

Chronic Emergency: Why NCDs Matter

Irina A. Nikolic, Anderson E. Stanciole, Mikhail Zaydman

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Health, Nutrition and Population (HNP) Discussion Paper

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Health, Nutrition and Population (HNP) Discussion Paper

Chronic Emergency: Why NCDs Matter

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Abstract: “Chronic Emergency: Why NCDs Matter” examines the magnitude of the challenge posed by noncommunicable diseases (NCDs) in middle- and low-income countries, and makes the case for elevating the challenge as a priority item to address on the agenda of decision-makers.

NCDs are on the rise in all middle- and low-income country regions. By 2030, NCDs are expected to account for three quarters of the disease burden in middle-income countries, up from two-thirds today and approaching the level of high-income countries. In low-income countries, the NCD share of the disease burden will increase even more quickly and will approach the levels currently found in middle-income countries. At the same time, many low-income countries will continue to contend with substantial communicable disease burdens, thus facing a “double burden” of disease. Further, compared to their higher-income counterparts, many developing countries will face elevated NCD levels at earlier stages of economic development and with a much compressed timeline to address the challenge.

The overall economic and social cost of NCDs vastly exceeds their direct medical costs. NCDs affect economies, health systems, and households and individuals through a range of drivers such as reduced labor productivity, higher medical treatment costs, and lost savings. These drivers aggregate into significant socioeconomic impacts, including in the areas of: country productivity and competitiveness; fiscal pressures; health outcomes; and poverty, inequity and opportunity loss.

Despite the magnitude of the NCD challenge, there is considerable space for action. While most countries will not be able to “treat their way out” of the NCD challenge because of the immense costs such a strategy requires, they can target NCD risk factors and promote healthier lifestyles through focused prevention efforts while also facilitating strategic adaptation measures to mitigate the impact of NCDs on economies, health systems, and households and individuals.

Keywords: noncommunicable diseases, NCDs, chronic disease, health systems, healthcare

Disclaimer: The findings, interpretations and conclusions expressed in the paper are entirely those of the authors, and do not represent the views of the World Bank, its Executive Directors, or the countries they represent.

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Preface

Noncommunicable diseases (NCDs), including cardiovascular diseases, cancer, chronic respiratory diseases, and diabetes, cause tens of millions of deaths each year, many of which are preventable and premature. They cause vast numbers of people to suffer, impose high long-term costs on health systems, and deplete household incomes and national economies. In middle- and low-income countries, they present a formidable challenge.

The current global focus on NCDs, including the first Global Ministerial Conference on Healthy Lifestyles and NCDs and the United Nations General Assembly's High-level Meeting on NCDs, mark a new level of attention to these challenges. Although the increased attention is encouraging, there are reasons to be concerned that the response could fall short of what is required. First, decision-makers at all levels may not be fully taking into account the extent of the NCD challenge in developing countries. As a result, NCDs might not be sufficiently elevated on national and global agendas. Second, NCDs could continue to be seen as predominantly a health challenge, with insufficient attention paid to their escalating costs on households, health systems, and economies. Third, responses to the challenge could be too narrow and left to the health sector, when what is required is a comprehensive approach that makes NCDs everyone's business.

The overarching goal of this paper is to inform stakeholders' understanding of the increasing burden and wide-ranging costs of NCDs in middle- and low-income countries to help raise the NCD challenge to the level of priority it warrants. This effort contributes to the World Bank's work in strengthening health, nutrition, and population outcomes, and complements its commitment to the Millennium Development Goals (MDG) agenda. The paper draws on a range of current data, as well as recent regional and country studies, to illustrate the magnitude of the "chronic emergency" presented by NCDs, particularly in middle- and low-income countries. It shows that the NCD challenge in middle-income countries is approaching that of high-income countries, and is rising rapidly in low-income countries. What makes the NCD challenge especially daunting for many developing countries is that, compared to their higher-income counterparts, they will be facing such elevated NCD levels, including amongst their working-age populations, at earlier stages of economic development and with a much compressed timeline to address the challenge.

The paper also emphasizes the breadth and complexity of the challenge by examining how NCDs affect national economies, health systems, and households and individuals. The paper concludes with a high level overview of the scope for action available to developing countries and their partners; emphasizing that what is needed is a multisectoral response that targets cost-effective opportunities for stemming the rise of NCDs while also taking steps to adapt to mitigate the adverse socioeconomic impacts of increased NCD levels.

I – The Mounting Challenge of NCDs

The great majority of NCD-related mortality and morbidity is caused by four disease groups: cardiovascular diseases, cancer (malignant neoplasms), chronic respiratory diseases, and diabetes. Together with other NCDs, such as digestive diseases, mental health disorders, and musculoskeletal conditions, these diseases cause premature mortality, disability, suffering, and loss of opportunity for many millions of people across the globe. NCDs are already the world's largest cause of death, accounting for 36 million deaths in 2008, or 63 percent of the global total, with 78 percent of these deaths occurring in middle- and low-income countries. They are also a leading cause of morbidity and poor health (WHO 2011a).

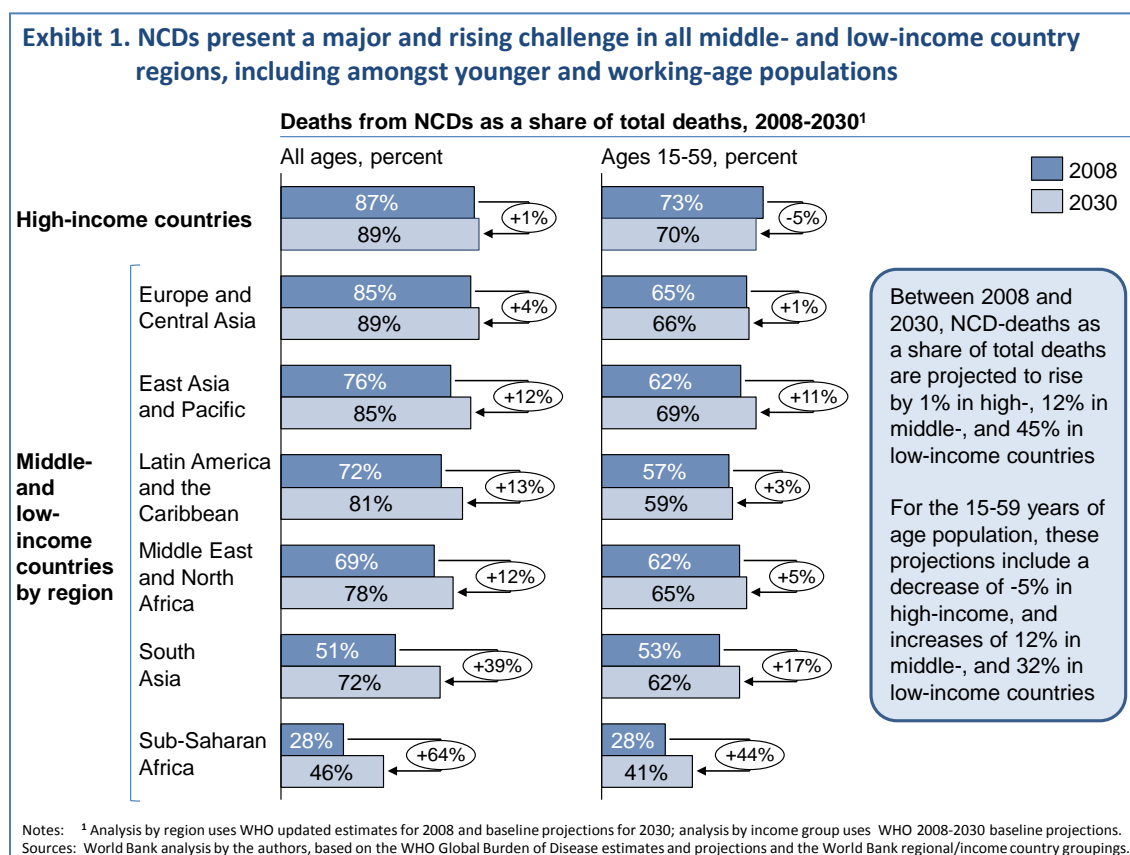
As discussed below, the NCD challenge in middle-income countries is approaching that found in high-income countries, and is also rising rapidly in low-income countries. As a result of people being affected by NCDs at a relatively younger age, suffering ill-effects of NCDs for longer periods in their lives, and dying prematurely from NCDs, NCDs will pose a formidable health and development challenge for these countries. Furthermore, many of these countries will lose out on benefits offered by their “demographic dividend” and will instead experience the challenge presented by rapidly and unhealthily aging populations. The magnitude of the challenge is also shown by the high number of healthy years of life lost as a result of NCDs. Unless they can stem the tide of NCDs, many developing countries will face substantial NCD burdens but at a lower level of economic prosperity and with less time to adapt.

The underlying causes of increased NCD levels in developing countries have been explored elsewhere. The key point to be made here is that while some of the increase in NCDs is a result of the success many countries have had in extending lives, including by curbing communicable diseases, a significant portion of the increase is a consequence of other addressable risk factors, many of which are linked to urbanization, modernization, and lifestyle changes. Particularly significant risk factors include physical inactivity, unhealthy diets (including excessive salt, fat, and sugar intake), obesity, tobacco use, excessive alcohol consumption, and exposure to environmental pollution. For poorer populations, exposure to multiple risk factors combined with inadequate preventive healthcare and education can constitute a “clustering of risk factors” that is further fueling the rise in NCD levels amongst those least able to afford the consequences.

Rising NCD challenge in middle-income and low-income countries

In high-income countries, NCDs have long been the leading cause of mortality and morbidity. However, it is the significant rise of NCDs in middle- and low-income country regions that is making NCDs a major global and development challenge. As the NCD burden rises in all middle- and low-income country regions, including amongst younger and working-age populations, many countries are already contending with a

“chronic emergency” of NCDs, and many others will face an NCD challenge of similar magnitude in the near future.



In absolute terms, deaths from NCDs in middle- and low-income countries are projected to rise by over 50 percent, from an estimated 28 million in 2008 to 43 million by 2030. The change will be particularly substantial in Sub-Saharan Africa, where NCDs will account for 46 percent of all deaths by 2030, up from 28 percent in 2008, and in South Asia, which will see the share of NCD deaths increase from 51 percent to 72 percent over the same time frame (Exhibit 1). Morbidity data, while less systematically available, paint a similar picture. By 2030, cancer incidence is projected to increase by 70 percent in middle-income countries, 82 percent in low-income countries, and 40 percent in high-income countries (WHO 2011a).

NCDs will also increasingly impact younger and working-age populations in developing countries. While the share of NCD-related deaths amongst those 15 to 59 years of age is projected to fall by 5 percent between 2008 and 2030 in high-income countries, many middle- and low-income countries are expected to see substantial increases. The change is expected to be modest in countries with advanced aging trends, such as some countries in Europe and Latin America, but will be more pronounced in others. The Sub-Saharan Africa, South Asia, and East Asia and Pacific regions are expected to see increases of 44, 17, and 11 percent, respectively, during this time period (Exhibit 1).

The effects of increased NCD prevalence in relatively younger populations can be severe. For example, life expectancy in the Russian Federation lags behind that of the 15 original member countries of the European Union (the “EU-15”) by 14 years on average, with NCDs accounting for 66 percent of the years of life lost (Marquez 2008, WHO 2011b). A World Bank study of neighboring Ukraine found that one in four people between the ages of 18 and 65 has an NCD and that a growing number of young adults are being affected. That and other similar findings prompted the conclusion that the country could “lose the next generation to chronic disease” (World Bank 2010a).

In South Asia, the situation is similarly serious, even though its population is on balance younger than in most other regions. Cardiovascular diseases are already a major cause of death and disability and a main driver of the region’s NCD epidemic. Indeed, the average age of first-time heart attack sufferers is 53, lower by six years than in the rest of the world (Engelgau et al. 2011). In the Middle East and North Africa, NCD prevalence is increasing amongst women and adolescents, driven by factors unrelated to age, such as increasing rates of obesity and smoking (World Bank 2010b). A recently completed study of six eastern Caribbean countries similarly found that the prevalence of obesity is steadily increasing, particularly amongst women, and that more children are becoming overweight (World Bank 2011b). In Dominica, for example, obesity prevalence amongst women is expected to rise to 65 percent by 2015 (World Bank 2011b), up from 39 percent in 2008 (WHO 2011a).

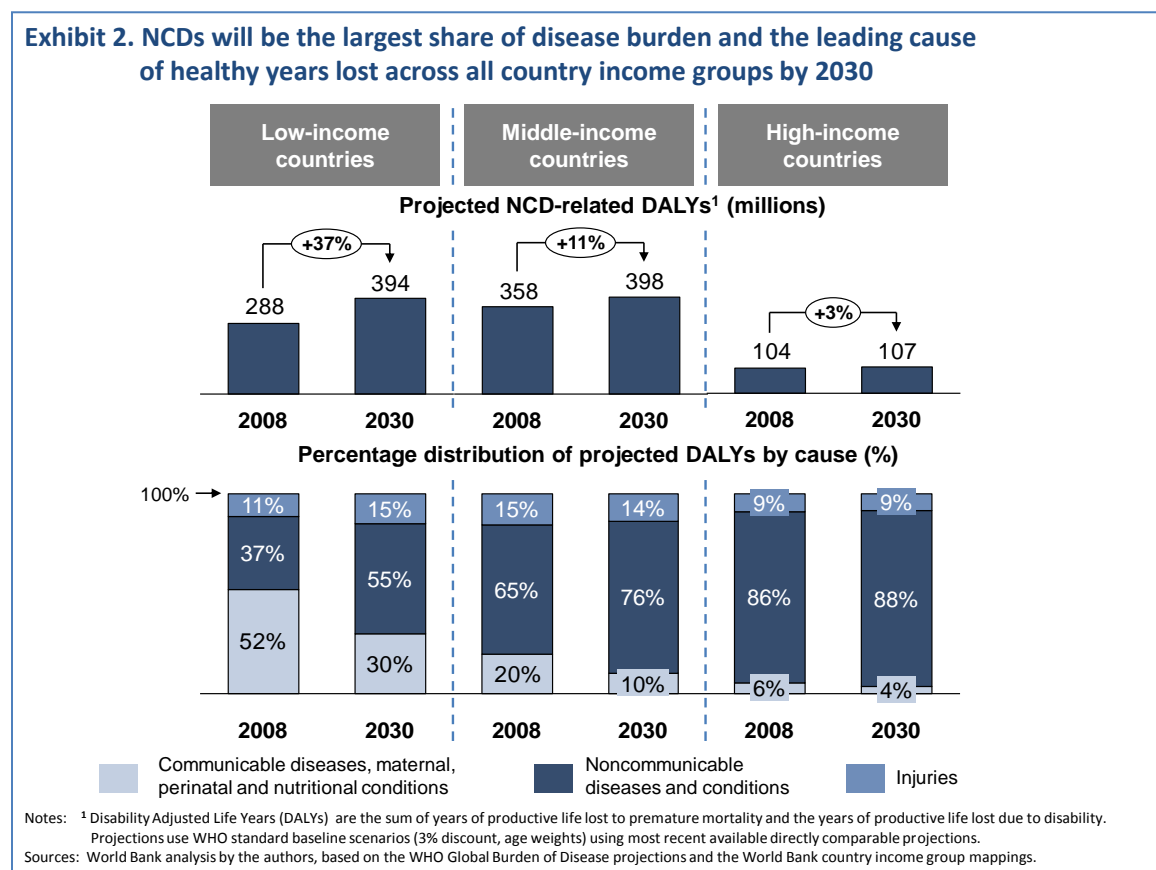
From an economic development perspective, the rise of NCDs amongst younger populations is cause for particular concern because it will diminish the ability of these countries to capitalize on the opportunities that would otherwise be provided by their “demographic dividend”—that is, the economic benefits generated during the period when a relatively larger portion of the population is of working age. During that period, one would expect higher economic output per capita, which allows greater wealth generation and more resources to be channeled into savings and productive investments. The significance of missing out on the “demographic dividend” will become all too apparent when many countries are confronted with the “rapid aging” of their populations. The proportion of people over 65 years of age is expected to double over a period of 21 years in Brazil, 25 years in India, and 26 years in China. In many high-income countries, the same demographic transition took more than a century (Cotlear 2011). With NCD levels also rising, many developing countries will face a compound challenge of rapid and unhealthy aging that threatens to place significant pressure on their economic and social structures while compressing the timeline available for effective adaptation.

China provides a vivid illustration of the impact of these factors. The country has seen a dramatic shift in its epidemiological profile, driven by rapid population aging as well as by better control of communicable diseases, and lifestyle changes brought by urbanization and modernization. NCDs, mostly cardiovascular diseases, diabetes, chronic obstructive pulmonary diseases, and lung cancer, account for over 80 percent of China’s total deaths each year, and are responsible for nearly 70 percent of the total disease burden. If these trends continue, the number of people over 40 years of age with at least one of these NCDs could double or even triple over the next two decades. NCD

morbidity and disability in relatively younger populations are of great concern, as about half of China’s NCD disease burden occurs in people under 65 years of age. In addition, China’s mortality rate for certain major NCDs, such as stroke, chronic obstructive pulmonary diseases, and cancers, is several times higher than in some high-income countries (World Bank 2011c).

Healthy years of life lost

A particularly meaningful measure of the impact of NCDs is the number of healthy years of life lost as a result of the diseases. That measure can be calculated in terms of disability-adjusted life years (DALYs), which is the sum of productive life years lost to premature mortality and disability. NCDs are expected to account for three quarters of total DALYs in middle-income countries by 2030, up from two-thirds in 2008 and near the level of high-income countries. In low-income countries, the share of DALYs attributable to NCDs will increase rapidly during the same time period, and will overtake the share due to communicable diseases and injuries by 2030 (Exhibit 2).

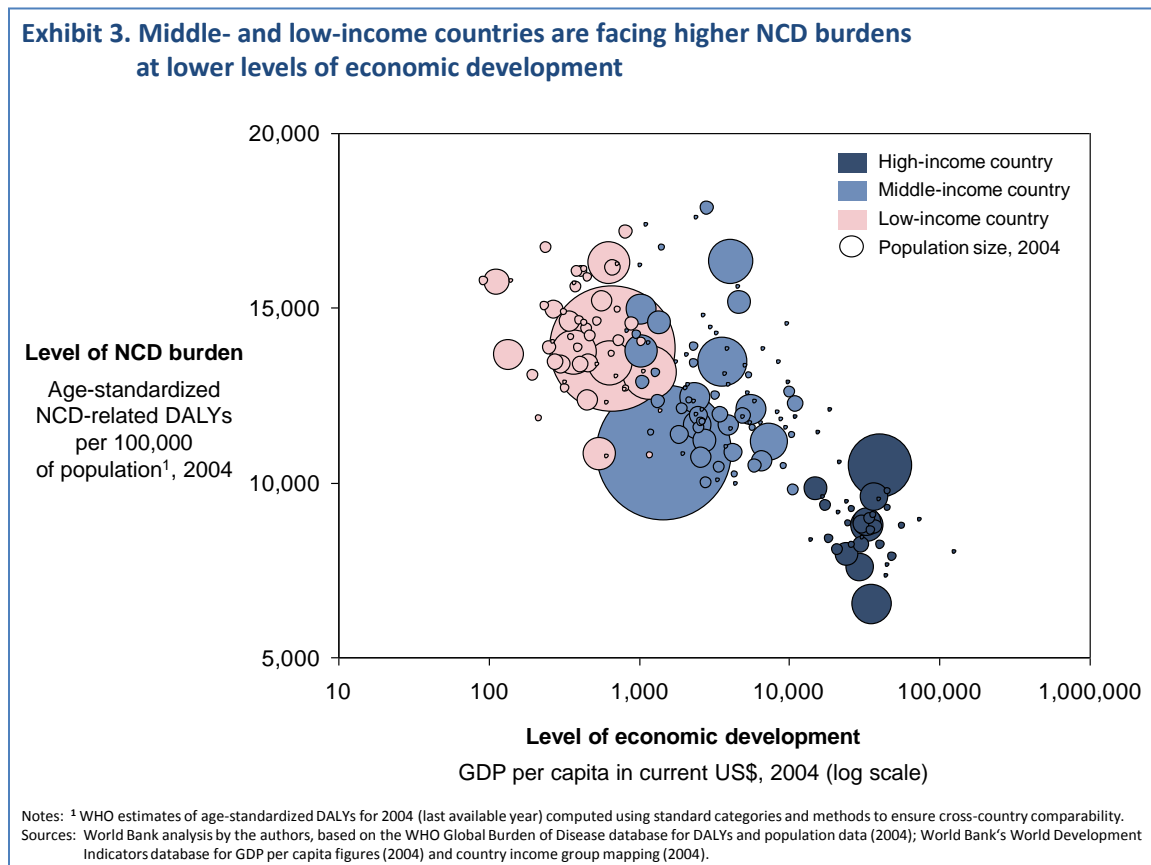


In absolute terms, the number of healthy years of life lost due to NCDs will increase steadily in middle-income and rapidly in low-income countries, and will be nearly eight times that of high-income countries by 2030. While the combined population of middle- and low-income countries far exceeds that of high-income countries (by more than a

multiple of five at present), the large number of total DALYs illustrates the tremendous human and economic cost of NCDs in these countries.

Increased NCD burdens at lower levels of economic development

NCDs present a particularly daunting challenge for middle- and low-income countries because of the scale of the burden relative to their level of economic development. The illustration below compares age-standardized NCD-related DALYs per 100,000 of population relative to national GDPs, using 2004 data (the most recent complete set available for country DALY estimates), to highlight the magnitude of the challenge (Exhibit 3). As discussed above, NCD burdens are expected to rise substantially in many middle- and low-income countries, which will make the challenge even greater, particularly as the increase will, in comparison with high-income countries, occur on a compressed timeline and often without corresponding rapid increases in economic and societal prosperity.



In South Asia, for example, aging is occurring rapidly, but without the same pace of developmental gains such as improved living conditions, gains in wealth, better nutrition, and access to health services. The region is now seeing significant increases in cardiovascular diseases, cancers, and diabetes, as well as a “clustering of risk factors” for NCDs in poorer segments of the population (Engelgau et al. 2011).

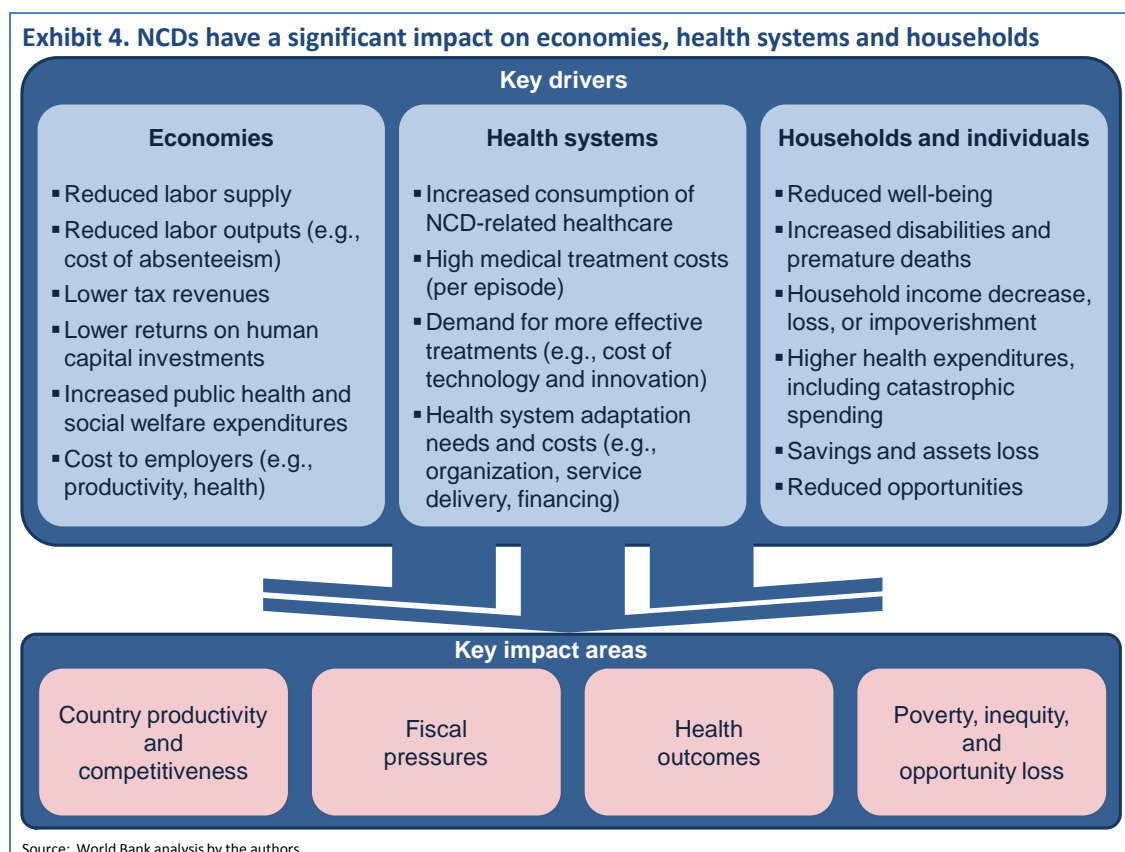
Many low-income countries will, in addition, continue to face major communicable disease burdens, resulting in a “double burden of disease.” In Sub-Saharan Africa and South Asia in particular, communicable diseases such as tuberculosis, respiratory infections, water- and vector-borne diseases, and HIV/AIDS are expected to remain prominent even as NCD levels grow rapidly. Other health burdens, some of which are also linked to increased risk for NCDs, such as fetal and early childhood malnutrition, will additionally remain a challenge (Engelgau et al. 2011).

Moreover, the challenge of confronting NCDs at a lower level of economic development can converge with related policy challenges. For example, rising food prices may persist, reflecting structural changes in the global economy, and could exacerbate the NCD challenge. Higher food prices will heighten risk factors related to poor diets and malnutrition, and poor families affected by NCDs will find it harder to meet their basic needs. Some middle-income countries will be confronted with increasing NCD burdens in the face of already existing dependency ratio and social welfare system challenges, which will make effective response even more challenging.

II – Beyond Health Alone: the Socioeconomic Impact of NCDs

The impact of the mounting NCD challenge cannot be appreciated without considering the full range of direct and indirect effects that NCDs have on economies and health systems, as well as on the affected individual and his or her household. Indeed, by any measure, the cost of NCDs to economies and societies is high and can vastly exceed the direct medical costs of NCDs.

A number of key drivers account for the high and broad-reaching cost of NCDs (Exhibit 4). These drivers constitute specific effects on economies, health systems, and households and individuals, which combine to have substantial impacts on top-line economic and human development outcomes. Key areas of such impacts include: decreased country productivity and competitiveness; greater fiscal pressures; diminished health outcomes; and increased poverty, inequity and opportunity loss.



Economies

Increased NCD levels can have a range of adverse economic effects, including: reduced labor supply, reduced labor output (resulting from, for example, absenteeism and the diminished economic output of sufferers and caregivers), lower tax revenues, increased

government expenditures, lower returns on human capital investments, and higher costs to employers (for example, from reduced productivity and higher employer healthcare costs).

Several studies have examined the general link between NCDs and economic prosperity. Although these studies differ in their assessment of the precise magnitude of impact, there is a broad consensus that it is substantial. A review undertaken for a 2006 study found the cost of chronic diseases and their risk factors to be “significant and sizeable” ranging from less than 1 percent up to nearly 7 percent of a national GDP (Suhrcke et al. 2006). A study of 23 middle- and low-income countries with high NCD burdens found that if no significant reduction to the risk of chronic diseases occurred, an estimated US\$84 billion of GDP would be lost between 2005 and 2015 due to just three NCDs – cardiovascular disease, diabetes, and stroke (Abegunde et al. 2006, 2007). Another study found that for every 10 percent increase in NCD-related mortality, annual economic growth would be reduced by 0.5 percent, an estimate that led the World Economic Forum to rank NCDs as one of the top global threats to economic development (Beaglehole et al. 2011).

Research at the country level further illustrates the economic effects of NCDs. In the United States, where one in three people reports suffering from at least one NCD, a study estimated the impact of seven NCDs (cancer, heart disease, hypertension, mental disorders, diabetes, pulmonary conditions, and stroke) at over US\$1 trillion in lost economic outputs in 2003 (mostly in productivity losses) compared to an impact of less than US\$300 billion in health expenditures. The study concluded that “the avoidable impact on GDP linked to reduced labor supply and lower rates of investment is gigantic” (DeVol et al. 2007).

Similar effects are found in developing countries. Estimates from a 2011 World Bank report on NCDs in China indicate that reducing cardiovascular mortality by 1 percent per year over a 30-year period (2010–2040) could generate an economic benefit equivalent to 68 percent of the country’s real GDP in 2010—more than US\$10.7 trillion at purchasing power parity. The society-wide economic costs of NCDs are even higher if measured by the value attributed to human life and health. By this measure, reducing mortality from cardiovascular disease by 1 percent per year would equal an annual benefit of about 15 percent of China’s 2010 GDP or US\$2.3 trillion at purchasing power parity. The report also found that if an effective response is not mounted in China to deal with NCDs, the disease burden posed by these conditions will aggravate the economic and social impact of the expected demographic shift in China to older citizens and a smaller workforce. Further, a reduced ratio of healthy workers to sicker, older

Examples of economic impact

- **China:** reducing cardiovascular mortality by 1% per year between 2010 and 2040 could generate an economic value equivalent to 68% of China’s real GDP in 2010 or over PPP US\$10.7 trillion (World Bank 2011c)
- **Egypt:** NCDs could be leading to an overall production loss of 12% of Egypt’s GDP (Rocco et al. 2011)
- **Brazil:** costs of NCDs between 2005 and 2009 could equal 10% of Brazil’s 2003 GDP (World Bank 2005a)
- **India:** eliminating NCDs could have, in theory, increased India’s 2004 GDP by 4%-10% (Mahal et al. 2010)

dependents could increase the odds of a future economic slowdown, while also posing a significant social challenge (World Bank 2011c).

“Dying Too Young,” a World Bank study of the impact of premature mortality and ill-health due to NCDs and injuries in the Russian Federation found that the annual cost of absenteeism due to ill-health, driven in large part by NCDs, equated to approximately 1.3 percent of GDP due to total production losses and benefits paid to absent employees. The same study estimated that on average 10 days are lost per employee per year due to illness in Russia, compared to an average of 7.9 days in the EU-15 countries (World Bank 2005b). A study of Brazil found that the financial and economic costs of NCDs between 2005 and 2009 would amount to approximately 10 percent of the country’s 2003 GDP (World Bank 2005a).

A study of Egypt found the aggregate labor supply to be approximately 19 percent below its potential, driven by lost employment and reduced numbers of hours worked by those reporting chronic conditions. The findings implied an overall production loss of roughly 12 percent of Egypt’s national GDP (Rocco et al. 2011). In Ukraine, NCDs, which are heavily concentrated among working age males, have had a devastating effect on the country’s labor force. One third of people die before the age of 65, with NCDs estimated to account for over 80 percent of those deaths (World Bank 2010a). And, a recent study found that if NCDs were eliminated in India, the country’s 2004 GDP would have been increased by 4 to 10 percent due to losses averted for the health system, individuals and the economy (Mahal et al. 2010, Engelgau et al. 2011).

Health systems

NCDs will place substantial and increasing demands on health systems. As the prevalence of NCDs rises, there will be greater demand for NCD-related healthcare services, including diagnosis and treatment. In addition to increasing demand on health systems’ scarce human resources, rising NCD levels will exacerbate health financing challenges. NCDs are generally more expensive to treat than communicable diseases. The chronic nature of NCDs requires patients to have multiple interactions with health systems, frequently in more expensive inpatient settings and over long time periods. Treating NCDs, particularly in advanced stages, tends to require the application of more costly and advanced medical technologies and pharmaceuticals. People suffering from NCDs often require disability management and long-term care. Moreover, NCDs frequently involve comorbidities – one person may suffer from two or more NCDs.

Healthcare expenditures – both public and private – are likely to increase significantly. The direct medical costs may be relatively low in lower-income countries and for lower-income populations, due to, amongst other things, lower rates of detection and less access to advanced and expensive diagnostic and treatment services and pharmaceuticals. However, those same factors contribute to higher overall NCD costs in terms of premature deaths, disability, and lost productivity. Further, economic growth and the globalization of a number of NCD-related risk factors may make demand for more expensive and advanced treatment options more universal.

Several studies have illustrated the substantial effects NCDs could have on the health systems of middle- and low-income countries resulting from changing disease and demographic profiles. A case study of Indonesia found that the country's health system needs to prepare for a future of rising healthcare demand "as the population simultaneously grows, ages, and becomes wealthier," with as much as four-fifths of all healthcare demand driven by NCDs by 2020 (Adeyi et al. 2007). A study of the Russian Federation found that circulatory system diseases, respiratory diseases, and digestive system diseases alone accounted for more than 40 percent of the country's total health expenditures (World Bank 2005b). In Brazil, there has been a significant increase in demand for the more expensive treatments required by older patients, alongside a reduction in demand for the cheaper treatments typically used for younger people. If current trends continue, the number of people over 60 years of age who need long term care will triple by 2040 (World Bank 2011a).

While more research into the likely effects of NCDs on health systems is needed, the magnitude of the challenge can also be illustrated through a simple comparison. The prevalence of obesity in the United States and Mexico is similar, at 31.8 percent and 32.8 percent respectively (WHO 2011a). Estimates of the direct medical costs of obesity in the United States—which represent just one third of overall costs from obesity to the country—range from US\$147 billion to US\$160 billion or approximately US\$479 to US\$520 per capita annually (Finkelstein et al. 2008, Algazy et al. 2010). That equates to 7 percent of the total United States' health expenditures per capita, and 15 percent of government healthcare expenditures per capita. In Mexico, total annual health expenditures per capita have been estimated at US\$588, of which US\$276 are government expenditures (WHO 2011b). While the cost of providing many medical services is certainly much lower in Mexico than in the United States, this comparison highlights the challenge developing countries face with respect to NCD treatment expenditures: they would have to spend high proportions of their entire health budgets to address just some of the NCDs if they were to treat NCDs at the level of the high-income countries.

Health systems in many countries will also need to undergo significant adaptation if they are to address NCDs effectively. In addition to the increasing demand for healthcare services, NCDs will require health systems to improve across a number of fronts, including service delivery, human capital (particularly in terms of medical skills), quality control and licensing, organizational structure, information management, infrastructure management, and health financing. Health systems in some low-income countries will face a particular challenge, as they will need to find a means of coping with the "double burden" of NCDs and communicable diseases. However, there may be opportunities to integrate cost-efficient NCD prevention, detection, and treatment practices into the entire existing continuum of care.

Health financing models will likewise need to evolve to ensure long-term sustainability. Health coverage and benefits packages will need to adjust to the changing nature of demand, while the financing models will need to reflect the different cost pattern of NCDs. Different approaches, such as changes to provider payment mechanisms and payor models to incentivize desired behaviors, implementation of suitable social health protection models, and effective use of tools such as health technology assessments, innovative risk factor reporting, and disease surveillance systems, will all be important to consider and apply in a targeted manner. Such reforms can be done in a less costly and more effective manner if strategic steps are taken in advance. Even if that is the case, however, health system adaptation and its costs represent another substantial effect of NCDs. Indeed, a recent study of macro-fiscal implications of healthcare reforms found that the issue of healthcare reform will be “a key fiscal policy challenge in coming years” (IMF 2010).

Examples of potential health system adaptation actions to address NCDs

- Improve financial health protection
- Create new fiscal space (e.g., through tobacco taxation)
- Improve financial allocations for health taking NCDs into account
- Strengthen prevention and the role of primary care in addressing NCDs
- Adapt healthcare organization and service delivery models (e.g., integrate NCD services along the continuum of care)
- Build on synergies with the existing health programs (e.g., maternal and child health, communicable diseases)
- Develop a comprehensive life course approach to NCD prevention/control
- Strengthen human resources for health (e.g., skills, incentives)

(Adapted from World Bank 2011c)

Households and individuals

NCDs can have serious social and economic effects on the well-being and development potential of affected individuals and their households. The most immediate impact lies, of course, in the suffering and decreased well-being caused by the disease. NCDs can also have severe economic consequences for the individual and his or her family, including a decrease or loss of household income, impoverishment, high and potentially catastrophic health expenditures, savings and assets loss, and reduced opportunities for family members.

People affected by NCDs are often at increased risk of losing their jobs and income, and their ability to capture educational and economic opportunities may also suffer. Amongst people suffering from chronic disease in Egypt, the probability of being employed is 25 percentage points lower than the average, and their working time is reduced by 22 hours per week on average (Rocco et al. 2011). In some cases, family members must also give up jobs or forgo formal education in order to take care of an ill person.

The premature death of a household member not only affects the economic welfare of a family but may have broader influences on family members’ prospects. A World Bank study found that NCDs are a very significant predictor of subsequent early retirement in the Russian Federation (World Bank 2005b). The same study also found that the alcohol consumption in a household increased by about 10 grams per day as a consequence of the death of an unemployed household member and by about 35 grams if the deceased was employed—thereby contributing to a vicious cycle of NCD vulnerability. In some

countries, women and girls may be particularly affected by NCDs, not only directly, but when, as a result of certain circumstances, which could include impact of an NCD on their family, they forgo education or employment opportunities and thus become more at risk to financial insecurity later in life (McKinsey 2010).

NCD-related healthcare costs can significantly affect households' financial security as evidenced by recent World Bank studies of NCD impacts in South Asia. In India, the share of out-of-pocket household health expenditures on NCDs was found to have increased from 32 percent to 47 percent between 1995-1996 and 2004, with a large portion of those expenditures (about 45 percent) spent on medicines (Mahal et al 2010). These studies also show that the costs of hospitalization due to an NCD can be very large relative to individual income levels. The cost of a single hospital stay for cancer or heart disease was found to equate to between 40 and 50 percent of per capita annual income in a public healthcare setting and between 80 and 90 percent in a private healthcare setting (Mahal et al. 2010). As approximately 40 percent of household NCD treatment expenditures in India are financed by household borrowing and sales of assets, the data indicates significant levels of financial vulnerability to NCDs (Mahal et al. 2010, Engelgau et al. 2011).

Examples of impact on households

- **Egypt:** amongst people suffering from NCDs, probability of being employed is about 25 percentage points lower than the average (Rocco et al. 2011)
- **China:** a change in adult health status can result in 16% gain in hours worked and 20% gain in individual income (World Bank 2011c)
- **India:** 40% of household NCD treatment expenditures are financed by household borrowing and sales of assets (Mahal et al. 2010)
- **South Asia:** chances of catastrophic hospitalization expenditures are 160% higher for cancer patients and 30% higher for cardiovascular disease patients than those with communicable diseases requiring hospitalization (Engelgau et al. 2011)

NCDs also increase the risk of incurring “catastrophic” health costs. In South Asia, the chance of incurring catastrophic hospitalization expenditures was 160 percent higher for cancer patients and 30 percent higher for those with a cardiovascular disease than it was for those with a communicable disease requiring hospitalization. In India, 25 percent of families with a male family member suffering cardiovascular disease experience such catastrophic expenditures, and 10 percent are driven into poverty as a result. For cancer cases, the effects were even worse: 44 percent of households experienced catastrophic spending and 24 percent were impoverished due to the related healthcare expenses (Mahal et al 2010, Engelgau et al. 2011).

One of the above-mentioned studies of NCDs in South Asia concluded that “the costs associated with chronic NCDs are likely to weigh more heavily on those least able to afford them” (Engelgau et al. 2011). That conclusion is not surprising. However, although the poor certainly are less secure from some of the effects of NCDs, NCDs can also have significant economic impacts on wealthier individuals and households. A recent analysis of the labor market in Egypt found that individuals with a university degree suffering from an NCD can expect their probability of being employed to be reduced by about 10 percent (Rocco et al. 2011).

Key impact areas

As indicated in Exhibit 4, the various drivers described above combine to have higher-order impacts on top-line economic and human development outcomes. While such impacts result, in part, from the drivers discussed in each area, they are also caused indirectly by drivers in other areas. For example, while an NCD-related loss of savings and assets may in the first instance affect the well-being of the affected individual and his or her family, it also undermines the overall economic performance by diminishing the family's purchasing power. Key areas of impact include:

1. *Country productivity and competitiveness:* The studies discussed above provide strong evidence that increased NCD burdens have the potential to decrease economic productivity and negatively impact countries' competitiveness. Indeed, preliminary results from a forthcoming World Economic Forum-funded study and other recent research could be pointing to the costs of NCDs in these countries being very significant and even potentially overwhelming if current trends continue unabated. While the linkage is, on a certain level, intuitive, research that clarifies the scale and form of the impact, generally and in individual countries, is crucial for galvanizing support for action.
2. *Fiscal pressures:* NCDs also place greater pressures on governments' fiscal positions, particularly through lost tax revenue and increased health and social protection expenditures. Reduced fiscal space not only limits governments' ability to invest in economic development and general social welfare, it also impedes spending on NCD prevention and mitigation, further highlighting the need for early, strategic, and cost-effective action. As with the impact on economies, more precise understanding of the fiscal impact of NCDs, particularly at the individual country level, will be crucial for marshaling support, as well as for clarifying the timeline and space for action.
3. *Health outcomes:* Increased NCD levels will obviously have a direct impact on a country's health outcomes. However, in addition to the direct health effects of NCDs on affected individuals, NCDs can contribute to diminished health outcomes by overwhelming health systems and diverting resources from other health programs. They can also impoverish families so that other family members are exposed to greater health risks (e.g., from poor nutrition or reduced access to preventive healthcare). Further, the rise of NCDs will, in one form or another, require adaptation of country health systems. If governments wait for NCDs to force the change, the cost will be unnecessarily high and systems are likely to be overwhelmed so that they deliver suboptimal results in all areas. However, if steps are taken in advance to strategically adapt health systems so that they promote prevention and evolve to better manage elevated NCD levels, the cost, while still substantial, will be lower and the outcomes will be more favorable.
4. *Poverty, inequity, and opportunity loss:* The mounting NCD challenge is likely to exacerbate issues related to poverty, inequity, and opportunity loss. These issues are not only important in their own right, but also stand as obstacles to better

development and health outcomes, and further fuel negative effects on economies. NCDs affect the lives of individuals and their families, and stand to exacerbate inequities in many societies that already face significant human development challenges. As discussed further below, governments may be able to take measures to reduce such effects and mitigate the overall impact of NCDs on affected households.

Deepening the understanding of these impact areas and identifying effective ways to mitigate the effects of NCDs in these and other priority areas should be a priority for developing countries and their partners.

III – Addressing the NCD Challenge: the Scope for Action

Confronted with evidence of the impending “chronic emergency” of NCDs, decision-makers may understandably be concerned that calls for action represent another demand for scarce public resources to be shifted to one more item on an ever growing list of urgent priorities. In the case of NCDs, there is no question that effectively responding to the NCD challenge will require a significant contribution of resources. However, the rising attention being given to NCDs is in large part motivated by the goal of taking steps now to avoid much larger costs down the road, while also enabling millions of people to live longer, healthier, more fulfilled and productive lives. As daunting as the NCD challenge may appear, there is considerable scope for action, including for taking meaningful steps now to help prevent NCDs and mitigate their impacts.

The need for a multisectoral response

Effective prevention and mitigation measures cannot be implemented by health ministries alone; instead they require action from a variety of government ministries and from global, regional, national, and local stakeholders across the public and private sectors and civil society. Highlighting the breadth of the NCD challenge is thus important to make a broader range of stakeholders aware of the challenge and the need for action beyond the health sector. The accompanying World Bank paper, “Effective Responses to Noncommunicable Diseases: Embracing Action Beyond the Health Sector,” explores the scope for response in greater depth, and considers the role that actors from various sectors—including health, education, urban planning, agriculture, transport, and industry—can play in preventing NCDs (Meiro-Lorenzo et al. 2011).

Abatement through targeted prevention

Most countries lack the resources to “treat their way out” of the NCD challenge and such a strategy would, in any event, constitute an inefficient use of resources. Action should therefore be taken to curb NCD risk factors and promote healthier lifestyles to reduce NCD incidence rates and push back the age of NCD onset. A growing body of evidence shows that targeted prevention measures can cost-effectively reduce the burden of NCDs, both through individual-based and population-based interventions. For example, research on diabetes incidence conducted as a background for this paper indicates that, globally, for each dollar invested in a limited prevention package (focused on exercise and diet advice) for individuals at high risk from developing diabetes, a minimum average return of US\$2 in low-income countries and more than US\$3 in middle-income countries could be expected in saved treatment costs (Stanciole 2011).

Based on a set of criteria including outcome-effectiveness, cost-effectiveness, and feasibility of scale-up, a recent Lancet article proposed five overarching priority prevention interventions for NCDs. These include four population-wide methods to curb key risk factors: accelerated tobacco control, salt reduction, promotion of healthy diets

and physical activity, and reduction in harmful use of alcohol. The fifth priority intervention focuses on cardiovascular disease risk reduction through access to essential drugs and technologies (Beaglehole et al. 2011).

As noted, effective implementation of these types of prevention measures may require contributions from actors outside the health sector. That is certainly the case with efforts to promote healthier lifestyles, which can involve, for example, economic policymakers adjusting tax-based incentives to change behaviors, private employers participating in health education and management programs, and city managers and urban planners taking steps to reduce pollution and expand options for increased physical activity. As the last example illustrates, strategies outside the national-level can provide important support to prevention efforts. Sub-national governments, including cities, can be vital players given their role, in, amongst other things, providing health, education, and social welfare services, setting consumption taxes and other regulations relevant to NCDs, and fostering behavioral change to address NCD risk factors. Regional responses can also be effective. A recent study recommended a set of regional strategies for NCD prevention in South Asia, including harmonization of tobacco policies and regulation (e.g., advertising bans, tobacco taxation) and standardization of food labeling policies (Engelgau et al. 2011).

Any comprehensive strategy to address NCDs should begin by considering these types of cost-effective prevention interventions and drawing on best practices for designing, implementing, and monitoring them.

Strategic adaptation to mitigate the impact of NCDs

While prevention measures should be at the center of any response to the NCD challenge, it is not realistic to expect to fully stem rising NCD levels. Indeed, some of the increase in NCDs is an almost inevitable result of economic growth and increased control of communicable diseases. Like the response to the climate change challenge, it is imperative to determine what strategic adaptation measures can be pursued so that the impacts of NCDs—at the level of economies, health systems, households, and individuals—can be mitigated. Stakeholders need to take strategic steps now to prepare for the “chronic emergency” of NCDs rather than wait until the crisis forces change.

For economies, strategic adaptation involves exploring ways to mitigate the impact of NCDs on productivity and competitiveness. For example, it may be appropriate to support targeted educational and worker training programs if NCDs are impacting labor supply and productivity in important industries. Efforts to minimize economic impacts may converge with efforts to mitigate impacts on affected individuals. Examples of such efforts include supporting access to cost-effective NCD treatments (e.g., effective pharmaceutical products) and encouraging employer-led disease management programs that help those with NCDs to continue working. Preparing economies for the challenge of NCDs also requires high-level fiscal planning to avoid undue debt burdens, tax increases, and reductions to productive public investments.

Strengthening health systems through strategic adaptation, as mentioned above, is critical for improving prevention efforts, and will also be necessary for ensuring that health systems are not overwhelmed by increased demands for NCD treatment services. For example, health systems can explore ways of complementing expensive hospital-based care (e.g., in some settings, by leveraging existing communicable diseases management channels and community health worker schemes) and developing strategies for efficiently providing key pharmaceuticals. Defining “best-buys”, not only in terms of prevention, but also in terms of effective and impactful treatment options, and equitably targeting them to populations will be very important.

The importance of taking steps in advance to mitigate the impact of NCDs on affected individuals and households should not be overlooked. The onset of an NCD can have tremendous impacts on households beyond the immediate health effects of the disease. At a high level, investments in poverty reduction and education should be part of an integrated approach to NCDs. In some countries, improved and expanded social health protection, disability, unemployment, and life insurance schemes can play a role in creating a social safety net that reduces the magnitude of NCDs’ impact. As noted, interventions that enable people to continue to be productive and active can mitigate the impact on individuals and households as well on the economy. Systems for facilitating reentry to the workforce (and to educational programs) for family members diverted to caring for the ill person may also be of value in protecting households from the impact of NCDs.

Country-tailored responses and the role of the international community

It makes tremendous sense for countries to learn from the experiences of other countries grappling with NCDs, particularly given the relatively long period of time some countries have explored innovative methods of responding. However, as with any development challenge, such lessons need to be tailored to fit the specific circumstances of each country. While the impact of NCDs will be broadly felt across the developing world, the nature of NCDs’ effects – and the implications for policy – could vary substantially.

For example, an initial distinction can be drawn between middle-income countries and low-income countries. Many middle-income already face high NCD prevalence levels, and must grapple with major NCD-related health expenditures along with the broader economic impact associated with larger numbers of working-age people suffering from chronic conditions. In many low-income countries, on the other hand, NCD prevalence is rising from a lower base and must be addressed alongside often very serious burdens of communicable diseases – with far fewer resources. Policy and funding responses in these countries will therefore require careful prioritization to ensure that rapid progress is made in addressing MDGs and that the rising burden of NCDs is addressed through early prevention and cost-effective treatment. Even that distinction is an oversimplification, however, as countries in any general category may share certain attributes while varying tremendously in other respects. Individual countries can also be internally heterogeneous, with populations in different areas displaying fundamentally different epidemiological characteristics.

Finally, it is worth reflecting on the role of the international community, and how the World Bank and other global and regional development partners and actors can help address the mounting NCD challenge. The current global process demonstrates a strong awareness and level of commitment to support regions, countries, and communities in addressing NCDs. This commitment needs to be followed by continued support.

International development and health organizations can provide support in a variety of ways. For example, the World Bank can assist countries with their efforts to integrate effective NCD prevention, treatment, and monitoring programs into their existing health systems, drawing on cross-country and cross-sector experiences in effectively designing and implementing such programs. It can help countries address the link between health and poverty, including by developing strategies to support the most vulnerable populations. Further, it can also support countries in designing and utilizing innovative mechanisms to foster behavior change (e.g., results-based financing). Those are only a few of many examples. As discussed throughout this paper, NCDs present a broad-reaching challenge demanding a multifaceted response, and a wide range of support mechanisms should be available to countries facing such a challenge.

Global and regional level actors can further support country actions by promoting knowledge sharing, facilitating networks, evaluating interventions, and developing global and regional standards. They can also build on existing channels and mechanisms, such as international agreements that support national actions (such as the WHO Framework Convention on Tobacco Control) or tobacco advertising and tax harmonization efforts, which provide lessons and models for collaboration that could be applied to other priority areas, such as reducing salt intake and promoting healthier nutrition. Global and regional actors can also support country-led NCD action plans through financing for NCD prevention, treatment, and adaptation measures, and through efforts at international policy coordination.

In summary, decisive country leadership that engages stakeholders across the public and private sector, and from civil society, can enable developing countries to achieve considerable gains in addressing NCDs over the critical period ahead. The United Nations General Assembly High-level Meeting on NCDs should be the start of an ongoing collaborative process of identifying best practices and supporting middle- and low-countries in preventing NCDs and mitigating their impacts so that people can live healthier, wealthier, and happier lives.

References

- Abegunde, D.O., C.D. Mathers, T. Adam, et al. 2007. "The burden and costs of chronic diseases in low-income and middle-income countries." *Lancet* 370: 1929-38.
- Adeyi, O., O. Smith, S. Robles. 2007. *Public Policy and the Challenge of Chronic Noncommunicable Diseases*. Washington, DC: World Bank.
- Algazy, J., S. Gipstein, F. Riahi et al. 2010. "Why Governments Must Lead the Fight against Obesity." *McKinsey Quarterly*: 10/2010.
- Baglehole, R., R. Bonita, R. Horton, et al. 2011. "Priority actions for the non-communicable diseases." *Lancet* 377: 1438-47.
- Chawla, M., G. Betcherman, A. Banerji, et al. 2007. *From Red to Gray: The "Third Transition" of Aging Populations in Eastern Europe and the Former Soviet Union*. Washington, DC: World Bank.
- Cotlear, D., ed. 2011. *Population Aging: Is Latin America Ready?* Washington, DC: World Bank.
- Commission on Social Determinants of Health (CSDH). 2008. *Closing the Gap in a Generation: Health Equity through Action on the Social Determinants of Health. Final Report of the Commission on Social Determinants of Health*. Geneva: WHO.
- DeVol, R., A. Bedroussian, et al. 2007. *An Unhealthy America: The Economic Burden of Chronic Disease. Charting a New Course to Save Lives and Increase Productivity and Economic Growth (Executive Summary and Research Findings)*. Santa Monica: Milken Institute.
- Engelgau, M., K. Okamoto, K.V. Navaratne, S. Gopalan. 2010. "Prevention and Control of Selected Chronic NCDs in Sri Lanka: Policy Options and Action." *Health, Nutrition, and Population Discussion Paper*. Washington DC: World Bank.
- Engelgau, M., S. El-Saharty, P. Kudesia, et al. 2011. *Capitalizing on the Demographic Transition: Tackling Noncommunicable Diseases in South Asia*. Washington, DC: World Bank.
- Finkelstein, E.A., et al. 2009. "Annual Medical Spending Attributable To Obesity: Payer and Service-Specific Estimates." *Health Affairs* 28/5: w822–w831.
- International Monetary Fund (IMF). 2010. *Macro-Fiscal Implications of Health Care Reform in Advanced and Emerging Economies*. Washington, DC: IMF.
- Lopez, A. D., C. D. Mathers, M. Ezzati, eds. 2006. *Global Burden of Disease and Risk Factors*. New York: Oxford University Press.

Mahal, A., A. Karan, M. Engelgau. 2010. "The Economic Implications of Non-Communicable Diseases for India." *Health, Nutrition, and Population Discussion Paper*. Washington DC: World Bank.

Marquez, P. 2008. "Better Outcomes through Health Reforms in the Russian Federation: The Challenge in 2008 and Beyond." *Health, Nutrition, and Population Discussion Paper*. Washington DC: World Bank.

Meiro-Lorenzo, M., Villafana, T., and M. Harrit. Forthcoming 2011. "Effective Responses to Non-communicable Diseases: Embracing Action Beyond the Health Sector." *Health, Nutrition, and Population Discussion Paper*. Washington DC: World Bank.

Nikolic, I.A., L. Taliento, et al. 2010. *The Business of Empowering Women*. Social Sector Office: McKinsey & Company.

McKinsey Global Institute (MGI). 2011. *Urban World: Mapping the Economic Power of Cities*. McKinsey Global Institute: McKinsey & Company.

Rocco, L., K. Tanabe, M. Suhrcke, E. Fumagali. 2011. "Chronic Diseases and Labor Market Outcomes in Egypt." *Policy Research Working Paper 5575*. Washington DC: World Bank.

Stanciole, A., 2011. "Return on Investment in Type 2 Diabetes Mellitus Prevention." Background analysis conducted for this paper.

Suhrcke, M., R.A. Nugent, D. Stuckler, L. Rocco. 2006. *Chronic Disease: An Economic Perspective*. London: Oxford Health Alliance.

WHO. 2005. *Preventing Chronic Diseases: a vital investment*. Geneva: WHO.

WHO. 2010. *Mental Health and Development: Targeting People with Mental Health Conditions as a Vulnerable Group*. Geneva: WHO.

World Health Organization (WHO). 2011a. *Global Status Report on Noncommunicable Diseases 2010*. Geneva: WHO.

———. 2011b. *World Health Statistics 2011*. Geneva: WHO.

World Bank. 2005a. *Brazil: Addressing the Challenge of Non-communicable Diseases in Brazil*. Washington, DC: World Bank.

———. 2005b. *Dying Too Young: Addressing Premature Mortality and Ill-Health Due to Noncommunicable Diseases and Injuries in the Russian Federation*. Washington, DC: World Bank.

———. 2007. *Healthy Development: The World Bank Strategy for Health, Nutrition and Population Results*. Washington, DC: World Bank.

———. 2010a. *What Underlies Ukraine's Mortality Crisis?* Washington, DC: World Bank.

———. 2010b. *Meeting the Challenges of Health Transition in the Middle East and North Africa.* Washington, DC: World Bank.

———. 2011a. *Becoming Old in an Older Brazil: Implications of Population Aging on Growth, Poverty, Public Finance and Service Delivery.* Washington, DC: World Bank.

———. Forthcoming 2011b. *The Growing Burden of Noncommunicable Diseases in the Eastern Caribbean.* Washington, DC: World Bank.

———. 2011c. *Toward a Healthy and Harmonious Life in China: Stemming the Rising Tide of Non-Communicable Diseases.* Washington, DC: The World Bank.

World Development Indicators (WDI). Washington, DC: World Bank.



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