setting from which other performance-related indicators are drawn. These indicators are further classified into 10 broad domains: (a) life expectancy, (b) mortality at different life stages (under five years, school age (ages 5–14), youths and young adults (ages 15–29), adults (ages 30–69), and older ages (ages 70 and above), (c) child health, (d) adult immunizations, (e) risk factors, (f) access to care for NCDs and NCD management, (g) education, (h) gender equality, (i) labor force, and (j) social protection.

Once indicators are selected, a country's performance, in this case, India, is estimated compared to other countries, using percentile and Z scores. In both approaches, the study country is compared with other countries that fall under the same income strata as the study country and have a population of more than 7 million (or 0.1 percent of the world population). The dashboard for India highlights its performance on HLI indicators in comparison to similar LMICs and the world. For example, India has a higher proportion of deaths that are attributable to NCDs and higher UHC coverage compared to the average of LMICs but lower than the global average. Moreover, where gender-disaggregated data are available, the dashboard shows that males score better than females on health indicators except in harmful alcohol use and prevalence of hypertension.

In addition to focusing on healthy longevity, the novelty of the HLI dashboard lies in its focus on international comparisons. The current HLI dashboard relies on data readily available in the public domain. As such, LMICs can replicate the dashboard for their countries without the need for additional data collection. However, relying only on readily available data restricts the range of indicators included in the dashboard. This only underscores the need for countries to invest in building up their essential data infrastructure to produce performance information of sufficient granularity

to enable relevant decision-making at the appropriate governance level, with information of high quality and of relevant timeliness and granularity. Finally, further research is required in understand-

ing the drivers of healthy longevity, improving its measurement, and producing performance dashboards of use to policy makers.