



Essay 3

Health in the Tropics

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Key Messages

- Life expectancy has increased in the Tropics over the last 50 years
- Non-communicable diseases now account for more global deaths than infectious diseases, but infectious diseases still kill two thirds of people in sub-Saharan Africa.
- Major global initiatives to control or eradicate a number of high burden infectious diseases, such as malaria, TB and NTDs mean that this trend towards NCDs should accelerate throughout the Tropics in the next decade.
- Resistance to front line interventions may become a constraint to progress unless the pipeline of new interventions is refreshed.

- Our ability to generate accurate data with which to monitor progress and drive initiatives is a major issue that needs to be addressed.

Introduction

Health is an essential requirement for all individuals. Poor health has a detrimental impact on an individual's quality of life and productivity. Across the world there are major disparities in life expectancy, causes of mortality, and risk factors in health that are linked to environmental, social and economic factors.

The World Health Organisation (WHO) collates global data according to income or WHO region rather than tropical or non-tropical. These data highlights the obvious inequalities in many

health indicators between high, middle and low income countries. As a significant proportion of low and middle income countries are in the Tropics, this variation is quite obvious when health indicators across tropical and non-tropical regions are compared. While these disparities are well documented, there is evidence the gap is narrowing for a number of key health indicators. The improvements are driven by economic development, increased advocacy and funding for tackling a number of major infectious diseases that are preventable and treatable, and increased political will to achieve key performance indicators that drive major improvements in health, both internationally and nationally. This overview outlines the major progress achieved in the last decade and the underlying agents for change. Major beneficial shifts in health can readily be tracked by monitoring shifts in life expectancy and

Table E3.1 Major causes of mortality 2000 – 2011.

Mortality cause	Low income	Lower middle income	Upper middle income	High income	World
1	Lower respiratory infection	Ischaemic Heart Disease	Stroke	Ischaemic Heart Disease	Ischaemic Heart Disease
2	HIV/AIDS	Stroke	Ischaemic Heart Disease	Stroke	Stroke
3	Diarrhoea	Lower respiratory infections	Chronic Obstructive Pulmonary Disease (COPD)	Lung Cancer	Lower respiratory infections
4	Stroke	COPD	Lung Cancer	Alzheimers	COPD
5	Ischaemic Heart Disease	Diarrhoea	Lower respiratory infections	COPD	Diarrhoea
6	Premature birth	Premature birth	Road injury	Lower respiratory infections	HIV/AIDS
7	Malaria	HIV/AIDS	Diabetes	Colon Cancer	Lung cancer
8	TB	TB	Liver Cancer	Diabetes	Diabetes
9	Malnutrition	Diabetes	Hypertensive heart disease	Hypertensive heart disease	Road Injury
10	Birth Asphyxia or trauma	Road injury	Stomach cancer	Breast Cancer	Premature birth

Source: WHO (2013)

causes of mortality. Improvements in quality of life through improved health are harder to quantify accurately at scale.

Life Expectancy

Life expectancy is covered in detail elsewhere in the State of the Tropics, and reports that between 1950 and 2010 the gap between life expectancy in the Tropics and the Rest of the World has narrowed. Over this period life expectancy in the Tropics increased by 22.8 years to 64.4 years and infant mortality reduced by 36%. The rate of change of mortality and morbidity has increased over the last two decades influenced by a range of different factors.

Underlying life expectancy data are aggregated data, collected by the WHO to document the

changing patterns of mortality. Table E3.1 provides the top ten causes of mortality in rank order over the last decade.

Non-communicable diseases (NCDs) accounted for two-thirds of global deaths in 2011 and infectious diseases for one-third. In 2000 the relative proportions were 60% NCDs and 40% infectious diseases. This rapid shift reflects the massive scale up in recent efforts to prevent and treat a number of major infectious diseases.

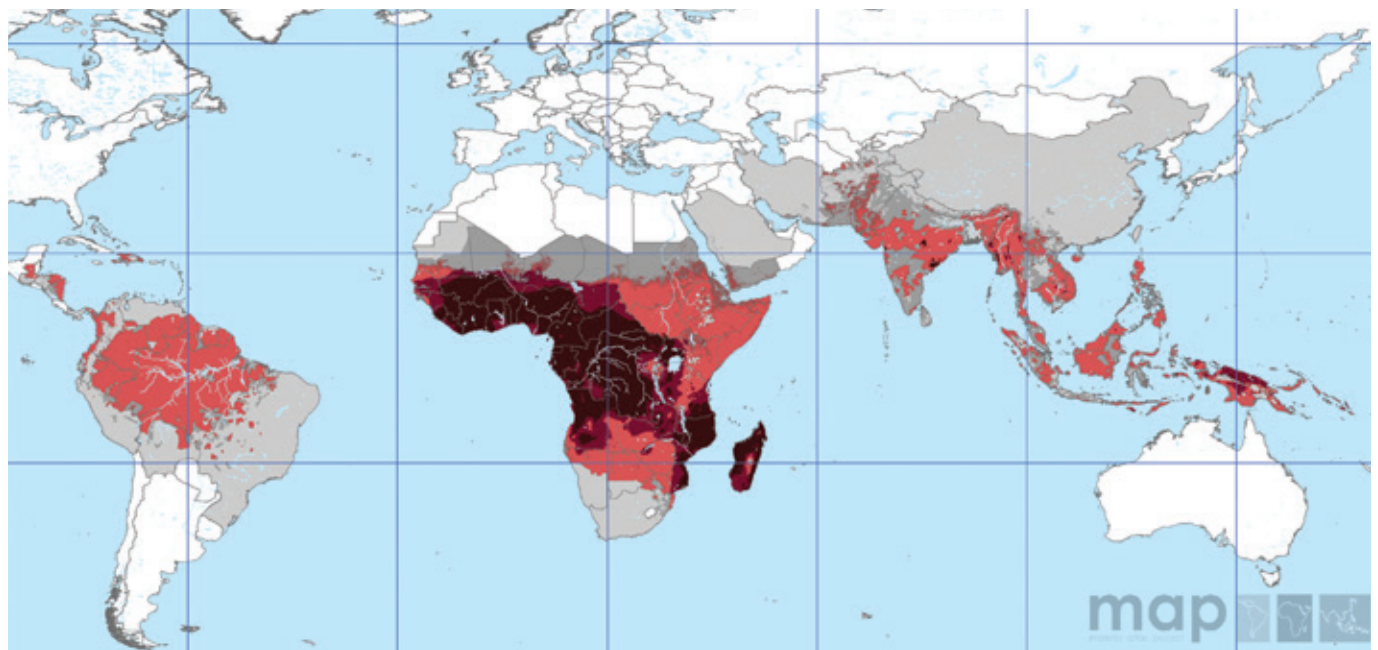
Although improvements in maternal and child mortality have been made these still remain unacceptably high. In 2011, 6.9 million children under the age of five died, 99% of these in low and middle income countries. Malaria, despite the enormous scale up in control activities still accounted for 14% of the under-five mortality in the Tropics.

There are differences in the age at which mortality occurs stratified by income. In high income countries 70% of deaths occur in the over 70s and only one in 100 occurs in an individual under 15 years of age. In low income countries 40% of deaths occur in individuals under 15 years and 20% in those over 70. The differences are predominantly due to the higher burden of infectious diseases and lower levels of access to appropriate maternal, neonatal and child health care. Efforts are being made to address these issues in many countries.

Infectious diseases

A number of infectious diseases occur at high levels in many parts of the Tropics. Many of these diseases are transmitted by insect vectors such as mosquitoes, sandflies or blackflies, and are ideally suited to transmission in warm, high

Figure E3.1 The spatial distribution of *Plasmodium falciparum* malaria stratified by endemicity class in 2010.



Source: Malaria Atlas Project (2014).

humidity environments. The spatial distribution of these diseases in some cases is now confined to the Tropics (see Figure E3.1 for *Plasmodium falciparum* malaria endemicity) and is largely driven by climate, as illustrated in Figure E3.2 for *P. vivax* malaria. Prevention of transmission of these diseases is significantly more difficult in the Tropics than in more temperate climates at the limits of the disease distribution. However, the figures, particularly in South East Asia and Latin America where the intensity of transmission of *P. falciparum* malaria has fallen dramatically despite having suitable climates for transmission, are encouraging.

The big three infectious diseases, AIDS, tuberculosis and malaria, are all preventable and treatable. The success rates of prevention and treatment for these diseases have been variable across the Tropics.

HIV

Improvements in HIV treatment have been dramatic since the HIV epidemic was first recognised in 1981. Individuals infected with HIV are now able to have relatively normal lives with access to the correct drugs and treatment regimes, but social stigma associated with HIV, inability to access treatment, sub-standard and/or counterfeit drugs entering the supply chain, and the potential of resistance developing to first line treatments are major threats to long term HIV prevention and treatment.

There were an estimated 35 million people living with HIV in 2012. As access to anti-retroviral therapy in low and middle income countries has improved, with 9.7 million people in these countries receiving treatment in 2012, the population living with HIV will continue to grow as fewer people die as rapidly from HIV and AIDs related causes. Expansion of long term treatment programmes, many with imperfect drug distribution channels and poor compliance will inevitably increase the rate at which resistance to essential HIV drugs is acquired.

While challenges persist in preventing new

infections, there are opportunities to dramatically lower HIV incidence. These represent a mixture of drug treatment for those who are infected and behaviour change and prophylactic treatment for those at greatest risk. Antiretroviral therapies can reduce the risk of HIV transmission by as much as 96%, voluntary medical male circumcision by approximately 60%, pre-exposure antiretroviral prophylaxis by more than 40% among men who have sex with men and by 49% among people who inject drugs. The success with which these changes can be implemented will be highly variable given the highly heterogeneous nature across nationalities, cultural groups and their customs and practises.

HIV remains a major issue in the Tropics although in many countries there have been dramatic improvements over the last decade. This has been underpinned by better access to voluntary counselling and testing and high level advocacy for improved access to appropriate and timely treatment. Across sub-Saharan Africa, many countries have reduced HIV prevalence among young people (15–24 years), with HIV prevalence among young women and men falling by 42% from 2001 to 2012. However, HIV prevalence among young women remains more than twice as high as among young men throughout sub-Saharan Africa. Trends are mixed elsewhere, with the Caribbean experiencing substantial declines, but with no clear downward trend apparent in the Middle East or North Africa.

The epidemic continues to have a profound effect on female, male and transgender sex workers. Globally, female sex workers are 13.5 times more likely to be living with HIV than other women. In Uganda, Swaziland and Zambia, 7–11% of new infections are attributable to sex workers, their clients and clients' regular partners. HIV prevalence among sex workers varies across the world, from 22% in Eastern and Southern Africa (eight countries) and 17% in Western and Central Africa (17 countries) to less than 5% in all other regions. These surveys are typically conducted in capital cities and are not nationally representative, so the findings may not be applicable to the entire

population. Such problems with data capture, analysis and extrapolation are common across the health sector.

While these downward trends are promising, increased political commitment and strategic action are still needed to reduce the number of adults who acquire HIV sexually. Globally sexual transmission will not be halved by 2015. In particular, key HIV prevention programme elements – including social-behavioural approaches, condom and lubricant promotion, male circumcision and HIV prevention programmes focused on key populations, such as men who have sex with men and sex workers – need to be scaled up and strategically combined to maximise the impact of finite funding and continue to drive down the rate of new infections.

Tuberculosis (TB)

TB is a major global health problem which has seen a resurgence in many countries. In 2012, an estimated 8.6 million people developed TB and 1.3 million died from the disease (including 320,000 deaths among HIV-positive people). Twenty-two high burden countries, many of which are in the Tropics, account for 80% of worldwide TB cases.

Estimates of TB infections have changed substantially since the 1990s, mainly with the recognition of the link between HIV and TB. In 1997 incidence per capita was highest in sub-Saharan Africa at 259 per 100,000 people. South East Asia had the highest number of cases (2.95million), followed by the Western Pacific (1.96 million). Africa had the highest rates of HIV cases that are co-infected with TB (1.2%) and the highest number of TB cases that were HIV positive (32%).

Resistance towards the drugs used for TB treatment is a threat to sustainable progress in driving down TB rates. There are internationally agreed targets for diagnosis and treatment of multidrug-resistant TB (MDR-TB), and new diagnostic technologies that are being rolled

out into resource poor settings to facilitate this. Despite these technological improvements, in most countries with a high burden of MDR-TB, less than 25% of the people estimated to have MDR-TB were detected in 2012.

Malaria

Malaria, which can be caused by infection with several *Plasmodium* parasites, has been a major cause of mortality and morbidity in the Tropics for centuries. Since 2000 expansion in the funding and coverage of malaria control operations has reduced malaria related incidence and mortality. Between 2000 and 2012 malaria mortality rates fell by 42% in all age groups and by 48% in children under 5. Malaria transmission still occurs in 103 countries, of these 59 have managed to reverse the trend of malaria

incidence and 52 are on track to meet the Roll Back Malaria and World Health Assembly targets of reducing malaria incidence rates by 75% by 2015 compared to the 2000 baseline.

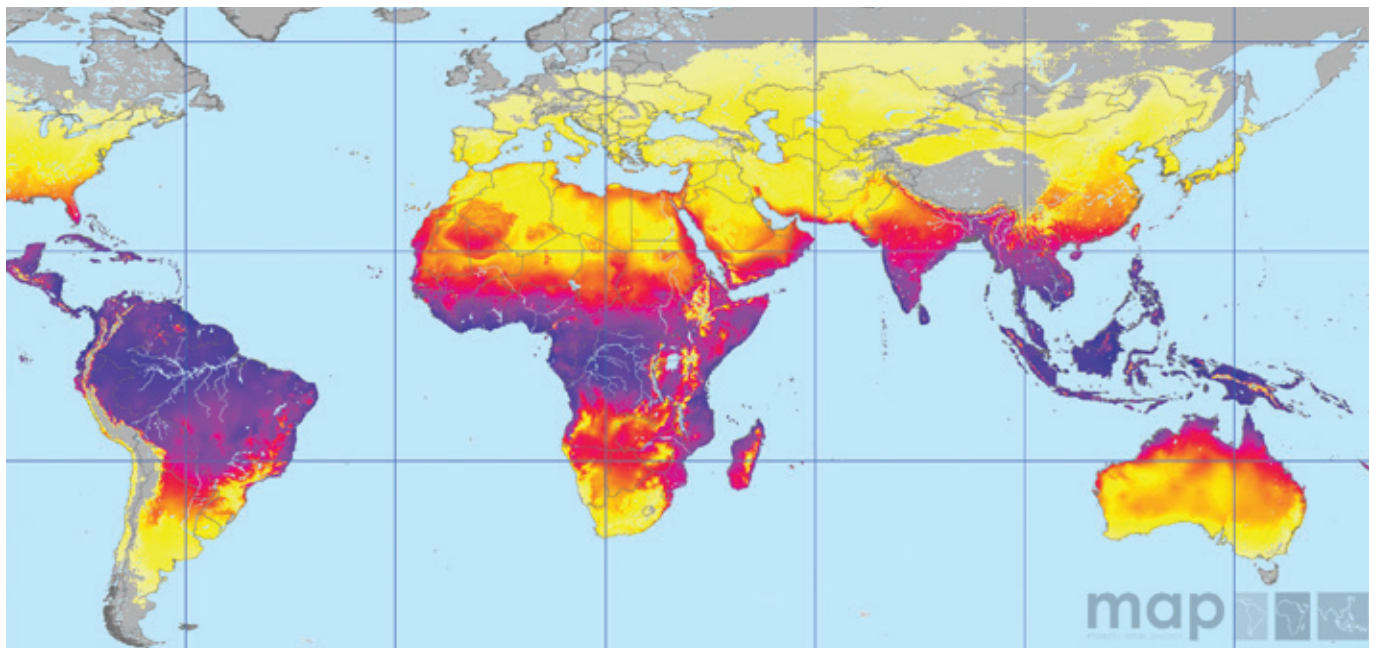
There is currently major debate on if, how and when malaria could be eradicated. A major WHO led programme in the 1960s was widely seen as a failure, despite notable successes in many countries. Renewed impetus for eradication of malaria has come from the Bill and Melinda Gates Foundation. They concluded that internationally the annual cost of sustaining malaria control was not achievable indefinitely, but scaling up over a finite period for eradication with the right tools, technologies, funding and political will was more feasible. To mark World Malaria Day 2014 (25 April), WHO published a manual to enable malaria-endemic countries to assess the feasibility of moving towards malaria elimination.

Since 2000 many countries have declared elimination as a national goal. The new guide will provide countries with a comprehensive framework to assess different scenarios and timelines for reducing the disease burden and moving towards elimination, depending on programme coverage and funding availability.

Neglected tropical diseases (NTDs)

The term neglected tropical diseases was coined by Kenneth Warren of the Rockefeller Foundation in the early 1980s through his Great Neglected Disease Initiative. The concept was revived in 2003, when the first of two WHO meetings was convened to suggest that these diseases should be taken forward as a group, because they shared considerable geographical overlap and could better be addressed by creating synergies

Figure E3.2 Temperature suitability index for *Plasmodium vivax* transmission in 2010



Source: Malaria Atlas Project (2014).

between existing programmes. The term neglected comes from the disparity between the catastrophic impact in terms of disability-adjusted life years (DALYs) attributed to these diseases and the attention and funding they receive (0.6% of official development assistance for health).

The 17 NTDs identified by the WHO are given in Table E3.2. They result from four different causative pathogens. These diseases affect more than 1 billion people and are endemic in 149 countries.

Although these are a medically diverse group of infections caused by different pathogens, combining the advocacy and call to action on these diseases under a single banner has had a dramatic effect. In 2012 the WHO produced

a road map aimed at accelerating the work to overcome the global impact of NTDs. Progress towards these end goals is now being closely monitored with encouraging but variable results. A large part of these programmes is an unprecedented mass drug distribution programme in all endemic countries. Table E3.3 shows the scale of this drug programme detailing the major donations that are being made by the pharmaceutical industry to support this global effort.

While these large scale efforts should dramatically improve health outcomes for many in the Tropics a worrying trend is the rapid spread and increased transmission of dengue in urban areas. This expansion is linked to changes in the range of one of the two main *Aedes* mosquito vectors and difficulties in predicting and stopping

epidemic sweeps of new serotypes of dengue into naïve populations.

Emerging and re-emerging diseases

About 75% of recently emerging infectious diseases affecting humans are diseases of animal origin, and approximately 60% of all human pathogens are zoonotic.

Zoonoses

Zoonotic diseases are contagious diseases spread between animals and humans. These diseases are caused by bacteria, viruses, parasites, and fungi that are carried by animals and insects. Examples are anthrax, dengue, Ebola haemorrhagic fever, *Escherichia coli* infection, Lyme disease, Plague, Q fever, salmonellosis, and West Nile virus infection

Transmission occurs where people come into contact with infected live poultry, rodents, reptiles, amphibians, insects, and other domestic and wild animals. A common way for these diseases to spread is through the bite of a mosquito or tick.

Recent emergence of such conditions as bovine spongiform encephalopathy (BSE) due to beef ingestion has alerted the medical profession to the dangers to humans of poor animal husbandry practices, such as feeding meat offal waste to cattle. Thankfully transmission has been limited as BSE can only be contracted by eating infected spine or brain tissue from infected animals.

Important bacterial zoonoses which remain problems in many tropical countries include brucellosis, bovine tuberculosis and listeriosis which can be contracted from unpasteurised dairy products.

Leptospirosis is a bacterial zoonosis of worldwide distribution. In tropical regions, the severe Weil's disease is caused by *Leptospira* carried by rodents and passed in their urine onto soil, water etc with humans being infected through the skin. Weil's disease may present with fever, jaundice, eye haemorrhages and renal failure and is a major

Table E3.2 The 17 Diseases that make up the NTDs.

Virus	Protozoa	Helminth	Bacteria
Dengue/Severe dengue	Chagas disease	Cysticercosis/Taeniasis	Buruli ulcer
Rabies	Human African trypanosomiasis (sleeping sickness)	Dracunculiasis (guinea-worm disease)	Leprosy (Hansen disease)
	Leishmaniasis	Echinococcosis	Trachoma
		Foodborne trematodiasis	Endemic treponematoses (including yaws)
		Lymphatic filariasis	
		Onchocerciasis (river blindness)	
		Schistosomiasis (bilharzia or snail fever)	
		Soil-transmitted helminthiasis	

Source: WHO (2013)

hazard for banana farmers and sugar cane workers.

Important protozoan zoonotic infections include the human trypanosomiasis. The African forms are transmitted by the bite of the tsetsefly (*Glossina* spp) while the South American form (Chagas' disease) is transmitted by triatomid bugs

Non-communicable diseases (NCDs)

Chronic conditions kill people at economically and socially productive ages and have a major effect throughout the Tropics. Much of the burden of chronic diseases is attributable to environmental and lifestyle factors, including tobacco consumption and decreased physical activity. NCDs are the major contributor to burden of disease in terms of disability adjusted life years (DALYs) in all regions apart from Sub-Saharan Africa. They are the underlying cause of more than half of deaths in adults aged 15-59 in all regions except South Asia and sub-Saharan Africa, where infectious diseases, result in one-third and two-thirds of deaths, respectively.

A similar trend of increased visibility and importance of NCDs is also been seen in Africa. The Global Burden of Disease Study, conducted in 2001, showed that 20% of deaths in sub-Saharan Africa were caused by NCDs. The majority (80%) of chronic disease deaths occur in low- and middle-income countries, reflecting both the size of these populations and the epidemiologic transition from infectious to chronic diseases.

Simple extrapolation from high to middle and low income settings to predict future trends may however be misleading. Cardiovascular disorders, cancer and injuries are consistently highly ranked NCDs. Half of cardiovascular disease deaths in low and middle income settings occur among people 30-69 years of age, which is >10 years younger than in more developed regions.

The NCD research agenda in the Tropics has evolved from learnings in high income countries. The current agenda focusses on evaluations of public health interventions (e.g. monitoring impact of tobacco control measures, voluntary restrictions

Table E3.3 Major donations of medicines for controlling neglected tropical diseases made by the pharmaceutical industry

Medicine Donation
Albendazole: Unlimited supply from GlaxoSmithKline for lymphatic filariasis worldwide and up to 400 million doses per year for soil-transmitted helminthiasis school-age children worldwide; donations made through WHO
Amphotericin B liposome 445 000 vials from GILEAD for control of visceral leishmaniasis in highly endemic countries in South-East Asia and East Africa; donation made through WHO – combined with preferential price for WHO for other countries (US\$18 per vial)
Azithromycin Donated by Pfizer in the context of a full SAFE strategy for the elimination of blinding trachoma; donated through the International Trachoma Initiative
DEC (diethylcarbamazine) Up to 2.2 billion tablets of 100 mg tablets by Eisai Co., Ltd., for the period 2013–2020; donation made through WHO
Eflornithine Unlimited quantity until 2016 from Sanofi for human African trypanosomiasis; donation made through WHO
Ivermectin Unlimited supply for as long as needed donated directly to countries by Merck & Co., Inc., for lymphatic filariasis and onchocerciasis; donated through the Mectizan Donation Program
Multidrug therapy (rifampicin, Unlimited supply for leprosy and its complications from Novartis; clofazimine and dapson in blister donation made through WHO packs) and loose clofazimine
Mebendazole 200 million tablets annually from Johnson & Johnson for soil-transmitted helminthiasis control programmes for children
Melarsoprol Unlimited quantity until 2016 from Sanofi for human African trypanosomiasis; donation made through WHO
Nifurtimox 900 000 tablets (120 mg) per year by 2017 from Bayer for treatment of Chagas disease and human African trypanosomiasis; donation made through WHO
Pentamidine Unlimited quantity by 2016 from Sanofi for human African trypanosomiasis; donation made through WHO
Praziquantel In 2007, Merck KGaA had committed to donating 200 million tablets of 600 mg praziquantel for distribution primarily to African school children. Having originally planned to end the project in 2017, Merck KGaA will continue its efforts to fight schistosomiasis indefinitely with an amount of 250 million tablets per year; donation made through WHO
Suramin Unlimited quantity by 2016 from Bayer for human African trypanosomiasis; donation made through WHO
Triclabendazole From Novartis for fascioliasis; donation made through WHO

Source: WHO (2013)

in salt and saturated fat in processed foods) and household and individual interventions (e.g. detection and treatment of high blood pressure; smoking cessation, diet and exercise advice; substitution of saturated with polyunsaturated cooking fats) in low- and middle-income countries. This may need to change substantially over the next decade, as most currently available interventions are appropriate for only a minority (i.e. the urban high-income populations of low- and middle-income countries) with scant attention paid to NCD prevention and control in urban poor and rural populations which still comprise the majority of the population in the Tropics.

Currently, health services for chronic diseases are fragmented, organisationally weak and are not rising to the challenge of preventing or managing chronic diseases in many low and middle income countries. As these diseases become increasingly important attention will need to shift to reform of the health services, although models will not be able to be adopted directly from those in high income countries.

Monitoring and evaluation

Significant progress has been made in improving health in the Tropics, but the ability to gather and analyse accurate data in the right formats and timescales can be an impediment to effective policy setting. While improvements to monitoring and evaluation systems have been made the implementation of these new systems is highly variable in different parts of the Tropics.

Health management information systems

Public health decision-makers, National health departments and other health professionals require accurate and timely information on the burden to the health service of disease-specific treatments, so they can accurately monitor and plan resource needs. A basic requirement is reliable national and sub-national data detailing the number of treatment events for a given disease or condition occurring at health facilities each month or year. In most tropical settings, this requirement is addressed with a health management

information system (HMIS) that coordinates the routine acquisition of treatment records from health facilities and the transfer, compilation, and analysis of these data through district, regional, and national levels.

A perfect HMIS requires all health facilities to report promptly in all months, allowing a comprehensive quantification of treatment events through time and space across the health system. The reality of HMIS in many countries is far from this ideal. Typically, many facilities never report, or report only intermittently, resulting in spatially and temporally incomplete national data. Even following several decades of national government and donor investment in HMIS, the incomplete nature of routine national reporting remains an issue in many countries. There is an expectation that mobile phone technology may improve these systems, reducing the reliance on paper based record keeping and reporting, with information subsequently needing to be keyed into electronic systems, the full benefits of this technology have however yet to be realised.

Data quality

To evaluate the benefit of different health interventions and establish evidence-based policies and practises it is essential that data at local, national, regional and global levels are collected in a timely, appropriate and accurate format. Data are highly variable in type, quality and availability for many health indicators. This can lead to major discrepancies in the quoted global incidence, prevalence and deaths attributed to many causes. Faced with poor data coverage, national treatment burdens are often estimated using rudimentary methods to account for missing values. National and global trends are then calculated by extrapolating available data.

Data quality and consistent formats for data collation and reporting can be a major barrier to assessing trends and developing appropriate national and international policies. For example in 41 of the 103 countries where malaria transmission occurs it is not possible to assess trends in malaria transmission due to a combination of poor data quality, changes in diagnostic methods

and different patterns of health service use. Unfortunately these countries account for 80% of all malaria transmission. Until these issues are addressed, progress towards reducing the burden of many diseases will be slowed. Lack of data may also make it difficult if not impossible to eradicate many of the major infectious diseases that are currently being targeted.

Drivers of recent progress

General trends for many health indicators have been improving in the Tropics in the past two decades. There has been greater advocacy for resourcing better health care and a major shift in emphasis on setting, tracking and achieving major targets for improvement in health. This has changed the landscape for how a number of diseases, which carry a significant level of mortality and morbidity in the Tropics, are tackled. These combined initiatives have accelerated the rate of change, but much still remains to be done. In particular, initiatives aimed at driving the elimination of a number of infectious diseases need to be driven to completion, or the risk of disease rates rebounding when special efforts are withdrawn will remain.

The millennium development goals

The United Nations Millennium Development Goals (MDGs) are eight goals that the UN member states agreed to achieve by 2015. These were contained within the United Nations Millennium Declaration resolution that was adopted by the General Assembly in September 2000. The goals are simply represented pictorially in Figure E3.3. The MDGs were crafted to commit world leaders to combat poverty, hunger, disease, illiteracy, environmental degradation and discrimination against women. Alongside a 2015 target for each MDG, there are a series of indicators to track progress from the 1990 baseline towards these targets. Many of these relate directly to health.

While many countries have made impressive gains in achieving their health related targets, others will fall far short of the targets by 2015. Many of the countries making the least progress are those afflicted by a high prevalence of HIV/AIDS, conflict and economic hardship.

Specific health related targets include:

4A: Reduce the under-five mortality rate by two thirds. The 1990 baseline was an estimated 12.6 million under-five deaths, this had declined by 47% by 2012. The global rate of decline has also accelerated from 1.2% per annum in 1990 – 1995 to 3.9% per annum between 2010 – 2012.

5A: Reduce the maternal mortality rate by three quarters. In 1990 there were an

estimated 543,000 deaths, while this had declined to 287,000 by 2010 the rate of decline is less than half that required to achieve the MDG target by 2015. Maternal mortality rates are highest where women have poor access to reproductive health care and effective interventions. While this has improved globally over the period there are still major disparities in access. The starkest of these is in the proportions of births that are attended by skilled personnel. While this is above 90% in three of the six WHO regions, the figure in the African Region is less than 50%.

6A: To halt and begin to reverse the spread of HIV/AIDS, TB and malaria

6B: Achieve Universal access to treatment by 2010
The rate of new HIV infections has clearly declined with an estimated 2.3million people

newly infected in 2012 a reduction of 33% on the new infection rate in 2001. Sub-saharan Africa accounted for 70% of all people who acquired HIV infections.

6C: To halt and reverse the incidence of malaria and other major diseases. In 2010 an estimated 219 million cases of malaria resulted in approximately 660,000 deaths. The majority of deaths are still in African children under the age of five.

The number of new TB cases worldwide has been falling slowly since 2006. In 2011 there were an estimated 8.7million new cases, of which about 13% were in people living with HIV. Mortality due to TB has fallen 41% since 1990. TB incidence rates have fallen in all six WHO regions. At 2% per year the rate of decline is slow. Globally by 2012, the TB

Figure E3.3 Simplified overview of the eight Millennium Development Goals.



Source: United Nations (2014).

mortality rate had been reduced by 45% from the 1990 baseline. Hence, the target to reduce deaths by 50% by 2015 is within reach.

7C: To halve the number of people without sustainable access to safe drinking water and sanitation. Globally the access to safe drinking water target has been met, with 89% of people in 2011 having access to an improved source of drinking water. Access however has been uneven between regions, urban and rural areas and rich and poor.

The basic sanitation target will not be met by 2015. In 2015, approximately 2.5 billion people still did not have access to basic sanitation facilities. There has been an increase of people living in urban areas without access to sanitation as shanty towns grow and migration trends into urban areas continue to increase.

8E: In co-operation with pharmaceutical companies, to provide access to affordable essential medicines in developing countries. This still remains an issue in much of the Tropics. Surveys in 2007 – 2102 showed that access to affordable generic medicines in low and middle income countries was only 57% via public sector outlets. Lack of availability forces patients to try and access medicines through the private sector where costs are five to 16 times higher.

The Global Fund

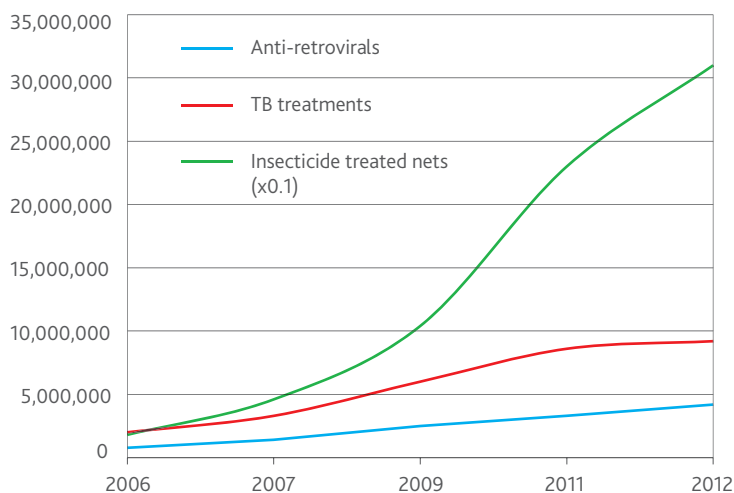
In many low and middle income nations the significant resources required to fund large scale campaigns to control major diseases are often not available. Numerous bilateral aid mechanisms exist to try and cover this gap, but these are often poorly co-ordinated in the disease endemic country. A different model of supporting efforts to control three major diseases which are prevalent in the Tropics was created in 2002. The idea of establishing a global fund was discussed at a G8 summit in Okinawa, Japan, in 2000. The real commitment began to coalesce at the African Union summit in April 2001, continued at the United Nations General Assembly Special Session

in June of that year, and was finally endorsed by the G8 at their summit in Genoa in July 2001. A Transitional Working Group was established to determine the principles and working modalities of the new organization, and the Global Fund came into being in January 2002.

The Global Fund to Fight AIDS, Tuberculosis and Malaria was created to dramatically increase resources for the fight against these diseases. The Global Fund provides a coherent and co-ordinated large scale funding package for each eligible country, linked to endemic county needs, through a managed application process. It does not manage or implement programs on the ground, relying instead on local experts.

Figure E3.4 shows the numbers of insecticide treated bednets for malaria control and treatments for TB and HIV that have been funded by this programme since 2006.

Figure E.3.4 Numbers of insecticide treated bed nets and treatments for TB and HIV funded by the The Global Fund to fight AIDS, tuberculosis and malaria.



Source: UN (2013a), State of the Tropics project.

Philanthropic foundations

A notable trend over the last two decades has been the increased engagement of high net worth individuals in global health, either by direct donations or through foundations. The most notable of these is the Bill and Melinda Gates Foundation with annual disbursements of around US\$6 billion.

These foundations have not only started to address the funding gap for research and development activities in health related areas that principally affect the poor, but they have also catalysed a new way of working with industry and the normative agencies. For example they have influenced the corporate social responsibility offerings of major pharmaceutical companies, who now donate millions of doses of drugs for NTD treatment and the country distribution systems through NGOs.

Alongside donations of existing products there is now a network of product development partnerships (PDPs) supported by public and philanthropic funding that work with industry to develop new drugs, vaccines, diagnostics, devices and public health insecticides. These PDPs have a portfolio of new products that will be needed to counteract resistance to drugs, antibiotics and insecticides, to improve diagnosis of many tropical diseases and to improve our ability to monitor and evaluate different interventions.

Conclusion

Health in the Tropics has broadly shown a number of dramatic improvements over the last two decades. The shift from infectious diseases to NCDs will force a move away from large scale vertical programmes into a network of health systems and health services strengthening as the population needs change. The level of interest and funding currently addressing global health issues is at an unprecedented high and the R & D and implementation bodies operating in this space have a responsibility to ensure that health benefits for all populations are maximised in a sustainable format from these initiatives. If these inputs are sustained the next decade should see further improvements in health throughout the Tropics. However, if interest, resources and advocacy decline then we will see resurgence in many infectious diseases.



San Juan de Dios Hospital in Guatemala.
Image: Maria Fleischmann.

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