PRESS RELEASE

Saving Lives at Birth: A Grand Challenge for Development Announces Award Nominees for Innovative Solutions to Prevent Infant/Maternal Deaths

53 finalists, development experts, and potential funders to be featured at DevelopmentXChange

Washington, D.C.

The Saving Lives at Birth: A Grand Challenge for Development today announced 22 Round 3 award nominees from a pool of 53 finalists – innovators who descended on Washington for three days to showcase bold, new ideas to save the lives of mothers and newborns in developing countries with aspirations of international funding to realize their vision.

The award nominees cut across maternal and neonatal health, family planning, nutrition and HIV and they present not only cutting-edge technologies that can be used in resource-poor settings, but innovative approaches to delivering services and the adoption of healthy behaviors. The announcement was made at the closing forum of the DevelopmentXChange by the Saving Lives at Birth partners. The nominees will now enter into final negotiations before awards are issued.

The Saving Lives at Birth partnership, launched in 2011, includes the U.S. Agency for International Development (USAID), the Government of Norway, the Bill & Melinda Gates Foundation, Grand Challenges Canada (funded by the Government of Canada), and the U.K’s Department for International Development (DFID). The grand challenge is a global call for groundbreaking, scalable solutions to prevent infant and maternal deaths around the time of birth.

The Saving Lives at Birth DevelopmentXChange provided a platform for top global innovators to present their ideas in an open, dynamic marketplace and exchange ideas with development experts and potential funders to help meet the immense challenge of protecting mothers and newborns in the poorest places on earth, during their most vulnerable hours. Other promising ideas will be considered for “incubator awards” to assist innovators in further developing their ideas through dialogue and mentorship.

Award nominees of Saving Lives at Birth Round 3 include 4 transition-to-scale grant nominees:
• **Africare – Dakar, Senegal:** A collaborative community-based technology that integrates community support services with mobile and telemedicine platforms to increase demand for, and access to, quality prenatal care services in Senegal.

• **Epidemiological Research Center in Sexual and Reproductive Health – Guatemala City, Guatemala:** An integrated approach to reduce maternal and perinatal mortality in Northern Guatemala through simulation-based training, social marketing campaigns and formal health care system engagement.

• **Massachusetts General Hospital – Boston, MA, USA:** A next-generation uterine balloon tamponade (UBT) device to treat postpartum hemorrhage (PPH) in Kenya and South Sudan.

• **The Research Institute at Nationwide Children’s Hospital – Columbus, OH, USA:** A low-cost paper-based urine test for early diagnosis of pre-eclampsia to reduce pre-eclampsia morbidity and mortality in resource-limited areas

And 18 seed grant nominees:

• **BILIMETRIX SRL – Trieste, Italy:** An inexpensive system to rapidly test for markers of hyperbilirubinemia (kernicterus)—an often fatal form of brain damage caused by excessive jaundice—in low resource settings in Nigeria, Egypt, and Indonesia.

• **Bioceptive, Inc. – New Orleans, LA, USA:** A low-cost, reusable, and intuitive intrauterine device (IUD) inserter to make the IUD insertion procedure easier and safer in low-resource settings.

• **Convergent Engineering Inc. – Newberry, FL, USA:** An inexpensive, easy-to-use, handheld early-warning system that detects pre-eclampsia 10-12 weeks before the onset symptoms. The system pairs a wrist strap embedded with inexpensive ECG and photoplethysmography sensors with a smart phone for processing, data aggregation, and communication.

• **JustMilk - Dept. of Chemical Engineering, University of Cambridge – Cambridge, UK:** A low-cost system that aids the administration of drugs and nutrients to breastfeeding infants via easily disintegrating tablets housed within a modified Nipple Shield Delivery System (NSDS).

• **Dimagi, Inc. (CommTrack) – Cambridge, MA, USA:** An open-source distribution management system integrating mobile and GPS technology to improve transparency, supply chain functioning, communication, and the timely delivery of medicine to hard to reach, low-income areas in Africa.

• **Duke University – Durham, NC, USA:** Healthcare system integration of the “Pratt Pouch”—a tiny ketchup-like packet that stores antiretroviral AIDS medication for a year—to enable the pouch to be used in home-birth settings to prevent transmission of HIV from mother to child. Testing taking place in Zambia.
• **Emory University** – Atlanta, GA, USA: A micro-needle patch that co-administers the influenza and tetanus toxoid vaccines to pregnant mothers and children in developing countries.

• **Mbarara University of Science and Technology** – Mbarara, Uganda: The Augmented Infant Resuscitator (AIR) which gives instant feedback to healthcare professionals performing newborn resuscitation to reduce neonatal deaths from intrapartum birth asphyxia or prematurity.

• **Nanobiosym, Inc** – Cambridge, MA, USA: A nanotech platform which enables rapid, accurate and mobile HIV diagnosis at point-of-care, allowing for timely treatment with antiretroviral therapy to reduce HIV-related mortality in infants in Rwanda.

• **Oregon Health and Science University** – Portland, OR, USA: The Xstat mini-sponge applicator for the treatment of postpartum hemorrhage (PPH).

• **Population Services International** – Washington DC, USA: A new inserter for immediate postpartum intrauterine device (PPIUD) insertions to increase contraceptive uptake in developing countries.

• **President and Fellows of Harvard College** – Boston, MA, USA: A handheld vital sign monitor for the rapid diagnosis of frail and sick newborns.

• **Program for Appropriate Technology in Health (PATH)** – Seattle, WA, USA: A heat-stable oxytocin in a fast-dissolving oral tablet to treat postpartum hemorrhage (PPH).

• **Program for Appropriate Technology in Health (PATH)** – Seattle, WA, USA: A magnesium sulfate (MgSO4) gel that simplifies treatment of pre-eclampsia and eclampsia.

• **The Board of Regents of the University of Wisconsin System** – Madison, WI, USA: A Lactobacillus casei strain that enables the sustainable home production of beta-Carotene enriched dairy products for at-risk mothers and families in Southern Asia.

• **The University of Melbourne** – Melbourne, Australia: A low-cost, electricity-free oxygen concentrator suitable for providing provisional oxygen for neonates in low-resource settings.

• **University of Toronto** – Toronto, Canada: A spray-encapsulated iron premix that will be attached to tea leaves to reduce rates of iron deficiency of pregnant women in South Asia.

• **University of Valencia** – Valencia, Spain: A rapid point-of-care test strips for early diagnosis of sepsis in pregnancy and childbirth.

The *Saving Lives at Birth* DevelopmentXChange featured discussions focused on meeting the needs and realities of women and children in low-resource settings as well as workshops that explored business planning, market research, impact investing, and strategies for scaling their innovations. The three-day event concluded with a forum featuring Ambassador Susan E. Rice, National Security Advisor; Dr. Rajiv Shah, Administrator, USAID; HRH Princess Sarah Zeid of Jordan; New York Times best-selling author Dan Heath and NASA astronaut retired Col. Ron Garan.
Leading into the Development\textsuperscript{X}Change, existing \textit{Saving Lives at Birth} grantees participated in a three-day, customized training program – a focal point of the global health Xcelerator. This eight-month program, offered through a partnership between National Collegiate Inventors and Innovators Alliance (NCIIA), the Lemelson Foundation and USAID, provides grantees the tools and knowledge to scale their ideas and maximize the impact of their innovations.

Every year 150,000 mothers and 1.6 million newborns die during childbirth and 1.2 million infants are stillborn. In an effort to accelerate progress toward the United Nations Millennium Development Goals (MDGs) 4 and 5, which aim to end preventable child and maternal deaths, this partnership brings together leading innovators, development experts, and potential funders in an open, dynamic marketplace of ideas, the DevelopmentXChange builds a community of creative thinkers to address this global need. \textit{Saving Lives at Birth} has funded 39 innovations since the challenge began in 2011.

To learn more about the \textit{Saving Lives at Birth} Round 3 award nominees go to: \url{www.savinglivesatbirth.net}

For additional information, contact:

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A. Despite WHO’s recommendations for antenatal vaccination against two life threatening diseases, influenza and tetanus, reduction of maternal and neonatal death rates in developing countries is far below the Millennium Development Goals.

In the first 10 years of the second millennium neonatal deaths dropped from 4 M to 3.1 M but the percent of \textit{tetanus} cases persists at the same or higher levels in developing countries and claims 30,000 lives of pregnant women every year. In sub-Saharan Africa pregnancy, child-birth complications and newborn illness are among the major challenges, with infections including tetanus accounting for 23% of maternal deaths whereas infections, intra-partum related conditions and pre-term births account for
88% of newborn deaths in the region. Neonatal tetanus is still around 10% in countries with disease occurrence with antenatal care far below 50% in many countries with tetanus a situation that has been practically unchanged since the late 1980s.

**Influenza** infection-related complications in fetuses and neonates, are associated with increased risk of miscarriage, stillbirth, neonatal death, preterm birth, and low birth weight. Notably 29% percent of neonatal deaths due to prematurity and low birth weight translates to 115,000 lives every year without even taking into account the unregistered deaths from baby deliveries at home. Pregnant women are also at risk from influenza infections during the second and third trimester of pregnancy showing a fivefold increase in cardiopulmonary complications, morbidity and mortality compared to a non-pregnant population.

To this day only 50% of pregnant women receive influenza vaccines and despite the tetanus toxoid vaccination the infection due to *Clostridium tetani* still contributes to 7% of neonatal deaths per year.

B. **Bottlenecks** for the poor record of vaccination against tetanus and influenza are:

- Lack of access and utilization of healthcare services due to residence in remote rural areas
- Shortage in trained health care personnel
- Both vaccines require syringes and needles for administration
- Both vaccines require refrigeration for storage with increased costs.
- Additional hurdles for effective immunization campaigns may include lack of information socioeconomic and religious factors

C. **We propose to engineer polymer microneedle patches encapsulating influenza and tetanus vaccines to simultaneously enhance universal antenatal influenza immunization and tetanus vaccination**

- **Application requires minimal training:** microneedle patches are applied to skin like a skin plaster (e.g. Band-Aid®).
- **Small size:** simplification of storage, transportation and administration logistics.
- **Vaccine stability:** Storage of patches at room temperature for prolonged periods of time
- **Rapid vaccine delivery and simplification of waste management:** Microneedles are formulated to dissolve and release the vaccine within minutes once inserted in skin
- **Improved safety:** Elimination of syringes and needles obliterates the risk of accidental infection by blood-borne pathogens, 90% of which occur in developing countries.
- **Elimination of cold chain:** No need for storage and transportation at 4°C.