

CANCER PREVENTION AND TREATMENT IN DEVELOPING COUNTRIES: RECOMMENDATIONS FOR ACTION¹

THOMAS J BOLLYKY, SENIOR FELLOW FOR GLOBAL HEALTH, ECONOMICS, AND DEVELOPMENT AT THE COUNCIL ON FOREIGN RELATIONS, USA AND **CAROLINE ANDRIDGE**, RESEARCH ASSOCIATE FOR GLOBAL HEALTH, ECONOMICS, AND DEVELOPMENT AT THE COUNCIL ON FOREIGN RELATIONS, USA

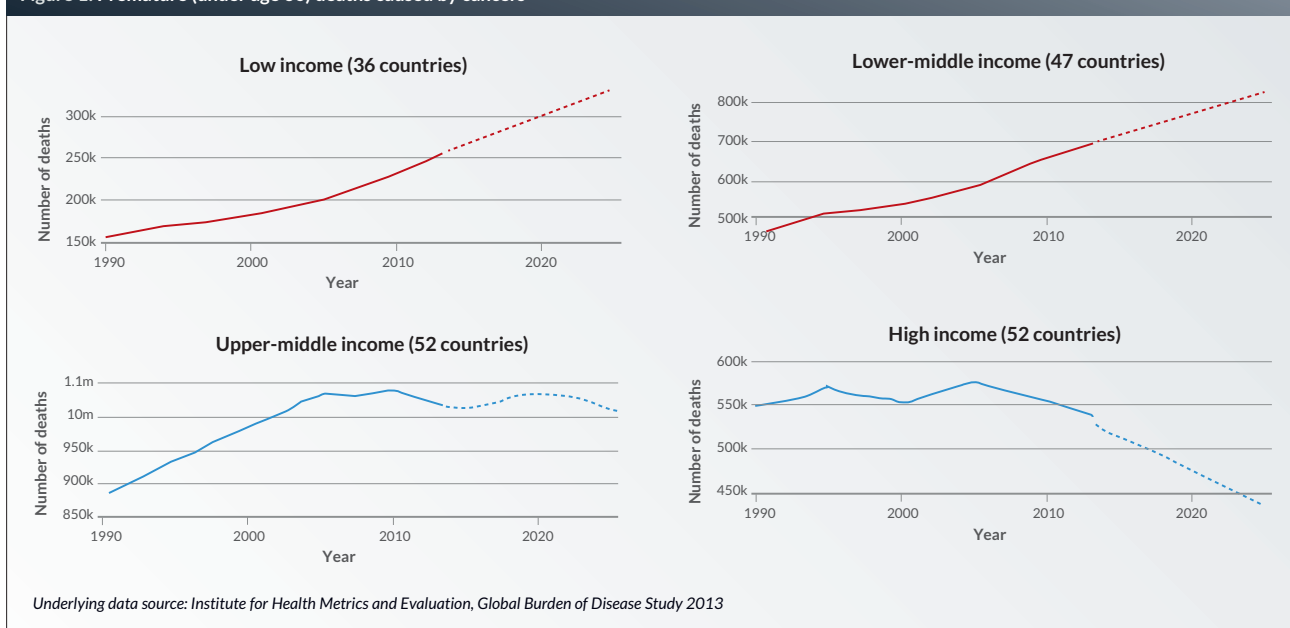
Once thought to be challenges for affluent countries alone, cancer, cardiovascular diseases, diabetes, and other noncommunicable diseases are now the leading cause of death and disability in developing countries. The economic and human costs are high and rising in low- and middle-income countries, threatening their continued development prosperity. Lung, liver, cervical and breast cancers constitute a large proportion of this growing burden and can be addressed with life-saving and low-cost interventions.

The biggest global health crisis in low- and middle-income countries is not the exotic parasites, bacterial blights or obscure tropical viruses that have long occupied international health initiatives and media attention. It is cancer, cardiovascular disease, diabetes, and other noncommunicable diseases (NCDs), which killed more than eight million people before their sixtieth birthdays in low- and middle-income countries in 2013 alone (1). The most

prevalent cancers – lung, liver, cervical, and breast cancer – constitute a significant proportion of this crisis and pose a growing burden (Fig. 1). Unless urgent action is taken, the cancer crisis emerging in developing countries will worsen and become harder to address with each passing year.

The urgency of this situation led the Council on Foreign Relations (CFR) to convene an Independent Task Force on Noncommunicable Diseases – its first ever devoted to a

Figure 1: Premature (under age 60) deaths caused by cancers



¹ This article is adapted from the Council on Foreign Relations' Independent Task Force Report No. 72, "The Emerging Global Health Crisis: Noncommunicable Diseases in Low- and Middle-Income Countries," with permission from report author and project director Thomas Bollyky.

global health matter. The Task Force was co-chaired by Mitchell E Daniels Jr, former governor of Indiana and Thomas E Donilon, former national security adviser to President Barack Obama. The bipartisan Task Force was composed of a distinguished group of experts that included former government officials, scholars, and practitioners.

The charge of this Task Force was to assess the case for greater United States engagement on the NCD crisis in developing countries and recommend a practical strategy for intervention. In doing so, the Task Force considered four questions: (a) the effect of NCDs in low- and middle-income countries now; (b) existing efforts to address them; (c) United States and international interests in doing more; and (d) possible cost-effective interventions to address the epidemic.

This article summarizes those findings, paying particular attention to the burden and interventions related to the prevention, management and treatment of cancer in low- and middle-income countries.

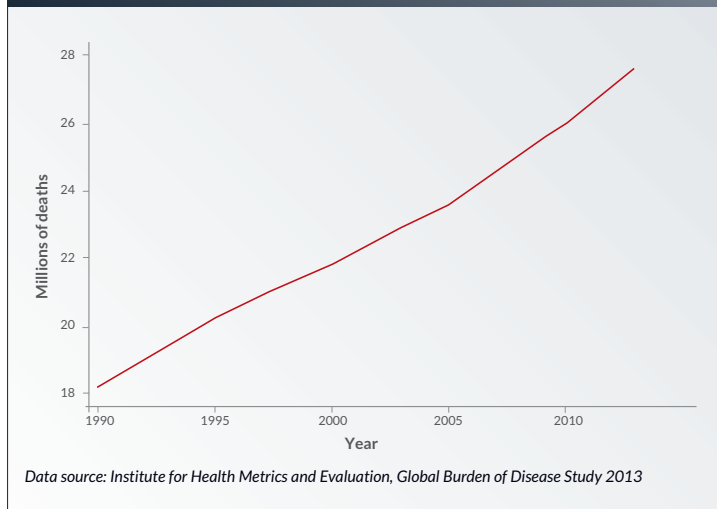
The effect of NCDs in developing countries

NCDs are rising faster, affecting younger populations and having worse health and economic outcomes than seen in developed countries. Cancer, cardiovascular disease and chronic respiratory illnesses cause 80% of the deaths and two-thirds of the disability from NCDs in these countries. Cancer and these other NCDs long ago became a challenge for developed countries as well, but the epidemiological transition happening in developing countries differs in speed, scale, and consequence (Fig. 2).

NCDs are affecting people at younger ages in low- and middle-income countries than they are in wealthy states. Most of the death and disability from NCDs in emerging countries occurs in working-age people (those under the age of 60). In many low-income countries, particularly in Africa, that proportion rises to 90% or higher.

Cancers and other NCDs are also yielding worse outcomes.

Figure 2: Deaths caused by NCDs in low- and middle-income countries



Cancers that are preventable or treatable in developed countries are often death sentences in developing countries (2). Whereas cervical cancer can largely be prevented in developed countries thanks to the human papillomavirus (HPV) vaccine, in sub-Saharan Africa and South Asia it is the leading cause of death from cancer among women (1). Ninety percent of children with leukemia in high-income countries can be cured, but 90% of those with that disease in the world's 25 poorest countries die from it (3).

The rise of NCDs in low- and middle-income countries is not merely a byproduct of success – reductions in infectious diseases or increasing incomes (4). Death and disability from NCDs in low- and lower-middle-income countries is increasing faster than the rate of decline from communicable diseases. Premature death and disability from cancer and other NCDs is increasingly associated with poverty in emerging countries, just as they are in wealthier nations. The trajectories of many NCDs depend on the wealth of the country where one lives. The death and disability wrought by breast, lung, and cervical cancer, (measured in Table 1 as disability-adjusted life years, or DALYs) are subsiding in developed countries but increasing

Table 1: Percentage change in DALYs: 1990–2010

	Low income	Lower-middle income	Upper-middle income	High income
All communicable diseases	-14%	-27%	-47%	-23%
All NCDs	42%	38%	18%	9%
Lung cancer	78%	56%	52%	7%
Breast cancer	124%	58%	55%	1%
Cervical cancer	28%	19%	18%	-16%
Leukaemia	54%	30%	-7%	1%

Data source: Institute for Health Metrics and Evaluation, Global Burden of Disease Study 2010

fast in developing countries.

The factors fueling the soaring rates of NCDs are dramatic changes in urbanization, global consumer markets, and longevity that occurred in wealthy nations over decades, but are happening simultaneously and much faster in still-poor countries. Urbanization, trade and the global integration of consumer markets have done much good in developing countries: improved sanitation, lifted millions from poverty and increased food production.

Yet these trends have also helped fuel a rise of NCDs and associated risk factors that is faster than developing countries have been able to establish the health and regulatory systems necessary to adjust. Health spending by low- and middle-income country governments has tripled over the past 20 years but remains low relative to higher-income countries (5). Health spending by all developing country governments, representing 5.7 billion people, is less than is spent by the governments of Canada, France, Germany and the United Kingdom, which have a combined population of 245 million (6).

The United States and international response to NCDs

United States' response

Despite the growing urgency, the United States and international community response has been modest. The United States currently has no dedicated programmes or budget to address cancers and other NCDs in low- and lower-middle-income countries (7), but has worked with international partners to incorporate cancer prevention and treatment into larger existing United States global health initiatives. The following list illustrates a few of these initiatives:

- ▶ The United States Centers for Disease Control and Prevention (CDC) has advised developing-country governments on cervical cancer screening, surveillance, and prevention programmes (8).
- ▶ The United States Department of State and the CDC Foundation support the Pink Ribbon Red Ribbon initiative, which leverages the President's Emergency Plan for AIDS Relief (PEPFAR) programme to promote breast cancer education and expand cervical cancer screening and treatment (9).
- ▶ The United States National Institutes of Health's (NIH) National Cancer Institute (NCI) has provided training on establishing cancer registries in low- and middle-income countries and contributed limited support to several sub-Saharan African countries to do so.
- ▶ The NCI promotes United States research collaborations

with China and five Latin American countries, participates in the Middle East Cancer Consortium, provides a four-week training course in cancer prevention, and offers a small number of grants to South African and Indian researchers working on low-cost, cancer-related technology (10).

- ▶ The United States Agency for International Development (USAID) has provided support for the Global Alliance for Clean Cookstoves and the Uganda Cancer Institute (11).

Though promising, these initiatives are small-scale. According to the Institute for Health Metrics and Evaluation (IHME), the United States government only dedicated US\$ 10.8 million of its more than US\$ 8 billion global health aid budget to NCDs in 2010 (5).

International community response

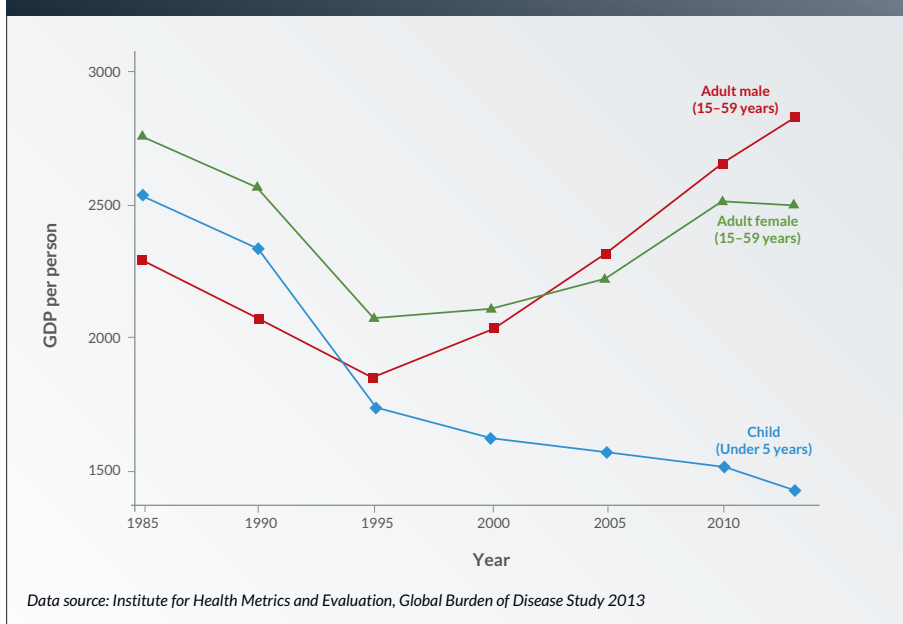
In the absence of strong United States leadership, the international response to cancers and other NCDs has struggled. The United Nations (UN) General Assembly's 2011 high-level meeting on NCDs helped broaden public recognition of the human and economic toll of NCDs and inspired several important country-led initiatives (12, 13). In May 2012, the World Health Organization (WHO) set a voluntary global target for reducing premature NCD mortality by 25% by 2025, reached agreement with its member states on an international monitoring framework, and released another global action plan on NCDs.

Yet donor aid, in-country resources, and a practical, well-prioritized agenda for collective action on NCDs remain elusive (5). In 2010, the international development assistance for health dedicated for each DALY lost to HIV/AIDS was US\$ 69.38, US\$ 16.27 per DALY lost to malaria, and US\$ 5.42 per DALY lost to poor maternal, newborn, and child health, but only US\$ 0.09 per DALY lost to NCDs (14, 5). Cancer research, treatment and prevention programmes targeting low- and middle-income countries receive only a fraction of the international aid devoted to NCDs.

The case for increased United States and international engagement

United States and international interests will be affected by the rise of NCDs in low- and middle-income countries because of their human, economic and strategic consequences. The international community has four compelling interests to increase its engagement on cancers and other NCDs.

Figure 3: GDP per capita associated with low- and lower-middle-income countries achieving the median mortality rates that existed in high-income countries in 1950



First, cancer undermines the effectiveness of existing global health investments. Cancers (and NCDs in general) are increasing in the same countries and populations that United States and international initiatives target for other global health concerns. The Task Force undertook case studies of the 49 countries in which the United States devoted US\$ 5 million or more in aid for health in 2013. NCDs accounted for 1.6 times as many premature deaths as malaria, tuberculosis, and HIV/AIDS combined.

Second, cancers represent an opportunity for the United States government and international partners to build on existing global health platforms to achieve sustainable reductions in premature death and disability that disproportionately affect the poor. Cancer prevention and treatment strategies incorporate similar elements of management of HIV/AIDS: promotion of healthy behaviours, long-term adherence to prescribed treatment, consistent monitoring of treatment outcomes and patient engagement in care and treatment decisions (15). The same approaches that the global health community uses to ensure safe, reliable supplies of AIDS and malaria treatment, childhood vaccines and contraceptives could be leveraged to improve access to the essential medicines needed to address cancer in developing countries. A successful low-technology screen-and-treat programme for cervical cancer in women with HIV was piloted through PEPFAR in Zambia, and is a good example of this opportunity (16).

Third, the United States has an important interest in fostering the long-term capacity of developing countries to prevent and reduce premature cancer-related death and

disability as a means of supporting economic development and promoting United States exports. Developing countries have represented roughly half of global growth since the 2008 financial crisis (17). United States private-sector investments in sub-Saharan Africa over the past decade have yielded among the highest rates of return of any region in the world, but low-income countries cannot sustain economic growth unless their middle-class and working-age people survive (18). In addressing the rising burden of cancer in these countries, the United States advances its own interests in international trade,

United States exports and American jobs.

Fourth, the international community has interests in enhancing the credibility of global health programmes and building fruitful partnerships with capable allies and rising powers. The discrepancies in international global health spending will grow in the coming years as the NCD crisis expands in low- and middle-income countries and continues to afflict young people disproportionately. Cancers and their associated health-care costs are a pressing concern for the economies and governments of countries of United States strategic interest and an untapped opportunity for collaboration. As the cancer epidemic expands, the economic costs of these diseases on working-age people and households could escalate into population dissatisfaction with the governments in countries and regions where United States interests lie.

The international community has strong interests to increase engagement now. While the costs of child health are declining in low- and lower-middle-income countries, the opposite is true for adults (Fig. 3) (19). The economic growth that developing countries must sustain just to achieve the adult health performance that existed in developed countries more than 60 years ago has risen sharply since the mid-1990s. This trend is independent of the HIV/AIDS epidemic. Three conclusions emerge from this analysis. First, effectively addressing cancer and other NCDs in developing countries will become more difficult with each year of inaction. Second, economic growth alone is unlikely to solve the NCD crisis in most of these countries. Third, effective, low-cost international initiatives can make a difference, as

they have with child health. Acting also allows international actors to take advantage of time-limited opportunities, such as leveraging the September 2015 announcement of the UN Sustainable Development Goals (SDGs) and implementing tobacco control in Africa, where tobacco-use rates are relatively low but projected to increase (20).

Prevention, management and treatment interventions

The Task Force examined the specific cancers and health risks that are causing large numbers of premature deaths in low- and middle-income countries but far fewer in high-income countries due to the widespread availability of effective prevention and treatment measures. The findings indicate that cost-effective measures exist to address the most prevalent cancers – lung, liver, cervical, and breast cancer – and their risk factors in developing countries in both the short and near term. The Task Force provides an investment case for each, which can be found in full in the Task Force report (www.cfr.org/NCDs_Task_Force).

Lung cancer

Lung cancer is the most common cancer and cause of death from cancer in low- and middle-income countries, and the burden is increasing (Fig. 4) (21). Seventy percent of lung cancer deaths worldwide are due to tobacco use; smokers are twenty times more likely to perish from that disease than nonsmokers (22). Tobacco use and secondhand smoke are also the leading risk factors for other cancers and all

major NCDs – diabetes, cardiovascular disease and respiratory disease (23).

Tobacco control is cost-effective and evidence-based (23). The Task Force recommends fostering partnerships between United States and international development and health agencies to provide technical assistance for tobacco taxation and control to interested developing countries; establishing a multi-donor trust fund at the World Bank to provide seed funding for tobacco-tax legislation; increasing resources for the United States Federal Drug Administration (FDA) and CDC to support tobacco regulations; integrating tobacco education and cessation into maternal, child health and tuberculosis initiatives; and including safeguards for tobacco control laws and regulations in ongoing United States trade negotiations of the Trans Pacific Partnership (TPP).

Liver cancer

The hepatitis B virus (HBV) is the source of most cases of liver cancer and each year is responsible for 500,000 deaths globally. The prevalence of this virus is greater and increasing in low- and middle-income countries, especially in sub-Saharan Africa and East Asia. A safe and highly effective HBV vaccine is cost-effective, widely used, and provides 20 years (and possibly lifelong) protection in infants, children and young adults (21, 24). Although 179 of 193 WHO member states have introduced the HBV vaccine into their immunization programmes, coverage remains suboptimal – an estimated 75% (24).

Figure 4: Percentage change in lung cancer DALYs, 1990–2010

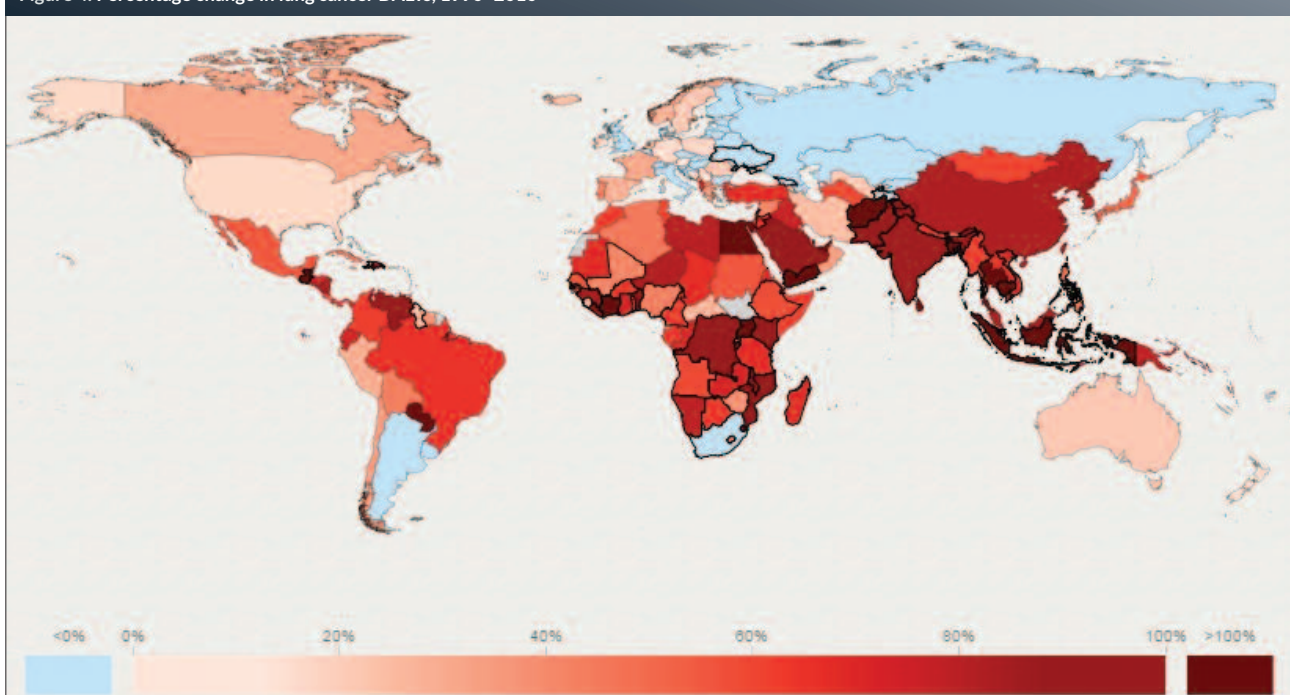
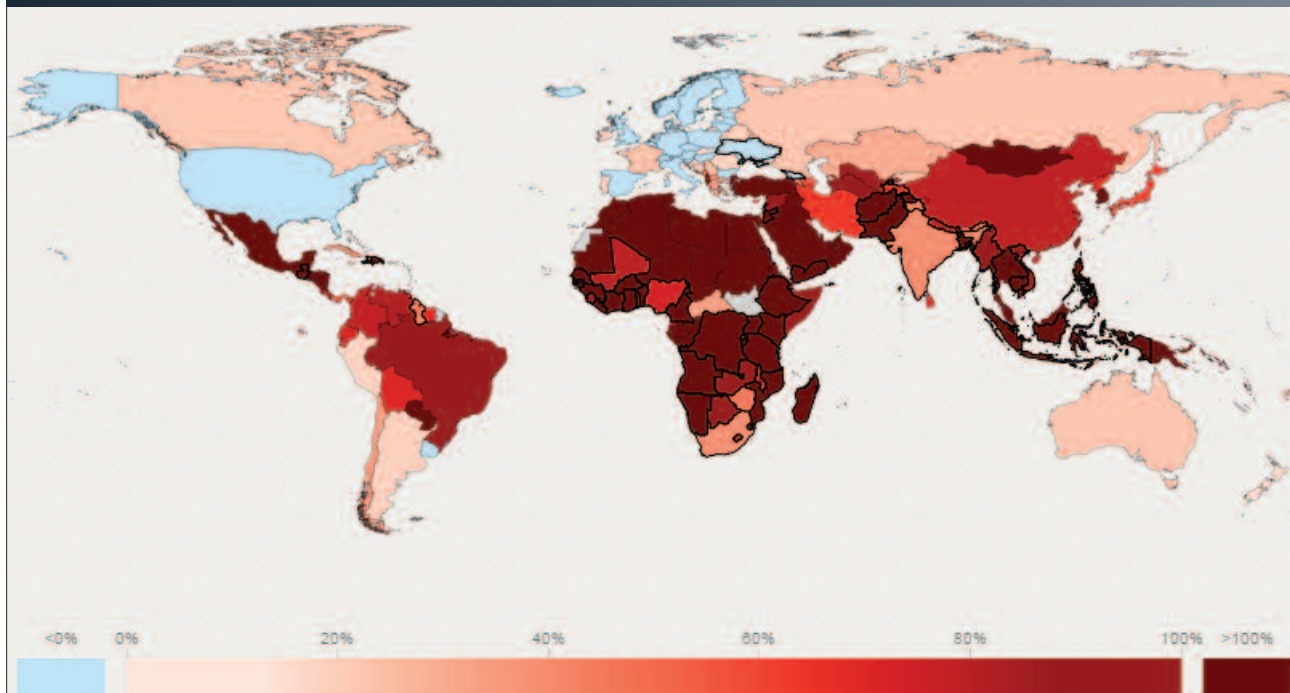


Figure 5: Percentage change in breast cancer DALYs, 1990–2010



More technical and financial support for those child immunization programmes must be provided; leveraging existing United States and international maternal and child health platforms to do so would help. This strategy may also yield compound benefits for controlling communicable diseases. Working with suppliers to package HBV vaccine in prefilled, auto-disable syringes appropriate for use in low-income countries would enable community-based health providers to deliver immunizations after home births, reducing the demand for health-care infrastructure in the poorest settings (25).

Cervical cancer

Approximately 300,000 women die from cervical cancer each year, mostly young women in low- and middle-income countries. Cervical cancer is now the leading cause of death from cancer among women in sub-Saharan Africa and is a persistent, rising health challenge in developing countries (Fig. 5) (1).

The Task Force identifies two interventions that could transform cervical cancer control in developing countries: increased access to the effective vaccines that exist for preventing HPV infection; and implementation of screening methods that are more compatible with the available resources and infrastructure in developing countries than Pap smear programmes. The international community should increase assistance to low- and middle-income countries seeking to lower HPV vaccine delivery costs and

investment in improving and integrating low-technology screen-and-treat programmes for cervical cancer into PEPFAR platforms (16).

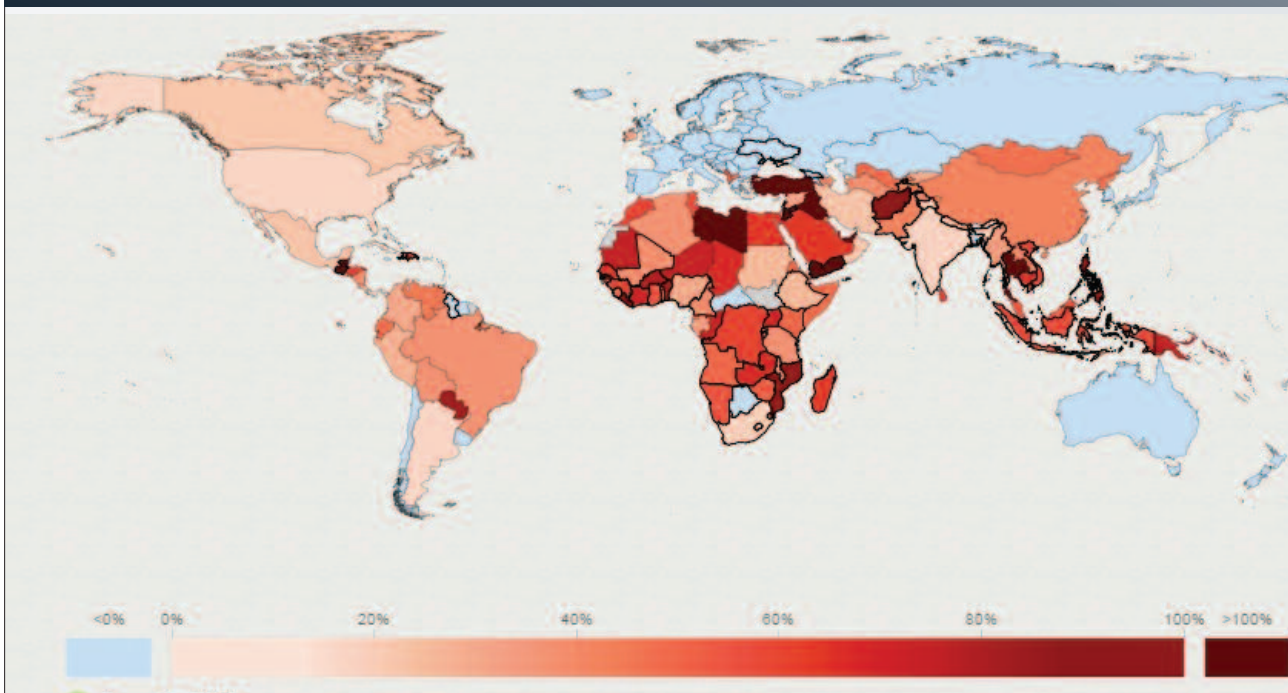
Breast cancer

Between 1990 and 2013, premature deaths in low-income countries from breast cancer grew 90%. The burden continues to increase globally (Fig. 6). People in poor countries have little access to the diagnostic and curative care that is widely available for breast cancer in wealthier countries.

The Task Force identifies four ways that the United States government and its international partners may assist low- and lower-middle-income countries in addressing breast cancer and other treatable or curable cancers: (i) support registries in developing countries to define the incidence, mortality, and survival rates of different types of cancers; (ii) mobilize more aid for the development of resource-level-appropriate guidelines for the management of treatable and curable cancers; (iii) boost the resources dedicated to NGOs that are working to adapt and develop lower-cost, less infrastructure-intensive breast cancer screening and diagnosis; and (iv) explore avenues for increasing “telepathology” programmes between developed-country public hospitals and developing countries.

With engaged United States and international leadership, more population and implementation research, and collaboration with private-sector and philanthropic

Figure 6: Percentage change in cervical cancer DALYs, 1990–2010



partners, progress on adapting these interventions for cost-effective, low-infrastructure use is possible in the near term (26).

Conclusion

Global health is in transition. The exotic parasites, bacterial blights and communicable diseases that have long occupied international health initiatives remain important but are declining in most countries. That is good news, but this epidemiological transition is not yielding the demographic and economic benefits that accompanied that transition in wealthier countries. Cancers and other NCDs are increasing in prevalence faster, arising in younger populations and having worse outcomes than in wealthy nations. Unless urgent action is taken, this emerging global health crisis will worsen and become harder to address.

These recommendations alone are not sufficient to stem the tide of NCDs in developing countries. Building health systems, allocating scarce resources, and enforcing public health laws and consumer protections are decisions for national governments alone. Yet the priorities of global health actors deeply influence those decisions. These recommendations would save lives, demonstrate the feasibility of progress on NCDs, and catalyze broader action. The time to act is now. ●

Thomas J Bollyky is the senior fellow for global health, economics, and development at the Council on Foreign Relations (CFR). He is also an adjunct professor of law at Georgetown University and consultant to the Bill & Melinda Gates Foundation. Mr Bollyky received his BA in biology and history at Columbia University and his JD at Stanford Law School.

Caroline Andridge is a research associate for global health, economics, and development at the Council on Foreign Relations (CFR). She received her BA in public policy at the University of Michigan-Ann Arbor.

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