U.S. Department of Health & Human Services
Administration for Strategic Preparedness and Response

Recommendations from the National Biodefense Science Board (NBSB):

Disaster Preparedness and Response Operations Lessons from COVID-19

August 28, 2023

ASPR

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The National Biodefense Science Board is a federal advisory committee authorized by statute (42 U.S. Code § 247d–7g) to provide independent advice to the Department of Health and Human Services (HHS). The board members welcome remarks on these recommendations, which may be sent by email to NBSB@hhs.gov. The positions and recommendations herein are not those of HHS, it's operating or staff divisions, or any employee of the federal government.

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Introduction

The NBSB provides expert advice and guidance to the Secretary of Health and Human Services (HHS) and the Assistant Secretary for Preparedness and Response (ASPR), per delegation of authority, on scientific, technical, and other matters of special interest to HHS, regarding current and future chemical, biological, nuclear, and radiological agents, whether naturally occurring, accidental, or deliberate. The Board also provides advice and guidance on general matters related to public health emergency preparedness and response. More information about the NBSB is available on the ASPR website. The current roster for the NBSB is in Appendix 1.

Since June 2022, the NBSB has focused on "lessons from COVID-19" in three specific issues areas:

1. Improving operational public health and health system data for disaster response
2. Addressing the unique needs of rural and underserved communities[1]
3. Utilizing virtual forms of healthcare during a medical emergency or disaster

In addition to federal experts (*ex officio* representatives and others), the NBSB discussed the issues with numerous non-federal subject matter experts. Drafted by the Readiness and Resilience Working Group, the findings and recommendations that follow are in several priority subgroups derived from those three issue areas. While this report includes observations that are specific to the COVID-19 pandemic, it is not intended to be a comprehensive after-action review or exhaustive list of all the challenges.

NBSB Findings and Recommendations

A. IMPROVING OPERATIONAL PUBLIC HEALTH AND HEALTH SYSTEM DATA FOR DISASTER RESPONSE

Improving population health surveillance for detection of emerging diseases and responding to infectious disease threats

1. **Develop and implement a strategy for One Health biosurveillance**. Human health surveillance programs in the United States remain largely disconnected from systems designed to detect biothreats in animals and the environment. Specific programs for influenza and a limited number of zoonotic diseases demonstrate the value in coordinating surveillance among multiple sectors. The Occupational Safety and Health Administration currently focuses on

[1] The Board's understanding of rural and underserved communities is consistent with the use of the terms in official HHS documents.

chemical, radiological, injuries but not on zoonotic pathogens; the Centers for Disease Control and Prevention (CDC) and U.S. Department of Agriculture oversee the possession, use, and transfer of biological select agents and toxins that have the potential to pose a severe threat, though without dedicated or parallel surveillance among lab workers and the animals involved. Effective One Health monitoring requires integrated surveillance of animal workers and the animals with which they are working.

Recommendation 1a: Noting that the U.S. Congress included a requirement in the Consolidated Appropriations Act of 2023 (Pub. L 117-328 Sec. 2235) for the CDC to lead development of a framework for One Health, the NBSB recommends inclusion of a specific program to conduct biosurveillance among related groups of animals and animal workers to identify and respond rapidly to zoonotic pathogen spillover risks. *Recommendations 1b:* Additionally, in assessing and coordinating biosurveillance capabilities from a One Health perspective as described in the National Biodefense Strategy, the NBSB recommends that HHS formalize partnerships among U.S. federal and state agencies with the goal of dedicating additional resources to combining traditional human health surveillance with new methodologies involving sampling of wastewater, air, animal reservoirs, and other relevant components of the environment. Human, animal, plant, and environmental partners should seek ways to transition from isolated impact to collective impact, including 1) establishing a shared vision and common set of priorities that each could work toward given their unique capabilities; 2) shared measurement systems to track progress; and 3) interoperable data systems to establish a common operating picture.

2. **Increase the ability to use novel diagnostic tests in an epidemic or infectious disease emergency.** For many months at the beginning of the COVID-19 pandemic, the United States experienced significant challenges developing, manufacturing, distributing, and obtaining results from health system, laboratory, and home-based tests for SARS-CoV-2. In addition to initial quality problems, there were challenges that limited the availability of test kits, options for testing, policies, and procedures for collecting and reporting test results, and access to tests in certain populations. The NBSB recommends development and structured coordination of a national system for rapid development, authorization, and deployment of tests for emerging infectious diseases. A comprehensive national strategy would, among other details, include improvements in regulations aimed at making more types of tests available quickly, with faster development and wider distribution of at-home and bedside "rapid tests" with procedures, clear instructions, and multiple options for easily reporting test results. One additional, critical component of that strategy would also allow for the use of laboratory developed testing procedures without employing duplicative regulatory requirements to better leverage the capacity of all types of clinical laboratories. Additionally, authorization to adapt diagnostic tests developed by the World Health Organization (WHO) or other internationally recognized organizations for local hospital laboratory use if domestic tests are not available.

3. **Standardize and improve the connection between public health and health system data**. While significant progress is being made in public health surveillance using emergency department and human health laboratory data, the response to COVID-19 demonstrated gaps in public health data authority and capacity to utilize other health record data. The NBSB recommends that HHS expand and expedite existing health data modernization programs to connect and standardize existing health system and public health data streams. Such work necessarily includes collaborating with stakeholders to define data standards and concurrently develop systems for national, regional, and local situational awareness using aggregated, protected human health data. Ensuring that reporting entities (governmental and non-governmental) have real-time access to aggregated, anonymized results and transparency regarding the uses of data, with appropriate protections for privacy, would serve as a critical incentive for voluntary participation.

   Board members note that the Consolidated Appropriations Act of 2023 adds requirements (in part) for strategies to improve sharing of data among state offices, public health departments, and healthcare providers, as well as reducing the administrative burden on state, local, American Indian and Alaska Native (AI/AN), and territorial governments (Pub. L 117-328 Sec. 2211). While there may be flexible mechanisms and resources available currently, the NBSB also recognizes that such work may require Congress to address the significant gaps in authorities and resources that are needed to achieve a comprehensive, coordinated, national network of data systems. Congress should build on these efforts to provide appropriate authorities to achieve the shared goal of improving sharing of data among state offices, public health departments, healthcare providers. The Board emphasizes that private sector entities also require situational awareness and bear significant administrative burdens with emergency reporting requirements, which must be taken into consideration through active engagement.

Advancing research and development to detect emerging infectious diseases

4. **Examine the use of artificial intelligence for biosurveillance**. Modern technology and information systems continue to evolve quickly, making it possible to utilize forms of artificial intelligence to collect and analyze health-related data to detect heightened threats, as well as collecting and analyzing indirect indicators of emerging infectious diseases that were previously beyond human capabilities. The NBSB recommends establishment of a unique program in HHS (or potentially alignment of programs from several agencies) to focus on the application of artificial intelligence to the task of predicting and characterizing emerging human health threats, including by using appropriate microbial genomic data and One Health analysis.

5. **Focus efforts on multi-pathogen and broad-spectrum pathogen detection**. Multi-pathogen detection systems could include laboratory and at-home tests that provide reliable, discrete pathogen identification based on a common array of viruses and bacteria that are seasonally and/or periodically prevalent. The flexibility of such systems can improve the identification of local infectious disease clusters and potential epidemics, as well as help local public health

officials and health systems to manage disease trends. Testing systems that are not specific to a pathogen (or family of pathogens) but detect a broad spectrum of threats, primarily as a mechanism for population-based surveillance, can provide additional indicators for infectious disease surges that escape pathogen-specific tests including antibiotic and other anti-infective drug resistance. The NBSB recommends that HHS significantly increase focus on developing multi-pathogen and pathogen agnostic infectious disease detection systems for diagnosis and surveillance, as appropriate, with easily accessible mechanisms for reporting test results when at-home tests are used.

Improving mechanisms for monitoring and evaluating healthcare system capacity

6. **Standardize and formalize procedures for obtaining timely operational data from the health system.** The response to COVID-19 required HHS to monitor health system stressors, evaluate the capacity of acute and critical care facilities, and make difficult allocation decisions for limited public health resources. COVID-19 revealed extreme gaps in standards, policies, and procedures for requesting, aggregating, analyzing, reporting, and sharing data from the many disparate components of the U.S. healthcare infrastructure required for disaster health response, to include pre-hospital data generated by emergency medical services (EMS). Initial reporting requirements resulted in multiple, duplicate, potentially inaccurate and conflicting data collection pathways; changes to reporting requirements resulted in confusion and added to the burden on the workforce without commensurate benefits to the health system or health outcomes. Data reported for action at the federal level often lagged reality at the local level, frustrating efforts to request and deploy resources where and when they were needed.

   The NBSB recommends that HHS formulate a nationwide strategy, implementation plan, and procedures to collect consistent, essential data about the functional status of the U.S. health system. Such a plan would include data about certain health workers who are subject to increased demand during a surge in patients and other critical treatment resources and hospital capacities. The data collection procedures would require the minimum amount of data needed to make operational decisions while enabling investigations that support decisions on the use of public health measures and resource allocation. HHS would need to assemble subject matter experts to design an indicator system for health facilities that defines the minimum data requirements, with appropriate assurances regarding patient privacy and intellectual property, while providing situational awareness for local, state, AI/AN, and territorial emergency management officials. Such systems should obtain programmatic data through automated routines, if possible, and be designed in collaboration with the reporting entities to ensure accuracy, reduce risks of diversion of resources during a crisis, and minimize reprogramming of data systems during an emergency.

B. ADDRESSING THE UNIQUE NEEDS OF RURAL AND UNDERSERVED COMMUNITIES

7. **Capitalize on successes from the HHS regional preparedness programs**. Regional programs in ASPR[2] and the Health Resources and Services Administration (HRSA) are successfully connecting rural communities and health centers with regional expertise and resources. Sustaining the gains achieved during the pilot phases, as well as during the COVID-19 response, and expansion to more parts of the country, requires several important steps. *Recommendation 7a:* First, the NBSB recommends that HHS hold a symposium on rural preparedness and response to analyze evidence and observations from existing programs, with the goal of developing a "playbook" or set of guidelines for regional structures and policies to better support disaster preparedness and response for rural and underserved areas, including AI/AN stakeholders. *Recommendation 7b:* Secondly, the NBSB recommends significantly increased funding for the rural components of existing partnerships, which would also incentivize for funded networks to invite and maintain rural partners.

8. **Develop support for highly localized mutual aid arrangements**. The Emergency Medical Assistance Compacts[3] are a model for inter-jurisdictional collaboration when there are declared states of emergency. In some locations, it would be helpful for regional coordinators and disaster network managers to work with local representatives from rural communities to establish formal agreements for disaster assistance beyond the existing forms of agreement that support fire, rescue, ambulance, and policing. The NBSB recommends that ASPR develop templates and pilot sub-programs (within the existing regional networks) to help establish agreements that fill gaps in public health and medical emergency response. While such agreements could be quite comprehensive, the NBSB suggests that the initial focus on disaster response be on the following:

    - Provisioning of emergency medical supplies, teleconsultation (tertiary health system support), and localizing care for critical and/or highly infectious patients, leveraging cultural traits of community and family self-reliance;
    - Procedures to remove financial and logistical barriers to critical patient transfer when needed; and
    - Disaster-related situational awareness and data sharing (beds, staffing, and resource availability, etc.) beyond other state and national requirements; and
    - Planning and implementing exercises and drills on a regular basis that realistically test the ability of the network to support the needs of rural and underserved communities.

9. **Advance the development of legal solutions for cross-jurisdictional recognition of health licensures**. With disasters increasing in frequency and magnitude, and the compounding stress of health workers that leads to attrition and reduced recruitment, jurisdictions will rely more and more on help from outside of their pool of licensed health professionals. The

[2] Healthcare Coalitions, Regional Disaster Health Response System, and the Pediatric Disaster Care Centers of Excellence.

[3] The ASPR website provides more insight into the role of the EMACs in regional coordination.

NBSB recommends that HHS open and lead a conversation with national accreditation and state licensing authorities to enable recognition or very rapid approval of cross-jurisdictional licensing for physicians, nurses, emergency medical technicians, paramedics, pharmacists, critical care therapists, and potentially others for in-person practice and telehealth. To accomplish the appropriate flexibility in "emergency licensing," HHS should consider additional funding, regulatory waivers, and/or programs that facilitate and support temporary, emergency allocation of health workers when shortages are identified; and identify mechanisms to expand the fast-track options to approve telehealth services across state lines.

10. **Expand and sustain civil biodefense and engagement programs.** Rural and underserved communities could benefit significantly from organized, sustained, collective actions that are organized at the local level but connected to regional and national initiatives. The NBSB highlights the FEMA Community Emergency Response Team (CERT) as an example of civic engagement in preparedness and response and recommends that HHS, either working with FEMA or separately, focus on bringing together and supporting coalitions of emergency responders, school officials, youth organizations, and other community resources organized around concepts of risk mitigation, biopreparedness, and biodefense. This could include enhancing the capabilities and scope of the Medical Reserve Corps and emergency medical services, but must include formal and consistent involvement from non-medical community members, business professionals, and social leaders who can commit to routine leadership roles in discussing and planning disaster preparedness that is guided by evidence and best practices.

C. UTILIZING VIRTUAL FORMS OF HEALTHCARE DURING A MEDICAL EMERGENCY OR DISASTER

11. **Assess existing telecommunications systems for disaster healthcare and develop backup plans for technology failures**. While technological advancements and connectivity are increasing (on average) nationally, rural, and underserved settings remain less developed and more vulnerable to outages. Such locations remain more vulnerable to outages due to the distances between "nodes" and the availability of resources to make rapid repairs. Though significant funding is now available for expansion of telecommunications through the Bipartisan Infrastructure Law of 2022, more focus is needed on supporting health care in rural and underserved areas, as well as "hardening" such systems against disasters.

    Recommendation 11a: The NBSB recommends that HHS convene a group to evaluate the impacts of telecommunication expansion on rural health systems and health facilitates in underserved areas, assess their vulnerability to outages, and identify opportunities to ensure that telecommunications can be sustained during a disaster. *Recommendation 11b:* Additionally, the NBSB recommends that ASPR work with current health system preparedness partners to establish practices and policies that utilize alternate "low-tech" and high-tech systems to sustain healthcare communications. Examples include the use of data over traditional, wired telephone systems, increased use and training for the Federal Emergency Management Agency (FEMA) "SHAred RESources" (SHARES) High Frequency Radio Program, and novel use of global satellite systems.

Appendix 1: National Biodefense Science Board Roster (as of August 2023)

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