

Health

“Smallpox was the worst disease in history. It killed more people than all the wars in history. In the last century it killed 500 million people. In 1967 the World Health Organization embarked on what was an outrageous program to eradicate the disease... and in 1980 we declared the globe free of smallpox... Soon we may see the eradication of polio.”¹

Dr. Larry Brilliant, Physician, Epidemiologist, Former Director of Google.org.* Participated in the World Health Organization (WHO) Smallpox Eradication Program

“85 percent of the global disease burden for cardiovascular disease is in developing countries... yet 90 percent of the resources are in the ‘West.’ Who is at risk? Anyone who visits Africa... if you get chest pains, shortness of breath, sweating; you are having a heart attack. Will you fly back to the US, Europe? No. You will die.”²

Dr. Ernest Madu, Cardiologist and Clinical Investigator,
Founder of the Heart Institute of the Caribbean

These quotes of Doctors Brilliant and Madu reflect the dual-nature of changing health panoramas entering the 21st century. On the one hand there are the infectious diseases – resulting from the transmission of pathogens such as viruses and bacteria. And on the other are the slow-progressing, long-lasting or recurrent chronic diseases such as heart disease, stroke, cancer, chronic respiratory diseases and diabetes.

* Google.org is the charitable arm of Google – the Internet search engine company.

On the infectious disease side, smallpox was truly awful. A picture of an afflicted child covered from head to toe by the hideous blisters and hard, deep pustules has to be one of the most moving images you could ever see. With an overall mortality rate of 30–35 percent – and up to 80 percent in children – the airborne *Variola major* virus, once inhaled, showed no mercy. Malignant and hemorrhagic forms of smallpox were usually fatal. Throughout the world everyone from kings to paupers was terrified of the disease which attained deity of death status in some cultures. The mummified body of Ramses V of Egypt indicates death from smallpox. Those lucky enough to survive the onslaught of the invasive virus could be blinded or suffer limb deformities for life. The terrifically lucky were “just” covered with lifelong scarring. As recently as 1967, the WHO estimated that 15 million people contracted the disease.

To eradicate such a cruel killer and maimer really does indicate that human beings are, indeed, capable of amazing things. It was no mean feat, taking concerted and sustained effort, dedication and organization at a global level to outsmart such a sinister virus. Yet, we are also capable of complicating health issues. The disparity between the rich and poor worlds is an ever present factor in ensuring that some live in deplorable conditions in which they inevitably become sick, and others live sedentary or opulent lifestyles that are simply not healthy. With both rich and poor worlds providing the conditions for incubating new diseases and generating new health problems, our actions in this globally connected world also enable the rapid transmission of new diseases with transport and travel habits and the transfer of unhealthy lifestyle habits.

Thus, having accomplished incredible goals in health during the 20th century, new challenges are emerging that will present distinct threats and novel opportunities for improving health and extending well-being in the 21st century. In the World Economic Forum’s Global Risks Landscape 2011, the world’s leaders recognize the dual infectious and chronic disease battle fronts. Infectious diseases are perceived as likely to cause global problems within the next ten years and have an economic impact of over \$250 billion. Chronic diseases are deemed to be even more likely to present problems in the next decade, and with an even greater economic impact of nearly \$500 billion. In fact, chronic diseases are rated on a similar risk-impact level to that of global water security. Of course, such a cold assessment says nothing of the human suffering caused by either infectious or chronic health conditions.³

Before delving into the specific evolution patterns of infectious and chronic diseases, let's take a step back and ask the question: *What is health, and to whom should health-care be directed?* According to the constitution of the World Health Organization:

Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity. The enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being without distinction of race, religion, political belief, economic or social condition. The health of all people is fundamental to the attainment of peace and security and is dependent upon the fullest co-operation of individuals and states.⁴

Article 25, Paragraph 1 of the United Nations Declaration of Human Rights states that:

Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing and medical care and necessary social services.⁵

Yet, it is plain to see that we live in a world that still does not meet such high ideals. If health really is a human right, then why are so many people not covered by basic health-care systems? Is it the responsibility of the state? And in any case, how attainable is this ideal and how relevant is it?

The priority status given to – and the ensuing political and social controversy surrounding – President Barack Obama's healthcare reforms in the USA demonstrate the complex and emotional issues behind this topic. Issues of health and healthcare provision in the 21st century are fiercely debated across many countries. While the debates are very different in character depending upon the nation, or group of nations in question, certain things are the same. For example:

According to WHO, health is a top concern for citizens in all countries.⁶

When people are asked to name the most important problems that they and their families are currently facing, financial worries often come out on top, with health a close second. Of most countries, between 30 percent and

50 percent of populations cite health as the most important concern before other issues. In certain nations this proportion goes over 60 percent – perhaps corresponding to where good health cannot be taken for granted, such as Bangladesh and Uganda.

Despite the worldwide importance given by citizens to the issue of health, the divergence in quality and scope of healthcare access between nations is shocking. We are living in a bipolar world regarding healthcare, divided by a line called “wealth.” Citizens of those countries with a GDP per person in excess of \$20,000 – such as the western European and Scandinavian nations, Czech Republic, Slovenia, the USA, Canada, Japan, Taiwan, Hong Kong, South Korea, Singapore, Australia, New Zealand, Brunei, Israel, Kuwait, UAE, Qatar, Oman – can all expect to live beyond 75 years old.⁷

Yet, poor sub-Saharan countries with GDP per person of under \$2,000 – such as Zimbabwe, Congo, Central African Republic, Somalia, Burundi, Mali, Sierra Leone, Mozambique, Chad, Zambia, Lesotho, and Guinea-Bissau, have life expectancies of under 50. Violence and war will take their toll in some of these places, but poor health is probably the bigger underlying cause of death. For example:

Even in war-torn Iraq in 2009, the average life expectancy was still just under 70, while the poor health conditions in Afghanistan lead to life expectancy of under 45 years.

Perhaps even crueler in these poor countries are the statistics for children dying.

In the poor sub-Saharan states and Afghanistan over 200 children die before the age of 5 for every thousand live births. This compares with much less than 10 child deaths per thousand births for most rich countries.

With child mortality rates in developing nations of over ten times higher than in developed nations, there are many knock-on negative social and economic impacts. Such problems are exacerbated by the lack of availability of healthcare for the poor – often because it is beyond their financial reach or simply because there is inadequate infrastructure in place in poorer nations to institute improvement programs.⁸

It has been shown repeatedly that poverty is strongly correlated to low levels of general health. With poverty come many problems including lack of hygiene – and other social ills such as drug use and violence. Furthermore, poor countries often lack adequate healthcare systems and many lives are lost due to lack of treatment. Yet more lives are lost due to lack of proper mechanisms to contain the spread of infectious diseases. Nevertheless, even though things may look bad now, they were a lot worse before. In fact, there has been considerable global improvement. For example:

If children were still dying at the 1978 rates, there would have been 16.2 million deaths globally in 2006. In fact, there were *only* 9.5 million deaths as a result of better education, better drugs, improved access to water, better sanitation and improved antenatal care.

A good part of the improvements in worldwide health are due to greater allocation of funds towards healthcare related issues. According to the WHO *World Health Report*, the global health economy grew faster than gross domestic product (GDP) from 2000 to 2005. In absolute terms, adjusted for inflation, this represented a 35 percent growth in the world's expenditure on health. With such public and private healthcare investment there has been a tendency of convergence towards improved health in a large part of the world.

Yet, in both developed and developing nations, spending on health services most often benefits the rich more than the poor. In other words, the people with the most financial means, and whose needs for healthcare are often less, consume the most care. Those with the least financial means and, generally, with the greatest health-related problems, have access to the least care. Thus the substantial progress in health over recent decades has been deeply unequal between rich and poor in both developed and developing nations. Even more illuminating is that many are actually pushed into poverty *because* of healthcare costs:

Over 100 million people annually fall into poverty through paying for high healthcare expenses.

In addition, while several countries have, undoubtedly, made great improvements in health, others, particularly in the African region, have stagnated or even lost ground. On the one hand, many countries such as Oman, Mongolia and Morocco made significant improvements in reducing child

deaths of the under-5s, from over 150 deaths per 1000 children in 1975 to considerably less than 50 in 2006. On the other hand, poorer countries such as Zambia are increasingly lagging behind, and are still recording similar levels to 1975 at around 160 deaths per 1000 children under five.

The online resource Worldmapper claims to show “the world as you’ve never seen it before,” and certainly in terms of public and private health spending it lives up to the promise. Using WHO data, Worldmapper creates some perspective-challenging images that can only be likened to those “wibbly-wobbly” mirrors in fairgrounds... you know, the ones that make you look short and fat or tall and thin. By re-sizing the area of each country according to its total public or private healthcare expenditure the world as we know it changes form into something really rather grotesque. The Northern American countries, Europe and Japan take on a form of utter obesity for both public and private spending. The Latin American, African and Asian continents, on the other hand, become emaciated for private spending – and completely skeletal for public health spending.⁹

In most developed countries, especially the USA, western Europe and Japan, a combination of public and private systems of health insurance covers a substantial portion of the population. However, sustainability of these systems is always a matter of debate. For example, in the USA more than 46 million people are not covered by any form of health insurance. The rest of the population is covered under schemes which are placed under more and more stress.¹⁰

In the USA alone, government spending on healthcare is expected to double from \$1.6 trillion to \$3.1 trillion between 2002 and 2012.¹¹

Higher spending on health is generally associated with better outcomes in terms of lower infant mortality and increased life expectancy. Nonetheless, living for more years is not necessarily desirable if many of those extra years are spent suffering from poor health. What is more important is the concept that people live longer lives and in better states of health. A common measure used to summarize this healthy life expectancy is the “health adjusted life expectancy” (HALE). This is an estimate of the number of healthy years, free from disability or disease, that a person can expect to live based on current trends.*

* The average number of years spent in unhealthy states is subtracted from the overall life expectancy, taking into account the relative severity of such states.

Figure 11.1, the WHO *World Health Report* graph of HALE against total health expenditure highlights some insightful issues. Firstly, it confirms the general trend that increased spending leads to a longer, healthier life. Residents of those countries that spend the most on health – such as Sweden, Germany and the USA – also tend to have longer, healthy lives. For example:

Sierra Leone spends less than \$100 per person on healthcare and the result is an average healthy life expectancy of less than 30 years. Conversely, Sweden has a per capita health expenditure of over \$2,500 and the average health-adjusted life expectancy is over 70 years.

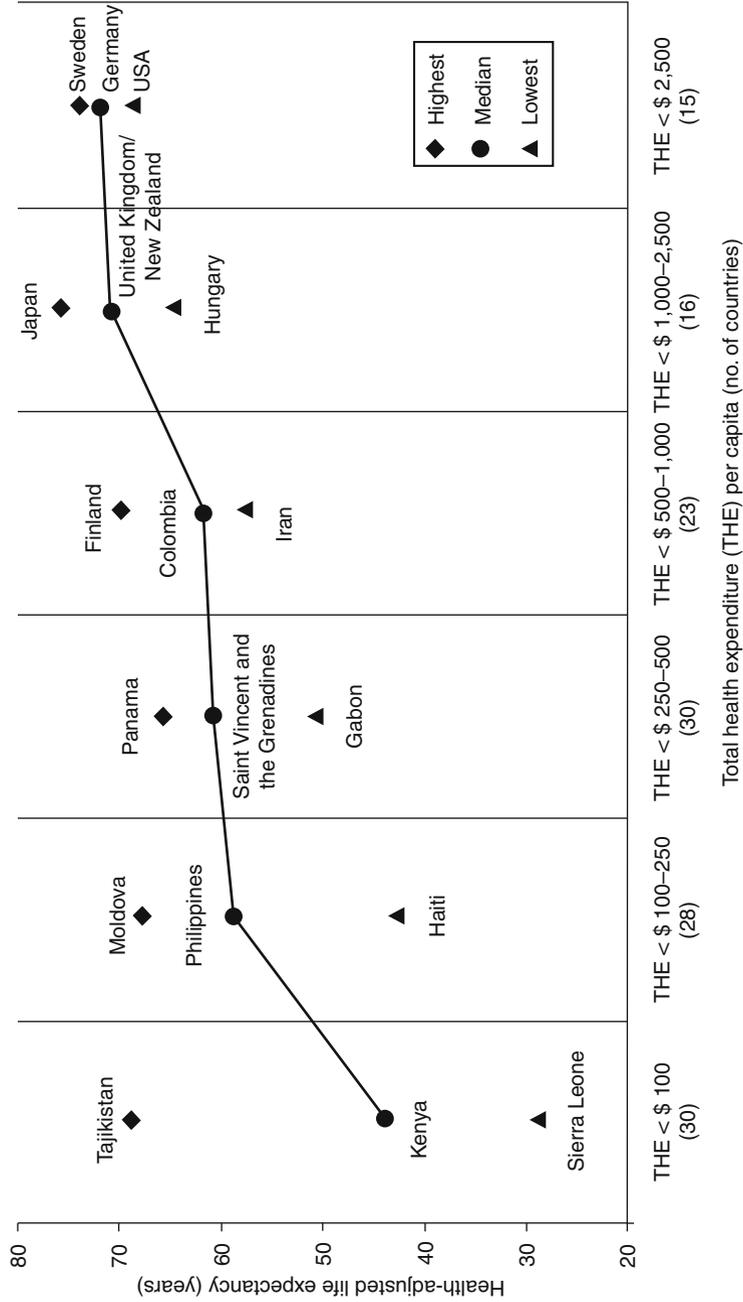
However, a second observation is that some countries appear to achieve longer, healthy lives with less expense. The best performing country, with average HALE exceeding 75 years, is Japan, which spends less than Sweden, Germany or USA. Even more pronounced is Finland, which manages to achieve an average HALE of 70 years – which is higher than that in the USA for at least \$1,500 less expense. Some other surprises can be seen, for example:

The average person in Tajikistan can expect to have an equally long and healthy life as the average American: about 69 years. But the level of healthcare spending is over 25 times higher in the USA.

Clearly, other factors are also at play such as diet and lifestyles. Nevertheless, as the WHO report states: “Such differences suggest that how, for what and for whom money is spent matters considerably.”

The WHO outlines several counter-productive issues and practices in the industrialized world that complicate the allocation of health spending. For example, there has been disproportionate focus of health expenditure on hospital treatment and curative services rather than primary prevention and health promotion measures that could prevent up to 70 percent of the burden in the first place. Also, the excessive sub-specialization of healthcare providers and the narrow focus of many health programs has become a major source of inefficiency that prevents more effective holistic approaches for continuing care. In OECD countries, the 35 percent growth in the number of doctors in the last 15 years was driven by rising numbers of specialists (up by nearly 50 percent between 1990 and 2005)– compared with only a 20 percent increase in general practitioners. Furthermore, as many as 25 percent of 65–69-year-olds and 50 percent

Figure 11.1: Health-adjusted life expectancy (HALE) and health expenditure



Source: *The World Health Report 2008*, WHO

of 80–84-year-olds in developed countries are affected by two or more chronic health conditions simultaneously. This creates higher levels of complexity for service delivery, which increases costs beyond the drugs or treatments themselves.

As a result of their differing healthcare contexts, profiles of major causes of death differ considerably between developing and developed countries. In high-income countries the top ten leading causes of death (with the number of people killed) in 2002 were: coronary heart disease (1.34 million); stroke and other cerebrovascular diseases (0.77 million); trachea, bronchus, lung cancers (0.46 million); lower respiratory infections (0.34 million); chronic obstructive pulmonary disease (0.30 million); colon and rectal cancers (0.26 million); Alzheimer's and other dementias (0.22 million); diabetes mellitus (0.22 million); breast cancer (0.15 million); stomach cancer (0.14 million).

In low-income countries the top ten killers are: coronary heart disease (3.10 million); lower respiratory infections (2.86 million); HIV/ AIDS (2.14 million); perinatal conditions* (1.83 million); stroke and other cerebrovascular diseases (1.72 million); diarrheal diseases (1.54 million); malaria (1.24 million); tuberculosis (1.10 million); chronic obstructive pulmonary disease (0.88 million); road traffic accidents (0.53million).

Therefore, both high- and low-income countries have something in common: the largely chronic conditions of coronary heart disease, respiratory infections, strokes and pulmonary disease are big killers of both rich and poor. Beyond these nonselective illnesses the main causes of death for the rich are other chronic conditions such as cancers, dementias, and diabetes (killing a total of 1.45 million). For the poor, nearly 2 million die around the period of childbirth (perinatal conditions); over 2 million of HIV/ AIDS and a total of nearly 4 million died in 2002 because of the other infectious diseases of diarrhea, malaria and tuberculosis.

Therefore, chronic diseases account for almost all deaths in developed countries, but these same conditions often kill more people in developing countries. In addition, poorer nations suffer high death tolls from potentially preventable infectious diseases.

Diarrhea, malaria and tuberculosis alone kill nearly as many poor as all the top ten rich country causes of death put together.¹²

* Relating to the period around childbirth, especially the five months before and one month after birth.

The fact that road traffic accidents are also a major killer in poor countries is alarming for other non-health related reasons.

Another important difference between the rich and poor is the age when people die.

In high-income countries 70 percent of deaths are among people over 70; 29 percent for those between 15 and 69; and 1 percent for children from 0 to 14. In low-income countries only 22 percent reach the age of 70; 44 percent die between 15 and 69; and an incredible 34 percent die before age 14.

As you would expect, the worst black-spots are in sub-Saharan Africa, but South Asia and the Middle East and North Africa also have high death rates in pre-14-year-olds.

To put these statistics into perspective in terms of percentage of global population: less than 14 percent of people live in high-income countries; whereas over 50 percent live in low-income nations. The remainder of around 36 percent live in emerging market, middle-income countries.

Clearly, infectious diseases remain a prolific problem – mainly in poorer countries where various poverty-related conditions conspire to undermine improvement efforts. Yet, as the history of smallpox shows, infectious diseases may be more common amongst the poor, but the rich are certainly not immune. Another example of the vulnerability of everyone to the spread of such diseases was the influenza pandemic between 1918 and 1920.

Within only 11 months of the outbreak of “Spanish flu” there were 20 million deaths. The total death toll rose to anywhere between 50 and 100 million – representing 3 to 6 percent of the world population. Young, *healthy* adults were the most susceptible. About 500 million people – or one-third of the world’s population – were infected as a result of increased travel as more rapid modes of transport made it easier for soldiers, sailors, and civilians to spread the disease.¹³

Transport systems and travel habits have become part of 21st-century lifestyles, and as such, risks of global infectious disease pandemics are heightened. A significant portion of healthcare coverage by the media in the past decade has been related with spread of infectious diseases. In the last ten years, there were several outbreaks of viral infectious diseases including SARS

in 2003, H5N1 “avian” flu in 2008, and H1N1 “swine” flu in 2009. All of these diseases originated in poorer nations, but many people were surprised by the global reach and speed of transmission, as carriers of the virus travelled in airplanes to other parts of the world. The WHO confirmed that few countries escaped without any H1N1-related deaths.¹⁴

In the USA alone, the Centers for Disease Control and Prevention (CDC) estimate that between 43 million and 89 million cases of H1N1 occurred between April 2009 and April 2010. During this time there were between about 195,000 and 403,000 H1N1-related hospitalizations and between about 8,870 and 18,300 H1N1-related deaths.¹⁵

In August 2010, the WHO declared the H1N1 pandemic over and these diseases to be largely under control. In retrospect, some questioned the seriousness of the H1N1 outbreak when compared with seasonal flu, which claims between 250,000 and 500,000 lives worldwide each year.¹⁶ Yet the issue of pandemics remains high on many experts list of concerns. In the Centers for Disease Control and Prevention paper relating recent infectious disease outbreaks to the Spanish flu pandemic, the authors (Taubenberger and Morens) state that:

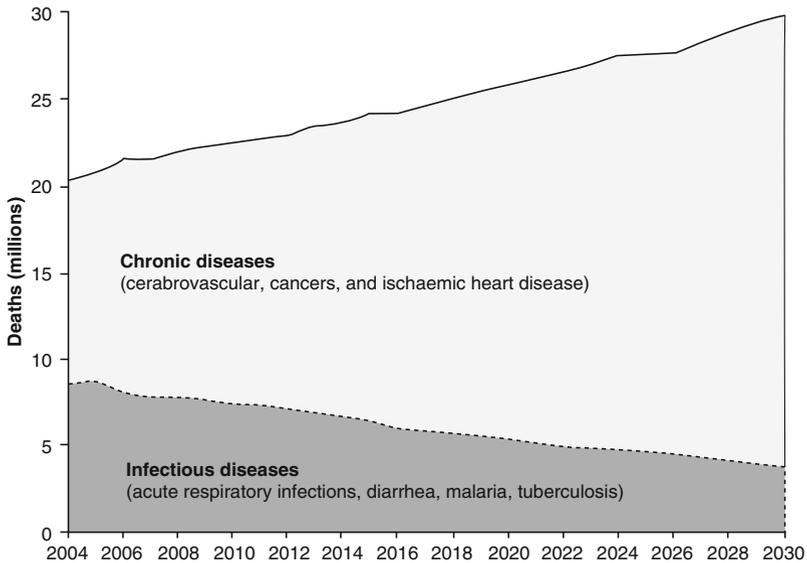
Even with modern antiviral and antibacterial drugs, vaccines, and prevention knowledge, the return of a pandemic virus equivalent in pathogenicity to the virus of 1918 would likely kill >100 million people worldwide. A pandemic virus with the (alleged) pathogenic potential of some recent H5N1 outbreaks could cause substantially more deaths.

Therefore, infectious disease pandemics originating in poor countries and rapidly spreading to the rest of the world remain a significant global threat.

Nevertheless, at present chronic diseases still constitute the lion’s share of mortality, representing 60 percent of worldwide deaths. In 2005, 35 million people died from chronic disease.¹⁷

According to the WHO *World Health Report*, increasing levels of urbanization, aging populations and globalized lifestyle changes will combine to make chronic and noncommunicable diseases – including depression, diabetes,

Figure 11.2: Past and predicted impact of chronic and infectious disease 2004–2030



Source: *The World Health Report 2008*, WHO

cardiovascular diseases, cerebrovascular diseases and cancers – increasingly important causes of morbidity and mortality worldwide. Figure 11.2 shows the forecast future Global Trend towards increasing impact of such chronic and noncommunicable health conditions. Over the last few decades there has been an increase in deaths from chronic and noncommunicable conditions of cancers, heart failure and stroke, and the forecast is for this trend to continue. After all, by 2050, the world will count 2 billion people over the age of 60, around 85 percent of whom will be living in today’s developing countries, mostly in urban areas.

In contrast to an increasing number of deaths from chronic disease, the forecast is for a Global Trend of decreasing impact of infectious diseases such as acute respiratory infections, tuberculosis, malaria and diarrheal diseases as general living conditions and access to adequate healthcare systems are expected to improve across the globe. However, this could be a dangerous

assumption if continued efforts are not made to fight such tenacious diseases in poor countries.

Such past and forecast trends towards a greater burden of chronic diseases have affected levels of drug research and development (R&D). Total global financing for health R&D exceeded US\$ 160 billion in 2005: with the private for-profit sector accounting for 51 percent of this, the public sector 41 percent and the private not-for-profit sector 8 percent. A 2009 study for the WHO indicated that within governments and pharmaceutical companies, the amount spent on research and development of noncommunicable diseases (NCD) was consistently about double the amount spent on communicable diseases (CD).*

In 2008, of all drug R&D projects in the top ten pharmaceutical companies by revenue, 84 percent were NCD-related and 15.3 percent were CD-related.¹⁸

The public sector has a similarly high level of R&D effort towards NCDs: cancer drugs constitute 31.5 percent of drugs in development; mental health drugs 22.4 percent and cardiovascular disease drugs 11 percent of relevant projects. Publicly funded cancer research alone absorbs the equivalent of – or more than – what flows into research for all CDs. Within the private not-for-profit sector, NCDs are also widely covered by charity funding, while CD funding remains almost exclusively in the realm of private foundations. Of the 2,900 medicines in development in 2008, only 13 were for tropical infectious diseases.

As a result of such skewed R&D funding towards chronic diseases and NCDs, there are concerns that the current system of drug development is neglecting diseases of the poor, and can be blamed for inequalities of health-care between developed and developing countries. Worse still, such distortions in drug development could result in losing the battle against certain infectious

* The terms NCD and CD approximately correlate to the respective terms ‘chronic disease’ and ‘infectious disease’ and are often used interchangeably. NCDs include chronic, long duration and generally slow progression conditions such as heart disease, stroke, cancer, asthma, diabetes, osteoporosis, Alzheimer’s disease and others. Yet NCDs are distinguished by their non-infectious cause. Not all chronic diseases are NCDs: for example, HIV/AIDS is a lasting medical condition requiring chronic care management, but is caused by transmissible infections.

diseases in poorer nations – especially in the light of increasing resistance of some diseases to existing drugs. For example, the primary drugs for tuberculosis are over forty years old and are quickly losing their effectiveness. Multidrug-resistant tuberculosis is already running rampant in endemic areas, and without badly needed novel compounds, it will continue to spread.¹⁹ Even when effective compounds are found, inadequate funding for appropriate roll-out can severely restrict effectiveness – as was the case with artemisinin and malaria.²⁰

Drug development costs have increased considerably over the last decades as there has been a greater use of high-cost services and procedures. For example:

The average cost to bring one drug to the market in 2010 was \$1 billion, although other studies have results ranging from \$500 million to \$2 billion.

With such high development costs, pharmaceutical companies are keen to recoup investments as fast as possible once a drug is launched. This is especially true since the clock is ticking with patent lives of around 20 years – 10 to 13 of which are spent in drug development. In order to recoup investment and return a profit within the available time-frame, large affluent markets are ideal targets. In addition, it is less risky for companies to develop drugs for which there is already a known and increasing demand. It would seem that there is often little financial incentive for pharmaceutical companies to develop drugs for relatively poor markets, and “non-profitable” diseases that are predicted to decline. Such a model of drug development leads to a reduced realm of innovation and serving the same wealthier customers, leaving many important areas of healthcare without improved treatments.^{21, 22}

The issue of patents is a particularly sensitive one. Extending patent lives gives more protection to drug developers and therefore a greater incentive to develop novel treatments. However, a delayed patent expiry also means a more expensive drug for a longer period of time before generic drug producers can legally produce a lower cost version. Higher patented-drug costs are borne by those who need the drugs. As a result, in developing countries, there has been strong pressure from interest groups and even the government to abolish patents and allow earlier low-cost generic production of certain drugs.

One example of this has been with antiretroviral drugs for the treatment of AIDS. According to the charity AVERT:

The availability of cheaper generic antiretroviral drugs has been instrumental in treating around 5.25 million HIV/ AIDS sufferers in low- and middle-income countries.

Such actions create strong disincentives for pharmaceutical companies to develop or market drugs in poorer countries. As such, many of the newer, more effective drugs are only available in richer nations where AIDS has passed from being a death sentence to a chronic illness. The same cannot be said of developing countries, where AIDS remains a big killer: sub-Saharan Africa alone still has two-thirds of AIDS patients, and prevalence rates in the area are six times that of the rest of the world.^{23,24}

As a result of such complex relationships between governments and pharmaceutical companies, development of drugs for many infectious diseases seems to remain largely the domain of foundations and charities. Some of the world's richest individuals have dedicated their fortunes towards charitable health initiatives, such as the Bill and Melinda Gates Foundation, Medicines for Malaria Ventures, and the Global Fund to Fight AIDS, Tuberculosis and Malaria. The resulting treatments sometimes have the benefit of an accelerated approval process with regulatory authorities. However, barriers to effective development and roll-out of such drugs still include bureaucracy, inefficient distribution of funding, and improper incentives. Where certain pharmaceutical companies have been working towards developing drugs for diseases that afflict developing countries, this seems to be more a gesture of corporate citizenship – either self-inspired or the result of government pressure – rather than an integral part of financially motivated corporate strategy.

In the corporate chase for profits in established, low-risk and wealthy markets, a heavily disproportionate amount of money is spent developing and marketing drugs that essentially serve the same function. Much of the advertising for drugs is for treatments for diseases of the affluent or for non-life-threatening diseases. One particular trend is the increased exposure of drugs in the public. Some of the best-known drug brands in the world are for non-life-threatening diseases many would not consider entirely necessary. They are known because they are heavily advertised, whether explicitly in media, or as references. One example is the increase of direct-to-consumer drug advertising in the United States. It has opened debates

over the effectiveness of advertising, as well as ethical and economic implications. Viewers of drug adverts may request that doctors prescribe them more expensive drugs when cheaper or more effective alternatives are available.

Several questions arise from such practices: Is it wise to shift the decision making from the expert to the patient? Does superficial advertising confuse the patient rather than create understanding of the implications behind taking these drugs? Do such actions encourage the dependence or abuse of certain drugs? Such issues have potentially profound social implications.²⁵

Threats and opportunities

What appears to emerge from the current picture of market-based healthcare activity is an increasing focus upon R&D and marketing directed at treatments for the established, wealthy markets of developed nations. This potentially leaves diseases of the developing world behind, further increasing the already considerable divergence between rich and poor worlds. With such current health scenarios, there would appear to be huge challenges to be faced before the WHO and UN human rights objectives of “health and well-being for everyone” can possibly become a reality of the 21st century.

Furthermore, the nature of health problems is changing in ways that were only partially anticipated, and at a rate that was wholly unexpected, as a combined result of global aging, the effects of urbanization, globalized lifestyle changes, accelerated worldwide transmission of communicable diseases, and the increased burden of chronic and noncommunicable disorders. The WHO World Health Report *Primary Health Care: Now More Than Ever* indicates that several other Global Trends in climate change, food security, social tensions will all have definite, but largely unpredictable, implications for health in the years ahead. Economic and political changes will challenge state and institutional roles to ensure access, delivery and financing of healthcare. Technological developments are creating new market opportunities, but are also driving increasing expectations for higher quality and longer-lasting health services.

According to the WHO, health systems seem to be drifting from one short-term priority to another, increasingly fragmented and without a clear sense of direction. As the WHO report states:

Today, it is clear that left to their own devices, health systems do not gravitate naturally towards the goals of health for all through primary health

care... Health systems are developing in directions that contribute little to equity and social justice and fail to get the best health outcomes for their money. Three particularly worrisome trends can be characterized as follows: health systems that focus disproportionately on a narrow offer of specialized curative care; health systems where a command-and-control approach to disease control, focused on short-term results, is fragmenting service delivery; health systems where a hands-off or laissez faire approach to governance has allowed unregulated commercialization of health to flourish.

These trends fly in the face of a comprehensive and balanced response to health needs. In a number of countries, the resulting inequitable access, impoverishing costs, and erosion of trust in healthcare constitute a threat to social stability.

Clearly, public policy has a huge role to play in addressing such issues. Yet, as the *World Health Report* points out:

Despite the benefits and low relative cost of better public policies, their potential remains largely underutilized across the world. One high-profile example is that only 5 percent of the world's population lives in countries with comprehensive tobacco advertising, promotion and sponsorship bans, despite their proven efficacy in reducing health threats, which are projected to claim one billion lives this century.

The health sector's approach to improving public policies has been singularly unsystematic and guided by patchy evidence and muddled decision making – not least because the health community has put so little effort into collating and communicating these facts. For all the progress that has been made in recent years, information on the effectiveness of interventions to redress, for example, health inequities is still hard to come by and, when it is available, it is confined to a privileged circle of concerned experts. A lack of information and evidence is, thus, one of the explanations for under-investment.”

To come close to accomplishing the WHO and UN human rights goals in the 21st century, several threats need to be addressed. Given the challenges we face on both infectious and chronic disease fronts, concerted efforts are needed to ensure medical innovation does not decline and is undertaken for

the benefit of all. A recent trend has been for mergers and acquisitions of small biotech companies by large pharmaceutical companies to restock dwindling R&D pipelines, potentially reducing innovation in the industry overall. In the wake of drug recalls in the past decade, regulatory authorities are considering drug application submissions with more scrutiny, potentially leading to fewer drugs being released in the market.²⁶

Without continued drug innovation, increased drug resistance could become a big 21st-century threat. Pathogens that cause diseases mutate and develop resistance to drugs over time, but such drug resistance is often hastened greatly by improper administration, improper adherence, or overuse of treatment regimens. As well as drugs for treating infectious diseases such as malaria and tuberculosis, several classes of important antibiotics – 70 percent of which are widely misused as growth promoters in animal feeds – are at risk of becoming ineffective in dealing with resistant “superbugs.”²⁷

Demographic changes will increase the burden on public and private insurance and health delivery systems since the globally aging population is more likely to suffer from multiple chronic conditions. Further strain will be imposed by increasing numbers of children being treated with emerging conditions such as obesity, attention deficit hyperactivity disorder (ADHD), allergies and diabetes. In fact, in the USA in recent years drug spending for child illnesses has increased four times faster than general medication spending.²⁸ Without adequate measures, increasing levels of urbanization, sedentary lifestyles and new eating habits are likely to lead to further increases in existing chronic illnesses, the emergence of new medical conditions and increasing burdens on healthcare services. Ultimately, with a smaller working-age population to pay for them, the sustainability of the increasingly stretched existing insurance and delivery systems will be brought into question.

If existing systems do not evolve to deal with such challenges, costs will spiral, medical care will suffer and the health of society will be jeopardized. Without changes in the way that the current biased healthcare systems work, inequalities are likely to become more pronounced, leaving a greater proportion of the world’s poor – both in developed and developing world – with health problems. As with a lack of economic opportunities for the underprivileged, if healthcare delivery systems continue to neglect those that need most care, there is clear potential for social unrest, especially if increasing numbers of people are forced into poverty through paying for ever-more-expensive treatments.

Several trends stand in the way of improving the efficiency and efficacy of healthcare systems in the face of new challenges. Increasing levels of sub-specialization, hospital treatment and curative services – at the expense of more cost effective holistic primary prevention and health promotion approaches – seems to be going in the wrong direction. With increased globalization and travel come increased risks of disease transmission and pandemics – especially if half of the world’s population lives in conditions that are ideal for incubating and creating new infectious diseases. With recent outbreaks such as the H1N1 virus, many health infrastructures were found wanting. In the face of more severe outbreaks, there is the risk of failing international health systems unless steps are taken: firstly to reduce the possibilities of such outbreaks; and secondly to have adequate measures in place should they occur.

Thus there are many challenges to overcome in improving global health. Nevertheless, these challenges point the way to a number of opportunities: actions to mitigate the above threats in themselves represent opportunities to work towards a healthier world. In addition, there are several specific opportunities for governments, businesses and individuals to improve the outlook for future health.

Governments and businesses have a social responsibility to work together to ensure the continued innovation of appropriate drugs. Of course profits for private companies are crucial. However, without doubt, more efforts could be made to funnel greater investment into projects benefitting the poor, aimed at eradicating further grotesque illnesses and, in the process, ensuring less potential spread of such diseases to wealthier regions. Generous donations from the wealthy will always be welcome in doing battle with infectious diseases, however, for-profit businesses could probably shoulder a greater proportion of the burden than they currently do. Ultimately, it is not to anyone’s benefit to have a world in which access to curing drugs is limited for the poor majority. With courageous and intelligent leadership, there will be ways of accomplishing the noble WHO and UN human rights goals without compromising healthy corporate profitability. A good place to start has to be working to rid the world of the scourge of various potentially eradicable infectious diseases, such as polio.

Other significant opportunities lie in improving infrastructure in developing countries to remove various causes of poor health to start with. Access to fresh water eliminates water-borne diseases such as cholera. Reducing the incidence of malnutrition and hunger improves general health of the population thereby reducing incidences of opportunistic infections. Other proactive steps such as

the distribution of insecticide-treated mosquito nets – along with appropriate education on their use – can be cheaper than drug administration and ensure less of a disease burden on the society and economy of the nation.

Clearly, there are huge opportunities in terms of driving more cost-effective and efficient health delivery systems. A greater focus upon more effective holistic approaches of primary care, prevention and health promotion that can eliminate up to 70 percent of health problems in the first place has to be sensible. Improving general education towards avoiding health pitfalls can achieve a lot. After all, widespread educational campaigns relating to awareness of AIDS have been successful for many countries in containing the spread of the illness.

Working to reduce child mortality and to extend “healthy life expectancy” represents big opportunities beyond ethical considerations. Such issues are extremely important to the long-term prosperity of a country. Those nations – both developed and developing – that spend wisely on improving healthcare systems have the opportunity to reap the social and economic benefits from a more productive working population. Longer healthy lifespans have positive impacts on society as adults can care for future generations. Breaking the cycle of parents dying young in developing countries could have huge impact in many areas. Making sound investments and decisions in healthcare to look after the growing youthful populations in developing nations, could lead to a closing of the gap between rich and poor nations. Of course, with increased lifespans and expectations for quality of life come a multitude of increased business opportunities. For pharmaceutical companies, there will always be opportunities to develop new drugs and treatments that further extend and improve the quality of life. For individuals, a long, happy and healthy life is what we all seek.

The inequality of healthcare access has led to two different worlds, which need to be tackled in different ways. The current system of healthcare development, which strongly favors the rich, contributes to the divergence of these two worlds. In developed countries, citizens have access to expensive, cutting-edge medical treatments for diseases which many would question as strictly necessary. In contrast, millions of people in developing countries die each year due to lack of access to the most basic treatments for diseases that developed countries have largely forgotten.

We need to rise to the challenge of eradicating nasty existing infectious diseases, such as polio, as well as reducing the potential for worldwide

transmission of new ones. If this can be achieved, there is tremendous potential for convergence of global healthcare as developing countries follow the same health trends towards more chronic conditions. With the combined efforts of the world focused upon dealing with a reduced set of illnesses, overall health can only improve. The example of smallpox eradication offers considerable cause for future optimism. Policy-makers, business leaders and motivated individuals have already shown that, with effort, they can work together to banish cruel diseases to the history books, as well as find new ways of treating emerging illnesses. If such efforts can be sustained into the 21st century, this can only improve overall social and economic development, and lead to more sustainable business models and rewarding lives.

Beyond diseases and lifestyles, there is another group of factors that can have a sudden and massive negative impact upon the health and well-being of individuals, businesses and societies: natural disasters. These are the topic of the final Global Trend.