GRAND CHALLENGES AFRICA

Inspiring innovation to address Africa's health and developmental challenges

GRAND CHALLENGES AFRICA – INNOVATION SEED GRANTS – Round 1
REQUEST FOR PROPOSALS

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Call Closure date: 17th February 2017

Challenge 1: ***Providing new impetus and solutions to meet the Sustainable Development Goal 3 targets for maternal neonatal and child health (MNCH) in Africa***

The Opportunity

While great strides have been made in reducing mortality in Africa, maternal and neonatal mortality rates remain unacceptably high. Estimates show that over half the global maternal deaths and over three-quarters of neonatal deaths occur in sub-Saharan Africa[1, 2]. More than half of maternal deaths are directly or indirectly attributed to infectious causes such as HIV, Malaria in pregnancy, sepsis, and sexually transmitted diseases (STDs) resulting in complications at birth that often lead to death. In addition, undiagnosed and untreated non-communicable diseases (NCDs) are significant contributors to acute maternal and neonatal morbidity and mortality. The close relationship between mothers and their infants results in shared aetiologies and as a result, around half of new-born deaths are due to mother transmitted infections, including tetanus[3]. Management of these infections is further complicated by anti-microbial resistance(AMR). Critically, the risk of dying during the first day of life in Africa is close to 1% with the top three causes being infections, birth asphyxia and complications of preterm birth which together account for 88% of the new-born deaths[4]. In addition, intrapartum and antenatal stillbirths are found in almost equal numbers to neonatal deaths and many of these are due to readily preventable causes such as maternal infection (e.g. syphilis) and better labour management to prevent neonatal asphyxia. Effective interventions to help reduce this mortality would target management of labour and delivery, still births, preterm births, timely diagnosis and treatment of infectious and non-communicable diseases, while also addressing malnutrition in both mothers and children.

Program Goal

This call is focused on the SDG3 targets with the overall objective of focusing African scientists to work in local and global partnerships on the ambitious but achievable goals of accelerating knowledge generation, developing and deploying interventions and innovations that will advance the prevention of maternal deaths, preterm birth and neonatal deaths and improve implementation of policies and innovations that will improve care for the mother and child in the first month of life and prevent death due to non-communicable causes in pregnant women and children under 5 years of age . The goal of this challenge is to determine what precise packages of interventions should be delivered to which group of individuals (mother or infant or both) to reduce the burden of maternal and neonatal deaths in Africa.

Program Objectives

We are looking for projects that:

1. Apply new technologies to enable rapid identification of exposures (communicable and non-communicable) that lead to poor outcomes in pregnancy, birth and in the first month of life.
2. Apply precision medicine approaches and techniques to identify microbes and other exposures in Africa that may increase susceptibility to non-communicable diseases (cancer, cardiovascular diseases etc.) in mothers and children under 5 years of age.
3. Provide innovative policy and clinical practice approaches and pathways that will enable the rapid and widespread adoption of:
    - Available well tested interventions whose uptake has been slow, but which would make profound impact if adopted and incorporated into ongoing MNCH programmes;
    - New innovations and technologies that can help Africa leapfrog and achieve rapid progress, in preventing maternal and neonatal deaths.

What we are looking for:

To reach these objectives, we are looking for projects that propose innovation in the following areas:

- **Measurement tools:** Pilot tests of new measurement tools, such as those based on a new technology or new biomarkers to enable the timely diagnosis and treatment of maternal/neonatal infections and NCDs that can lead to significant improvement of fetal and neonatal outcomes as well as prevent sill births, maternal mortality and morbidity.
- **Intervention packages:** Tests of new interventions – especially combinations of interventions –that 1) develop a new human cohort with unique advantages over existing cohorts, such as the potential for developing a unique biorepository; or 2) add an activity, such as a prospective pilot trial of an intervention or new measurement tool, to ongoing work with a human cohort, including at sites of intervention trials and sites for public health surveillance
- **Analytical tools:** Pilot tests of new analytical tools that use existing biorepositories or existing health and development databases for retrospective analysis

  Examples of what we will consider funding:
  - Rapid diagnosis of infectious/microbial pathogens that lead to preterm births;
  - Relation between undiagnosed NCDs in pregnant women and complicated births and low birth weight;
  - Relation between long term exposure to microbes (pathogenic or non-pathogenic) and maternal and neonatal mortality;
  - Neonatal sepsis (ideally bacteria/virus specific and even with AMR patterns);
  - Common metabolic disruptors/predictors such as glucose, acidosis, electrolytes;
  - Predictors of occurrence and severity of encephalopathies in Africa;
  - Contributors to common problems that afford a treatment/prevention option like ABO/Rh blood typing, apnea/oxygen etc;
  - Measures of fetal and sickle hemoglobin;
  - Wearable sensors for Heart Rate /Respiratory Rate/BP/EEG/Temperature etc.;
  - Interventions that encourage high coverage of known effective interventions to reduce maternal and neonatal mortality such as tetanus vaccination, antibiotic therapy to treat infections in mothers, screening for diabetes and hypertension;
  - Systems approaches to identify predictors of poor outcome in mothers and babies to allow for targeted interventions;
  - Studies aimed at understanding vaginal and neonatal microbiomes in relation to the burden of preterm birth sequelae, stunted postnatal growth, and impaired cognitive development because of alterations to the neonatal microbiomes;
  - Relation between long- term treatment of chronic diseases such as HIV and poor neonatal outcome;
  - Studies to provide a better understanding of the specific causes of antenatal and/or intrapartum stillbirths.

Examples of policy topic areas that would be relevant include, but are not limited to:

- Integration of MNCH into national health strategies;
- Human rights based approaches to MNCH including related reproductive health issues;
- Innovative approaches to mobilization of financial resources in support of MNCH programmes;
- Human resource issues including training, task shifting, deployment, retention, accreditation of medical personnel working in MNCH areas etc.;
- Better provision of essential health infrastructure, medicines and commodities, including specialized MNCH services and quality of service;
- Approaches to data usage and evaluating progress in MNCH and related reproductive health areas;
- Programs targeted at specifically addressing the prevention of stillbirths.

We will not consider funding for:

- Basic research that does not provide a clear path to development and testing of prevention, diagnosis and treatment strategies;
- Projects without the potential to expand in scale to provide solutions to a greater number or diversity of people;

- Projects lacking metrics to determine success or failure and to allow decisions about the appropriateness of follow-on/phase II funding;
- Solutions that are only slight improvements over existing approaches e.g., replication of an approach in a new geography in the absence of added innovation;
- Projects that cannot be implemented in LMIC countries in Africa;
- Approaches that simply propose/reproduce what is already widely available, and which fail to address key barriers to implementation; or only seek to modify policies that are already in practice;
- Proposals which could be well meaning but have the potential to enhance vulnerability, discrimination and marginalization of women and children;
- Ideas and approaches whose implementation would be financially too demanding for low resource settings;
- Policies and health management approaches that potentially could hinder widespread adoption of well proven technologies such as vaccine rollouts, screening opportunities, treatment compliance, especially those that target adolescent girls and young mothers;
- Projects earmarking African Academy of Sciences funds for lobbying activity (e.g., attempts to influence legislation or legislative action) or efforts to influence political campaigns for public office.

References

1. Alkema, L., et al., Global, regional, and national levels and trends in maternal mortality between 1990 and 2015, with scenario-based projections to 2030: a systematic analysis by the UN Maternal Mortality Estimation Inter-Agency Group. Lancet, 2016. 387(10017): p. 462-74.
2. Bhutta, Z.A., et al., Can available interventions end preventable deaths in mothers, newborn babies, and stillbirths, and at what cost? Lancet, 2014. 384(9940): p. 347-70.
3. Lawn, J.E., et al., Born too soon: accelerating actions for prevention and care of 15 million newborns born too soon. Reprod Health, 2013. 10 Suppl 1: p. S6.
4. Lawn, J.E., et al., Every Newborn: progress, priorities, and potential beyond survival. Lancet, 2014. 384(9938): p. 189-205.

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Challenge 2: Finding cutting-edge approaches to advocacy and communication that will motivate citizens of Africa and African governments to support investments in scientific research development and innovation.

The Opportunity

In 1980, African leaders' Lagos Plan of Action[1] called for countries to allocate at least 1% of gross domestic product (GDP) to Research and Development (R&D), to help spur the continent's development. In 2005 the African Ministerial Council on Science and Technology (AMCOST) endorsed the Science and Technology Consolidated Plan of Action (CPA) [2], which re-emphasised the investment of 1% of GDP in R&D by the year 2010. The CPA was adopted by the Heads of State and Government in 2007 but to date very few African governments have increased their funding for R&D and only a handful are approaching the 1% target. Reports from the AU suggest that the lag is not primarily the result of limited funding, but of a lack of appreciation for the value of such investments. As a result, policy makers do not give R&D funding priority when developing annual budgets. To achieve targets set for SDG9 and ultimately targets set for MNCH in SDG3, African Governments' must increase investments in science, technology and innovation.

Program Goal

We seek to find cutting-edge approaches to communication and advocacy of scientific research in Africa to increase Government investment in R&D for interventions that seek to reduce childhood mortality, improve maternal health, and combat HIV/AIDS, malaria, and other communicable and non-communicable diseases. The goal of this call is to ignite new ways of communicating the importance of investments in scientific research and development to motivate African governments and their citizens to support increased investments in scientific R&D from within the continent to complement, and eventually surpass, global/external investments.

What We are Looking For:

- Proposals that deliver innovative ideas, and that show a compelling plan for how to communicate and sustain public engagement around the importance of science and technology investments led by Africa for Africa and with potential global applications;

- Ideas and approaches that demonstrate both the progress made so far by African governments in support of Science Technology and Innovation (STI) and the potential of broad local and external partnerships, and which debunk cynical views about the lack of interest by African governments to invest in Science and Technology and which convince, incentivize and steward African governments to dedicate substantial annual budgets to support Science and Technology programmes.

We Are Accepting Proposals with An Emphasis in Four Areas:

1. **Mobile**: We seek proposals for projects that will activate these rapidly emerging mobile telephony/digital networks and engage users, through basic and smart phone technologies, in ways that build support for science and technology investment in Africa by Africa for Africa. We seek proposals for projects that not only use mobile technology to gather, tell stories and source funding, but also compel people to collaborate and take collective and correctives action.
2. **Data**: We seek proposals for projects that produce new analysis of and insights to existing data about lack of existing science and technology efforts, and that use it to tell compelling, new stories about how accelerating investments is important to achieving human development and socio-economic impact. We seek proposals that include strategies for how to interpret, visualize, organize and communicate data to broad audiences including policy makers, planners, strategists, development experts, funders, etc.
3. **Young audiences**: We believe it is critical to engage the large demographic dividend that is the youth of Africa in strategies to address Africa's challenges. We seek proposals for projects that will increase innovative ways of disseminating Science Technology Engineering and Mathematics (STEM) education and enhance youth awareness of the importance of science and technology so they are informed advocates and leaders in creating solutions to locally relevant problems by becoming Citizen Science themselves. Proposals must include specific information about how to engage the youth, how to attract them into science careers, which youth audiences the project will reach, how it will activate those audiences, and why.
4. **Direct Appeal to African Governments**: When spent wisely consistently and at the right levels, scientific investments in Africa can reverse the economic impact of the huge African disease burden

which is roughly estimated to reduce GDP by 20% [3]. We seek innovative and creative proposals that would make a strong case and direct appeal to African governments to dedicate increased annual funding to research, science and technology in their countries.

We will not consider funding for:

- Projects not aligned with the African Academy of Sciences strategic goals;
- Projects centered entirely around donations made by individuals to support narrowly defined development efforts;
- Projects that do not have a robust engagement strategy;
- Basic research without a clear objective to solve a communications and advocacy problem;
- Projects earmarking African Academy of Sciences funds for lobbying activity (e.g. attempts to influence legislation or legislative action) or efforts to influence political campaigns for public office;
- Projects that focus on a specific location or community, without a plan to expand the program more broadly;
- Projects centered entirely on running workshops without a clear outcome for communication and engagement strategy.

References

1. *Lagos Plan of Action for the Economic Development of Africa, 1980-2000*. (1982). Geneva, Switzerland: International Institute for Labour Studies.
2. Mugabe, J., & Ambali, A. (2006). *Africa's science & technology consolidated plan of action*. Midrand, South Africa: New Partnership for Africa's Development.
3. Fonkwo, P. N. (2008). Pricing infectious disease. The economic and health implications of infectious diseases. *EMBO Reports, 9*. doi:10.1038/embor.2008.110

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