a rapid situation analysis was carried out to characterize existing disease surveillance systems in animal and public health sectors in Burundi, Democratic Republic of Congo (DRC) and Tanzania and it was found that there was no formal, routine collaboration between the two sectors. It was further observed that in the two sectors, disease surveillance and reporting starts with the lowest level where officials residing within community are engaged. The new system designed combines the use of participatory and OH approaches with district-based passive- (DPS) and community-based active (CAS) surveillance system components promoted to participate in detection of disease events at source. The CAS system is based on use of community-based health reporters (CHRs) to search for and report disease events occurring in animal and human populations in the study areas. Mobile technologies are being employed as the technology enablers. We selected two sites, Ngorongoro (an ecosystem with maximum human-wildlife and domestic animal interactions) and Kagera River Basin (a cross-border ecosystem with two districts across the border between Burundi and Tanzania) to test performance of the system. We have piloted and introduced android mobile phones running the EpiCollect and Open data kit (ODK) applications to aid geo-spatial and clinical data capture and transmission from the field to the remote IT servers at the research hubs for storage, analysis, feedback and reporting. Phase I results have proved that the participatory disease surveillance approach in combination with use of mobile technologies are capable of improving early detection and response to disease events particularly in remote hard-to-reach areas. A total of 387 disease events were reported by CHRs between 2011 and 2013. In some cases, reports of disease events submitted by CHRs triggered immediate response from official system making use of them in public health relevant. Phase II of this work focuses on integrated disease surveillance combining voice recording, hand-writing recognition, mobile spatial and participatory epidemiology revolutionizing collection and reporting of disease event data. We also plan to set up a one health disease surveillance resource center that will strengthen regional capacities in designing ‘fit-for-purpose’ technologies to support disease surveillance and response and develop appropriate technology transfer platform to expedite use of mobile phone technologies in disease surveillance.

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Upstream surveillance - Scanning for zoonoses in wildlife

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Nowhere in the world are the health impacts from both emerging and endemic zoonotic diseases more important than in developing countries, where daily work and livelihoods are highly dependent on natural resources. These diseases are estimated to cause over one billion cases of human disease annually. Many developing countries have little to no capacity for diagnosis of endemic zoonoses nor for detecting disease emergence from wildlife and domestic animals prior to spread to humans. Working in twenty countries in the first four years of the PREDICT project, over 1600 local collaborators have been trained, 59 ministries of health, agriculture and environment are collaborating on zoonotic disease control, capacity for diagnostic screening for viral pathogens has been developed in 25 laboratories, over 240,000 samples have been collected from wild animals at interfaces facilitating contact with humans, and over 200 new viruses have been identified. While the linkages of human, animal, and environmental health is at the heart of the One Health approach, an increasingly important prism through which governments, NGOs, and practitioners view public health, we still have three critically important challenges facing us: 1) we need a much broader and deeper knowledge of what pathogens are waiting to emerge from the animal kingdom, 2) we need to better target our surveillance efforts to maximize available resources, and 3) we need to greatly improve local capacity for preventing endemic and emerging zoonoses. The PREDICT project of the USAID Emerging Pandemic Threats program is demonstrating the feasibility of building capacity for surveillance of endemic and emerging diseases from animals in developing countries, with a focus on wildlife reservoirs, in order to help to address these three challenges, as well as directly contributing to the improvement of programs to prevent and respond to infectious disease.

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