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During the course of the last century, public policies with a focus on technological innovation have shown the importance of this issue for the governmental agenda of several countries. Technological innovation acquires more importance to the extent that the countries’ markets are strengthened, and reach, in the last two decades of the 20th century, an increasing strategic weight in proportion that the international inequality scenario of economic globalization is characterized by the interplay of the following actors: (i) economically wealthy and innovative countries; (ii) poor countries situated on the boundaries of world consumption of goods and services; (iii) countries at an intermediate development stage, such as the “BRICs” (Brazil, Russia, India, China) or, as they are also denominated, the Innovative Developing Countries (IDCs).

According to the World Health Organization’s records, in its World Health Report 1998, at the beginning of this new millennium we live a unique moment of accelerated technological evolution that has never been seen in the history of health care. To that effect, the Swedish Council on Technology Assessment in Health Care (SBU) emphasizes that at least 50% of all therapeutic methods in use, were not available ten years ago.

Regarding biomedical sciences, it has been observed, a trend by the knowledge production international centres of ignoring the diseases of major prevalence in humanity, providing substantial funds for research and development of products that generate greater economic earnings, clearly described by the so called 10/90 Gap and its effects on the financing of research related to neglected diseases and, as a consequence, on national health care of the poor and developing countries, where such diseases constitute a factor which defines the epidemic challenges to be faced.

Although the Brazilian C&T system is the most solid in Latin America, the Ministry of Health, since its foundation in the 1950s, was of less importance in the development of technological research and innovation of interest to public health issues. Traditionally, science and technology policy and management have been conducted by the Ministers of Science & Technology and Education, responsible for the horizontal promotion of research and personnel training through their agencies, namely: the National Council of Scientific and Technological Development (CNPq), the Studies and Projects Funding Body (FINEP) and the Coordination for the Improvement of Higher Education Personnel (CAPES).

As a consequence of the constitutional acknowledgement that health is a citizen’s right and the State’s obligation (1988) and, particularly, after publication in 1990 of Law 8080, which regulates the Brazilian Unified Health System (SUS; 1990), it established the legal landmarks which allowed the Ministry of Health to incorporate the mission to develop a vertical format to technological research, development and innovation, in compliance with the prerequisites of Brazilian sanitary reform and the political atmosphere resulting from, at that time, recent redemocratization of the political institutions. Therefore, it was in the light of the principles of universality, equity, integrity and decentralization related to the attention given to health, which guided the SUS management, that the 1st National Conference of Science and Technology in Health (1st CNCTS; 1994) established that the National Policy of Science and Technology in Health (PNCTS) cannot be separated from a National Health Policy, having as a goal the generation of knowledge and material goods to strengthen Brazilian social policies. It must be pointed out that PNCTS, due to the nature of its constitutional object, is a sectorial component of the National Innovation System, since “it searches for a complementarily between agents and systems in a new and more strategic context and contemplates all relevant processes: basic research, strategic research, directed research, applied research, operational research, disclosure of results, technological development and management, pilot and industrial scale production, quality guarantee, marketing, technological regulation and evaluation and patent protection. It shall further contemplate a wide range of development of human resources. The parameters shall be applied to health technologies, such as: health processes and products, health organization, control and management, environment and health information”.

The recommendations of the 1st CNCTS however, were not very effective, due to the prevailing influence, at that time, of neoliberal ideas in the economy of the peripheric countries, based on the forecasts of the so-called Washington...
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Consensus (1989). Concerning sector C, T, & I policies, according to Guimarães, the 1980s in Brazil:

"did not represent a radical breaking up, in relation to models, political proposals or system development. It began in a period of economic recession, and, due to one of these dramatic ironies, it was also the time of the country’s redemocratization associated with a rebound of the neoliberalism against the developing model and destruction of the public sector. To the C & T system, this represented a continuous limitation of the previous decade’s achievements, that was only discontinued from 1985 through 1988, when it pursued a return to the situation existing in the 1970s, a vain attempt due to the tax crisis and the impasse with foreign creditors which respectively, hindered the increase of National Treasury funds and raised difficulties to the negotiation of new agreements with multilateral organizations".

A revisiting of the project has occurred during the two governments of President Luiz Inácio Lula da Silva. As from 2003, the Ministry of Health redefined its structure and a new strategy was set forth for the purpose of strengthening the managing role of the institution concerning the development of scientific knowledge and technological innovation significant for the Brazilian health system. The most important institutional event of this period was the establishment of the Ministry of Health; representation of the Ministry of Health in the Science, Technology and Innovation Council of the Ministry of Health and Science and Technology (MCT); establishment of Technical Cooperation Agreement between the Ministries of Health and Science and Technology and the Industrial Complex and Innovation in Health; signature of a major legislation contract with multilateral organizations”.

Within a macro-organizational structure, over the last five years, the following may be pointed out: the establishment of the Secretary of Science, Technology and Innovation in Health (SCITIE), encompassing the following departments: Biotechnological Productive Chain organized by the Ministry of Health; representation of the Ministry of Health in the Forum of Competitiveness in a Pharmaceutical and Biotechnological Production Chain; and the Ministry of Health; signing of a Technical Cooperation Agreement between the Ministries of Health and Science and Technology (MCT); establishment of the Science, Technology and Innovation Council of the Ministry of Health; representation of the Ministry of Health in the Forum of Competitiveness in a Pharmaceutical and Biotechnological Production Chain organized by the Ministry of Development, Industry and Foreign Trade and, chiefly, the “More Health” Programme (Programa Mais Saúde).

The health production chain, marked by a strong reliance on imports and a high trade deficit (US$ 5.5 billion in 2007) accounts for 7-8% of the GDP, using funds of approximately R$ 160 million (US$ 102 million). As per 2007, for the purpose of promoting economic growth, the Brazilian government launched the Growth Acceleration Programme (PAC) – 2007-2010. PAC gathers a set of institutional actions representing a larger public investment in infrastructure, credit and financing incentives, improvement of investments and tax system in the medium and long term. It is expected the application of funds amounting to approximately R$ 503.9 billion (US$ 320.5 billion), for investments in social and urban infrastructure, transport logistics and energy.

The “More Health” Programme (Mais Saúde), an integral part of PAC, is a mobilizing programme, under the supervision of the Ministry of Health, which has the challenge of reducing the vulnerability of the National Health Policy, from a strategic point of view, including the national production chain into the health industrial complex, by means of major investments in innovation, modernization and development of a public laboratory network, export expansion and diversification and by attracting more technologically advanced foreign companies to produce in the Brazilian market.

As a productive system structuring programme, the “More Health” Programme (Mais Saúde), will invest R$ 5.1 billion (US$ 3.3 billion) in (i) the consolidation of a more competitive Brazilian industry in the production of medical equipment, materials, reagents and diagnosis devices, blood by-products, immunobiologics, chemical intermediates and vegetable extracts for therapeutic purposes, active principles and drugs for human use and (ii) strategic areas of the field of scientific-technologic knowledge for the purpose of reducing the vulnerability of the National Health System. It is expected that 80% of the needs of the National Immunization Programme (FNI) will come from local production, including the incorporation of new vaccines: pneumococcus, meningococcus AC, double viral and quinquevalent (DPT & Hib & Hepatitis B virus). The purpose of Mais Saúde is to replace the import of 20% of the demand for pacemakers, ultrasonography and mammography equipment for the Brazilian National Health System (SUS).

The other action of great impact on the National Innovation System is the conclusion of Hemobrás, a state-owned company that will allow Brazil’s self-sufficiency in blood by-products, complying with 100% of SUS demand for Factor IX, immunoglobulin and human albumin and 30% of the demand for Factor VIII. The funds necessary for expansion of the production capacity will be provided by the Brazilian National Development Bank (BNDES), by means of the Novo
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Profarma (Programme to Support the Development of the Health Industrial Complex). Development of Mais Saúde is pointed out as a fundamental factor to reach the proposed objectives, Brazilian integration with Latin American, Caribbean and African markets, as a strategic space to expand the local industry scale and productivity, integrate local and regional production chains and establish technical cooperation for technical and scientific abilities4.

In addition to provisions for Mais Saúde, considering the 2002–2007 period, the Secretary of Science, Technology and Strategic Supplies (SCTIE) has been guaranteeing increasing funds to comply with the guidelines provided by the Health Research Priority National Agenda Funds for the selected projects have been guaranteed through resources from SCTIE, MCT and state governments. The total investment applied to innovation projects (see Table 1), during the 2002–2007 period, was approximately R$ 109 251 729 (US$ 70 033 160), or up to 40% of all funds intended for the 25 sub-agendas of ANPPS (see Figure 1).

Research and development on neglected diseases is an example of a key strategic area that only now is receiving the high priority it deserves. Through open competition and peer-review processes the Ministry of Health and the Ministry of Science and Technology, through their funding agencies DECIT and CNPq, invested in 2006–2007 R$ 20 million (US$ 12 million) in six diseases that disproportionately hit poor and marginalized populations in Brazil: Dengue, Chagas disease, leishmaniasis, leprosy, malaria and tuberculosis. In a radical departure from traditional national or international initiatives in this area that are usually academic and just curiosity-driven, the DECIT/CNPq Neglected Diseases R&D Programme is based on a Call for Applications that simultaneously require the proposals to have high scientific merit and to address critical health priorities. In addition, efforts are made to invest at least 30% of the R&D funds in projects located in the three Brazilian geographic regions where these diseases are highly prevalent – the Centre West, the North East and the North, particularly the Amazon (see Table 2).

This example should not be perceived as an isolated case, but as representing the paradigmatic shift occurring in Brazil’s science, technology and innovation policies in health, traditionally limited to “Mode I” and now also addressing “Mode II” of knowledge production5.

Upon evaluating the present stage of the Science, Technology and Innovation Policies in Health, we observe that there has been progress concerning a definition of the priorities of research topics and corresponding funds by means of public calls. The Mais Saúde Programme constitutes a powerful strategy to implement and strengthen the National Innovation System, through investments in infrastructure which will enable Brazilian public and private companies to incorporate adequate programmes to introduce new health technologies into the local and foreign markets. However, since it is a medium- and long-term structuring project, it is necessary to take into consideration scenarios which may, if existing, jeopardize the success of these public policies.

At first, among a possible combination of events, we may consider non-accomplishment of funding within the deadlines and amounts necessary to implement the policy, due to a need to increase the primary surplus, which means the economy of budget resources intended for payment of government debt charges. Although Brazil is now enjoying a better situation regarding economic turbulence in the international market, Brazilian interests have recently returned to an increasing trend and additional resources from the federal budget may be requested to pay the government debt, therefore jeopardizing the funds intended for the Mais Saúde Programme. The increase of interest and shortage of offers from other funding sources may also be reflected on the project, it is necessary to take into consideration scenarios which may, if existing, jeopardize the success of these public policies.
practice that is not usual in terms of the political culture in Brazil, particularly if, the Programme deadlines do not include strict regulatory limits to account for the current sectorial needs. Finally, reliance on foreign resources and technologies may constitute another difficulty, intensified by the current international financial crisis. Foreign companies have been cautious concerning new investments in developing countries and they have shown a trend, as a result of this adversity, to sell their assets in these countries.

Innovation policies are important instruments to foster national economies. When well executed they should originate a favourable socioeconomic ambience that positively influences the internal economic market and the national balance of trade. Besides, the scientific development can potentially promote social inclusion.

In Brazil, the “More Health” Programme (Mais Saúde) constitutes a powerful strategy to strengthen the National Innovation System by means of major investments in innovation, modernization and development of public laboratory work, export expansion and by attracting more technologically advanced foreign companies in Brazilian Market.

**Key messages**

- Innovation policies are important instruments to foster national economies and they should originate a favourable socioeconomic ambience that positively influences the internal market and the national balance of trade.
- In Brazil, the “More Health” Programme (Mais Saúde) constitutes a powerful strategy to strengthen the National Innovation System by means of major investments in innovation, modernization and development of public laboratory work, export expansion and by attracting more technologically advanced foreign companies in Brazilian Market.

**References**


Health markets and future health systems: innovation for equity

Article by Gerald Bloom (pictured), Health policy analyst, Institute of Development Studies, UK
with Claire Champion, Henry Lucas, M Hafizur Rahman, Abbas Bhuiya, Oladimeji Oladepo and David Peters

Many low- and low-middle income countries have pluralistic health systems, characterized by widespread and often highly segmented markets offering a diverse range of health-related goods and services. Out-of-pocket payment for health care averages more than 50% of all health spending in these countries, with non-state providers, both private and not-for-profit, typically providing the majority of outpatient curative care. If health services are to benefit the poor, it is essential to gain a detailed understanding of such markets that can both inform attitudes towards them and guide innovations that attempt to engage with them to improve health outcomes.

The spread of market relationships in the provision of health services has coincided with the growth of markets in other sectors. In some countries this has been associated with economic liberalization and economic growth. In others, its emergence is linked to economic decline and the failure of state-provided services to meet popular expectations. In many circumstances the spread of markets has been much faster than the capacity of the state and other key actors to establish regulatory arrangements to influence their performance. A large proportion of market transactions now take place outside a legal regulatory framework or in settings where regulatory regimes are poorly implemented, particularly for the poor. In addition, the boundaries between public and private sectors have become blurred. In many countries users routinely make informal payments for services or drugs at public facilities, or consult government health workers privately. In others, public providers are officially encouraged to generate income in order to supplement often very limited government subsidies.

The marketization of health services has created both opportunities and challenges for poor people. They may have greater choice about where to seek drugs and medical advice, but cost is often a barrier to access. There are examples of excellent services but, as Das et al document, the quality of services that both public and private health workers provide is often flawed, partly in response to perverse incentives. Such incentives also result in an emphasis on medical care at the expense of prevention and health promotion. It is widely recognized that both government and other intermediary organizations can play important roles in altering these incentives and improving the performance of these markets. There is less agreement on what those roles should be in different development contexts and how health systems can construct the institutional arrangements for them to play these roles effectively.

The spread of market relationships has advanced so far in many countries that official policies often have limited relevance to the realities that poor people face when coping with health problems. We propose an approach which explores the operation of health markets in order to help explain how health systems are changing, identify potential opportunities for intervention and innovation, and guide the design of monitoring systems that can track and learn from both the intended and unintended consequences of such innovations. We then examine different types of emerging innovations, and focus on two in Nigeria and Bangladesh.

Conceptual framework
This section describes an approach for analysing and understanding health markets in low- and middle-income countries. It draws on the framework for understanding markets that poor people use presented in a recent paper by Elliott et al and summarized in Figure 1. The authors of that paper place at the centre the relationship between providers and consumers, that is in our case, the relationship between health service providers and patients. Those relationships are greatly influenced by a multi-dimensional and complex environment made of formal and informal rules and of agencies that undertake a number of supporting functions. Strategies for change need to take into account the diverse components of this context as well as ways to improve the management of a single organization or intervention. They also need to acknowledge the importance of conflicts of interest and the degree to which power relationships influence the organization and functioning of relevant markets. For example, many health-related markets are segmented, with well-regulated components used mostly by the better off and unregulated ones used by the poor.

An important aspect of the relationship between providers and patients concerns the transfer of the benefits of medical expert knowledge to the latter. This transaction is characterized by varying degrees of asymmetry of information.
and a consequent imbalance in power, which possessors of expertise can use to their advantage. Societies have evolved mechanisms to address this problem through a combination of regulation by the state, different forms of self-regulation and organizations that build and maintain a reputation for competent and ethical behaviour. The relevant actors include the regulatory arms of central and local government, professional and trade associations, large service provision organizations, and a variety of civil society organizations and consumer associations.

Current rules and regulations often do not take into account the importance and diversity of health markets in developing countries, and thus many actors operate outside a legal framework. Barriers to appropriate regulations are often linked to a lack of government capacity to enforce them or incentives to do so. Many government regulatory agencies focus on the services used by the better off and shy away from attempts to regulate the informal sector which is of paramount importance for the poor. This has led to the emergence of a variety of partnerships between governments and other actors to co-produce rules and improve market performance.

Where regulation is limited and information asymmetries are large, trust is a key dimension in the relationships between providers and consumers. Patients in low- and middle-income countries have shown a willingness to pay more for the services of providers whose competence they trust and many providers have adopted strategies to build and maintain a reputation for high expertise and ethics. Trust and reputation may be based on a variety of factors including directly experienced quality of services (e.g., availability of drugs, cleanliness, courteous staff), perceived status of providers (e.g., professional title, advertised qualifications and experience) and brand recognition (e.g., widely known franchise, accreditation or licensing authority). Less formal arrangements are often important at the community level, where providers operate within local trust networks. Word of mouth is an important medium for the establishment and maintenance of a facility’s reputation.

Another important aspect of the performance of health-related markets relates to information flows. Providers and users of health services get information from many sources. In Bangladesh, for example, the primary source of information for informal providers is from sales representatives or wholesalers who are associated with generic manufacturers. Other sources include the diverse communications media that national and international advocacy groups, government agencies and commercial advertising agencies increasingly use to deliver messages to both providers and the general population. New
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Health market innovations in developing countries

Innovations aimed at improving health services have taken place in both informal and formal sectors. Those happening in organized markets have taken various forms, ranging from commercial models (mostly found in Asia and Latin America) to highly subsidized but market-oriented interventions such as the establishment of provider networks, social franchises or accreditation schemes (mainly run by nongovernmental organizations or faith-based organizations). Notwithstanding the innovations described above, many health transactions involving poor people still take place in the informal sector, where there are minimal quality standards and no reporting requirements. To examine ways of addressing these constraints, two initiatives that involve partnerships between informal providers, policy-makers and the public to shape better health markets for the poor are discussed below.

In Bangladesh, informal providers (village doctors, medicine vendors) are the major source of health care for rural people. A recent formative study conducted in one southeastern sub-district (560 000 people) of Bangladesh by icddr,b found that 96% of health-care providers were informal including village doctors, traditional healers (Kabiraj), traditional birth attendants and spiritual healers. The study found many instances of inappropriate and even dangerous prescribing. The consortium has launched a three-pronged intervention of training informal providers, establishing an association of these providers to implement a degree of quality control and the involvement of the Bangladesh Health Watch in monitoring the performance of informal providers.

In Nigeria where malaria is a major cause of illness and death, most people depend on patent medicine vendors (PMVs) as a source of anti-malarial medication. PMVs operate in poorly markets. A scoping study by the School of Public Health at Ibadan University found that PMVs were the major source of malaria treatment (39%) followed by self-treatment (26%). It also indicated that PMVs often recommend inappropriate products that are inexpensive but also ineffective. In this complex and unregulated market environment, local PMV associations were identified as institutions with the potential to play an important role in providing information, influencing PMV behaviour, and procuring drugs. Also, a large proportion of PMVs (92%) said that community involvement in drug regulation would be highly desirable to complement the relatively weak government system. For example, they could use relatively inexpensive equipment to test the efficacy of anti-malarial drugs. Recent consultations with stakeholders found overwhelming support for an intervention that would involve a partnership between public and private sectors.

Key messages

- Given the pervasiveness of markets for health-related goods and services and the great degree to which the poor obtain medical care in these markets, it is time for health policy-makers to take action to improve their performance, based on a systematic understanding of how these markets operate. In doing so, they need to take account of the following:
  - Attempts to achieve long-lasting change through the efforts of a single organization or a particularly innovative individual tend to be unsuccessful; it is important to understand and address market systems as a whole in order to achieve sustainable change.
  - Reforms should begin with markets in which poor people are already engaged and will often involve informal providers, who operate outside formal legal and regulatory frameworks, and local agencies such as provider associations, citizen groups and local accountability structures.
  - Interventions intended to benefit the poor need to acknowledge and take into account the influence of power and conflicts of interest on their outcome and this should be anticipated in a detailed stakeholder analysis.
  - Interventions that focus solely on providers of health services are unlikely to have a great impact on the poor unless they are linked to measures that provide more equitable access to government funding and donor financial flows.

Acknowledgement

This paper is an output of the DFID-funded Future Health Systems Consortium (http://www.futurehealthsystems.org). The opinions expressed do not necessarily reflect the views of DFID. It also draws on a soon-to-be published background paper for an initiative of the Rockefeller Foundation on the role of the private sector in health systems. This initiative applies a broad health systems lens and is undertaking exploratory work in three broad areas: attitudes of key stakeholders, analysis of five functional areas (risk-sharing, regulation, logistics, contracting and provider performance) and identification of country level programmes and organizations that show a strong potential for replication and/or scaling up. It is expected that the Rockefeller Foundation and additional partners will launch a programme in the near future.

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References

This short paper briefly highlights the “10/90 gap” between high-income and low-income countries for both climate change as well as public health research. The term “10/90 gap” as used here is broadly reflective of the disequilibrium between high- and low-income countries in research and other investments in health interventions. The paper then goes on to discuss the significant overlaps and commonalities in terms of climate change impacts as well as solutions when considered against the broad unfinished public health agenda. Through the use of a few selected examples, readers are encouraged to think about how they can foster a holistic, comprehensive approach to address both climate change as well as public health within their jurisdictions.

The 10/90 gap in research and intervention in climate change

There is now irrefutable proof that climate change due to human activity is occurring, and will accelerate in the coming decades unless significant mitigation to reduce greenhouse gas emissions occurs. Empirical data from meteorology, agriculture, hydrology, ecology and other natural sciences is demonstrating the ecological impact of anthropogenic climate change.

Direct and indirect, short- and long-term effects of climate change on human health are being recognized. Data at the global and high-income country level is good. Data from low-income countries is improving. Researchers, policy-makers and civil society now need to use established knowledge translation tools and approaches to ensure that research informs practice and vise versa. Expanding empirical research only from high-income to low-income regions in itself will not be sufficient or timely to bring about change. This is especially true because some of the modelling exercises are complex and the impacts not easily generalizable to the local context.

Health, environmental, ecological and social sciences researchers have learnt a great deal about the value of linking researchers with civil society and policy-makers. These lessons learnt need to be applied broadly to the climate change and health agenda.

The 10/90 gap in research and intervention in public health

Many of the successes of public health that are now taken for granted in high-income countries remain unattainable for the majority of the population in low-income countries. There have been notable successes in public health achievements in low-income countries, such as childhood immunization programmes, resulting in reduction of childhood deaths from vaccine-preventable infectious diseases. However preventable illnesses due to issues such as unsafe water, malnutrition and vector-borne diseases such as malaria remain unacceptably high. It is pertinent to note that many of the existing gaps in public health in low-income regions continue to have a major environmental, nutritional or infectious disease component. These are the very issues that will be further negatively impacted by global climate change.

Research gaps are not limited to technical issues. They are also in governance, funding and operationalization. Therefore research should not only be on causes of morbidity and mortality due to climate change and surveillance of health effects, but also on feasibility of applying cost-effective interventions and evaluating their impact.

Opportunities for convergence in climate change and public health research and action

There is considerable overlap between research needs for public health and climate change when one considers protecting human populations form the adverse effects of climate change, especially for the worlds’ most vulnerable populations. For these populations, the greatest impact of climate change will not be some novel disease or other environmental stress; it will be an accentuation of existing challenges including vector-borne diseases such as malaria.

Table 1: Key tools for application of climate change research and interventions by level of implementation

<table>
<thead>
<tr>
<th>Level of implementation</th>
<th>Key tools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual</td>
<td>Education</td>
</tr>
<tr>
<td>Household</td>
<td>Empowerment</td>
</tr>
<tr>
<td>Community</td>
<td>Information, resilience, facilitation</td>
</tr>
<tr>
<td>Region/country</td>
<td>Policy, regulation, financing, equity</td>
</tr>
<tr>
<td>Global</td>
<td>Collaboration, equity, financing</td>
</tr>
</tbody>
</table>

Article by Saqib Shahab (pictured), University of Alberta with Abdul Ghaffar
and dengue; poor water quality and quantity; hunger and malnutrition; hot and unpredictable weather patterns; and more frequent storms and natural disasters.

The direct effects of climate change such as thermal stress have been well quantified for high-income countries and are beginning to be modelled for low-income countries. Similarly, the indirect but early effects of climate change such as increase in water- and vector-borne diseases are also now beginning to be estimated. Long-term effects however, such as impact of ecological changes on food security, water accessibility and extreme weather events such as hurricanes and storms is harder to estimate globally.

There is some debate about what the microclimatic impacts of climate change at the local level will be. It is a fair assumption that they will be predominantly negative for the majority of people living in low-income countries. They may be initially climate neutral or positive for a few people living in low-income countries and some in high-income countries. However, over time, the global impacts on health, economy, and ecology are now considered to be profoundly negative.

Investments made in research in public health programmes and interventions that are impacted by climate change now and into the future are also, in many instances, issues that are or should also currently be high priority in terms of preventable public health disease burden.

Achieving the Millennium Development Goals (especially as they relate to hunger, universal primary education, gender equality, child mortality, malaria, environmental sustainability and a global partnership for development) will increase the resilience and adaptive capacity of the most vulnerable populations to the known and potential negative consequences of climate change, in addition to being a demonstrated public health goal in their own right.

The “new public health” stresses not just the direct, proximate causes of ill-health, but also the more distal, broadly defined “determinants of health”. Application of these public health principles would foster a more holistic understanding of the approach to health protection and health promotion in the face of climate change. Health should, after all, be “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity”.

### Table 2: Approach to application of technical knowledge in low-income settings

<table>
<thead>
<tr>
<th>Issue</th>
<th>Do technical solutions exist?</th>
<th>Are technical solutions successfully implemented in low-income countries?</th>
<th>Barriers to implementation</th>
<th>Opportunities for research, knowledge translation, implementation and evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vector-borne diseases</td>
<td>Yes</td>
<td>Somewhat</td>
<td>Climate, geography, economy, governance</td>
<td>Solutions need to be appropriate, acceptable and sustainable</td>
</tr>
<tr>
<td>Disasters: hurricanes, cyclones</td>
<td>Limited</td>
<td>Limited</td>
<td>Populations already vulnerable</td>
<td>Increase state and community capacity and resiliency to predict and respond to natural disasters</td>
</tr>
<tr>
<td>Water stress</td>
<td>Limited</td>
<td>Limited</td>
<td>Loss of local control over water resources, Powerful competing interests on decreasing fresh water supplies</td>
<td>Resource poor communities have always traditionally conserved water; local knowledge and empowerment has to be linked to new technologies for water conservation</td>
</tr>
<tr>
<td>Safe water supply</td>
<td>Yes</td>
<td>Not uniformly</td>
<td>Macroeconomic limitations; lack of local training and infrastructure</td>
<td>National fiscal transfers to public health; investment in infrastructure and point of use capacity</td>
</tr>
<tr>
<td>Changing agricultural yield</td>
<td>Historically strong capacity to increase agricultural yields</td>
<td>Significant experience in translating research into improved agricultural yields</td>
<td>Some areas may have peaked in their capacity to sustain increasing yields</td>
<td>Understanding fundamental changes that may be required in crop types</td>
</tr>
<tr>
<td>Poverty and inequity</td>
<td>Limited</td>
<td>Significant successes related to micro credit, literacy and empowerment</td>
<td>Continuing unmet needs in female literacy and gender equity</td>
<td>Demonstrating how addressing poverty and inequity can increase community capacity and social capital</td>
</tr>
<tr>
<td>Conflict</td>
<td>Limited</td>
<td>Non conflict based dispute resolution as advocated by intergovernmental organizations and local and global civil societies</td>
<td>Perceived national self interest. Historical rivalries</td>
<td>Demonstration of non conflict based solutions as ultimately more sustainable</td>
</tr>
</tbody>
</table>

The synergistic, catalytic power of this convergence has great potential. It can protect vulnerable populations from current known public health threats that are also being potentiated by climate change; and also make vulnerable populations more resilient to cope with future potentially unknown threats. Not seeking convergence of the climate change and public health research and intervention agenda, however, runs the risk of potentially undoing many of the public health gains of the recent past.

Innovative strategies for research in climate change and public health

Mitigation is preventing climate change in the first place, primarily by reducing greenhouse gas emissions and other anthropogenic activity contributing to climate change. Adaptation is adjusting to current and future impacts of climate change. The health sector needs to engage with and support research in both the mitigation as well as the adaptation sector.

While research in mitigation is primarily seen as a responsibility of the energy sector. There are substantial potential co-benefits to health beyond reversal of climate change if health-centric approaches to mitigation are adopted. These include:

- Improved air quality with reduction of fossil fuel use and greater use of cleaner alternative energy sources.
- Reduction in injuries due to road traffic accidents with increased reliance on public transport and better urban,
community and work life planning.

- Prevention of chronic diseases such as diabetes, stroke and heart disease by promoting active transport such as walking and cycling and healthier diets.

As the benefits for mitigation are global, for both high-income as well as low-income countries, momentum is building globally for a concerted effort to mitigate the health impacts of climate change. It is important to continue to document the health impacts of climate change as well as mitigation by enhanced surveillance systems to continue to provide evidence and impetus for climate change mitigation.

Meanwhile, it is essential that populations globally prepare to adapt to some of the inevitable adverse consequences of climate change until such time that mitigation efforts start to have a stabilizing effect.

The application of research for adaptation, while of global significance and import, has to be rooted in local contexts of geography, economics and culture. It is important to have a conceptual map of what research is required (see Figure 1). It is also important to ensure that resources for research are used most efficiently to maximize the public good. Many of the most urgent impacts of climate change can be countered with existing knowledge and a more cost-effective way of leveraging proven public health interventions for vulnerable populations in sustainable ways (see Figure 2).

Research approaches need to be empirical but also ecological. The translation and application of existing and new research findings needs to act both at the community level in terms of empowerment as well as at a global/regional level in terms of policy and funding. Many public health interventions that will also protect vulnerable populations against progressive climate change act at a variety of levels including individual, household, community, national and regional (see Table 1).

Examples of successful interventions include:

- Household uptake of long-lasting insecticide-treated bed nets when combined with other more standard vector control programmes.
- Provision of effective, affordable, locally manufactured point-of-use water filters.

For each example of a successful or promising intervention, it is not sufficient just to know whether a technical solution exists. Research on cost-effective and sustainable implementation also needs to occur (see Table 2).

Conclusions

While the challenges are significant, so are the opportunities. Climate change seems to have acted as a catalyst promoting trans-disciplinary, holistic, global partnerships in research, knowledge generation, translation and action.

Many initiatives are currently underway especially in the environmental, agricultural and water resources sectors to assess impacts to and adaptation from a developing country perspective. The issue of health should be one of the explicit foci of these initiatives.

### Key messages

- **Incorporation of climate change health impacts into public health planning:**
  a) Estimate current and future impacts of climate change when planning public health interventions.
  b) For each public health intervention assess if there will be an impact of climate change, and adjust for that.
  c) Climate change should be one of the variables when estimating the impact and outcomes of public health interventions.

- **Partnering with all stakeholders:**
  a) Partner with other stakeholders outside the health sector for climate change adaptation strategies.
  b) Continue to advocate for mitigation as the ultimate goal to address climate change.
  c) Maximize the diffusion of innovations through civil society and the Internet.
  d) Incorporate climate change mitigation and adaptation impacts in intra- and intersectoral planning. Should include all possible sectors such as transportation, housing, energy policy, education, health, agriculture, land use, environment, industries, trade etc.

- **Supporting innovation, collaboration and knowledge translation in research:**
  a) Include climate change as an element to consider for trans-disciplinary research funding.
  b) Make knowledge translation and collaboration with low-income countries a prerequisite for research funding approval in high-income countries.
  c) Support the establishment of public health surveillance systems that monitor the impact of climate change as an integral part of health status and assessment measures.
  d) Ensure research is translated into locally relevant, cost-effective and sustainable interventions.

Innovative approaches from regional “second generation” assessments of the impacts of and adaptation to climate change done primarily in agriculture and water resources need to be replicated and expanded to include direct and indirect health impact and adaptation assessments.

Civil society is well prepared to engage with governments and researchers to advocate for and adopt contextually appropriate local interventions to mitigate and adapt to climate change. There is unprecedented open access for most if not all stakeholders to information thorough the World Wide Web.

Along with the expected increase in funding for climate change research and interventions, it is vital that this spirit of openness and collaboration is maintained. Innovation in climate change research and interventions potentially has the promise to address many existing and long-standing public health issues as well as prepare for future risks.
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He has a long history of working internationally in global public health, including with the Global Forum for Health Research, with a special interest and expertise in enhancing health systems capacity to participate in and apply research, especially in developing country and resource poor settings. His recent focus has been emphasizing research not just on technical and biomedical issues, but also health system organization, policy, capacity and cost effectiveness.

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Global health diplomacy may be thought of as a political activity that meets the dual goals of improving health while maintaining and strengthening international relations. As diplomacy is frequently referred to as the art and practice of conducting negotiations, the term "global health diplomacy" aims to capture the multi-level and multi-actor negotiation processes that shape the global policy environment for health. It bridges the commitment to development and the need to define collective action in an interdependent world. This emerging field draws on a broad range of disciplines including international relations, medical anthropology, political science, history and public health. Therefore it is important to understand some of the historical and conceptual underpinnings of this emerging field.

Academic rigour applied to global health diplomacy is a critical leaven in a chaotic global health environment. This paper presents a brief review of the issues that provide a possible focus for future training, research and service in global health diplomacy.

Historical roots

A historical perspective may help illustrate an emerging tension surrounding health cooperation and diplomacy. In fact, international public health agreements were originally created to protect against the importation of foreign-born diseases and as a defence for national commercial and trading interests, going as far back as the Middle Ages in Europe.

We may also find some roots of health diplomacy in early missionary work, which adopted medical treatment as part of evangelical activities. For example in India, Fitzgerald described the emergence of medical assistance as a tool for religious conversion among British colonial subjects. There is thus a need to consider the normative foundations of global health diplomacy, such as in the humanitarian activities of the Red Cross Movement, with equity and social justice being key components. The current structures of global public health may perpetuate the imbalance of power between the developed and the developing world. However, we now see a power shift in the role of the emerging economies, as in the recent Doha rounds of World Trade Organization negotiations.

From the mid 1850s, countries have dealt with the increasing risk of disease from beyond their borders as a national and economic security issue. These national interests now mandate that countries engage internationally as a responsibility to protect against imported health threats or to help stabilize conflicts abroad so that they do not disrupt global security or commerce. Concerns for health security include the threat of bioweapons (accidental or purposeful) as well as both infectious diseases and noncommunicable diseases that can wreak havoc on global economies. It is the careful balancing of sometimes competing global health priorities, playing out both nationally and globally, that make partnership across disciplines essential in raising the profile of health as a foreign policy concern. Global health efforts will founder unless and until nation states cooperate in combining their national interests with the global public good.

Contributing concepts

Humanitarian assistance

The notion of humanitarian assistance as part of foreign policy was described in a 1974 editorial in Preventive Medicine, wherein Cahill advocated using medicine as a tool of modern diplomacy. His more recent work suggests that health is a common ground for understanding and cooperation among peoples and nations with differing traditions and values. This is especially true in nations that are shattered by war, civil conflicts and ethnic violence. Over the next 25 years, humanitarianism rather than foreign policy per se was the focus for health diplomacy. However, humanitarian assistance provided by the United States and others to disaster areas such as Sudan fulfilled broader political and economic objectives rather than just beneficence. Aligning aid organizations with dysfunctional governments may enable these governments to be unresponsive to their own national crises. These examples suggest that aid organizations must be politically and ethically more savvy in order to assure justice-based approaches to international health assistance. Health diplomacy attempts...
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...to prioritize the health outcomes of humanitarian aid as a route to negotiations in the political sphere.

A critical new development in global health is the proliferation of private sector and government donations in international aid; these have been largely disease-specific enterprises (such as the Global Fund for AIDS, TB and Malaria). A 2004 estimate suggested that international funding for global health reached US$14 billion in that year, due largely to contributions from the Bill & Melinda Gates Foundation and the US government’s Presidential Emergency Plan for AIDS Relief (PEPFAR). The proliferation of smaller nongovernmental organizations (NGOs), privately funded and focused on single communities, specific health outcomes or specific medical interventions is also unprecedented in history. Along with this bonanza, there is increasing convergence of thought on the evidence of effectiveness for global health interventions11. This evidence has been thoroughly reported in the hallmark publication, Disease control priorities in developing countries12. What may be missing from these discussions, however, is a sense of the absorptive capacities and global governance needs that are necessary for both recipients and donors to manage these resources13.

Human rights

The emergence of human rights as a global movement clearly sparked challenges and debates within the field of humanitarian assistance that have yet to be resolved. The notion of human rights and health assistance has emerged as a basis for cooperative action across nations, the private sector and NGOs. The right to health became a key element as a basis for cooperative action across nations, the private sector and NGOs. The right to health was recognized as a human right in 2000 by the World Health Assembly’s 53rd Meeting of States Parties. It has been developed into the right to the highest attainable standard of health. The right to health has been recognized by the United Nations as a fundamental human right and has been included in the International Covenant on Economic, Social and Cultural Rights.

Globalization has also expanded the threat of noncommunicable disease to populations and economies worldwide14. This latter set of threats (tobacco-related diseases, obesity, injuries, mental health problems, cancers, stroke and cardiovascular disease) are much less attention-grabbing as global health problems compared with the high-profile infectious diseases that are now so well funded; nevertheless, they are the largest contributors to the global burden of disease15. Noncommunicable diseases have emerged as global threats, no longer considered a condition of only affluent populations16. These conditions may contribute to developmental stagnation in emerging economies, and they may lead to inordinate demands on health systems that disrupt production and trade capacities of these economies.

Enlightened self-interest

Improvements in health status globally – especially in developing countries – promote economic and security interests for both donor countries and the larger global community17. In 1997, the Institute of Medicine (IOM) published a volume of evidence supporting the United States’ critical need to address global health as a vital national priority18; following this, infectious diseases were recognized in the National Intelligence Estimate as a significant threat to national security, with an emphasis placed on the importance of HIV/AIDS19. Recently, some have even suggested that the avian influenza threat presents potential for cooperation between the militaries of, for example, the United States and China. They may be encouraged to pool their resources in order to address a common threat such as this20.

Given the potential for new commitments to global health diplomacy in a changing global political environment, the IOM’s Board on Global Health is now organizing a 14-month consensus study to examine and articulate the case for why multinational cooperation and perhaps new ways of addressing the global health workforce crisis (see www.iom.edu/CMS/3783/51303.aspx).

Multinational cooperation

In December 2004, the United Nations issued an important report, A more secure world: our shared responsibility: report of the high-level panel on threats, challenges and change21, a follow-up to the 2000 UN Millennium Summit, where commitments to global cooperation were made in response to several major health and development challenges. The 2004 report emphasized the need to achieve the Millennium Development Goals (MDGs; see Table 1), with a focus on health and biological security.

The focus of the UN report also extends to the social determinants of health (especially poverty and economic...
The role of nonstate actors, including private philanthropies, private individuals and private industry, has emerged as a concern from both political and social science perspectives. These new global networks are clearly a 21st century humanitarian assistance phenomenon. The disparate, uncoordinated efforts within global health call for a more systematic global cooperative effort. However, neither the traditional state actors nor the modern nonstate actors are likely to accept either centralization under a ruling global authority or harmonization of goals, practices and procedures across organizations. Nonetheless, the acceptance and integration of health as a global public good has crossed a variety of thresholds, including trade, security, bioethics, international relations and economics. This suggests that the principles and policies of global health governance, what Fidler terms the “source code”, have functioned independently of centralized efforts. Instead of developing a new governance structure, global health actors should consider how successful applications of this source code will look in the 21st century. A range of proposals that build on network governance and aim to bring together the many actors in this new political space have since been put forward. A growing international consensus on what works and what does not work in global health, and the growth of the new academic global health programmes and philanthropic structures will redefine global health governance in the years to come.

What should also be evident is the need for new public health instruments to support collective health efforts. Fidler calls for further examination of new efforts in global health governance such as the Framework Convention on Tobacco Control (FCTC) and the revised International Health Regulations (IHR). The FCTC was the first treaty calling for further examination of new efforts in global health governance, what Fidler terms the “source code”, have functioned independently of centralized efforts. Instead of developing a new governance structure, global health actors should consider how successful applications of this source code will look in the 21st century. A range of proposals that build on network governance and aim to bring together the many actors in this new political space have since been put forward. A growing international consensus on what works and what does not work in global health, and the growth of the new academic global health programmes and philanthropic structures will redefine global health governance in the years to come.

What should also be evident is the need for new public health instruments to support collective health efforts. Fidler calls for further examination of new efforts in global health governance such as the Framework Convention on Tobacco Control (FCTC) and the revised International Health Regulations (IHR). The FCTC was the first treaty implemented under the WHO’s constitutions, Article 19. It has now been ratified by 155 countries and will call for national policies to assure full participation in the Conference of the Parties, the supervising entity for the treaty. In addition, there are challenges posed by the new IHR as a consensus agreement within the WHO for countries to support global responses to critical public health problems and to share information and responses to these problems.

Emergence of health diplomacy in the United States

In 2001, the Council on Foreign Relations made a strong case that the US government had a critical responsibility to make health a priority in foreign policy. US global health policy today is rooted in both national security concerns and a worldwide desire for social justice and equity. Health diplomacy offers the potential for breaking free of the governance dilemma by bringing together health and foreign policy based on a concept of human security that embraces rights and well-being rather than only enlightened national self-interest.

Recently several US government officials have discussed medical diplomacy as an element of foreign policy, often focusing on the delivery of health care within low-resource settings and the distribution of medical technology. In 2005, the IOM reviewed a number of international models for increasing humanitarian assistance within the HIV/AIDS epidemic with the suggestion for development of a Global Health Corps that would provide for improved global health capacity through elective service by US health professionals. This programme would actually emulate...
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Hideyo Noguchi Africa Prize

Article by Kiyoshi Kurokawa (pictured), Chair, Hideyo Noguchi African Prize and Special Advisor to the Cabinet of the Japanese Government with Tamaki Tsukada and Eri Maeda

On 28 May 2008 Brian Greenwood, of London School of Hygiene and Tropical Medicine, and Miriam Were of National AIDS Control Council of Kenya, were awarded the First Hideyo Noguchi Africa Prize.

The presentation ceremony hosted by Prime Minister Yasuo Fukuda was attended by their Majesties the Emperor and Empress of Japan and hundreds of international dignitaries, including more than 40 heads of state and government of the African countries participating in the Fourth Tokyo International Conference on African Development (TICAD IV). The presentation ceremony marked the first day of the TICAD IV held in Yokohama. The day happened to coincide with the “80th anniversary plus one week” of Noguchi’s death in Ghana, 21 May 1928.

The best description of the ideals of the Hideyo Noguchi Africa Prize is perhaps the acceptance speeches of the two laureates (excerpts as follows):

“Forty-three years ago, as a young man, I set off on my first visit to Africa to take up an appointment at University College Hospital, Ibadan in Western Nigeria. At that time, this was considered rather a strange thing to do. I had up to that point done well in my medical career in England and some of my seniors in the UK considered that going to work in Africa was bizarre, almost a form of professional suicide for a young physician. This evening is the occasion on which I have finally proved them wrong. The concept underlying the Naguchi Prize is an extremely important one as it establishes the point that what is sometimes considered as rather soft, that is applied or field, research, is as intellectually rigorous and demanding as the high technology laboratory research that, in the past, has usually attracted the international prizes. The establishment of the Naguchi Prize will help to redress this balance and the Japanese Government is to be commended on taking this initiative”, (Brian Greenwood).

“Reduction of the disease burden on the people of Africa and improvement of health is crucial for the creation of wealth and social stability are some of the requirements for us, the people of Africa, to get out of the indignity in which most of us live. We, the people of Africa, believe that through this forum (TICAD) and the prize outcomes will be positive for Africa”, (Miriam Were).

The creation of the prize came out as a typical Koizumi-style coup de main during his visit to Africa in May 2006. It was literally a top-down initiative. Nobody at the time actually thought about the meaning, let alone the consequence, of creating yet another prize in the already over-crowded international prize market. However, it turned out that this particular field of science – tropical medicine, public health, or so-called translational research – lacked a proper system of reward which commanded substantial international outreach and legitimacy. It was precisely this area of science and research which warranted particular attention of the international science community if we were to defeat the global health challenges.

Why do we have to constrain ourselves on a specific continent when a global issue like health and medicine is at issue? Because Africa is the continent most in need of resources, financial or otherwise, in order to achieve the United Nation’s Millennium Development Goals (MDGs). These were the founding principles and parameters which determined the framework of the new prize. The prize has set itself a totally different and radical approach on how to recognize, inspire and shape research in a globalizing world.

Before going into the prize further, let us briefly review Hideyo Noguchi, a figure who captivated Koizumi’s imagination to conceive this prize.

Who is Noguchi?
Hideyo Noguchi (1876–1928) was a prominent Japanese bacteriologist in the early 20th century, internationally acclaimed for his contribution to the understanding of infectious diseases. Noguchi eventually died in Accra, Gold Coast (now Ghana) of yellow fever while working in search of its pathogen. It is said that the death of his close Rockefeller colleague Dr Adrien Stokes of yellow fever made Noguchi decide to travel to Africa. It was still a decade before the virus was discovered by mankind and ascertained as the pathogen.

Noguchi was born in a very poor family in the impoverished rural village of Fukushima. He had a physical
handicap, a deformity on his left hand due to a burn that he suffered during his early childhood. Notwithstanding these handicaps, he managed to obtain, through extraordinary hard work, a licence to practise medicine in Japan. He did exceptionally well in school but in those days, obtaining higher education, especially in medicine, was expensive and exclusive. The professional horizon of a medical student from a lowly family background without a degree from the Imperial University, could not extend much further than a provincial practitioner. Naguchi was not content to remain in obscurity.

In 1901, at the age of 23, Naguchi moved to the United States and made his way to the laboratory of Simon Flexner at the University of Pennsylvania. In 1904, Flexner was invited to head the newly founded Rockefeller Institute for Medical Research (now Rockefeller University), and brought Naguchi, his most trusted protégé, with him. In the early years in the institute, Naguchi earned the epithet “human dynamo”, not without a racist hue. But by the 1910s he was one of the top researchers leading the institute to world fame comparable to its European counterparts. In those days in the field of medicine (and to a large extent science in general), the United States had been playing the second fiddle to Europe.

His extraordinary appetite for research and zeal to conquer the cause of diseases, brought him to various places in the western hemisphere in Central and South America where the rate of death from yellow fever was particularly high. The Rockefeller Institute for Medical Research had formed a special task force for South America and appointed Naguchi as one of its leaders. In 1918, Naguchi landed on Guayaquil, Ecuador, the epicentre of this disease; his battle against yellow fever thus began. In just nine days, he isolated the pathogen (Leptospira icteroides) and produced a vaccine and antiserum, successfully lowering the death rate. Naguchi was worshipped as a crusader against yellow fever in places where he visited: Mexico, Brazil and Peru. However, it was not possible at that time to identify a virus; it did not exist even in people’s imagination. However, Naguchi harboured some doubts about the veracity of his findings and he did record certain observations to this effect true to his academic conscience. That was what motivated Naguchi to set sail for Africa.

A prominent Rockefeller scientist travelling all the way to Africa, notwithstanding various prejudices against a non-white, physically handicapped upstart had a tremendous impact worldwide. It is this courage and passion combined with his belief in field-based research that makes Naguchi and his contribution remarkable. And this is the nexus between Naguchi and the newly created prize.

Hideyo Naguchi (1876–1928) was a prominent Japanese bacteriologist in the early 20th century, internationally acclaimed for his contribution to the understanding of infectious diseases. Naguchi eventually died in Accra, Gold Coast (now Ghana) of yellow fever while working in search of its pathogen.

Business model or process of the prize

It is not possible to make a simple comparison between the style of research in the days of Naguchi, when researchers were honoured simply by discovering or isolating agents from patients, and that of the contemporary scene where conditions and requirements have become much more complex. However, the field-based research style of Naguchi is increasing in its value in combating diseases in Africa. There is an atavistic call for simple but high quality research based on practical needs on the ground combined with a deep understanding of the ecological and human factors indigenous to Africa.

In May 2006, Prime Minister Koizumi announced the establishment of the prize in the joint press conference with President Kufuor of Ghana. After returning to Japan, Koizumi instructed the ministries of foreign affairs, health and welfare, and science and education to elaborate on the concept. The Cabinet Office was designated as the coordinating agency and in July 2006, in the Japan-African Union (AU) summit, the prize became the main agenda. In the joint press conference by Prime Minister Koizumi and AU Chairperson Konare it was announced that the prize will be awarded every five years and that the first will be awarded in 2008 within TICAD IV. A cabinet decision was made to that effect.

The latter part of 2006 was consecrated to establishing a truly effective business model or process in order for this prize to be competitive and attractive in the science community as well as pertinent to the global (i.e. African) health needs.

The first demand was to ensure diversity and inclusiveness. Nominations will be sought from around the globe including all the 53 countries in Africa. Africa has often been a non-entity in the science community. By inclusiveness, we do not mean affirmative action. What is needed is a truly fair and equitable playing ground to encourage research of Africa, for Africa, by Africa. The composition of the three selection committees will be international with a balanced representation from various continents6.

The second demand was to ensure fairness and academic rigour of the selection process. Not only the outcome but also the process through which the laureate is elected should be superlative, that is worthy of the substantial amount of honorarium attached to the prize. Prestige and appeal of a prize is not something which could be bought but only earned by example. For this purpose, two sub-committees were set up to conduct the expert level screening in respect...
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The laureates.

those who issued genial statements congratulating Foundation and the Rockefeller University were among the World Bank, the Gates Foundation, the Rockefeller community were cordial and encouraging. The WHO, Prime Minister.

Were as the candidates for the first prize. This was duly unanimously recommended Brian Greenwood and Miriam February 2008, the Hideyo Noguchi Africa Prize Committee Noguchi Africa Prize Committee for final consideration. In candidates. These six candidates were referred to the Hideyo Services Sub-Committee selected three among 23 candidates. Meanwhile, from June to December 2007, the Medical Research Sub-Committee selected three among 57 candidates. Achievements of the two laureates Achievements nomination requests together with the nomination guidelines were sent out to more than 2000 individuals and institutions, and slightly more than 100 nominations were received.

From February to December 2007, the Medical Research Sub-Committee selected three among 57 candidates. Meanwhile, from June to December 2007, the Medical Services Sub-Committee selected three among 23 candidates. These six candidates were referred to the Hideyo Noguchi Africa Prize Committee for final consideration. In February 2008, the Hideyo Noguchi Africa Prize Committee unanimously recommended Brian Greenwood and Miriam Were as the candidates for the first prize. This was duly approved and announced on 26 March 2008 by the Prime Minister.

Reactions from the international health and research community were cordial and encouraging. The WHO, the World Bank, the Gates Foundation, the Rockefeller and the Rockefeller University were among those who issued genial statements congratulating the laureates.

Brian Greenwood was honoured for his bold and innovative work on malaria. At a time when malaria was spreading uncontrollably across the African continent claiming more than 1 million lives a year, Greenwood contributed to the creation and designing of effective strategies to control malaria. His crucial contributions in malaria research greatly helped developing the tools and knowledge that are essential in turning the tide on this devastating disease. His work brings hope where very recently only despair existed.

Greenwood has spent more than 30 years on site in Africa including 15 years as Director of the MRC Laboratories in The Gambia where he pioneered landmark research contributing to the understanding of the immunology, pathogenesis and epidemiology of malaria, a major killer in Africa, and other infectious diseases such as meningitis and pneumonia, all major contributors to mortality among children in Africa. His research and translational clinical studies, involving simple but high quality methods as well as field trials of drugs and vaccines, have provided the scientific underpinning to a wide range of influential public health policies at national and international levels. His important contributions include:

- Demonstration of the effectiveness of insecticide-treated bed-nets for control of malaria, which is now the cornerstone of malaria interventions throughout the continent, supported and financed by many donor agencies;
- Primary studies on artemisinin-based combination therapies (ACTs), now widely adapted as first-line treatment for malaria;
- Demonstration that malaria chemoprevention reduces child mortality. This is now being applied for intermittent preventive treatment in infants, children and in pregnancy;
- Substantial contributions of malaria vaccines, including the efficacious RTS,S vaccine.

Another important aspect of Greenwood’s achievements is his reinvention of field research in tropical medicine – changing it from an ancillary colonial or military activity focusing on hygiene to a multi-party, multi-disciplinary endeavour, wherein holistic solutions are required – based on cutting-edge science and a genuine understanding of the complex eco-system as well as real-life challenges unique to Africa. Thus laboratory and clinical research, preventive and curative medicine, epidemiology, anthropology, and behavioural research were all brought together. These modern approaches which we now take for granted came from Greenwood’s prescience and leadership.

Over the years, Greenwood has made capacity building – another lasting legacy of his research based on African soil – a central objective including the training and support of young African scientists. A cohort of students, doctors and clinicians who developed their careers under Greenwood’s inspirational mentorship has immensely contributed to the increase in
stature of medical research in Africa amongst the scientific community in general.

Under the medical services category, the inaugural award went to Miriam K Were, whose efforts to bring basic medical services and health rights to women and children in the villages of East Africa has been a beacon of hope for millions of people in Africa and the world. Through her work with African Medical and Research Foundation (AMREF) and UZIMA Foundation, Were has been a source of inspiration for all people on the African continent.

For the past 40 years, Were has dedicated her life to advancing the health and welfare of the people of Africa through a focus on the practicalities of delivering service at a local level. She has united communities to develop and implement innovative solutions to quotidien health problems. The most illustrious example of her community-based approach is her ongoing work to build public toilet facilities in local communities, improving hygiene and overcoming longstanding taboos. She also drastically raised the infant vaccination rate by organizing children into small groups to visit local clinics. Her innovation and systemic precedents have had enduring impacts not only in Kenya but throughout the East African region and across the entire continent, through her engagement with the African Union and as a key health adviser to the African Heads of State on AIDS, tuberculosis and malaria.

Her style of work through the direct engagement of the youth, sex workers, intravenous drug users, homosexuals and others to encourage openness and frank discussion on sexuality and HIV/AIDS has galvanized communities in Kenya and contributed to the reduction of stigma and discrimination against people living with HIV/AIDS. She is a dedicated advocate for vulnerable populations, especially the poor and the marginalized. She is also committed to the empowerment and development of all voices across lines of sex, tribe, and age and class background. Widows and orphans severely affected by HIV/AIDS are amongst those most positively touched by her contribution to expanding access to medical services.

We would also like to pay tribute to the families, particularly the spouses, of the two laureates whose continuing support and understanding for the harsh working environment of medical profession/career in Africa has been instrumental to realise these achievements. The importance of these familial ties came home to all of us during the flower presentation ceremony by the children of the alma mater of Hideyo Noguchi in Fukushima when Alice Greenwood (wife of Brian Greenwood) and Humphreys Were (husband of Miriam Were) hugged each other in tears congratulating each other’s enduring assistance over the years.

Conclusion
The prize is a unique call to marshal the multitude of activities on research and service delivery in the field of health transpiring on the African continent – a continent most in need of resources and care but often marginalized and neglected – and eventually to transform the way in which the international community addresses medical and health issues on Africa.

Japan as Chair of G8 this year, which is incidentally the year of TICAD, is leading the efforts to harness the surging enthusiasm of the international community on the health agenda. The Japanese government considers the Hideyo Noguchi Africa Prize mechanism to be an integral part of this policy context.

Health and medical interventions tend to be subject to the whim of ply. Of course, health matters are by nature humanitarian. However, we need to conscientize the public that charity is not sufficient to roll back the overwhelming health challenge in Africa. We need to encourage robust science and research in Africa. Science should not be a monopoly of the developed world. Research on African health cannot be truly meaningful or sustainable unless it is owned by Africans.

The following excerpt from an article by Professor Makgoba, Vice-Chancellor of KwaZulu Natal University, perhaps best captures the African hope and expectations.

“Major international prizes that have shaped modern medical scientific advancements such as the Nobel Prize, have the thrust on individualistic scientific achievements without a direct link to society or a focus on global health burden. For these reasons they have advanced science and health research in a particular, esoteric way; have become prizes of the elite and advantaged science and scientists of the developed world; and have been detached from real global health problems. As a result, while prestigious, in reality they have been exclusive and insensitive to the health realities of the developing world. Often the processes and structures of their decision-making have been shrouded in secrecy and have lacked diversity and internationalism. It will be interesting to see how these established awards rise to the challenges of the modern world and in particular to the impact of this newly launched Hideyo Noguchi Africa Prize.”

We wish to acknowledge our indebtedness to each and all of the three selection committees in particular the three chairpersons for their intellectual and moral support throughout the process. We must also record our deep gratitude and almost thunderstruck admiration for Junichiro Koizumi for his sense of mission which constantly motivated and inspired us to make this concept a reality.

*The opinions contained herein do not necessarily represent the views or policies of the Government of Japan.

**Kiyoshi Kurokawa MD is Chair of the Hideyo Noguchi Africa Prize Committee and Special Advisor to the Cabinet of the Japanese Government. See www.kiyoshikurokawa.com**

**Tamaki Tsukada is Director of the Hideyo Noguchi Africa Prize Unit, Cabinet Office (currently Director of Economic Security Division, Ministry of Foreign Affairs).**

**Eri Noguchi is Officer of the Hideyo Noguchi Africa Prize Unit, Cabinet Office (currently South-East Asia Division, Ministry of Foreign Affairs).**
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2. See acceptance speech by MiriamWere at the Presentation Ceremony, 28 May 2008 (http://www.cao.go.jp/noguchisho/jyusyousiki-sikiside-e/were-e.pdf).
4. Noguchi's major research achievements could be summarized as follows:
   1. Discovery of *Treponema pallidum*, the causative agent of syphilis, in the brains of progressive paralysis patients (1913).
   2. Success in growing pure culture of *Syphilis spirochete* (1911), however, no one has succeeded ever since in the replication of pure culture of *Syphilis spirochete*.
   3. Proves that both Oroya fever and Verruga peruana are caused by a single pathogen *Bartonella bacilliformis* by verifying that *Bartonella bacilliformis* invades red blood cells in both cases (1926).
   4. Observation of *Leptospira icteroides* from patients of yellow fever (1919). (Leptospira, which was then identified as the cause of yellow fever by Noguchi, was later disproved and proved to be in fact the spirochete of Weil's disease. His name is remembered in the binomial *leptospira noguchi* in the classification of spirochetes.)
5. The number of research papers written by him reached almost 200 and various kinds of infectious diseases came under the scope of his interest, varying from study of pathogens and immunology to development of vaccine and experimental technique. Noguchi was three times nominated as a Nobel-Prize candidate in the period 1914–1920.
6. The Noguchi Memorial Institute for Medical Research was established in 1979 and named after Hideyo Noguchi who died from yellow fever in 1928, the very same disease he was researching into (http://www.noguchimedres.org/).
7. The nationality of the members of the Sub-Committee for Medical Research is as follows: 19 Japan, 1 France, 1 Mexico, 1 USA, 1 Ghana and 1 Australia. See the following for details: http://www.cao.go.jp/noguchisho/iinkai/iinmember-e.html.
8. Professor Were serves as a Chairman, International Board of Directors of the African Medical and Research, Foundation, AMREF from February 2003 to date (www.amref.org).
9. Professor Were was Founding Chairperson up to 2001 and is a Member of the Board of Trustees of the UZIMA Foundation to date. The Foundation is a charitable trust registered in Kenya (http://uzimafoundation.org/main/).
10. See following report by the G8 health experts group: http://www.g8summit.go.jp/doc/pdf/0708_09_en.pdf
11. See following commentaries and reports by the author Kiyoshi Kurokawa: http://www.bdafrica.com/index.php?option=com_content&view=article&id=172&Itemid=5821

References

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Innovation is a complex concept referring to the creation of something new, normally through study and experimentation. In the context of public health, innovation usually results from research and may include new medicines, medical devices, diagnostic methods, clinical practices or means of health care delivery.

Economic development is associated with a progressive increase and improvement in the production of goods and services, however, social development is associated with the level of cohesion and distribution of wealth. The Index of Human Development is an approximation to the degree of social development, and is a weighted measure of the GDP per capita, life expectancy and literacy level. In this context, the Millennium Development Goals have galvanized unprecedented efforts to meet the needs of the world’s poorest and range from halving extreme poverty to halting the spread of HIV/AIDS and providing universal primary education, all by the target date of 2015. These estimates make evident a tendency towards the globalization of health problems, sharing risks, disability and moral consequences, all of which require unified efforts to combat these threats.

Within the broad context of health and innovation and its outlook in the context of world health we will briefly comment on the recent advances in defining objectives and policy instruments in research and development in health-related areas in Spain, and some of the challenges still facing us.

The Spanish framework of research, development and innovation

The general aim of biomedical research is still the prevention, improvement or cure of human diseases. Spain has one of the best national health systems in the world; it provides essentially free medical and hospital health care coverage to all residents of Spain, including immigrants, as well as high standards of diagnosis and treatment. Although biomedical research has increased significantly in Spain in the last decade, it is still not among the ten most productive countries in the EU, keeping in mind a number of indicators and corrected for population. We have, therefore, developed a new framework to try to close this gap, based on:

- The Biomedical Research Act (of July 2007), which provides modern regulation for the most advanced tools in biomedicine, i.e. human stem cell and embryonic tissue use, genetic analysis, biobanks, etc. The Act also addresses the recognition of health research as a career for health professionals and provides incentives for pursuing it. This new law was fostered by the Ministry of Health and Consumer Affairs and many of its aspects will be implemented by the Instituto de Salud Carlos III (ISCIII).
- The Research and Development and Innovation (R&D&I) 2008–11 National Plan, including all areas of public central government funded research, came into effect in September 2007. The three guiding principles of this plan for scientific and technological policy in Spain are: i) to serve the citizens, increasing social well-being and sustainable development with complete and equal incorporation of women; ii) to contribute to improving competitiveness in the private business sector; iii) to recognize and promote R&D as an essential element for the generation of new knowledge. The health component pursues the following goals: 1) to generate knowledge in order to improve health; 2) to foster innovation; and 3) technology transfer and translational research “from the bench to the bed side”. The budget allocated to this initiative has greatly increased and new initiatives have been set up such as research networks, training and technology transfer. Main lines of research include: 1) cellular and molecular technologies; 2) translational research; 3) public health, environment and occupational health; 4) pharmaceutical research; and 5) scientific and technical research.
- The recently created Ministry of Science and Innovation (April 2008) will manage the majority of central government funds earmarked for R&D&I and will cooperate with the 17 autonomous regions, each of which have independent budgets for health and R&D&I.

According to the 2008 edition of Science, Technology and Innovation in Europe published by EUROSTAT, analysing the data of 2006, Spain spent 1.16% (6546 million euros) of its GDP in R&D, whereas the EU27 devoted 1.84% of their GDP.
expectancy in all continents will increase, mortality due to health challenges

A recent study on Global Burden of Disease (GBD) projections from 2002 to 2030 predicts significant changes with regard to mortality and disability in the world. Life expectancy in all continents will increase, mortality due to infectious diseases will decrease while that caused by noncommunicable diseases will rise. Ischaemic heart disease and cerebrovascular disease will be the two leading causes of mortality in the world (see Table 1).

Although deaths due to HIV/AIDS are still on the rise, they will be overtaken by deaths due to the consumption of tobacco. Vascular diseases are the first cause of mortality in all regions, with major differences based on the classification of countries according to their income. In general, these forecasts place the world on an equal footing with regard to the definition of research priorities and the benefits of possible results.

The three leading causes of Disability Adjusted Life Years (DALYs) are projected to be HIV/AIDS, unipolar depressive disorders and ischaemic heart disease. In this case, there are also significant differences based on the level of income of countries (see Table 2).

Infectious diseases have not yet been overcome. In this context, aside from the potential benefits of a global strategy for more efficient development cooperation, synergy and wealth generation, greater investment in health is needed. On the other hand, forecasts for HIV/AIDS growth create new challenges for cooperation and R&D policies. This epidemic, as well as other infectious diseases, on account of their relationships with the adoption of behaviour patterns, offers areas for cross research with chronic diseases, so very widespread in developed countries. Strategies like “Multiple Health Behaviour” could benefit developing countries in their fight against HIV. Evidence-based medicine and rational use of antibiotics still suffer from large gaps in their application, extension and potential benefits both in developing and developed countries.

As for future threats to health, Spain is contributing in a variety of ways. The National Plan for R&D&I 2008–2011,

Table 1: Ten leading causes of death, 2030

<table>
<thead>
<tr>
<th>Rank</th>
<th>Disease or injury</th>
<th>% of total deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ischaemic heart disease</td>
<td>13.4</td>
</tr>
<tr>
<td>2</td>
<td>Cerebrovascular disease</td>
<td>10.6</td>
</tr>
<tr>
<td>3</td>
<td>HIV/AIDS</td>
<td>8.6</td>
</tr>
<tr>
<td>4</td>
<td>Chronic obstructive pulmonary disease</td>
<td>7.8</td>
</tr>
<tr>
<td>5</td>
<td>Lower respiratory infections</td>
<td>5.5</td>
</tr>
<tr>
<td>6</td>
<td>Trachea, bronchus, lung cancers</td>
<td>3.1</td>
</tr>
<tr>
<td>7</td>
<td>Diabetes mellitus</td>
<td>3.0</td>
</tr>
<tr>
<td>8</td>
<td>Road traffic accidents</td>
<td>2.9</td>
</tr>
<tr>
<td>9</td>
<td>Perinatal conditions</td>
<td>2.2</td>
</tr>
<tr>
<td>10</td>
<td>Stomach cancer</td>
<td>1.9</td>
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</tbody>
</table>

Table 2: Estimated leading causes of DALYs in 2030

<table>
<thead>
<tr>
<th>Rank</th>
<th>Disease</th>
<th>DALYs</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Ischaemic heart disease</td>
<td>8.9</td>
</tr>
<tr>
<td>2</td>
<td>Unipolar depression disorders</td>
<td>7.8</td>
</tr>
<tr>
<td>3</td>
<td>Cerebrovascular disease</td>
<td>10.6</td>
</tr>
<tr>
<td>4</td>
<td>Perinatal conditions</td>
<td>3.0</td>
</tr>
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<td>5</td>
<td>Cerebrovascular disease</td>
<td>3.1</td>
</tr>
<tr>
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<td>Chronic obstructive pulmonary disease</td>
<td>7.8</td>
</tr>
<tr>
<td>7</td>
<td>Lower respiratory infections</td>
<td>5.5</td>
</tr>
<tr>
<td>8</td>
<td>Hearing loss, adult onset</td>
<td>2.9</td>
</tr>
<tr>
<td>9</td>
<td>Stomach cancer</td>
<td>1.9</td>
</tr>
</tbody>
</table>

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prioritizes translational research in those diseases that create the highest mortality and burden of disease in the world. Public health, environmental health and occupational health are common to the entire set of prioritized diseases.

International cooperation is present in the National Plan and other solidarity-based government initiatives. The Iberoamerican Program for Science and Technology (CYTEC) endowed with US$ 6 million (70% donated by Spain) strengthens all areas of knowledge and technology, financing projects, research networks or technological innovation consortia. The Interuniversity Cooperation Program with Iberoamerican and Mediterranean countries was endowed with 21.5 million euros in 2008.

Within the framework of the World AIDS Conference for 2008, the Spanish government has just announced a contribution of 10.2 million euros to the UNAIDS Programme giving priority to research on vaccines and microbiocides. As far as other infectious diseases are concerned, in 2008, Spain contributed 16.3 million euros to the International Union against Tuberculosis and 12.9 million euros to the fight against zoonosis in the Mediterranean.

In the Iberoamerican context, the Spanish government supports the Pan American Health Organization’s programmes with a total of 1.4 million euros to fight the main health problems in Iberoamerica especially communicable diseases. Lastly, the ISCIII contributes to the Tropical Diseases Research Programme of the WHO and other multilateral partners, focused on research and development of programmes to fight neglected diseases, as well as others led by the WHO within the field of infectious and chronic diseases.

The most important benefit of progress in understanding the human genome may be for common chronic diseases such as cardiovascular disease, diabetes mellitus and cancer. However the integration of such knowledge into clinical practice is still in its early stages. Therefore many questions surround the current state of this translation. Some researchers have found gaps in knowledge about medical organization, clinical behaviour and practice, and patient needs that should be addressed to translate scientific advances of chronic diseases into practice11. It is estimated that it takes on average 17 years for proven medical advances to be incorporated into common practice, with the exception of new technologies and pharmaceuticals12.

We have not found estimates applicable to developing countries, including technologies that are already widespread in the developed world. However, new and innovative initiatives of public-private partnership are underway13, 14, 15, 16, and the results of such programmes will create a precedent for R&D&I at the service of the neediest populations.

Key messages

- Global burden of disease makes evident a tendency towards the globalization of health problems, sharing risks, disability and moral consequences, all of which require unifying efforts to combat these threats.
- Spain is beginning a most exciting time for biomedical research growth in quality and impact in innovation. The target of the new Ministry of Science and Innovation is to make Spain one of the world’s ten most productive countries in the field of science, technology and innovation by 2015. We already have the human potential, we just need to be successful in the management of economical resources, and to keep increasing these resources with public and, in higher proportion than now, private participation.
- New and innovative initiatives of public-private partnership are underway, especially in vaccines. The results of such programmes may create a precedent for R&D&I at the service of the neediest populations.

Flora de Pablo is Director-General of the Instituto de Salud Carlos III (National Health Institute Carlos III). An MD and PhD from the University of Salamanca, she worked at the National Institutes of Health in Bethesda (USA) for nine years until 1991, and in the California Institute of Technology in Pasadena (USA) in 1996. Until 2007 she was Professor at the Center for Biological Investigation (CSIC) in Madrid, where her group studied growth factors in embryonic development.

Isabel Noguer MD, MPH, PhD Isabel Noguer is currently working for the Instituto de Salud Carlos III, as a Deputy Director-General of International Research Programmes, and mainly devoted to promoting the participation of the ISCIII and National Health System centres in international research programmes, especially 7FP of the EU.

She is an epidemiologist and public health expert. She worked for the Spanish Ministry of Health for 15 years in different fields, particularly HIV/AIDS. She conducted a wide range of technical and operational studies for international and multilateral agencies (World Bank, PAHO, UNAIDS, WHO), has several international publications and led different European and international projects.
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15. Ryman TK, Eliz D, Carras KL. Too little but not too late; results of a literature review to improve routine immunization programs in developing countries. BMC Health Services Research, 2008, Jun 21;8:134.
There is a need to rethink the role of research in development assistance and move beyond health research to a new paradigm, called “research for health”. The Danish Government considers research for health the tipping point in building good governance and democratic processes that are important for health. It is through such progress that long-term change on indicators of health and overall well-being can be accomplished. Health indicators, in particular, have come increasingly into focus as the world aims to achieve the Millennium Development Goals (MDGs) by 2015. However, it is also becoming evident that capacity to undertake research is as important as the research itself. Without a mass of qualified personnel able to think and act critically at all levels of the health system, core indicators of maternal and infant mortality, nutrition, malaria and tuberculosis will not reach the targets set by the international community, especially in Africa.

The Council on Research for Development (COHRED) has defined this new paradigm, research for health, as “the wider range of activities and strategies that take health research one step further, and make it an essential element of poverty reduction efforts. It is my pleasure to present the article, “The changing landscape of research for health” below, which describes more than 30 years of Danish experiences in funding research as part of development cooperation. The article demonstrates a deep commitment to the ultimate goal of equal partnership based on a new paradigm, through the process of research for health. The Danish Government is committed to ensuring that the support to research is demand driven and adheres to the Paris Declaration. It is also important to emphasize that the research results are an essential element of poverty reduction efforts.

I find it important to stress that the developing countries together with their development partners will need to work together and broaden the scope of research to extend beyond academic institutions. In an environment of globalization, urbanization and rapid technological innovation there is an urgent need for innovation and rethinking of the role of research and the knowledge that it generates. In particular, it needs to become integrated as part of development co-operation. It is my hope that the article on the Danish perspectives and experiences can contribute to the rethinking and innovation needed in the area of research and health.

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The changing landscape of research for health

**Article by Kirsten Havemann, Senior Technical Adviser, Ministry of Foreign Affairs, Denmark**

**Introduction: policies for innovation – the Danish perspective and experiences**

**It is my pleasure to present the article, “The changing landscape of research for health” below, which describes more than 30 years of Danish experiences in funding research as part of development cooperation. The article demonstrates a deep commitment to the ultimate goal of equal partnership based on a new paradigm, through the process of research for health. The Danish Government is committed to ensuring that the support to research is demand driven and adheres to the Paris Declaration. It is also important to emphasize that the research results are an essential element of poverty reduction efforts.**

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Ulla Tørnæs, Minister for Development, Ministry of Foreign Affairs, Denmark

**There is a need to rethink the role of research in development assistance and move beyond health research to a new paradigm, called “research for health”. The Danish Government considers research for health the tipping point in building good governance and democratic processes that are important for health. It is through such progress that long-term change on indicators of health and overall well-being can be accomplished. Health indicators, in particular, have come increasingly into focus as the world aims to achieve the Millennium Development Goals (MDGs) by 2015. However, it is also becoming evident that capacity to undertake research is as important as the research itself. Without a mass of qualified personnel able to think and act critically at all levels of the health system, core indicators of maternal and infant mortality, nutrition, malaria and tuberculosis will not reach the targets set by the international community, especially in Africa.**

The Council on Research for Development (COHRED) has defined this new paradigm, research for health, as “the wider range of activities and strategies that take health research one step further, and make it an essential element of poverty reduction efforts.**

Research for health demands multidimensional knowledge which takes into account social, political, economic, ecological and environmental determinants of health, while simultaneously redefining “who” has the power to lead, fund, implement and use research. Thus, traditional biomedical models and systems of health research are giving way to a more holistic paradigm based on equity and inclusion in order to impact and improve global health. This new emphasis, along with greater focus on quality of the research processes, will require major attention to capacity development, most notably for governments and civil society organizations in developing countries.

Through case studies emerging from Denmark’s support of research cooperation, and from global experience, this article will demonstrate how traditional research can be strengthened and complemented through the emerging paradigm and utilized in an effort to positively impact global health and well-being. More specifically, the article progresses as follows: it details the requirements of the new paradigm, and subsequently touches upon the road towards new standards, attitudes and behaviours as well as tools and methods within the framework of research for health. It ends with key challenges and recommendations based on the Danish experience.

**Shifting paradigm**

The World Health Organization states that three out of eight MDGs, eight of the 16 targets to achieve the MDGs and 18 of the 48 indicators for success of the MDGs relate directly to health. Health is an important contributor not only to the
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MDGs, but is also the basis for effective social and economic progress. In order to achieve the MDGs, a focus on better health for all – regardless of status – is very much needed. In addition, research and the knowledge it generates is in demand. The emerging research paradigm requires building a broad based public health and research system. This requirement demands a shift in the culture and practice of health research to “reach beyond academic institutions and laboratories” for providing a comprehensive evidence base for rights-based approaches to health policy that will include political and socioeconomic determinants that influence health and well-being. Policy-makers, implementers of health sector reforms, health promoters and researchers need to expand their understanding of what constitutes “legitimate evidence in this new paradigm, research for health, with the aim of more positively impacting inequalities, and for the creation of conditions that create better research environments.

Take for example the Danish funded ENRECA (Enhancement of Research Capacity in Developing Countries) which had the goals of enhancing local research capacity and partnership through cooperation on equal terms between Southern and Northern partners. ENRECA began 15 years ago and spearheaded an increased focus on capacity building as a more integrated part of research projects. The researchers from the South who have participated in the ENRECA programme have been able to share their knowledge with other local co-researchers, and they have often been called upon as advisers by local authorities and by donor countries, such as Denmark. Within Denmark, ENRECA has been supportive in building a network of researchers for health. These programmes were the basis for what is now the Danish Research Network for International Health (DRNIH) (see Table 1).

What are the standards in the new research for health paradigm?

Central to the notion of Essential National Health Research Systems (ENRH) is the reference to “creating the conditions for health” and therefore the conditions for research for health. This not only implies that local communities, sociologists, development practitioners, economists, urban planners and public health specialists may inform the health agenda at the national level. It also increases the responsibility of the policy-makers in ensuring that they have the evidence needed to make appropriate policy recommendations for the health of their populations. This responsibility is amplified when considering civil society’s increasing role in research and “evidence-based advocacy,” and the trends towards a rights-based perspective in health internationally.

In the sphere of health and development, the gap between those who “know” (research community), those who “rule” (policy-makers) and those who “implement” (health technicians) has often been cited as a reason for political failure and the rise of the global burden of disease. A growing body of literature refers to this as the “know-do” gap. The trend towards research for health introduces more domains of knowledge into the landscape aiming to ensure that all relevant fields (for example: social, environmental, political, economic) and levels (for example: individuals, civil society, local communities, academia at national level) of society are considered in health research policies and practices.

This is further complicated by the changing burden of disease where noncommunicable diseases now have overtaken communicable diseases worldwide. These diseases are the primary cause of death in the 21st century – and will demand a very different approach to knowledge. In addition, other key challenges in bridging the know-do gap include the diversity of communication styles between the various actors, the tendency to develop research in isolation, competing agendas, time conflicts, and a difference in the understanding of “new” and “relevant” knowledge and research methods. Approaching these challenges and creating appropriate research conditions will require the establishment of new standards with a stronger focus on capacity strengthening, collaboration, and the creation/management of knowledge through networks and partnerships.

Effective application of research implies that Denmark and our partner countries have the capacity to integrate new knowledge for policy-making and sustainable development. Thus, capacity building (or strengthening) must be an integral part of research programmes in the Danish development co-operation.

Capacity strengthening is not only intended to provide technical skills to our partner countries in the South. It provides a learning environment where multiple actors and stakeholders can engage in a process of producing and sharing knowledge from research which promotes social mobilization for accountability, inclusion, cohesion and participation. In doing so, it strengthens the demand side of governance, giving an impetus to local knowledge production, management, and partnership as well as narrowing the know-do gap. It is important here to differentiate between networks and partnership. Networks exist as a “loose form of cooperation” whereas partnerships are “highly structured forms of cooperation.” Partnerships demand multidisciplinary actions and the setting of new standards on research for health which was stressed by the Pearson Commission on International Development.

North-South and South-South research networks and partnerships can serve mutual benefits when they promote and support equal participation of Southern partners. This approach has been promoted through support to the Danish Research Network for International Health (DRNIH) with a view to create synergy between research and policy. In addition, they contribute to the evidence base on which informed action can be taken. While these types of networks and partnerships are not new in the research/policy paradigm, Denmark has observed that the emerging paradigm is shifting away from the traditional definitions of a “researcher” to include actors ranging from national governments and the private sector to institutions of higher education and civil society organizations. These actors are now taking an active part in networking or partnerships around research for health.
<table>
<thead>
<tr>
<th>Global Forum for Health Research (1998-present)*</th>
<th>History</th>
<th>Mission and objectives</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Established as an independent international foundation</td>
<td>• Reduce inequalities in health research and in the distribution of health research expenditure for addressing health problems of the poor</td>
<td>• Bring together influential stakeholders in health research for development to:</td>
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<td></td>
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<td>• Initiate research</td>
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<td></td>
<td></td>
<td>• Strengthen use of research findings</td>
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<td>• Strengthen the above is accomplished through:</td>
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<td>• An annual conference</td>
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<td></td>
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<td></td>
<td>• Other related forums</td>
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<td></td>
<td></td>
<td></td>
<td>• Disseminating up-to-date information about global research initiatives on the web</td>
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<thead>
<tr>
<th>African Health Research Forum (AHRF) (2002-present)*</th>
<th>History</th>
<th>Mission and objectives</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Emerged from consultation process within Africa on health research concluding limited research input from countries in Africa due to lack of conducive research environments and leadership to build stronger health research systems (CGHHR 2006)</td>
<td>• Ensure that Africa's voice on health research is recognized.</td>
<td>• Organizes regional health research forums to enhance collaboration and efforts, and training for both researchers and community members</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>• Emphasizes the importance of ethical analysis in research</td>
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<td></td>
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<td></td>
<td>• Publishes Africa Health Research Review and sponsors the Africa Health Research Fellowship to train research leaders and managers</td>
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<td></td>
<td></td>
<td></td>
<td>• Considers itself a “network of networks” (COHRED 2004)</td>
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<td></td>
<td></td>
<td></td>
<td>• In conjunction with WHO Regional Office for Africa and African Advisory Committee for Health Research and Development (AC/HRD), provides technical support to African nations on developing their respective health research systems to meet local priorities (CGHHR 2006)</td>
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<tr>
<th>Danish Research Network for International Health (DRNIH) (1996-present)</th>
<th>History</th>
<th>Mission and objectives</th>
<th>Activities</th>
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<tbody>
<tr>
<td>• An amalgamation of ENRECA programmes with emphasis on capacity-building in the South and the North</td>
<td>• Strengthens dialogue and interaction between research and development assistance in international health as a means of improving health in low-income societies, in line with the principles of Danish Development Assistance (DRNIH, 2007)</td>
<td>• Provides unique set-up for different actors to work hand-in-hand in defining needs for further research in the area of international health as well as consolidating new knowledge</td>
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<td></td>
<td></td>
<td>• Funds projects in thematic areas such as vaccine development, nutrition, neglected tropical diseases, noncommunicable diseases, environmental health, sociocultural aspects of illness and medicine, the use of pharmaceuticals and drug resistance, capacity development for research and research networks</td>
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<td>• Encourages collaborative approaches to research in interdisciplinary settings</td>
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<td></td>
<td>• Generates new knowledge in areas that span traditional disciplinary boundaries</td>
<td>• University of Copenhagen to work on skills development of Africa Universities</td>
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<td></td>
<td>• Tororo Community Health project in Uganda to focus on capacity enhancement. Together with district health teams are researching change processes in health systems to improve intersectoral collaboration</td>
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<td>• Jointly with Danish Water Forum, supported Tanzanian partners in conducting workshop on water, health and sanitation. Forum advocated for new knowledge, exchange of international experiences, identifying effective methods to improve conditions, and gathering financial support for relevant research. The forum used to identify specific research projects and proposals that could be undertaken through a consultative process with all stakeholders involved</td>
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<tr>
<th>The South Africa-Netherlands Research Program on Alternatives in Development (SANPAD) (1997-present)*</th>
<th>History</th>
<th>Mission and objectives</th>
<th>Activities</th>
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<tr>
<td>• A collaborative research programme between South African and the Netherlands</td>
<td>• Promote dialogue between Dutch and South African researchers</td>
<td>• Subsidize and foster research projects that are social development or policy oriented through annual call for proposals</td>
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<td>• Advance more conducive research environment, particularly in historically disadvantaged communities, for quality research</td>
<td>• Organize Research Capacity Initiative (RCI), an intensive research methodology course intended to enhance research capacity of disadvantaged/inexperienced researchers</td>
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<td></td>
<td>• Adhere to joint committee governance structure with North and South representation aiming to highlight policy relevance of research (Baud, 2002)</td>
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Table 1: Networking towards partnerships
In considering the conditional and contractual aspects of partnerships, Maxwell and Riddell argue that actors in the current development environment have yet to reach true partnerships, which requires more than information sharing and policy dialogue. Characteristics of a true partnership include jointly agreed country programmes and multi-annual financial agreements. Using these guidelines, a recent collaboration between the Danish Water Forum and the DRNIH to support practitioners in Ghana around issues of water, health and sanitation demonstrates an early stage of such partnership (see Table 1).

The growing international research for health landscape also boasts a range of networks that progressively show the emergence of true partnerships. Table 1 lists case examples, starting from the more global network, the Global Forum for Health Research, the regional African Health Research Forum (AHRF), the national DRNIH and lastly to an institutionalized North and South linkage, the South Africa-Netherlands Research Program on Alternatives in Development (SANPAD). In its trajectory to partnership, Denmark has been an active participant in the international dialogue for developing global research norms and has provided funding for specific research programmes. Furthermore, numerous thematic areas have been addressed with Danish research funding (see Table 1). A conscious choice is thus made to ensure that the research becomes demand driven, adheres to the Paris Declaration, and focuses on the research results to be used and implemented as a contribution to poverty reduction. In this way the "know-do" gap that currently exists can be bridged.

What are the attitudes and behaviours needed in the research for health paradigm?

There is growing recognition globally that simply channelling additional funds into traditional health-care services (such as clinical medicine) and health research cannot be equated with "good health" and "good research" particularly when considering the rise of noncommunicable diseases. In order to truly improve the global burden of disease and reach the MDGs, the vision for research for health must not be limited to the national research/policy regime. It needs to be expanded locally and globally in order to ensure that knowledge is shared equally and capacity is enhanced in the research and policy regimes of countries which have limited resources to build up and sustain their research communities. This does not imply that the "North" defines its technical assistance in this regard to funding a handful of doctoral candidates from the "South". Rather, research for health should be considered a learning process for all partners involved, and this requires collaborative networking (horizontal South-South, vertical North-South and South-North, as well as diagonal across sectors and levels) between partners, and a balancing of health care between micro (immediate) and macro (long-term) needs. It should be based on the principles of the Ottawa Charter and include considerations beyond funding/financing. Understanding the diversity of the landscape and considering issues related to sustainability, relevancy and power relationships are a few of the requirements of this attitude shift. One important lesson learnt for Denmark has been that the shift in attitude had to start "at home" with recognition of the need to adapt to the new environment, as well as to develop our institutional capacity. This was the first step in ensuring equity and equality in the health sector.

Which tools and methods are used for research for health?

Crucial to the process of innovation in research for health are the different types, methods and tools of research. Types of research are for example biomedical research, health policy and systems research, social science and behavioural research, operational research and participatory action research. While the spectrum of the research landscape varies from the controlled clinical trials in the biomedical sphere to the analysis of power in the participatory action research sphere, each of the two spectra has its own strengths and weaknesses. While quantitative research often contributes to the understanding of the biological nature of diseases and assists in developing the products for treating ill health, qualitative research adds to the understanding of the "how, who, why, what when and where" of health. Qualitative research also informs the products and interventions of health systems and planning and provides the relevant knowledge of scaling up efforts that have the greatest potential of benefiting communities. How different methods and tools are selected and merged will depend on the researchers and the relevant stakeholders involved, as well as the context in which research is being implemented. It is important to remember that while methods and tools are scientifically developed, the choice of which is needed must remain context-specific.

Key challenges in research for health

The key challenges ahead for development research include the growing impact of globalization, technological innovations and urbanization, which will make it increasingly difficult to separate research relevant for poverty reduction and research relevant for technological advances. Furthermore, 42% of global spending on health research and development is made by the pharmaceutical sector. Adjusting research funding to the changing aid modalities means that networking and partnerships in the future will be increasingly important. Having effective and efficient research structures and systems built into the local level planning systems, and having sufficient and qualified human resources to undertake research, add to the challenges emerging in the research for health paradigm. This fact will not only impact the funding and financing of research but will also impact the priorities of research as adjustments are made to the contingencies of this new reality. While this process needs to be addressed in donor countries such as Denmark, the importance of system strengthening and capacity building of our partner countries and us cannot be overlooked. The long-term aim is to ensure that qualified researchers will contribute to the global knowledge base as well as be able to develop their own countries.

Conclusion

Denmark’s lessons learnt from funding, implementing and supporting research, have been two-fold. First of all, capacity...
building must be an inherent part of the development and research process. This does not simply mean funding PhD research students from the South to study in the Northern countries. Capacity building implies that both the South and the North are engaged in a “learning process.” This means recognizing that the Northern countries have just as much to learn as their Southern partners about process and collaboration. Investing more into higher education collaboration, which is fundamental for having qualified researchers in the first place, could be one option to be considered. Secondly, that establishing networks is only the beginning and not an end goal. The ultimate goal in the process of research for health is equal partnership. This process is ever-beginning and not an end goal. The ultimate goal in the process considered. Secondly, that establishing networks is only the collaboration, which is fundamental for having qualified collaboration. Investing more into higher education learn as their Southern partners about process and countries. Capacity building implies that both the South and research process. This does not simply mean funding PhD building must be an inherent part of the development and health research systems development. She has extensive knowledge and skills in interest and expertise in health and social sector analysis, design and practice. Lessons from the Field. Washington, D.C., AED, 2005. 5 Baud, I. North-South Partnerships in Development Research: An Institutional Approach. International Journal of Technology Management and Sustainable Development, 2002, 1 (3): 153-170. (Quoting pp. 154-155) 6 Tostensen, A. Bridging Research and Development Assistance: A Review of Danish Research Networks. Bergen, Chr Michelsen Institute, 2006/7. 7 Baud, I. North-South Partnerships in Development Research. An Institutional Approach. International Journal of Technology Management and Sustainable Development, 2002, 1 (3): 153-170. 8 Maxwell, S. & Riddell, R. Conditionality or Contract: Perspectives on Partnership for Development. Journal of International Development, 1998, 10 (2): 257-268. 9 Organization for Economic Co-operation and Development (OECD). The Paris Declaration. Online: http://www.oecd.org/document/18/0,2340,en_2649_32636388_35401554_1_1_1_1_00.html (date accessed 31 July 2008). 10 This Charter supports the building of healthy public policies, creating supportive environments, strengthening community action, developing personal skills and re-orienting health services. 11 Global Forum for Health Research. Online: http://globalforumhealth.org (date accessed 26 July 2008). 12 South Africa. Netherlands Research Program on Alternatives in Development. Online: www.sarped.org.za (date accessed 26 July 2008).

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Global health and the foreign policy agenda

Article by Jonas Gahr Støre, Minister of Foreign Affairs, Norway

This article is based on the transcript of a speech delivered at the State of the Planet Conference on 27 March 2008, held by the Earth Institute at Columbia University in New York, United States.

This afternoon I would like to share with you what I would call a personal journey, which has meant a great deal to me and helped to shape some of the key ideas that we are working on now.

You might ask why a foreign minister has been invited here to talk about health. Surely we have health ministers for that. I will try to answer this question.

I was brought into the field of global health in 1997, when Dr Brundtland, the outgoing Norwegian Prime Minister, decided to run for Director-General of the World Health Organization. And I was invited in on her team.

In the autumn of 1997, we campaigned in Africa. During these travels with Dr Brundtland, I saw things that I had never really seen before. I saw that health issues had important implications extending far beyond the health sector. And how incredibly important human health, national health and global health were to so many of the dimensions of society.

I remember when we arrived in Botswana, a country that Norway has worked closely with for many years. We had just concluded our development cooperation with Botswana because the country had made so much progress. Life expectancy had risen to 70, which is quite sensational in an African context.

But while we were there, researchers from the University of Harare published new figures that readjusted average life expectancy in Botswana to 35 years. This was in 1997, when the first AIDS figures really started to make an impact. And we could literally see and feel the consequences for the population, for the integrity of the state. What would happen to the teachers, the police, the army, the civil servants, the mothers and fathers?

Then we went on to Angola, which had a seat on the board of WHO and was going to cast its vote. There we met with the Health Minister, and I discovered that the Minister was not in the Angolan cabinet, not in the inner circle of government.

I then developed my own thesis that there is a negative correlation between the weight of the health challenge and the influence of the health minister.

In my country, as in other developed countries with good health status, you win or lose an election because of health policy. Whereas in the poorest countries, health is all too often simply given low priority.

When Dr Brundtland was elected and took up her post in Geneva, one of the first things she said was that our main challenge is not to deal with health ministers – because they know the problems. It is to try to get through to presidents, prime ministers and finance ministers, and give them this simple message: you too are health ministers.

We need to find new ways of portraying health expenditures as more than costs, but also as an investment. And we need to develop a new language and a new mindset that will enable us to reach and communicate with the real circles of power. Health professionals are too focused on their own field and have a limited ability to communicate with people in other sectors.

This is really an extension of the conclusion of the Brundtland report, Our Common Future. We need to get to the core of the economic dimension and speak a language that people with power really understand.

We need to establish a link between investing in health and improving the health status of the population – of the productive fabric of society. We need to convince political leaders that if we do these things, there will be more to share. If they fail they will be wasting their opportunity as political leaders.

This is in fact what brought us to Jeffrey Sachs. We wanted someone who could convene some of the world’s leading economists with experience in these areas to work on documenting what everybody could see – that if you are poor, you are more likely to have poor health. But it is less well documented that poor health in itself breeds poverty, creating a vicious spiral. So we were convinced that we had to get this down on paper and document it and its implications.
Jeffrey Sachs’ commission presented the report at the end of the year 2000. I am certain that the process we launched then contributed to the methodology used in devising the Millennium Development Goals (MDGs). The study documented how appropriate, timely action can save 8 to 10 million lives a year. That in itself would be a real humanitarian gain. But such action would also help to increase life spans, productivity and economic well-being, especially of the poor. But the study also documented that this will not happen by itself. There has been a prevailing idea that as long as countries continue to develop, health will simply follow. This is not the case.

So there is a need to scale up the spending on health, by the poor countries themselves, and by better targeting development assistance for health. The report is particularly valuable because it demonstrated how affordable this operation could be. It documented the difference it would make if rich countries devoted one tenth or 1% of their gross national income to health-targeted development assistance for specific interventions.

That would be an investment that would be repaid many times and save millions of lives every year, and it would provide economic development and global security.

There were many who criticized this approach and argued that there are too many vertical interventions, such as bed nets and vaccines. And that the approach to health care should be much more horizontal.

But these approaches can be combined. Unless we have a massive focus on what is literally on our own doorstep, we can forget about the horizontal process, and about making tangible differences in health.

Another conclusion of the report was the importance of partnership – which I believe is really a key lesson. Partnership is a simple word, but a very complex thing to practise. The Sachs Commission concluded that more development assistance should be targeted towards health, while poor countries should allocate more money for health in their national income to health-targeted development assistance for specific interventions.

It is only if this works together that it will make a difference. Partnerships between rich and poor, partnerships between the private and the public sectors.

Some said that this was going to be a great challenge for the UN. Why are we inviting the private sector in? Isn’t it the UN that has the mandate to do these kinds of things?

You have to remember that the idea of public-private partnerships still was quite new as it first emerged as an idea in the 1990s. We felt that in the WHO, working with Dr Brundtland, the way she reached out to the private sector, was being criticized by those who said “it says in our mandate that we are the leaders in health”.

But let’s not forget that it was Kofi Annan himself who invited other sectors to join the global fund to fight AIDS, TB and malaria. To mobilize US$ 10 billion every year to make a difference. So if the UN had not embarked on that course, I think the idea would have been marginalized.

There were a number of other areas that started to attract attention. Vaccines for example. A major effort by the WHO and UNICEF in the 1990s had brought coverage up to 80%. A very high level. But since 1990, there has been stagnation and almost status quo. How do we mobilize a new campaign for vaccines? How do we create new markets for malaria medicine?

When the first Stoltenberg government took office in March 2000, the Prime Minister decided that Norway would take on responsibility for providing vaccines for every child in the world. So this was a “Norway–Gates coalition” in a way. Gates in the private sector and Norway in the public sector – investing in a specific alliance: GAVI, the Global Alliance for Vaccines and Immunization.

I remember discussing this with Prime Minister Stoltenberg, and how easy it was to bring him on board – for three reasons. First, because he was a father and he had had his children vaccinated. It is something you do for free in Norway. You don’t have to think about paying for it, you take it for granted. Because it is part of what the welfare state offers. Secondly, he is an economist, and he saw that vaccination is by far the most cost-effective intervention you can make. You can prevent disease with two shots at a very early stage in life. And, finally, he was a politician. So he could bring this into the realm of political action.

I believe that what happened around 2000, with the launching of the MDGs, was a response to the heightened awareness of all politicians, not just health ministers, of the link between health and development.

I would like to touch briefly on a few of the changes that have taken place since then. Ten years ago, world investments in health aid totalled US$ 4 billion a year. This has more than tripled to US$ 15 billion today.

Around 2000 AIDS treatment was out of reach, and when drugs came on the market, it was at a cost of US$ 40–100 a day. A cost that neither poor people nor donors could afford. Now it costs 4 cents a day to treat AIDS, and more than 2 million people are receiving treatment. That is far too few, but it is a beginning.

Malaria was and is the top priority of every African health minister. Today, tens of millions of bed nets have been distributed and new drugs have been made available on a broad scale. Where the majority of children sleep under nets, malaria wards stay empty.

As I said, there was great frustration about vaccination, with coverage stagnating and new vaccines not being introduced. This situation has now been turned around, and for example measles mortality has dropped by 90% in Africa.

Additional hundreds of millions of children are being vaccinated. The GAVI Alliance has saved between two and three million children from dying every year since it began its work. Tobacco was another serious world health problem. Around 2000, it was predicted that tobacco would be the leading cause of death by 2020. That might still happen, but it is likely – thanks to the framework convention on tobacco control – that this prediction will not come true.

The process of developing the convention is quite another story, and I will not spend time on it here. But work on the convention started two months after Dr Brundtland took office, and was concluded two months before she left the
Innovating for health and development

WHO. It is modelled on the Kyoto Protocol. So it is another example of lessons learned across sectors. These approaches gave rise to an ethics of politics. It is about engagement, it is about the political will to seize opportunities, it is about partnership, and it is about burden sharing. And I believe that these approaches can be used to combat climate change, to promote health, not only in a number of development areas, but also in dealing with international conflict. And it coincides closely with what we are trying to achieve in Norwegian foreign policy.

In 2005, Jens Stoltenberg returned as Prime Minister and I became his Foreign Minister. And we scaled up our approach to health. Stoltenberg took the vaccine initiative one step further, and Norway pledged to make a real difference, not only in vaccinating every child, but also in fulfilling MDGs 4 and 5 – reducing child and maternal mortality.

And we are now investing 100 million dollars a year specifically for interventions in this area, not alone, but in partnership with the private sector and with specific governments. Having worked with and been inspired by my countryman Jan Egeland and his work in the UN and elsewhere, and with Jeffrey Sachs, I saw that as Foreign Minister, I could deal with health differently than has been the case in the past.

I realized that health was not just the province of health ministers, finance ministers, presidents, prime ministers, but also of foreign ministers. Because health disasters are also a cause of conflict. They are a cause of environmental degradation and of collapsing and failing states.

We all know that threats to health do not respect national borders. So this is clearly a challenge for foreign policy. We know that developing countries carry the heaviest burden as regards disease, but have the lowest capacity for prevention, treatment and control. So global health security is only as strong as the weakest link.

Are we prepared, as foreign ministers, to face a global health crisis? Norway closed its border with Sweden for the first time in modern history during the outbreak of mouth and foot disease in 2000. And we were completely puzzled by the question “how do we reopen borders? When are we certain that the epidemic is over and we can do so safely?” This is a foreign policy issue. It is easy to deal with Sweden, our neighbour, in such cases. But there can be other settings were this is more complicated. As foreign ministers, we need to review government structures and systems and adapt them to better respond to global interdependence.

When I became Foreign Minister, I called six of my colleagues in different corners of the world and asked them to join me in an informal setting to address this issue. And to try to highlight what it means to be a foreign minister in an era where health problems are global. I approached France, Thailand, Indonesia, South Africa, Senegal and Brazil. And they all responded favourably. We met at the UN in 2006 and appointed experts to work out an agenda, identify the problems and to advise us on a plan of action. We came together in Oslo in March last year to adopt the Oslo Agenda, the Oslo Declaration and a plan of action. We singled out ten foreign policy areas where we need to take a look at the health implications. Are health concerns being given the necessary priority? Are we applying the foreign policy tools at our disposal to get to grips with them?

Against the backdrop of an evolving health and development agenda, I believe we have something new emerging here. At the UN General Assembly last September, we were 30 foreign ministers who came together to discuss these fields.

In order for us to make these ideas workable, we need to continue take a broader view and work out new perspectives. We still take a very traditional approach in the debate on national and global health security. We discuss our own country’s perspective – with the main focus on protecting our own population. That is our responsibility as governments.

Even the threats of pandemic flu can be seen in this light. We buy drugs for our populations. But as we all know, viruses and bacteria know no borders. So if we include the perspective of interdependence and shared vulnerability across nations and regions, we need to add a broader dimension to this debate. More than anything, it calls for solutions in which the benefits of preparedness are equitably distributed.

Because my insecurity does not depend on the Norwegian health system, it depends on systems far beyond Norway. All of this has to influence our development policy, our UN policy and also our Norwegian foreign policy.

As a final observation, one important insight of this group of experts is that health security cannot be interpreted narrowly. What we need is an understanding of the determinants of health. Poverty is of course intuitively recognized as a core determinant even though we have failed to address it fully.

Two more direct determinants of health that are often overlooked are trade and intellectual property rights. In many countries, HIV and AIDS are overlooking already weak health systems and having impacts on capacity, preparedness, human rights and movement across borders. This has foreign policy implications.

We also have to address how fragile states might collapse under what we call “the double burden of disease”. Poor countries struggling with the burden of infectious diseases are increasingly being burdened with non-infectious diseases – which often cripple a poor health system.

Another dimension is that rich countries are recruiting health workers from poor countries to take care of an ageing population. This gives rise to a number of very serious, ethical and economic issues. These, too, must be brought into the foreign policy agenda.

I would like to conclude by mentioning a concrete example that I never thought I would deal with as foreign minister – the issue of virus sharing.

Indonesia has been hard hit by avian influenza. Bird flu is widely considered to be one of the most likely sources of the next global pandemic. And global preparedness relies heavily on monitoring the outbreaks, particularly those which affect humans. A year ago, Indonesia felt that it was being short-changed by the international community and asked bluntly why it should contribute to the production of...
a vaccine it will not be able to afford and would be unlikely to ever have access to by sharing its virus – good question. I disagree with Indonesia’s decision to stop sharing the virus from local outbreaks, because I believe that Indonesia and all other countries should contribute fully to global preparedness. But I also understand and agree that we must make sure that the benefits of preparedness are shared equitably and sustainably.

One of the most shocking observations I was met with when I got to the WHO was that there is no opportunity to prepare malaria drugs, because where there is no money there is no market for these drugs. But for a disease that strikes somewhere between a half and one billion people each year, how can we say there is no market? And if we accept that there is no market for malaria medicine simply because people can’t afford to buy it, that is also a market failure.

What this all adds up to is that this is a matter of political will, of knowledge and of partnership. Thank you for accompanying me on this personal journey.

 Jonas Gahr Støre is Minister for Foreign Affairs of Norway. He has a degree in political science from the Institut d’Études Politiques de Paris, and has held a teaching position at Harvard Law School. His first introduction into public life was as Special Advisor to the Prime Minister, followed by a three-year tenure as Director-General of the Prime Minister’s International Department. In 1998, Mr. Støre was appointed Ambassador of Norway’s Permanent Mission at the United Nations in Geneva, but served only briefly as he was asked by former Prime Minister of Norway and then Secretary-General of the World Health Organization, Gro Harlem Brundtland, to become her Chief of Staff.

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“Policies for innovation”: evidence-based policy innovation – transforming constraints into opportunities

Man has created new worlds – of language, of music, of poetry, of science; and the most important of these is the world of the moral demands, for equality, for freedom, and for helping the weak.

KARL POPPER.

Health policy in developing countries is increasingly committed to the worlds of science and equity. Evidence-based policy-making can thus be conceived as an innovation process integrating, within politics, the values of healthy life, objective truth and fairness. Innovation becomes particularly important to support the political processes of decentralization, poverty reduction and regional integration. Health metrics are increasingly focusing on inequities and therefore on the potential as well as on the urgency for improvement. Comparative sociology, economics and health system sciences are responding through innovative social and policy arrangements as well as through improved evaluation methods.

This article presents case studies in innovation at the two health system poles of decentralization and regionalization. Attention is given to the role of evidence-based financial protection policy implementation by local health authorities. Two case studies are presented to illuminate evidence-based policy-making at the regional level: Salud Migrante, a pilot project to develop binational health insurance for Mexican migrants in the United States, and the Mesoamerican Health System, a multi-national effort to address disease control and health system strengthening. These examples suggest that research can be an invaluable tool to transform what are political constraints for policy-making at local and regional levels into opportunities to move towards new organizational frontiers.

Health system vulnerability

Middle-income countries, particularly in Latin America, are finding it increasingly difficult to extend health care through traditional social security institutions due to increasing costs of medical care, growing competitiveness from international markets, and the growth of the informal sector. Innovative social protection models are thus being designed and implemented to reduce catastrophic family health expenditure, channel national and state subsidies and to encourage family prepaid contributions.

Mexico’s System of Social Protection in Health was thus established in 2003 through a Constitutional amendment with the aim of reaching universal coverage of pre-paid health care for 2010. Seguro Popular was established to implement the programme through payments to state health authorities based on strengthening infrastructure, meeting federal standards and promoting the voluntary and in most cases contributory affiliation by families to the insurance scheme. Yet reaching this goal may not be easy, particularly in poor states where the proportion of the uninsured is highest and the health system capacity gap also the greatest. Furthermore, health expenditure is currently being channelled through out-of-pocket private health care for about half of the total, involving families across the social spectrum.

Adding to this complexity is the fact that 11.8 million Mexicans work as migrant labour in the United States of America, accounting for 10% of the population. They also leave behind close to 4 million relatives, and have 4 million US-born children with them, for a total of close to 20 million of population that rely to different extents on institutions both sides of the border. Up to one third of financing for private care in Mexico could be resourced from the remittances sent by migrants. These families face a complex scenario for health insurance. They express health needs in both countries, they face highly differentiated service and insurance demand and supply factors across them, including insurmountable barriers for comprehensive health insurance in the United States. The question is whether Seguro Popular will be able to insure health needs in Mexico and to reduce private expenditure. Another question is whether Seguro Popular can provide a backbone of services to support returning migrants and to provide health care for needs that cannot be insured abroad.

Looking South, Mexico shares an ecology with its Central American neighbours and needs to address health issues such as malaria, dengue and HIV/AIDS from a regional standpoint. Mexico also has an important number of...
Strengthening local capacities and knowledge brokering

To address the need to strengthen research capacity at state level in Mexico a number of research and policy institutions joined forces to establish the consortium Health Systems Research for State Sector Development (INDESES). This effort is being supported through national and international funding and collaboration, including Mexico’s Science and Technology Institute (CONACYT), the Canadian Health Services Research Foundation (CHSRF), IDRC and the Alliance for Health Policy and Systems Research. INDESES aimed to strengthen the demand of health systems research by state policy-makers and managers through assessing and intervening along the four “A”s of research – acquisition, assessment, adaptation and application.

INDESES developed a curriculum originally structured by CHSRF’s EXTRA training programme, aiming to strengthen evidence-based policy-making through increasing capacity to utilize research. The focus has been on multi-institutional managerial teams to address their coordination issues through research-based interventions. Specific tools to strengthen the interface between researchers and users were also developed. Literature synthesis methods were developed on the basis of international experience focusing on interventions for vulnerable groups. On this basis a listening exercise was developed to identify policy-maker and managerial concerns. CHSRF’s 1:3:25 executive summary format was also implemented to provide an effective means to divulge research results.

Policy-makers and mangers were provided with a tool also developed initially by CHSRF’s to assess their capacity to utilize research and to plan strategies to strengthen it accordingly. Results of a first wave of application were collated to test the tool and to obtain a diagnosis of utilization capacity at the aggregate level. Not surprisingly, results demonstrated widely differing capacities and strengthening needs according to level of development. Less evident were findings suggesting that research acquisition is a higher priority above analysis, adaptation and application. In richer states it was recommended to strengthen acquisition mainly through increasing the skill levels of mangers. In poorer states preference was given to strengthening the importance accorded to research by top decision-makers. No major differences were detected across the various public institutions or private providers, in spite the fact that they operate with very different resource bases. This suggests that the importance that the socioeconomic context plays in determining research utilization patterns and capacities.

South-North collaboration for binational health insurance innovations

INSP established a collaboration between US and Mexico health providers, authorities and academics to develop Salud Migrante, an evidence-based binational health insurance for migrants. Innovation design were based on evidence coming from a wide range of intersectoral issues: the effects of remittances on private health spending in Mexico, catastrophic health spending in the US, lack of access to health services due to distrust, forced repatriation of migrants to Mexico due to unmanageable health conditions, the political pressure for regularization of migrants in the US as well as willingness to pay studies for highlighting the potential of cross-border health services. Innovation design focuses on integrating the private not-for-profit health providers and insurance agencies in the US with the public health system in Mexico, with the aim of integrating as far as possible financing and referrals. A coalition of partners has been established and pilots are being prepared across two US and two Mexican states. The Mexican federal government has made critical commitments to support binational health insurance. On this basis, a package of essential primary care services is being designed for universal access by migrants in the United States, to be provided mostly by community health centres and insured through non-profit health plans. A key provision is that funding for services in the US should come from migrant contributions and other private or public sources. Migrants will be supported to access Seguro Popular in their states particularly to access secondary care services and to insure their dependents’ integral care in Mexico. To this end, Seguro Popular promotion and affiliation will be made available in the United States through web-based facilities and with the support of community agencies.
The main challenge of Salud Migrante includes organizing the insurance scheme in such a way that it gains the migrants’ trust to cross the border for secondary care and to reunite with a public service in Mexico that has not always responded to their needs. A key component to surmount this barrier will be the design and implementation of Salud Migrante, an agency in Mexico capable of articulating health service providers and insurers within each country and across the border.

Research is being undertaken to develop the operational platforms required for the sound operation of Salud Migrante. This involves a coalition of research and service provider partners and is being led by INSP. This effort represents a historic South-North collaboration in research and innovation. INSP is well prepared to assume this task given its full accreditation with the Council on Education for Public Health, the US body accrediting most schools of public health in the US.

South-South collaboration for regional integration

INSP is collaborating with efforts to establish the Mesoamerican Health System, an initiative recently announced by the presidents of Central America, Colombia and Mexico as part of their ongoing regional integration. With the international funding from partner countries, foundation and bilateral agencies, such a system aims to eradicate malaria and undernutrition, the control of dengue, lowering the costs of medicines and strengthening capacity to address emerging epidemiological risks. CISS is now leading a regional effort to assess research and epidemiological surveillance capacity by public health institutions in participating countries, an initiative funded by the International Association of National Public Health Institutes. Based on this assessment, a Mesoamerican Public Health Institute is being developed as a consortium to provide the secretariat and technical support coordination functions for participating countries, an initiative funded by the International Association of National Public Health Institutes.

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Lessons

Middle-income countries in Latin America and other regions have the capacity and indeed the imperative of promoting innovations for health systems integration through national-local, South-South and South-North collaboration. These efforts should be accompanied by North-South selective funding efforts and technology transfer to empower their Southern partners with the capacity to develop large-scale, international projects based on their proven technical and political leadership.

Research institutions can play a critical role to bridge across bureaucratic and international boundaries through mission-oriented research. Projects of sufficient scale and scope can lead innovation design, enable the incubation of new institutional arrangements and undertake piloting and evaluation. Research institutions in middle-income countries have in many cases developed sufficient networking, trust and accreditation by partners North and South to support this important role for innovation.

Innovations should also be supported through knowledge brokering and research capacity building efforts. Research institutions can play a key role to help in the assessment of the capacity to utilize research by programme managers and policy-makers, to train knowledge brokers based on such assessments, to facilitate the uptake of research by policy-makers through specific tools and methods, and to develop research and innovation priorities in critical health system development areas.

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References

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