Global Health & Medicine. 2020; 2(2):145-147.
DOI: 10.35772/ghm.2020.01023

The necessity of continuous international cooperation for establishing the coronavirus disease 2019 diagnostic capacity despite the challenges of fighting the outbreak in home countries

Ikuma Nozaki[1,*], Shinsuke Miyano[1,2]

[1] National Center for Global Health and Medicine, Tokyo, Japan;
[2] JICA's adviser for infectious disease control and laboratory services, Yangon, Myanmar.

Abstract: The importance of laboratory diagnostic capacity for effective infectious disease control has been widely recognized in recent years, but many of the countries still struggled to establish it when the newly discovered diseases was happened, such as coronavirus disease 2019 (COVID-19). Even in the country that the laboratory system was highly evaluated by Global Health Security Index like Myanmar, support from external partners is essential to establish the diagnostic capacity for COVID-19. WHO and other contributors, including Japan, have been supporting the establishment of a diagnostic system for SARS-CoV-2 in response to the disease outbreak. The testing laboratory was established in Myanmar on February 20, 2020. The first confirmed diagnosis was reported on March 23, and 15 positive cases as of March 31. Since it is difficult to control the outbreak in a given country without controlling it in the neighboring countries, continuous international cooperation for establishing the coronavirus disease 2019 diagnostic capacity was crucial despite the challenges of fighting the outbreak in home countries.

***Keywords*:** health security, COVID-19, international cooperation, laboratory capacity

As JICA's adviser for infectious disease control and laboratory services in Myanmar, we have been involved in the mission for strengthening the laboratory capacity, especially concerning infectious disease control (*1*). The importance of laboratory diagnostic capacity for effective infectious disease control has been widely recognized in recent years, which requires not only the ability to detect the diseases but also the introduction of new diagnostic technologies as well as the quality control schemes. The laboratory capacity is also important for global health security, as it was listed in the core capacities of the International Health Regulation 2005 (*2*). Many of the health programs, including HIV, TB, malaria, hepatitis, antimicrobial resistance, and health security, have requested the commitment of laboratories to the programs.

The laboratory capacity in Myanmar has been improved and highly evaluated in the Joint External Evaluation of IHR Core Capacities and Global Health Security Index survey (*3,4*). Table 1 shows the results of the JEE assessment and the GHS Index on the laboratory system in Myanmar. Although it mainly assessed the capacity to conduct diagnostic tests for the 10 core tests defined by the WHO, JEE found that Myanmar developed its capacity in each category, and the GHS Index score was far beyond the world average and ranked in 20th in the world.

However, in case of epidemics of newly discovered diseases such as coronavirus disease 2019 (COVID-19), it would still not be possible for such countries to establish a diagnostic system solely by themselves. Support from external partners is essential, especially for the procurement of reagents for diagnostic testing. For instance, at the time of the Zika virus outbreak in 2016, the US-CDC initially supported establishing the diagnostic capacity by providing reagents such as primers for PCR diagnosis, and the Nagasaki University and others joined the cooperation (*5*). Under the threat of the influenza epidemic in 2017, the people of Myanmar panicked, and the Myanmar Ministry of Health had to establish the diagnostic capacity in order to rule out the possibility that it was the novel influenza. The Niigata University and others helped Myanmar and found that it was a seasonal influenza epidemic (*6*).

Similarly, WHO and other contributors, including Japan, have been supporting the establishment of a diagnostic system for SARS-CoV-2 in response to the disease outbreak (*7*). In order to functionalize the testing laboratory, the national reference laboratory and its partners collaboratively worked on *i*) the procurement of necessary testing reagents including PCR primers and probes that all needed to be imported, *ii*) securing other

Table 1. Myanmar's laboratory capacity assessed by the WHO joint external evaluation and Global Health Security Index

Joint External Evaluation in May 2017 (*https://www.who.int/ihr/publications/WHO-WHE-CPI-REP-2018.5/en/*)

National Laboratory System		Score
D 1.1	Laboratory testing for detection of priority diseases	3
D 1.2	Specimen referral and transport system	3
D 1.3	Effective modern point-of-care and laboratory-based diagnostics	3
D 1.4	Laboratory quality system	3

Scores: 1 = No capacity; 2 = Limited capacity; 3 = Developed capacity; 4 = Demonstrated capacity; 5 = Sustainable capacity

2019 Global Health Security Index (*https://www.ghsindex.org/*)

Detection and Reporting	Country score*	Average of 195 countries	Ranking
Laboratory system	83.3	54.4	20/195

*Scores are normalized (0–100, where 100 = most favorable)

test-related items, such as consumables for specimen collection, *iii*) securing PCR testing devices with sufficient capacity for the estimated testing needs, *iv*) setting up the quality control scheme, *v*) arrangement of human resources, *vi*) training of the laboratory staff on testing procedures, specimen handling, testing quality, and biosafety including guidance on Personal Protective Equipment (PPE), *vii*) establishing the specimen transfer network, *viii*) establishing the laboratory data management system for this new diagnostic testing, and *ix*) resource mobilization for these processes. After all these efforts, the testing laboratory was established in Myanmar on February 20, 2020. The first confirmed diagnosis was reported on March 23, and 15 positive cases as of March 31.

In addition to direct support for establishing diagnostic capacity, indirect support for business continuity is often crucial to functionalize the laboratory. New disease epidemics will put more pressure on the already stretched human resources of the laboratories. For the sustainability of the laboratory function, external support was crucial in reducing staff workload and protecting laboratory technicians from infection, since most of the laboratory staff were involved in establishing laboratory capacity.

We have noticed some arguments over the rationale of supporting other countries while having a hard time controlling the outbreak in our own country. We strongly believe that supporting other countries where health security capacities are weak will contribute to a successful outbreak control also in the home countries of the supporters. In the case of Myanmar, although their laboratory capacity was highly evaluated by the JEE and GHS Index surveys, there was still room for improvement to establish the diagnostic capacity for the new SARS-CoV-2 strain within their country. As the WHO Director-General emphasized in his speech, diagnostic capacity is central for controlling the COVID-19 outbreak. Considering that the epidemic could spread worldwide from Wuhan, China within a few months, it is difficult to control the outbreak in a given country without controlling it in the neighboring countries. In case other counties are struggling with an outbreak, those that succeeded in controlling disease transmission would still have to close their borders. Considering the huge impact of "lockdown" on the economy and society, this would not be a sustainable option. Therefore, international cooperation is crucial under the spirit of global health security. We believe that now is the time to unite for fighting against the outbreak of COVID-19.

Acknowledgments

The authors wish to acknowledge Tomomi Ibi and Mako Nagao, Human Development Department, Japan International Cooperation Agency (JICA), for their continuous support on the project and useful comment on this letter.

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Received April 9, 2020; Accepted April 20, 2020.

Released online in J-STAGE as advance publication April 21, 2020.

**Address correspondence to*:
Ikuma Nozaki, Bureau of International Health Cooperation, National Center for Global Health and Medicine, 1-21-1 Toyama, Shinjuku-ku, Tokyo 162-8655, Japan.
E-mail: i-nozaki@it.ncgm.go.jp