Innovating for women's, children's, and adolescents' health

Innovation is central to reaching the sustainable development goals on women's, children's, and adolescents' health. The task now is to scale up these innovations in a sustainable way, say **Haitham El-Noush and colleagues**

The progress report on the UN secretary general's Global Strategy for Women's and Children's Health, *Saving Lives, Protecting Futures*, notes that "innovation is essential to achieving the ultimate goal of ending preventable deaths among women and children and ensuring they thrive."¹ The report advocates for integrated innovation, which combines science and technology and social, business, and financial innovation to enable sustainability and the scaling up of interventions.²

Innovation is required in all aspects of the Every Woman Every Child initiative (www.everywomaneverychild.org), including health systems, social determinants of health, human rights, leadership, finance, and accountability, to help to achieve the United Nations' sustainable development goals.

Strategically, innovation forges non-traditional partnerships among the public and private sectors, attracts new sources of funding through investment opportunities for the private sector and governments, and stimulates creative ways for countries to use innovation to accelerate attainment of their health goals. Innovation complements programmes that achieve results in the near term but that may not be sustainable without ongoing support from donors.

Alongside Every Woman Every Child in 2010 the UN secretary general, Ban Ki-moon,

launched an associated Innovation Working Group to advocate for, identify, and support innovations to accelerate progress on the health targets in the millennium development goals. Meanwhile, global partners of the secretary general's strategy were developing a pipeline of innovations in women's, children's, and adolescents' health. Research conducted for *Saving Lives, Protecting Futures* showed that more than 1000 innovations totalling over \$255m (£165m; €235m) had been supported in the research and development pipeline.

We are in a watershed year. The transition from the millennium development goals to the sustainable development goals provides a pragmatic opportunity to advance the innovation agenda to ensure that the best innovations are scaled up and have maximum impact on saving and improving the lives of women and children by 2030.

In this paper we propose challenges and solutions for the post-2015 period, aimed at meeting the goals of the Global Strategy for Women's, Children's and Adolescents' Health and the sustainable development goals.

Methods

Evidence for this article was gathered from the published literature, UN reports, and the authors' experiences in development innovation. While we cannot claim consensus, this paper was reviewed by members of the Every Woman Every Child Innovation Working Group and other global health experts, whose feedback was used to modify it.

What is the problem?

Despite important progress, unfortunately each year 6.3 million children still die before the age of 5 and 289 000 women die in pregnancy and childbirth. A third of children, meanwhile, fail to reach their full potential. Innovation is needed to rectify this situation and help us reach the new sustainable development goals. In the past five years over 1000 innovations in women's, children's, and adolescents' health have been supported. Most of these, however, are at proof of concept stage, with only a few being fully scaled up.

A major gap is the lack of a smooth pathway along which innovations can be scaled up sustainably. Every Woman Every Child is uniquely positioned to bridge any gaps by providing a platform to deliver strong political and leadership commitments, mobilise resources, and connect the stakeholders needed to successfully scale up an innovation. These stakeholders include innovators, universities, small and medium enterprises, incubators and accelerators, foundations, development agencies, civil society organisations, multinational corporations, investment banks, high net worth individuals, and governments.

EWEC innovation marketplace

The Innovation Working Group aims to smooth the innovation pathway in a sustainable manner by establishing the Every Woman Every Child innovation marketplace to facilitate the four interlinked elements of innovation: the pipeline, curation, brokering, and investment. The group seeks to create links to already existing resources and initiatives, thus establishing a more coherent system for scaling up innovations in a sustainable manner. But it does not propose to replicate what is already being done well by others in the innovation ecosystem. Every Woman Every Child provides investors with a trustworthy source of investment opportunities that is free from conflicts of interest, developed by a trusted partner that used transparent criteria and governance processes. It catalyses the convergence of initiatives and stakeholders in a way that might not otherwise be possible.

Priority interventions

The goal of the EWEC innovation marketplace is to scale up 20 investments in women's, children's, and adolescents' health by 2020 and to enable at least 10 of these innovations to be widely available and having a significant effect by 2030.

One inspiring example of innovation is the African meningitis vaccine project, which took 15 years to start saving lives but has now been used to immunise more than 215 million people. By 2020 the vaccine is expected to protect more than 400 million

KEY MESSAGES

Innovation in healthcare is essential to the achievement of the post-2015 sustainable development goals

Over the past five years over 1000 innovations in women's, children's, and adolescents' health have been supported but few have been fully scaled up in a sustainable manner

To tackle the scaling challenge in innovation, the Every Woman Every Child Innovation Working Group builds networks of investors and links innovations to private sector commitments and national resources, through the brokering function of its innovation marketplace

BOX 1: EXAMPLES OF INNOVATIONS*

Preventing bleeding after childbirth

Effort has been made to accelerate the development of an innovative, heat stable, and low cost inhaled form of oxytocin to manage postpartum haemorrhage after childbirth in developing countries. An innovation was developed by Monash University and initially supported by the Saving Lives at Birth partners. It is now being accelerated through a collaboration with GlaxoSmithKline, McCall MacBain, the Planet Wheeler Foundation, and Grand Challenges Canada. It has the potential to save the lives of almost 20 000 pregnant women each year.

Assisting difficult births

The BD Odón Device is a delivery assistance device supported by the Saving Lives at Birth partners, which is designed to be safer and easier to use in resource limited settings than forceps, vacuum extractors, or caesarean sections. It has the potential to prevent 200 000 deaths a year in sub-Saharan Africa. Development of this new device continues, in partnership with the World Health Organization (WHO). The medical technology company BD (Becton Dickinson) intends to manufacture and distribute it at full scale, assuming that ongoing clinical testing validates its safety and efficacy.

Preventing infection among newborns

With investment from the Saving Lives at Birth partners, John Snow International has pioneered the use of the antiseptic compound chlorhexidine in Nepal as a safer, more effective alternative than existing methods for disinfecting a newborn's umbilical cord stump. Research indicates that routine use of chlorhexidine could reduce the incidence of newborn death by 24%. Already 1.2 million babies have had chlorhexidine applied to their umbilical cord stump, leading to an estimated more than 7 500 lives saved in Nepal alone. Scaling up is already occurring in Nigeria and Madagascar, and in other countries.

*Descriptions adapted from www.everywomaneverychild.org/global-strategy-2/g52-progress-report.

people and prevent one million cases of meningitis A, 150 000 deaths, and 250 000 cases of severe disability.³

The time frame for innovation means that their full impact may not be felt for five, 10, or even 15 years.⁴ Examples of innovations that are in the process of being scaled up are in box 1.

Four interlinked aspects of innovation Pipeline

The pipeline comprises early stage innovations supported by investments of \$100 000 to \$250 000 to reach the proof of concept stage. There are more than 1000 innovations in the pipeline for women's, children's, and adolescents' health. Examples of key sources of innovations in the pipeline are shown in box 2.

Although the innovation pipeline is robust, it is difficult to access and analyse. For example, 1689 innovative projects (including but not limited to women's, children's, and adolescents' health) in 80 countries are listed on grandchallenges.org. This level of information is an advance, but it is difficult to search for all the projects on a specific topic, access project level information (potentially including results), analyse individual projects, or allow other qualified funders to deposit projects. The Bill and Melinda Gates Foundation, USAID, Grand Challenges Canada, and the Results for Development Institute are working together to improve the interoperability of these data.

The Innovation Working Group's role is to stimulate funders to refresh the pipeline, to monitor it, and to encourage the consolidation of pipeline information to make it easier to access and analyse. A specific example is

the use of common data elements, allowing project information and updates to be easily transferred from one repository to another.

Curation

Curation is the comparative analysis of innovations in the pipeline. It answers the question of which of the innovations are best. It is a critical step in distilling dozens of innovations that might be in the pipeline for a women's, children's, and adolescents' health sub-topic such as pneumonia down to a few of the best to present to an investor who may be interested in supporting an innovation for pneumonia. Naturally, what is "best" depends on the intended audience, and the curation process needs to take this into account. The figure shows a taxonomy of sub-topics developed through consultation by the Innovation Working Group.

Currently there is not enough comparison of innovations. The provenance of initial

funding at proof of concept stage often determines which investments are scaled up. Curation activity must focus on conditions with the greatest disease burden and on innovations with the greatest potential to save and improve lives.

A process and criteria are needed to enable comparison among innovations, especially those vying for further investment in certain sub-topics. A good example of an attempt to do this is the PATH Innovation Countdown 2030 report, funded by the Norwegian Agency for Development Cooperation (Norad), US Agency for International Development (USAID), and the Bill and Melinda Gates Foundation (see <http://ic2030.org>). Many groups, from foundations to companies to venture capital firms, do their own curation when deciding on investments, but there is no system to share and build on these efforts.

Curation may show that some innovations are not quite ready for investment because they have not reached the stage of scientific proof of concept or because their business plan is poorly developed. This highlights the need for bridge financing in the range of \$250 to \$1m and also for mentoring through investment readiness programmes such as Lemelson/Venture Well, Duke SEAD, Villgro, GSBI, and NESST.

A neutral body associated with the UN can gain the confidence of investors and governments. The Innovation Working Group can stimulate, organise, and finance curation exercises in the sub-topics shown in the figure so that the most promising innovations can be scaled up through brokering and investment, ultimately achieving impact. WHO has a track record of providing technical assistance to governments and can lend expertise. The working group's neutrality is crucial, because investors seek a trustworthy list of investment opportunities that is free of conflicts of interest and has transparent criteria and governance processes.

BOX 2: INNOVATIONS IN PIPELINE (WITH KEY SOURCES)

- Saving Lives at Birth (USAID, Gates Foundation, Grand Challenges Canada, Norway, UK Aid, Korean International Cooperation Agency)
- Saving Brains (Grand Challenges Canada and partners including Aga Khan Foundation Canada, World Vision Canada and the Norlien, Bernard van Leer, Maria Cecilia Souto Vidigal, and UBS Optimus Foundations)
- All Children Thriving, and Putting Women and Girls at Center of Development (Gates Foundation and partners including Brazil and India)
- Global Innovation Fund, DIV@USAID, Gates Grand Challenges Explorations, Grand Challenges Canada Stars in Global Health, and similar innovations
- Grand Challenges projects in India, Brazil China, Israel, and Peru and nascent initiatives in Thailand and ASEAN countries
- Every Woman Every Child Innovation Working Group's Catalytic mhealth Grants Program, supported by Norad through UN Foundation

In addition, there are individual company pipelines, from small and medium enterprises to multinational corporations, and universities are a key source of innovation

Sub-topics among innovations in the pipeline for women's, children's, and adolescents' health

Brokering

Brokering is the process of investment due diligence and of matching innovations to investors. Brokers need a "line of sight to the entire community," including looking "backward" to curation and "forward" to investment, to effectively link innovators and investors. Communication of the curation effort is important to the marketing of the investment opportunity, conveying messages of the product's benefits and, critically, that it is "doable," given a sound investment thesis. Lessons can be learnt here from other impact investment organisations, such as the Global Health Investment Fund.

There is no successful systematic evaluation of experience of offering social investments to investors. As Judith Rodin of the Rockefeller Foundation has pointed out, trillions of dollars in private capital are sitting on the sidelines.⁵ Investors require trustworthy channels and an effective and neutral deal sourcing process through which to make investments that have an impact. An impact investment manager is needed to broker such opportunities.

The week of the UN General Assembly, and the annual Every Woman Every Child innovation sector session, are opportunities to celebrate private sector commitments in the form of brokered deals. Examples of brokered deals announced at the assembly include the Odon device (2013) and inhaled oxytocin (2014).

Health ministries have an important role in selecting innovations on the basis of need. The Innovation Working Group can help by creating "a global platform that thinks locally." This platform would provide user feedback from frontline staff and bring other benefits to countries in terms of procurement and distribution. The ultimate goal is to

create a culture of innovation in health ministries. As a neutral platform, the innovation group can take the lead on brokering and the development of brokering models, including using the annual UN General Assembly as a brokering platform and to celebrate successful deals. This is one important way for the EWEC innovation marketplace to add value.

Investment

Investment is the process of decision making for public and private funding of innovations of more than \$1m. We need ways to access new pools of capital, such as private sector investors, and to mobilise countries' domestic resources. Investors include multinational companies, impact investors, venture philanthropists, "angels," venture capital funds, civil society organisations, foundations, and governments. The innovation marketplace is not itself an investment fund but provides channels that increase opportunities to invest in innovation. Investment can also be enhanced by online platforms such as the Canadian government's "Convergence" platform, which will help create partnerships for new blended finance investment vehicles.

Innovation in women's, children's, and adolescents' health, and in particular its shared global governance through the Grand Challenges initiatives (<http://grandchallenges.org>), has great potential as a domestic resource mobilisation strategy to help countries reach the sustainable development goals.⁶ Countries support their own innovators because this leads to social and economic development and jobs. Country plans under the UN global financing facility—a recently launched mechanism that pools resources to fund women's, children's, and adolescents' health programmes in low and middle income countries—will provide a

means of financing innovations. Nothing drives innovation like market demand. Scaling up and adoption of innovative service delivery approaches and new technologies by countries is associated with an annual decline of about 2% per year in the under 5 mortality rate.⁷

Imagine a scenario whereby a health minister can survey the national gaps in care, match these gaps to innovations in the EWEC marketplace, and finance the scaling up of these innovations through procurement, by using domestic resources or the UN global financing facility. Ultimately, countries are the biggest investors in innovation as it is scaled up, and health ministries institutionalise these innovations. Such a system optimises country leadership and the lifesaving and life improving power of innovation for women's and children's health.

Civil society organisations are another source of finance and are well positioned to adopt and scale up innovations. The same foundations and development agencies that helped create the pipeline at proof of concept stage will also help finance the most promising innovations, serving to further reduce risk for subsequent private and public investors.

Although beyond the scope of the innovation marketplace, a country's regulatory environment influences the adoption of innovations. International technical agencies such as WHO have a valuable role in making recommendations in support of health interventions, including innovations. More generally, mechanisms that focus on creating enabling environments for national health systems to absorb innovations, including the lessons learnt from scaling innovations in other countries, would be useful.

Conclusion

In 2010, the challenge for Every Woman Every Child was to create a pipeline of innovations. In 2015, a pipeline of over 1000 innovations in women's, children's, and adolescents' health has been created, and the challenge now is to scale them up. A key strategy of the Innovation Working Group will be to link existing activities and gaps in care and to create a global marketplace for the innovations, where they meet investors so that they can be scaled up sustainably and achieve widespread impact. The innovation model developed for women's, children's, and adolescents' health may also be useful to pave the way from innovation to impact for other sustainable development goals in the post-2015 era.

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