

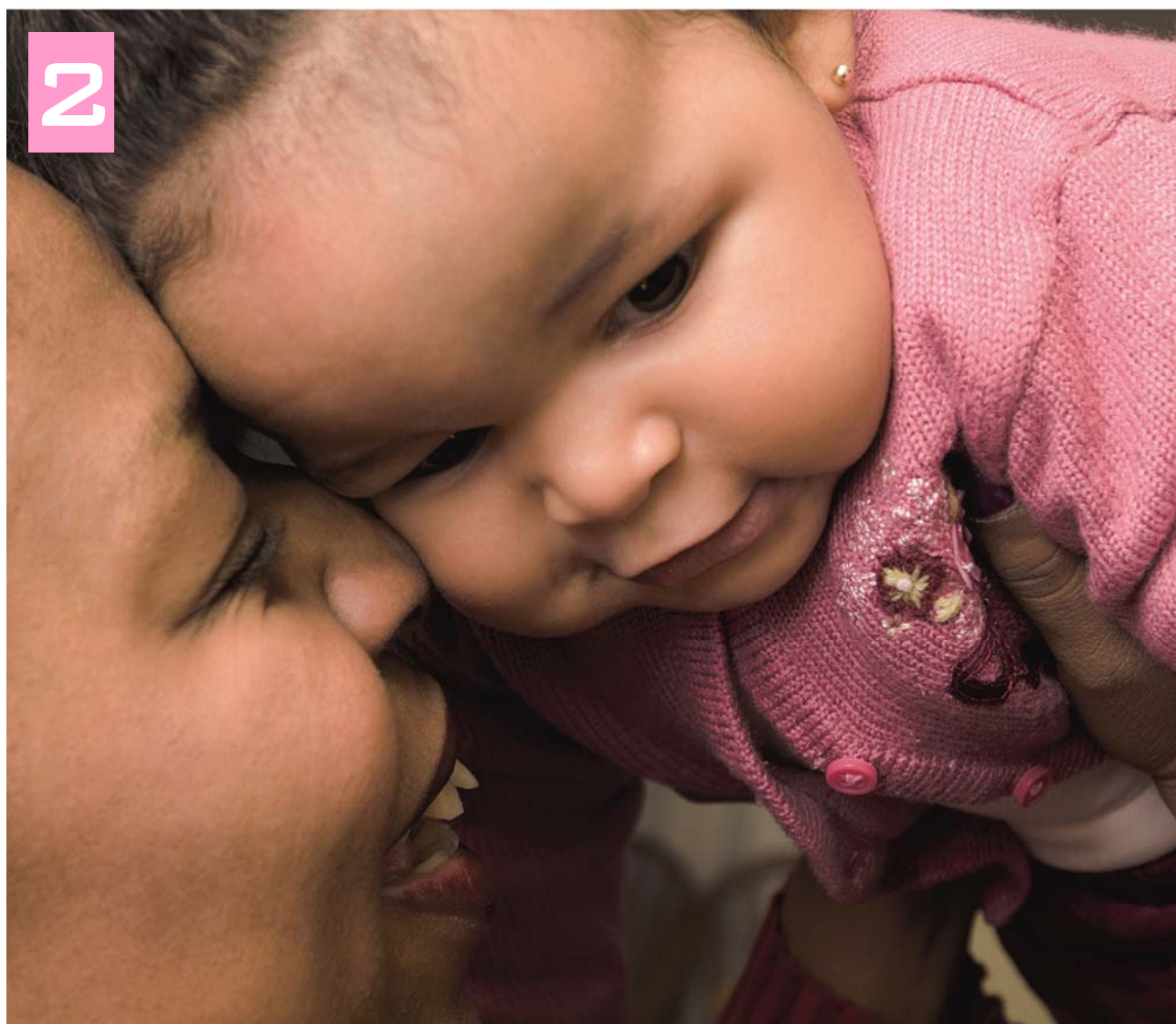


EVERY WOMAN

EVERY CHILD

INVESTING IN OUR COMMON FUTURE

2



Global Strategy for Women's and Children's Health

BACKGROUND PAPER FOR THE GLOBAL STRATEGY
FOR WOMEN'S AND CHILDREN'S HEALTH:
INVESTING IN OUR COMMON FUTURE

WORKING PAPERS OF THE INNOVATION WORKING GROUP - VERSION 2

CONTENTS

	Page
Introduction	5
<i>Tore Godal</i> , Special Adviser to the Prime Minister of Norway on Global Health - Co-Chair, Innovation Working Group, Global Strategy for Women's and Children's Health	
<i>Scott C Ratzan</i> , Vice-President, Global Health, Government Affairs & Policy, Johnson & Johnson - Co-Chair, Innovation Working Group, Global Strategy for Women's and Children's Health	
Executive Summary	7
1. Results-Based Financing (RBF) In Service Demand and Delivery	11
Health Results Innovation Program Team: <i>Darren Dorkin, Petra Vergeer, Rachel Skolnik</i> and <i>Jen Sturdy</i> of the World Bank	
2. The Health Systems Funding Platform	15
GAVI Alliance, The Global Fund to Fight AIDS, Tuberculosis and Malaria, World Bank and World Health Organization	
3. Public-Private Partnership Models	19
<i>Barry Bloom</i> , Professor of Public Health, Harvard School of Public Health	
<i>Wendy Woods</i> , Partner and Managing Director, Boston Consulting Group	
4. Innovative Use of Mobile Phones and Related Information and Communication Technologies	28
<i>Scott C Ratzan</i> , MD, Vice-President, Global Health, Government Affairs & Policy, Johnson & Johnson	
<i>Denis Gilhooly</i> , Executive Director, Digital He@lth Initiative, United Nations	
5. New and Emerging Medical Technologies	36
Bill & Melinda Gates Foundation: Program Officers <i>Andrew Serazin</i> and <i>Margaret Cornelius</i>	
6. Innovative Technologies for Women's and Children's Health	39
<i>Christopher J Elias</i> , MD, MPH, President and CEO, PATH	
7. Innovations on The Indian Scene that Relate to Improved Maternal and Newborn Health	43
<i>Dr T Sundararaman</i> , Executive Director, the National Health Systems Resource Centre – Technical Support Agency to the Ministry of Health and Family Welfare, Government of India	
8. Innovative Online Collection Methods for Decision - Making	51
<i>Benjamin Schwartz</i> , M.D., Senior Director, Health Programs, CARE USA	
9. Innovations in Promoting Gender Equity and Accountability	53
<i>Benjamin Schwartz</i> , MD, Senior Director, Health Programs, CARE USA	



Page

10. Innovation in Service Delivery	56
<i>Rohit Ramchandani</i> , MPH. Senior Health Analyst, Strategic Policy and Performance Branch, Canadian International Development Agency (CIDA) and DrPH Candidate, Johns Hopkins Bloomberg School of Public Health	
11. New Business Models: Humanitarian Entrepreneurship	62
<i>Mikkel Vestergaard Frandsen</i> , CEO of the Group, Vestergaard Frandsen SA	
12. Innovative Approaches to Political Leadership	65
<i>Agnes Binagwaho</i> , Permanent Secretary of the Ministry of Health of Rwanda	
13. Innovative Platform to Strengthen Generation and use of Implementation Research for Improved Policy and Management Decisions	69
<i>Dr. Abdul Ghaffar</i> , Executive Director, Alliance for Health Policy and Systems Research	
14. Innovation between Political Commitment and Outcomes	71
<i>Wim Van Lerberghe</i> and <i>Sowmya Kadandale</i> , Department for Health System Governance and Service Delivery (HDS), World Health Organization	
References	75
Disclaimer	80
Acknowledgements	80

INTRODUCTION

Tore Godal, Special Adviser to the Prime Minister of Norway on Global Health - Co-Chair, Innovation Working Group, Global Strategy for Women's and Children's Health

Scott C Ratzan, Vice-President, Global Health, Government Affairs & Policy, Johnson & Johnson - Co-Chair, Innovation Working Group, Global Strategy for Women's and Children's Health

The health of women and children is at the forefront of the development agenda. Yet we are making less progress against the Millennium Development Goals (MDGs) that relate to women's and children's health than any other. A woman in a developing country is 300 times more likely than a woman in a developed country to die during childbirth, or from pregnancy-related complications.

Bold, focused, and coordinated action is required to accelerate progress. With only five years left until the 2015 deadline for achieving the MDGs, UN Secretary-General Ban Ki-moon has initiated a global effort entitled: "Global Strategy for Women's and Children's Health." This aims to broaden and intensify support for the health MDGs, reinforce existing commitments, secure new commitments and establish an accountability framework for delivering results. It also provides information about the opportunities and potential for innovations that can be scaled up, and will have local as well as global impact.

Without innovation, hundreds of thousands of women and girls will continue to die in pregnancy and childbirth every year, and between 10 and 15 million more will suffer long-lasting disabilities.

We know that it is possible to make progress in ensuring healthier pregnancies and healthier babies. Some of the poorest countries are making significant reductions in maternal and neonatal mortality. Country-led, as well as global, innovations can achieve further reductions, enabling health services to produce better outcomes for the same cost. These innovations range from financial incentives to promote better performance and results, to innovative use of mobile phones and other communication tools.

The papers that follow give a concise outline of potential innovations that are improving the health of mothers and children, and show how a broad scope of further innovation can achieve better and more effective services. They show, for example, how we can improve health literacy, develop and use new technologies such as mHealth, and innovate in the delivery of services through an array of public-private partnerships.

This global effort provides a new opportunity to re-energize our commitment to the health MDGs. As we have been fortunate to engage with the Secretary General to co-chair the Innovation Working Group, it is our intent to add expertise to the drafting of the components



for the Global Strategy, as well as to engage with and expand a wide-ranging group of champions across many constituencies.

We hope that this renewed global effort will dramatically improve women's and children's health over the next five years and beyond.

EXECUTIVE SUMMARY

Millennium Development Goals (MDGs) 4 and 5 set aggressive targets for improving the lives of mothers and children by 2015. Now that financial concerns are pressing, innovation offers a way to do more with the money that is available. As a result, there is increasing collaboration among policy-makers, donors, multilateral organizations, civil society organizations, health-care professionals, the private sector, and academic and research institutions. All are working together to develop and introduce innovative policies, products, and processes to help achieve the ambitious targets set by the MDGs.

Many innovations consist of inexpensive and creative approaches to problems that had previously been considered too difficult to solve without prohibitively lavish financial backing. Innovation can be applied in all areas: leadership, financing (including performance incentives), tools and interventions, service delivery, and monitoring and evaluation. These are some of the most important fields in which innovative ideas and solutions are urgently needed.

In the accompanying working papers, examples of innovations are introduced and the authors discuss their impact on improving maternal and child health. These innovations are a small sample of those that are known internationally. Many other creative ideas are being introduced in local areas – and these also present enormous opportunities if they can be categorized, tested and shared with the international community.

Some of the innovations discussed in the working papers are potential “game-changers” that could fundamentally alter the way countries act to improve women’s and children’s health, and how those women and children access the support they need. Promoting and accelerating game-changing innovations, such as the examples that follow, will be critical to meeting the MDG targets.

POTENTIAL GAME-CHANGERS

RESULTS-BASED FINANCING

Many national health-care programs are experimenting with results-based financing (RBF) as a way to motivate and accelerate initiatives. RBF transforms health systems so that they focus on outcomes, as well as creating demand for services focused on women’s well-being, and contributing to the creation of a market that caters for the poor. There have been early indications of success when RBF has been used, both on the supply and the demand side.

In Paper 7, “Innovations on The Indian Scene that Relate to Improved Maternal and Newborn Health,” Dr. T Sundararaman explains how cash-transfer programs in India have resulted in more women delivering babies in private or public health facilities. This type of initiative, if scaled up, could have a dramatic impact on mortality rates for mothers and children. In Paper 1, “Results-Based Financing (RBF) In Service Demand and Delivery,” the World Bank takes a more detailed look at why RBF is increasingly being adopted, and discusses recent efforts to further develop and disseminate RBF mechanisms in the countries that could benefit most.

TRANSFORMING HEALTHCARE WITH MOBILE TECHNOLOGIES

As the pace of advances in information and communication technology continues to increase, more innovations are being introduced that could benefit women and children in developing countries. In Paper 4, “Innovative Use of Mobile Phones and Related Information and Communication Technologies,” Dr. Ratzan provides several examples of how mHealth (mobile health) is already making huge strides forward in countries around the world. In Ghana, pregnant women receive personalized messages informing them about child health and reminding them of the importance of immunization. In Tanzania, mobile phones are used to collect timely information about child mortality, which can be responded to quickly and proactively. In the US, Text4baby programs provide underserved mothers personalized information on their phones relating to pregnancy, delivery and newborn care advancing their health literacy. In Norway, mobile technology is used to send concerned parents information about their diabetic children – allowing them to act at the right time and in a non-invasive way to keep their child safe.

The growth of mobile networks means that more ways will be found to use mHealth to help the world’s needy. In Paper 8, “Innovative Online Collection Methods for Decision - Making,” Dr. Schwartz describes how innovative ways of collecting data online and tracking it better can improve outcomes by encouraging adaptation and faster decision-making. In several countries mobile phones have started to be used for paying health workers as part of M-banking. Looking into the near future, and in the context of medical applications such as high-resolution imaging it is clear that the rapid migration to broadband technology will provide the next great digital leap forward.

PUBLIC-PRIVATE PARTNERSHIPS AND OTHER INNOVATIVE ORGANIZATIONAL MODELS

In many developing countries, public-private partnership (PPP) models are becoming an increasingly viable way to deliver services, pool risk, provide financing, develop new

products and conduct many other activities. By increasing collaboration with the private sector, local governments are able to deliver needed services at a faster rate – while benefitting from local community networks and know-how.

Private-sector participation (on a for-profit basis) increases local expertise, develops self-sufficiency (and hence sustainability), and involves more people in achieving the MDGs. It also encourages innovation that caters for the unique needs of the mothers and children living in a particular country. One notable PPP model is discussed in Paper 3, “Public-Private Partnership Models,” This is BRAC, a large NGO in Bangladesh, which has partnered with the National Tuberculosis Program to treat over 86 million patients with tuberculosis. At the beginning of the treatment program, patients sign a bond and make a payment. When they complete the program, this payment is returned to them. Another example is the Global Alliance for Improved Nutrition, which operates in 25 countries and has already provided micronutrient fortification to over 200 million people.

DEVELOPMENT OF NEW AND BETTER TECHNOLOGIES

Paper 4, “Innovative Use Of Mobile Phones And Related ICT Technologies,” shows that there is a significant need for innovations that create more efficient and effective drugs, vaccines, diagnostics and tools, and that at the same time lower the cost of providing aid and equip local communities with the capabilities and resources to help themselves. These new products will enhance overall efficiency, empower local community action and increase the opportunities for women and children to connect with local health services. Paper 6, “Innovative Technologies for Women’s and Children’s Health,” written by the international non-profit organization PATH, highlights a variety of new technologies being developed through public-private partnerships to improve the health of women and children in resource-poor settings. The technologies range from new diagnostic tests and vaccines to address deadly childhood diseases to new contraceptive tools and cancer prevention methods for women.

With development of new technologies innovation in service delivery is vital. This could be accompanied by implementation research to gather evidence about what works and what does not within specific contexts. Paper 13 describes a new innovative implementation research program on the health MDGs focusing on women's and children's health that was initiated in 2010. In addition to developing new methods and producing synthesis of research findings across countries, the first call for proposals directed towards south-based research institutions and consortia attracted significant interest generating more than 200



letters of interests. Country demand for this type of research is huge and increasingly integrated into global and bilateral aid initiatives.

However, these game-changers alone are not enough. To succeed, we will need significant political support within countries and organizations. Strong political commitment and cutting-edge policy ideas are also needed at all levels of government in the developing world. Rwanda, through programs such as the “Working as One” initiative (described in Paper 12, “Innovative Approaches to Political Leadership”), is a good example of a country that has used policy innovations to encourage gender equality and improve the lives of women.

FUTURE DIRECTION

This work is just the beginning. Our ability to identify and take advantage of innovations from all over the world is a powerful force in efforts to improve maternal and child health. To realize fully the potential benefits of innovation, it is important that the international community work closely together. It needs to collaborate on identifying, prioritizing, evaluating, investing in and implementing the ideas that are most able to reduce mortality rates among mothers and children around the world. To formalize this process, the following steps should be considered:

- I. Agree on the overall approach, including using “innovation matrices” (discussed in Paper 14, “Innovation Between Political Commitment and Outcomes”) to categorize existing innovations and identify areas for further innovation to improve maternal, newborn and child health.
- II. Establish a web based marked place where all information, assessments, and updated experiences are available to interested parties.
- III. Prioritize areas in which innovation work should be nurtured. The Innovation matrices can help focus stakeholders on specific areas, by helping them make tradeoffs between the potential impact and what is possible with the time and resources available.
- IV. Review the results of the innovation-mapping and begin a structured process of deliberations between key stakeholders. This should identify innovations – both those that do things better and those that do better things – in each target area.
- V. For each identified innovation, develop a realistic and achievable plan for resource mobilization, implementation and evaluation.

1. RESULTS-BASED FINANCING (RBF) IN SERVICE DEMAND AND DELIVERY

Health Results Innovation Program Team:

Darren Dorkin, Petra Vergeer, Rachel Skolnik and Jen Sturdy of the World Bank

Most countries, especially those in Africa, will not achieve the Millennium Development Goals (MDGs) for maternal, newborn and child health (MNCH) by 2015 unless progress is greatly accelerated. To this end, governments and development partners are seeking innovative strategies – through the International Health Partnership Plus (IHP+) and other coordination efforts – to increase the impact of investments in health. One promising strategy is results-based financing (RBF). This is being used increasingly by national health programs in developing countries to accelerate progress towards achieving the health MDGs.

RBF is the provision of cash or goods on condition that measurable actions are taken, or defined performance targets achieved. It holds considerable promise for increasing the utilization of health services, improving service quality, increasing efficiency and enhancing equity. It focuses attention on health results (such as the number of women receiving early antenatal care and having their babies in health facilities) rather than inputs (such as the construction of health centers and training of staff). As a result, budgets and financing are more tightly linked to results.

Some RBF programs work on the “supply-side”, paying incentives to health facilities for performance tied to services. These incentives can be used to pay staff bonuses or to improve the performance of the health facility by, for example, financing more outreach visits or purchasing essential equipment. Other RBF mechanisms work on the “demand-side” to overcome barriers to utilization of health services. Here, pregnant women, the poor and other target groups are given financial or “in-kind” incentives, such as transport vouchers or supplies for newborn babies. In some countries, a combination of demand- and supply-side incentives is used.

TARGETED FINANCING

Demand-side mechanisms, such as conditional cash transfers (CCTs), are by definition targeted at the poor, and eligibility is based on degree of poverty. Other demand-side RBF mechanisms, such as vouchers, can reach the poor through “categorical targeting” of groups and geographical areas that are more likely to be poor, while explicit testing of means or income can also be used to target poor people.



On the supply-side, there are two main ways to enhance equity using RBF. Firstly, poor individuals can be targeted by paying bonuses to health workers for the services they deliver to the poor. Secondly, RBF can pay more for services delivered to a poor person or in a poor area, giving health workers an extra incentive to reach the poor. One example of this is the “equity bonus” in Burundi. Here, fees paid to providers are graduated depending on the poverty rate where the health-care facility is located. It is also possible to target the type of facility most likely to be used by the poor (public, private or concessional) and the level of care they are most likely to seek. Similarly, services or indicators can be targeted where, if used, they will improve health service delivery in areas where the greatest utilization gaps exist between the rich and poor.

RBF can enhance accountability and transparency and improve health information systems at all levels, because reported results are verified when linked to incentives. Local authorities (e.g. in Rwanda) and/or external organizations (e.g. in Afghanistan) verify results, which are published for each organization or health facility. The decision to pay health facilities for results is often taken at a decentralized level (e.g. in Argentina) and in the public sector (e.g. in Burundi) with the involvement of civil society. Community involvement at the health facility level helps ensure accountability for performance incentives. Quality assurance mechanisms are closely tied to implementation and their use is incentivized through balanced scorecards.

IN-COUNTRY EXPERIENCES

Early evidence from programs piloting RBF shows great potential, based on some impact and output indicators. In Afghanistan¹, the government was able to reduce mortality among infants and the under-fives by 22% and 26% respectively in just three years. Furthermore, in Rwanda² a recent impact evaluation³ of a performance-based financing scheme – which gave financial incentives to health facilities to increase the quantity and quality of their services – found large and significant positive impacts. Compared with baseline, these amounted to a 21% increase in institutional deliveries, a 64% increase in preventive visits for children under two, and a 133% increase in visits for children between two and five. The evaluation suggests that paying health facilities for results is a feasible and effective way to improve health outcomes and health system performance. It also shows that incentives are key, and that the same results could not have been achieved by simply increasing the amount of resources provided to health facilities.

In Rwanda, much of the technical assistance was provided by non-governmental organizations contracted by the US President's Emergency Plan for AIDS Relief (PEPFAR), which purchased HIV services through the RBF approach. This highlights how different donors might pay for particular services to support RBF in different countries. For example, the Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM) might focus on TB and malaria, or the GAVI Alliance on immunization. Similarly, the Rwanda model included quality indicators related to processes and organization of the health system. This is one example of how the Health Systems Funding Platform could support health system strengthening through RBF. In addition, RBF encourages providers to offer a comprehensive service package at the level of health facilities, because it does not focus on a single indicator or service at the expense of others. RBF also encourages harmonization and alignment by utilizing country systems wherever possible.

In Burundi,⁴ the RBF system represents an advanced approach, and may be indicative of future trends in RBF. Here, funds for “free health care” and RBF funds from the World Bank and the European Union have been pooled to create a single, harmonized mechanism for paying providers. Fees for service are conditional on the quality of care provided and an estimated 20% of total health expenditure is made available for RBF. Cost-effective packages of basic health services are strategically purchased by semi-autonomous provincial purchasing bodies. Meanwhile, grassroots organizations and other non-state actors are closely involved in creating the institutional elements of this system, including mechanisms for capacity building, monitoring, evaluation and approval.

GLOBAL SUPPORT FOR RBF

The World Bank’s multi-donor Health Results Innovation Trust Fund (HRITF) supports RBF approaches in the health sector, for achievement of the health-related MDGs (particularly MDGs 1c, 4 and 5). The HRITF finances activities to enhance access to basic health services using a variety of RBF mechanisms, and specifically aims to:

- Support the design, implementation, monitoring and evaluation of RBF mechanisms
- Develop and disseminate the evidence base for implementing successful RBF mechanisms
- Build country institutional capacity to scale up and sustain the RBF mechanisms
- Attract additional financing to the health sector



The HRITF works with development partners and client countries to build and use country systems wherever possible. It aims to be consistent with the principles of the IHP+ and the Global Consensus on Maternal, Newborn and Child Health.

Norway was the first donor to the HRITF, and recently increased its already sizable contribution from US\$104 million to US\$368 million. The United Kingdom also recently committed 114 million British pounds (US\$190 million) to the HRITF.⁵ These additional contributions, totaling US\$454 million in installments over 10 years, will increase the HRITF to US\$558 million.

The HRITF currently supports:

- Nine countries to design, implement, monitor and evaluate their RBF mechanisms
- Six seed grants for exploring the feasibility of RBF
- Analytical work
- A global website for knowledge and learning (www.rbfhealth.org)

CONCLUSION

RBF for health can help ensure more health for the money. RBF mechanisms have now been introduced or explored in more than 40 low-income and middle-income countries, while evidence from around the world suggests that cost-effective interventions are readily available to help achieve the health MDGs. These interventions include impregnated bednets, immunization, contraceptives, antenatal care, skilled attendance at birth, postnatal care, growth monitoring, deworming, nutrition and health education. RBF has the potential to improve the quantity and/or quality of such services. It can also strengthen the effectiveness of health systems by enhancing the skills and motivation of health workers. However, it should not be seen as a substitute for the input financing needed to provide infrastructure, drugs and equipment, or the technical assistance required to deliver results. Wherever possible, RBF builds and uses country systems, and the design of the RBF mechanism is country-owned. Therefore, donors supporting countries through RBF are adhering to the aid effectiveness principles described in the Paris Declaration on aid effectiveness and the Accra Agenda for Action.

2. THE HEALTH SYSTEMS FUNDING PLATFORM

Developed by the following Health Systems Funding Platform partners:

GAVI Alliance, The Global Fund to Fight AIDS, Tuberculosis and Malaria, World Bank and World Health Organization

STRONGER HEALTH SYSTEMS THE KEY TO ACHIEVING GREATER HEALTH IMPACT

Countries, partners, global health initiatives and funding agencies increasingly recognize that weak health systems are an absolute impediment to better health for all people. This is especially true for vulnerable, marginalized and underprivileged populations in poor countries – which are the focus of the Millennium Development Goals (MDGs)⁶ and of health development in general.

With five years remaining to the 2015 deadline for the MDGs, progress is still off track in many countries, particularly for health-related goals. Increased investments are urgently needed to improve health services and systems in poor countries and to accelerate progress towards MDGs 4, 5 and 6. Cost-effective and evidence-based interventions are not enough – the focus must now be on how these interventions can be delivered to everyone who needs them.

The Health Systems Funding Platform (the Platform) was established in 2009 on the recommendation of the High Level Taskforce on Innovative International Financing for Health Systems. It is intended as a mechanism to accelerate progress towards the MDGs, and specifically to: “...coordinate, mobilize, streamline and channel the flow of existing and new international resources to support national health strategies.” The Platform is being developed initially by the GAVI Alliance, the Global Fund and the World Bank, and facilitated by the World Health Organization (WHO), in consultation with countries and other key stakeholders, including civil society. It is based on the principles of the International Health Partnership Plus (IHP+)⁷, in line with the Paris Declaration on Aid Effectiveness, to promote: national ownership; alignment with national systems; harmonization between agencies; managing for results; and mutual accountability among partners, donors and countries.



PUTTING "HARMONIZATION AND ALIGNMENT" INTO PRACTICE FOR HEALTH

The Platform will enable countries to use new and existing funds more effectively for health systems development. It will also help them to access donor funds in a manner that is more aligned to their own national processes. Platform partners will do this by coordinating, mobilizing, and channeling health resources – from both domestic budgets and international aid – to comprehensive, integrated, country-driven health plans and strategies.

Through the Platform, countries will benefit from international development funding for health systems strengthening that is:

- Better aligned with country priorities and processes;
- More harmonized in terms of planning, reporting, and financial management (i.e. decreased administrative burden and using time and energy more effectively)
- More predictable over the course of a country's planning cycle

In practice, this will work differently from country to country. However, the overarching aim is to streamline significantly the way health financing is provided, so as to get “more health for the money.” For example, countries that have completed a Joint Assessment of National Strategies (JANS)⁸ will have the option of submitting a funding request based on their jointly assessed national health plan. In terms of existing funding, the Platform encourages development partners to find ways to simplify planning and financing, and procurement and monitoring procedures, with the aim of reducing transaction costs and duplication. Improvements might include agreeing to a common reporting system and a common set of indicators (including those that reflect MDGs 4, 5 and 6) and establishing common processes for financial management, such as joint audits and simplified procurement systems.

Work has already begun among a number of countries and Platform partners to establish baselines, benchmarks and indicators that better align health planning and programming with national priorities and existing processes, including health information management systems. A joint proposal form for GAVI Alliance and Global Fund support to strengthen health systems is being developed for countries to use starting in 2011.

COUNTRIES MAKING PROGRESS

A. NEPAL

Nepal has made significant progress in maternal and child health and is on track to meet many of the health MDGs. The Nepal Health Sector Program II (NHSP II) is supported by a number of development partners and seeks to overcome the remaining challenges – in particular by reaching out to marginalized, remote and poor populations. The NHSP II sets out objectives, results and targets to be achieved in service delivery, health systems strengthening, equity and social inclusion. Its work is based on the principle that health systems should be responsive to the needs and expectations of people.

The collaboration around the Platform in Nepal was agreed in consultation with the government, civil society and development partners to fit the country's priorities and context. In Nepal, high transaction costs, imposed by multiple externally funded programs, have been identified as a real burden, which the Platform is seeking to address through a focus on results and value for money.

As a first step, Nepal's Ministry of Health and its development partners conducted a JANS to revise and strengthen its NHSP, and merged the assessment with project reviews produced by the World Bank, DFID and AusAid. Following this, the leading aid donors (DFID, the World Bank, the GAVI Alliance, USAID, UNFPA and UNICEF) agreed to sign a joint financing agreement (JFA).⁹ This indicated their commitment to a single framework for financial management – with one report and one audit – to support the NHSP, as opposed to the burden of multiple, agency-specific reports and audits.

This JFA, signed in August 2010, was one of the first steps to implementing the Platform in Nepal. It brings together donors (the World Bank, DFID and the GAVI Alliance) that are able to “pool” their development funds in support of the government's health programs with others (such as USAID, UNFPA and UNICEF) that provide on-budget resources but do not pool their funds. The Platform will provide a focus for joint ownership of, and support to strengthen systems around agreed objectives and targets. It will also foster improved collaboration and communication around health-system issues, and has encouraged development partners to ensure that their programs and grants fully support Nepal's own health-sector program.



B. CAMBODIA

Here, the GAVI Alliance, the Global Fund and the World Bank are reviewing current funding agreements, and exploring options to harmonize support for health systems strengthening. A first joint-country mission (with representatives of the GAVI Alliance, the Global Fund, the World Bank and WHO) took place in early June 2010. Consultations focused on country procedures and possibilities to harmonize institutional processes in four areas:

- I. Financial management
- II. Pharmaceutical management systems
- III. Performance frameworks
- IV. Technical support

The Ministry of Health approved this approach in August 2010, and has given permission for work to go ahead. All three funding agencies have now harmonized their performance indicators with those of the government, thus reducing transaction costs for monitoring and evaluation, and have agreed to strengthen the country's health information system.

C. ETHIOPIA

Ethiopia is in the early stages of implementing the Platform, having carried out a JANS, which culminated in a July 2010 workshop. The assessment was led by the Ministry of Health over several months and brought together international and local development partners, including civil society representatives. The JANS built on existing mechanisms for sector coordination and dialogue and was viewed by the government as a key part of the process to develop and strengthen its fourth national health strategic plan,.

Following the JANS, all Platform partners continue to discuss how to build on this process to achieve better harmonization and alignment of health sector support in Ethiopia. A particular focus is on harmonization of financial management, reporting and monitoring. The GAVI Alliance, for example, is working with the government on the next steps for progressing from the JANS to a funding decision, and then to scheduled releases of funding tranches. Meanwhile, the World Bank is developing new financing in support of the National Health Strategy. Again, the overall focus is on creating an equitable and integrated service delivery model, and extending it throughout the country.

3. PUBLIC-PRIVATE PARTNERSHIP MODELS

Barry Bloom, Professor of Public Health, Harvard School of Public Health

Wendy Woods, Partner and Managing Director, Boston Consulting Group

Because the resources available for health are limited – particularly in developing countries – greater innovation and efficiency are needed to make them most effective. This means that we need to find the best ways for public and private sectors to learn from one another and work together. In most developing countries, the private sector is important because of the large proportion of private health-care providers and the high percentage of health costs that are “out of pocket.” The key is the way the public sector takes advantage of the private sector’s ability to innovate, take risks, and achieve (and measure) economies of scale. It may also be possible for the public sector to take advantage of private-sector distribution systems.

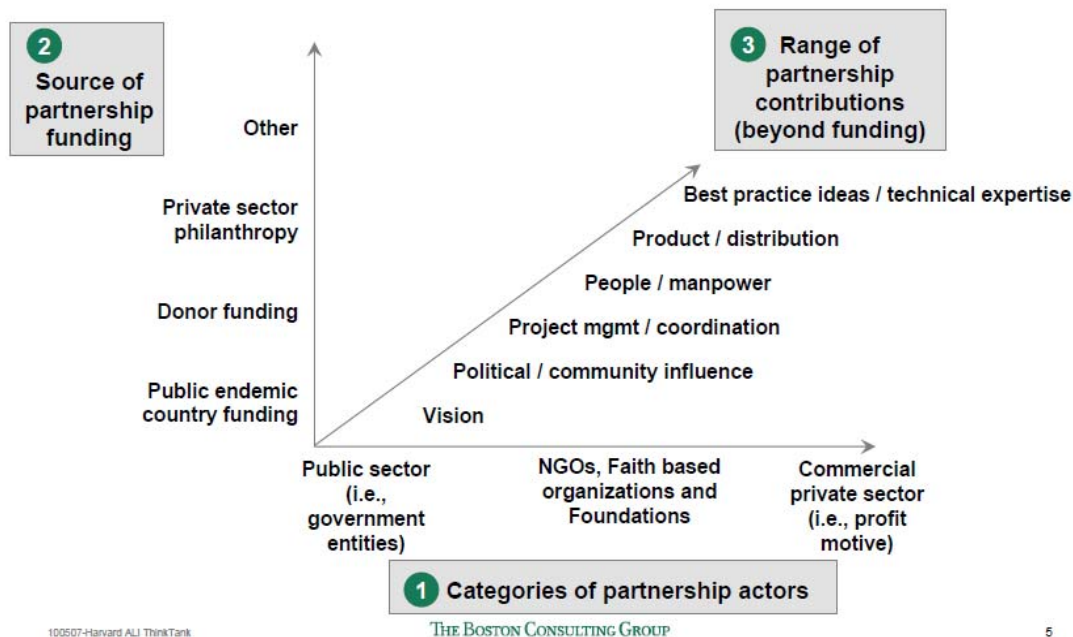
In return, the private sector would be able to take advantage of the increasing wealth generated by emerging economies. The private sector’s reach could thus be extended – from the 1.2 billion people in the developed world whose custom it currently competes for – to an increasing proportion of the 5.7 billion people in developing countries, whose health needs are largely underserved¹⁰. To achieve this, interfaces will need to be created that allow dialog between the public and private sectors. There will also need to be a strategy for developing mutual trust and a regulatory framework that encourages transparency, fairness and mutual stewardship. Public-private partnership (PPP) is a mechanism that can fulfill all these requirements.

Hundreds of PPPs have been set up in developing countries in the past decade. A number of recent studies and websites provide detailed rationales for the development of public-private partnerships, and have begun to create a comprehensive list of innovative and successful PPPs. The Results for Development Institute and its Center for Health Market Innovations have created a valuable website (resultsfordevelopment.org) and documents of special interest, listing many PPPs and describing some of their functions, including innovative service delivery, risk pooling, financing, supply and contracting, and government and self-regulation.^{11 12 13}

TYPES OF PUBLIC-PRIVATE PARTNERSHIP

The figure below shows the wide spectrum of public-private relationships.

One framework for dissecting public-private partnerships



There are three main types of PPP:

- **Private-sector social responsibility model**

In this model of PPP, public goods are provided by a corporate entity – either a for-profit or not-for-profit company. This model requires very little actual partnership.

- **Product-development partnership (PDP)**

This is a collaborative partnership between industry and the public sector, resulting in sustainable products aimed at developing-country diseases for which market incentives are insufficient.

- **Global and national public-private partnerships**

In this model, the government and the private sector (either can initiate it) work together on the ground in developing countries to deliver health care and solve major health problems.

The rest of this paper provides several examples of each of these types of partnership.

PRIVATE-SECTOR SOCIAL RESPONSIBILITY MODEL

GOODBABY – CARE FOR CHILDREN, CHINA¹⁴

Goodbaby has more than 70% of the market for baby products in China and 40% in some categories in the US. As a public service it provides advice for parenting and clubs for care of babies and children. It has more than 1,000 trained health professionals available for phone consultations and its website receives 3 million hits a day.

UNILEVER, INDIA¹⁵

Unilever uses Shakti entrepreneurs for door-to-door sales and to provide health information in villages unreachable by the public sector. Lifebuoy Swasthya Chetna is a hygiene-education initiative that has reached more than 27,000 villages and 80 million people. Soap sales in those areas have increased significantly.

HATTON NATIONAL BANK, SRI LANKA¹⁶

The Bank has developed a scheme whereby people who save more than 5% of the money that goes into their account can have access to loans, and can receive a reduction of up to 50% on health-insurance premiums. This has not only been useful to the public, but has been profitable for Hatton Bank.

GVK EMERGENCY MANAGEMENT AND RESEARCH INSTITUTE, INDIA¹⁷

GVK EMRI is a pioneer of emergency-management services in India. Developed originally in Andhra Pradesh, it is the only professional emergency-service provider in India. It was launched by a private company as a not-for-profit service, and now handles medical, police and fire emergencies on its emergency telephone number, operating in seven states 24 hours a day, seven days a week. This is a free service, largely paid for by government funds, that delivers state-of-the-art emergency-call response which could not have been provided by the government. GVK EMRI has 2,600 ambulances and is training a cadre of paramedical workers. Its services take no longer than 20 minutes to transport someone from any village in Andhra Pradesh to a local a hospital or clinic.

These examples suggest that the public sector could more actively encourage private businesses to contribute their innovation and expertise to address national and local health problems. This



private contribution to a public good might also be helpful to the business. The innovation the private sector brings can lead to sustainable programs that pay for themselves, as in the Unilever and Hatton examples – services that are profitable are by definition sustainable.

PRODUCT-DEVELOPMENT PARTNERSHIPS (PDPs)

These bring together public-sector funding and private-sector pharmaceutical know-how. The key strengths of global health organizations include deep knowledge of developing countries' health systems, the global health community of funders, purchasers and UN agencies and non-dilutive capital. The strengths of the private sector include product development and manufacturing. Product development partnerships combine both sets of strengths to mitigate market and development risks while creating sustainable products such as drugs, diagnostics and vaccines.¹⁸ There are many such PPPs for specific needed products:

- **Drugs** – the Medicines for Malaria Venture (MMV), Global Alliance for TB Drug Development (TB Alliance), and Drugs for Neglected Diseases initiative (DNDi)
- **Diagnostics** – Foundation for Innovative New Diagnostics (FIND)
- **Vaccines** – International AIDS Vaccine Initiative (IAVI), Aeras Global TB Vaccine Foundation, PATH Malaria Vaccine Initiative (MVI), and Tuberculosis Vaccine Initiative (TBVI)

PDPs have significantly increased the numbers of drugs, diagnostics and vaccines in the pipeline and have been involved in registering and launching almost a dozen new products.

GLOBAL AND NATIONAL PUBLIC-PRIVATE PARTNERSHIPS

GAIN – GLOBAL ALLIANCE FOR IMPROVED NUTRITION¹⁹

GAIN, initially created with funding from the Gates Foundation, provides programs in micronutrient fortification, and infant and young child feeding. Its goal is to reach a billion people with fortified foods. After a difficult and unsuccessful beginning, it has reinvented itself and now operates in 25 countries, reaching 200 million people. GAIN is helping to build trust between the public and private sectors through National Fortification Alliances. These provide strategic guidance and governance of programs, bringing together ministry officials, the private sector, civil society, academia, and international and development agencies. GAIN supports a pre-mix facility to help reduce the price of the fortification ingredients.

GRAMEEN DANONE FOODS LIMITED²⁰

Grameen and Danone have partnered to create this Bangladeshi food company which has, among other achievements, created a nutrient-fortified yoghurt for Bangladeshi children at a price that even the poorest can afford. They sell products through Grameen's micro-finance channels, thus improving nutrition and creating jobs. "Grameen ladies," all microfinance recipients, are trained to sell the products and to deliver positive nutrition messages.

JANANI SURAKSHA YOJANA (JSY) – MOTHERHOOD PROTECTION SCHEME²¹

This Indian scheme was created under the umbrella of the National Rural Health Mission (NRHM) to reduce maternal and infant mortality. It works by identifying complicated cases early, providing antenatal care, post-delivery visits, and referral transport. JSY integrates conditional cash transfers with a system of coordinated care, using field health workers. This includes antenatal care, as well as institutional care in a health centre during delivery and in the immediate post-partum period. Because public-sector facilities are not adequate, JSY has created a mechanism to recognize private-sector hospitals, nursing homes and clinics so that they can provide obstetric care to JSY beneficiaries. In the states in which it has been implemented, JSY has dramatically increased the number of births taking place in clinics, with by skilled birth attendants. The outcomes for maternal and infant mortality are still being evaluated.

GREENSTAR SOCIAL MARKETING²²

This is a component of the Pakistan Initiative for Mothers and Newborns (PAIMAN) to reduce maternal and infant mortality. It is a consortium partner in the Pakistan Initiative, led by John Snow Inc and funded by USAID. Working with private health-care providers, Greenstar seeks to improve maternal and newborn health services by training female doctors and local health volunteers in emergency obstetric care, making their clinics part of the GoodLife franchise. Greenstar gives vouchers to pregnant women from poor socio-economic groups. They can use these vouchers at any GoodLife clinic for a set of services, including three antenatal care visits, normal delivery or cesarean section, postnatal care and family-planning counseling. Antenatal care includes basic laboratory work, ultrasonography and tetanus immunization, along with iron, folic acid and multivitamin medication.



FAITH-BASED PARTNERSHIPS

It has been estimated that about 40% of HIV/AIDS treatment and care in Sub-Saharan Africa is provided by faith-based and religious organizations. There are many faith-based NGOs providing a wide variety of services, too numerous and diverse to mention here. One example is CHAZ²³, the Churches Health Association of Zambia. This is an umbrella organization representing work done by church health institutions in Zambia. It provides support to over 1,100 faith-based organizations in Zambia that provide preventive and care services for HIV/AIDS, malaria, tuberculosis and leprosy. Because of its extensive infrastructure, it is the largest recipient of support from the Global Fund for AIDS, TB and Malaria. It collaborates with a number of partners, including DanChurchAid, the Royal Netherlands Embassy, Irish Aid, Catholic Relief Services/PEPFAR, and Centre for Disease Control (CDC). Another example is the Rwandan government, which has formal contractual partnerships with several faith-based organizations. These provide HIV/AIDS care and other health services, making important contributions to achieving the MDGs and developing universal health coverage.

RWANDA TRACNET²⁴

There are 4.9 billion mobile phone subscriptions in the world, almost two-thirds of them in developing countries.^{25 26} That compares with 1.5 billion PCs.²⁷ Over the next decade, mobile phones have the potential to reach people in the most remote regions of developing countries, transforming the way health information is provided and compiled.

Rwanda Tracnet is an Integrated phone and IT network, linking information technology and health. It focuses primarily on HIV/AIDS. Tracnet is jointly run by Voxiva, a private telecom company, and the Rwandan Ministry of Health, and is partially funded by the World Bank. Rwanda Tel and MTN Rwanda provide toll-free numbers and network airtime while Voxiva provides the IT system for coordination and management. In Tracnet, the public sector contributes the concept, funding, training, quality supervision and distribution, as well as monitoring drug supplies and ensuring that diagnostics and drugs are rapidly dispensed where needed. A similar project, Phones-for-Health, is being implemented in all PEPFAR programs, also in partnership with Voxiva and Motorola.

BRAC, BANGLADESH²⁸

BRAC is probably the world's largest NGO, providing basic health-care coverage for 100 million people, in addition to microfinancing, agricultural and educational activities. It has more than 70,000 health volunteers working in village organizations in all 64 districts of Bangladesh, and in seven other countries in Asia and Africa. BRAC has partnered with the National Tuberculosis Program (NTP) to create an innovative program to diagnose and treat TB, covering 86 million people. The program's patients sign a bond and deposit 125tk (US\$3.50), which is returned in full when they complete their treatment. Drugs provided free by the NTP are distributed by village health workers. As a result, by 2007 TB case detection rates had risen from 25% to 84% and cure rates had risen from less than 50% to 93%.

OPERATION ASHA, INDIA²⁹

This is a similar TB care and treatment program for patients in urban slums. It engages local centers with trusted community leaders, such as priests and traditional healers, with support from families and neighbors. The cost is relatively low (US\$15 over 7 months) – the level the government has set as its payment for each “cured” patient – and the reported cure rate is high, at 94%.

DUTCH NGO PHARMACCESS AND A NIGERIAN NGO, HEALTH INSURANCE FUND³⁰

These two NGOs have created a novel model for private health insurance in Nigeria. In Nigeria, public-sector workers have health insurance. Working with the Health Insurance Fund – an initiative of Dutch insurance companies and multinationals with large operations in Africa – PharmAccess developed an insurance model for low-income groups. The concept is based on risk pooling, donor support, co-payments and using public as well as private health-care providers. It uses donor money to subsidize insurance premiums not for individuals but for groups of previously uninsured people on low incomes. This intervention is expected to generate an increasing demand for prepaid health schemes and will thereby improve investment opportunities in local health capacity. The concept facilitates the enforcement of quality standards, as it focuses on the output side of the health-care sector and relates the payment of providers to their performance. Similar programs are running in Ghana and Tanzania.



PHARMACCESS INTERNATIONAL

PharmAccess has also launched a program in 19 countries which will expand employee health-care coverage in industry. PharmAccess is working in collaboration with the Coca-Cola Africa Foundation, Coca-Cola Bottlers, Population Services International and GlaxoSmithKline. The program includes prevention campaigns at all company sites, voluntary counseling and HIV testing for the 60,000 employees and their partners, and antiretroviral drug treatment, according to the latest WHO guidelines, for all who need it.

ADDO, TANZANIA³¹

An innovative regulatory system for pharmaceuticals was created by the Tanzania Food and Drug Authority in collaboration with Management Sciences for Health, and local governments. This has created a system of accredited retail drug-dispensing outlets (ADDOs) that provide affordable, good-quality drugs and services in rural areas and the outskirts of towns, where pharmacies were rare. Funding also comes from USAID and DANIDA. In addition, ADDO provides loans, monitoring and evaluation inspections, and training in business practices. It has strengthened local regulatory capacity, increased treatment quality and created a skilled pool of dispensers and inspectors.

LESSONS

- I. The private sector can make enormous contributions in developing countries – in terms of innovation, risk-taking, capital investment, increasing access to products and services, scaling up innovation, and driving improvement in the quality of services. By partnering with it, the public sector can gain better-quality services, greater access to the population, greater accountability and increased consumer satisfaction.
- II. The different models need to be seriously evaluated, so that we can learn what works well and what does not, and so we can find good, sustainable examples that can be adopted more widely. However, many PPPs are too recent for their health outcomes to have been analyzed.
- III. There is no “best” model for PPPs. The need for creativity and innovation and the variety of contexts suggest that a wide variety of models is needed, from which we can learn the principles of success and apply them in other contexts. It is important to

take advantage of a wide variety of partnership models that engage the public and private sectors in complementary and functionally distinct ways.

- IV. Allowing all stakeholders a voice, and the right to make decisions, often allows significant progress to be made in changing systems – examples include GAIN’s fortification alliances, and Nigerian risk pooling for health insurance. Often no party could have accomplished these outcomes alone. This makes worthwhile the extra complexity involved in having partnerships that involve several decision-makers.
- V. There is a critical need for a regulatory framework that allows the private sector and PPPs to contribute, and that increases transparency while preventing and punishing exploitation and corruption. At present, out-of-pocket payments – the least efficient payment mechanism – are used for perhaps 70% of health care in resource-poor countries, and this is delivered by the private sector.
- VI. Finally, leadership is essential. The success of PPPs is often determined to a great extent by the quality, vision and persistence of leaders in both the private and public sectors.

4. INNOVATIVE USE OF MOBILE PHONES AND RELATED INFORMATION AND COMMUNICATION TECHNOLOGIES

Scott C Ratzan, MD, Vice-President, Global Health, Government Affairs & Policy, Johnson & Johnson, and Denis Gilhooly, Executive Director, Digital He@lth Initiative, United Nations

BACKGROUND

In many regions of the world, including North Africa, East Asia, South-East Asia, Latin America and the Caribbean, child mortality rates have more than halved since 1990. However, globally the fall has only been 28%, which is still well short of the target of a two-thirds reduction.³² Tragically, although most of the major causes of child mortality are treatable – malnutrition, pneumonia, malaria, diarrhea, measles, HIV/AIDS and tetanus – communities lack both the resources and the knowledge to treat them. Children’s health is closely correlated with maternal health and (more loosely) with maternal education.

Given that there are rarely enough health practitioners to serve everyone in need of health care, information and communication technologies (ICTs) and broadband are essential for bridging this gap. Advances in modern medical technology usually require large amounts of money, but telemedicine can make a huge impact with relatively simple low-cost technology. Just one computer, a scanner and a digital camera, for example, can transform a hospital, making a real difference where it counts.

In the global effort to improve health, mobile communications technology can also be used in a variety of ways: to disseminate basic health and sanitary information via text or voice message to parents (such as vaccine reminders and advice on maternal hygiene and nutrition); to train intermediary health-care workers and rural doctors; to track disease and epidemic outbreaks; to monitor patients remotely; and to remind patients about the need to take medicines or come in for a check-up. These types of application are known as Mobile Health (mHealth), which is the communication of health information and provision of health-related services via mobile technologies.

To leverage the full power of telemedicine, broadband is needed to enable doctors to share digital images and diagnose patients hundreds of miles away, using technologies such as video-conferencing. A number of developing countries – for example, Kenya and Rwanda – are already prioritizing broadband as a platform for future delivery of health services. The aim is to improve patient care, reduce the impact of distance and bring telemedicine to tens of millions of people, thereby reducing child mortality.

More than half a million women die every year as a result of complications in pregnancy and childbirth, almost all of them in the developing world.³³ The vast majority of these deaths are preventable. However, although maternal mortality rates are falling, the rate of reduction is still considerably short of the 5.5% decline needed annually to meet the MDGs target. In Africa and South Asia, fewer than half of all births are attended by a midwife or skilled health worker, and complications during pregnancy and childbirth remain the most frequent cause of death for women.³⁴ Lack of access to health services is particularly acute for women in remote rural areas.

While there is obviously no substitute for increased numbers of health-care professionals and their attendance before, during and after childbirth, broadband services have already begun to demonstrate their potential for improving the health of women and their babies. High-speed internet connections enable health workers outside major centers to receive quality training and to exchange experiences and information through video-conferencing, interactive discussion forums and the use of social networking sites.

Broadband services give women easier access to information on family planning, hygiene and other reproductive health issues, including visual presentation materials, information in local languages and culturally appropriate content. Expectant and new mothers can get better information for themselves and their children about childbirth and the early warning signs of infection or disease. Broadband applications linked to “smart” mobile phones or portable computers linked to mobile broadband networks can enable health workers to create and access online patient records and to transmit health information to policy-makers and researchers. And there is an important and growing role for community centers with internet access to deliver essential connectivity and health information, especially to women in rural and remote areas.

New communication technologies can be applied across the continuum of care for maternal, newborn and child health (MNCH), including: family planning, pregnancy, safe labor and delivery, and newborn care. mHealth can increase the reach of tailored health messages, especially when they are complemented by print, radio, television and internet communications. There is also an opportunity to develop health literacy, by enhancing peoples’ knowledge and skills while also reducing complexity – helping individuals and health providers to make informed, appropriate decisions. Although mHealth is in its early stages in relation to women’s and children’s health, there are indications that it is starting to transform health systems – demonstrating its potential for extending the reach of health information and services to remote populations and promoting a shift toward citizen-centered health care and well-being.

MHEALTH FOR CHILD AND MATERNAL HEALTH

There is a growing body of evidence that mobile devices can advance progress on MNCH in some of the most remote and resource-poor environments. As nearly 85% of the world's population is now covered by one or more commercial wireless signals, the wireless, information technology and health industries are extremely interested in supporting the growth of mHealth.³⁵

The following mHealth demonstration projects have shown encouraging results:

CONSULTATION AND COMMUNICATION

Nurse midwives in Dangme West, Ghana, used mobile phones to consult with their peers, supervisors and other medical colleagues on complex cases. Mobile phones helped patients to communicate with their health-care providers, which saved travel time and resulted in quicker, more efficient delivery of health services.³⁶

INFORMATION ON PREVENTION AND CARE

An intervention called mDhil in India provides health information in text messages of 40 characters or less. They cover various health topics not commonly discussed, and support disease prevention and patient self-management.³⁷

DISEASE SURVEILLANCE

In rural southern Tanzania, mobile phones were used to gather data on infant mortality.³⁸

MONITORING

Mobile technology was used in Norway to transmit data via text message from the glucometer of a diabetic child to a parent's mobile phone.³⁹

However, despite these promising projects, no integrated, interoperable system has yet been developed to support the full continuum of care for MNCH, and to share salient information among relevant parties.

INNOVATION IN DESIGN AND DIPLOMACY WITHIN PARTNERSHIPS

Greater innovation and efficiency are required to overcome the limited resources available to support health in developing countries. To this end, the public and private sectors need to work together and make the most of synergies to maximize their strengths. For example, the public sector can learn from the private sector's ability to innovate, take risks, achieve efficiencies of scale, address customer interests and exploit established distribution systems. The private sector can take advantage of the demand for health care being generated by emerging economies. In many cases, in order to achieve successful partnerships, it is necessary to foster a dialogue where one does not currently exist, and to establish partnerships based on mutual trust and respect.

Many of the private-public partnerships (PPPs) in mHealth have been developed in relation to MDG 6 (HIV/AIDS, malaria and other diseases) and MDG 8 (global partnership for development). In these areas, the deployment of mobile and other modern ICTs is an appropriate and efficient way to deliver care and to track results. In the area of MNCH, it would be possible to use wireless applications connected to databases to support more efficient registration of pregnant women, new mothers and babies. This information could be valuable in workforce planning and administration along the continuum of care, as illustrated by the following examples:

TRACNET

This is an integrated phone and ICT network designed to collect, store, retrieve and disseminate critical program, drug and patient information. In Rwanda, doctors and health workers use it to monitor and manage patients with HIV/AIDS. In Masaka, southern Uganda, it is being used to track and record the distribution of anti-retroviral medications, ensure drug adherence, electronically create and submit patient reports, and access the most up-to-date information about HIV/AIDS care and treatment.⁴⁰

MOBILE TECHNOLOGY FOR COMMUNITY HEALTH (MOTeCH)

In Ghana, the Grameen Foundation has used a grant from the Bill and Melinda Gates Foundation to develop a suite of services delivered over basic mobile phones. This provides relevant health information to pregnant women, via text and/or voice messages, and encourages them to seek antenatal care from local facilities. It also sends personalized messages about child health and routine immunizations.⁴¹



PROJECTUNITE

In India,, a clinical-decision support system (developed by the Robertson Research Institute) is being integrated into MoTeCH. The work is funded by a grant made by Johnson & Johnson to the Grameen Foundation. This will extend the capabilities of MoTeCH by enabling it to use the medical status of individual users to personalize the interventions provided. A randomized, controlled trial in 2011 will assess the impact of the platform on treatment success among HIV-1 infected patients who begin first-line anti-retroviral therapy.⁴²

TEXT4BABY

In the US, the White House announced the first large-scale mHealth partnership with the launch of a free “Text4baby” service. This provides timely and expert health information through SMS text messages to pregnant women and new mothers during the first year of their babies’ lives. Johnson & Johnson was a founding sponsor of Text4baby, along with BabyCenter, a Johnson & Johnson Company. It is a broad-based partnership, which includes federal, state and local governments, corporations, academic institutions, professional associations, tribal agencies and non-profit organizations.

LOOKING TOWARD THE FUTURE

The organic spread of digital media (i.e. mobile phones and the internet) to new populations has created valuable new channels for communication with citizens, patients, care givers and health workers. It has also created a range of potential opportunities, some of which are discussed below.

Women can receive health information that is both engaging and personalized through their mobile phones. This has potential to improve their “health literacy” and to educate them about healthy behaviors. By creating demand for services and encouraging compliance, this will complement other investments in health systems. Methods of communication include simple voice and text messages, and reminders based on basic personal records. Basic training for health workers can be delivered electronically, and mobile and electronic media can also be used for emergency calls and tasks such as data collection, completing checklists and managing workers.

Mobile and electronic media could be used to feed data collected in the field back into the health system. This type of activity could cover any information taken from basic electronic

medical records for mothers and children, such as registries of pregnancy and childbirth and records of disease outbreaks. These media can also potentially enhance the effectiveness of research and evaluation, by providing channels for rapid feedback from results-based health programs. This will support more efficient assessment, measurement and evaluation of programs based on data from the actual delivery of care.

Similarly, mobile and electronic media could provide communications links for applications that support health workers – helping them to manage their workloads, receive training, communicate with central clinics or educate their patients. Over time, this can be extended to a range of remote diagnostics connected wirelessly to medical facilities and expertise.

INTEGRATED WORKING

One of the most promising areas for MNCH could be the development of an ICT system or platform that is standards-based, open architecture and inter-operable. This would support the many different electronic programs used in developing countries and would reduce the fragmented nature of the investment in mHealth across the developing world. Organizations and programs could use the system to pick and choose from a suite of evidence-based communication strategies and components, which would support their initiatives to improve health care.

ICT is advancing from an approach based on IEC (information, education and communication) to one centered on IHC (interactive health communication) and mHealth. However, to support the needs of MNCH, a coordinated, transparent and integrated approach is required, based on five related principles:

I. Applying ICT to priority needs

MNCH and ICT experts need to answer the question: how can ICT, especially mobile solutions, assist in meeting the existing requirements of the MNCH community?

II. Designing and building solutions that strengthen systems

NGOs, government and industry need to work with users and stakeholders to design specific ICT reference models (and the content and policies to go with them) to support MNCH. These should be integrated and end-to-end systems, designed to scale and effective along the continuum of care. Key areas include: software for information sharing, content, diagnostic devices and capacity building.

III. Measurement and evaluation

New approaches to measurement and evaluation must be agreed and designed to meet the demands of the future information-rich environment. Both the health and economic value-chains need to be measured.

IV. Trial deployments of systems-strengthening solutions

A survey must be undertaken of current MNCH projects supported by ICT. Partnerships then need to be formed to contribute technology, financing, content and/or time and expertise (local leadership or supporting work) to deploy and test new solutions.

V. Communications

All of the above activities must be exposed to global input and use, and there must be full coordination and information sharing between the work streams. A virtual, interactive platform, would serve this need best. One idea would be to embrace the Maternal and Newborn mHealth Initiative (MNMI).⁴³ This growing public and private partnership takes a science-based approach, which includes: priority setting; needs analysis; integrated design; measurement (including formative, operational and summative research and evaluation); and integrated communication. The MNMI includes the mHealth Alliance (hosted by the United Nations Foundation), the Partnership for Maternal, Newborn and Child Health (PMNCH), the Digital He@lth Initiative, BRAC, the White Ribbon Alliance, PATH, the wireless industry, and other stakeholders. All share the goal of applying the benefits of modern ICT, especially mobile, to help achieve the MDGs and strengthen country health systems, starting with MDG 5 (improve maternal health).

Similarly, the next generation of opportunities in digital content and connectivity can be embraced by the PMNCH, the IWG and the Global Strategy for Women's and Children's Health via the Broadband Commission's Plan of Action for 2010-2015.⁴⁴ This follows the delivery of the final report of the Broadband Commission for Digital Development to the UN Secretary-General and member states on 19 September 2010, prior to the 2010 MDG Summit.

Given the potential of mobile and broadband networks, we have only just begun to leverage the many ways that mobile technology can help poor and needy people around the world. For example, the private sector is engaging in multiple ways as Johnson & Johnson recently announced a new commitment to provide health information to pregnant women in six developing countries via existing mobile phones.

CONCLUSION

In summary, successful mHealth initiatives can best be developed with multidisciplinary input, creativity, collaboration and partnership.

Ideally, it will be essential to:

- Reach underserved and remote populations by integrating telecommunications core business expertise with national telecommunications infrastructure – taking into account political realities, the national health infrastructure and health priorities
- Identify and evaluate health needs highlighted by the data-gathering capacity of mHealth, while leveraging resources to meet those needs
- Understand and promote interactive health communications that enhance the health literacy of women and mothers
- Leverage and engage multiple stakeholders to construct innovative models for mHealth, which take into account the constraints of a country's health system and a community's purchasing power

It is through public-private partnerships or “public-interest partnerships” that progress can be made in achieving the MDGs on maternal, newborn and child health.

5. NEW AND EMERGING MEDICAL TECHNOLOGIES

Bill & Melinda Gates Foundation: Program Officers *Andrew Serazin* and *Margaret Cornelius*

The last century has seen some remarkable improvements in maternal and neonatal health in the wealthiest parts of the world. Pregnancy outcomes have improved dramatically – reducing maternal mortality, stillbirth and neonatal mortality – and much of this can be traced to specific medical interventions. These include: the use of antibiotics for infections and blood transfusions for hemorrhages; the monitoring of fetuses for the risk of asphyxia in the antenatal and intrapartum periods; safe cesarean section; and the use of antibiotics, surfactant, corticosteroids and mechanical ventilation for newborns. The impact of these improvements has been increased by early diagnosis of medical complications – which prevents some of the most severe consequences – and by the ability to provide appropriate medical care rapidly when they occur.

Unfortunately, pregnancy outcomes have improved much less in the developing world. Most of the world’s approximately 350 000 maternal deaths (2008), 3.2 million stillbirths and 3.6 million neonatal deaths occur in developing countries.^{45 46} In those countries, nearly half the world’s births (60 million) occur outside of medical facilities, and most are attended – if at all – by untrained or minimally trained birth attendants. Many of the birth attendants are illiterate and cannot read and interpret numbers. Indeed, in those countries there are few trained health professionals or functional hospitals, and people often have few resources, little or no clean water or electricity, and poor transportation.

A critical set of conditions (shown in the box, right) accounts for the majority of maternal, fetal and neonatal deaths. These problems are especially acute in sub-Saharan Africa and South Asia, which have the highest rates of maternal, fetal and neonatal mortality and the lowest use of hospitals for delivery or newborn care.

Major causes of maternal mortality, stillbirth and neonatal mortality

Maternal mortality:

- Hemorrhage
- Serious infection/sepsis
- Pre-eclampsia/eclampsia
- Complications of abortion
- Obstructed labor/ruptured uterus

Stillbirth:

- Hemorrhage
- Fetal infection/sepsis
- Pre-eclampsia/eclampsia
- Obstructed labor
- Syphilis
- Malaria

Neonatal mortality:

- Premature birth
- Asphyxia
- Neonatal sepsis/pneumonia

Uptake is equally low for other potentially life-saving interventions aimed at mothers or infants. While investments in infrastructure, transportation and other basic health services can overcome some of these barriers, there is an opportunity to create the next generation of medical technologies to save lives at the “frontline” of care. We see three essential elements to this approach:

- I. Proving the effectiveness, at scale, of technologies in development
- II. Adapting proven high-cost technologies for low cost and high performance
- III. Seeding the next generation of ideas

Approximately 60% of newborn deaths (2 million) could be prevented annually by improved access to interventions that do not currently reach those most in need.⁴⁷ In many cases, these technologies have proven efficacy in controlled clinical contexts, so the challenge is to conduct studies that examine how they would work under “real world conditions.” An example from maternal health is provided by Gynuity Health’s project to study how misoprostol, a pill that can prevent and treat postpartum hemorrhage, can be safely used outside of tertiary-level facilities.⁴⁸ In newborn health, we also know that there are a number of promising interventions being developed, particularly for preventing infections. For example, trials are underway to test the treatment of umbilical cord and skin antisepsis with chlorhexidine, and the use of topical emollient therapy to prevent invasion of pathogens through the skin barrier.

Many maternal and newborn technologies are currently in use in well-resourced hospitals, but need to be further adapted for cost-effective use in the home, in communities and in primary-clinic settings. A suite of preterm newborn technologies provides a clear example. Antenatal corticosteroids, administration of surfactant after birth, and mechanical ventilation have all been used in the developed world to reduce drastically infant mortality due to respiratory problems. With recent advances in biopharmaceuticals and medical device

Selected technologies with potential to impact maternal and newborn health

- Community-based antenatal administration of corticosteroid
- Community-based application of surfactant
- High-performance, low-cost infant ventilators
- Blood-pressure management devices
- Safe and appropriate ultrasound machines
- Devices to monitor the progress of labor
- Markers for early detection (first trimester) of pre-eclampsia
- Simple approaches to diagnosing postpartum hemorrhage
- Phototherapy for neonatal jaundice



technologies, it is worth investigating whether the performance of these relatively complicated and expensive technologies can be simplified.

Numerous emerging technologies are at various stages of development by independent inventors, large healthcare companies, universities and non-profit organizations. For example, the Grand Challenges Explorations initiative has encouraged inventors from across the world to put forward thousands of new technology concepts for improving maternal and newborn health. This highlights the depth of the pool of emerging technologies still to be developed.⁴⁹

These technologies serve different clinical needs (e.g. maternal hemorrhage versus newborn asphyxia) and face a variety of uncertainties in their ultimate delivery (e.g. cost constraints, user specifications and private markets). In addition there is a growing interest in bundling these interventions by the time period when they are effective (e.g. antenatal, intrapartum or postnatal) and by service-delivery mode. The latter might be at home or in the community, or through outreach or at health facilities, which would theoretically increase the cost-effectiveness of the intervention and thus lead to greater coverage.⁵⁰ In practical terms, interventions are bundled according to the type of health worker delivering them, and the place and time at which patients receives them.

Furthermore, the potential of any technology, whether in health care, agriculture or information technology, can only be realized when it is used. A wide variety of powerful attitudes and cultural practices affect utilization of maternal and newborn health technologies, so it is essential that inventors and designers take these human factors into consideration. Similarly, the uptake or performance of new technologies will be affected by external environmental factors, especially in the developing world. For example, barriers to utilization will include factors such as the patient's distance from hospitals or skilled attendants, and the absence (or unreliability) of electricity, skilled maintenance personnel and replacement parts.

To help give guidance across this broad landscape of technologies, the *Maternal and Neonatal Directed Assessment of Technologies* (MANDATE) project will provide a comprehensive framework for understanding and quantifying the potential of technologies to deliver health impact for maternal and neonatal health. It combines clinical and technical feasibility considerations with end-user preferences and specifications to generate information that will help developers and funders make informed decisions about the most promising technologies – especially where they relate to trade-offs in technology design or prioritizing specific sets of technologies.⁵¹

We have great expectations for the potential that new and emerging technologies can have in terms of improving health outcomes for mothers and their babies.

6. INNOVATIVE TECHNOLOGIES FOR WOMEN'S AND CHILDREN'S HEALTH

Christopher J. Elias, MD, MPH, President and CEO, PATH

Health care for women and children often focuses on the critical periods of pregnancy, childbirth, and the early weeks of infancy. However, to achieve the health-related Millennium Development Goals, it is also necessary to address women's and children's health more broadly and to consider the use of innovative technologies. These advances can enable women to control their contraception, protect them and their children from the most common causes of disease, and support accurate diagnosis to ensure appropriate treatment. To develop new technologies, innovative partnerships harness the strengths of both the public and private sectors to deliver accessible, sustainable advances in health to populations in need. This paper considers some technologies and approaches that can significantly improve the health of women and children.

PRODUCTS IN THE PIPELINE TO IMPROVE THE HEALTH OF WOMEN

NEW CONTRACEPTIVE TECHNOLOGIES

Reducing fertility rates contributes significantly to declines in maternal mortality rates, so effective, readily available contraception has an important role in women's health.⁵² Examples of new contraceptive technologies in the pipeline include female condoms, one-size-fits-most diaphragms, and injectable contraceptives packaged in easy-to-use, single-use syringes. These technologies can give women greater control over their fertility and are specifically designed for low-resource environments.

POSTPARTUM HEMORRHAGE PREVENTION AND TREATMENT

Postpartum hemorrhage is a leading cause of maternal mortality, but many cases can be easily prevented by an injection of the hormone oxytocin. To make this as easy and safe as possible, doses of oxytocin have been made available in Uniject®—a prefilled injection device. Oxytocin in Uniject has great value for birth attendants who either work alone or have limited injection skills. Use of the device can potentially increase uterotonic coverage to all levels of the health care system, as well as to women who give birth at home. When



hemorrhage does occur, an antishock garment can be used to control bleeding by applying counter pressure to the lower body. Balloon tamponades are devices used to exert direct pressure at the site of postpartum hemorrhaging, and may be combined with hemostatic agents to facilitate their delivery to the hemorrhage site.

CERVICAL CANCER PREVENTION AND TREATMENT

A disproportionately higher number of women die from cervical cancer in the developing world than in wealthy countries.⁵³ However, human papillomavirus (HPV) vaccines can protect women against the primary cause of cervical cancer. Screening technologies that can help detect HPV, and markers that detect the progression of HPV to cervical cancer, are critical tools to manage the treatment and care of women.

OTHER DIAGNOSTICS

Point-of-care diagnostics that detect sexually transmitted infections enable health care workers to treat women quickly and protect them and their unborn children from serious disease. Diagnostics that detect maternal and neonatal sepsis enable health workers to treat infections appropriately by administering antibiotics.

Uniject is a registered trademark of BD.

PRODUCTS IN THE PIPELINE TO IMPROVE THE HEALTH OF CHILDREN

NEW VACCINES

Pneumonia, diarrhea, and malaria accounted for 41 percent of all deaths worldwide in 2008 among the under-fives.⁵⁴ However, new, improved, and less-costly vaccines are in the pipeline for each of these illnesses and hold significant potential for reducing child mortality. Other vaccines, including one to target the most prevalent strain of meningitis in sub-Saharan Africa, address specific diseases that disproportionately affect poor people.

NEW DIAGNOSTICS

Appropriate treatment of disease relies on accurate diagnosis. New diagnostic technologies offer the potential to increase the effectiveness of treatment and simultaneously reduce the risk of drug resistance by working to eliminate over-treatment of poorly diagnosed symptoms. For example, as the incidence of malaria falls due to the deployment of insecticide-treated bednets and other preventive interventions, health care workers can no longer assume that a patient with a fever has malaria. A fever panel diagnostic tool can identify multiple potential causes of the fever, enabling health workers to administer the appropriate treatment. Accurate diagnosis and treatment also reduce the risk of the malaria parasite developing drug resistance.

SAFE INJECTION DEVICES

Injection devices designed to be used by non-medical and less-skilled health care workers can potentially enable governments to reach more people in need of health services. For example, use of the antibiotic gentamicin in Uniject (see above) could be of great importance for the management of newborn sepsis, both in communities and, potentially, for hard-to-reach patients. Similarly, steroids in Uniject could potentially be useful during preterm labors at the community level and could be administered by less-skilled personnel. Corticosteroids reduce the risk of respiratory distress syndrome and intraventricular hemorrhage in premature babies, but are known to be much underutilized.⁵⁵ However, anyone likely to administer steroids in Uniject would first have to be trained to accurately estimate gestational age and to carefully assess any woman who presented with uterine contractions in gestational ages less than 36 weeks.

NEW DELIVERY TECHNOLOGIES

New technologies to protect vaccines and medicines during transport and storage can extend the coverage area for these interventions and ensure vaccines reach their target populations. These technologies include heat- and freeze-resistant vaccine formulations, solar-powered refrigerators, and alternative formats—such as vaccines that can be administered through nasal sprays or microneedles.

INNOVATIVE PARTNERSHIPS

DEVELOPING IN-COUNTRY CAPACITY

The developing world is increasing its regulatory sophistication and expertise in clinical trials and manufacturing. In part, this results from work with local innovation partners, which generates both economic and health benefits. For example, the new meningitis A vaccine for sub-Saharan Africa, MenAfriVac™, resulted from a public–private partnership implemented by the Meningitis Vaccine Project. This partnership between PATH, the World Health Organization, and a developing-country partner (Serum Institute of India) resulted in an appropriate, affordable product. It costs just 40 US cents per dose, meets public health needs, and offers a reasonable return on investment.

CONCLUSION

The diagram below illustrates the success factors needed to develop and deploy innovative technologies for improving the health of women and children. It shows that product developers who solicit input from communities that are directly affected by health issues will gain a clearer understanding of their problems, the most appropriate solutions, and the preferred product profiles.

Innovative partnerships that use both public and private resources during product development are more likely to create accessible, high-quality interventions and to generate reasonable financial returns. Firm financial commitments and strong political leadership throughout the processes of engagement and development can enable a supportive policy environment and ultimately lead to the desired health impact.



7. INNOVATIONS ON THE INDIAN SCENE THAT RELATE TO IMPROVED MATERNAL AND NEWBORN HEALTH

Dr T Sundararaman, Executive Director, the National Health Systems Resource Centre – Technical Support Agency to the Ministry of Health and Family Welfare, Government of India

BACKGROUND

This paper focuses on seven important innovations that address maternal, newborn and child health (MNCH) in India:

- I. Janani Suraksha Yojana – a conditional cash-transfer scheme to promote institutional delivery
- II. Multi-skilling of medical officers with specialist skills to provide emergency obstetric care
- III. Community health workers in maternal and child health: the ASHA program
- IV. West Bengal’s Accelerated Nurse Training and Deployment approach
- V. Emergency referral transport for obstetric intranatal care
- VI. Mobile-based reporting integrated into health management information systems
- VII. Name-based information tracking

A CONDITIONAL CASH-TRANSFER SCHEME TO PROMOTE INSTITUTIONAL DELIVERY

The Janani Suraksha Yojana scheme (JSY) was launched under the National Rural Health Mission as a centrally sponsored scheme. Its objective is to reduce the maternal mortality ratio and infant mortality rate by promoting institutional deliveries and empowering and enabling women to access safe delivery in health facilities.

The scheme provides INR 500 (500 Indian Rupees) cash assistance to all pregnant women in families living below the poverty line, wherever their babies are delivered. They receive an additional INR 700 if they go to a public health facility or to an accredited private sector facility for delivery. An incentive is also given to accredited social health activists (ASHAs), or any equivalent health worker, to motivate them to escort pregnant women to institutions for delivery.

JSY covers both public and private institutions, so beneficiaries are entitled to the JSY incentive if they opt to use a private facility accredited under the scheme. There are some variations across states in the inclusion criteria and implementation packages, which enables the scheme to focus on poor women in states with low percentages of institutional deliveries. The package also varies for rural and urban areas, taking into account the larger expenses incurred for transport in rural areas.

The scheme has experienced phenomenal growth in the last three years. Starting with about 700 000 beneficiaries in 2005-06, the total had reached 7.84 million in 2009-10 – a tenfold growth.⁵⁶ Though the JSY scheme has informally demonstrated positive results in enabling women to reach institutions to seek delivery care, the Ministry of Health and Family Welfare is now undertaking the first formal evaluation to assess and comment on the outcomes of the scheme.

<p>LOW-PERFORMING STATES (LPS)</p>	<ul style="list-style-type: none"> ▪ All pregnant women delivering in government health centers such as: sub-centers (specifically approved for institutional delivery by the state), Primary health centers(PHCs), community health centers (CHCs) and first referral units (FRU and general wards of district and state hospitals. ▪ Below poverty line (BPL) and scheduled castes and scheduled tribes (SC/ST) women delivering in accredited private institutions.
<p>HIGH-PERFORMING STATES (HPS)</p>	<ul style="list-style-type: none"> ▪ BPL pregnant women aged 19 and above delivering in government health centers such as: sub-centers (specifically approved for institutional delivery by the state), PHC/CHC/FRU and general wards of district and state hospitals or accredited private institutions. ▪ All SC/ST women delivering in government health centers such as: sub-centers (approved for institutional delivery by the state), PHC/CHC/FRU and general wards of district and state hospitals or accredited private institutions. ▪ For SC/ST women, the age restriction of 19 is not applicable. ▪ Cash assistance for institutional delivery would be limited to two live births for all the women.
<p>LPS & HPS</p>	<ul style="list-style-type: none"> ▪ BPL pregnant women, aged 19 and above, who delivered at home are entitled to JSY benefits of INR 500 per delivery. Such JSY benefits would be available only up to two live births.

CATEGORY	RURAL AREA		TOTAL	URBAN AREA		TOTAL
	Mother's package	ASHA's package		Mother's package	ASHA's package	
INSTITUTIONAL DELIVERY	Mother's package	ASHA's package	INR	Mother's package	ASHA's package	INR
LPS	1400	600	2000	1000	200	1200
HPS	700		700	600		600

MULTI-SKILLING OF MEDICAL OFFICERS WITH SPECIALIST SKILLS TO PROVIDE EMERGENCY OBSTETRIC CARE

Multi-skilling refers to a strategy where existing health personnel, who are trained and certified in one skill-set, are provided with a further set of skills (often associated with another qualification) to enable them to provide an expanded service package. For example, medical officers with the MBBS qualification (Bachelor of Medicine and Surgery) are not trained to do surgery, especially C-sections, or to administer anesthesia. However, under the National Rural Health Mission (NRHM), multi-skilling of these medical officers has been adopted to address the shortage of specialists. As part of the strategy, medical officers with the MBBS qualification are trained in emergency obstetric care (Emoc) for 16 weeks and in life-saving anesthesia skills (LSAS) for 18 weeks.

These medical officers are then permitted to manage complications in delivery, including those requiring surgery and blood transfusion, which could previously be managed only by a specialist. These multi-skilled medical officers are posted at secondary-level care facilities. About 25 out of 35 states have rolled out this training. By 2009, about 519 medical officers had completed multi-skill training in Emoc, and 657 in LSAS, and are now providing specialty services at health facilities where specialists are not present.

COMMUNITY HEALTH WORKERS IN MATERNAL AND CHILD HEALTH: THE ASHA PROGRAM

One of the key strategies under the NRHM is the Community Health Worker strategy. One Accredited Social Health activist (ASHA) is appointed for every 1000 population in a village—large villages would have more than one ASHAs. In tribal areas, even smaller habitations would be sanctioned an ASHA each, . Selected from within the village, and accountable to



it, the ASHA is trained to work as an interface between the community and the public health system. The ASHA forms the first point of contact for anyone, especially a woman or child, who finds it difficult to access health services.

Usually the ASHA is a female resident of the village with a formal education up to eighth grade. The selection process for the ASHA is designed to encourage greater participation and ownership of health issues within the community. The ASHA undergoes 23 days of induction training in five modules, and 12 days of refresher training, mainly to cover areas related to maternal and child health. A new module focused on maternal and newborn health – built on the experience of the home-based newborn care model pioneered in Ghadchiroli – has now been incorporated and is being implemented.

The ASHA was initially envisaged as a volunteer with a performance-based incentive. However, with ASHAs facing an increasing work load and responsibilities, many states are also considering the introduction of some element of fixed payment. The ASHA's role is a mix of facilitator, community mobilizer, rights activist and service provider. Recent figures show that 749 000 ASHAs have been selected, of whom 565 000 have completed training in four modules.⁵⁷ Today, the ASHA is one of the best-known faces of the NRHM, and has shown some positive results in generating health awareness and demand for services in rural areas.

WEST BENGAL'S ACCELERATED NURSE TRAINING AND DEPLOYMENT APPROACH

India faces a huge crisis of human resources for health. The recommended norm for skilled service providers is 25 per 10 000 people. However, many states have less than 10 per 10 000. The nurse-to-doctor ratio is also very poor in many states, at 0.6 to 1 against a norm of 3 to 1. One of the major components of the NRHM is the sanction of a second auxiliary nurse midwife (ANM) at more than 100 000 sub-centers. A sub-center provides immunization and outreach services, including midwifery and antenatal care, for a population unit of 5000. However, most states that needed additional ANMs, such as West Bengal, simply did not have enough nurses available for recruitment. Even if nurses were available, it was a big problem to persuade them to work in remote and underserved rural areas.

The State of West Bengal faced the challenge of recruiting 10 000 ANMs within five years. It simultaneously had to address its poor record for ANMs staying at their places of work and being available to attend women who want to have their babies in institutions. West Bengal addressed the problem by adopting the strategy of recruiting ANMs from specific localities,

and then deploying them back to the same places after training. Community partnerships and public-private partnership were used to expand training capacity and deployment.

As a first step, the state government revived its 24 ANM schools, which had become run-down during the 1990s. Another 18 were started up in partnership with private hospitals. Then each local government body at village level (panchayat) was given the powers to select a woman resident in the village to be sent for training as ANM for that village. The criteria for selection were that the woman should have completed schooling and been married (to avoid the risk of her leaving the village due to marriage) and that she should be assessed as likely to remain resident in that village due to her family, property and social circumstances. During the process of training, her links with her village were maintained, and as soon as she completed training she became an employee of the local government institution as an ANM. A plan was drawn up to meet the entire requirement of 10 356 ANMs in three to four years.⁵⁸

EMERGENCY REFERRAL TRANSPORT FOR OBSTETRIC INTRANATAL CARE

The need for referral transport in the Indian public health system is mainly met through public-private partnerships (PPPs). The most important emergency ambulance services are provided by the Emergency Management and Research Institute (EMRI), launched in 2005. The EMRI handles medical, police and fire emergencies through the 24x7 “1-0-8 emergency service.” This service is free for users, and is delivered through emergency-call response centers. About 10 states have signed a memorandum of understanding with the EMRI. This allows for all the costs to be borne by the states, while the EMRI undertakes the technical and operational management. Currently there are about 2600 ambulances across 10 states. Each ambulance is manned by a trained emergency medical technician and is equipped with a mobile phone (cell phone), which can be used for consultation with the in-house emergency response care physician. The ambulances carry the most common medications and equipments needed for first aid and pre-hospital care. About 60% of the emergencies the service handles in a state like Andhra Pradesh involve pregnant women being moved from their homes to health facilities for delivery.⁵⁹

Another example of the PPP model is the Janani Express service in the state of Madhya Pradesh. This offers round-the-clock transport to bring pregnant women to secondary-care public health facilities. Service contracts are drawn up by the state health authorities, and



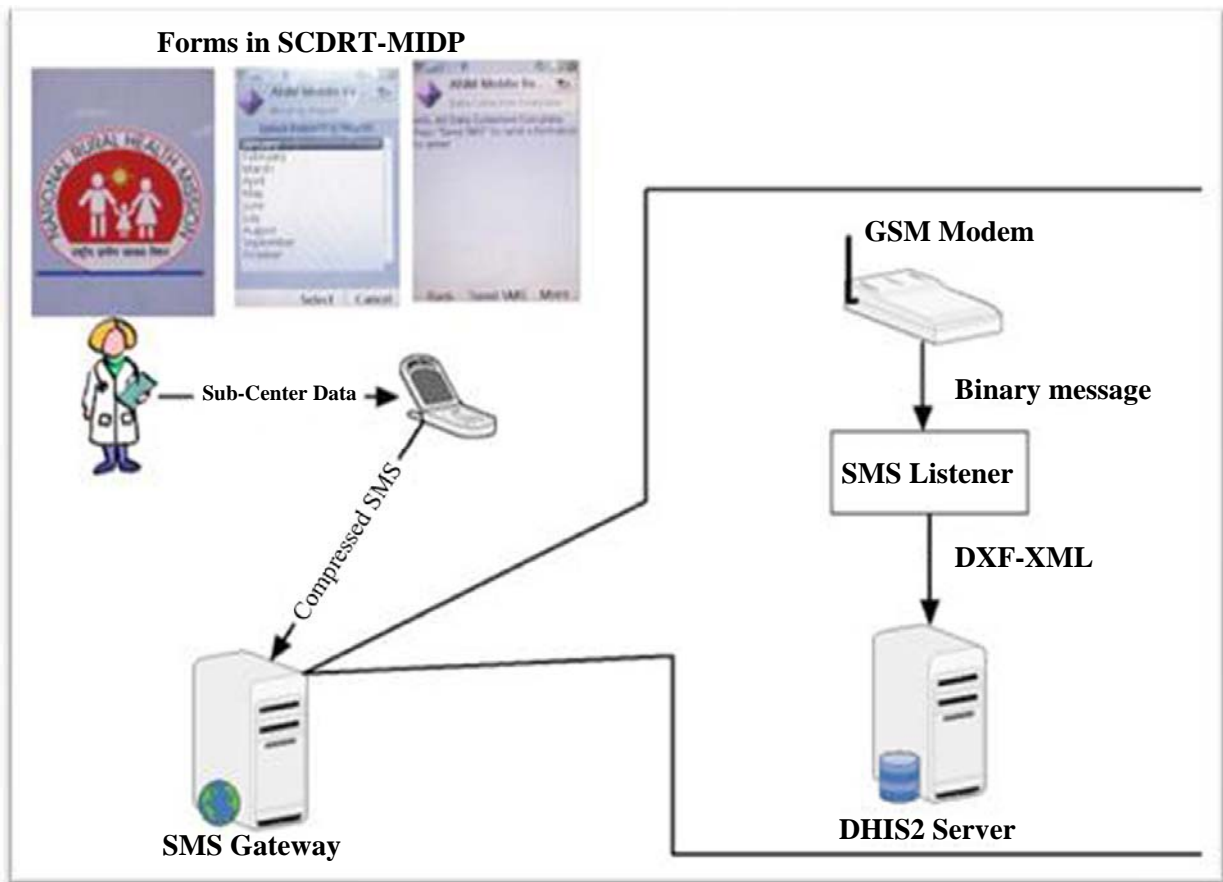
are signed by the district- or block-level authorities and a local transport provider. The vehicles provided are not equipped as ambulances and are primarily used for transferring patients. Currently, the Janani Express service is available across 287 blocks with six call centers in the state of Madhya Pradesh. The latest figures (December 2009) show that 30% of rural JSY (see section 1) beneficiaries were able to access institutional deliveries using the Janani Express service.

Some states have NGO partnerships (West Bengal) or local PPP arrangements (Bihar) that provide transport for intranatal obstetric care.

MOBILE-BASED REPORTING INTEGRATED INTO HEALTH MANAGEMENT INFORMATION SYSTEMS

The health sector is showing increasing enthusiasm for using new telecommunications and mobile devices to improve delivery of health care. For example, an initiative of the National Health Systems Resource Centre (NHSRC) using a mobile-based sub-center data registration and transmission (SCDRT) application is a step towards mHealth (the use of mobile-phone technology in health care). The mobile-based SCDRT application has been designed and developed to capture sub-center reporting through mobile phones. This application enables ANMs to send monthly reports by SMS text from their mobile phones up to the next level (primary health center, block or district). About 75 data elements are reported on each month, and it takes about 10 to 15 minutes to key in and transmit the data. Primary health centers need to transmit about 200 data elements, and these too can be transferred by mobile phone. Most of these data elements relate to reproductive and child-health services, although some are related to other areas of care. Child health data relate mainly to children in the first five years of life.

The data transmitted electronically are integrated into the state's application or database for the respective facility. Furthermore, SCDRT is not a standalone application. It has been integrated with district and state health management information systems and applications, ensuring that any sub-center report is included in the aggregated report sent up through the health system. The entire application has been developed on open-source platforms, which allows it to be integrated anywhere, and means it can be used without license fee or installation charges anywhere in India (and potentially anywhere in the world).



The implementation of SCDRT was completed in two phases: a pilot phase in one-block areas in Gujarat, Kerala, Nagaland, Himachal Pradesh and Rajasthan; and a scaling-up phase in the entire state of Punjab, which has just started. Other states are likely to follow.

The main benefits of the mHealth system, as seen in the pilot blocks, are:

- I. A great reduction in time and effort spent on paper reporting
- II. An increased validity of data, because errors in data entry and aggregation are reduced. The work load of the data-entry operator at the block level is also decreased
- III. The mobile phones can be used for (pre-paid) verbal communication between the service providers and their peers, supervisors and even beneficiaries



NAME-BASED INFORMATION TRACKING

For closer monitoring of mortality indicators, the Ministry of Health and Family Welfare has launched a name-based information tracking system (NBITS). This will help track health services provided to each pregnant women registered for antenatal care, and the immunization cycle of each child. In addition, it will help service providers to use each patient's recorded treatment history to provide follow-up care – for example in the treatment of chronic conditions such as leprosy, HIV or tuberculosis.

The implementation of the NBITS for pregnancy and immunization has been planned in three phases, and each state is at a different phase depending on how rapidly it is progressing. The data are delivered in written form to the block, where they are entered into a computer so the aggregated numbers can be transmitted upwards. In response, schedules of work for service providers are fed back down the system to help them follow up on each case. A future enhancement would be the integration of unique numbers for each individual. This would also help to ensure continuity of services for migrant workers.

One pilot project undertaken by the NHSRC has begun experimenting with an open-source solution in 10 districts of the country. Another pilot program, e-Mamta, was developed by the National Informatics Centre as a public sector enterprise in the state of Gujarat. Based on preliminary positive reports from the state, consideration is being given to scaling up the system to cover the whole country.

Line listing and follow-up is being undertaken to ensure better outreach to marginalized sections of the population, more extensive coverage and better accountability.

8. INNOVATIVE ONLINE COLLECTION METHODS FOR DECISION - MAKING

Benjamin Schwartz, MD, Senior Director, Health Programs, CARE USA

INTEGRATED CONTINUOUS SURVEYS

It is possible to monitor trends in key health indicators by intermittently collecting high-quality data, such as five-yearly demographic and health surveys (DHS). However, this is not an effective means of generating real-time information to guide programmatic decisions that could accelerate progress in health outcomes. An innovative way of addressing this challenge is to use “integrated continuous surveys”. These work on an ongoing basis, collecting DHS-like household survey data, and information from health facilities through clinical observations, review of records, and exit interviews of clients. Results are reported monthly – from individual survey clusters as well as geographically linked clusters (for example, clusters within a single district or from neighboring districts).

To track changes in a health indicator over time, temporal rolling averages are calculated using data from three consecutive months.⁶⁰ Statistically valid estimates for more common health events can be tracked on a monthly basis or, for less common events, data can be aggregated and reported less often. This approach has been introduced in Peru, which has implemented a continuous DHS, and in Nicaragua, which has had integrated continuous monitoring of nutritional interventions since 2003. Peru’s continuous surveys began in 2003 and were evaluated in 2007.⁶¹ The findings of this external evaluation suggested that the approach was successful, with the data being held in high regard by government and non-government users in Peru. The evaluators recommend this approach for countries that currently conduct periodic surveys. Although the cost of fielding continuous survey teams may be substantial, this strategy is essentially cost-neutral if it replaces the similarly expensive periodic surveys while providing additional value for decision-makers.

QUALITY IMPROVEMENT

In addition to providing information that can support data-driven management, continuous survey data can also contribute to quality improvement (QI) processes. QI improves health outcomes by assessing and improving care processes. This is done in a participatory manner with QI teams identifying problems, considering potential solutions, and testing a solution using “Plan-Do-Study-Act” cycles.⁶² The success of this approach depends, in part,



on the availability of timely data that can be used to assess the impact of the changes that were implemented. This allows QI teams and collaboratives to monitor progress and identify where it is necessary to modify strategies to achieve optimal success. Results from USAID's Quality Assurance Project indicate that this approach may help to strengthen health systems and improve outcomes.⁶³

Other strategies for ongoing data collection and feedback may also contribute to improving maternal health outcomes. This could include, for example, a program of surveillance for maternal deaths with social and medical audits to identify contributing factors. Sharing results with health officers, facility staff and community organizations leads to discussion and problem-solving to avoid further deaths. This can identify ways of improving outcomes by strengthening health systems and promoting changes in behavior in families and communities. Because maternal deaths are infrequent in any community – even in countries or areas with a high maternal mortality rate – sharing the data broadly among health facilities, geographical units, and communities can help to prevent maternal deaths by reminding people of the key factors to attend to in their area.

Although evaluations have been limited, data from Senegal, for example, showed that facility-based audits contributed to a significant reduction in maternal mortality.^y During a three-year period, all maternal deaths at a district hospital were audited and the results presented to a committee composed of hospital staff, local and national health authorities, and community representatives. This group agreed on recommendations which were implemented by doctors, midwives, and nurses, under the supervision of the district health manager. Overall, 13 recommendations of the audit committee were implemented, addressing a range of interventions occurring at the hospital as well as in primary care centers and the community. Compared with the baseline, in the project's third year, the maternal mortality rate decreased by more than half, from 830 per 100,000 to 410 per 100,000.⁶⁴

9. INNOVATIONS IN PROMOTING GENDER EQUITY AND ACCOUNTABILITY

Benjamin Schwartz, MD, Senior Director, Health Programs, CARE USA

Interventions at the community level can address social norms and establish a greater role for the community in governance and accountability systems. These interventions can significantly improve maternal health behaviors, the functioning of health systems, and outcomes for mothers and their children. Gender inequality is a key factor contributing to high rates of maternal mortality. And two of the most important – though not the only – factors in gender inequality are women’s lack of decision-making capacity and lack of control of resources.

TESTING THE EFFECTIVENESS OF INTERVENTIONS

A controlled trial was carried out to assess whether addressing gender and social norms improved maternal and reproductive health outcomes. CARE, in partnership with the International Center for Research on Women, implemented this trial in two districts of Uttar Pradesh, India. In the intervention communities, program staff participated in activities leading to reflection on – transformation of – their own attitudes to gender. These were followed by household and community activities with women and men, to promote dialogue and change attitudes to gender and sexuality, and the behavior that accompanied them.⁶⁵

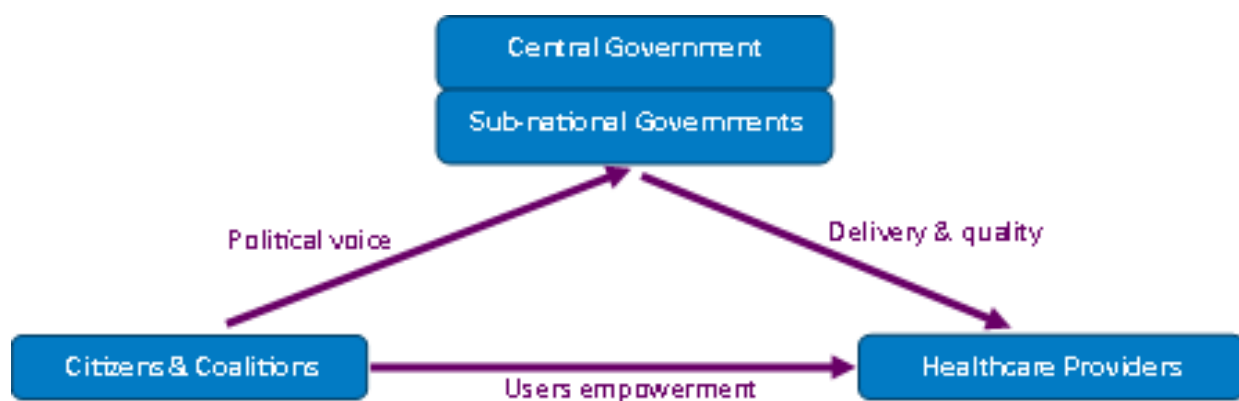
⁶⁶ Comparison of intervention and control groups showed significantly increased odds ratios in the intervention group for:

- Birth preparedness (adjusted OR = 3.2)
- Delivery with a trained healthcare provider (adjusted OR = 3.2)
- Discussion of family size (adjusted OR = 1.9)
- Sharing household chores (adjusted OR = 2.7)
- Women’s ability to refuse sex (adjusted OR = 12.5)
- Women’s mobility (adjusted OR = 7.4),
- Women having their own money to spend (adjusted OR = 10.5)

While these results have not yet been replicated elsewhere, the strategies used have been implemented in many programs where addressing underlying gender inequity and social norms contributed to improved outcomes.

INTRODUCING COMMUNITY INPUT – PERU

Accountability and governance systems that include community input, especially from women and marginalized groups (such as people from lower castes, in South Asia), contribute to improved healthcare policies, and services that are higher quality and more acceptable. In Peru, community engagement occurs at each level of the “accountability triangle”, illustrated below. The diagram identifies areas in which community involvement can improve policy, quality and acceptability.



A consortium of civil society organizations in Peru convinced the government to include *ForoSalud* – community representatives – in any forum on health policy decisions.⁶⁷ In three provinces, *Vigilantes* – women from the community – act as monitors, observing maternal health services, interviewing women who use them, and regularly reporting to government ombudsmen. As a result, both delivery and quality of health services have improved. Users have also been empowered by means of local committees. These include government, the health system and community representatives, and provide oversight of first-level health facilities.⁶⁸ This combination of interventions has contributed to substantial reductions in Peru’s maternal mortality rate, and to the promulgation of national guidelines for improving maternal health care.

HEALTH FACILITY OPERATIONS AND MANAGEMENT COMMITTEES – NEPAL

Several of these same elements have been introduced in Nepal in several of the far western districts where CARE is currently implementing a USAID-funded child-survival program. As part of the decentralization of health services in Nepal, Health Facility Operations and Management Committees (HFOMCs) have been formed to provide governance of each facility. Participants include a health-care provider, a representative of the Village Development Council (VDC), and community representatives. To strengthen the HFOMCs, CARE provided training in organization, management, resource mobilization, planning, monitoring and evaluation, as well as regular follow-up and monitoring. Assessment showed that, after the intervention, significantly more health facilities had:

- Implemented an action plan (100% vs 3%)
- A written commitment from the VDC to support the program (86% vs 3%)
- Engaged in fundraising at the local level (86% vs 34%)

A second component of the program in Nepal is citizen pressure on local governments to protect the rights of women, lower-caste (*Dalit*) and other marginalized populations. In collaboration with a local NGO, CARE catalyzed the formation of *Dabi*, or pressure groups. These groups met weekly to increase their awareness of their rights, identify and analyze problems, and define solutions. They developed alliances with other community organizations, participated in HFOMCs, and took direct action in their communities. Issues addressed included domestic violence, caste-based discrimination, irregular availability of healthcare workers at facilities, and the practice of isolating women during menstruation and post-partum. Despite funding for this initiative ending in 2007, groups continue to meet and progress continues to be made.

10. INNOVATION IN SERVICE DELIVERY

Rohit Ramchandani, MPH. Senior Health Analyst, Strategic Policy and Performance Branch, Canadian International Development Agency (CIDA) and DrPH Candidate, Johns Hopkins Bloomberg School of Public Health

At no point in history has the world been so focused on improving health and averting unnecessary loss of life. Millions of preventable deaths occur each year throughout the developing world from diseases like malaria, AIDS and tuberculosis, and because many of the world's poor lack access to appropriate maternal and child health services. To counter this, major investments are being made to provide care and discover new treatments and technologies for the future. This new paradigm has the potential to save millions of lives, but it also draws attention to our ability (or lack thereof) to utilize new investments effectively, and to deliver health services systematically to those who need them most.

This paper aims to highlight examples of innovations in service delivery based on the experiences of the Canadian International Development Agency (CIDA). Under the Innovation Working Group's working definition, "innovation" is:

"... generally understood as the successful introduction of a new thing or method ... Innovation is the embodiment, combination, or synthesis of knowledge in original, relevant, valued new products, processes, or services."

In addition, we highlight "innovations" that, while not necessarily "new", could have benefits through replication and/or scale-up at the global level.

INNOVATIONS

THE REACH EVERY DISTRICT (RED) APPROACH⁶⁹

Developed by WHO and UNICEF, the RED approach addresses common obstacles to increasing immunization coverage by building district capacity and focusing on planning and monitoring. The approach emerged from a search for innovative strategies to improve stagnating immunization coverage. Based on the successful approaches of the Global Polio Eradication Initiative, and taking the district as the operational level, RED includes five components:

- Planning and management of resources
- Supportive supervision

- Re-establishing outreach services
- Linking services with communities
- Monitoring for action

Previously, regional and other inequalities in access to vaccines within a country were masked by the focus on national immunization coverage rates.⁷⁰ However, the RED approach increases equity of access within countries by concentrating efforts, and setting targets, at the district level. Within each district, it improves the targeting of hard-to-reach populations with limited or no access to health services.

FOCUS ON THE POOREST QUINTILE AND MOBILE SERVICES

It is of paramount importance to improve access to care, particularly for the most vulnerable and hard-to-reach populations, if we are to accelerate progress towards the health-related MDGs. Mobile services have an important role to play here.

ENGAGING CIVIL SOCIETY ORGANIZATIONS (CSOs)

Essential health interventions are still not reaching the poorest fifth of the population in many areas that account for the highest number of deaths. To counter this, CIDA has a program that engages in-country CSOs to deliver life-saving health services, such as anti-malarial drugs, antibiotics to treat respiratory infections and oral rehydration therapy (ORT) to treat diarrhea-related dehydration. CSOs already deliver a large proportion of front-line health care throughout the developing world⁷¹, in countries such as Sierra Leone, Uganda, and Indonesia. Their involvement alongside government institutions is expected to have a catalytic effect on strengthening the reach of programming and research⁷², and is expected to increase sustainability.

USING MOBILE CLINICS

Mobile clinics are run by teams of multi-disciplinary health professionals, such as community health workers, nurses and midwives. Their use during periods of humanitarian crisis has the potential to deliver maternal, newborn and child health (MNCH) services effectively in conflict areas and fragile states. As an example, CIDA and UNICEF are collaborating to



expand coverage of child survival interventions by establishing sustainable outreach services (SOS) in under-served and rural communities of Kandahar province in Afghanistan.

Local involvement is key to the success of SOS. Accordingly, community elders are encouraged to participate in planning and to help identify community focal points. Mobile teams of health workers go from village to village providing services at least four times per year. During these visits, health workers deliver immunizations and bi-annual de-worming tablets for children under five, and insecticide-treated bednets (ITNs) during seasons of high malaria transmission. They also identify suitable local individuals and train them to establish bases for the demonstration and distribution of ORT salts, micro-nutrients and zinc supplements. These services are building on the earlier experiences of the Pulse Immunization Campaigns, which used community structures as partners for planning and implementation.

Along with existing health facilities, SOS are ensuring access to health interventions for over 156,000 children under five, and approximately 29,000 pregnant women living in Kandahar province.⁷³ Through these mobile services, UNICEF is now able to reach 15 of Kandahar's 17 districts.⁷⁴

Community support and strong connections to the national system are essential, especially as the security situation remains a central challenge. Moreover, discussions with community leaders have helped to improve the reach of services. Nevertheless, there are still issues to overcome, such as the difficulty of recruiting female vaccinators due to cultural barriers and insecurity. These issues need to be addressed if services are to be expanded to include more comprehensive disease prevention, health promotion, family planning and reproductive care.

INTEGRATED COMMUNITY CASE MANAGEMENT (ICCM)

iCCM is a cost-effective, high-impact approach that aims to prevent and treat those diseases that kill the most children, including malaria, pneumonia and diarrhea. It works by training and equipping community health workers to diagnose and treat these diseases, which together kill approximately four million children each year, and account for over 40% of deaths among the under-fives.⁷⁵ Malaria and pneumonia can be fatal in children within 24 hours of symptoms developing, so treatment must be made available promptly if lives are to be saved.

iCCM is a proven strategy for reaching children at the community level and overcoming barriers to accessing care. It supports programs that achieve high equity because they reach the most vulnerable. They can also be a platform for other key interventions, such as

screening for severe acute malnutrition, delivering vitamin A supplements and injectable antibiotics (for neonatal sepsis), and supporting immunization and ITN campaigns. This type of programming is also a focus of the Catalytic Initiative to Save a Million Lives, which is being implemented in countries including Rwanda, Southern Sudan, Malawi, Mali and Sierra Leone.

CHILD HEALTH DAYS AND WEEKS (CHDW) AS A SERVICE DELIVERY PLATFORM

CHDW programs provide the main mechanism for distributing vitamin A supplements. They involve events organized to deliver an integrated, community-based package of low-cost, high-impact health and nutrition interventions for children aged from six months to five years. Other services, such as malaria prevention and immunization, are also provided and have helped to reduce inequities in service coverage by increasing the access of communities in poor and low-performing districts. In fact, the average coverage achieved by CHDW programs has been over 80%.⁷⁶ Canada was one of the first countries to fund CHDW and provide it with the impetus to reach countries such as Ethiopia, Madagascar, Mali, Mozambique, Tanzania, Zambia, Nigeria and Niger.

Studies should be undertaken into costing, cost-effectiveness and impact to consider CHDW as a platform for other health and nutrition interventions for MNCH. These might include: distribution of ORT salts to combat diarrheal diseases; promotion of iodized salt consumption; screening for and treatment of severe acute malnutrition; promotion of hand washing with soap; antibiotics to fight pneumonia; family planning; promotion of exclusive breastfeeding; complementary feeding; and/or provision of antenatal care.⁷⁷

GLOBAL POLIO ERADICATION INITIATIVE (GPEI) – AN ESTABLISHED PROGRAM LEADS TO INNOVATION IN SERVICE INTEGRATION AND HEALTH SYSTEMS STRENGTHENING

GPEI is the largest single public health project the world has ever known. Coordinated internationally, it is spearheaded by national governments, WHO, Rotary International, the Centers for Disease Control and Prevention (CDC) and UNICEF. Its work to strengthen immunization services can accelerate progress towards the Millennium Development Goals (MDGs) by:



- Increasing coverage with the full range of Expanded Program on Immunization (EPI) childhood vaccines (especially for measles)
- Facilitating the timely introduction of new vaccines against pneumococcal and rotavirus infections
- Assisting with the delivery of other important child survival interventions such as vitamin A, zinc supplementation, and distribution of ITNs

The infrastructure that has been established by the GPEI for the purposes of polio eradication encompasses both physical assets (including skilled human resources) and a combination of institutional arrangements and operating procedures that can be leveraged in new ways.

AFRICAN HEALTH SYSTEMS INITIATIVE – RESEARCH (AHSI-RES) PARTNERSHIPS

AHSI supports African-led efforts to strengthen health systems by emphasizing the scale-up of human resources for health. It also promotes synergies between multilateral, bilateral and research mechanisms (Canada's contribution under the Catalytic Initiative supports the AHSI).

Another component of the AHSI is support to African research partnerships (AHSI-Res). This is funded through the Global Health Research Initiative (GHRI), which is a unique research funding partnership of five agencies and departments of the Government of Canada. These include CIDA, the Canadian Institutes of Health Research (CIHR), Health Canada (HC), the International Development Research Centre (IDRC) and the Public Health Agency of Canada (PHAC). GHRI funds research on global health and strengthens the capacity to conduct global health research and apply findings to address real-world problems.

AHSI-Res brings together both decision-makers and researchers to look for innovative ways to strengthen health systems. Each team is co-led by a researcher and a decision-maker and works to connect research, policy and action to improve knowledge translation, health decision-making and programming across the sub-Saharan region. All solutions are aligned with government priorities.

In Malawi, for example, Dignitas International and the REACH (Research for Equity and Community Health) Trust have partnered with key stakeholders to test a novel intervention for the training of primary health care workers (HCWs). Called PALM-PLUS (Practical

Approach to Lung Health and HIV/AIDS in Malawi), it is designed to simplify existing national guidelines for the management of HIV/AIDS, tuberculosis and primary care conditions, and integrate them into a single, simple and user-friendly guideline. This approach has the potential to be scalable within the country and beyond. Given that the ultimate purpose of the research is to inform policy-level decisions around the training of HCWs and the integration of HIV/AIDS care into primary health, it has been beneficial to have a team comprised of both policy makers (decision makers) and researchers.⁷⁸

LEVERAGING WEB 2.0 TECHNOLOGIES

Knowledge translation has continually been cited as a challenge in global public health. Information abounds but access is often limited, and only now are barriers being removed that in the past have contributed to the inaccessibility of information. In large part this is due to information and communication technology (ICT)⁷⁹ and in particular to Web 2.0. The latter is a form of ICT that facilitates interactive information sharing, interoperability and collaboration on the World Wide Web.⁸⁰ Web 2.0 holds great potential for enabling health information (once restricted to individual organizations and people) to flow rapidly to all parts of the world – from the halls of CIDA to rural communities in sub-Saharan Africa and back again.

Forward-looking organizations can use Web 2.0 to harness their collective capability and knowledge to spur innovation, collaboration and problem-solving in order to address global health challenges in creative new ways. Policy and programming are often set by experts and vested interests, and this can lead to excessive partisanship, gridlock and stagnation of policy and programming.⁸¹ Experts and individuals outside of the traditional global health systems should be engaged in the process of finding new solutions. This does need to constitute a risk if efforts are made to support the appropriate checks and balances.

One example of how Web 2.0 technology is being leveraged to improve global health is the website [DevelopmentWell.com](#), which will showcase development solutions via online profiles. It will include resources such as videos, images, links to evidence, results/impact information, cost-effectiveness data and related contact information. The website is expected to launch in 2011 and will allow users from around the world to create profiles of solutions (e.g. technologies, service delivery models, innovative financing methods, interventions) that can be ranked and sorted by various categories (e.g. country, disease, affiliated organization).⁸²

11. NEW BUSINESS MODELS: HUMANITARIAN ENTREPRENEURSHIP

Mikkel Vestergaard Frandsen, CEO of the Group, Vestergaard Frandsen SA

Investments in global public health in recent years have created opportunities for private innovators, technology developers and business investors to join the fight against infectious diseases. As a result, business people are shaping a new business model: humanitarian entrepreneurship (HE). In this model, corporate social responsibility (CSR) is core to the business, and there is no conflict between doing business and doing good.

For Vestergaard Frandsen, HE involves focusing its entire innovation effort on developing technological breakthroughs for the world's most vulnerable people, who often live in the most extreme circumstances and are the most prone to disease. This focus has made Vestergaard Frandsen a leading company in the fight against diseases of the developing world.

In the case of malaria, the development and scaling up of the Long-Lasting Insecticidal Net (PermaNet) – and a new version of the product that is effective against insecticide-resistant mosquitoes – has created an important tool for combating one of the world's biggest killers. In the campaign to eradicate guinea worms – parasites that cause widespread suffering, mainly in Africa – Vestergaard Frandsen introduced its Pipe Filter, which has a stainless steel mesh that filters out guinea worm larvae from contaminated water. Inspired by the incredible success of the guinea-worm program, the company developed its LifeStraw microbiological water purifier for household use. Other innovative breakthroughs have been made by enhancing food security and nutrition, by combating neglected tropical diseases – such as trypanosomiasis and schistosomiasis – and by introducing “diagonally integrated” distribution campaigns, which succeed by integrating distribution of health products and services and forging closer links between relevant partners and stakeholders.

THE BUSINESS CASE FOR HE

Inherent within the HE business model is the notion that technology development for “the other 90%” (people in developing countries) makes sense in business terms as well as in CSR terms. Vestergaard Frandsen neither seeks nor receives grants from foundations or other donors to develop its products, technologies or concepts. Most investments are made in the expectation that a donor-funded market exists to supply and implement its life-saving technologies to developing countries.

Although the end-users of Vestergaard Frandsen's technologies are people in developing countries, the paying customers are governments, social marketing organizations and private companies. Most of the products are given away free to end-users, but paid for by the customer.

There are 3 key issues for humanitarian entrepreneurs:

I. **Ensure stable and predictable policies**

These are a prerequisite for the success of the HE business model. A new tool or product can take five or 10 years to develop. Therefore, an investment made today must be based on more than just hope that, when the tool comes to market, public desire will still exist to deal with the challenge it is designed to address.

II. **Don't stifle innovation**

When new public health tools are being developed for developing countries, organizations such as WHO can (willingly or unwillingly) act as *de facto* regulatory bodies. This is due to the sheer influence they have over the health ministries of recipient countries. With such influence, WHO should take the responsibility for either evaluating or creating standards for tools that are likely to prove game-changers. We often miss "leap frog opportunities" – when major advances can be made rapidly – because there is no current standard or test protocol or process. When this is the case, the potential game-changer effectively doesn't "exist", because it is not officially recognized by the system.

Both points 1 and 2 will positively influence a company's ability to invest in innovative ways to help achieve the Millennium Development Goals (MDGs).

III. **Integrate delivery**

The main challenges when getting life-saving tools to the people who need them most are: (1) Cost – particularly in the current environment, when resources are constrained and there is the need to get more health for less money; (2) Coverage – reaching more people using the same distribution system. In the example of bednets, the cost per unit is approximately US\$5.00 when a vertical-distribution network is used. However, when distribution is integrated with other interventions – as happened from 2002 to 2004 with measles vaccination, vitamin A and de-worming campaigns – bednets can be distributed for approximately US\$1.80 per unit. This type of integration has other advantages, such as: (3) Reducing stigma – when an intervention for a disease that attracts stigma is integrated with a disease that does not; (4) Incentivized early detection – this is especially relevant when integrating tangible life saving products with, for example, HIV counseling and testing or breast-cancer screening.



PROMOTING THE HE MODEL

The HE business model provides plenty of opportunities for creating new tools that can have a major impact on world health. To take an example from recent history, the “bifurcated needle” developed by Wyeth provided a new and easy-to-use tool for smallpox vaccination, and contributed massively to eradication of the disease. It is possible that the guinea-worm filter and Long-Lasting Insecticidal Net may eventually enter the history books with equal importance. The HE model is so important in our collective efforts to achieve the MDGs because it presents the opportunity to invent the next Wyeth needle, the next LifeStraw or the next PermaNet.

Companies like Vestergaard Frandsen have an important role to play in promoting the HE model because, in the process of developing new tools that save lives, they also demonstrate that doing good is good business. This builds the case for more entrepreneurs, and more companies, to rethink their business model and invest towards the MDGs.

12. INNOVATIVE APPROACHES TO POLITICAL LEADERSHIP

Agnes Binagwaho, Permanent Secretary of the Ministry of Health of Rwanda

In the field of health, “political leadership” refers to the government’s ability and willingness to achieve favorable health outcomes and to ensure that resources are used effectively. It can be exercised by any part of government – not just health ministries.

The political environment and the government’s sense of commitment are decisive factors in determining health outcomes and results. Political leadership matters for the health and well-being of women and children.

The challenges of political leadership include:

- The number of priorities on the health agenda, and the limited funds available to meet them
- The large number of stakeholders involved in health, including domestic interest groups and development partners
- The limitations of managers and leaders, often exacerbated by short institutional memories and lack of staff continuity
- Information systems that are not adequate for data-driven analysis and decision-making

It might seem puzzling that the rise of global health initiatives over the past decade has not been accompanied by an interest in political leadership and good management – both factors that are critical for success. One reason may be that leadership cannot be prescribed from outside. It needs to come from within, and countries need to lead by example.

EXPERIENCES IN RWANDA

Rwanda’s achievements in the field of women’s empowerment over the past decade are the result of its national leadership taking a central role. Today, the country is a prime example of the ways in which good leadership can promote gender equality and empower women.

In particular, Rwanda has demonstrated the importance of political leadership working at different levels in a mutually reinforcing way:

- Central, national government

- Local government – in Rwanda, this is the district level
- Community – where Rwanda’s local and religious leaders play a particularly important role

Rwanda’s experience highlights four innovations in political leadership, described below.

I. The whole government works for the health of women and children

Although the ministry of health plays a crucial technical and facilitating role, it is only one part of the larger institutional system that determines health outcomes. Health is the business and responsibility of the entire government, including the head of state, the finance ministry and other ministries, including education, justice and gender. This integrative approach is in line with WHO’s “Health in All Policies” initiative. It is also one of the four primary health-care goals, though it is not systematically applied in practice. The emergence of new health threats, including climate change and chronic non-communicable diseases, make it even more imperative for the whole government to engage with health.

II. Parliament transforms political goodwill into action

In developing countries generally, the ministry of finance has become much more robust – in response to the demands of globalization and because of the strong focus on fiscal policy. But this needs to be complemented by parliament taking responsibility for monitoring national health and development efforts, especially where women and children are concerned. National priorities and resource allocations need to be agreed upon and government made accountable for overseeing their implementation.

With resources scarce, it is crucial that gender-budgeting is introduced and that ministries highlight women-centered actions in their plans and reports. In Rwanda, not only does parliament monitor the use of funds, it also determines which people and which entities should be called on to take action to improve the population’s wellbeing. In 2007, in response to the high rate of maternal deaths in the country (750 per 100,000 live births), parliament asked for an audit of delivery facilities. This audit revealed significant weaknesses in infrastructure and management, and the minister of health was called upon to rectify them.

III. Local government is accountable for health results

Although the national government pays adequate attention to the health sector, it is local government that has the main responsibility for implementing national policies and delivering basic services. In order to ensure that local government is accountable, national strategies must be fleshed out and customized locally. In this way, Rwanda

has succeeded in making sure its district health plans incorporate action on gender equality and maternal and child health.

When a district action plan is conceived, civil society must be engaged in a meaningful way. Building good district plans that are aligned with national priorities is an iterative process, conducted over several years. As a result, Rwanda's district authorities have set annual health targets and signed a contract, *Iminigo*, with the country's president, guaranteeing that they will deliver the results. Each of the 30 districts is independently evaluated, and ranked on the basis of its progress towards the targets.

The mayor of each district must report once a year in a public session, *Umushikirano*, chaired by the president. This public report is broadcast live on TV and radio, and is attended by the diplomatic corps and high-ranking government officials. The public may ask questions by telephone at any point during the day. This is made possible by strengthening health information systems and enhancing information for local action – key to supporting leadership and good management.

IV. **Communities are engaged over the longer term**

Solutions for communities cannot be found without involving those communities, and this must include input from civil society. In Rwanda, partnerships between the public sector and civil society are part of district health plans. These partnerships have proved to be a crucial, low-cost contribution to maternal, newborn and child health outcomes. Such collaboration requires willingness to engage in longer-term community dialogue. It also requires education and empowerment programs that go beyond single-purpose initiatives and include critical health issues. The annual planning and budgeting exercise helps to shape district health plans and contributes to holding local governments to account.

Another innovation relevant to women's health in Rwanda is the systematic introduction of maternal death audits. When a woman dies during pregnancy, the household is visited and the cause assessed by a community member with a delegation of local leaders, religious leaders, administrators and politicians. And when a woman dies in a health facility, the director must report the death to the health ministry. Giving due priority to the death of a woman builds awareness, changes attitudes towards maternal health and cements the accountability between communities, local authorities and health professionals. In Rwanda, these activities are also monitored at the central level.



NEXT STEPS

Leadership has to come from within the country, and its form reflects the country's culture and needs. For this reason, each country and its development partners need to find more systematic ways of learning from innovative approaches that have worked in similar places. It might be a good idea to reinforce countries' efforts to do this by promoting in-depth work to study successful models of leadership – at central, district and community level.

We also need to look at what regional and international organizations can do to support countries' leadership capacity. Some initiatives are already up and running, and include executive leadership programs for health ministry employees (including budget analysis, advocacy and negotiating skills), networks to encourage global learning, and research on how local institutions can be involved to support knowledge dissemination and evidence-based decision-making.

13. INNOVATIVE PLATFORM TO STRENGTHEN GENERATION AND USE OF IMPLEMENTATION RESEARCH FOR IMPROVED POLICY AND MANAGEMENT DECISIONS

Dr. Abdul Ghaffar, Executive Director, Alliance for Health Policy and Systems Research

BACKGROUND

The Implementation Research Platform (IRP) is an initiative led and hosted by the Alliance for Health Policy and Systems Research (AHPSR). The AHPSR works on the IRP in collaboration with three departments of the World Health Organization (WHO):

- I. Child and Adolescent Health and Development (CAH)
- II. Special Program of Research, Development and Research Training in Human Reproduction (HRP)
- III. Special Program for Research and Training in Tropical Diseases (TDR)

The IRP is primarily supported by funding from the Government of Norway. Recently, the Government of Sweden joined through a grant by the Swedish International Development Agency (Sida). Other development partners – particularly the UK’s Department for International Development (DFID) – have expressed their interest in joining the IRP.

DEFINITION OF IMPLEMENTATION RESEARCH

In this initiative, implementation research is defined as research that:

- Identifies common implementation problems and the main determinants that hinder effective access to interventions,
- Develops and tests practical solutions to these problems that are either specific to particular health systems and environments, or that address a problem common to several countries in a region, and
- Determines the best way of introducing these practical solutions into the health system, and facilitates their full-scale implementation, evaluation and modification as required.



SCOPE AND OBJECTIVES

The scope of the IRP initiative is the promotion and support of implementation research that accelerates progress towards the health-related Millennium Development Goals (MDGs 4-6) – especially as they relate to maternal, newborn and child health (MNCH), and link to sustainable strengthening of health systems. Specific objectives are:

- To support country-led research and derive lessons on best ways of scaling up interventions and services in low- and middle-income countries (LMICs), and to translate this into policy
- To synthesize and disseminate evidence related to promising approaches for addressing health-systems barriers
- To build capacity for health systems research (with focus on implementation research) and translation, and use of knowledge, particularly in LMICs
- To create a common platform for promoting implementation research
- To establish an effective research collaboration in countries (under the umbrella of health systems) between reproductive and maternal, newborn and child health, and HIV/AIDS, TB, malaria and other diseases

PROGRESS TO DATE

A systematic review of the literature was commissioned to identify the priorities for implementation research. Based on these research priorities, a call for Letters of Intent (LOI) for direct research funding was issued in July, 2010. In response to this call, 223 LOIs were received. After initial screening, 113 were sent to a panel of external reviewers. The top 14 (based on scores awarded by the reviewers) will be invited in the second week of October to develop full proposals. Awards to the successful grantees will be announced on 17 November at the Montreux Symposium, where the IRP will also be formally launched.

A curriculum to teach researchers from LMICs about implementation research, and to provide training, is being developed. For this purpose, a workshop of experts is planned for 12-15 September in Geneva. LOI for "evidence synthesis" will be issued by the end of October, 2010.

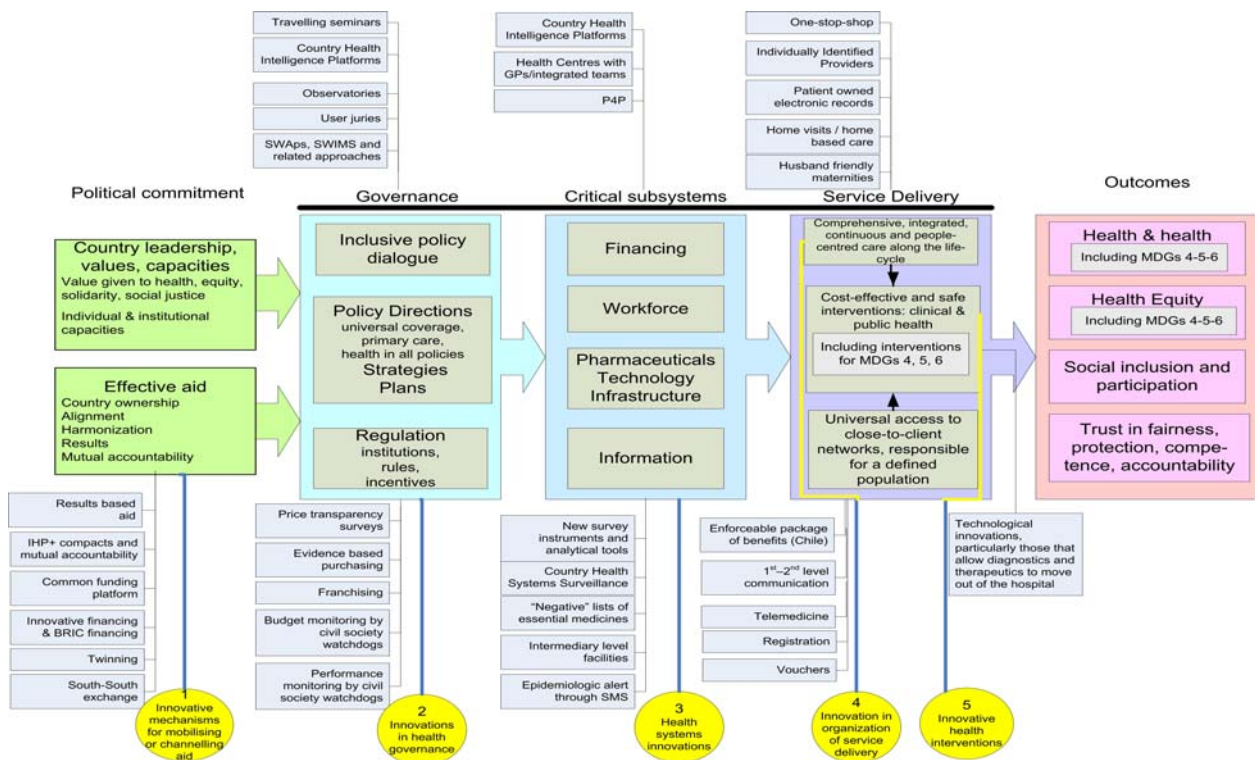
Discussions have been completed with two schools of public policy (Kennedy School of Government, USA, and Lee Kuan Yew School of Public Policy, Singapore) to launch an executive course for research users (primarily national policy makers). A final decision to launch this course will be taken before the end of November, 2010.

14. INNOVATION BETWEEN POLITICAL COMMITMENT AND OUTCOMES

Wim Van Lerberghe and Sowmya Kadandale, Department for Health System Governance and Service Delivery (HDS), World Health Organization

Many countries are implementing innovations to improve their health systems, and these new ideas can be grouped in several ways. For example, one approach is to group them as new ideas that are promising, new ideas that have proven their effectiveness or effective ideas that are new in context. Another approach is to categorize innovations by type, such as *social innovations* (e.g. involvement of consumer organizations in holding services accountable for access or quality), *organizational innovations* (e.g. franchising, incentive packages and vouchers), *technological innovations* (e.g. SMS for ensuring continuity of care) or *innovations in channelling and effectiveness of aid*.

This however, underestimates the potential *joint* effect of packages of innovations to bridge the gap between political commitment and improved outcomes. To do this it is necessary to identify the pathway from commitment to outcomes and to plot the sets of innovations that operate at various levels and jointly translate political commitment into outcomes. This is illustrated in the diagram below, which plots innovations carried out in making primary care more *people-centred*.



Looking at the diagram above, it is essential to note that policy innovation is more important than the search for magic bullets. Effective innovation often comes from “packages” of innovations that work together to result in better outcomes. The experience of implementing innovative reforms in various low- and middle-income countries has demonstrated that effective innovation is spurred by overriding political/policy initiatives, such as moving towards universal coverage, integration of services or people-centeredness. This is further illustrated by experiences from two countries.⁸³

I. Thailand: innovations for moving towards universal coverage

Until recently, the health system of Thailand was based on a conventional approach to care, which emphasized hospital-based and specialty services over community-based and primary-care services. While hospital medicine flourished, family practice was essentially unknown.

However, from 1991 onwards a few innovators were able to show that people-centered primary care was both possible and preferable. Working across a range of different health centers, they implemented a new approach with key features such as: regular community meetings to hear people’s views; systematic use of patient and family records (as well as registries for clinical populations); improved referral systems between primary-health centers and hospitals; strengthened use of home visits; and a payment system based on flat rates per illness episode. Importantly, the model also introduced a new way of interacting with people during clinical encounters – emphasizing privacy, listening and negotiation. Over time, tools were developed to disseminate this approach, and training in its methods was introduced into the pre-service curricula of nurses and physicians.

Furthermore, the political will to support the new approach was carefully and strategically cultivated. Politicians, high officials and representatives of civil society were invited to attend demonstrations at family practice health centers, which provided a clear vision of what people-centered family practice could achieve. Consumer organizations, students and health workers were also encouraged to see the work of the centers for themselves.

Following Thailand’s universal coverage reforms of 2001, this model of care was adopted by the government as the cornerstone of its new primary-care-based health-care system. Within one year, the program spread from 60 health centers covering 600 000 people, to 1164 health centers covering 12 million.

A key lesson from the Thai experience is that both technical field work and political pressure are important in facilitating change. Their people-centered family medicine model was in development for over ten years before becoming part of the national strategy for universal coverage. During that time, the approach was refined, tools and guidelines were developed and, importantly, the model's visibility was enhanced among political and health leaders. In 2001, when the political movement for universal coverage resulted in national reforms, the people-centered family medicine model was already tried, tested and known, and was therefore adopted as the means of delivering health care to all.

II. **Malaysia: innovations in delivering people-centered integrated care**

In Malaysia, the starting point for health innovation was a political consensus based on the concept “people first – performance now.” This has led to national policies and strategies that are fully consistent with the ideals and principles of people-centered care. They include a focus on wellness, a commitment to the provision of accurate and timely information, and empowerment of people for self-management of their health. The principles are backed by tailored health services provided close to people's homes, and integrated services provided throughout the life of each individual. Importantly, primary care services are accessible to all people and are almost free of charge. Each patient is charged a nominal fee of MYR 1 (equivalent to US\$0.30) for each outpatient visit.

In addition to its broad policy commitments, the Ministry of Health has introduced a set of innovations to improve the quality of health care and to enable health services that are people-centered. For example, people living in rural and remote parts of the East Malaysian states have their own home-based health cards, which give them ready access to their health records, and allow them to access health care at any facility. Recently, a “my health e-portal” has been made available online and electronic lifetime health records have been introduced on computer systems in some of the newer hospitals. Clinic hours have been extended to be more convenient for patients, and home visits are now available in some hospitals for pediatric patients. Pilot projects are underway to assess the usefulness of drive-through pharmacies and delivery of medication by post.

To help further assure quality of care, the government has introduced new practice guidelines and legislation, and new processes to ensure that the credentials and access privileges of health-care practitioners are verified regularly (“credentialing and privileging”). Also to improve the quality of care, and health services generally, health

workers are required to engage in continuing professional development, while systematic mechanisms have been created for patient and family feedback. In parallel, efforts have been made to create a stronger culture of professionalism, caring and teamwork within the health workplace. These and other innovations are intended to improve quality and efficiency of health care, while simultaneously improving the experiences of patients and families within the health-care system.

The experiences of Thailand and Malaysia reinforce the importance of focusing on policy innovation and packages rather than on isolated technical innovations. Any successful health innovation must be backed by appropriate efforts to persuade stakeholders of the need for policy innovation. Furthermore, systematic “policy innovation profiles” are key. These include:

- The origin, background and purpose of the policy innovation and the process envisaged
- The stage the innovation has reached, on a continuum from: idea – pilot – policy paper – legislation – implementation – evaluation – change
- Critical characteristics:
 - Degree of innovation
 - Degree of controversy (from consensual to controversial)
 - Public visibility
 - Transferability
 - Expected changes on the commitment-to-outcomes path
 - (Potential) systematic impact: from marginal to fundamental

REFERENCES

- 1 For information on Performance-Based Contracting in Afghanistan see:
 - B. Loevinsohn and G. D. Sayed. 2008. “Lessons from the Health Sector in Afghanistan: How Progress Can Be Made in Challenging Circumstances”. *JAMA*. 2008. 300(6):724-726 [<http://jama.ama-assn.org/cgi/content/full/300/6/724> – downloaded September 2, 2008].
 - p.137, B. Loevinsohn . 2008. “*Performance-Based Contracting for Health Services in Developing Countries- A Toolkit*”.. The International Bank for Reconstruction and Development / the World Bank.
- 2 For more information on the Rwanda Performance-Based Financing scheme see:
 - B. Meessen, L. Musango, JP. Kashala and J. Lemlin. 2006. “Reviewing institutions of rural health centers: the Performance Initiative in Butare, Rwanda”. *Tropical Medicine & International Health (TMIH)* 11(8) 1303-1317.
 - R. Soeters, C. Habineza, P.B. Peerenboom. 2006. “Performance-based financing and changing the district health system: experience from Rwanda”. *Bulletin of the WHO* 84(11)
 - L. Rusa and G. Fritsche. 2007. “Rwanda: Performance-Based Financing in Health”. *Emerging Good Practice in Managing for Development Results, MFDR 2nd Edition*.
- 3 P. Basinga, P. J. Gertler, A. Binagwaho, A.L.B. Soucat, J.R. Sturdy and C. M.J. Vermeersch. 2010. “Paying Primary Health Care Centers for Performance in Rwanda”. Policy Research Working Paper 5190. The World Bank
- 4 For information on some of the Performance-Based Financing programs in Burundi see:
 - J.F. Busogoro and A. Beith. 2010. “Pay for Performance for Improved Health in Burundi”. Health System 20/20 P4P case study series. Health System 20/20 (<http://www.rbfhealth.org/rbfhealth/library/doc/371/pay-performance-improved-health-burundi>).
 - Toonen J, A. Canavan, P. Vergeer, and R. Elovainio. 2009. “Learning lessons on implementing performance-based financing, from a multi-country evaluation”. KIT Royal Tropical Institute, in collaboration with Cordaid and the World Health Organization (<http://www.kit.nl/smartsite.shtml?id=SINGLEPUBLICATION&ItemID=2692>).
- 5 “Major New Funding for RBF”. Interagency Working Group (IWG) Newsletter on Results-Based Financing (RBF). February 2010 (<http://www.rbfhealth.org/rbfhealth/system/files/RBF%20newsletter%203.pdf>).
- 6 <http://www.un.org/millenniumgoals/>
- 7 <http://www.internationalhealthpartnership.net/>
- 8 http://www.internationalhealthpartnership.net/en/about/j_1253621551
- 9 <http://go.worldbank.org/OD4C6GPQU0>
- 10 Population Reference Bureau. 2010 World Population Data Sheet. <http://www.prb.org/Publications/Datasheets/2010/2010wpds.aspx>

-
- 11 Lagomarsino, G., Nachuk, S. and Kundra, S.S. 2009. *Public stewardship of private providers in mixed health systems: Synthesis report from the Rockefeller Foundation-sponsored initiative on the role of the private sector in health systems*. Washington, DC: Results for Development Institute.
 - 12 Dimovska, D., Sealy, Bergkvist, S. and Pernefeldt, H.. 2009. *Innovative pro-poor healthcare financing and delivery models*. Washington, DC: Results for Development Institute.
 - 13 Reich, M. *Public Private Partnerships for Public Health*, Nature Medicine 6: 617-620, 2000
 - 14 <http://jsfamous.js.cei.gov.cn/0504003/ehaohaiq.htm>
 - 15 <http://www.unilever.com/sustainability/casestudies/economic-development/creating-rural-entrepreneurs.aspx>
 - 16 http://www.hnb.net/data/investor_relations/HNBANR1/data/social_responsibility/about_our_report.html
 - 17 <http://www.emri.in/>
 - 18 Moran, M, Guzman, J., Ropars,, A.L., Illmer, A.. *The role of product development partnerships in research and development for neglected diseases*. Intl. Hlth. 2:114-122, 2010.
 - 19 <http://www.gainhealth.org/>
 - 20 <http://www.grameencreativelab.com/live-examples/grameen-danone-foods-ltd.html>
 - 21 http://india.gov.in/outerwin.php?id=http://mohfw.nic.in/dofw%20website/JSY_features_FAQ_Nov_2006.htm
 - 22 www.greenstar.org.pk
 - 23 www.chaz.org.zm
 - 24 http://www.kiwanja.net/database/project/project_voxiva_hivaidrelief.pdf
 - 25 GSMA. Global Systems for Mobile Communications. Courtesy of Christopher Locke. www.gsmworld.com
 - 26 ICTU World Telecommunication. ICT Database. <http://www.itu.int/ITU-D/ict/statistics/index.html>
 - 27 Computer Industry Almanac – <http://www.c-i-a.com/compuseexec.htm>
 - 28 BRAC's annual report – <http://www.brac.net/oldsite/useruploads/files/brac-ar-2009.pdf>
 - 29 <http://old.opasha.org/>
 - 30 http://www.pharmaccess.org/RunScript.asp?Page=191&ap=../FileLib/country_matrix.asp&p=ASP\~PgDefault.asp
 - 31 http://www.msh.org/seam/country_programs/3.1.4b.htm
http://www.msh.org/seam/reports/SEAM_Final_Report_Summary-Tanzania_ADDOs.pdf
 - 32 “The Millennium Development Goals Report 2010.” UN New York. www.un.org/millenniumgoals
 - 33 United Nations, as reported at www.un.org/News/Press/docs/2010/dsgsm497.doc.htm

-
- 34 “The Millennium Development Goals Report 2010.” UN New York. www.un.org/millenniumgoals
- 35 TU/UNESCO. (n.d.) “Report of the Broadband Commission Digital Development to the United Nations Secretary-General.” August 6, 2010.
- 36 Mechael PN and the Dodowa Health Research Center. “MoTeCH: mHealth Ethnography Report.” For The Grameen Foundation. 2009.
- 37 Dolan B. “@mHI startup boasts 150K paying mHealth users.” *Mobilhealthnews*, February 3, 2010.
- 38 Shirima K, Mukasa O, Schellenberg JA, Manzi F, John D, Mushi A, et al. “The use of personal digital assistants for data entry at the point of collection in a large household survey in southern Tanzania.” *Emerg. Themes Epidemiol.* 2007 Jun 1; 4:5.
- 39 Gammon D, Arsand E, Walseth OA, Andersson N, Jenssen M, Taylor T. “Parent-child interaction using a mobile and wireless system for blood glucose monitoring.” *J. Med. Internet. Res.* 2005 Nov 21; 7(5):e57.
- 40 http://www.un.org/esa/sustdev/publications/africa_casestudies/tracnet.pdf
- 41 Grameen Foundation. (n.d.). Mobile Technology for Community Health (MoTeCH). Retrieved 09 02, 2010, from AppLab - Transforming Lives through Innovation in Information Access: <http://www.grameenfoundation.applab.org/section/ghana-health-worker-project>
- 42 ProjectUNITE. (n.d.). “ProjectUNITE: Using Novel information technologies to Improve Treatment Effectiveness.” Retrieved 09 02, 2010, from <http://www.project-unite.net/public/default.aspx>
- 43 <http://www.unfoundation.org/global-issues/technology/mhealth-alliance.html>
- 44 www.broadbandcommission.org
- 45 Note use of revised maternal mortality figures as estimated by Hogan M et al of the Institute for Health Metrics and Evaluation.
- 46 Black RE, Cousens S, Johnson HL, et al. “Global, regional, and national causes of child mortality in 2008: a systematic analysis.” *The Lancet* 2010;375:1969-87.
- 47 Darmstadt, GL, Bhutta ZA, Cousens S, Adam T, Walker N and de Bernis L. (2005). “Evidence-based, cost-effective interventions: how many newborn babies can we save?” *The Lancet.* 365(9463): 977-988.
- 48 <http://gynuity.org/programs/postpartum-hemorrhage>
- 49 <http://www.grandchallenges.org>
- 50 Darmstadt GL, Walker N, Lawn JE, Bhutta ZA, Haws RA, Cousens S. “Saving newborn lives in Asia and Africa: cost and impact of phased scale-up of interventions within the continuum of care.” *Health Policy Plan* 2008;23:101-117.
- 51 <http://www.maternalandneonataltechnologies.org>

-
- 52 Hogan MC, Foreman KJ, Naghavi M, et al. Maternal mortality for 181 countries, 1980–2008: a systematic analysis of progress towards Millennium Development Goal 5. *The Lancet*. 2010;375(9726):1609–1623
- 53 Human papillomavirus infection and cervical cancer page. World Health Organization website. Available at: http://www.who.int/vaccine_research/diseases/hpv/en/. Accessed July 26, 2010.
- 54 Black RE, Cousens S, Johnson HL, et al. Global, regional, and national causes of child mortality in 2008: a systematic analysis. *The Lancet*. 2010;375(9730):1969–1987.
- 55 Mwansa-Kambafwile J, Cousens S, Hansen T, Lawn JE. Antenatal steroids in preterm labor for the prevention of neonatal deaths due to complications of preterm birth. *International Journal of Epidemiology*. 2010;39(Suppl 1):i122–i133.
- 56 Government of India. Ministry of Health & Family Welfare. National Rural Health Mission. “Meeting People’s Health Needs in Partnership with States: The Journey so far (2005-2010)”. March 2010. New Delhi, India. Available at: http://mohfw.nic.in/NRHM/Documents/5_Years_NRHM_Final.pdf. Accessed: September 2010.
- 57 Government of India. Ministry of Health & Family Welfare. National Rural Health Mission. Ibid.
- 58 Sundararaman T, Prasad BM, Gupta G. “Documenting the 2nd ANM training and deployment of West Bengal.” National Health Systems Resource Center. Available at: http://nhsrcindia.org/index.php?option=com_docman&task=cat_view&gid=322&Itemid=114. Accessed on: Sept 2010
- 59 Raj FG. “Importance of Effective Emergency Medical Transport in Addressing Maternal Complications: Case Study, EMRI 108 EMS Service in Andhra Pradesh.” *Indian Emergency Journal*. January 2009; 4(1):7-16. Available at: http://www.emri.in/images/stories/EMRI_Journal_Round%2010.pdf. Accessed: September 2010.
- 60 Rowe AK. *Potential of integrated continuous surveys and quality management to support monitoring, evaluation and the scale-up of health interventions in developing countries*. *Am J Trop Med Hyg* 2009;80:971-9.
- 61 USAID. *External evaluation of the Peru Continuous survey experiment* (Stan Becker and Thomas Pullem for the Global Health Technical Assistance Project). December 2007.
- 62 IHI. 2003. *The Breakthrough Series: IHI’s collaborative model for achieving breakthrough improvement*. <http://www.ihl.org/NR/rdonlyres/3F1925B7-6C47-48ED-AA83-C85DBABB664D/0/TheBreakthroughSeriespaper.pdf> (accessed July 16, 2010).
- 63 See <http://www.qaproject.org/products.html> for further information and publications on the USAID Quality Assurance Project (accessed September 7, 2010).
- 64 Dimont A, Gaye A, de Bernis L, et al. *Facility-based maternal death reviews: effects on maternal mortality in a district hospital in Senegal*. *Bull WHO* 2006;84:218-24.
- 65 See ISOFl toolkit and other materials at http://www.care.org/careswork/whatwedo/health/srh/publications.asp?s_src=170760770000 (Accessed Sept. 7, 2010).

-
- 66 Kambou SD, Magar V, Gay J, Lary H. "Walking the talk: Inner Spaces, Outer Facer – a gender and sexuality initiative." CARE and ICRW, May 2006.
www.care.org/careswork/whatwedo/health/.../walking_the_talk_isofi.pdf (Accessed Sept. 7, 2010).
- 67 Frisancho A, Goulden J. "Rights-based approaches to improve people's health in Peru." *Lancet* 2008;372:2007-08.
- 68 Iwami M, Petchey R. "A CLAS act? Community-based organizations, health service decentralization and primary care development in Peru." *J Pub Health Medicine* 2002;24:246-51.
- 69 http://www.who.int/immunization/funding/03_WHO_AFRO_IVD_RED.pdf
- 70 Mhatre S, Schryer-Roy AM. "The fallacy of coverage: uncovering disparities to improve immunization rates through evidence." Results from the Canadian International Immunization Initiative Phase 2 - Operational Research Grants. *BMC International Health and Human Rights* 2009, 9(Suppl 1):S1 (14 October 2009).
- 71 World Health Organization Maximizing Positive Synergies Collaborative Group. "An assessment of interactions between global health initiatives and country health systems." *The Lancet*, Vol. 373 No. 9681 pp 2137-2169.
- 72 Sanders D, Labonte R, Buam F, Chopra M. "Making research matter: a civil society perspective on health research." *Bull World Health Organ* vol.82 no.10 Genebra October 2004.
- 73 Unpublished CIDA Report.
- 74 UNICEF report to CIDA, March 2010
- 75 Black R, Cousens S, et al. "Global, regional, and national causes of child mortality in 2008: a systematic analysis." *The Lancet* 2010; 375: 1969-87.
- 76 UNICEF, 2009. Unpublished CIDA report.
- 77 In addition, while the evidence is not conclusive, there is indication of benefits from using community health workers and/or family members in the prevention/management of postpartum haemorrhage (PPH) with misoprostol. This is another area for further research.
- 78 Personal communication with Dr Sumeet Sodhi, Research Scientist, Dignitas International. September 2010.
- 79 Abbott P. "E-Health: Accessing Knowledge for Global Health." *Knowledge Management and E-Learning: An International Journal*: Vol. 2, No. 2.
- 80 http://en.wikipedia.org/wiki/Web_2.0
- 81 Tapscott D, Williams AD. "Wikinomics: how mass collaboration changes everything." New York: Portfolio, 2006.
- 82 See World Bank paper, "Are You Being Served: New Tools For Measuring Service Delivery." 2008.
- 83 World Health Organization (2010). "People-centred care in low- and middle-income countries: Report of the meeting held 5 May 2010." Geneva, World Health Organization. Based on the presentations by Bakar AA (Malaysia) and Pongsupap Y (Thailand).

DISCLAIMER

The views expressed herein are those of the authors and do not necessarily represent those of the respective organization/institution.

ACKNOWLEDGEMENTS

This report was written and commented on by members of the Innovation Working Group for the Global Strategy for Women's and Children's Health under UN Secretary-General Ban Ki-moon.

Geir Sølve Sande Lie, Consultant, Norwegian Agency for Development Cooperation (NORAD) provided editing and overall coordination.