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

Lawrence O. Gostin  
*Georgetown University - Law Center - O'Neill Institute for National and Global Health Law,*  
gostin@law.georgetown.edu

Georges C. Benjamin  
*American Public Health Association*

Tequam Worku  
*National Academies of Sciences, Engineering, and Medicine*

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

Organizational Capacity

An agency’s ability to fulfill its mission requires organizational capacity: infrastructure, finances, workforce, and culture. DGMQ’s infrastructure is comprised primarily of a complex quarantine station network, which monitors and responds to sick travelers and high-risk cargo (dogs, human tissue, monkeys, and other non-human primates) moving through ports of entry (see e-Figure). 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 post-entry partnerships with local, state, and federal agencies, sharing resources and responsibilities using modern technology. Finally, the maritime unit should be moved within DGMQ to address the unique needs of cruise ships and other maritime vessels.

DGMQ’s core funding has remained stagnant over the past decade, even as the agency has faced growing frequency and complexity of infectious disease threats, including MERS, Zika, Ebola, Influenza H1N1, and COVID-19. The committee found that DGMQ’s budget is incommensurate with its core responsibilities. The division has an urgent need for reliable funding streams beyond routine appropriations and intermittent surge funding. CDC should reevaluate DGMQ’s financial and personnel resources to better respond to COVID-19 and future
health emergencies. One innovative model would be to require user fees to ensure the division has a consistent and dependable revenue source.

Faced with unpredictable funding, the division has struggled with personnel recruitment, retention, skills development, vacancy rates, and burnout. DGMQ has had to rely on contract and temporary staff to fill gaps. The committee recommended DGMQ develop 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 in responding to unanticipated health emergencies. DGMQ should also assess its organizational culture, so its values support the mission. CDC’s 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. 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 WHO recommendations under the International Health Regulations.4 While evidence of the impact of travel restrictions is incomplete, the available data shows they are most effective if implemented early and combined with community mitigation strategies.5 The 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 would better inform DGMQ, undergirded by scientific evidence.

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

Technologies and Data Systems
The COVID-19 pandemic revealed gaps in global health systems’ capacity to detect and respond to emerging threats in a timely manner, underscoring the need to improve early warning systems. Nationally, the pandemic shed light on flaws in CDC’s data systems for disease surveillance and mitigation, including innovative technologies for genomic and wastewater monitoring. Better data would facilitate understanding the effectiveness of key interventions such as masks, ventilation, and social distancing. Interoperability across data systems would also improve the rapid exchange of timely data. In collecting and using data, the committee recommended DGMQ should 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, trace transmission, and alert 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 ONC’s 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 non-governmental entities including the World Health Organization, the International Organization of Migration, and governments. Fostering trust and strengthening DGMQ’s functional working relationships are critical to effectively respond to infectious disease threats. The committee recommended DGMQ strengthen partnerships through defined and planned activities that enhance working relationships and build trust. It should also modernize health communication for travelers to improve public understanding of disease prevention and control as well as compliance.

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, 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 CDC’s housing eviction moratorium, transit mask mandate, and expulsion of migrants at the southern border (Title 42).

While recognizing the political context, the 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 requires 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 acting 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 alternative 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 it 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 face novel 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.

**Disclaimer:** The authors are responsible for the content of this article, which does not necessarily represent the views of NASEM.

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2. Add report link when it becomes available


