

Straining the System: Novel Coronavirus (COVID-19) and Preparedness for Concomitant Disasters

Just a few weeks before the first confirmed case of novel coronavirus (COVID-19) was reported in the United States, the US Centers for Disease Control and Prevention (CDC) issued a bold promise to the nation: the agency will use its scientific expertise to bring a new level of preparedness in the United States and global health security against current and growing threats, finally eliminate certain diseases, and bring an end to the devastation of epidemics.¹ The current outbreak of COVID-19 reminds us how urgent this promise is and just how critical it is to continue to sustain and strengthen our nation's public health infrastructure. The unprecedented pace of the public health response to COVID-19 has only been possible because of prior investments in public health preparedness. To accelerate our pace and meet the challenges of current and future health threats, we must advance our world-class data and analytics capabilities; maintain and expand our state-of-the-art public health laboratory capacity; continue building a workforce of trusted, expert, public health professionals; sustain our capacity to rapidly respond to outbreaks at their source; and assure a strong global and domestic preparedness capacity.

WORLD-CLASS DATA AND ANALYTICS

Advancing world-class data and analytics to support public health decision-making is vital to our disease surveillance and response activities. It is unacceptable that today across the United States many clinicians and public health professionals use 20th century technology to protect and promote the public's health. Think about this: in the year 2020, we still depend on facsimile machines (faxes) to report information about communicable disease cases to state and territorial public health authorities and follow up with paper forms. Critical health data are still managed on paper records or in spreadsheets that require extensive manual data entry and analysis. While we have improved in some areas, the uneven distribution of information technology across the country calls for an upgrade and modernization of the public health data enterprise. The US Congress' recent \$50 million down payment on a 21st century public health data superhighway is a start,² but to put that figure in context, that is about the cost of installing one electronic health records system in one medium-sized health system.

LABORATORY SCIENCE

The CDC's public health laboratory capacity is second to none, and our state and territorial labs complement that national capability, but the CDC must continue to keep pace with scientific advancements in laboratory science and bring partner laboratories along too. The only way that the CDC was able to quickly develop a test for COVID-19 was by having world-class laboratories and a cadre of skilled laboratorians capable of rapidly taking genomic sequence data and developing assays. The outbreak of COVID-19 was recognized by public health authorities in China at the end of December 2019, and days later genomic sequence data for the putative etiologic agent were published by Chinese health authorities. Within a week, a diagnostic polymerase chain reaction was developed,

validated, and published by the CDC, just in time to confirm the first cases in the United States. We can only do such quick work with sustained and enhanced laboratory capacity at the CDC as well as at state and territorial health departments.

WORKFORCE OF EXPERT PRACTITIONERS

Public health professionals are our biggest asset, and governmental public health agencies need to be able to accelerate the expansion of a workforce of expert practitioners to serve as disease investigators and health ambassadors here in the United States and around the world. The CDC's Epidemic Intelligence Service (EIS) officers have been instrumental in responding to every modern public health emergency in recent history. EIS officers are critical to federal, state, tribal, and local capacity to detect and respond to health threats, and yet we are training fewer officers today than ever because of funding reductions (at its height, the CDC trained 80 disease detectives a year). Currently, there are only 62 available slots in next year's cohort.

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This editorial was accepted February 9, 2020.

doi: 10.2105/AJPH.2020.305618

Likewise, cuts at the state and local level have resulted in fewer public health professionals across all functional areas, including public health preparedness experts, epidemiologists, disease investigation specialists, and many others.³ Further reductions may create uneven response capacity and readiness in the future, potentially compromising our nation's health security at a time when it is needed the most.⁴

INTERNATIONAL COLLABORATION AND DOMESTIC HEALTH SECURITY

Many of the infectious diseases that threaten the United States emerge outside the country, including the Zika virus, SARS (severe acute respiratory syndrome), MERS (Middle East respiratory syndrome), H1N1 and other influenzas, Ebola, and of course COVID-19. Responding to these diseases at their source, rather than awaiting their arrival on our shores, is the best and most prudent public health approach. CDC teams and state and territorial health officials work closely with world health experts in various countries overseas. The CDC embeds staff in, or partners with, ministries of health in more than 60 countries as well as in most state and territorial health departments and many tribal, county, and city public health agencies. Increasing the number of CDC public health advisors and technical specialists who can work side-by-side with staff in ministries of health and other governmental public health agencies means a higher likelihood of detecting threats and preventing a disease's spread. An outbreak anywhere across the globe is a potential

danger to our health security: almost any place on earth is within a 24-hour flight from a major US airport. The outbreak in Wuhan, China, reminds us just how interconnected the world is and the threats that global travel pose for our nation's health security.

RESTORING PREPAREDNESS INVESTMENTS

Our global interconnectedness is why the CDC needs a strong global health security capacity and complementary domestic public health preparedness capabilities. After the events of September 11, 2001 and the anthrax attacks that same October, Congress invested significant resources in federal, state, and local public health preparedness programs. In 2018, Congress also established the Infectious Disease Rapid Response Reserve Fund to provide needed resources to public health departments during outbreaks and other emergencies. The United States has a robust emergency response capacity in federal, state, territorial, local, and tribal public health agencies, and this capacity has been built in large part by these investments. However, from federal fiscal year (FFY) 2002 to FFY2019, the budget for CDC's Public Health Emergency Preparedness cooperative agreement has been reduced by almost one third (from \$940 million to \$675 million),⁵ and public health threats, like COVID-19, continue to increase. As a result, the entire public health system is strained during large scale outbreaks and epidemics. Congressional leadership to bring our public health preparedness investments back to at least

FFY2002 levels should be a common-sense priority for federal legislators, regardless of political party.

PREPAREDNESS FOR CONCOMITANT DISASTERS

Imagine a scenario that involves having to effectively respond to a severe influenza season, control multiple domestic outbreaks of hepatitis, respond to the health impacts of an earthquake, prepare for severe weather emergencies, and prevent the spread of a novel coronavirus, simultaneously. Indeed, that is not a scenario: it is where we are today. As public health leaders, health officials take the responsibilities of preventing disease and protecting the health of the nation extremely seriously. Governmental public health agencies share a unique and important mission: they work to keep America healthy 24 hours a day, 7 days a week. Outbreaks like the COVID-19 are critical reminders of the significance of public health readiness and the need for continued strengthening of public health agencies' core response capabilities. COVID-19 also reminds us of the importance of realizing the CDC's bold promise to all Americans with adequate investments in the governmental public health system. **AJPH**

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Both authors contributed equally to the preparation of this editorial.

CONFLICTS OF INTEREST

The authors have no conflicts of interest to report.

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