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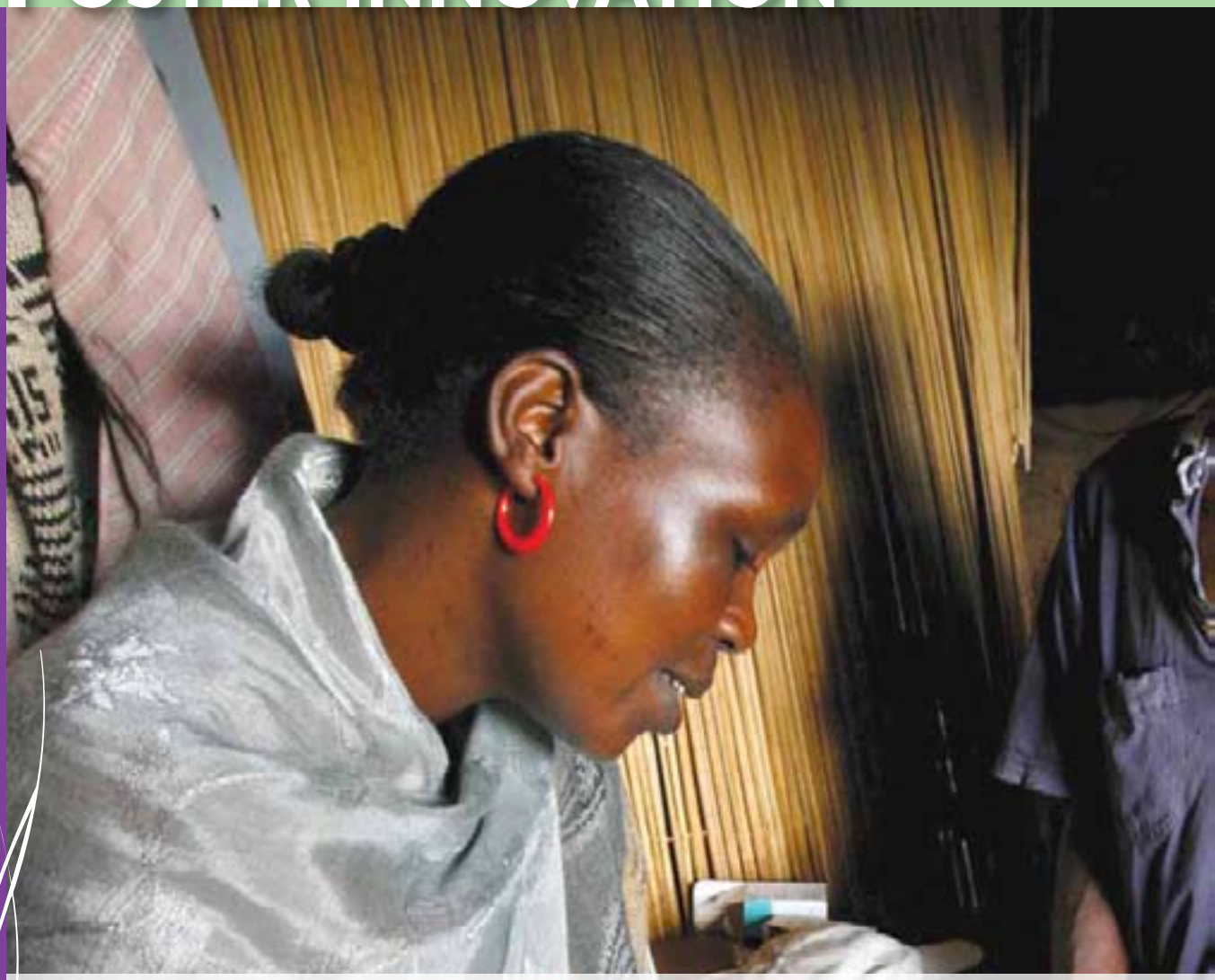
Foster innovation

KNOWLEDGE SUMMARY: WOMEN'S & CHILDREN'S HEALTH

2010



Innovation is one of the keys to accelerating progress in reproductive, maternal, newborn and child health (RMNCH). This includes finding new and creative ways to deliver services, apply new technologies, raise new money, and form new partnerships. All innovations, however, must pass through a robust process of testing and refinement before precious resources are used to scale up.

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The Partnership for Maternal, Newborn & Child Health

UNIVERSITY OF ABERDEEN

The problem

Science and technology continually yield new ideas for improving human welfare.[1] Some prove successful when tested, while other less promising innovations may still feed back into the research pipeline, so advancing knowledge incrementally. Innovations are needed along the continuum of care to accelerate progress towards MDGs 4 and 5 and must be relevant to local health systems. Emerging creative solutions include those related to testing new models for service delivery, and those created through technology. Innovations in financing are referred to in Knowledge Summary 3. Here we highlight just a small selection of the many promising ideas currently at various stages of development.

Figure 1

An Innovation Framework for Women's and Children's Health

Service delivery innovations

Several rural, remote and conflict-affected areas now receive healthcare through approaches that "take the care to the people". These include mobile clinics, special health days and home visits. For example, teams of health workers visit villages in Afghanistan to deliver immunizations and insecticide-treated bednets (ITNs).[2] Mobile clinics treated women, newborns and children affected by the flood crisis in Pakistan in July 2010 for illnesses such as diarrhea and malaria.[3] Home visits by health workers after childbirth have helped to reduce newborn deaths in Bangladesh and Pakistan by 30% to 61%, and are now being recommended as standard practice.[4] Child health days in Ethiopia have helped increase the coverage of Vitamin A.[5]

Task-shifting (delegation to less specialized health workers) can help address shortages of health workers. Communities and civil society groups are getting involved in delivering health services or distributing commodities, such as contraceptives and anti-malarial drugs. Injectable contraceptives are being distributed in Malawi by health-surveillance assistants (frontline health workers) working with communities.[6] Pneumonia case management in Nepal by community-based workers helped reduce child deaths by 28%.[7]

Box 1 – Misoprostol – reducing maternal deaths

Severe bleeding after childbirth accounts for about 35% of maternal deaths, but it can be prevented or managed by good clinical practice and by using drugs. Misoprostol in particular does not require refrigeration and has a longer shelf-life than other uterotonics, like oxytocin. However, the right dose needs to be administered by a trained health worker to avoid side effects, such as high fever and unconsciousness.[1, 2, 3]

A trial in India found that misoprostol reduced bleeding after childbirth by 5.6% and severe bleeding by 1%.[4] A recent study on the cost-effectiveness of misoprostol at the community level, also in India, estimated that it reduced maternal mortality by an estimated 70% when given sublingually (under the tongue) to *treat* severe bleeding. When given orally to *prevent* severe bleeding, the reduction was 81%. The *treatment* intervention increased the costs of delivering and managing obstetric care by 6% and the *preventive* intervention by 35%. The additional cost for every disability adjusted life year saved was estimated at US$6 and US$170 respectively.[5]

Sources:

[1] *Hofmeyr GJ, et al (2009). "Misoprostol to prevent and treat postpartum haemorrhage: a systematic review and meta-analysis of maternal deaths and dose-related effects." Bulletin of the World Health Organization, Vol 87, No. 9 September 2009.*

[2] *WHO (2009). "WHO Statement regarding the use of misoprostol for postpartum haemorrhage prevention and treatment." (PDF). http://whqlibdoc.who.int/hq/2009/WHO_RHR_09.22_eng.pdf*

[3] *WHO (2010). "Clarifying WHO position on misoprostol use in the community to reduce maternal death." (PDF). http://whqlibdoc.who.int/hq/2010/WHO_RHR_10.11_eng.pdf*

[4] *Derman RJ, Kodkany BS, Goudar SS, et al. "Oral misoprostol in preventing postpartum haemorrhage in resource-poor communities: a randomised controlled trial." Lancet 2006; 368:1248–53.*

[5] *Sutherland T, et al (2010). "Community-based distribution of misoprostol for treatment or prevention of postpartum hemorrhage: Cost-effectiveness, mortality, and morbidity reduction analysis." International Journal of Gynecology and Obstetrics 108 (2010) 289–294.*

Technology innovations

Several new drugs, treatments, procedures and devices currently still in the research pipeline are expected to bring significant improvements to the health of women, adolescent girls, newborns and children (see Table 1 and Box 1).

Sophisticated technologies are often available in private sector hospitals in the urban areas of many developing countries. However, their use in rural areas is problematic because they are often too expensive and complex to apply. Some low-cost solutions have been tested, such as pre-filled syringes, pocket-size ultrasound devices[8] and manual vacuum aspirators, and their suitability for different contexts is now being explored. For example, oxytocin to prevent heavy bleeding during childbirth, provided in pre-filled syringes (Uniject),[9] has been tested in Angola, Vietnam and Mali for use by frontline health workers to improve women's access to this life-saving drug.[10]

Equipment to monitor fetal heart rates is not usually suitable for use in rural areas, where electricity and maintenance can be problematic. Simple, manually-operated heart rate monitors are now available.[11] Similarly, a wider range of health workers can now practice neonatal resuscitation with a simple oral and nasal suction device.[12] And for children, discoveries on the benefits of zinc supplements and oral rehydration salts (ORS) to reduce the severity of acute diarrhea and diarrhea-related deaths are being extended in countries such as Bangladesh.[13]

New information and communication technologies (ICTs) have also contributed significantly. Telemedicine – the use of interactive audio-visual media, such as the internet, email, video-conferencing or telephony – is being used in several countries for clinical consultations and information exchange.[14] Mobile phones have the potential to significantly change the ways in which healthcare is delivered and sought (see Box 2).

Some terms explained

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

Working definition of the Innovation Working Group, Global Strategy for Women's and Children's Health.

Source: "Investing in Our Common Future." Background Paper for the Global Strategy for Women's and Children's Health. (PDF). www.who.int/entity/pmnch/activities/jointactionplan/100922_2_investing.pdf

Table 1 – A selection of innovations in the pipeline

Cleaning the umbilical cord with an antiseptic

WHO recommends dry cord care for newborns. However, in many developing countries practices during childbirth, together with poor hygiene, lead to infections and newborn deaths. Cleaning the umbilical cord with a chemical antiseptic (4.0% chlorhexidine) could reduce the risks.

Source: Mullany LC, et al (2009). "Impact of 4.0% chlorhexidine cleansing of the umbilical cord on mortality and omphalitis among newborns of Sylhet, Bangladesh: design of a community-based cluster randomized trial." BMC Pediatrics 2009, 9:67. www.biomedcentral.com/1471-2431/9/67

Anti-malarial drugs for infants

The use of anti-malarial drugs for infants is an innovation, and is under investigation for safety and effectiveness.

Source: Grobusch MP, et al (2007). Intermittent preventive therapy for malaria: progress and future directions. Curr Opin Infect Dis 20:613–620 (PDF). www.ipti-malaria.org/LinkClick.aspx?fileticket=Buwx9cln2tA%3D&tabid=228

Nutritional improvements

There is some evidence that home fortification (adding nutrients to regular diets) can reduce anemia risk and improve the height and weight of children. A study found that home fortification was acceptable to mothers and children, and had few side effects. Scaling up requires more evidence on benefits and cost-effectiveness.

Source: Dewey K G, et al (2009). "Systematic review and meta-analysis of home fortification of complementary foods." Maternal & Child Nutrition, Vol.5, Issue 4, pp 283 – 32.

Clean birth kits (CBK)

These kits are designed to help support the use of the "six cleans" practices at the time of birth, which reduce significantly the risks of infection among mothers and newborns. Simple CBKs typically include only a few disposable items, such as soap, blade and a plastic sheet. Mother-held CBKs are already used in over 50 countries. Current evidence suggests that CBKs are appropriate in conflict or humanitarian emergencies and in settings where there is low coverage of facility births, now and in the foreseeable future. There is a need for more robust information about the benefits and costs of introducing mother-held CBKs, particularly given the potential to use this as a mechanism for providing other proven commodities, such as ITNs.

Sources: Blencowe H, Lawn J, Graham W. (2010) Clean Birth Kits – the potential to deliver. Evidence, experience, estimated lives saved, and cost. Save the Children and Immpact, University of Aberdeen. Available at: www.healthynewbornnetwork.org

Birth Kits Working Group. See: http://maternalhealthtaskforce.org/component/search/clean%2Bbirth%2Bkits/%252F?ordering=&searchphrase=all&limit=20

Box 2 – mHealth – reaching the unreached

About 64% of mobile phone users are in developing countries.[1] Several countries are now capitalizing on this opportunity through mHealth – which provides health solutions through mobile phones. Some of the innovative uses of mobile phones include: storing patient data and managing cases (e.g. TRACnet in Rwanda); providing information and advice (e.g. mDhil in India); accessing transport for emergency referrals (e.g. MoTech in Ghana); and linking patients, community workers and hospitals (Frontline SMS).

Rigorous evidence is still needed on the impact of mHealth on health and costs. Most mHealth solutions are currently single applications, such as data generation or disease surveillance. The next step is to enable solutions to undertake multiple tasks, including, for example, gathering data and then integrating this with routine health information systems.[2] A new initiative of the mHealth Alliance now aims to apply mHealth solutions to RMNCH needs and support proven interventions along the continuum of care.[3]

Sources:

[1] Vital Wave Consulting (2010). "mHealth for Development: The Opportunity of Mobile Technology for Healthcare in the Developing World." Washington, D.C. and Berkshire, UK: UN Foundation-Vodafone Foundation Partnership. (PDF). www.vitalwaveconsulting.com/pdf/mHealth.pdf

[2] Earth Institute (2010). "Barriers and Gaps Affecting mHealth in Low and Middle Income Countries. A Policy White Paper." Washington, D.C.: mHealth Alliance. (PDF). www.mhealthalliance.org/sites/default/files/OurWork.ThoughtLeadership.Reports.mHealth%20Policy%20Barriers.pdf

[3] "Maternal and newborn mHealth initiative." mHealth Alliance. (PDF). www.mhealthalliance.org/sites/default/files/files/MNMI%20Fact%20Sheet%2007%206%2010%20FINAL%20UPDATED.pdf?phpMyAdmin=45nAL7CwKV1F-wrVO14sFfNVg60

Conclusion

Ultimately, the benefits of all innovations depend on their availability at scale. Barriers to successful implementation of any new device or service-delivery innovation, such as rickshaw ambulances to transport women in labor,[15] vary across countries. Knowledge of which efforts work (or do not) in specific contexts and conditions comes from robust implementation research (see Box 3). Such lessons not only help to strengthen health systems and the drive towards universal access (see Knowledge Summary 8), but also to optimize the benefits of service delivery and technology innovations.

Useful resources

- Innovations for Maternal, Newborn & Child Health www.innovationsformnch.org/learning/
- Center for Health Market Innovations (CHMI) http://healthmarketinnovations.org
- Health Unbound (HUB) www.healthunbound.org

Box 3 – Investing in implementation research

The Implementation Research Platform (IRP) is an initiative of the Alliance for Health Policy and Systems Research (AHPSR). It aims to support research on implementing RMNCH interventions and to build developing countries' capacity to conduct this type of crucial research.

Source: http://www.who.int/alliance-hpsr/about/en/

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3 In Pakistan's makeshift camps, mobile health clinics save lives. UNICEF news item (accessed on 6 October 2010). www.unicef.org/infobycountry/pakistan_55949.html
4 WHO and UNICEF (2009). "Home visits for the newborn child: a strategy to improve survival." (PDF). http://whqlibdoc.who.int/hq/2009/WHO_FCH_CAH_09.02_eng.pdf
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7 Dawson P, et al (2008). "From research to national expansion: 20 years' experience of community-based management of childhood pneumonia in Nepal." *Bulletin of the World Health Organization*, May 2008, 86 (5) (PDF). www.who.int/bulletin/volumes/86/5/07-047688.pdf
8 GE V-Scan pocket-sized mobile ultrasound. www.ge.com/innovation/vscan/
9 www.bd.com/immunization/pdfs/products/bd_uniject.pdf
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14 Wootton R, et al (eds) (2009). "Telehealth in the developing world." http://books.google.co.uk/books?hl=en&lr=&id=MkX5zjCoVIcC&oi=fnd&pg=PA68&dq=telemedicine+in+the+developing+world&ots=HwzAH1K-Hb&sig=JEP_LT3cAI2wZhgrSGpYVoOrWeA#v=onepage&q=telemedicine%20in%20the%20developing%20world&f=false
15 http://gizmodo.com/5023869/jaambaaro-vehicle-puts-the-rickshaw-in-ambulance