The Federal Global Migration and Quarantine Network
A Report From the National Academies of Sciences,
Engineering, and Medicine

The COVID-19 pandemic thrust the US Centers for Disease Control and Prevention (CDC) Division of Global Migration and Quarantine (DGMQ) into the epicenter of the national response. DGMQ is charged with preventing the importation of infectious diseases at land and sea borders and the spread of those diseases within the US. For more than 50 years, the agency’s comprehensive quarantine system, its regulatory powers, and scientific guidance has placed DGMQ at the forefront of emergency response.1 CDC requested the National Academies of Sciences, Engineering, and Medicine (NASEM) to assess the performance of the DGMQ during the COVID-19 pandemic,2 covering 5 key areas.

Organizational Capacity
An agency’s ability to fulfill its mission requires organizational capacity: infrastructure, finances, workforce, and culture.3 The DGMQ infrastructure is composed primarily of a complex quarantine station network, which monitors and responds to travelers exhibiting symptoms of an infectious disease and high-risk cargo (eg, human tissue, dogs, monkeys, and other nonhuman primates) moving through ports of entry. The NASEM committee recommended that DGMQ reassess its quarantine station network model, determining if quarantine stations should be added, deleted, or upgraded. DGMQ should also enhance postentry partnerships with local, state, and federal agencies, sharing resources and responsibilities using modern technology. In addition, the maritime unit should be moved within DGMQ to address the unique needs of cruise ships and other maritime vessels.

The core funding for DGMQ—approximately $45 million in 2021—has remained essentially unchanged over the past decade, even as the agency has encountered increasing frequency and complexity of infectious disease threats, including multidrug-resistant tuberculosis, Middle East respiratory syndrome (MERS), Zika virus, Ebola virus, influenza H1N1, and COVID-19. The NASEM committee found that the DGMQ budget is insufficient to support the mission. The CDC director is appropriating a comprehensive plan for a diverse and well-trained workforce. Recruiting well-qualified staff requires new strategies, including engaging academic institutions to develop a pipeline of future employees. A “ready reserve corps” could give the division surge capacity to respond to unanticipated health emergencies. DGMQ should also assess its organizational culture, so its values support the mission. The CDC director is appropriately focusing on achieving diversity and inclusion to reduce health inequities. DGMQ should enhance its workforce and activities in line with this goal.

Disease Control and Prevention
The rapid spread, morbidity, and emergence of SARS-CoV-2 variants demonstrated the need for more effective disease control and prevention tools. DGMQ has a suite of infectious disease control tools, such as quarantine stations, mask orders, “do not board” lists,4 and “public health lookouts” to prevent travel of those suspected or confirmed of having a contagious disease. During the pandemic, DGMQ has had to operate without critical evidence, which undermined its effectiveness. Traditional testing, contact tracing, isolation, and quarantine failed to significantly curb introduction and spread of SARS-CoV-2. Interventions such as border closings and travel restrictions were not consistent with World Health Organization (WHO) recommendations under the International Health Regulations.5 While evidence of the effects of travel restrictions is incomplete, the available data show that these restrictions are most effective if implemented early and combined with community mitigation strategies.6 The NASEM committee recommended CDC conduct an external formal evaluation or modeling studies on the effectiveness of travel restrictions and active screening and monitoring of international travelers. A more robust research agenda supported by scientific evidence would better inform DGMQ.

Planning for, and simulations of, infectious disease outbreaks have been inconsistent, whereas planning for a pandemic of the magnitude of COVID-19 was virtually nonexistent. The committee recommended detailed operational plans based on high-risk scenarios, across multiple agencies. Enhanced coordination with state, local, and tribal partners, as well as academic centers and the private sector, is critically important.

Technologies and Data Systems
The COVID-19 pandemic revealed gaps in the capacity of global health systems to detect and respond to emerging
threats in a timely manner, underscoring the need to improve early warning systems.7 Nationally, the pandemic shed light on flaws in the CDC data systems for disease surveillance and mitigation, including innovative technologies for genomic and wastewater monitoring. Better data could facilitate understanding the effectiveness of key interventions such as masks, ventilation, and social distancing. Interoperability across data systems could also improve the rapid exchange of timely data.8 In collecting and using data, the committee recommended DGMQ be attentive to legal and ethical concerns about equity and privacy, especially when deploying novel and powerful digital technologies, including location tracking.

The committee recommended DGMQ develop and use innovative technologies to aid in outbreak detection and response. These technologies should facilitate gathering travelers’ health data, tracking transmission, and alerting travelers to exposures. DGMQ should support adoption of the Office of the National Coordinator for Health Information (ONC) roadmap by health care and public health practitioners and facilitate the ONC roadmap and interoperability networks.

Collaboration in a Federalist Public Health System

The COVID-19 pandemic revealed the broad range of partners with which DGMQ must engage to effectively execute its responsibilities, including federal interagency partners, and state, tribal, local, and territorial agencies. The division must also coordinate effectively with the private sector and international partners. The Immigrant, Refugee, and Migrant Health (IRMH) branch within DGMQ partners with international entities and nongovernmental entities including the WHO, the International Organization of Migration, and other governments.9 Fostering trust and strengthening functional working relationships are critical to effectively respond to infectious disease threats. The NASEM committee recommended DGMQ strengthen partnerships through defined and planned activities that enhance working relationships and build trust. The DGMQ should also modernize health communication for travelers to improve public understanding of disease prevention and control as well as adherence to public health and travel measures.

Legal Authorities, Powers, and Limits

The COVID-19 pandemic demonstrated the urgent need to modernize public health legal authorities. DGMQ regulates pursuant to the Public Health Service Act of 1944,10 which predated the age of large-scale travel, mass migration, changing land-use patterns, encroachment on animal habitats, and climate change—all drivers of rapid disease spread. The 1944 act is so outdated and vague that the judiciary delayed or blocked many federal executive measures designed to curb SARS-CoV-2 transmission, including the CDC housing eviction moratorium, transit mask mandate, and expulsion of migrants at the southern border (Title 42).

While recognizing the political context, the NASEM committee urged Congress to modernize the Public Health Service Act to provide CDC adequate legal authority and flexibility to respond to public health threats. This will require broader and more flexible delegations of public health authority to reflect what CDC needs to carry out its mission through evidence-based measures. CDC should be empowered to implement science-based public health measures to mitigate disease spread, which states could not achieve on their own. Critically, it includes ample authority to prevent the introduction and interstate spread of infectious diseases. Congress should also ensure that CDC’s exercise of power is the least restrictive intervention to achieve its public health mission, while protecting individual rights and freedoms. Individuals should have due process of law when challenging CDC orders. Congress should also ensure that CDC exercises its powers fairly and equitably.

The COVID-19 pandemic posed major challenges to CDC. DGMQ has been at the front lines, acting at the nation’s land and sea borders and on interstate carriers. The division had to implement novel tools and intervene at an unprecedented scale. Yet the DGMQ lacked modern data systems, a well-trained workforce capable of surge capacity, adequate funding, and strong legal powers. It often had to operate in the absence of full scientific information. Going forward, DGMQ will encounter new challenges, as the pace and scope of emerging and reemerging diseases accelerate. The NASEM report offers a roadmap to build capacities to better identify and control COVID-19 and future health emergencies.