U.S. NATIONAL SCIENCE FOUNDATION
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ALEXANDRIA, VIRGINIA 22314

NSF 24-088

Dear Colleague Letter: Mathematical Modeling of Policy Options for Evolving Public Health Challenges (MPOPHC)

May 8, 2024

Dear Colleagues:

The National Science Foundation's (NSF) Directorates for Mathematical and Physical Sciences (MPS) and Social, Behavioral, and Economic Sciences (SBE) and the Centers for Disease Control and Prevention's (CDC) Coronavirus and Other Respiratory Viruses Division (CORVD) will jointly support innovative research in modeling policy options for evolving public health challenges. Mathematical modeling can further the public welfare and national security in many ways, notable among them by increasing understanding of biological phenomena and elucidating matters affecting the success of public health measures to prevent or mitigate infectious diseases. The CDC also has an interest in promoting research to strengthen modeling for the prevention and control, through immunization, of disease, disability and death.

This Dear Colleague Letter (DCL) encourages the submission of research projects aimed at mathematical modeling of the transmission of respiratory pathogens among human hosts, the most likely cause of future pandemics, with a focus on policy options for evolving public health challenges. This joint activity will provide support to multidisciplinary teams that work on increasing the quality of mechanistic models capable of evaluating the merits of alternative policies for mitigating public health threats. Proposers are encouraged to explore a wide range of innovations that address various aspects of this challenge and to use different modeling techniques.

BACKGROUND

Models can be descriptive or mechanistic, systems of equations or lines of computer code. They can describe observations or the processes giving rise to observations. This DCL focuses on mechanistic modeling because, provided that those processes are formulated correctly, the models can be used to explore policy options through analysis or simulation.

Moreover, mechanistic models can facilitate communication of the consequences of alternative policies to members of Congress and the public, whose support is necessary for the funding and implementation of policies, respectively. During the recent pandemic, mechanistic modelers illustrated the consequences of alternative policy options, given current understanding of relevant phenomena, thus enhancing communication to lay audiences.

Mechanistic models also can quantify both the impact of alternative assumptions when data are lacking and importance of the requisite information, ensuring that unnecessary data are not collected during health crises.

DESCRIPTION OF THE OPPORTUNITY

Proposals funded through this DCL are anticipated to focus on developing models capable of exploring policy options for evolving public health challenges (MPOPHC) and to be based on innovative modes of collaboration among researchers working at the interface of mathematics, epidemiology, and public health policy. Investigators should address current research challenges and propose strategies that integrate mathematical and biological understanding. In addition, proposals should describe unique interdisciplinary training opportunities for graduate students and postdoctoral researchers.

Competitive proposals will address important policy questions via innovative mathematical methods and articulate well-defined plans for answering such questions within the funded period. Proposals that include a strategy for using mathematical models as central tools to explore options for mitigating infectious diseases that could be generalizable or applicable to emerging policy questions and unexpected outcomes will receive favorable consideration. This DCL specifically encourages proposals from collaborative teams that include expertise from both the mathematical and epidemiological sciences and focus on the development of highly innovative approaches that address the outlined challenges.

SUBMISSION AND REVIEW

Proposals in response to this DCL should be prepared in accordance with the guidance contained in the NSF Proposal & Award Policies & Procedures Guide (PAPPG) and submitted to the Division of Mathematical Sciences (DMS) via the Mathematical Biology Program. The proposal title should begin with "MPOPHC:". Proposals must adhere to all the requirements outlined in the program synopsis for the Mathematical Biology Program and be received prior to June 20, 2024.

NSF will manage and conduct the review process of all proposals submitted in response to this DCL. CDC-designated Program Officers may not participate as reviewers, but may attend NSF review panels as observers and can participate in the award selection process of proposals submitted in response to this DCL. CDC-designated Program Officers may receive copies of proposals and unattributed reviews and panel summaries as part of the review

process.

Awards resulting from proposals submitted in response to this DCL will be made by NSF and may be partially supported by funds from the CDC. CDC and its staff are ineligible to participate in any proposals submitted in response to this DCL, including as unfunded collaborators, via letters of collaboration or support, or via any other means.

Recipients funded under this DCL may engage with CDC/CORVD subject matter experts to ensure their research is aligned with CDC program goals.

For further information, please contact:

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Sincerely,

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