COMMENTRY

Unique multi-sector approach adds to global pandemic preparedness efforts

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ABSTRACT

Heart Early detection and characterization of infectious disease outbreaks are critical for early detection and response to potential pandemic threats. The rapid global spread of Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) in 2020 highlighted the importance of early diagnosis in understanding the virus's epidemiology. The Abbott Pandemic Defense Coalition (APDC) was established in early 2021 as a natural continuation of Abbott's work in diagnostics, viral research, and virus surveillance. The APDC is a global, multi-sector scientific and public health collaboration whose primary goal is to detect and mitigate infectious disease threats with pandemic potential as early as possible. The APDC network, which includes academic institutions, governmental and non-governmental organizations, has partners on five continents as of January 2022. A unique feature of The APDC has the capability to develop and deploy scalable, high-quality diagnostics for newly found viruses with pandemic potential as early as possible.

Key Words: *Recovery; Pandemic; Virus; Pegivirus*

INTRODUCTION

Several infectious disease concerns have emerged and resurfaced in recent decades around the world. Human Immunodeficiency Virus (HIV), Influenza A (H1N1), Ebola Virus (EBOV), Yellow Fever Virus (YFV), Zika Virus (ZIKV), Chikungunya Virus (CHIKV), Severe Acute Respiratory Syndrome Coronavirus (SARS-CoV), and Middle Eastern Respiratory Syndrome Coronavirus (MERS-CoV) are just a few of the viruses that have wreaked havoc on human. Globalization, international travel, population displacement, environmental changes, and human encroachment on natural ecosystems are all elements that contribute to outbreaks and facilitate their global spread (Mourns et al. 2020). With the recent appearance of Severe Acute Respiratory Syndrome Coronavirus 2, international capacity to respond to emerging disease threats was put to the test (SARS-CoV-2). One of the responses to SARS-success CoV-2's was the extraordinary development of many safe and efficient vaccines in less than a year after the genetic sequence for SARS-CoV-2 became known (US Government Accountability Office 2021) [1]. This accomplishment can be due in significant part to US government funds made available through Operation WARP Speed, which helped the pharmaceutical industry mitigate financial risks associated with vaccine development. Diagnostics, on the other hand, were created by business with limited government assistance as the "first line of defence" in the response to SARS-CoV-2. While the development of diagnostics for SARS-CoV-2 has been a success story, a public-private global disease surveillance network could have potentially helped identify SARS-CoV-2 earlier and/or understand the virus's epidemiology (e.g., person-to-person spread, asymptomatic infections) earlier, resulting in earlier detection and/or understanding of the virus's epidemiology (e.g., person-to-person spread, asymptomatic infections) earlier, resulting in earlier The World Health Organization (WHO) and member states formulated and adopted revised International Health Regulations (IHR) in 2005, in response to growing concerns about global health security and preparedness, and in order to engage governments and ministries of health in pandemic preparedness and control. Countries must create and maintain defined core capacities for national surveillance and response to illnesses with epidemic potential, according to the IHR. The IHR emphasises the worldwide importance of early disease recognition so that actions can be implemented quickly to manage the threat at its source before it spreads to other countries. With its fast global spread, SARS-CoV-2 exposes this gap in prepared and repair or replacement surgery [2].

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ABBOTT'S INFECTIOUS DISEASES

Abbott instruments screen more than 60% of the world's blood supply, and the company has been providing blood screening technology for more than 40 years (Abbott Diagnostics 2021a). Abbott has been undertaking global monitoring of known infectious illnesses, with a focus on extremely diverse pathogens such as HIV, hepatitis B virus (HBV), and hepatitis C virus (HCV), since 1994 to maintain the safety of the blood supply and the accuracy of diagnostic tests for infectious diseases (Abbott Diagnostics 2021b). The goal of this programme is to ensure that recombinant and variant strains are not undetected. This study effort has not only contributed to the safe supply of blood, but it has also resulted in the discovery of novel, unusual HIV-1 strains.

The Virus Discovery Program is a natural continuation of this effort, in which metagenomics next-generation sequencing for recognised infections and potentially novel viruses is used to analyse specimens from individuals with illnesses of unknown etiology. Following the discovery of human pegivirus-2, molecular. Furthermore, Abbott has invested significant efforts in developing and delivering SARS-CoV-2 diagnostics since 2020, launching 12 tests globally, including molecular, antigen, and antibody detection assays (Abbott Laboratories 2021). Abbott's global surveillance operations include monitoring for novel SARS-CoV-2 varieties, as well as SARS-CoV-2 surveillance (Mary A Rodgers 2021). Abbott has been able to respond promptly to the SAR-CoV-2 pandemic, assuring the development of essential diagnostics and contributing to the study and detection of variant strains thanks to these efforts. serologic diagnostic tests were developed, as well as a global effort to describe the virus's epidemiology. These studies discovered HPgV-2 to be a blood borne virus associated with HCV that can cause chronic infection, though no discernible threat to human health has been identified [3]. The cascade from invention to test development to translational research was depicted in this successful industry- academia collaboration.

The Abbott Pandemic Defense Coalition (APDC) is a groundbreaking global scientific and public health collaboration with the purpose of detecting and responding to future pandemic threats early [4]. The programme aims to identify new pathogens, determine their potential for pandemic spread, rapidly develop and deploy new diagnostic testing if indicated, and assess public health impact in near real-time by connecting global centres of excellence with expertise in infectious diseases, laboratory testing, genetic sequencing, and epidemiology with industry. Data collection will be unified across the APDC for emerging pathogen discovery, allowing for collaborative study and analysis of findings. Acute Febrile Illness (AFI), Influenza-Like Illness (ILI), Severe Acute Respiratory Infection (SARI), and other syndromes of relevance will be included in the case definitions. To support epidemiologic capacity in pandemic preparedness in low- and middle-income countries, the programme has formed a first-of-its-kind business relationship with the Task Force for Global Health's Training Programs in Epidemiology and Public Health Interventions Network (TEPHINET) (LMICs). TEPHINET is a global network of 75 Field Epidemiology Training Programs (FETPs) typically connected with National Ministries of Health and CDC Country Offices dedicated to enhancing public health capacity (Martin and Fall 2021). Abbott and TEPHINET will work Fall 2021).

Abbott and TEPHINET will work by offering funding and mentorship to FETP Fellows to promote pathogen discovery and other priority public health research projects in partnership with their home country's APDC partners.

DISCUSSION

While it is impossible to anticipate when or where the next pandemic will occur, or how the next pandemic disease will spread, the SARS-CoV-2 pandemic has demonstrated that complacency and inaction will result in significant human deaths and economic disruptions around the world. Human-to-human respiratory transmission provides the greatest risk for rapid spread of novel pathogens; nonetheless, the toll of HIV, viral hepatitis, malaria, and diarrheal disorders serves as a reminder that respiratory pathogens are not the only threat [5]. Emerging infections have the ability to surprise us and spread through blood, feces-oral, sexual contact, or other routes of transmission, including vector-borne. The APDC will track and monitor SARS-CoV-2 variants while continuing surveillance for new and variant blood, air, and water-borne pathogens to identify novel pathogens and collaboratively respond to these threats in a timely manner to prevent and/or mitigate the impact of the next pandemic in order to prevent and/or mitigate the impact of the next pandemic In terms of global pandemic preparedness, the APDC has certain distinctive features. The APDC's strengths include the established industry-academic-government collaborations, the focus on building laboratory and epidemiologic capacity, particularly in LMICs, and the ability to quickly develop and deploy scalable diagnostic tests following the discovery of a new pandemic threat; all of these will be critical to a timely response to the next pandemic [6].

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Although no evident hazard to human health has been established, this research discovered HPgV-2 to be a blood-borne virus related with HCV that can cause chronic infection. This successful industry-academic collaboration demonstrated the necessity for translational research to understand the nature of the discovery, a model that serves as the cornerstone for the APDC [8]. Furthermore, Abbott has invested significant efforts in developing and delivering SARS-CoV-2 diagnostics since 2020, launching 12 tests globally, including molecular, antigen, and antibody detection assays. Abbott's global surveillance operations include monitoring for novel SARS-CoV-2 varieties, as well as SARS-CoV-2 surveillance. Abbott has been able to respond promptly to the SAR-CoV-2 pandemic, assuring the development of essential diagnostics and contributing to the study and detection of variant strains thanks to these efforts.

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