

PUBLIC HEALTH IN TRANSITION

By Barry R. Bloom

5 *Chronic disorders such as heart disease and diabetes, once common only in the industrial nations, are now sweeping the rest of the globe. Meanwhile the threat of infectious diseases still looms large. New public health priorities are urgently needed.*

Not long ago Stephen Lewis, United Nations special envoy for HIV/AIDS in Africa, **toured** Zimbabwe. He **stopped** by an elementary school and **asked** the children what most troubled them. Their answers **were** revealing for their **bleakness**: seven out of 10 **replied**, "Death." Lewis then **traveled** to Zambia, where he **saw** fields of cabbages. He **asked** the villagers whether they had enough to eat. "Yes," they **told** him, "we even have cabbages to sell." "What do you do with your profits?" he **asked**. "We buy coffins," they **replied**.

For people in wealthy countries, **such stories** reinforce an image of the developing world, **one** in which death dominates the landscape. **Yet** that world, home to 83 percent of the planet's population, is a vast and diverse place. Across much of the globe, stereotypes of death ravaged countries no longer match reality. On every continent, a remarkable demographic transition is occurring: rural populations are **moving** to urban areas, women are **bearing** fewer children, and populations are **growing** older. **Accompanying this trend** is an epidemiological transition: countries undergoing rapid economic expansion, such as India and China, are now **confronting** health problems similar to **those** of the U.S.

In fact, many nations **have lessened** the impact of infectious disease and **improved** the health of their people by **providing** access to vaccines, clean water, basic medical services and good nutrition. People in most developing countries are living longer and increasingly dying not from infection but from the chronic conditions common among the aged: heart disease, diabetes and cancer. Today chronic disorders are the greatest contributor to the global burden of disease.

Infectious diseases are far from gone, **however**; they remain a threat not just to Africa but to all countries, **including** the U.S., where antibiotic resistance is a **growing** menace and where 45 million people, lacking health insurance, are vulnerable to readily treatable diseases. Threats from new infectious agents also draw the world's nations together. In this era of globalization, pathogens eschew national borders and can spread across the planet at jet speed. Indiscriminate in where they choose to settle, they represent a real danger to humanity, **one** that no nation can deal with by itself.

As a consequence, an extraordinary convergence is taking place. No longer is the world cleaved in two, with developing countries roiled by infectious disease and developed nations largely isolated from its scourges. **Healthwise**, the Northern Hemisphere and the Southern Hemisphere outside of sub-Saharan Africa are more alike than different.

Instead the world is divided along other lines. Within countries and within regions, the divisions between rich and poor, healthy and **diseased**, remain sharp. In the **poorest** nations, half the children die before age five. In parts of the U.S., the health disparities are also shocking. Native Americans living in certain parts of South Dakota can expect to die some 13 years before white Americans of the same age in parts of Minnesota. About 88 percent of white men in the U.S. reach age 65; only 76 percent of African-American men do.

In a world where great strides are being made in the prevention and treatment of disease, **such inequity** is morally **unacceptable**. **It** is also economically **unwise**. Poor health can retard economic growth, and good health can drive growth, stem poverty and promote social equity. **Moreover**, the costs of health problems in one place can spill into **others** (as the 2003 SARS outbreak in Asia demonstrated).

The gap between what we know about the new realities of public health and how we translate that knowledge into action is huge. Addressing the health problems of every country will require international cooperation and a global coordinating architecture that is not yet in place.

A Chronic Burden

A SHORT WHILE AGO mortality was the only measure used by the World Health Organization (WHO) to describe health. A person was either dead or alive. Those who were somewhere in between, suffering from ongoing illness or injury and often unable to work, were statistically invisible. Public health officials could neither track people affected by disability nor monitor the social and economic impact of their disorders.

With the help of sophisticated analytical tools, WHO now has a solid grasp not only of chronic disease but also of the hardships such afflictions impose on society. **Indeed**, the data it has **amassed**, so-called quality-of-life indicators, have **played** a key role in helping epidemiologists forecast trends, corral contagions, monitor patterns of disease and meaningfully compare the burden imposed by persisting conditions to **that imposed** by infectious disease. Having **such information** in hand enables countries to establish their health priorities.

Among the most powerful tools is an application of metrics called disability adjusted life-years, or DALYs. These statistics tabulate the number of healthy years lost to injury, illness, and premature death and can be **broken** down in numerous ways: by disease, region, age, gender and so on. By allowing the effects of disease to be accurately **tallied** and **tracked**, DALYs have **opened** a new era in preventive health care. In 1999, the first year for which DALYs were **collected**, some 56 million people **died** worldwide, but the equivalent of 1.4 billion healthy years were **lost** to survivable but disabling conditions-a far higher number than epidemiologists had predicted. Sub-Saharan Africa, home to only 10 percent of the world's population, **accounted** for 26 percent of the healthy years of life lost, largely because of infectious disease, especially HIV/AIDS.

DALYs also provide a stark analysis of unhealthy behaviors and the toll they impose on society. In the U.S., half of all deaths in any given year--some 1.2 million--are related to tobacco, alcohol, poor diet and lack of exercise. Worldwide, tobacco addiction alone kills some five million people a year and shackles millions more with heart, lung and circulatory problems. **And** obesity, which is reaching epidemic levels, contributes to coronary artery disease, diabetes, depression and a host of other serious conditions. **Moreover**, workplace-related deaths and injuries are skyrocketing in developing countries, where production goals and abundant labor too often compromise worker safety. **Although** exact numbers are hard to come by, the International Labor Organization estimates that on-the-job fatalities in China are five times more common than in the U.S. and that injury rates are considerably higher.

If current trends continue (barring unforeseen calamity), by 2020 global rates of infectious diseases, such as diarrhea, pneumonia and tuberculosis, **will** decline relative to chronic diseases. Mental illness, particularly depression (which accounts for relatively few deaths but much disability), **will** increase, occupying second place on the list of contributors to the world's burden of disease. Heart disease **will** hold first place, and, surprisingly, vehicular accidents **will** climb to third--being especially numerous in countries that lack (or poorly enforce) licensing, registration and inspection requirements. At the same time, rates of obesity, tobacco-related disease and industrial accidents **will** continue to ascend, threatening gains made elsewhere in health care.

Prevention Is Key

PREVENTION MUST BE paramount in the war against chronic and infectious disease. Not only is prevention more powerful than treatment in reducing morbidity and mortality, but simple strategies can also produce big gains. Consider the 2004 tsunami, a horrific calamity by any measure. Emergency help was badly needed, outbreaks of infectious disease loomed, and time was short. Public health officials feared a second round of deaths greater than **the first**. But by setting realistic goals and coordinating relief efforts, they were able to quickly amass the essentials--bottled water, vaccines, mosquito nets--and so thwart the spread of cholera, measles and dysentery. Ironically, when public health interventions succeed, as **they** did in the wake of the tsunami, there is little to show. Absence defines success in the public health realm.

Elsewhere, **targeted** efforts to bring vaccinations, antibiotics and nutrition to millions--along with **improved** sanitation--have dramatically **reduced** the number of deaths from infectious disease, as much as 60 percent in some regions. Today major immunization campaigns are under way to **meet** WHO's and the U.N. Millennium Development Project's goals of vaccinating all youngsters against childhood diseases, particularly in Africa. **Also**, countries such as India and China have **launched** National Immunization Days, with extraordinary results. In just one week in November 2004, 2.5 million volunteers **immunized** 167 million Indian children. In addition to prolonging life, vaccination makes tremendous economic sense. For every dollar the U.S. spends on diphtheria, pertussis and typhus (DPT) vaccines, an **estimated** \$29 is **saved** in medical costs; for measles, mumps and rubella (MMR), the return averages \$21--a bargain by any measure.

Prevention programs **targeted** at HIV/AIDS have also **been** highly effective in the U.S. as well as in Uganda, Thailand and Brazil. All prove that, with **concerted** effort, this disease can be **averted** and **controlled** on a national scale. The increasing availability of antiretroviral drugs, many now **provided** at cost by pharmaceutical companies, will keep people who are HIV-positive alive and, in offering hope, will increase interest in voluntary testing. By linking treatment to the prevention of transmission, these key strategies could help shift HIV infection from an invariably fatal disease to a chronic illness worldwide. But national leadership, educational programs, and a major effort to mobilize the people and the media are **needed**. Time is of the essence: HIV/AIDS is spreading not just across Africa but also throughout India, South Asia and eastern Europe.

Prevention efforts focused on chronic diseases associated with aging have **scored** some big successes, too. One need only look to the U.S., where over the past 20 years antihypertensive medications, along with diet and exercise, have **reduced** deaths from heart attacks and strokes by 50 and 30 percent, respectively. **Because** many key drugs for treating heart disease--aspirin, beta blockers, statins and ACE inhibitors--are now off-patent and thus relatively inexpensive, similar reductions could theoretically be **achieved** worldwide. And the Human Genome Project is helping to identify genes **associated** with health and disease **and** to assess genetic influences on responses to pharmaceuticals and environmental factors. **This research**, in turn, is **expected** to spawn a new era of **targeted** drugs and therapies, maximizing health care and improving the lives of those with chronic diseases.

For both adults and children, a critical approach to protecting health--albeit a politically difficult one--is combating tobacco use. Smoking is not an individual choice; it is an addiction. Powerful social pressures and advertising lure individuals into smoking. **And** physiology takes over from there: nicotine is one of the most addictive substances known. Governments must lead the charge, such as by mounting media campaigns aimed at preventing young people from starting to smoke and by enacting policies and laws that prohibit cigarette advertising and ban smoking in public places.

For children, two other preventive strategies would vastly improve health: feed those who are malnourished and provide them with vitamins and minerals; limit weight gain in **those** who are overnourished.

Prevention is obviously crucial as well in dealing with emerging infectious diseases; **it** is better to stop **them** before they begin to spread. A highly contagious pathogen traveling swiftly can render quarantine efforts ineffective. We need strong global as well as national surveillance systems capable of reacting quickly to perceived threats, systems that can recognize both naturally arising diseases and agents of bioterrorism.

We **also** need laboratories that can identify unknown microbes and health departments capable of multilateral communication and coordination. So far we have been lucky: recent outbreaks of new diseases--namely, SARS in Asia and Ebola in Africa--have been mercifully benign. But we must remain vigilant; **it** is only a matter of time before a decimating pathogen will make its appearance.

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