**Project Summary/Abstract**

**INSTRUCTIONS:**

*Instructions are taken directly from the* [*NIH SF424 Application Guide*](https://grants.nih.gov/grants/how-to-apply-application-guide/forms-d/general-forms-d.pdf)*. For internal use only, do not distribute. Please delete prior to submission.*

**Format:** 30 lines of text maximum, 11pt font or larger (suggest fonts - Arial, Garamond, Georgia, Helvetica, Palatino Linotype, Times New Roman, Verdana), at least 0.5” margins, single column formats are highly encouraged. Attach this information as a PDF file.

**Content:** The project summary is a succinct and accurate description of the proposed work and should be able to stand on its own (separate from the application). This section should be informative to other persons working in the same or related fields and understandable to a scientifically literate reader. Avoid both descriptions of past accomplishments and the use of the first person. Please be concise.

State the application's broad, long-term objectives and specific aims, making reference to the health relatedness of the project (i.e., relevance to the mission of the agency). Describe the research design and methods for achieving the stated goals. Be sure that the project summary reflects the key focus of the proposed project so that the application can be appropriately categorized.

Do not include proprietary, confidential information or trade secrets in the project summary. If the application is funded, the project summary will be entered into an NIH database and made available on the NIH Research Portfolio Online Reporting Tool ([RePORT](https://report.nih.gov/)) and will become public information. Note that the "Project Summary/Abstract" attachment is not same as the "Research Strategy" attachment.

Ensuring a world safe from viral threats is a pressing scientific and civil challenge; outbreaks exact tolls on human health, disrupt regional security and economic stability, and have the potential to escalate into a catastrophic global crises. Recent public health emergencies, such as those caused by Ebola and Zika viruses, have highlighted vulnerabilities in health systems and the need for improvements in global surveillance, particularly in low and middle income countries. The number of cases of dengue across the Americas has risen dramatically since the 80s, and severe dengue is a leading cause of serious illness and death among children in Latin America. After the 2014-16 Ebola outbreak, the WHO noted that “better information was needed to understand best practices in clinical management” and that “innovations in data collection should be introduced, including geospatial mapping, health communications, and platforms for self-monitoring and reporting”. Progress is needed across a wide range of emerging and endemic microbial threats.

New technologies in rapid diagnostics, participatory syndromic surveillance, and data analytics have the potential to transform how infectious diseases are detected, treated, and monitored, as well as to inform public health policy with epidemiological and genomic data collected in the field. However, these technologies need to be weaved together into a coherent framework that can be successfully deployed, maintained, and upgraded on the ground. An overarching goal is to make the data actionable, at the scientific, clinical, and the public health levels.

Our proposal will tackle these challenges in three complementary aims. First, we will develop software for collecting and integrating laboratory diagnostics results with epidemiological data from suspected dengue cases reported at the University Teaching Hospital in Tegucigalpa. This requires carefully designing data entry systems that can be merged into the current clinical protocols. Second, we will identify the barriers for adoption of mobile-based participatory syndromic surveillance systems in Honduras and pilot a new self-reporting app for dengue symptoms. This app will enable real-time dengue monitoring across Honduras’s Central District, and will provide timely alerts of severe dengue cases reported through the app. Third, we will integrate the data produced by these two near-real-time sources to develop novel forecasting models that strengthen traditional epidemiological surveillance of dengue. While our proposal focuses on conducting a small-scale pilot of this integrative dengue surveillance and forecasting platform in Honduras, the methods and platforms will have broader applications to a wide range of microbial threats in other LMICs. We will make all of the computational tools we develop freely accessible, well-documented, and based on open standards.