

# Medicine in resource-poor settings: time for a paradigm shift?

Churchill Lukwiya Onen

**ABSTRACT** – The current global health system, which concentrates on a few and neglects billions of people who live in resource-poor settings and carry the largest burden of global diseases, is unacceptable. The weight of medical practice patterns ought to shift from the therapeutic phase of medical care to prevention. Achieving better health for the majority of humanity requires innovation, improved resources, new cooperation between the rich and the poor, and a clear ethical vision, consolidated by goal-oriented and system-focused strategic health planning. Development assistance from wealthier nations to developing countries must shift from the current donor-driven agendas to country-driven sector-wide approaches for health development with adequate accountability and sustainability. There must be a fundamental departure from classical universalism to new universalism, reoriented by a new public health, and reinforced by a new solidarity, using holistic approaches to ensure better health for the whole of humanity.

**KEY WORDS:** developing countries, global inequalities, medicine, paradigm shift, physicians, resource-poor settings

‘Medicine in resource-poor settings’ is the subject of the Lilly Lecture, in recognition of the current global disparities in wealth, resources, burden of disease and mortality trends between rich and poor nations. The world can ill-afford a global health system which, without parallel in history, concentrates on a few and neglects billions of people who carry the largest burden of global disease. Left to itself, the current global health strategy is poised to create an ecological disaster, an unparalleled genocide resulting from the ever-greater neglect of the poor, the unfit, the sick and the suffering in the third world.

Medicine, the art and science of preserving health when present and of restoring it when lost, addresses imbalances brought about by environmental factors and poor personal habits, and physical and mental stress. Medicine has evolved from magico-religious, empirical, rationalistic, and dogmatic practices to

the current evidence-based medicine, founded on the conclusions of randomised controlled trials and meta-analyses. Although western medicine has become the dominant type of practice worldwide, a vibrant mix of allopathic and various forms of complementary medicine co-exist in many resource-poor settings. No major argument is necessary to show the potential for improvement in settings where choices are dictated by what alternatives are open to people in real life.

The physician, widely regarded as highly intelligent and specialised, is extremely busy, constantly preoccupied with recycling a handful of patients with recurrent and/or chronic diseases. As internists, we appear to have erected walls around ourselves, buttressed these walls and become blinded by them. Physicians need to think and act in logarithmic terms if we are to address effectively the dire health situation of the majority of humanity, instead of concentrating on the tip of icebergs, oblivious to the bulk of diseases.

Even in modern twenty-first century medicine, a great danger has arisen from the division of medicine into disciplines (cardiology, pulmonology, gastroenterology, nephrology, neurology, endocrinology, rheumatology, infectious diseases etc). Specialisation and super specialisation has resulted in complete fragmentation of medical care. Patients with several different disorders have to see various doctors in the respective specialties of their diseases. This is untenable in resource-poor settings. Medical school curricula for trainees from developing countries ought to recognise the need for robustness and versatility because classical medicine is largely mechanistic, with doctors picturing the body as a machine made of many parts, with the respective individual parts treated separately. Holistic medicine treats the person as a whole.

## Global inequalities

Wealth is ever more unevenly distributed in the globalised planet, with the rich rapidly getting richer and the poor getting poorer. To take the analogy of driving a stretch limousine through a ghetto, inside are the post-industrialised countries of Western

This article is based on the Lilly Lecture given at the Royal College of Physicians on 28 April 2004 by **Churchill Lukwiya Onen** MBChB MMed, Senior Consultant Physician, Centre for Chronic Diseases, Gaborone, Botswana

*Clin Med* 2004;4:355–60

Europe, North America, Australasia, Japan and the emerging Pacific Rim; outside the limousine is the rest of the world. The richest 20% of the countries share 86% of world's gross domestic product (GDP) while the poorest 20% share only 1.3%. Ninety per cent of the world's health resources are spent on research of diseases which affect only 10% of humanity.<sup>1</sup> Americans spend more on cosmetics and Europeans on ice creams than it would cost to provide schooling and sanitation for 2 billion people in poor countries. The world's three richest individuals had more assets than 600 million who make up the world's poorest inhabitants combined in 1999. The top 358 billionaires are collectively richer than almost a half of the earth's inhabitants combined. A mere 4% of the wealth of 225 richest individuals would be sufficient to provide elementary educational and medical facilities and adequate nutrition for the entire world's poor.<sup>2</sup> The rich truly appear to be picnicking in a graveyard.

According to the WHO Director General, a baby girl born in Japan today can expect to live for about 85 years, while a girl born in Sierra Leone has a life expectancy of 36 years. The Japanese child will receive vaccinations, adequate nutrition and good schooling. If she becomes a mother she will benefit from high-quality maternity care. Growing older, she may eventually develop chronic diseases, but excellent treatment and rehabilitation services will be available, and she can expect to receive on average medications worth US \$550/year and much more if needed.

The girl in Sierra Leone has little chance of immunisations and will almost certainly be underweight throughout her childhood. She will probably marry in adolescence and go on to give birth to six or more children without assistance from a trained birth attendant. One or more of her babies will die in infancy, and she herself will barely escape death from childbirth. If she seeks medical care from a health facility, she can expect, on average, medicines worth about US \$3/year. If she survives to middle age, she too, will develop chronic diseases, but without adequate treatment she will die prematurely.

The top ten countries with the lowest life expectancy and highest mortality rates are in sub-Saharan Africa; half of them are in southern Africa, where the epicentre of the HIV/AIDS pandemic is currently located. These poorest nations also have the fewest healthcare personnel and the highest patient per doctor ratios.

### **The global burden of disease and mortality**

The global epidemics of the next two to three decades will be dominated by neuropsychiatric disorders, non-communicable diseases (NCDs), and a lingering menace of endemic, resurgent and emerging infections.<sup>3</sup> The majority of these disorders occur in developing countries. About 17 million people die of cardiovascular diseases (CVDs) every year. The three most important CVD risk factors that are readily modifiable are tobacco smoking, physical inactivity, and poor nutrition (low intake of fruits and vegetables, excessive intake of energy-dense foods, increased sodium chloride intake). Tobacco smoking increases

the risk of dying from coronary heart disease and cerebrovascular disease two- to three-fold. Cardiac events fall by 50% within two years in people who stop smoking and the risk of other CVDs, including stroke and peripheral vascular disease, also decreases significantly over the first two years of not smoking. Non-communicable diseases account for nearly 80% of mortality and 85% of the burden of disease in developing countries. There must be ways to influence the dynamics of epidemiological transition in developing countries and to achieve effective community interventions. Global strategies should be applied for tobacco control and to promote healthy diets and lifestyles, including giving children and young people life skills to achieve better cardiovascular health and healthier survival chances in adulthood.

### ***Atherosclerosis***

Interventions against atherosclerosis must start with the interruption and modification of factors that promote lipid deposition and lead to cellular infiltration of vessel walls. Treating complications of atherosclerotic vascular disease offers little more than palliative care to patients.

### ***Overweight and obesity***

Overweight and obesity, though tightly intertwined with other CVDs, appear to provide the earliest conditions conducive to a cascade of processes leading to occlusive vascular disease. Excessive weight increases the risk of type 2 diabetes mellitus, dyslipidaemia, hypertension, coronary heart disease (CHD), certain cancers and degenerative joint diseases. Obesity is the first wave of a defined cluster of NCDs associated with modernisation and acculturation. It is a major global health problem and must therefore be approached from a public health perspective. There is strong evidence of regression of obesity and risks of type 2 diabetes in aboriginal societies following reversion to traditional lifestyles (Pima Indians, Australian Aborigines and South Asians). A target mean population body mass index (BMI) of 21–23 kg/m<sup>2</sup> is associated with extremely low levels of overweight and obesity. The introduction of energy-dense foods as a substitute for nutritionally adequate traditional diets must therefore be discouraged in developing countries. Increasing community-wide levels of physical activity has numerous potential benefits for the population, in addition to substantial cost-saving related to a reduction in the prevalence of obesity.

The principles of dealing with excessive weight must incorporate social, cultural, political, physical and structural elements.<sup>4</sup> The processes and programmes to deal with individuals and groups who are at particularly high risk of obesity and comorbidities must include management protocols for those with existing obesity and related comorbidities, prevention of weight gain, promotion of weight loss and maintenance of ideal body weight. Universal prevention should be applied to all members of a community. At the same time, selective and targeted preventive strategies must be directed at high-risk individuals and

those with existing weight problems. In the main, what is needed is a radical improvement in the social, cultural and economic environment through combined efforts of governments, the food industry, the media, communities and individuals. There is a need to closely review urban designs and transportation policies, as well as laws and regulations regarding food labelling and advertisements. Economic incentives for low energy-dense foods should be widely offered. Likewise, sporting and recreational facilities, physical education and nutritional and home economics ought to be firmly entrenched in school curricula.

### *The current epidemic of diabetes mellitus*

Type 2 diabetes is a serious problem. About 155 million adults were diagnosed in 2000, and a 110% increase to 300 million by 2025 is predicted. The greatest increases are expected to occur in the developing world, with 110% increase in the Americas (excluding the USA), 134% in Africa and 131% in Asia, compared to a 20% increase in Europe, 23% in Japan and 46% in the USA.<sup>5</sup> By the year 2025, more than 75% of people in developing countries will have diabetes, compared with 62% in 1995. Aggressive interventions designed to prevent the emergence and long-term complications of diabetes are, and will continue to be, urgent priorities. The cost of treating diabetes is prohibitive and developing countries can ill afford a full epidemic of dysglycaemias. Even in developed countries like the USA and Western Europe, treating patients with diabetes carries a heavy economic cost. In 1997, the USA spent \$98 billion treating diabetes<sup>6</sup> while eight countries in Western Europe spent the equivalent of US \$33 billion treating type 2 diabetes, translating into US \$3,000–10,000 per capita.<sup>7</sup>

### *Hypertension*

Worldwide, it is estimated that 20% of the adult population have hypertension (HT). It is associated with urbanisation and increased dietary sodium intake and tends to cluster with other atherosclerotic risk factors. Hypertension is often undiagnosed and under-treated, thus increasing the risk of stroke, myocardial infarction, atrial fibrillation, heart failure, peripheral arterial disease, renal failure and death by as much as 1.5 to 3.0 times. Results from the Third National Health and Nutrition Education Study (NHANES III) in the USA showed that up to 70% of those who are aware of their disease did not achieve the goal systolic blood pressure (BP) of the JNC VI/WHO-ISH (the sixth report of the Joint National Committee on Prevention, Detection, Evaluation and Treatment of High Blood Pressure/World Health Organization – International Society for Hypertension). Nearly a quarter of them did not achieve goal diastolic blood pressure.<sup>8–10</sup> Yet a reduction of just 3% in average BP levels, which might be achieved, for example, by sustained reductions in dietary sodium, low calorie intake and increased consumption of fruits, vegetables, fish, and olive oil, would reduce the incidence of disease, as would antihypertensive pharmacotherapy. The greatest dividends would be expected if whole populations and communities were targeted. The interaction of

multiple risk factors may lead to multiplicative, rather than additive increases in cardiovascular risk. Individual risk factors should therefore not be considered or managed in isolation. Refined global risk assessment can lead to more accurate determinations of absolute cardiovascular risk and identification of high-risk patients needing aggressive intervention. Individuals with intermediate or low risks can benefit from primary prevention measures. Strategies for effective management of hypertension in resource-poor settings must include public education, large-scale screening, prompt and aggressive multimodality approaches involving therapeutic lifestyle changes and the use of drugs.

### *The concept of case-finders*

Non-communicable diseases cluster within the individual, in families and within communities. Empowerment of people with some NCDs through training during their regular contacts with health-care professionals, group sessions, educational materials (pamphlets, fact sheets, videos, books etc), and provision of screening tools, such as blood pressure monitoring devices (BPMs), glucometers, weighing scales and measuring tapes, may enable them to pick out undiagnosed individuals within their families and communities. In addition, national blood pressure and glucose screening days could be fixed, appropriate devices widely distributed to trained volunteers, and important data gathered for purposes of guiding policy. Voluntary screening centres (similar to HIV voluntary counselling and testing centres) can be established. Case-finding must be combined with case-management.

### *Coronary heart disease*

Post-transitional diseases are occurring simultaneously with infectious diseases, compounded by rising rates of injuries in resource-poor settings. Developing countries currently have about two-thirds of the cases of myocardial infarctions. The prevalence and incidence of CHD are predicted to rise to 75% in the next one to two decades as a consequence of adverse lifestyle changes accompanying industrialisation and urbanisation. Both the degree and duration of exposure to CVD risk factors will increase as a result of higher risk factor levels coupled with increasing life expectancy. Rising prevalence of both risk factors and CVDs in urban India and China provide evidence for these trends.

With all its misfortunes, the only good news to come from sub-Saharan Africa is the likelihood of a drop in cause-specific mortality related to CHD. This is the direct impact of HIV/AIDS, slashing life expectancy in most sub-Saharan countries by as much as 20–30 years. However, a similar prevalence of CHD to that found in African-Americans is predictable once Africa emerges from the age of pestilence and famine and reaches the age of receding pandemics. If Soweto, a suburb of Johannesburg with about 3 million Blacks, were inhabited by African Americans today, there would be 2–3,000 patients admitted annually with CHD to Chris Hani Baragwanath Hospital, the largest hospital in Africa – a frightening prospect

for a centre with limited health resources and competing health priorities. In general, cardiovascular diseases in Blacks occur at younger ages, exhibit explosive manifestations and cause premature deaths. Pragmatic measures against NCDs such as hypertension, diabetes and obesity are also likely to reduce the prevalence of cerebrovascular disorders and cancers. Despite coronary heart disease risk models<sup>11</sup> elsewhere showing that the benefits of risk factor modifications are greater when started early, calls for behaviour change in developing countries may fall on unresponsive ears in communities that are in rapid transition towards industrial market economies. Aggressive marketing and media influences unleash consumer aspirations toward affluent and indulgent lifestyles.

### HIV/AIDS

Although lower respiratory infections tops the list of the most common infectious causes of mortality and comes third among the worst global diseases, there is little doubt that the greatest scourge today is HIV/AIDS. It is closely associated with tuberculosis. More than 95% of people living with HIV/AIDS are in low-income countries, and 70% of them are in sub-Saharan Africa. With over 42 million infected adults and children worldwide, over 5 million new infections in a year, over 3 million HIV/AIDS-related deaths in a year and 14,000 new infections per day, the World Health Organization's '3 by 5' initiative of reaching 3 million infected persons with antiretroviral drugs by 2005 seems a mockery. Only 1% of people in need of antiretroviral therapy in sub-Saharan Africa had access to these life-saving drugs in 2002. This inequality confronts national and international leaders with a humanitarian, human rights, healthcare and socioeconomic emergency of monumental proportions. Antiretroviral therapies not only prolong life, they enable those living with HIV to continue contributing to the well-being of themselves, their families and society at large.

While sub-Saharan Africa appears to have the monopoly on HIV/AIDS, the greatest experience and knowledge on HIV/AIDS has come from Africa, and the rest of the world has a lot to learn from Africa's misfortune. Regional and international antiretroviral treatment initiatives are urgently needed to address key health issues facing low-income countries. The foundations of effective responses to the HIV/AIDS pandemic must be built on:

- the commitment of countries towards national responses
- broad, determined and committed leadership from all walks of life (political, religious, educational and traditional)
- institutional mechanisms that foster sound policies and programmes to achieve measurable goals
- responses involving all sectors of society
- reduction of stigma and discrimination against People Living With HIV/AIDS (PLWHA)
- protection of human rights, including the rights of the most vulnerable members of society (women, children, sex workers, marginalised and minority groups, refugees and internally displaced persons)

- community mobilisation and greater involvement of the civil society
- AIDS activism and networks of PLWHA
- regional initiatives (eg the Southern African Development Corporation (SADC), the New Economic Partnership for African Development (NEPAD), The Economic Community of West African States (ECOWAS))
- international organisations (WHO, UNAIDS, United Nations Development Programme, UNICEF, Global Fund in the fight against AIDS, Tuberculosis and Malaria, World Bank's Multi-country AIDS Programme)
- not least, poverty reduction and alleviation.

Successful programmes in Thailand, Uganda and Brazil clearly demonstrate the impact of open and direct approaches to the HIV/AIDS pandemic: levels of high-risk behaviour have declined; seroprevalence among pregnant women is dropping; rates of new infections are falling; and HIV-related mortality rates have either been halted or are declining in these countries. Their initiatives further show that any outbreak of infectious disease can be contained even without any curative drug or vaccine if existing interventions are appropriately tailored to the circumstances and adequately backed by political commitment.

The spread of HIV/AIDS in southern Africa and the former socialist republics of Eastern Europe is alarming. A potentially more explosive epidemic is predicted for India and China – two of the most populous countries on earth. The experience learnt from countries like Uganda, Thailand and Brazil should be urgently adapted to curb the rapidly escalating HIV epidemic in other resource-poor settings. On a day like World AIDS Day, sufficient funds for condoms could easily be raised from richer nations, if for instance, Americans gave up buying their cosmetics and the Europeans their ice creams for just that day. As many as 14,000 people in resource-poor countries might be spared HIV infection that day by effective condom distribution and use.

These initiatives require sound financial and material resources as well as ongoing training and capacity building. The paradigm shifts required in the fight against HIV/AIDS must include:

- recognition of the long-term impact of the pandemic
- appreciation of successful proven approaches to HIV prevention, especially in young people
- recognition of the value of community mobilisation
- comprehensive care, treatment, and support in a continuum, including treatment of opportunistic infections, provision of highly active anti-retroviral treatment, and home-based care
- tackling the economic, political, social and cultural barriers to successful prevention, care and treatment programmes
- optimising the utilisation of available resources
- and capacity building through ongoing training, partnerships, pharmaceutical industries and philanthropic foundations.

### Other infectious diseases

The situation regarding reproductive tract infections (RTIs) and sexually transmitted infections (STIs) is equally dire. Eighty-five per cent of the global 340 million annual cases of RTIs and STIs occur in developing countries. Among them are 170 million cases of trichomoniasis, 89 million chlamydia, 62 million gonorrhoea, 12 million syphilis and 7 million chancroid cases. It costs less than US \$0.50 to diagnose and cure syphilis. The key principles of rapid strengthening of existing weaknesses in health systems, accurate and unambiguous information, education and communications about the disease to preempt and minimise fears, stigmatisation and discrimination of those at risk or those affected by the disease, should be broadly applicable to contagious diseases such as ebola, SARS and bird flu.

### Malaria

Malaria remains a major problem in tropical and subtropical regions of the world. However, because of international travel, up to a third of the world population is exposed to malaria each year; 350 to 500 million become infected mainly by *Plasmodium falciparum* (Africa, South-East Asia, Oceania, Haiti, Amazon Basin, Dominican Republic) and *P vivax* (Central America, Middle East, India). Over 100 million people become ill each year and 3 million die, especially children under five years old. The magnitude of the problem is due to inadequate tools to combat malaria, the dynamic nature of the disease, multiple variables affecting disease, lack of relevant research, limited chemotherapeutic options, and lack of effective malaria vaccine. The resurgence of malaria has also been due to increased resistance of malaria parasites to chemotherapy, increased resistance of Anopheles mosquito to insecticides, increased international travel to malaria-endemic areas, and ecological and climatic changes.

Most healthcare facilities in developing countries are ill-equipped to deal with the acute and chronic complications of malaria. Cerebral malaria is universally fatal if untreated; the mortality is 15–20% with treatment; 10–12% of survivors are left with neurological abnormalities. In most developing countries, facilities for renal replacement therapy are very limited, including lack of basic modalities such as peritoneal dialysis for patients with acute renal failure complicating malaria. Acute respiratory distress syndrome (ARDS) requires intensive care, which is limited to tertiary facilities and generally inaccessible to the majority of those who truly need them. Anaemia in malaria is multifactorial and occasionally requires blood transfusion. Hypoglycaemia is often unrecognised and occurs because of inadequate oral intake, depletion of liver glycogen stores, and increased glucose consumption by parasites and TNF-alpha/quinine stimulated hyperinsulinaemia. Bloody diarrhoea may occur in non-immune individuals.

The conventional method of diagnosing malaria, using thin and thick smears, is time-consuming and requires considerable technical expertise plus a microscope. It has unacceptably low sensitivity and specificity and is operator-dependent. Newer diag-

nostic techniques such as fluorescent microscopy, polymerase chain reaction (PCR) and antigen detection have much greater sensitivities and specificities but are also very expensive. PCR is also labour-intensive, requires great technical expertise and is unable to distinguish viable from non-viable organisms. Sensitivity and specificity is nearly 100%. Antigen detection is a rapid (10–15 min) and simple technique using dipstick test from finger prick blood but it is currently too expensive. It uses two antigens: histidine-rich protein-2 (HRP-2) and parasite lactic dehydrogenase (pLDH), each with sensitivities ranging from 80–96% and specificities between 95–100% compared to PCR/blood smears. HRP-2 is specific for *P falciparum* and therefore cannot diagnose *P vivax*, *P ovale* or *P malariae*. Persistence of the antigen even after effective treatment makes the kit unsuitable in falciparum-endemic areas. On the other hand, pLDH (eg the OPTIMAL kit) is able to distinguish *P falciparum* from the other species; it is suitable for monitoring parasite resistance to treatment, but cross-reactivity makes it unreliable in mixed infection involving *P falciparum* and *P vivax*. Because antigen techniques are currently costly (US \$1.2–3.00), efforts should be made to make these kits widely affordable and available in malaria-endemic resource-poor settings. The quantitative buffy coat (QBC) method using acridine orange has a sensitivity of 88–98% and specificity of 58–90% especially with >100 parasites/ $\mu$ l.

Malaria is not only a major public health problem, it is a development problem. Populations and health workers in endemic areas should be motivated and educated regarding important aspects of malaria prevention, recognition of symptoms, and the importance of rapid and correct diagnosis and treatment. Effective treatment strategies targeting populations at the greatest risk of severe disease will prevent most malaria-related mortality. Vector control measures must take into consideration epidemiological, cultural and socio-demographic factors. Health policies must be guided by relevant local data. Adequate funding from international organisations such as the World Bank should be provided for malaria control and management.

### Development aid

There are several problems with development aid to poorer countries. They have tended to be characterised by donor-driven agendas with lack of recipient ownership, poor donor coordination, weak host country aid management, unfavourable policy environment, and use of inappropriate instruments to measure impact. As a result, there is inadequate evidence of improved development outcomes for recipient countries. There is therefore an urgent need for donor aids to shift towards country-driven aid coordination systems, adopting sector-wide approaches for health development. Sector-wide approaches aim to achieve sustainability and national ownership by shifting external bilateral and multilateral funding from individual projects to the implementation of national strategies and programmes. This shift should correct the lack of accountability and sustainability among donors and recipients that frequently results from the fragmentation of development assistance.

## Ethics and guiding principles for a paradigm shift

The road map towards the required paradigm shift requires recognition of the constitution of the WHO, the 'new public health', human rights and the principles of equity, and significant departures from classical universalism to new universalism, and from the therapeutic phase of medical care to prevention. The constitution of the WHO stipulates that the highest attainable standard of health is one of the fundamental rights of every human being without distinction of race, religion, political, economic or social condition. By focusing on broader influences of environmental factors, and physical, social and psychological elements, as well as healthy lifestyles, the new public health has shown that health improvements are best attained by behavioural and environmental change. The ethics of the twenty-first century should embrace the integration of individual bioethical issues, individual health and human rights into the broader arena of public health, guided by the principles of equity. A shift from classical universalism where the state is responsible for providing health services to the entire population, to the new universalism where the main role of the state is to regulate and coordinate health services, as well as a major shift away from therapeutic phase of medicine to prevention, are essential in resource-poor settings if there is to be any significant impact on the deteriorating health of poor people.

## Summary

A deadly mixture of infectious diseases, non-communicable diseases and injuries is occurring throughout the developing world, leading to a crisis of priorities for health systems already struggling with inadequate resources. Achieving better health for the majority of humanity who live in developing countries requires innovations, improved resources and unprecedented levels of cooperation among multilateral agencies, national authorities, communities, the private sector and other stakeholders, based not only on rigorous science but also on a clear ethical vision.

The current imbalance and inequality in global health is unjust, unkind and unfair to resource-poor countries. There must therefore be a fundamental departure from classical universalism to new universalism, reoriented by a new public health, and reinforced by a new solidarity, using holistic approaches to ensure that better health for the whole of humanity is attained. A paradigm shift can only be expected if the guiding principles and ethical vision are consolidated by goal-oriented and system-focused strategic health planning with improved health outcome measures, such as disability-adjusted life expectancies (DALEs) and disability-adjusted life years (DALYs), community satisfaction and greater community responsibilities for their own health. The new solidarity and universalism in medicine must entail greater partnerships between the rich and the poor, involving a new form of cooperation between international health agencies, national health leaders, health workers and communities and all other relevant sectors of society. There must be mutual respect, wisdom and a common sense of purpose, and a radical departure

from current donor–recipient, master–slave relationships that epitomise the economic entrapment of poorer nations by the wealthy ones. Existing knowledge and technologies must be effectively utilised, applying innovative means to create new health tools using appropriate structures and strategies; striving for affordable, effective, and efficient health services including the preservation of medical pluralism. Centres of excellence must also be centres of relevance.

Our role as physicians is to shape the vision that can ensure better health for the whole of humanity. Let this be our little contribution to the WHO Constitution that identifies the 'enjoyment of the highest attainable standard of health as one of the fundamental rights of every human being without distinction'.

## References

- 1 Global Forum for Health Research. The 10/90 report on health research 2003-2004. Geneva: Global Forum for Health Research, 2004.
- 2 UNDP 1999. *Human development report*. <http://stone.undp.org/hdr/reports/global/1999>
- 3 World Health Organization. *World health report 2002*. [www.who.int/whr/2002/en/](http://www.who.int/whr/2002/en/)
- 4 Royal College of Physicians, Royal College of Paediatrics & Child Health, Faculty of Public Health. *Storing up problems: the medical case for a slimmer nation*. Report of a working party. London: RCP, 2004.
- 5 King H, Aubert RE, Herman WH. Global burden of diabetes, 1995–2025: prevalence, numerical estimates, and projections. *Diabetes Care* 1998;21:1414–31.
- 6 American Diabetes Association. Economic consequences of diabetes mellitus in the U.S. in 1997. *Diabetes Care* 1998;21:296–309.
- 7 Jönsson B, on behalf of the CODE-2 Advisory Board. Revealing the cost of type 2 diabetes in Europe. *Diabetologia* 2002;45:S5–S12.
- 8 Brown MJ, Haydock S. Pathoetiology, epidemiology and diagnosis of hypertension. *Drugs* 2000;59 (Suppl 2):1–12.
- 9 Pepine CJ. Systemic hypertension and coronary artery disease. *Am J Cardiol* 1998;82:21H–24H.
- 10 Burt VL, Cutler JA, Higgins M, Horan MJ *et al*. Trends in the prevalence, awareness, treatment, and control of hypertension in the adult US population. Data from the health examination surveys, 1960 to 1991. *Hypertension* 1995;26:60–69.
- 11 Grover SA, Abrahamowicz M, Joseph L, Brewer C *et al*. The benefits of treating hyperlipidemia to prevent coronary heart disease. Estimating changes in life expectancy and morbidity. *JAMA* 1992;267:816–22.