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Enhancing health security against infectious diseases: Perspectives on the emergency operations capabilities of the Japan Institute for Health Security

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Abstract: The Japan Institute for Health Security (JIHS) will be established in April 2025 by merging the National Institute of Infectious Diseases (NIID) and the National Center for Global Health and Medicine (NCGM). JIHS aims to enhance health security against infectious disease crises by integrating NIID's surveillance, epidemiologic investigation, and research expertise with NCGM's clinical care and research capabilities. An effective response to an infectious disease crisis depends on robust intelligence, systematic data analysis, and surge capacity – the ability to rapidly scale responses through mobilization of resources and an established infrastructure. An Emergency Operations Center (EOC), which centralizes emergency response coordination, is critical to harmonizing these diverse capabilities, enabling technical experts to focus effectively on specialized tasks. NIID has contributed to disease prevention through surveillance, laboratory reference services, and devising medical countermeasures. The establishment of NIID's Center for Emergency Preparedness and Response (CEPR) in 2020 and the EOC in 2021 markedly improved crisis management in the NIID, as demonstrated during events like Tokyo 2020 and the SARS-CoV-2 Omicron variant outbreak. These experiences highlight the importance of centralized coordination, which is being incorporated in the operational framework of the newly established JIHS. This article reviews NIID EOC's evolution and its crucial role in enhancing Japan's health security by consolidating lessons learned from recent public health crises.

***Keywords*:** National Institute of Infectious Diseases, National Center for Global Health and Medicine, crisis management, emergency operations center

Introduction

The Japan Institute for Health Security (JIHS) was established through the integration of the National Institute of Infectious Diseases (NIID) and the National Center for Global Health and Medicine (NCGM) in April 2025 (*1*). JIHS is expected to play a central role in health security particularly in infectious disease crises by integrating NIID's expertise in surveillance, epidemiological investigations, and research and development with NCGM's expertise in infectious disease clinical care and research. This integration aims to enhance its intelligence capacity and enable a more comprehensive response to infectious disease crises – including pandemics – and increase surge capacity.

Health security from infectious disease crises requires a comprehensive societal approach that builds upon infectious disease control while also encompassing measures to sustain economic activities and social functioning during emergencies. To effectively intervene in infectious disease crises and minimize their negative impact on society, intelligence derived from systematic information collection, analysis, and assessment is essential. Additionally, ensuring surge capacity – the ability to respond rapidly and at scale during a crisis – requires enhancing logistics to mobilize resources, pre-establishing a scalable response infrastructure, and obtaining the necessary resources for large-scale emergency operations. In order to harmonize these diverse operational capabilities, robust coordination is indispensable, thereby underscoring the importance of an Emergency Operations Center (EOC).

An EOC is a place within which, in the context of an emergency, personnel responsible for planning, coordinating, organizing, acquiring, and allocating resources and providing direction and control can focus

their activities on responding to the emergency (*2*). Such emergency operations capacity and capabilities are required not only by public health authorities but also by technical agencies like JIHS, which will need similar coordination to capitalize on its integrated strengths.

Drawing on its experience, NIID has played a crucial role in infectious disease prevention and control by operating infectious disease surveillance under the Infectious Diseases Control Act, providing laboratory reference services, and conducting research and development on medical countermeasures. By centralizing coordination, the EOC has enabled NIID experts to concentrate on their specialized roles, thereby maximizing operational effectiveness. The establishment of the Center for Emergency Preparedness and Response (CEPR) in 2020 and the EOC in 2021 was a pivotal step in enhancing crisis management operations at the NIID. These experiences underscore the importance of effective coordination – a lesson now being incorporated in the emergency operations capabilities of the newly formed JIHS, which is expected to further enhance Japan's health security.

This article provides an overview of NIID CEPR's activities over the past five years (Figure 1), with a focus on the evolution of its EOC, which has served as a central platform for NIID's responses to high-risk mass gatherings – such as the Tokyo 2020 Olympic and Paralympic Games (Tokyo 2020) – and outbreaks like the emergence of the Omicron variant of SARS-CoV-2. The article further discusses lessons learned from the EOC's establishment and its operations in the NIID over the past four years and offers insights on the role of emergency operations capabilities in enhancing health security through the JIHS.

Establishment of the CEPR in the NIID

Before the CEPR's establishment, the NIID primarily consisted of laboratories focused on pathogen research and wet lab studies, except for the Infectious Disease Surveillance Center, which was responsible for national surveillance and field epidemiology and related research. The CEPR was established to enhance disease control capabilities by enhancing crisis management capabilities, such as preparedness, response coordination, and the emergency laboratory response networks in the NIID. In response to the growing need to enhance crisis management capabilities during the early stage of the COVID-19 pandemic, the CEPR was expanded in April 2021. It was reorganized into eight offices under three group directors (Figure 2).

Development of the EOC in the NIID

The physical EOC space was first established in July 2021 in preparation for Tokyo 2020. The largest conference room on the NIID Toyama Campus was renovated to include an operations room surrounded by two medium-sized and two small meeting rooms, 2 single working booths, and a media monitoring room (Figure 3). During normal times, CEPR Office 2 leads the activation of the EOC structure with the cooperation of the relevant departments and centers. This office is a focal point for the consolidation of a variety of information – ranging from surveillance, investigations, and research on diseases and pathogens to media reports – from both internal and external sources. CEPR Office 1 maintains the EOC facilities and manages logistics, while CEPR Office 3 oversees media monitoring and risk communications. CEPR Office 5 handles the planning and support of exercises and training for EOC operations.

Microsoft Teams serves as the virtual platform for EOC operations, ensuring real-time sharing of information and communication among EOC members. Through several operation experiences, an activation/

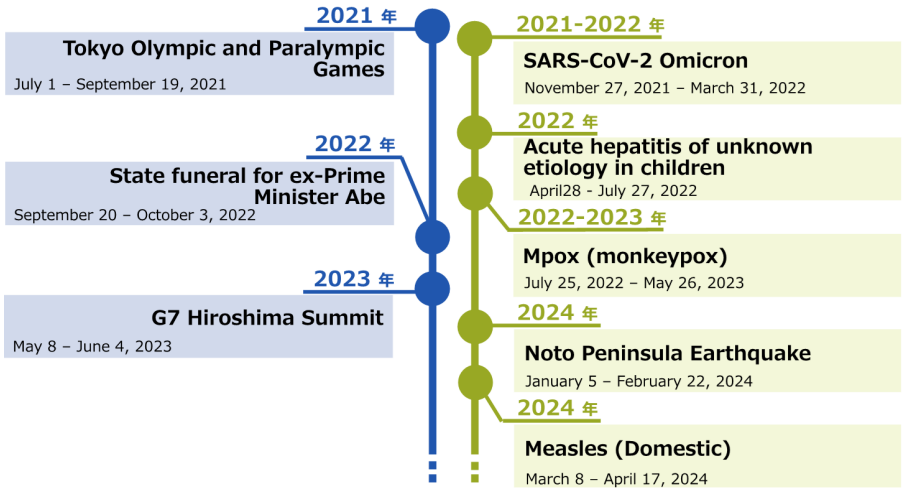

Figure 1. Activation of the Emergency Operations Center at the National Institute of Infectious Diseases, 2021 to 2024.

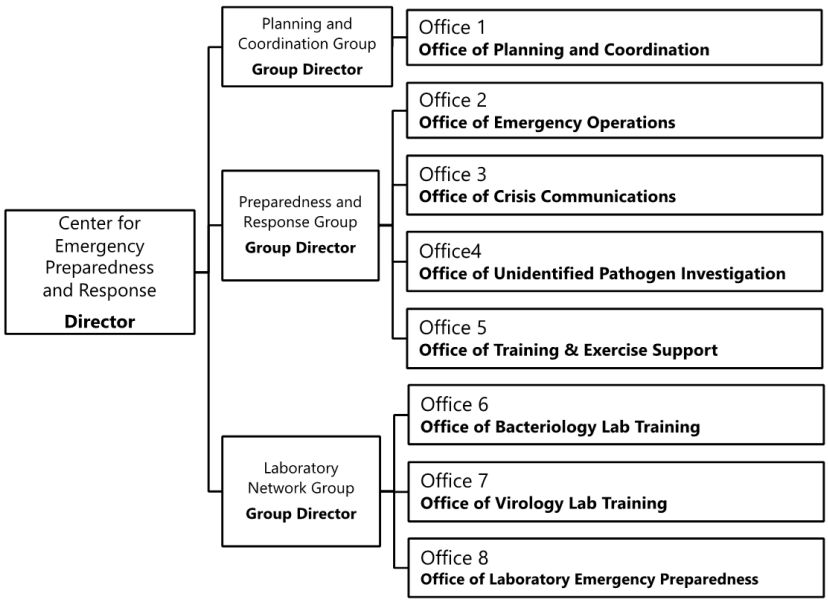

Figure 2. The organizational chart of the Center for Emergency Preparedness and Response, National Institute of Infectious Diseases from April 2021 to March 2025.

Figure 3. Emergency Operations Center at the National Institute of Infectious Diseases.

deactivation protocol, standard operating procedures, and a prototype organization chart were drafted and refined through after-action-reviews and exercises. The decision to activate/deactivate the EOC is guided by a situational assessment of the risk of an event, the expected response by the NIID, and the NIID's capabilities and readiness, using the NIID EOC Operational Risk Assessment Tool (NEORAT) (*3*) (Table 1).

History of activation of the NIID EOC and its activities

Tokyo 2020 Olympic and Paralympic Games, 2021

The NIID EOC was first activated from July 1 to September 19, 2021, in preparation for Tokyo 2020. The NIID EOC for Tokyo 2020 aimed to enhance surveillance, support response efforts, and enhance a cross-divisional response system (*4*). It mobilized personnel from multiple specialized departments within the NIID, established a cross-divisional incident management framework, and operated under a structured system organized by function. Additionally, the NIID EOC also served as a communication hub with external organizations by publishing daily reports.

To ensure efficient operations, three major functional groups were established and then further divided into specialized teams (*5*). The Surveillance and Assessment Group conducted enhanced surveillance to monitor potential infectious disease cases and events that were related to or could impact Tokyo 2020 and carried out timely risk assessments (*6*). The Event Response Group was responsible for supporting field investigations, surveillance, and risk assessments at local health departments and the Tokyo 2020 Games Health and Hygiene Support Tokyo Branch (Tokyo HHB), and at the Infectious Disease Control Centre of the Tokyo 2020 Organising Committee (IDCC) (*7*). It also provided consultations on infection control and prevention and conducted genomic epidemiology analyses of COVID-19 cases related to Tokyo 2020. The Logistics Group played a role in facility management, personnel management, document control, and general administration, including the organization of regular and *ad hoc* meetings (*5*).

Although this was the first activation of the NIID EOC, the decision-making process was well-defined, enabling the swift and efficient execution of cross-departmental operations during this high-profile mass gathering. In particular, logistics played a crucial role in ensuring the seamless and efficient implementation of specialized operations by experts (*5*).

SARS-CoV-2 Omicron, 2021 to 2022

Table 1. Overview of the NIID EOC Operational Risk Assessment Tool (NEORAT)*

No	Questions
1	Is the risk of the event high? - Probability of its occurrence - Probability of spread - Impact such as its clinical severity - Risk perception
2	Are internal departments' roles and coordination systems well organized? - Are roles of departments clarified? - Are the coordination and collaboration systems established?
3	Is the external communication system well organized? - Are communication needs (*e.g.*, the need for regular reporting) high? - Is the communication system established?
4	Is collaboration beyond the normal scope of the department's responsibilities needed? - Does the burden of the responsible department exceed its capacity? - Is there a need to activate a business continuity plan?
5	Is an out-of-business-hours response expected? - Is a response expected late at night, early in the morning, on weekends, and on public holidays?

*modified from Reference (*3*).

On November 26, 2021, the World Health Organization (WHO) designated the newly identified SARS-CoV-2 lineage B.1.1.529 as Omicron and classified it as a Variant of Concern (VOC). To facilitate rapid information collection and countermeasure planning, the NIID activated the EOC on November 27, 2021, prior to detection of the first Omicron case in Japan (*8*). In addition to surveillance, risk assessment, and support for field investigations of clusters, the EOC coordinated laboratory and epidemiological investigations at the NIID in collaboration with clinical investigations at the National Center for Global Health and Medicine, and the Ministry of Health, Labor, and Welfare (MHLW), to conduct the First Few Hundred (FF100) study on the SARS-CoV-2 Omicron (*9*). Given the anticipated rapid escalation in the volume and urgency of related tasks, the organizational structure of the EOC was expanded to include two additional groups beyond those established for the NIID EOC during Tokyo 2020: "Special Studies & Other Activities" and "Laboratory Response". These groups consist of highly specialized personnel from various departments and research centers within the NIID (*8*). These experts were tasked with facilitating the active sharing of information and rapidly characterizing the Omicron variant's properties and transmission dynamics to facilitate decision-making on control measures. As sufficient information on the Omicron variant was obtained and an appropriate response framework was established, the EOC was deactivated on March 31, 2022. During the 125-day activation period, a total of nine risk assessment reports on the Omicron variant were issued, with the sixth report receiving the highest number of webpage views (460,000 as of late April 2022) (*8*).

Acute hepatitis of unknown etiology in children, 2022

In early April 2022, cases of severe acute hepatitis of unknown etiology in children were reported in the United Kingdom of Great Britain and Northern Ireland. In response, the collection and sharing of information among relevant departments at the NIID began on April 7, 2022. On April 25, NIID published a summary of information from Europe and the United States, along with a mini-review on adenoviruses and hepatitis, which were suspected causes (*10*). Although there were no indications that a similar increase in cases had been observed domestically, since efforts to identify cases may lead to an increase in the number of reported cases and consultations, the NIID EOC was activated on April 28 for a better institute-wide response (*11*). The EOC's activities were relatively smaller in scale than during the previous two events. The main task was to conduct a situational assessment, integrate the domestic reporting of cases, and to clarify the lab consultation process for those reported cases. After three situational reports in April (*10*) and May (*12,13*) and an interim report on a domestic investigation (*14*) were published, the NIID EOC was deactivated on July 27, 2022 since a monitoring framework had been established at the MHLW and NIID (*11*).

Mpox, 2022 -2023

In May 2022, the United Kingdom reported mpox cases that were unrelated to travel to endemic countries (*15*). Subsequently, a significant number of cases were reported, primarily among men who have sex with men (MSM) in Europe and the United States, with no history

of travel to endemic regions. In response, the NIID worked on revising the mpox fact sheet on its website, publishing situation reports in May (*16*) and July (*17*) and issuing guidance on infection control measures for confirmed and suspected mpox cases in collaboration with the Disease Control Center of the NCGM in June (*18*). Additionally, efforts were made to establish a laboratory diagnosis protocol and provide reagents to local public health institutes (*19*). On July 23, 2022, the outbreak was declared a Public Health Emergency of International Concern (PHEIC). Following the PHEIC declaration and the identification of the first domestic case, the NIID EOC was activated on July 25, 2022 (*11*).

After its activation, the EOC facilitated the review of epidemiological and laboratory findings, investigations of domestic cases, diagnostic testing at the NIID upon request from local governments, and support for establishment of diagnostic capabilities at local public health laboratories. Development of an mpox vaccine was a key focus of the response, leading to the establishment of a vaccine team at the NIID to support a clinical study on the efficacy of the LC16m8 vaccine for mpox prevention (*20*). As a part of its EOC response, three additional risk assessment reports (*21-23*) and a Q&A document for the general public (*24*) were published. One notable aspect of the mpox response was risk communication and community engagement activities (*25*). The EOC engaged in community-based communication efforts aimed at facilitating informed decision-making among MSM. These efforts were carried out in collaboration with the MHLW, the Tokyo Metropolitan Government, the NCGM, and community-based organizations (CBOs) dealing with MSM, utilizing media, websites, and educational materials. After the PHEIC was lifted on May 10, 2023, the mpox situation stabilized both globally and domestically, and the NIID EOC was deactivated on May 26, 2023 (*11*). With experience from three prior EOC activations, the NIID staff had become familiar with inter-departmental collaboration, and many preparatory activities were completed efficiently before the formal activation of the EOC. Nonetheless, the activation reinforced the prioritization of activities for the mpox response at the NIID and cross-departmental activities for an effective mpox response

State funeral for a former Prime Minister, 2022

For the state funeral of former Prime Minister Shinzo Abe on September 27, 2022, the NIID EOC was activated from September 20 to October 3, 2022, to address infection control measures and risk management particularly with regard to COVID-19 (*11*). As usual, a risk assessment was conducted in collaboration with relevant departments and centers. While these types of short-term VIP events, including the subsequent G7 Hiroshima Summit in 2023, are considered low risk in terms of infectious disease control, they are high-profile events requiring a swift response and vigilance, particularly with regard to potential bioterrorism threats. To ensure clarity in roles and responsibilities among centers and departments involved in EOC activities, a standard operating procedure (SOP) was developed in advance. Additionally, potential scenarios involving bioterrorism or other unusual events were considered.

This event was the first time a pre-event exercise was conducted. The framework for sharing information, communicating with external agencies, and laboratory testing capabilities was reviewed and strengthened through a pre-event mini simulation exercise with local public health departments (*11*).

G7 Hiroshima Summit, 2023

In May 2023, the G7 Hiroshima Summit was held in Hiroshima City. Given the summit's status as a high-profile event, the NIID EOC was activated from May 8 to June 4, 2023 to ensure comprehensive readiness and a swift response to infectious disease outbreaks that could disrupt the event, including potential bioterrorism threats. As has been done before the state funeral, a pre-event exercise was conducted to assess the communication and coordination framework among internal and external stakeholders, including local public health laboratories. in preparation for emergency testing related to bioterrorism or severe infectious diseases. During the summit, EOC staff members were deployed to the medical response headquarters on-site to provide technical support. Simultaneously, the EOC conducted enhanced surveillance for infectious disease outbreaks and monitored media and other sources to maintain real-time situational awareness (*25*).

Noto Peninsula Earthquake, 2024

On January 1, 2024, a major earthquake struck the Noto Peninsula in Ishikawa Prefecture, Japan. The prolonged evacuation period following the disaster necessitated infection control measures in shelters and enhanced collaboration with relevant organizations in the affected areas (*25*). Recognizing the need for a cross-departmental public health response, the NIID EOC was activated on January 5, 2024. The NIID EOC provided logistical support to NIID staff deployed to the response headquarters on-site, where they contributed to *ad hoc* enhanced surveillance efforts in the affected areas. Additionally, the NIID published two risk assessment reports on infection risks in the affected areas and evacuation shelters (*26,27*). To support infection control efforts on the ground, an infection prevention advisory document for volunteers was also prepared and disseminated (*28*). With significant progress in the restoration of public infrastructure and improvements in infection control measures at evacuation shelters,

NIID's deployment concluded on February 21, 2024. As no further urgent coordination efforts were required, the NIID EOC was deactivated on February 22, 2024.

Measles, 2024

Since 2023, there have been frequent reports of measles outbreaks worldwide. In February 2024, a case of imported measles was reported in Japan, with confirmation that the patient had traveled on an international flight during the infectious period. Along with cases linked to this case of imported infection, there were concerns about additional imported cases and the potential for further domestic spread. Given the risk of a measles outbreak in Japan, the need for clear communication through situational updates and timely risk assessments, and the necessity of preparedness for a large-scale or prolonged response, the NIID EOC was activated on March 8, 2024 (*29*).

During the activation period, the EOC's mission was defined as follows: *i*) situation awareness and early alerting, *ii*) technical support for domestic cases, *iii*) epidemiological investigations, and *iv*) research to identify unknown public health aspects of the measles response. A weekly EOC meeting was held six times to review the response and plans of relevant departments And develop a common situational awareness at the NIID. An advisory document was issued to enhance awareness and preparedness at healthcare facilities (*30*). The EOC also coordinated genomic epidemiological investigations across relevant departments (*29*). The measles clusters were considered to have been contained after the health monitoring period for contacts ended by mid-April, so the EOC was deactivated on April 17, 2024.

Perspectives on JIHS's crisis management role and capabilities

Effective crisis management in infectious disease emergencies requires a well-defined chain of command, streamlined consolidation of information, and efficient sharing of information–challenges that became evident through the NIID's experience with EOC operations. Additionally, fostering broader awareness and understanding of the EOC concept and incident management is crucial to improving overall readiness.

The establishment of the JIHS through the integration of the NIID and the NCGM represents a significant step toward enhancing Japan's health security framework. By combining the NIID's strengths in surveillance, epidemiological investigations, and research and development with the NCGM's expertise in clinical care and infectious disease research, the JIHS aims to create a more comprehensive response system for infectious disease crises, including pandemics, while also increasing surge capacity.

To operationalize these expanded capabilities within a robust governance structure, the JIHS will establish the control bureau as its coordinating body. Within this framework, executive directors will also serve as bureau directors, ensuring consistency in the chain of command during both emergency and non-emergency operations (*31*). The Bureau of Health Security and Management, a key division within the control bureau, will function as both an intelligence hub and the crux of integrated emergency operations. To enable the JIHS to efficiently conduct large-scale responses, particularly during pandemics, centralized consolidation of information and coordination will be essential. By assuming coordination and logistical responsibilities, the EOC will allow JIHS experts to focus on their specialized tasks, thereby maximizing operational efficiency during public health emergencies. The lessons learned from the NIID EOC's operations have underscored the importance of structured coordination, intelligence gathering, and surge capacity in crisis management. Building upon these foundations, the JIHS will refine emergency response capabilities, enhance Japan's health security framework, and develop an agile and scalable rapid response system — ensuring preparedness for future infectious disease threats.

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