Forum 2012

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BEYOND AID

Research and innovation as key drivers for health, equity and development

COHRED
Council on Health Research for Development

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Contents

Abbreviations

AAAS . . . . . .American Association for the Advancement of Science
ACHEST . . . . .African Centre for Global Health and Social Transformation
AMANET . . . .African Malaria Network Trust
ARESA . . . . . .Advancing Research Ethics Training in Southern Africa
BRICS . . . . . .Brazil, Russia, India, China, South Africa
CARICOM . . .Caribbean Community
CARTA . . . . . .Consortium for Advanced Research Training in Africa
CEWG . . . . . .Consultative Expert Working Group
CNHR . . . . . .Consortium for National Health Research
COHRED . . . .Council on Health Research for Development
COSTECH . . .Commission for Science and Technology Tanzania
CSO . . . . . .Civil Society Organisation
DALY . . . . . .Disability-Adjusted Life Year
EDCTP . . . . . .European and Developing Countries Clinical Trials Partnership
EQUINET . . . .Network on Equity in Health in Southern Africa
ESSENCE . . .Enhancing Support for Strengthening the Effectiveness of National Capacity Efforts
EU . . . . . .European Union
FERCAP . . . . .Forum for Ethical Review Committees in Asia and the Western Pacific
FLACEIS . . . .Foro Latino Americano de Comités de Ética en Investigacion en Salud (Latin American Forum of Ethics Committees in Health Research)
FWB . . . . . .Facilitators Without Borders
GDP . . . . . .Gross Domestic Product
GIZ . . . . . .Gesellschaft für Internationale Zusammenarbeit
GSPA . . . . . .Global Strategy and Plan of Action on Public Health Innovation and Intellectual Property
HRCSI . . . . . .Health Research Capacity Strengthening Initiative
HRH . . . . . .Human Resource for Health
IAVI . . . . . .International AIDS Vaccine Initiative
ICPD . . . . . .International Conference on Population and Development
ICTs . . . . . .Information and Communication Technologies
ICTRP . . . . . .International Clinical Trials Registry Platform
IDRC . . . . . .International Development Research Centre
IFPMA . . . . . .International Federation of Pharmaceutical Manufacturers and Associations
IP . . . . . .Intellectual Property
IPIHD . . . . . .International Partnership for Innovative Healthcare Delivery
IRB . . . . . .Institutional Review Board
IRENSA . . . . .International Research Ethics Network for Southern Africa
KFPE . . . . . .Swiss Commission for Research Partnerships with Developing Countries
KT . . . . . .Knowledge Translation
LMICs . . . . . .Low and Middle Income Countries
MAMA . . . . . .Mobile Alliance for Maternal Action
MARC . . . . . .Mapping African Research Ethics Review Capacity
MASCOT . . . .Multilateral Association for Studying Health inequalities and enhancing North-South and South-South Cooperation
MTN . . . . . .MTN Group (telecommunications provider in 21 countries across Africa)
NEPAD . . . . .New Partnership for Africa's Development
NGO . . . . . .Non-Governmental Organisation
NTD . . . . . .Neglected Tropical Disease
ODA . . . . . .Official Development Assistance
OECD . . . . . .Organisation for Economic Co-operation and Development
PACTR . . . . . .Pan-African Clinical Trials Registry
PAHO . . . . . .Pan American Health Organization
PPP . . . . . .Public-Private Partnerships
PRISM . . . . . .Panamanian Research Institute of Science and Medicine
REC . . . . . .Research Ethics Committee
SARETI . . . . .South African Research Ethics Training Initiative
SEARCH . . . .Society for Education, Action and Research in Community Health
SENACYT . . . .Secretaría Nacional de Ciencia, Tecnología e Innovación (Panama)
SIDCER . . . . .Strategic Initiative for Developing Capacity in Ethical Review
SME . . . . . .Small and Medium Enterprise
SRH . . . . . .Sexual and Reproductive Health
TB . . . . . .Tuberculosis
TDR . . . . . .Special Programme for Research and Training in Tropical Diseases
TRREE . . . . . .Training and Resources in Research Ethics Evaluation (WHO)
UAPS . . . . . .Union of Africa Population Studies
UNICEF . . . . .United Nations Children's Fund
USAID . . . . . .United States Agency for International Development
WHO . . . . . .World Health Organization
WHRAP . . . . .Women's Health and Rights Advocacy Partnership
XJP . . . . . .Xian-Janssen Pharmaceuticals

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Forum 2012 team at COHRED

Ellie Carrier-Walker, Anne Celestino, Louis Currat, Sylvia De Haan, Ole Doetinchem, Danny Edwards, David Hayward, Carel IJsselmuiden, Sonali Johnson, Andrew Kanyegirire, Francisco Songane and Laurence Verhagen.

Report team

A team of rapporteurs was responsible for collecting content from Forum 2012 to prepare this report: Esther Adebayo, Nicola Barsdorf, Camille Bostrom, Jantina de Vries, Sumaiyah Docrat, Gabi Falanga, Anna Grimsrud, Damian Hacking, Denis Jjuuko, Mara Kardas-Nelson, Lisa Lau, Khabiso Ramphoma and Dirk Smit.

The report was prepared by Priya Shetty, with the input of the rapporteurs and the Forum 2012 team – under the overall guidance of Francisco Songane, Chair of the Forum 2012 Steering Committee, and Carel IJsselmuiden, the Executive Director of the COHRED Group.

The report benefitted from excellent inputs from internal peer review sessions. The chief internal reviewers from the COHRED Group were Ole Doetinchem, Danny Edwards and Sonali Johnson. The report also benefitted from the valuable inputs of other staff of the COHRED Group.

The overall editing, design and production of the report was managed and coordinated by Andrew Kanyegirire.

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Foreword

Delegates at Forum 2012.
Photo credit: COHRED

Forum 2012 was the 14th meeting of the Global Forum for Health Research. Previous meetings have focused on providing a global platform to measure the 'closing of the 10/90 gap'. The '10/90 gap' is in the distribution of research resources – only 10% of global resources spent on health research deal with diseases and conditions that cause 90% of mortality. Since 1997, Global Forum for Health Research meetings have been key in putting health research on the global aid and development agenda.

In November 2010, the Foundation Council of the Global Forum for Health Research decided that a merger with the Council on Health Research for Development (COHRED) was timely and appropriate. COHRED concentrates on providing technical support to research and innovation for health, equity and development in low income countries. The Global Forum for Health Research measures progress and advocates for greater investment by high income countries in research to address health problems in low income countries. Merging the two organisations has created an integrated and synergistic force for change. Forum 2012 was the first Global Forum for Health Research meeting since the merger and sets a new direction for the way forward.

Forum 2012 takes up where closing the '10/90 gap' leaves off. In 1990, when the Commission on Health Research for Development published the substantive report 'Health Research: Essential link to equity in development', closing this gap was an appropriate focus. The mandate of the Global Forum for Health Research was to help– principally by monitoring the gap, creating a global platform to discuss progress, and by advocating for high income countries to spend more of their research resources on dealing with diseases of low income countries. The predominant model of global solidarity was that development and better health happen by transferring more resources from rich to poor countries.

Forum 2012 adopts a very different focus. The world has changed since 1990, and substantially so. Major and sustained growth in emerging economies, including in Africa, is creating dynamic countries where health improves because of increased prosperity, democracy, human rights and access to advanced healthcare. The proportion of people living in absolute poverty is falling rapidly everywhere, and middle classes are burgeoning. Trade, education and travel have also expanded research and innovation capacities in low and middle income countries – to the extent that the global health and health research agenda is no longer set in 'the north' and solutions to global health problems are increasingly being developed in 'the south'. In terms of setting agendas and developing solutions, therefore, the distinction between 'developing' and 'developed' world has become very fuzzy – if not irrelevant.

Aid, in absolute and relative terms, is on the decline. Countries that were previously recipients of aid have become donors. Aid is also becoming less charitable and more explicit in serving the economic and political interests of donor countries. The private sector is an increasingly important player in healthcare, but also in improving health by creating economic opportunities, engaging in research and innovation, and developing health specific services and products for consumer markets.

As a result many developing countries now have double or triple disease burdens that are becoming ever more similar to those in 'high income countries' in the past. However, the score is poor on one indicator – equity, specifically health equity. Within and between countries, income and health disparities are increasing. Inequities within countries are even more blatant than those between low and high income countries. This means that most of the world's poor will soon live in middle income rather than in low income countries.

Fifteen years after the first meeting of the Global Forum for Health Research, the concept of the '10/90 gap' is less relevant, no longer really measurable and can no longer be addressed simply by advocating for high income countries to spend more on research to deal with conditions in low income countries.

Forum 2012 launched a new series of meetings to examine ways to maximise the impact of research and innovation on health, equity and development. Driven by a global health agenda that is as much determined by low and middle income countries as by high income countries, Forum 2012 focused on using resources and solutions from all to deal with problems everywhere.

Forum 2012 set itself a tough new mission. The meeting brought together politicians, researchers,

non-governmental organisations, business, international organisations, financiers, donors, research sponsors, policy shapers, youth, media and development experts in a format and venue aimed at generating partnerships for action. As these different groups do not often meet spontaneously, and because innovation can happen when key people with differing expertise meet around common topics and solutions, we dubbed these partnerships 'improbable partnerships for action'.

Holding the conference in South Africa proved to be an inspired decision. Not only has South Africa triumphed over decades of political adversity, it also has a very forward looking science and innovation culture which contributes to improving health directly, as well as boosting economic activity and increasing capacity in the development of health products.

Delegates at Forum 2012 heard from countries around the world about their successes and failures in using research and innovation for health. Detailed reports are available on the internet (www.forum2012.org). Most importantly, however, participants actively engaged with each other. The Forum was designed to be highly interactive and to allow sufficient flexibility for initiatives and opportunities that developed as a result of getting together in Cape Town to grow and flourish.

Forum 2012 focused on three themes: i) increasing investment, ii) creating partnerships and networks, and iii) making environments in low income countries more conducive to research and innovation. We believe we made good headway on all of these, as this report will show. We also know that much more needs to be done to optimise these and other key areas. Future Forums will continue to focus on these themes rather than on fragmented drives and calls to action – perhaps in different contexts but in ways that spin a strong, unbroken thread year-by-year.

We hope this report will generate further action, and we look forward to hearing from you and meeting you again at a future Forum meeting.

Dr Francisco Songane,
Chair, Forum 2012 Steering Committee (left)

Prof. Carel IJsselmuiden,
Executive Director, COHRED (right)

1 Introduction

The global landscape has seen seismic shifts in international aid. In the 1950s, countries like China and India were floundering economically and desperately trying to achieve basic goals such as feeding their people. Research and development were not especially high on their agendas.

Fast-forward to half a century later and emerging markets, including South Africa where Forum 2012 was held, are powering the world's economy. As rich countries saw their financial markets descend into freefall, several of the more advanced developing countries became donors to less resourced ones. BRICS countries – Brazil, Russia, India, China and South Africa – with the launch of their own development banks and perhaps the advantage of being better attuned to the research and innovation needs of low and middle income countries (LMICs), are reshaping aid.[1]

While BRICS often take the limelight as the stars of the developing world, we should not overlook progress in other countries. In Africa, South Africa is not the only country to have advanced in recent years. Many others have seen their economies grow and are starting to invest in R&D and also in innovative solutions. Over the past decade six of the world's ten fastest-growing economies were African.[2] Rwanda, for instance, once war-torn, now offers its people affordable health insurance – something that few LMICs, or even richer ones, have achieved. Latin America has seen many of its countries go from strength to strength, and revolutions in the Middle East have, in some countries, led to more democracy. South-East Asia, meanwhile, continues to grow its biotechnology capabilities to rival those of the West. The developing world is far from stagnating; in fact, it is in the throes of major transition.

Yet despite economic improvements in LMICs, the end of conflict in some areas, growing investment in R&D and innovation and decades of increasing aid, many countries still see millions of people dying – from a lack of access to basic medicines, ineffective or counterfeit drugs, or from the sheer absence of cures for some of the world's biggest killers. Clearly, a new strategy is needed. With the population boom in LMICs, and the economic recessions that have wrought havoc on the finances of many developed countries,[3] aid will inevitably never be enough.[4] Aid needs to stop being a band-aid for problems in the developing world and to start improving the ailing systems that are the root of problems – it is time for a new model.

> *Over the past decade six of the world's ten fastest-growing economies were African. Rwanda...now offers its people affordable health insurance...*

1.1 What does 'beyond aid' really mean?

Before charging off in a new direction, it is important to clarify what going 'beyond aid' means. It does not mean abandoning reliance on aid altogether – at least, not yet. Many countries will continue to need significant international help, and there is a chance that they may always do so.

It is important to differentiate between 'aid as relief' and 'aid as development'. By 'relief aid', we mean aid that provides technical and material support to deal with a specific problem, sometimes without even involving recipient country systems. By 'development aid', we mean aid that supports countries, their institutions and people in identifying their priorities and beginning to address them – alone or in partnership – for the benefit of all inhabitants.

Most countries – irrespective of their development status – deal with this dichotomy by creating separate ministries and budgets for relief aid and development aid. Taking health as an example, ministries of health often deal with disease crises and access to health services. Ministries of science and technology or ministries of education deal with the links between health and economic development, research and innovation, product and technology development, and exports and scaling up production. The reason for this separation is simple: it is very difficult for researchers or innovators to compete for scarce funding from health budgets because the outcomes of research are uncertain, whereas the outcomes of measures to control health crises are more certain. Research loses out on funding unless it can be shown to improve health indirectly, by creating jobs, competitive advantage, technologies and medicines for export, for example.

[1] Shifting Paradigms. How the BRICS are reshaping global health and development. March 2012. http://www.ghsinitiatives.org/downloads/ghsi_brics_report.pdf

[2] http://www.economist.com/node/21541015

[3] Development: Aid to developing countries falls because of global recession. OECD. 2012. http://www.oecd.org/document/3/0,3746,en_21571361_44315115_50058883_1_1_1_1,00.html

[4] Robert B Zoellick. Beyond Aid speech. World Bank Group. 2011. http://go.worldbank.org/J0VM93C6Z0

'Aid' seems to focus on the immediate, on crises, on the 'poorest of the poor' without giving much thought to the adage that 'in fighting the crocodiles, it is easy to forget that we actually need to drain the swamp'. That has to change – as sometimes 'relief' is counter-productive to 'development'.

Research and health systems in the developing world are still too dependent on international aid. Going 'beyond aid' would mean that:

- domestic rather than global health and development agendas govern collaboration and national funding priorities;
- burgeoning capacity, assertiveness and eagerness to take over in developing countries further eliminate the gaps between the developed and developing world; and
- research and innovation act as key drivers in achieving health, equity and development.

Read more online: 2011 COHRED Colloquium Report
http://www.cohred.org/publications/cohred-publications/policy-and-synthesis/

Going 'beyond aid' would mean that countries decide how funds are spent in their countries and that the health needs of their people are paramount. It would mean encouraging local capacity so that local scientists develop thriving research environments. It would mean that local and regional collaboration is valued as highly, or even more highly, than global collaboration.

Read more online: The Busan Partnership for Effective Development Cooperation
http://www.aideffectiveness.org/busanhlf4/en/about/busan-partnership.html

Breaking out of the current mould will not be easy. The system of international aid is vast. There are hundreds of donors – large, small, government and philanthropic. Recipient countries have their health and research systems so dependent on foreign assistance that moving beyond this will require careful and innovative thinking.

Innovation in health, equity and development means innovative research, technology and solutions that promote health and development, and lead to more productive, healthy and fulfilling lives for all. Innovation is frequently used to refer to R&D for new medicines and health technologies. However, innovation also refers to creative ways to:

- organise and deliver healthcare;
- manage information;
- respond to the needs of providers and users;
- develop business models for increased productivity and sustainability; and
- ensure that vulnerable or disadvantaged groups become healthier through solutions that promote equity.

Innovation for health is not limited to healthcare but is also highly relevant in other sectors that have an impact on health and wellbeing, such as agriculture, education and economic development.

Building a system that supports research and innovation is important to development. Such a system can create an environment that:

- encourages the production and development of new technologies, medicines and processes, and
- develops an evidence base of research to inform policymaking and service delivery.

A strong system can also link the various institutions, networks and individuals involved in supporting and using research and innovation in both the public and private sector – scientists, policymakers, programme managers, advocates, entrepreneurs and investors. Links between these make greater coordination and collaboration within and across national borders possible.

Investment in strong innovation systems has been an approach followed by high income countries for decades. In the latter half of the 20th century particularly, R&D was part of large-scale national endeavours to increase national security and productivity.[5]

Investment in research and innovation is also a feature of emerging economies. For example, the BRICS are developing new medicines, diagnostic tools and technologies, and producing them for both domestic and export markets. In India, the main drivers of R&D include multinationals, which set up laboratories and R&D centres in-country, as well as large Indian pharmaceutical and technology companies, and national research institutes.

> *In India, the main drivers of R&D include multinationals, Indian pharmaceutical and technology companies, and national research institutes.*

However, media reports suggest that small businesses and entrepreneurs are increasingly working in innovative research and developing innovative products.[6] As noted by the Organisation for Economic Co-operation and Development (OECD),[7] human capital is essential for

[5] Gordon Conway and Jeff Waage. Science and Innovation for Development. UK Collaborative on Development Sciences (UKCDS). London. 2010.
[6] Shilpa Kannan. R&D gives India its big boost in the tech world. BBC News. 6 June 2012. http://www.bbc.co.uk/news/business-18330837
[7] OECD, The OECD Innovation Strategy: Getting a Head Start on Tomorrow, 2010.

achieving innovation. Countries can empower innovators by investing in education and training, putting in place supportive policies and fostering an entrepreneurial culture for example.

The payoffs of innovation also have important consequences for human capital. Innovation can drive national growth, lead to greater employment and improve living standards.

1.2 The goals of Forum 2012

The main objective of Forum 2012 was to discuss ways to strengthen systems for research and innovation that would integrate innovation into long-term development processes, particularly in LMICs. Discussions spanned investment, building partnerships and networks, and developing facilitating environments.

'Beyond aid' is wide in scope so, to shape discussions cohesively, the Forum organising committee decided on three themes:

- improving and increasing investment in research and innovation;
- networking and partnerships for research and innovation; and
- creating environments that support research and innovation.

Traditionally, discussions on research for health have been confined to the health sector, with little involvement of other sectors or other constituencies. But, for governments to sustain research for health, efforts need to involve a wide range of stakeholders from sectors other than health. The Forum sought to bring together governments, research institutions, business, youth, social enterprises, international organisations, NGOs, funders and the media.

The purpose of involving a wide range of stakeholders was to encourage an exchange of views and to come up with concrete suggestions on how to move from research findings to solutions to problems. Such a move requires a combination of skills, most of which are not available within the health sector alone. Furthermore, the root causes of many health problems are linked to factors that are the responsibility of other sectors. These other sectors must also be part of the effort to manage health situations.

Sustainability was a dominant note throughout the Forum and, indeed, is a basic requirement for moving beyond aid and finding solutions adapted to local contexts.

The Forum aimed to provide a platform for dialogue and exchanges in a language that was easy for everyone to understand while respecting the rigour of research. The Forum wanted to paint a picture of a world beyond aid – a world in which innovation is key to achieving health, equity and development.

This report distils the conversations between stakeholders. It provides suggestions for going beyond aid rather than attempting to impose a concrete set of rules. The report summarises the key topics and issues that delegates at the meeting shared with each other through discussion and debate.

We have started the conversation. Now, we call on everyone interested in 'aid as development' to continue investigating ways to move 'beyond aid' and to lead dialogues with other sectors.

"I am excited at the notion 'beyond aid'. We need to bring developing countries to a point where we are able to stand up for ourselves. ... The time for us to be clients, must come to an end.

'Beyond aid' must mean we're producing drugs, running the companies, being entrepreneurs and devising solutions. If this is not happening, then we are still aid material."

Naledi Pandor, Minister of Science and Technology, South Africa

2 Aid in the 21st century

One of the most noticeable changes in international aid over the decades has been the growth in the demand for accountability and transparency. Donors now routinely require recipient countries to improve monitoring and evaluation of aid programmes. However, recipient countries themselves have the right to ask for more transparency in how donors allocate grants, including to which countries (and which stakeholders within those countries) they allocate their money.

The end of 'aid' is not simply an aspiration or speculation – aid as proportion of the income of recipient countries has reduced tenfold and more since its heyday in the 1960s.

"Increasingly, the influence of donor agencies is eclipsed by private sector growth, more trade and higher remittances from abroad. Development assistance has slumped from a peak of 70 percent of capital flows to poor countries in the 1960s to just 13 percent by 2011."

Carel IJsselmuiden, Executive Director, COHRED

Two examples demonstrate this shift. In 2009, China eclipsed the World Bank as the leading source of foreign investment in African infrastructure,[8] and over the last two decades, 64 countries have increased their ranking on the World Bank's list of low/middle/high income countries.

In 2009, China eclipsed the World Bank as the leading source of foreign investment in African infrastructure.

Breaks between Forum sessions provided an opportunity to network and share ideas.
Photo credit: Gabi Falanga

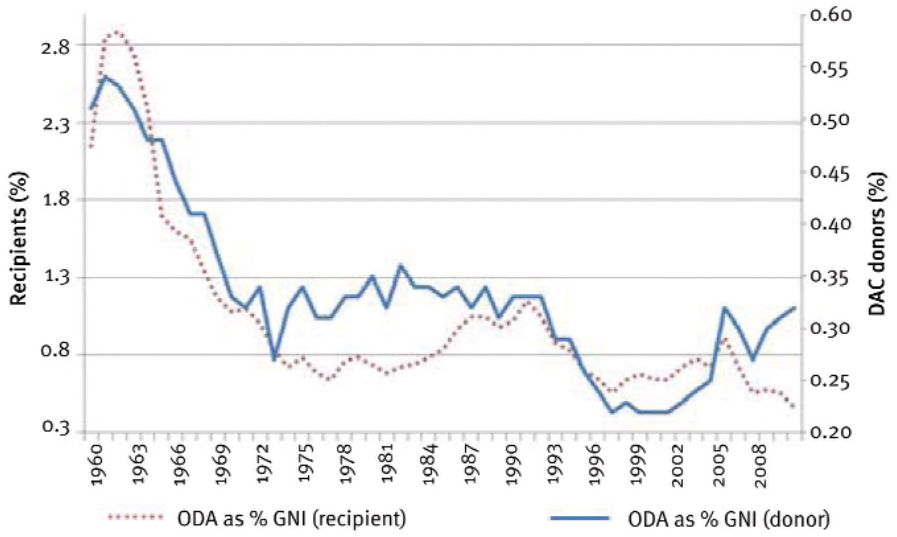
National economies are increasingly stepping up their budget allocations to key public services. They are using their own resources to cover shortfalls in official development assistance (ODA).

LMICs also have the right to ask that aid money be free of political influences and biases. Sexual and reproductive health in many countries suffered tremendously when some donor agencies promoted abstinence over the use of condoms, or refused HIV/AIDS funding to NGOs if they provided family planning and safe abortion.

Another reason for requiring more accountability for how aid is spent has nothing to do with donors wanting their money to be spent wisely. It is because measuring the effectiveness of aid is important for understanding the sectors and processes for which aid is useful, and those for which it is not. This understanding is vital for countries to move from being dependent on aid to using aid as additional help only when necessary.

Sexual and reproductive health in many countries suffered tremendously when some donor agencies promoted abstinence over the use of condoms.

Figure 1. Total net official development assistance as a proportion of donor and recipient gross national income 1960-2010



Correlation coefficient by decade	
1960s	0.92
1970s	0.25
1980s	-0.40
1990s	0.96
2000s	0.09

Notes: ODA as a % of GNI (Recipient) includes aid to all Part I Developing country recipients from DAC donors. ODA as a % of GNI (DAC Donors) includes DAC Donors only. The correlation coefficient illustrates the linear relationship between aid to GNI from donors and recipients' perspectives.
Source: DAC Aggregate Aid Statistics, accessed 4 January 2012.

Source: Jonathan Glennie and Annalisa Prizzon. March 2012. From high to low aid: a proposal to classify countries by aid receipt. Overseas Development Institute Background Note. http://www.odi.org.uk/resources/docs/7621.pdf

[8] Devex 2 March 2012. http://www.devex.com/en/news/77635/print

2.1 Devising metrics to measure aid effectiveness

As well as demanding transparency in how aid money is used, donors are increasingly requiring that money is spent efficiently and that expenditure leads to substantial benefits. This is hard to argue against, but the metrics used to measure aid effectiveness are contentious. They depend on whether the donor or the recipient defines what value for money actually means – donors need to justify their spending and recipients need to prove to their citizens that, overall, health systems are improving.

The number of lives saved by a particular intervention is an often-used and easily understood metric. It is also an inexact measure in that it only looks at an end result – often of a number of interventions – and is prone to double-counting. The choice of metric can insidiously define the way aid money is spent. If the goal is to increase the number of lives saved, then the quickest, cheapest route to achieving this (e.g. by handing out cheap drugs) would be preferable to the longer, messier route of training healthcare workers and bolstering healthcare systems. But progress along the latter route is what countries need to measure to gauge their evolution towards better health systems. Metrics to measure aid effectiveness should be just as useful to recipient countries as they are to donors.

In terms of sustainable aid, rather than asking "How many lives have we saved this year?" a better question might be "How many lives can we save over 10 years if we improve the health system?" However, some metrics, such as disability-adjusted life years (DALYs), can be too complicated for the typical parliamentarian or taxpayer to understand, but may be crucial for reassuring donors that their funds have been spent as intended.

Efforts to refine metrics for aid effectiveness include the 'health impact accounts' currently being investigated by the World Bank and Institute for Health Metrics and Evaluation, and 'impact nets' which combine multiple non-linear cause and effect relationships.

Recipient countries which want a say in the metrics used to measure aid will need to set up systems to monitor and evaluate health interventions, and rigorously collect data. Although most countries have some form of health information system, these do not always function well. Some countries even lack reliable basic registration statistics. In addition, donors have different data reporting mechanisms which result in fragmented information. These issues underscore the importance of setting up a robust and unified national health management information system to enable assessment of whether or not programmes and policies are promoting equity, and whether or not the health of the population is improving. Such a system will also identify areas that require additional resources and changes to policies. These perspectives have been lacking in providing aid throughout the decades.

Read more online: The Busan Partnership for Effective Development Cooperation
http://www.aideffectiveness.org/busanhlf4/en/about/busan-partnership.html

2.2 Humanitarian aid can be local

Often, the most visible face of international aid is humanitarian assistance. Newspapers, television and the internet all show that when a disaster – whether natural or manmade – affects a developing country, the world responds by deploying UN aid workers and doctors to provide immediate relief. But this slightly skewed view does many countries a disservice. It is true that, in some situations, global emergency aid dominates but often – in the recent Libya crisis, for instance – local ministries of health and local healthcare professionals provide most of the medical support.

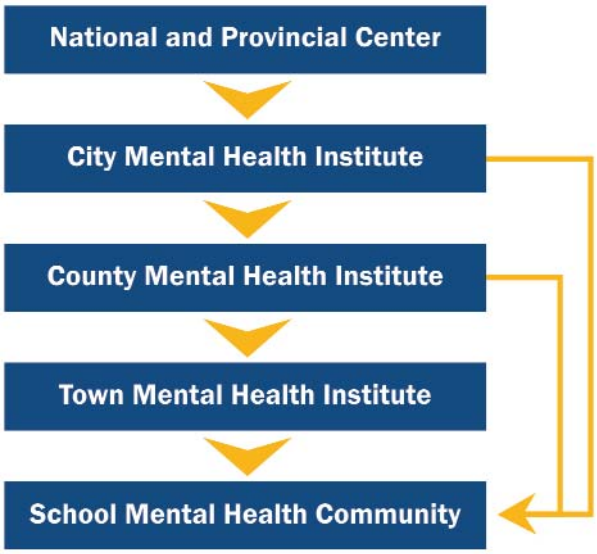
International aid – including the deployment of aid workers who frequently move from one disaster zone to another and therefore may know little about a local situation – can sometimes undermine or duplicate local efforts. Often, money or resources pledged in response to a disaster take many months to reach the scene. Clearly, humanitarian aid is vital in many countries around the world, but countries themselves need to understand how best they can mobilise existing systems in response to disasters.

In a session at Forum 2012 that focused on research and innovation in response to humanitarian emergencies, case studies were presented from China and Libya. These showed how research was part of the humanitarian response and how local partnerships were built in the process. For instance, after the 2008 earthquake in Wenchuen, China, a survey of adolescents and children found that they had high levels of emotional difficulty, depression and mental trauma. The survey highlighted gaps in the psychological counselling available to survivors. China has since implemented counselling guidelines on mental health, and trained hundreds of teachers and mental health counsellors to provide ongoing support to the millions of people affected by the earthquake.

Exhibition stall at Forum 2012.
Photo credit: Gabi Falanga

A collaborative project was undertaken to integrate mental health counselling into schools and to train psychologists, counsellors, head and regular teachers, and parents to identify and respond to common psychological problems of children and adolescents in the earthquake-affected areas. Activities for earthquake survivors included group therapy sessions, counselling, alternative therapy, expressing anger, conversation and other activities. The programme team also linked and coordinated various sectors to create a strong ongoing referral system for mental health problems. This involved government departments, educational institutions, healthcare providers, enterprises and NGOs, and became known as the Five Level Mental Health Service System (Figure 2).[9]

Figure 2. A five level mental health service system for adolescents and children.



Source: Xueli Sun and Jun Yan. Experience for Providing Evidence-based Mental Health Service after May 12, 2008 Wenchuan Earthquake in China. Presented at Forum 2012

In Libya, during and after the conflict-related humanitarian crisis, there were large displacements of people, including health workers. The Ministry of Health was assisted in the humanitarian response by international and national partners. However, most health facilities (both inpatient and outpatient) were provided by the Health Ministry and the private health sector, rather than NGOs. Medical student volunteers assisted by substituting for nurses.

While undertaking operational research can be challenging in humanitarian emergencies, such research can provide a better understanding of how to ensure a continued flow of drugs and vaccines, and how to track injuries and outbreaks of infectious diseases – all necessary information to sharpen responses to the next emergency. Here too, innovations in healthcare – such as medical assessments by videoconferencing or Skype – could be extremely useful when travel is dangerous or restricted. Remote medical assessment – building on the Libyan experience – was identified as a potentially useful innovation.

In states emerging from humanitarian disasters, post-crisis research may focus largely on collecting information in priority areas, such as about injuries sustained, or the state of health facilities and drug procurement systems. However, there are also opportunities for research and innovation. For example, scientists and policy makers met at a series of workshops at the 2011 American Association for the Advancement of Science (AAAS) conference in Washington DC to discuss ways to develop Haiti's system of research and innovation in collaboration with international partners.

"Scientific capacity is required for advancing Haitian technological innovation and economic opportunities, improving medicine and healthcare, creating access to clean water, improving disaster preparedness and mitigation, developing sustainable agriculture and reducing hunger, sustainably managing natural resources, educating citizens, and advancing human rights.

This is the responsibility of the Haitian scientific community, government, private sector, and educational and research institutions. Haitian science must be Haitian-led and directed."

American Association for the Advancement of Science conference 2011
http://www.aaas.org/news/releases/2011/media/0919haiti/haiti_report_2011.pdf

Most responses to humanitarian crises and research on humanitarian aid take place in the early acute stages. However, there are also opportunities in the reconstruction and development phases to build national systems to support research, innovation and development, and to guide the setting of national priorities for research and advancing development.[10]

2.3 Recipient countries should set their own research priorities

Handing the reins of autonomy to recipient countries is one of the key requirements for sustainability. Donors, quite fairly, require accountability for how the aid funds they provide are spent. But recipients of support must ensure that they determine what that money needs to be spent on. This means recipient countries must have the capacity to properly assess their own research priorities.

[9] Xueli Sun and Jun Yan. Experience for Providing Evidence-based Mental Health Service after May 12, 2008 Wenchuan Earthquake in China. Presented at Forum 2012.

[10] Science for Haiti: A Report on Advancing Haitian Science and Science Education Capacity. American Association for the Advancement of Science, Washington. June 2011.

Development of such priorities requires the input of a broad range of stakeholders – in government, NGOs, industry and civil society. For example at Forum 2012, researchers working in the area of sexual and reproductive health (SRH) discussed how large donors and international agencies impose the SRH research agenda on a number of countries. Frequently, research on behalf of national governments is undertaken by international consultants and is part of a system of 'bidding' for research projects. This has the effect of making less funding available to local institutions and means that not many local people have the opportunity to train in SRH research at academic institutions and in NGOs. This, in turn, contributes to limited capacity in SRH research in many LMICs. The group of researchers discussing this issue highlighted the importance of basing research agendas on national needs and adopting a long-term view to building national research capacity.

Priority setting is essential for defining the focus, scope, extent and direction that research and innovation systems should take to lead a country towards equity and health. When countries have clear priorities, these can guide research expenditure and stimulate appropriate human resource development. Moreover, countries that have invested time and effort into setting research priorities often have clearer insights into their own resources, abilities and needs that those that have not.

LMICs are highly heterogeneous – research priorities in one will not necessarily translate to another. Each country will need to develop its own method of identifying its research priorities and, crucially, understanding what it can achieve with the money it is willing to spend. South Africa, for instance, focuses on driving research for health, rather than research on specific diseases. This focus has led to a strong biomedical sector and an understanding of what research is most relevant for the country.

> *South Africa focuses on driving research for health, rather than research on a specific disease.*

Other countries use different methods to identify research priorities. Argentina uses a combined matrix approach, assessing the magnitude, causes, cost-effectiveness, evidence for and available resources for different diseases. Tanzania holds consultations with relevant parties and tries to align their priorities with available resources and national development goals. The Philippines takes a grassroots approach, consulting at regional level to identify health research priorities.

The keys to setting research priorities are to balance short-term wins with long-term strategy and to ensure that there is a financing mechanism that is independent of the interests of a particular ruling political party.

Read more online: Priority setting in research for health
http://www.cohred.org/prioritysetting/

"We need to invest in our own research activities. We do not have to wait for donors in order to do this. Investments into research and innovation are the backbone to the sustainable development of any country.

Tanzania intends to be a middle income country by 2025, and science and technology are going to help us get there".

Makame M. Mbarawa, Minister of Communication, Science & Technology, Tanzania

3 Financing the future

Advocacy to boost international aid for R&D is still vital as many countries cannot fight disease or build up their research and health infrastructures alone. But, increasingly, there is a call for aid recipients to commit their own money and, importantly, to try to increase their spending and become more independent.

3.1 Boosting investment

Most LMICs fall behind on the percentage of gross domestic product (GDP) they commit to spending on R&D. India, for instance, has long pledged to double its spending on R&D from 1% to 2%, but has not yet managed to do so. At a summit meeting in Khartoum in 2006, the Executive Committee of the African Union pledged that African countries would aim to spend 1% of their GDP on R&D. Yet a 2010 survey of 19 African countries found that only Malawi, Uganda and South Africa spent more than 1% of their GDP on R&D. The other 16 countries spent between 0.2% and 0.48%.[11] In 2009 Tanzania committed to meeting the 1% target, and is working towards increasing its investment in R&D.

[11] African Innovation Outlook 2010. New Partnership for Africa's Development (NEPAD). 2010. http://www.nepad.org/humancapitaldevelopment/knowledge/doc/2418/african-innovation-outlook-2010

Some countries are raising money for R&D through 'sin taxes'. For example, the Health Research Fund in Colombia is funded from 7% of the country's gambling profits. In addition, Colombia taxes royalties from the exploitation of oil fields and non-renewable energy to fund research and innovation.

Yet increasing the amount of money for research is not just about increasing the total sum for research and innovation. One of the greatest inefficiencies in research is that the money invested is not spent efficiently or effectively across different sectors.

> *In Africa, only Malawi, Uganda and South Africa spend more than 1% of their GDP on R&D.*

For instance, researchers are often constrained by short-term funding that is guaranteed for perhaps only a year. By the time they receive a grant, it may be almost time for them to write up a report on how the grant was used. This short-term funding is not conducive to a research strategy that needs more time. Proper regulatory frameworks are needed to ensure sustained financing over the duration of a study so that funding does not disappear when political interests, or the minister in charge, change.

Human capacity is also a key driver of research and effective investment in research. In Panama, scientists are offered incentives, such as annual bonuses for exemplary publications or overseas training, to encourage them to push their research forward and to work hard.

> *In Panama, scientists are offered incentives, such as annual bonuses for exemplary publications or overseas training, to encourage them to push their research forward.*

Creating the right environment is important so investors do not have to make a total leap of faith. This means undertaking feasibility studies to scope out whether an environment would be receptive to a new product and whether there are unmet needs that indicate a demand. Governments need to provide incentives, such as tax breaks or an innovation fund, to ignite local players, encourage their participation in innovation systems and help convert the products of innovation into marketable goods.

3.2 Private investors and entrepreneurs

There are huge market opportunities in critical service sectors in LMICs, but poor links between the financial and health sectors.

Entrepreneurs face challenges such as regulatory barriers in commercialising their ideas. Investments also take time to deliver a pay-out, meaning that entrepreneurs need patient investors and start-up funding. A small but growing number of impact investors and venture capitalists – from philanthropic foundations to private investors – are emerging. These are willing to fund start-ups in the health sector in developing countries. Other mechanisms – from seed funding for innovative ideas to rewarding successful social innovations or, in some cases, government-sponsored incubators – help to kick-start local innovation. Among those bringing their insights to Forum 2012 were Impact Investment Partners, the Impumelelo Social Innovations Centre, South Africa's Technology Innovation Agency and Grand Challenges Canada.

In LMICs there are tremendous growth opportunities, particularly for small and medium sized businesses, in delivering healthcare services, and in developing and bringing to market solutions involving new technology. Profitable businesses that improve the health of the poor came to Forum 2012 to showcase what is possible and to uncover new opportunities. Examples include health clinics run as franchises (e.g. OneFamilyHealth in Kenya and Rwanda) and managed-care networks that extend to underserved populations (e.g. CareCross in South Africa www.carecross.co.za/). Common to these was the need to do operational research and to innovate to find new solutions to health problems. Enabling and incentivising innovation is key to unlocking investor and business potential in low and middle income economies.

Ultimately, sound business principles can help make health systems more sustainable and self-financing, provided they do not become overly commercial and compromise care. Business, by nature, must be highly efficient in order to turn a profit, and business principles – such as streamlining processes – could bring down the costs of basic healthcare.

3.3 Innovative financing

Innovative financing will require infrastructure that can adapt to new ways of collaborating and partnering. For instance, the grant regulations imposed by research bodies should not curtail the potential for interdisciplinary collaboration – grants given to one research team should be able to be shared with, or used in conjunction with, another team in a different discipline.

Patents are often used to finance research, but the current patent system is not being used effectively and is

patchy across the developing world. For instance, few patents are registered in Africa and South America.[12] But South Korea registers more patents than the whole of Europe each year. In part, this is because of a lack of expertise in intellectual property and poor regulatory structures in some LMICS. A lack of awareness of why patents are important in research in general – not just for drugs and vaccines – still permeates some countries. In Indonesia, for instance, few public-sector researchers think about patenting their findings and, even when they try to, it can take several years to get a patent approved.

Just 25% of research on neglected diseases is done in developing countries.

In pharmaceuticals, the role of patents is more clear-cut, but the whole system depends on commercialising products to repay the costs of R&D. When it comes to diseases that only affect poor people who cannot afford to buy expensive drugs, the patent incentive structure falls apart.

Royalty-free licences allow local manufacturers to develop products without paying a fee. These can encourage the production of drugs, or research into drug candidates which are important for neglected diseases.[13] However, drug companies do not give up their licence fees easily, and royalty-free licences tend to be limited to the least developed countries.

Thus, more sustainable mechanisms that incorporate innovative financing need to be found. Delegates at Forum 2012 discussed the new R&D treaty put forward to stimulate research into the health needs of the developing world.

Spotlight: A global R&D treaty

The global health community has long known that the current model for R&D into diseases that mostly affect the developing world does not work. Neglected tropical diseases (NTDs) burden 1.4 billion people around the world. When new drugs, diagnostics and vaccines are developed, they are often aimed at the advanced world, while diseases such as chagas, leishmaniasis and dengue that prevail in the developing world receive far less attention.

Yet, even research into diseases mainly affecting developing countries is mostly done in the developed world. Seventy-five percent of the 348 organisations developing 374 drugs or vaccines for 23 NTDs[14] are in high income countries. Not one African government is currently funding the African Network for Drugs and Diagnostics Innovation (ANDi). LMICs need to take more control of research into the diseases that affect their people.

Even when new medical technologies do reach the market, they are often prohibitively expensive because of monopoly rights conferred by the patent system. Thus, the market system, in which the incentive for innovation is purely profit, fails to stimulate the development of drugs, vaccines and diagnostics for diseases affecting the poor. A new system is needed to ensure that R&D addresses their needs.

To respond to this problem, The Consultative Expert Working Group on Research and Development: Financing and Coordination (CEWG) was established by the World Health Assembly in 2010 under the auspices of the Global Strategy and Plan of Action on Public Health Innovation and Intellectual Property (GSPA). This group recently published their final report recommending a global treaty to ensure sustainable financing of research and development to address the health needs of LMICs.

Read more online: WHO website on public health innovation www.who.int/phi

The proposed treaty would seek to achieve predictable financing through a commitment by all countries to devote 0.01% of GDP to government-funded research targeting the health needs of developing countries. Importantly, this would de-link the cost of drug development from the price of medicines – meaning that prices could be set at levels the poor could afford, increasing their access to health products. The CEWG also recommended that funds gathered through the treaty should support building the innovative capacity of developing countries, including through technology transfer, and improving priority setting according to the needs of developing countries.

[12] Strengthening Pharmaceutical Innovation in Africa. COHRED, NEPAD. 2010. http://www.cohred.org/downloads/cohred_publications/Strengthening_Pharmaceutical_Innovation_Africa_Report.pdf

[13] Research consortium. London Declaration on Neglected Tropical Diseases. 2012. http://unitingtocombatntds.org/downloads/press/ntd_event_london_declaration_on_ntds.pdf

[14] BIO Ventures for Global Health. Global Health Primer. http://www.bvgh.org/Biopharmaceutical-Solutions/Global-Health-Primer.aspx

"If the lever is long enough you can move the earth with your weak hands. With science and research in the people's hands, they can move the earth. If we want to move beyond aid, we need to participate in research with the people."

Abhay Bang, Director, Society for Education, Action and Research in Community Health (SEARCH)

4 Creating capacity

Building scientific capacity in developing countries is a cornerstone for moving beyond aid. An adequate science capacity allows countries to become autonomous in scientific research, improve their ability to collaborate internationally, raise their global standing and boost their economies by increasing productivity.

4.1 Technology transfer

Advances in technology drive research and improve healthcare delivery. The transfer of technologies from countries that have developed it (usually rich countries) to less developed countries is an important enabler of research as it avoids less developed countries having to reinvent the wheel.

The promise of new technologies is huge. An example is lens-free holographic microscopy that allows technicians to count blood cells in holographic images. Another is miniaturisation of the endoscope into capsule form that can put 'a camera in a pill'. Yet another is the 'smart pill' that can provide readings on body temperature, pH and pressure.

But a technology that suits a high income country, or that relies on good infrastructure, cannot be exported to a LMIC without careful thought. For instance, lab-on-chip technology, by enabling offering mobile diagnostic services and speeding up diagnosis times, might revolutionise healthcare in developing countries. But this technology is still largely too expensive, not robust enough, nor sufficiently standardised to export to developing countries.

There are three main types of technology transfer:

- manufacturing and entrepreneurial know-how;
- scientific collaboration and knowledge-sharing; and
- healthcare capacity building.

Successful transfer of technology requires that recipient countries know what they want to import, which means setting their own health priorities, and that they have a stable enough system to import it into. Importing technology for local production greatly increases access to products like vaccines and drugs but requires:

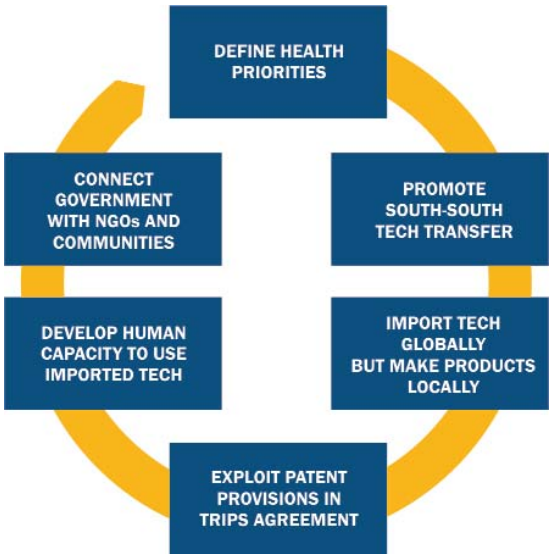
- skilled personnel to be available locally;
- access to investment capital;
- availability of suitable input materials;
- adequate infrastructure;
- access to relevant technologies;
- an adequate regulatory environment; and
- achieving economies of scale.

Governments play a key role in encouraging technology transfer. They need to align industry and health policies for local production to be worthwhile and sustainable.

Exchanging ideas on how to improve technology transfer will be vital. The Health Technologies for Development (HTech4Dev) initiative,[15] led by the Institute for Health Technologies, is one such effort. HTech4Dev brings international stakeholders together to develop ways of transferring new technologies for health in developing countries. The initiative has linked several institutions and laboratories, and signed 18 cooperation agreements across 15 countries.

HTech4Dev links several institutions and laboratories, and has signed 18 cooperation agreements across 15 countries.

Figure 3. The technology transfer cycle



Source: Forum 2012. This figure is the result of ideas and discussions that were generated during Forum 2012.

[15] Health Technologies for Development. http://htech4dev.blogspot.co.uk/

Once technicians from Mozambique have been trained in Brazil, the pharmaceutical plant in Mozambique will begin manufacturing antiretroviral drugs as well.

The growth of South-South technology transfer is highly promising as an alternative to traditional North-South one-way technology transfer. In fact, South-South technology transfer can often be more valuable than North-South transfer. The lessons being transferred South-South are between countries that are at, or which have recently gone through, similar development stages. Thus lessons are more transferrable. For example, in a pharmaceutical collaboration announced in July 2011, Brazil is transferring its biotechnology know-how to Mozambique. Antiretroviral drugs manufactured in Brazil, which developed a robust biotechnology industry several years ago, will initially simply be packaged in Mozambique. Once technicians from Mozambique have been trained in Brazil, the pharmaceutical plant in Mozambique will begin manufacturing the drugs as well.[16]

Delegates at Forum 2012 discussed technology transfer extensively as it is key to development. Some of the key take-home messages were:

- there is a need for LMIC governments to support each other in sharing technology;
- technology transfer should be accompanied by capacity building in the recipient country;
- the social effects of technology transfer should be analysed before going ahead; and
- local production greatly improves local access to products.

4.2 Research and innovation capacity

Traditionally, strategies to improve research capacity have focused on increasing training and research at academic institutions. Although these strategies are necessary they are not sufficient and efforts need to be more holistic. Sessions on building research capacity at Forum 2012 looked at various aspects of capacity building including:

- how to optimise the role of international partnerships in strengthening research for health systems;
- building capacity for research in non-university settings;
- developing robust mechanisms and processes for ethics review; and
- supporting careers in science and innovation, particularly those of women and young people.

Participants felt that increasing training in scientific research is not enough – scientists need to feel that there is a steady career path in research. Researchers also need to be empowered to ask innovative, challenging questions that might go against the status quo.

In an interactive session co-organised by the International AIDS Vaccine Initiative (IAVI), the New Partnership for Africa's Development (NEPAD) and COHRED, participants discussed how international partnerships, such as public-private product development partnerships and other multilateral research collaborations can optimise research systems in LMICs. Health research is predominantly funded from external sources. Externally funded programmes often do not create sufficient opportunities for building national systems for health research as they frequently operate in a 'vertical' manner – focusing on research on specific diseases and funding this research through calls for proposals and grant allocations. The focus of this kind of research is not primarily to build sustainable research governance systems, but rather to achieve the objectives of individual research projects.[17]

The criticism here echoes that levelled at the 'vertical' approach to financing and delivering health services. Programmes linked to preventing and treating HIV/AIDS, malaria, TB and other diseases have traditionally been how development agencies funded health projects in countries with weak health systems. Again, the emphasis has been more on achieving the objectives of the programmes rather than strengthening the overall health system – although this is beginning to change as more attention is being paid to approaches that underline 'health systems strengthening'.[18]

With the current worldwide financial insecurity, there is a risk of a reduction or cut in funding from development agencies, foundations, and other international and multilateral development partners. Hence, there is a need for countries to limit their dependency on donors, increase their ownership in development processes, and strengthen national systems to support research and innovation.

[16] Mozambique launches Brazil-funded drugs plant to battle HIV. Radio Netherlands Worldwide Africa. 21 July 2012. http://www.rnw.nl/africa/bulletin/mozambique-launches-brazil-funded-drugs-plant-battle-hiv

[17] A vertical 'research programme' is responsible if it succeeds in building the capacity of a country's researchers and the national research system – in the process of achieving its own research goals. Research plays a crucial role in developing solutions to the health problems suffered by the populations of low and middle income countries. Most health research for and in low and middle income countries is funded from external sources. And most of this externally funded research takes the form of 'vertical' – condition – specific – programmes. Also see: http://www.cohred.org/publications/cohred-publications/policy-and-synthesis/cohred-statement-1-responsible-programming-of-global-health-research/

[18] Don de Savigny and Taghreed Adam. Systems thinking for Health System Strengthening. WHO, 2009
Ooms, Gorik, Van Damme et al. 2008. The 'diagonal' approach to Global Fund Financing: a cure for the broader malaise of health systems?

Participants discussed how to strengthen key areas such as country ownership of research agendas, funding and investment in research, and collaboration across sectors, including NGOs and the private sector. Some of the recommendations that emerged from discussions were:

- harmonise priority setting in local agendas to increase ownership and ensure the relevance of research to national priorities, and align donor agendas with local agendas;
- develop mechanisms to assess the contribution of vertical collaborative research projects to system capacity beyond specific research objectives;
- countries should develop long-term visions for research and innovation with the aim of building self-sustaining research infrastructure;
- LMICs should increase the proportion of GDP they spend on supporting research and innovation; and
- develop stronger linkages – through loci such as national platforms for dialogue between government, scientists, policymakers, civil society, private sector and donors on investing in research, conducting research and translating research findings into policy and practice.

Capacity building can sometimes be too top-down, for example when the focus is on increasing research capacity at university level based on the assumption that knowledge flows down to the grassroots level. However, solid research and knowledge dissemination can also be generated at grassroots and feed up. Competing priorities for capacity building are not surprising. Academic excellence must be fostered and rewarded. However, it is important to recognise that excellent researchers are at the top of a pyramid of support staff, community-based researchers and less prestigious institutions that also require capacity building and funding.

Civil society organisations (CSOs) that attended Forum 2012, and the meetings enabled by satellite, emphasised that, in addition to bringing a strong community voice into the research arena, CSOs have a wider role in health research and innovation. CSO involvement is extensive, ranging from advocacy, holding researchers accountable and setting the research agenda, to conducting and using research and translating research findings into policy papers.

Additionally, in many countries, CSO researchers build research capacity in government institutions and other organisations. CSOs are also important partners in moving from knowledge to implementation as they translate knowledge into practical action.

At the same time, representatives of CSOs at Forum 2012 felt that civil society needs to participate more meaningfully in setting national research agendas and to forge closer links with national research for health systems. This would include, amongst other activities:

- participating in national ethics review committees and monitoring and evaluation programmes and projects;
- implementing research findings and 'best practices';
- identifying advocacy issues; and
- simplifying public health and research messages for community action.

CSOs looking to build their capacity in conducting and using research also emphasised the need to forge better links with research institutes and universities.

Government departments need to liaise far more on capacity building than they do now. Often, the separation of responsibilities between ministerial departments means either that training is duplicated and resources are allocated inefficiently between ministries of health, science and technology or, worse, that none of the departments take responsibility for capacity building.

Read more online: Africa's neglected area of human resources for health research – the way forward. C IJsselmuiden, DL Marais, F Becerra-Posada, H Ghannem. South African Medical Journal, Vol 102, No 4 (2012) http://www.samj.org.za/index.php/samj/article/view/5377

Spotlight: Future champions: researchers of the future

Young scientists are the research workforce of the future and vitally important to the development of their nations. Yet they face significant hurdles. Science education is not always a priority. The path from student to researcher can be difficult in countries where there are few research positions or where there is no significant mentoring. Funding is also a hurdle. Grants can be short term making it difficult for developing country scientists

Youth in Motion at Forum 2012 closing ceremony.
Photo credit: Gabi Falanga

to engage in the high level, game-changing research that allows developed countries to lead in the global scientific arena.

At Forum 2012, a group of young researchers (under 35 years) from around the globe met several times to share experiences and devise a strategy for investing in future scientists. They formed a knowledge network called Youth in Motion. The network will help them to:

- exchange best practices to contribute to the global evidence base on health, equity and development;
- take the lead in sustainable resource strategies and promote ownership; and
- become active members of their communities, using research and innovative thinking tools to implement youth participation in the process of local development.

Young researchers also called on the wider research community to:

- foster collaboration between young and more experienced researchers and promote mentorship and training programmes;
- introduce reforms in the education sector that promote multidisciplinary training;
- provide appropriate and sustained financial and non-financial incentives to attract and retain young researchers in health research and innovation;
- enact national and international policies and agreements that encourage and protect communities' local or indigenous knowledge and subsequent development of innovations through fair partnerships;
- actively support alternative innovation systems that encourage data sharing and product development with the goal of maximising access to knowledge and technologies;
- ensure delivery of measurable, high quality healthcare through responsible regulation of private and public providers;
- appropriately use social networks and mass media to identify, develop, communicate and disseminate research and innovations; and
- support youth-led research and innovation incubator initiatives that can drive health, equity, and sustainable development everywhere.

Read more online: The Youth in Motion communique http://www.forum2012.org/2012/05/yim-draft-communique-send-through-your-comments/

Youth in Motion facebook page: https://www.facebook.com/groups/344225828958036/

4.3 Capacity to review ethical research for health

Despite swathes of international guidance and regulations on research ethics, it can be hard for researchers in LMICs to apply these gold standards to their own work. This can be either because the human resources required, for example, for ethics review committees, are not there or because ethics research governance (the structures, processes and standards that provide a framework for research ethics in countries) is fragmented or weak. Up to 80% of patients recruited in some LMICs are not properly informed about the exact nature of the study they are participating in.[19]

In addition, in research institutions or universities already lacking in human resources, academics are sometimes understandably reluctant to take on the extra responsibility of being on an ethics committee. Even when people are willing, however, they may find it difficult to get training in bioethics. Further, it is not simply the difficulty of encouraging researchers to join ethics committees. What is also important is to raise the awareness of researchers so that they recognise ethical issues in their work and ethical issues that arise as research progresses.

> *Up to 80% of study participants in some LMICs are not informed about the nature of the study.*

While countries still need to find ways to improve the capacity of research ethics committees to approve protocols, bioethicists are increasingly trying to train researchers to recognise and address ethics issues that arise during projects. Ethics issues can crop up at any point during a study. This means it is important for researchers to have a working knowledge of ethics to deal with these issues as they come up. Some issues may simply not be addressed by the guidelines that are available.

MalariaGen, a Wellcome Trust funded network, links researchers in around 20 countries who are working together to understand how genomic variation affects the epidemiology of malaria. MalariaGen recognises that building capacity in ethics is an important part of the work carried out with researchers in the network. Working in genomics raises specific issues related to storing and sharing genomic data across large consortia, and can raise additional difficulties in applying standard ethical principles. Obtaining informed consent becomes more difficult when the issues are complex, such as when genomic data may provide information not only

[19] Sonia Shah. The Body Hunters: Testing New Drugs on the World's Poorest Patients. New York, New Press, 2006.

about the research participant, but about their families and communities.

While most countries have some mechanisms for ethics review, many countries do not have a strong and integrated 'ethics governance' structure – legislation and policies that provide a legal framework. Strong ethics governance structures would:

- support ethical research and support the establishment of research ethics committees as the primary mechanism to monitor ethics;
- accredit ethics committees;
- provide stewardship at the national level through, for example, a national ethics council or committee;
- develop national ethics guidelines and/or adopt international ethics guidelines; and
- strengthen capacity for ethics review.

Current efforts, discussed at Forum 2012, to improve understanding of ethics include:

- Ethox Centre at the University of Oxford through MalariaGEN Genomic Epidemiology Network (www.malariagen.net);
- Global Health Ethics programme;[20] and
- Fogarty funded programmes such as Advancing Research Ethics Training in Southern Africa (ARESA).[21]

Developing countries have several home grown efforts to boost research ethics:

- International Research Ethics Network for Southern Africa (IRENSA)[22] based in Cape Town;
- South African Research Ethics Training Initiative (SARETI);[23] and
- African Malaria Network Trust (AMANET) ethics courses.

Global funders are increasingly trying to support building research ethics capacity as well as research. The European Union (EU) increasingly funds research ethics capacity building through the European and Developing Countries Clinical Trials Partnership (EDCTP). The Wellcome Trust links its bioethics programme explicitly with its programmes on biomedical research. Such financial support is important as several ethics networks – the WHO Strategic Initiative for Developing Capacity in Ethical Review (SIDCER), the Latin American Forum of Ethics Committees in Health Research (FLACEIS) and Pan-African Bioethics Initiative (PABIN) – are struggling for funding.

Internet-based training modules and networks could be useful for building capacity in bioethics as they are globally accessible and also increasingly available. For instance, Training and Resources in Research Ethics

[20] http://www.ethox.org.uk/research-1/global-health-ethics/global-health-ethics
[21] http://sun025.sun.ac.za/portal/page/portal/Health_Sciences/English/Centres%20and%20Institutions/Bioethics1/ARESA
[22] http://www.irensa.org
[23] http://shsph.up.ac.za/sareti/sareti.htm

The Wellcome Trust explicitly links its bioethics programme with its programmes on biomedical research.

Evaluation (TRREE),[24] Global Health Reviewers[25] and Mapping African Research Ethics Review Capacity (MARC)[26] all provide online training, online ethics review and other support to researchers anywhere in the world.

Research involving human participants needs, in principle, to be reviewed by a capable research ethics committee (REC) or institutional review board (IRB). The ethical review of research protocols before research studies start has become an essential requirement for good research in all but a very few countries. Capable RECs/IRBs – and where appropriate national ethics committees – and high quality ethics guidelines that adapt international guidelines to local conditions can help to facilitate the conduct of ethical research and will minimise the risks and maximise the benefits of research for health, especially in LMICs.

The Mapping of ethics review capacity in sub-Saharan Africa (MARC) project, for instance, is trying to come up with a sustainable, self-updating, wiki-type map of research ethics committees across Africa. This will provide information on the operation of different committees, available infrastructure, standard operating protocols and so on. So far MARC has identified 160 ethics committees in Africa and 1,000 committees in Latin America (Figure 4).[27]

The Mapping of ethics review capacity in sub-Saharan Africa (MARC) project has identified 160 ethics committees in Africa and 1,000 committees in Latin America.

MARC also runs open and closed forums, to review of multi-centre trials for example. The benefits for researchers and ethics committees are instant visibility, positive competition, the ability to share documents and know-how, and opportunities to network.

The sustainability of ethics training relates not just to funding networks or individuals, but also to how individuals are supported by their own institutions.

[24] http://elearning.trree.org/
[25] globalhealthreviewers.tghn.org/
[26] http://www.researchethicsweb.org/
[27] http://www.healthresearchweb.org/en/regulation_and_ethics_review_of_research

Figure 4. Regulation and ethics review of research

Source: www.healthresearchweb.org. The map provides information about the number of registered research ethics committees under COHRED's work on Health Research Web (HRWeb). The information is provided partly by COHRED but increasingly by research ethics committees themselves under an agreement with HRWeb.

Researchers who train in ethics or sit on ethics review committees often give up valuable, unpaid time. Organisations must value these activities. Newly trained scientists returning to their institutions may feel isolated or discouraged in pursuing ethics issues if they are not part of a broader community.

Ethics review is also strongly tied to the politics of science and even national laws. Delegates at Forum 2012 discussed the case of a Zambian student who did not receive ethics approval to research the way that antiretrovirals are provided to men who have sex with men because homosexual sex is illegal in the country.

> *A student did not receive ethics approval to research the way that antiretrovirals are provided to men who have sex with men because homosexual sex is illegal in Zambia.*

Participants in the sessions on ethics looked particularly at strengthening ethics research governance by developing benchmarks for the quality of ethics reviews. The WHO Forum for Ethical Review Committees in Asia and the Western Pacific (FERCAP) is trying to build sustainable ethics review systems in LMICs. Partners – regulators, funders, research institutions, industry and civil society – serve as resources for building national research ethics capacity and also support partnerships for building research ethics review capacity across LMICs. This initiative has moved 'beyond debate'. Partners are no longer just talking they are taking action and looking at 'good ethical governance'. Through voluntary surveys they will find out whether or not countries comply with international standards. FERCAP is trying to promote decentralisation so that ethics review is not only done by international organisations. Decentralisation should stimulate the development of national bioethics committees, organisations and councils, and get these to provide training and accreditation.

Participants also talked about the need for members of research ethics committee to help identify common challenges facing committees in particular regions and to contribute to discussions on solutions. They should also work with researchers to discuss constructive ways to strengthen research and make it more ethical.

4.4 Evaluating capacity strengthening in research and innovation

Given scant resources for strengthening capacity, efforts cannot be haphazard. Action needs to be designed and evaluated strategically. This could mean, for instance, designing a specific programme to develop a critical mass of researchers in one particular discipline in one particular institution. Many capacity development initiatives are 'add-ons' to research projects, although there are a few programmes specifically aimed at developing capacity, for example, the Consortium for Advanced Research Training in Africa (CARTA).[28]

A community of practice comprising funders, researchers and decision makers is beginning to coalesce around bringing more rigour, transparency and learning to evaluation of health research capacity strengthening.[29]

[28] http://www.cartafrica.org/

[29] Capacity Development Impact Research Unit, Liverpool School of Tropical Medicine (LSTM) http://www.lstmliverpool.ac.uk/research/academic-groups/disease-control-strategy/capacity-development

Since 2010, Enhancing Support for Strengthening the Effectiveness of National Capacity Efforts (ESSENCE), a collaboration of development agencies, research funders, philanthropists and multilateral initiatives, has been working to develop a planning, monitoring and evaluation framework.[30] This will make it easier for funding recipients to fulfil their obligations regarding monitoring and evaluating capacity development activities. It will also facilitate synergy in funding and sharing knowledge among funders.

Evaluation so far has found an incredible heterogeneity of capacity strengthening initiatives and, consequently, of approaches to monitoring and evaluating processes and outcomes.[31,32,33] Current approaches to evaluating health research capacity strengthening may not provide adequate evidence for assessing value for money or opportunities for joint learning. There is a need to consider the purpose of the capacity strengthening activity, who it is influenced by and who it influences, the context in which capacity is being built and, if sustainability is the goal, then to be explicit regarding mechanisms to achieve this from the outset.

Discrepancies and tensions are also emerging. There are disparities between how funders and implementers perceive the goal of capacity strengthening. There is recognition that knowledge and evidence to guide effective evaluation is weak, but this has yet to be translated into a cohesive strategy and investment for demanding, producing and using better evidence.

4.5 Women in science and technology

Women now hold key positions in science and technology yet, despite these successes, women seem to have reached a ceiling. For instance, only 43 women have won a Nobel Prize compared with 783 men. Successful women scientists often say that they have never felt discriminated against because of their gender, but participants suggested that could be because they were shielded from discrimination by their social class or level of education.

Robust democracy and good governance goes hand in hand with women's rights and their ability to progress in science. Societies in which girls' education is not prioritised as highly as that of boys, or where their safety in the classroom or on the way to school is not guaranteed, do not encourage girls to strive to become female scientists.

> *Only 43 women have won a Nobel Prize compared with 783 men.*

Governments need to promote the education of girls at all levels, from primary to tertiary, and also to encourage female participation in the labour market. Programmes at community level are also important for generating awareness of the value of educating both boys and girls, and to engage young men and boys as partners in achieving gender equality.

The 2012 World Development Report[34] highlights significant progress in closing gender gaps in education, even in regions with the largest gender gaps, such as South Asia and sub-Saharan Africa. In many countries, gender parity in primary education enrolment has been attained. However, in countries where the enrolment of girls in school still lags behind enrolment of boys, female disadvantage is closely linked to low income.

In addition to economic status, access to education is also influenced by ethnicity, geographical isolation and other factors that compound gender inequality. The report notes that almost two-thirds of out-of-school girls around the world belong to ethnic minority groups in their countries.

Participants in the session on women in science and technology also discussed the interactions between gender and other social characteristics, such as race and class, and participation in higher education. Some participants noted that in South Africa, where there have been considerable efforts to encourage the participation of women in research, there are significantly more white women enrolled in doctoral programmes than black women. Efforts to promote gender equality also need to consider the effects of social inequalities on women's access to opportunities.

For young women, mentoring by role models is important to inspire them to pursue careers in science, technology and medicine. Many young women considering a career in science may not know any successful women who could provide advice on career options, balancing family and work commitments, and other issues. This is particularly the case in fields where there are relatively few women compared with men, such as in engineering,

[30] Planning, Monitoring and Evaluation: Framework for Capacity Strengthening in Health Research. ESSENCE Good practice document series. 2011. http://whqlibdoc.who.int/hq/2011/TDR_essence_11.1_eng.pdf

[31] Imelda Bates, et al. Indicators of sustainable capacity building for health research: analysis of four African case studies. Health Research Policy and Systems 2011, 9:14. doi:10.1186/1478-4505-9-14.

[32] Ritsuko Kakuma, Donald Cole , Imelda Bates, et al. Evaluating Capacity Development in Global Health Research – Where is the evidence? First Global Symposium on Health Systems Research (HSR), Montreux, Switzerland, 16–19 November 2010. Available at www.hsr-symposium.org

[33] Sara Bennett, Ligia Paina, Christine Kim, et al. What must be done to enhance capacity for Health Systems Research? Background paper for the global symposium on health systems research. Montreux, Switzerland. 16-19 November 2010. Available at www.hsr-symposium.org

[34] World Development Report 2012: Gender equality and Development. The World Bank: Washington D.C, 2011. http://publications.worldbank.org/index.php?main_page=product_info&products_id=24225

information technology and medical specialties such as surgery. In order to encourage women in their careers, companies and institutions need to develop family friendly policies, institute gender-sensitive career development and coaching, and strive for diversity in staffing.

Learning in science and technology, however, is not only limited to young people. Rather, it is also ongoing and is an important part of female empowerment. For example, training rural women in information and communication technologies (ICT) helps them to develop skills that enhance their opportunities for employment and entrepreneurial activities. Access to ICTs can also improve women's access to health, nutrition and education initiatives, and create the potential for greater participation in political processes.[35]

In the workplace itself, sexism can be nuanced, for instance when institutions do not accommodate the needs of women who decide to have children. Though the image of women in the developing world as oppressed is outdated, socioeconomic class or safety concerns can bar women from achieving their goals in science and technology.

4.6 Science and innovation parks

For innovation to take place effectively, a variety of constituencies need to work together at different, but overlapping, stages of the research and development pathway. Private, public and academic players must all collaborate.

Various policies have been devised to bring together this 'triple helix' of constituencies. Sometimes collaboration takes the form of partnerships between public and private organisations. Sometimes it is literally co-location of business and academia in a science park to spark collaboration.

Driving innovation in research is a key goal for developing countries, yet it can be tremendously hard to achieve. Innovation and allowing new thinking to thrive require the investment of both time and money. The right equipment also needs to be readily available. Developing countries with pressing health and other societal needs may struggle to dedicate time and resources to fledgling companies. Yet some countries, especially those in Southeast Asia, such as Singapore and Malaysia, have shown that long-term strategic thinking in setting up innovation hubs can indeed reap great rewards.

Singapore has shared its experience in setting up science parks with Panama, which is now launching a US$50 million Panamanian Research Institute of Science and Medicine (PRISM). This will house five research centres, both biotechnology research units and industry, including the Panama Biodiversity Research Centre in Coiba Island, a UNESCO-recognised biodiversity-rich area, and Biotech Park.

Spotlight: Science parks in South Africa

The Cape Health Technology Park focuses on innovation for human health and encourages a knowledge-based economy. This park is strategically placed to take advantage of the capabilities of the University of Cape Town and the University of Stellenbosch. The park provides facilities, equipment and technical support for small and medium enterprises (SMEs) to help them innovate. As a central hub, the park gathers research from around the country.

However, previous science parks have fallen into a 'property trap', where profits derive from rent rather than innovation. It is important for political will, money and human resources to be in place before investing in such a facility.

5 New technology

Advances in healthcare have often taken place in parallel with technological progress, whether a more advanced form of imaging cells or a quicker method of diagnosis. Technology continues to drive improvements in healthcare but, in the last decade, technologies have spread beyond hospitals and clinics. This revolution has been brought about by the internet.

The ability to link doctors and hospitals, rural patients with healthcare professionals, or link researchers to one another, is transforming healthcare, particularly in LMICs.

5.1 Mobile health

Mobile phones have revolutionised communication and have spread to an extraordinary degree in developing countries. This spread was initially assumed to be linked to industrialisation and growing wealth but it soon became apparent that it was because mobile phones were cheap and needed no infrastructure. This meant that rural people like farmers or fisherman who would not have been able to own a landline could own and use a mobile phone. The wide penetration of mobile phones

[35] Gender equality and empowerment of women through ICT, United Nations, Division For the Advancement of Women, September 2005, United Nations: New York.

in developing countries, especially in rural areas beyond the reach of regular health systems, has opened up a promising area of mobile healthcare.

After a flurry of disparate pilot schemes and much duplication, research in mobile health is starting to become a distinct discipline.[36] Initial evidence suggests that mobile health can be highly effective in communicating directly with people (e.g. sending them reminders of drug regimens or sexual health information), in communicating information from community healthcare workers or physicians quickly (e.g. on the spread of infectious disease epidemics) and in monitoring the condition of patients. Digital stethoscopes, for instance, can be used to examine heart and lung conditions at a distance, through video conferencing. This technology provides healthcare to people who would not be able to access clinics and offers much-needed support and back-up to healthcare workers in remote areas. In Bangladesh, for instance, there are 12,000 electronic consultations every day.

> *Bangladesh has 12,000 electronic consultations every day.*

Experts predict that much of the mobile health or 'mHealth' innovation in LMICs will emerge around financial incentives and payments. Mobile money services targeted at those without bank accounts are expanding. Examples are M-Pesa, a mobile-phone money transfer service of Kenya's Safaricom mobile network operator and MTN which operates MobileMoney (an electronic wallet) in various African countries.

There are concerns around data protection in mobile health services but, with proper checks and balances in place and stringent security controls, mobile health providers have been able to keep data secure.

Spotlight: E-health in action

Much of the innovative work in mobile health has emerged in South Asia and sub-Saharan Africa. Innovation in these regions is due to many factors, such as targeted private and public funding, flourishing mobile-phone markets and significant health gaps.

In Ghana in 2010, for instance, the most widely prescribed anti-malarial medications were found to be fakes and had to be removed from shelves. Counterfeit medicines are difficult to identify and can be fatal to patients. Now each pack of medication in Ghana has a unique code, which can be sent to a local NGO company, mPedigree.[37] The NGO can confirm whether the pack is original, whether or not it complies with the law, and that it has not been removed from the market. This system relies on mutual accountability between various stakeholders to be successful.

In South Africa, the Nompilo mobile technology project of Vodacom and Geomed allows health data to be uploaded to a web-based portal. So far, over 2,000 healthcare workers have used the Nompilo platform.

Another programme, Mobile Alliance for Maternal Action (MAMA) operating in South Africa, India and Bangladesh, is designed to get health information to expectant mothers at little or no cost. It is not used in isolation but alongside other healthcare input.

Spotlight: Text to Change

Text to Change (www.texttochange.org) is an Africa-based mobile platform that uses text messages to educate people about health and wellbeing, sends reminders to patients to help them comply with drug regimens or to seek HIV testing and counselling, and collects data on health indicators. For instance, health workers can use Text to Change applications on their phones to report monthly data on the patients they look after directly to ministries of health in digital format.

Since its inception in 2008, Text to Change has partnered with many stakeholders to raise awareness of health and human rights issues. In 2009, for example, it partnered with the UN to raise awareness of HIV/AIDS, malaria and child health in Uganda through 10,000 mobile-phone subscribers. Between 2009 and 2011, it partnered with UNICEF in Namibia to run opinion polls about the Millennium Development Goals to improve the civic participation of young people. Between 2010 and 2011, it ran a treatment adherence programme for people with HIV in Uganda, in conjunction with USAID and the Kawempe Home Care Initative.

All of this is done on basic mobile phones, rather than smartphones, as Text to Change realises that this is the technology that will be available to many in Africa for some years to come.

[36] Opportunities in Mobile Health. November 4, 2011. Stanford Social Innovation Review.

[37] http://mpedigree.org/home/

Although mHealth is promising, there is a need for evidence of improved health outcomes – both globally and locally. Early mHealth programmes rarely included a strong measurement component, and this needs to be rectified in future trials. Evidence of improved health will encourage policymakers and decision makers to invest in new technologies and programmes at a significant scale.

5.2 A virtual space for research and innovation

The internet has immense potential as a virtual archive of essential health research information which researchers all over the globe would be able to access at the click of a mouse. Increasingly, researchers use the internet as a virtual laboratory or meeting place for exchanging ideas and commenting on each others' work. Peer review and collaborative research can take place in real time and across different time zones, allowing truly international collaboration.

Research portals such as HRWeb (www.healthresearchweb.org), the WHO International Clinical Trials Registry Platform (ICTRP www.who.int/ictrp/en), the Pan American Health Organization (PAHO) website (www.paho.org/researchportal) and the Pan-African Clinical Trials Registry (PACTR www.pactr.org), which is funded by EDCTP, have made great strides in creating databases of research underway in different parts of the world. These both encourage knowledge-sharing and help avoid duplication.

The Virtual Training and Mentoring International Network (ViTaMIN Project) of the Bahrain branch of the Cochrane Collaboration seeks to boost publishing capacity by increasing collaboration between new authors and those who have published extensively.

Great strides have been made in research to improve health and health systems through tools such as social networks and platforms. Participants at the Forum 2012 session on a virtual arena for research discussed the ways in which using virtual space can lessen the load of academic paper documentation. Since most platforms are transparent and open-access, they allow users to view the status of current trials and enable them to work on shared research simultaneously.

Crucially for LMICs, virtual spaces are low-cost and can be relatively low-tech. The challenges, said Forum delegates, are to construct a virtual platform or database from scratch and to develop incentives for sharing information. Unwillingness to share information is a major barrier. However, social networks can be platforms for sharing data, information and ideas.

5.3 Social networks

Social networks such as Facebook and Twitter are being used to share information between researchers, and between researchers and journalists. The informality of such exchanges and conversations, however, means that they are relatively unedited. In a 140-character tweet, a researcher might tell another researcher about research that a decade ago would have been kept relatively confidential until the results were published.

This sharing – perhaps even over-sharing – is leading to the democratisation of knowledge exchange. Rwandan President Paul Kagame is a famously enthusiastic tweeter. A journalist might be drowning in bureaucratic red tape while trying to get a comment on policy through official government routes, but President Kagame is known for answering tweets almost immediately.

Social media can help address health problems at many levels. Social media helps individuals benefit from better access to health knowledge. Communities benefit from better coordination in solving civic problems. Healthcare providers can become better practitioners by using social media to access the latest evidence and confer with experts around the world and they can do more with what they have at their disposal when they have access to better record keeping and decision support through social media. At the system level, healthcare information no longer has to trickle in. Rather, data on diseases, disasters and resource needs can be recorded and communicated in real time, alleviating the huge inefficiencies that hamper coordinated efforts.

A popular social media tool with the potential to provide global health solutions is Ushahidi.[38] This is a crowd sourcing tool built on open-source platform technology. Ushahidi was developed in Kenya to gather information from text messages, twitter, email, blog posts and other sources and map it in near real time. Rescue teams used the technology after the Haiti and Chile earthquakes to save many lives. Activists fighting human trafficking have used Ushahidi to visualise geospatial data in risk areas to help in prevention.

> *In the Facebook frenzy, South Africa has 1.1 million members, Egypt 800,000, Morocco 369,000, Tunisia 279,000, Nigeria 220,000, and Kenya 150,000.*

Social networks and blogs may seem informal, technical and time-consuming but there is enormous value in using them. They allow scientists to quickly share research and scientific information that is important but not ready or appropriate for publication in journals. Social media allow researchers to openly critique one another's work and offer feedback in a way that would once only have been possible in the letters pages of scientific journals. They also allow direct communication between

[38] http://ushahidi.com/

journalists and scientists, ensuring that science journalism is accurate and truthful.

"Health is development. Through health you reach development, and there's no development without health."

Jailson de Barros Correia, Director, Department of Science and Technology, Ministry of Health, Brazil

6 Setting up for sustainability

Research, science and technology are important to development. Modern economies are founded on substantial and continuous investment in building the research and innovation capacity of people, institutions, industries and governments. In order to move beyond aid, countries must assume the driving seat when finding and implementing solutions to health and development challenges. Nations need to have the will and capacity to govern, stimulate, use and translate research into innovation for health, equity and development. In order to stimulate research, to develop locally appropriate products and tools, and to turn knowledge into better health for all, everywhere, countries need strong institutions for steering and implementing research and innovation agendas. These must be an integral component of overall national research and innovation systems.

Robust systems for research and innovation have numerous benefits including:

- providing a platform for translating knowledge and research into national policies and programmes;
- developing linkages and encouraging collaboration between public and private organisations and initiatives; and
- creating new jobs through competitiveness and growth of the science and technology sector.

During Forum 2012 sessions, participants examined various aspects of setting up a sustainable system – increasing attention to human resources, supporting innovation in the health sector, identifying enabling factors for sustainability such as country-led priority setting processes, and fostering partnerships.

Panel session at Forum 2012.
Photo credit: Gabi Falanga

6.1 Strengthening capacity for research and innovation

6.1.1 Sustainable health workforces

The crisis in human resources for health, particularly in Africa, is marked by a severe shortage of health workers, many of whom have left to seek opportunities abroad. Poor salary structures, lack of career incentives and motivation, as well as poor working environments are some of the issues facing health workers in a number of countries.[39,40,41]

In addition to the impact of permanent migration on the provision of healthcare, internal migration from the public to the private sector and from rural to urban settings also contributes to shortages of health workers and uneven health services within countries. This situation is experienced by almost all countries, developed and developing alike. However, internal migration coupled with international migration adds to the severity of the human resource for health (HRH) crisis in developing countries.

Health workers doing similar jobs in similar positions that require similar skills and qualifications are often paid more if they work for donors or international organisations than if they work for the government. Delegates at Forum 2012 indicated that jobs in donor agencies and international organisations do not tend to be equal opportunity. Locals tend to work in government jobs and expatriates in international positions. It can be hugely de-motivating for a local health worker to work side by side with an expatriate and receive a fraction of the salary.

[39] Delanyo Dovlo. Wastage in the health workforce: some perspectives from African countries. Human Resources for Health 3:6. 2005.
[40] Carmen Dolea and Orvill Adams. Motivation of healthcare workers-review of theories and empirical evidence. Cahiers de Sociologie et Demographie Medicale 45 (1): 135- 162. 2005.
[41] World Health Organization. Working together for health: The World Health Report, 2006. Geneva: WHO. 2006.

Furthermore, local staff working for international donors may be on higher salaries than their government colleagues. The hiring of staff formerly employed in government health facilities by large NGOs and international organisations, particularly in fragile states emerging from humanitarian crises, is part of a wider problem of parallel healthcare systems that compete with rather than complement and strengthen national health systems.

The crisis affecting health workforces, particularly in low income countries, has important public health consequences. A loss of staff can lead to heavy workloads for remaining health workers and can result in more stress and burn out, as well as longer waits by patients.[42] HIV/AIDS related illnesses add to pressures on health workers and lead to the loss of workers.[43] Concern is growing about the ability of countries to mobilise staff to roll out antiretroviral therapy programmes for HIV/AIDS and other related initiatives.[44] National tuberculosis (TB) programme managers cite human resource issues such as staff shortages, the lack of qualified or trained staff, an inadequate mix of skills and uneven staff distribution, along with low motivation and poor staff retention, as constraints to meeting global TB control targets.[45]

Staff shortages, the lack of qualified or trained staff, an inadequate mix of skills and uneven staff distribution, along with low motivation and poor staff retention, are constraints to meeting global TB control targets.

'Task-shifting', where health workers take on responsibilities not conventionally within their scope of practice, has attracted much attention from the global health community in recent years. Initially, the concept was viewed with much suspicion by governments and the UN. However, as evidence of the value of task-shifting has accumulated, organisations such as the WHO are starting to incorporate it into strategies to bolster health systems. Various research projects – in a variety of contexts such as HIV/AIDS, sexual and reproductive health, malaria treatment and control and tuberculosis – are examining the feasibility, acceptability and effectiveness of shifting patient care to mid-level and community providers.

However, we urgently need more research on task-shifting, both in low income and in high income settings. For instance, high income countries might be able to solve shortages of health workers through task-shifting instead of poaching health workers from low income countries. However, it is difficult to know exactly what evidence we need and what will be useful as task-shifting involves many issues. We also need to find innovative ways of translating research findings on task-shifting to action on the ground which will improve the performance and motivation of health workers.

While participants at Forum 2012 welcomed the potential of task-shifting, they stressed that it must align with longer-term strategies for strengthening workforces through improving recruitment processes, retention, career progression and motivation. Task-shifting is a step forward in addressing healthcare challenges, but not an end in itself.

6.1.2 Human resources for health research

Human resources are a key component of national research capacity and national health systems, but are rarely explicitly addressed in global efforts to improve health. Unless the issue of human resources for health research is tackled, many countries, especially those in Africa, will remain spectators rather than participants in global health research.

Funders supporting improvements in human resources for health research still largely focus on giving grants to individuals. Delegates at the Forum learned that organisations such as the Wellcome Trust want donors to try to provide funding for local research institutions to fund their own capacity development, the Consortium for National Health Research (CNHR) in Kenya and the Malawi Health Research Capacity Strengthening Initiative (HRCSI) for example.

Governments still need to be convinced of the economic benefits of research and to understand exactly how science can improve development. This is where policymakers and scientists need to collaborate. They need to make the case for investing in human resources and also to devise projects that show where research can make the biggest impact. For instance, a project funded by the International Development Research Centre (IDRC) investigated the link between maternal morbidity and mortality, and agricultural productivity. The findings showed a direct link between the death of

A project that showed a direct link between the death of women and a decrease in national revenue made a clear economic argument for improving women's health.

[42] Awases, M. Gbary, A, Nyoni, J and Chatora, R. 2004. Migration of Health Professionals in Six Countries: a Synthesis Report. Harare: World Health Organization Regional Office for Africa.

[43] Marchal, Bruno, De Brouwere, Vincent and Kegels, Guy. 2005. HIV/AIDS and the health workforce crisis: What are the next steps? Tropical Medicine and International Health Vol 10, No.4 300-304.

[44] Narasimhan, Vasant, Brown, Hilary, Pablos-Mendez, Ariel, Adams, Orvill et al. 2004. Responding to the global human resources crisis. The Lancet Vol 363, May 1.

[45] World Health Organization. 2004. Recruitment of health workers from the developing world: Report by the Secretariat. Report to the Executive Board 114th Session, Provisional agenda item 4.3, 19 April 2004 EB114/5.

Figure 5. Push and pull incentives to encourage researchers

Source: Forum 2012. This figure is the result of ideas and discussion during Forum 2012.

women and a decrease in national revenue, and made a clear economic argument for improving women's health.

At Forum 2012, participants discussed ways to strengthen human resources for health research. Building up human resources for health research does not mean just focusing on researchers. While researchers are important, one researcher cannot simultaneously undertake scientific studies, advocate, engage in policy dialogues, teach and build networks. Researchers need to be encouraged to develop specific skills and work as part of a team. Administrative and non-biomedical public health staff are just as important in driving strong research systems. More than one institution has seen its profile remain low because it is poorly run or does not have press officers or communication staff to translate its work for wider constituencies.

Researchers need much more support in their career paths than they currently receive. Many doctoral graduates (PhDs) change profession because they cannot see a clear career path ahead, or because career paths in better-paid jobs outside science and technology or health seem to be more stable. Countries could look at developing joint PhD-postdoctoral programmes as part of South-South collaboration to help retain doctoral graduates.

Often, scientists from LMICs find it hard to publish their research in major journals, either because the study was too context-specific and not relevant to a global audience or because the researchers cannot communicate their research findings clearly enough to be accepted by a high impact journal. Many journals cater to the English-speaking world. This means that results of research studies that are not written and published in English may receive less attention than those that are. Developing local, regional and national journals and publications which have different priorities to global journals will be a way to provide an outlet for research in LMICs. Encouraging journals in high income countries to make more information open-access will also be key to enabling researchers in low income countries to access vital data.

Read more online: C IJsselmuiden, DL Marais, F Becerra-Posada, H Ghannem. Africa's neglected area of human resources for health research – the way forward. South African Medical Journal 2012 Vol 102, No. 4.
www.samj.org.za/index.php/samj/article/view/5377

6.1.3 Innovative models for healthcare delivery

Healthcare delivery in many LMICs urgently needs innovative thinking to improve. It is often costly, of poor quality and difficult to access. Models for healthcare delivery must be sustainable and should build on what works before trying to invent something new – they must be idealistic in vision, but realistic in action. Crucially, they must respond to healthcare needs and bolster a health system in general, rather than merely being an add-on.

One of the major problems in LMICs is that the cost of most healthcare is shouldered by people out-of-pocket. In Pakistan, where 74% of healthcare financing is out-of-pocket, Heartfile Health Financing[46] was set up in 2010 as a social protection programme to increase access to healthcare. Healthcare costs up to US$200 are covered but above this limit, patients have to find financing elsewhere.

In some cases people cannot access clinics at all. Across East Africa, in Kenya and Rwanda, a business-style franchise network of medical clinics – Child and Family

[46] Heartfile Financing. www.heartfilefinancing.org/

In Pakistan, 74% of healthcare financing is out-of-pocket.

Wellness Clinics In some cases people cannot access clinics at all. Across East Africa, in Kenya and Rwanda, a business-style franchise network of medical clinics – Child and Family Wellness Clinics[47] – serves over three million people. Such franchises can address the insufficiency and maldistribution of healthcare workers in developing countries. Each clinic is run and owned by a female nurse franchisee. Franchises cost US$500 and promote entrepreneurship among female healthcare professionals while addressing gender inequalities in the workplace. The clinics target health priorities such as malaria, respiratory infections, diarrhoeal diseases and family planning.

The International Partnership for Innovative Healthcare Delivery (IPIHD)[48] brings together successful innovations to healthcare delivery around the world. IPIHD has identified key factors in successful innovations, which include forcing professionals to put patients first, overhauling professional regulations on patient safety, and matching training and staffing to systems of care.

Innovative systems are often devised by NGOs or private enterprise because they can be nimble in implementing new systems and are not necessarily subject to the same restrictions as government agencies.

When Iran's Ministry of Health and Medical Education developed a system to train healthcare workers in health promotion in the 1980s infant and maternal mortality rates dropped significantly.

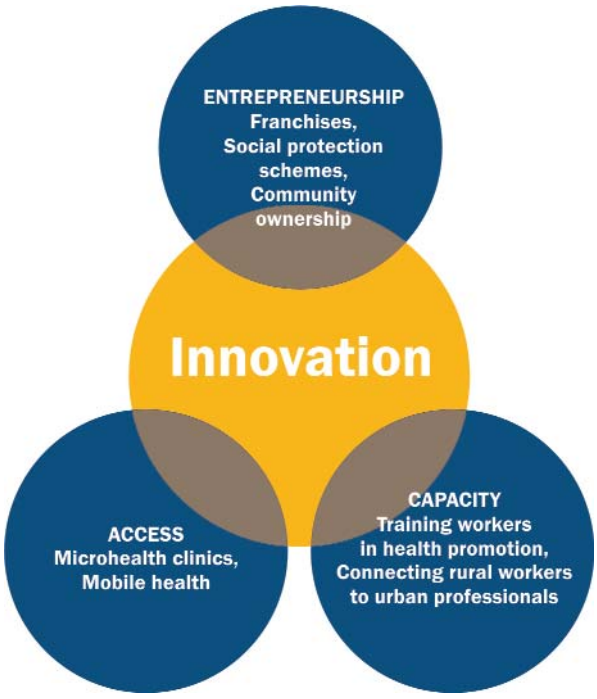
6.1.4 Engaging communities

The idea of giving communities a say in their own healthcare has been a focus of global health for years, but putting it into practice has been much harder. For one thing, the concept of a community is nebulous, so researchers are faced with the challenge of defining a community in different contexts. A community may not be defined by geographical boundaries but by shared notions of identity, or characteristics such as religious belief, sexual orientation, ethnic origin or occupation.

[47] Child and Family Wellness Clinics. http://en.wikipedia.org/wiki/Child_and_Family_Wellness_Shops_CFW

[48] www.ipihd.org/

Figure 6. What works in innovative healthcare



Source: Forum 2012. This figure is the result of ideas and discussion during Forum 2012.

Indigenous values and ethics can also be very different from those of the researchers undertaking trials or researching specific contexts. Despite these challenges, including communities in discussions about what type of research they feel is necessary can reveal priorities that may surprise researchers and that they may be totally unaware of. Forum 2012 participants from NGOs and CSOs discussed the various strategies they use to engage communities. These include:

- participatory research;
- community mapping; and
- workshops and discussion groups for community dialogue and collaborative planning on health issues such as sexual and reproductive health, HIV/AIDS prevention and care, nutrition, sanitation and other topics.

Spotlight: Engaging communities in the Asia-Pacific

The founding public health researchers of the Society for Education, Action and Research in Community Health (SEARCH) in rural Maharashtra, India, learned from discussions with local tribes that people were more concerned about chronic back pain (a common problem as tribal people are often labourers) than infectious diseases.

Communities and civil society can often provide critical feedback on a variety of issues. They can report how a health intervention has actually benefited local people and this information may be valuable input to researchers' reports to

funders. The data communities collect can be key evidence in advocacy for change.

The Women's Health and Rights Advocacy Partnership (WHRAP) South Asia, for instance, is an international partnership with a regional voice. WHRAP brings together organisations led by women and other civil actors to improve the quality of life of former marginalised women across Asia through evidence-based advocacy on sexual and reproductive health.

Spotlight: A new sexual and reproductive health agenda: reviving the International Conference on Population and Development

Revolutions can be frustratingly short lived. The 1994 International Conference on Population and Development (ICPD) in Cairo radically altered the way the world thinks about women's sexual and reproductive health.

Yet for a variety of reasons – the emerging HIV/AIDS epidemic being one of them – goals such as greater access to safe abortion and the provision of sexual healthcare aside from reproductive care have fallen by the wayside.

The only goal that has seen any traction is the improvement of maternal and child care. However, it should be noted that these improvements are still far from reaching the desired level. Women are not just mothers, and focusing narrowly on maternal care without paying attention to the full spectrum of women's reproductive and sexual health makes it impossible to improve women's health overall.

Worryingly, the trend against the right of women to choose an abortion is growing, especially in parts of Europe. In Hungary, the right of women to choose an abortion has been changed in favour of recognition of foetal life and, in Poland, conscientious objection is being pushed as a rationale for pharmacists to refuse contraception.

Several research institutions are pressing to revive the goals of the 1994 ICPD. The Multilateral Association for Studying Health inequalities and enhancing North-South and South-South Cooperation (MASCOT) brings together experts from Africa, Latin America and Europe to identify and implement strategies for tackling health inequalities, particularly those affecting women and children. Research to map and understand these inequalities will guide the development of strategies and policies to tackle women's health in LMICs.

The ICPD session at Forum 2012 agreed that a key move to improve women's health would be to re-instate human rights at the heart of efforts. A consideration of political and cultural environments is also important. The allocation of funds, political commitment, policy and socio-cultural factors all play a part in determining the extent to which maternal and child health will improve. Legal advocates also need to get involved and use the courts to defend the human rights of women.

There are promising developments. In July 2012, The London Summit on Family Planning pledged to provide access to family planning for 120 million women.[49] The UK Government and the Bill & Melinda Gates Foundation brought together representatives from governments, the private sector, donors and civil society. These promised to halve the number of women in developing countries who lack access to modern contraception.

6.2 Enabling research and innovation

The consistent message throughout Forum 2012 was that research should be regarded as a critical activity across sectors, and that everyone in society has a contribution to make. In most instances, research is regarded as something mystical that only a very few 'special' people can deal with. Unfortunately this perception of research still prevails, thus hampering the benefits that can be derived. Research is a pre-requisite for generating knowledge, understanding processes, identifying problems and gaps, and contributing to action to find solutions.

Sustainable development implies finding solutions that are effective, but can be maintained using available resources in-country. In this, innovation plays a critical role, and should be introduced as part of institutional cultures. For this to happen, it is essential to engage the top leadership in a country in order to set in motion a process to streamline research in the different structures in society, and put in place the necessary enabling instruments.

It is the innovation aspect that brings multiple sectors and players into the quest for solutions or to take advantage of the information generated by research. Bringing in other sectors and players is particularly important when operating in an environment where there are very limited resources. So, for LMICs, putting research and innovation very high on their agendas is not only pertinent but also strategic as they transition to higher levels of development.

[49] http://www.dfid.gov.uk/fpsummit

6.2.1 Setting priorities

National research and innovation systems that aim at sustainable development need consistent and solid management support. Priority setting is one of the essential mechanisms that these systems can use to define the focus, the scope, the extent and the direction of management efforts to lead a country towards equity and health.

Countries with clear research priorities are able to guide research expenditure to these priorities and to promote science, technology and innovation for better health. Countries with clear research priorities can stimulate relevant human resource development. In addition, countries that invest time and effort into setting research priorities often have clear insights into their own resources, abilities and needs – insights that ensure sustainable development.

Setting national research priorities is simply not possible without national funding and support. Providing this support is the responsibility of governments. For this reason, scientists and health leaders must lobby policy makers to make them recognise the importance of priority setting, and must work with them to set meaningful, relevant priorities. To facilitate this process, there need to be platforms for dialogues between country governments, scientists, policy makers, civil society, the private sector and the community.

Relationships between scientists and policy makers need, however, to be built over time. It takes time to develop rapport, to engage research councils and to set directions for research that will benefit communities. Engaging other stakeholders is also valuable. There needs to be interaction between community leaders, both small and large research institutions, universities, academies, government, NGOs and donors.

6.2.2 Encouraging donors to invest in research and innovation systems

Governments in LMICs need to lead the way. A renewed push to increase investment in research systems for health and systems to encourage research is urgently required. Countries need to develop healthcare workforces with appropriate skills, and to develop effective strategies to retain specialised skills and counter the brain drain.

Governments must show long-term commitment and provide institutional incentives to encourage a research culture. They should also encourage joint and cooperative funding, and lead coordination of the research agenda. There needs to be a culture at top levels that sets priorities, expectations and procedures. Leaders should also require performance measures. Likewise, quality indices should be required for incentives. While it is crucial for LMIC governments to take a leading role, at the same time development partners and funders should change their attitude and support country leaders rather than set conditions that are often not in line with country strategies.

Efforts should address multiple challenges, from building infrastructure and supply chains to strengthening human resources and capacity. These are important steps in translating 'beyond aid' into concrete action that will impact on the wellbeing of people, and will contribute to a better future. To achieve these goals it is essential for countries to build and strengthen the capacity of their institutions, so that they are able to respond to multiple challenges. Countries need to build multidisciplinary capacity – in health and infrastructure – for research groups. Improved governance in countries would also reduce donor-perceived risks and make more investment possible.

6.2.3 Fostering regional collaboration

Collaborative research between neighbouring countries can have significant benefits for individual countries, as well as across regions. Adjacent countries often have similar challenges that can benefit from regional health research. Indeed, many problems can only be tackled through co-coordinated regional approaches (e.g. eliminating polio). Regional efforts also allow for a stronger global voice.

However, efforts to introduce regional cooperation have largely been driven from outside regions, and have often depended on donor funding. Countries should take ownership of these regional groupings in order to stimulate government funding.

It is crucial that collaborations are partnerships, not merely networks. 'Partnership' and 'network' are terms that are often used interchangeably, but there is a subtle yet vital difference between them. A network can be a loose grouping of like-minded individuals. A proper partnership needs nurturing – it requires trust, mutual goals, close relationships, equitable investment and rewards.

> *Unlike networks, partnerships need nurturing: they require trust, mutual goals, close relationships, and equitable investments and rewards.*

Spotlight: Dialogue in the Middle East

Many Arab countries have a very low scientific output, low citation levels for scientific papers and a low level of investment in R&D. Across Organisation of Islamic Cooperation member states, R&D spending averages 0.38% of GDP compared with a global average of 1.7%.

Many of these countries have experienced long-term political crises and, with the 'Arab

Spring', many face new upheavals in political, economic and health systems. There is a great need for regional collaboration, especially in research for health and research for health systems. However, some scientists question whether, given political volatility in the region, the idea of such research is a luxury. A robust health system does not have short-term goals but must have long-term plans to be effective and function well.

Currently, research for health in the Arab world is highly fragmented. What is needed is a database of research so that it can be better coordinated. Evidence-based research should be used as a tool of accountability to the beneficiaries of the research results. Stakeholders are demanding evidence – in large part because of the 'Arab Spring' – that research is paying dividends, especially in terms of reducing inequalities.

Even in crises, research can be prioritised. In countries like Syria, for instance, people are losing their lives and being injured as a result of the violence. Massive displacement has meant infectious diseases are being spread because of poor sanitation. Research is vital in these cases to find out what happens in countries in crisis. For example, according to delegates at Forum 2012, research has shown that during the Syrian conflict, vaccination rates dropped dramatically.[50] Understanding the reasons for the drop in vaccination rates could be crucial in filling gaps once the conflict is over.

Investment is key – investing in R&D now is necessary for reaping benefits in 20 years. Investment needs to be made in human resources. The Middle East already has many competent and talented local researchers. Yet countries and institutions in the region still hire researchers from outside. The focus needs to turn inwards to existing expertise to see how different countries can collaborate with each other.

6.2.4 Building partnerships

We need to move beyond partnerships between scientists and to extend research and innovation to include government, NGOs, business, social enterprise and the media. Partnering with these groups can not only support research but can also change the environment within which research is done – supporting changes in government research policies, and strengthening public support for research and the communication of research.

Extending research and innovation partnerships can be done by establishing teams of experts well acquainted with global issues, including economists, researchers, healthcare leaders and academics. These experts can evaluate the impact of research and build an evidence-based case to encourage government to support research partnerships, and to influence commitment and investment in health research.

Partnerships must also be equitable and partners, whether they are so called North-South partnerships or South-South partnerships, must invest equally. Striving for fairness should be a cornerstone of all partnerships. For instance, a partnership that joins public funding with private sector expertise should require a promise from the private sector to repay investment over time.

Cross-sector networks and partnerships can work on common issues such as information technology (IT), intellectual property (IP), regulation and research management to develop overarching systems for coordination and management. This, for instance, could mean looking at successful examples of partnerships (e.g. Public-private product development partnerships (PPPs) and sharing models.

Spotlight: A Partnership Index: measuring value

The Dean of the Faculty of Health Sciences, University of Cape Town, suggests that a Partnership Index could be used to recognise the importance of partnerships and shift the focus from individual performance as the sole criteria for success to the performance of multidisciplinary partnerships. This would encourage collaboration between basic, clinical, public health and social science partners. It would also mean involving non-health ministries, industries, businesses and entrepreneurs in health partnerships.

There are opportunities to use existing platforms for dialogue, such as those of the BRICS, to push collaborative R&D and progressively bring together LMICs. The suggested Partnership Index could stimulate multidisciplinary research by involving people from outside the health sector, such as experts on intellectual property or the environment, in R&D for health. The Index would need to pay attention, however, to fairness, so that institutions from both rich and poor countries benefit from partnerships.

6.2.5 Equality in North-South collaborations

Research contracts are traditionally set up on the basis of trust. However, the nature of international health research causes problems with contracts drawn up on this basis. For example, international health research is an uneven playing field. LMICs can end up signing contracts that are not ideal, both in terms of the content of contracts and the process of negotiation.

[50] See for instance, http://www.drlatulane.org/groups/syria/reports/Yale-Tulane%20ESF-8%20PRP%20MOC%20Brief%20-%2026%20MAR%202012%20-Syria%20Uprising.pdf

Inequality often stems from differences in the research systems of collaborating countries. Richer countries tend to have more developed technical expertise, and crucially, are able to attract funding. This means their researchers take the lead on grants and, therefore, are responsible for making decisions related to the research. Richer countries also tend to have more in the way of non-financial resources, such as equipment and, while scientists in LMICs may collect data, quite often it will be their colleagues in developed countries who analyse and report on the data. In some instances, researchers in developed countries may even publish results without acknowledging partners in LMICs who helped gather the original data.

Intellectual property rights are one of the key areas of contention. Contracts need to ensure that agreements on ownership of data, samples and authorship are fair. Research collaborations can unfairly burden partner institutions in developing countries as these often tend to be left with a small share of the grant with the result that they end up funding a significant chunk of the project themselves. Indirect costs need to be factored in right from the beginning and donors need to consult with researchers and institutions in partner developing countries.

Devising more equitable research contracts was a key topic of discussion at Forum 2012. Participants made several recommendations:

- since legal expertise may not be as robust as it could be in LMICs, creating model contracts that contain protective clauses would be helpful, though these need to be carefully adapted to each situation. These would help ensure that collaborations are genuine partnerships;
- many participants felt that collaborations should have an inherent capacity-building element to prevent 'safari research' in which scientists from rich countries extract what they need, without worrying about what LMICs need. Research managers, patent officers and other stakeholders in LMICs should be offered training on what fair research contracts entail, and on basic terminology (memorandum of understanding, etc.) so that they leave the collaboration better equipped than they were at the start;
- intellectual property systems need to be bolstered. Many countries would benefit from the development of technological innovation centres that support researchers in-country;
- indirect costs can exert a great toll on LMICs. Often, a collaborative project leaves behind a legacy – perhaps a bio-bank or a treatment programme – that the LMIC is expected to maintain. But the country can only do this if they have the required expertise and funding;
- even with the best checks and balances, contracts may not be upheld, or parties may dispute the implementation of a contract. In these cases, it is important for there to be a mechanism for resolution whereby each party can seek neutral mediation (e.g. through the World Intellectual Property Organization) rather than resorting to the courts. At national levels, all contracts should be standardised so that they do not differ from one another, especially for publically financed research.

Spotlight: Towards equitable research contracts

COHRED's fair research contracting project aims to identify best practices for the research contracting (negotiation) process which would be useful in the following three scenarios:

i) where there is no lawyer;
ii) where there may be lay personnel who could be trained; and
iii) where there is a lawyer or legal expertise.[51]

The Swiss Commission for Research Partnerships with Developing Countries (KFPE) is dedicated to promoting research partnerships with developing and transition countries. KFPE is engaged in Swiss scientific policies and is committed to promoting the interests of researchers and their affiliated institutions on both a national and international level. It furthers innovative and development-oriented research and designs concepts for research strategies. In this context, KFPE ensures that partnership principles are followed, the quality of research is assured and the interests of all partners are respected.[52]

6.2.6 Measuring the impact of research and innovation

Assessing the impact of research is challenging and multifaceted. However, it is crucial to have an understanding of impact to guide funding and to ensure research aligns with priorities. Assessing the impact of research requires measuring several factors, which is often challenging with respect to accuracy and comprehensiveness.

Research can be assessed by traditional indices, such as the number of publications. However, traditional indices are increasingly being seen as one-dimensional factors that may stifle innovation and risk-taking in research.

An alternative is to assess impact by 'outcome mapping', which is more comprehensive. Besides traditional indices (broadly defined as 'contributed knowledge products'), outcome mapping assesses research outputs at both local and more distant levels (such as changes in policy), and changes in the abilities of researchers themselves.

Evaluation of research is often done by an independent, external evaluator. However, it is unlikely that an external assessor will have a comprehensive understanding of the

[51] http://www.cohred.org/fair-research-contracting/
[52] http://www.kfpe.ch/about/about_e.php

research and its impact. Therefore, internal monitoring and assessment that is ratified by an external examiner may be more beneficial.

Spotlight: Outcome mapping

Outcome mapping is a project progress measurement system that was designed by the International Development Research Centre (IDRC). It differs from traditional metrics in that it does not focus on measuring deliverables and the effects on primary beneficiaries but on changes in the behaviour of secondary beneficiaries. The outcome mapping process consists of a lengthy design phase followed by a cyclic record-keeping phase. Outcome mapping is intended primarily for charitable projects in developing countries funded by large developed country donor organisations.[53]

6.3 Translating knowledge into practice

Knowledge translation links research and action.[54] While the concept itself is not new, there is a disconnect between research and policymaking – frequently referred to as the 'know-do' gap. The establishment of mechanisms for knowledge translation is part of strengthening research for health systems and involves fostering linkages and exchange between researchers, policymakers and programme managers. Given the diversity of research 'producers' and 'users' in many settings, what is frequently required is to create links between the various constituencies that conduct or use research, such as government ministries, universities, research institutes, NGOs, CSOs and research networks.

There were several sessions on approaches to knowledge translation in different regions at Forum 2012. The sessions highlighted mechanisms of knowledge translation such as setting up communities of practice, context mapping, developing 'best practices' and priority setting. The focus of many of the presentations, however, was on the 'relationship-building' aspect of knowledge translation.

Actions that can strengthen exchange and collaboration between researchers and government institutions were:

- clarity on the roles and responsibilities of parties in the research-policy making process;
- setting frameworks to promote and facilitate collaboration together with complementary legislation to institutionalise procedures;
- communicating research findings in a way that can be easily used by policymakers; and
- encouraging policy and decision makers to be more attuned to the importance of research in developing evidence-based policy.

Engaging the community is vital to promoting equity and in translating knowledge into practice. Researchers, policy makers and programme managers often need to actively engage communities. Such engagement means knowledge passes from researchers to communities but also that researchers get feedback from communities on their needs and how well programmes work. This is an important part of empowering communities to participate meaningfully in translating research to action.

In a session on engaging communities in knowledge translation at Forum 2012, participants discussed the importance of ensuring that a high percentage of staff, in healthcare clinics and laboratories for instance, are local. Community workers do not always need to be formally trained. They can translate knowledge to communities through short films, mapping health problems on street plans and meetings, for example.

Communication plays a key role in knowledge transfer. One session at Forum 2012 looked at the role of journals and authors in sexual and reproductive health and rights. Participants noted that one of the challenges in communicating knowledge is the long time lag between research and collecting evidence, and disseminating evidence-based practices.

Open-access is clearly very important in giving researchers, policymakers and the general public access to information published in journals. Many journals are too costly even for research institutions to buy. Despite this, and provided that the information disseminated is relevant to developing countries, journals have an important role in providing unbiased information.

Spotlight: Approaches to knowledge translation

Forum discussions highlighted examples of approaches to translating knowledge into practice from different regions.

Organising workshops and conferences that bring together policy makers and researchers, along with NGOs and other constituencies

- The Union of Africa Population Studies (UAPS) organises regular technical training workshops on population and development issues for professionals, including researchers, media personnel, parliamentarians and other policymakers. These training workshops – often carried out in partnership with other institutions – improve skills in disseminating research and using research findings.

[53] Sarah Earl, Fred Carden, and Terry Smutylo Outcome Mapping, Building learning and reflection into development programs, IDRC, 2001.

[54] Gavin Bennet and Nasreen Jessani (Eds). The knowledge translation toolkit. Bridging the Know–Do Gap: A Resource for Researchers, International Development Research Centre (IDRC), New Delhi: Sage Publications. 2011.

- The Health Research Agenda for the Caribbean, the first regional research agenda, was formally endorsed by health ministers of the Caribbean Community (CARICOM) in September 2011. It was developed by the Caribbean Health Research Council and involved over 100 people from 17 countries. The process of developing the Agenda – using Delphi methodology (an iterative process to achieve consensus) and COHRED's Health Research Web – was also innovative. The Agenda identifies priority areas for research. The findings will guide the development of policies, programmes and best practices. All Caribbean health research stakeholders, especially those involved in research and funding research, are encouraged to embrace the Agenda and contribute to its implementation.
- The Network on Equity in Health in Southern Africa (EQUINET) links professionals, civil society, policy makers and state officials in eastern and southern Africa. EQUINET aims to advance and support health equity and social justice by sharing information and experience, conducting research and networking and building strategic alliances. The Network promotes country level and regional dialogue on policy and action to address equity issues and the sharing of best practices in eastern and southern African countries. In addition, EQUINET develops policy briefs across theme areas of the Network.

Ms Yvonne Chaka Chaka, internationally renowned singer and humanitarian, sings at Forum 2012's closing ceremony.
Photo credit: Gabi Falanga

7 Summary of key messages from Forum 2012

This report conveys key messages for achieving sustainable health research systems arising from the rich debates at Forum 2012. The developing world is so heterogeneous that no list of recommendations can apply to all countries. Yet, common themes emerged from Forum 2012 on where the shortfalls are, where innovation and research could yield the biggest benefits, and what countries could realistically do to improve the health of their people.

The new format of the conference proved effective, and was welcomed by all participants. Opportunities for diverse constituencies to interact were judged to be stimulating and a new style of dialogue, involving different sectors of society, emerged. Forum 2012 contributed to a better understanding of the value of research for health. Research for health is more than a mere step in the process of finding solutions to health problems, it has a critical role in realising equity and achieving development in general. 'Beyond aid' is about development that builds and consolidates countries' capacity to address their challenges themselves and to generate the necessary resources.

7.1 Recommendations

The goal of any country is to give everyone access to healthcare, and for healthcare provision to be equitable. But this is a mammoth task, and offering up an idealistic wish list would not help scientists and policymakers.

Instead, by synthesising ideas, discussions, debates and recommendations from Forum 2012, we offer 11 key practical steps for going beyond aid.

Spotlight: Eleven key recommendations from Forum 2012

Priorities
Trying to accomplish every goal at once is doomed to failure. Instead, countries need to collect evidence and use it to identify priorities for their people, and to decide which direction they want to head in. While donors may provide financial support, it is not their role to set agendas.

Metrics
Assessing where research is needed before embarking on projects is essential, as is constant monitoring and evaluation to ensure projects are working as planned.

Regulation
Research ethics frameworks are still poor and ethics are not an integral part of health research systems. Regulation on ethics needs to be put in place if developing countries are to produce meaningful data, and to compete at the global level.

Innovation
Innovation is vital across the board, but especially in healthcare delivery. Jump start innovation by providing capital, incentives and recognition through both public and private channels. The current system is failing badly and, in the absence of billions of dollars to improve health systems, only innovative thinking can surmount deficiencies.

Collaboration
Partnerships are going to be crucial in terms of going beyond networks, providing meaningful exchanges of knowledge and ensuring commitment. Local and regional partnerships are just as important as high-profile global partnerships.

Technology
New communication methods such as social networks hold much promise for improving the exchange of information. Mobile health and other technologies are revolutionising healthcare delivery and development.

Career development
Scientists need to be nurtured. They need mentoring, the prospect of stable jobs and good salaries, and to know they are valued. Throughout their careers, they need to be trained and encouraged to share their knowledge with others in different institutions and countries. Hiring scientists is pointless if they are not happy to stay.

Youth
People need to be engaged at a young age about the importance and possibilities that research and innovation hold for development. Younger people, with their greater openness to dealing across sectors, and between the public and private spheres have a huge potential to drive health and equity outcomes. Forum 2012 sought to help them do this through the creation of a Youth platform, *Youth in Motion.*

Accountability and transparency
Openness is vital for showing value for money and to avoid wasting money through corruption or inefficiency.

Long-term planning
Investing in research for health requires patience and faith in science. Short-term plans rarely yield big rewards.

Equity in health
Promoting equity in health means addressing the social and economic conditions that cause inequality. Research and innovation can help identify and develop solutions to expand the availability of good quality healthcare and people's access to it, thereby reducing disparities in health.

7.2 Consolidating the way forward

The debates at Forum 2012 were rich. Participants left on a very positive note, but with the understanding that further discussion is needed to consolidate the new approach and to clarify the process of moving from evidence to innovation. The gathering was an important step in launching the new approach. Future meetings will consider what impact this new approach has at the country level.

The global discussion was exciting and created momentum. Nevertheless, local contexts must be taken into account when considering sustainability and finding local solutions. For this reason, participants in several sessions pointed out that it is also worth considering holding regional meetings, where regionally-specific experiences can be exchanged and appropriate learning can take place.

Beyond aid is about development that builds and consolidates countries' capacity to address their challenges themselves and to generate the necessary resources. We need to continue the discussions and complement them with concrete action at the country level – thus adding value to the platform provided by the Forum.

Beyond aid is about development that builds and consolidates countries' capacity to address their challenges themselves and to generate the necessary resources.

Winning photos capture research and innovation

The Forum 2012 Photo Competition was organised by the COHRED Group in collaboration with Humanity Watchdog to show how innovative research changes people's lives. While the importance of research for health, equity and development is all too clear to those working in the sector, it is often difficult to grasp from an 'outside' perspective. The photos illustrate ways in which research for health can be brought to the next level through appropriate policies and investments.

The winning photo was 'Life Straw Family: Cheap Water Filtration for World's Poor' taken in Kenya by Georgina Goodwin for Vestergaard Frandsen. The water filter needs no power or spare parts and provides safe drinking water for a family for two years.

The runner-up was 'Malaria Must Go' taken by Andrew Sordy. Malaria Must Go bolsters the fight against malaria with a multi-pronged attack to increase the level of protection against malaria and support current anti-malaria programmes.

Second runner-up was 'A family in rural Asahan, North Sumatra – Indonesia using insecticide-treated nets' taken by Andi Anshari. Insecticide-treated nets reduce the transmission of malaria.

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The COHRED Group

Supporting research and innovation systems for health, equity and development

Council on Health Research for Development (COHRED)
1–5 Route des Morillons
P.O. Box 2100
1211 Geneva 2
Switzerland
Tel. +41 22 591 89 00
Fax +41 22 591 89 10
Email: cohred@cohred.org

In Latin America
Contact: Dr Francisco Becerra-Posada
P.O. Box 22–151
Tlalpan
Mexico DF
Mexico 14091
Tel. +52 55 46 22 54 41
Email: becerra@cohred.org

In North Africa and Middle East
Contact: Dr Hassen Ghannem
University Hospital Farhat Hached
4000 Sousse
Tunisia
Tel. +216 98 404 357
Email: ghannem@cohred.org

In South Africa
Contact: Debbie Marais
School of Psychology
University of KwaZulu-Natal
P/Bag X01, Scottsville
Pietermaritzburg, 3209
South Africa
Tel: +27 33 260 6135
Email: marais@cohred.org

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