GRAND CHALLENGES SOUTH AFRICA – INNOVATION SEED AND FULL GRANTS REQUEST FOR PROPOSALS

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Call closure date: 16th May 2018

New Approaches to Characterize the Global Burden of Antimicrobial Resistance.

The South African Medical Research Council (SAMRC) is launching a new Grand Challenge: New Approaches to Characterize the Global Burden of Antimicrobial Resistance. These grand challenge innovation grants will be issued and administered under the banner of Grand Challenges South Africa, a program implemented by the SAMRC in partnership with the Bill & Melinda Gates Foundation. This call for proposals is being launched in collaboration with the Grand Challenges Africa program of the African Academy of Sciences.

Funding for this call
Grand Challenges South Africa will provide Innovation Seed and Full Grants to *South African Innovators* based at South African institutions. Grand Challenges Africa will fund *African Innovators* through this *GC Africa Innovation Seed and full Grants call*. We are seeking innovative global health and development solutions from South African researchers subject to the eligibility requirements in the SAMRC Terms and Conditions of funding. *South African* investigators are invited to apply, with the support of the primary organization where they are affiliated, and where the major programme of work will be undertaken. Applications **MUST** be submitted through the AAS Ishango Online Application Portal. Grants will go to investigators in African countries, but we encourage partnerships with investigators in other countries, especially where the opportunity exists to build new or strengthen existing collaborations. The SAMRC will contract and provide awards directly to successful South African Principal Investigators' institutions. For collaborative projects, the South African Principal Investigator's institution will subcontract with any co-Principal Investigators' institution(s) to facilitate funds transfer.

Applicants can be at any level of experience and working in any discipline, from any organization, including colleges and universities, government laboratories, research institutions, and non-profit organizations. For-profit companies are not eligible to apply directly for funding, but can be included as sub-contractors on projects.

Funding levels

The request for proposals for designing *New Approaches to Characterize the Global Burden of Antimicrobial Resistance* will fund two-year grants: seed grants at up to USD $100,000 (~R1,500,000) for a period of 2 years and full grants at up to USD $250,000 (~R3,500,000) for a period of 3 years. We expect that projects funded at either level with promising results will have the opportunity to apply for additional funding to build on initial success. How many seed grants and how many full grants will be funded depends on the response to the request for proposals.

- Seed grant applications do not require extensive preliminary data and are meant to provide an opportunity to test particularly bold ideas, including applying approaches from outside the field or that bridge fields. New approaches could be piloted as additions to ongoing funded projects. The application process entails submission of a two-page application succinctly describing the new approach and how it will be tested.
- Full grant applications do require substantial preliminary data and are meant to provide an opportunity to refine and rigorously test approaches, including those that have previously shown promise in controlled or limited settings.

In all cases, individual project budgets should be representative of the scope and magnitude of the proposed studies and carefully designed to get the best possible value out of the award. Applicants must refer to the SAMRC Terms and Conditions of funding to familiarize themselves with allowable costs. The applicant recipient institution, organization or company will also be required to provide assurances on their capacity to manage the grant through detailed letters of support from the appropriate research or innovation support office. AAS and the SAMRC reserve the right to undertake due diligence site visits to organizations hosting successful candidates before making final awards.

Background to this Call

Antimicrobial resistance (AMR) within a wide range of infectious agents is a growing public health threat of broad concern to countries and multiple sectors. Increasingly, governments around the world are beginning to pay attention to a problem so serious that it threatens the achievements of modern medicine. A post-antibiotic era—in which common infections and minor injuries can kill—far from being an apocalyptic fantasy, is instead a very real possibility for the 21st century. Determining the scope of the problem is essential for formulating and monitoring an effective response to AMR.

The prevalence of AMR limits the therapeutic options for treatment of infections and decreases the social benefit from disease prevention. Like an environmental resource, antimicrobials require stewardship. The effectiveness of an antimicrobial agent is a global public good. [1]

Program goal
This call is focused on the SDG3 targets with the overall objective of focusing African innovators 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 improve awareness of antimicrobial resistance, strengthen knowledge through surveillance and research, reduce infection incidence, optimise the use of antimicrobial agents, and develop the economic case for sustainable investment as well as defining the role of ecosystems, particularly the evolution of a microbial system shared by humans, animals, and other biological organisms, which will all be critical to tackle current and future AMR challenges.

This joint initiative of Grand Challenges partners (Grand Chalenges Africa, Granch Challenges South Africa and the Bill and Melinda Gates Foundation) also aims to nurture and strengthen the innovation ecosystem in Africa by supporting the development of sustainable research networks which will contribute in solving Africa's challenges in Global Health. We want to develop a community of African leaders in research and innovation; strengthen the development of innovative solutions facilitating the resolution of challenges in global health and development that Africa is facing; reinforce research and training capacity in African institutions through skills transfer between international networks and partner organizations hosting the grand challenges projects; and facilitate sustainable multidisciplinary partnerships between research groups in Africa.

Program objectives
We seek new approaches that have the potential to transform public health action on a regional or global scale by identifying and filling gaps in knowledge on the burden of resistance to antibacterial agents – we are not seeking incremental improvements in typical disease surveillance solutions. Specifically, we seek projects that propose innovation in the following areas:

- **Data sources:** Pilot tests of new sources of data, particularly those that would bring together different research communities for new perspectives on the problem
- **Analytical methods**: Pilot tests of bioinformatics approaches, including those that combine or connect existing databases in novel ways
- **Biomarkers:** Pilot tests of new biomarkers or combinations of biomarkers that could lead to new understanding of the actionable implications of antimicrobial resistance surveillance data
- **Low-cost technologies and products**: Exploratory work in developing new technologies and products, including 1) those that specifically target improved infection prevention and control in healthcare settings to reduce reliance on healthcare provider behavior change, and 2) technologies to remove antibiotics from effluents

We will give highest priority to those projects that:
- Pilot test approaches that could be added to existing surveillance platforms, since we are not seeking to create new surveillance platforms
- Incorporate multiple of the areas of innovation listed above
- Could contribute to a portfolio of funded projects that addresses a country's regional diversity and the diversity of vulnerable populations; and
- Explain how proposed approaches will be tested so that they have the highest likelihood of being relevant for implementation in the country's public health system

Examples of what we are looking for

- Characterizes examples of the burden of AMR (e.g., exploring the role of AMR in community or hospital sepsis-related mortality, focusing on children)
- Includes data sources that could indirectly reflect AMR burden (e.g., antimicrobial usage patterns or specifically how vaccination against respiratory or diarrheal diseases impacts antimicrobial use)
- Addresses the diversity of vulnerable populations and the different aspects of the AMR burden that might be reflected in urban versus rural settings
- Includes data sources ranging from the level of the individual (e.g., microbiome across body sites) to the community (e.g., public toilets and sanitation systems), while maintaining a focus on gaining new understanding of the actionable consequences of AMR gene flow.
- Includes data sources that could reflect AMR transmission dynamics between communities (e.g., modes of transportation) or within communities over time (e.g., seasonal-related behaviors)
- Provides an ecological perspective, such as a One Health perspective integrating antimicrobial use in livestock or perspectives that can integrate environmental monitoring in the community setting with medical monitoring in the hospital setting – if these perspectives are explicitly linked to human health outcomes and particularly a focus on vulnerable populations
- Leverages opportunities to build in new ways on existing public health interventions or environmental monitoring platforms - and to bring together different research communities
- Contributes to control of infections in healthcare settings: novel techniques and products to control hospital infection rates and break the chain of transmission of bacteria in clinical settings
- Exploratory work into developing low-cost technologies to remove antibiotics and associated chemicals from effluents

We will NOT consider funding for:

- Proposals to develop diagnostic devices and technologies or for drug discovery. Although diagnostic devices and new drugs are potentially critical to AMR solutions, these areas are not unique to AMR challenges and should therefore be advanced more comprehensively against a broader landscape of possible needs and solutions. Thus, while excluded here, they may be part of a future request for proposals.
- Proposals without a clear application to surveillance or facilitating the development of new evidence describing the global burden of AMR
- Proposals seeking to apply existing tools in ways that do not transform our understanding of the global emergence or spread of AMR
- Incremental improvements to conventional solutions or typical disease surveillance. We will not consider local surveillance programs or projects or small improvements in surveillance, e.g., use of mobile data collection, automation of traditional processes, or improving access to existing tools or technologies.
- Proposals that simply expand the availability of primary data without a clear link to informing our understanding of global AMR epidemiology
- Applications proposing basic research
- Ideas not directly relevant to low- and middle-income contexts
- Genomic and other laboratory-based approaches that lack a clear application to AMR surveillance or epidemiology
- Ideas focused on quantifying resistance in animal or livestock populations or in environmental samples without a direct linkage to how data would impact public health practice
- Proposals involving clinical trials in human volunteers or patients (note: use of existing datasets or other outputs from clinical trials may be considered, as long as the proposed approach is feasible within the time and financial envelopes provided).

Promoting Intra-African and global collaborations

This request for proposals seeks to encourage scientific collaborations between African researchers, and between different organizations across the continent. We therefore seek to encourage data sharing between individually funded projects. We expect that such sharing will help to ensure that the goals of the innovative approaches in individual projects are ultimately integrated with each other. Furthermore, we expect that sharing experimental methods, data, and resources will ultimately improve the ability to compare and validate local research findings and to develop innovations, interventions and products that can have impact at a greater

scale. The reviewers to this call will evaluate how well applications address these requirements. Collaborative efforts include:

- Cohort harmonization: when collaborating with projects with existing cohorts or establishing new cohorts, investigators will be expected to participate, whenever possible, in cohort harmonization. Study sites will be expected to develop and follow standard operating procedures and quality control protocols for specimen collections and participate in the establishment of a minimum common set of data and specimens to be collected across the program.
- Data sharing: Projects will submit a data sharing plan that is equitable, ethical, and efficient.

ABOUT GRAND CHALLENGES

Grand Challenges is a family of initiatives fostering innovation to solve key problems in global health and development for those most in need. It seeks to establish a portfolio of projects with complementary approaches that encompass multiple types of innovation, including innovation in biological research, medical health technology and product development, service delivery, and behaviour change. Grand Challenges initiatives therefore seek to engage diverse investigators, including those outside of the areas that might traditionally be associated with the initiative. The challenge also encourages partnerships that bring together investigators from diverse organizations, including for-profit institutions, non-governmental organizations, academic and health research institutions, foundations, and civil society groups. Today, a variety of funding partners use “Grand Challenges” to accelerate research, creating an expanding network of funding and research partnerships spanning diverse topics (Bill and Melinda Gates Foundation, Grand Challenges Canada, United States Agency for International Development, Grand Challenges Brazil, Grand Challenges India, Grand Challenges South Africa, Grand Challenges Africa).

Contacts:

Please contact **GCAfrica@aasciences.ac.ke** if you need any clarification or encounter any difficulties as you use the online system.

Resources

SAMRC Terms and Conditions of funding

Eggleston K., et al: **The Global Challenge of Antimicrobial Resistance: Insights from Economic Analysis**. Ijerph, 2010. ISSN 1660-4601: p.1

Antimicrobial resistance in Africa: a systematic review

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5594539/

A pharmaceutical fix for drug resistance
https://www.youtube.com/watch?v=0IVz_Lfz-2k