

# The University of Yamanashi battles COVID-19

## (Part 3)

Japan's PCR test count parallels levels in developing countries

Opinion

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### 1. Japan's woefully inadequate framework for PCR testing: A national embarrassment

In the first two entries of this series, we recounted the University of Yamanashi Hospital's experiences in identifying Japan's first case of meningitis/encephalitis associated with SARS-CoV-2<sup>1-2</sup> and diagnosing an eight-month-old infant with the SARS-CoV-2 infection.<sup>3</sup>) Key to both of those breakthrough cases were PCR tests, which the University of Yamanashi Hospital moved quickly to perform in-house. The positive PCR result in the infant case may have forced a total of 47 medical professionals—including 18 doctors and 20 nurses—off the front lines for a full two weeks, but the benefits far outweighed the temporary setback: the positive PCR test helped prevent an in-hospital infection before it could occur. Other institutions have not been so fortunate. In-hospital infections have hit Keio University Hospital,<sup>4</sup>) the Jikei University Hospital,<sup>5</sup>) and a string of other university hospitals with calamitous effects, including suspensions of medical service. Concerns that the spread of the infection might trigger a full-scale collapse of the medical system from within are mounting.

We have criticized the Japanese government's stance on PCR testing, calling it a "national embarrassment" and emphasizing the need for an immediate shift in policy. Other observers are harboring similar sentiments. The United States Embassy and Consulates in Japan, for example, noted in an April 3 health alert that the "Japanese Government's decision to not test broadly makes it difficult to accurately assess the COVID-19 prevalence rate."<sup>6</sup>) If that appraisal is any indication, the testing framework may very well be losing Japan some of its credibility in the international arena. Voices calling Japan's approach to PCR testing into question have risen to the fore in the press and other settings since the start of April.<sup>7-8</sup>) The growing discontent even led Prime Minister Shinzō Abe to pledge action at a floor session in the Lower House of the Diet on April 2: the national

government, he said, would “follow up on prefectures, such as Tokyo, where the numbers of PCR tests are disproportionately low relative to the number of COVID-19-related consultations.”<sup>9)</sup>

The Novel Coronavirus Expert Meeting has stood firm against rolling out a large-scale PCR-testing regimen. Despite recognizing that PCR testing is the “only way of testing for COVID-19,”<sup>10)</sup> officials have said that they will implement the tests “as appropriate in cases where testing is deemed necessary.”<sup>10)</sup> The Ministry of Health, Labour and Welfare (MHLW) has even gone as far as adding de facto limitations on PCR testing; in its “Q&A on Coronavirus Disease 19 (COVID-19)” (April 7) the organization declared that PCR testing would be conducted “in cases deemed necessary by the prefectural government based on the individual’s travel history and contact with COVID-19 patients.”<sup>11)</sup> Media reports have also reported that some prefectures have implemented even harder-line restrictions, reserving PCR tests exclusively for patients with severe symptoms.<sup>12)</sup> Japan has clearly taken an ambivalent, if not evasive, approach to PCR testing. How does it compare with strategies abroad? Context is crucial. Having called the situation a “national embarrassment” for Japan, after all, we need to corroborate that claim.

## **2. Japan’s PCR test count: Scuffling on par with the developing world**

According to the Johns Hopkins University COVID-19 research team, which provides daily updates on COVID-19 cases and other information for a total of 120 countries,<sup>13)</sup> Japan had the 30th-most patients with positive PCR tests (confirmed cases) as of April 11, 2020. Japan’s COVID-19 fatality rate (the ratio of deaths to confirmed cases) was 1.6%, 90th of 120 in a tie with Taiwan and two other countries. The relatively low percentage of deaths would appear to suggest that Japan is doing a solid job combating the spread of the virus (see Table 1). Just below Japan, in 94th place, sits the *Diamond Princess* cruise ship—obviously not a region or country but still a valuable point of reference for understanding the disease’s risks.

Table 1. COVID-19 confirmed cases and fatality rates in select countries

1. Countries/regions with similar numbers of confirmed cases					
Rank (0-120)	Country/region	Confirmed cases (A) (cases)	Fatalities (B) (deaths)	Fatality rate (B/A)(%)	Fatality rate per 100,000 people (%)
26	Norway	6,409	119	1.90	2.24
27	Poland	6,356	208	3.30	0.55
28	Australia	6,303	57	0.90	0.23
29	Denmark	6,191	260	4.20	4.48
30	Japan	6,005	99	1.60	0.08
31	Romania	5,990	291	4.90	1.49
2. Countries/regions with similar fatality rates					
88	Pakistan	5,011	86	1.70	0.04
88	Finland	2,905	49	1.70	0.89
90	Japan	6,005	99	1.60	0.08
90	Malaysia	4,530	73	1.60	0.23
90	Cyprus	616	10	1.60	0.84
90	Taiwan	385	6	1.60	0.03
94	Cameroon	820	12	1.50	0.05
94	<i>Diamond Princess</i>	712	11	1.50	—

Created using data from the Johns Hopkins University Coronavirus Resource Center

The next logical step is to look at Japan’s framework for administering PCR tests, which the MHLW has called the “only way of testing for COVID-19” and provides the basis for the above calculations. The following section explores the numbers in a global context.

Using “Our World in Data,” a collection of information that the University of Oxford updates on a daily basis,<sup>14)</sup> we determined the cumulative PCR test counts per 1,000 people in several countries. The test count in the United States, which has more COVID-19 patients than any other country, was 13.6 times the total in Japan as of April 11. Italy, which has the third-highest number of patients, dwarfed Japan in terms of total test count by a factor of 27.5. The cumulative PCR test totals in France and Germany, home to the fourth- and fifth-largest patient populations, respectively, surpassed Japan’s test count by similarly significant margins: France’s total was 11.6 times Japan’s as of April 7, while Germany’s was a whopping 45.2 times the Japan total as of April 5. The United Kingdom, with the sixth-highest patient count, had performed almost 7 times (6.8) the number of tests that Japan had. While there was no available data for Spain, the country with the second-most confirmed cases, we found that five of the six countries with the highest COVID-19 patient populations had PCT test counts between 6.8 times (at the very least) and 45.2 times (at the most) Japan’s total. Of course, one could easily argue that the elevated PCR test totals are a simple consequence of the massive COVID-19 case counts in the countries where the pandemic has run most rampant—the patient populations are on a different order of magnitude, virtually incomparable with the numbers in Japan. A more apt comparison, then, would situate Japan’s PCR-testing data relative to the figures in countries with similar confirmed-case counts and fatality rates.

Again drawing on the University of Oxford’s “Our World in Data” repository,<sup>14)</sup> we plotted PCR test counts from around the world on a graph (Figure 1) of cumulative PCR tests performed per 1,000 people over the period from March 20 to April 11. For our sample, we first incorporated the data for several countries that had confirmed-case counts similar to the levels in Japan as of April 11: Norway, Australia, Denmark, and Romania. We excluded Poland, whose confirmed cases also approximate Japan’s, due to data unavailability. Also in the graph are Pakistan, Finland, Malaysia, and Taiwan, four countries that share a similar COVID-19 fatality rate with Japan. Cyprus and Cameroon, though also close to Japan in terms of fatality rate, did not have the requisite data for inclusion. Finally, we included South Korea—a country that the Japanese mass media frequently employs as a point for comparison. The graph contains several gaps in certain lines due to missing data points, but the general trends are still evident.

As the graph shows, Norway has performed the largest number of tests, followed by Australia, Denmark, South Korea, and Finland. Japan, meanwhile, comes in near the bottom of the list along with Romania, Malaysia, Taiwan, and Pakistan, clearly demonstrating the severely limited scope of the country’s PCR-testing framework.

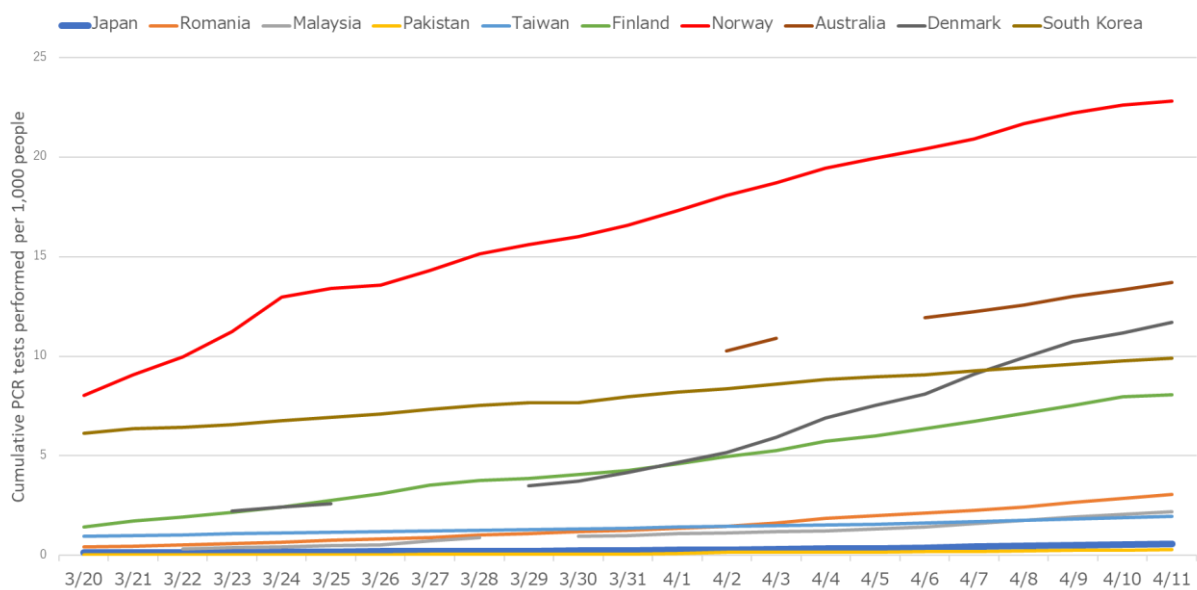


Figure 1. PCR test counts in countries with similar numbers of confirmed cases and fatality rates (1) March 20–April 11

Figure 2 presents the same data as Figure 1 but focuses exclusively on the cumulative PCR test counts for the bottom five-ranking countries (Japan, Romania, Malaysia, Pakistan, and Taiwan). The numbers for Romania and Malaysia climb steadily, shooting upward over a relatively short period of time. On the other hand, the counts for Japan, Taiwan, and Pakistan maintain a slow ascent across the time frame. Taiwan is a slight outlier, however; while the slope of the line indicating cumulative

test numbers is small, the line itself sits well above those for Japan and Pakistan—in fact, Taiwan had already performed roughly 10 times the tests than Japan had as of March 6.

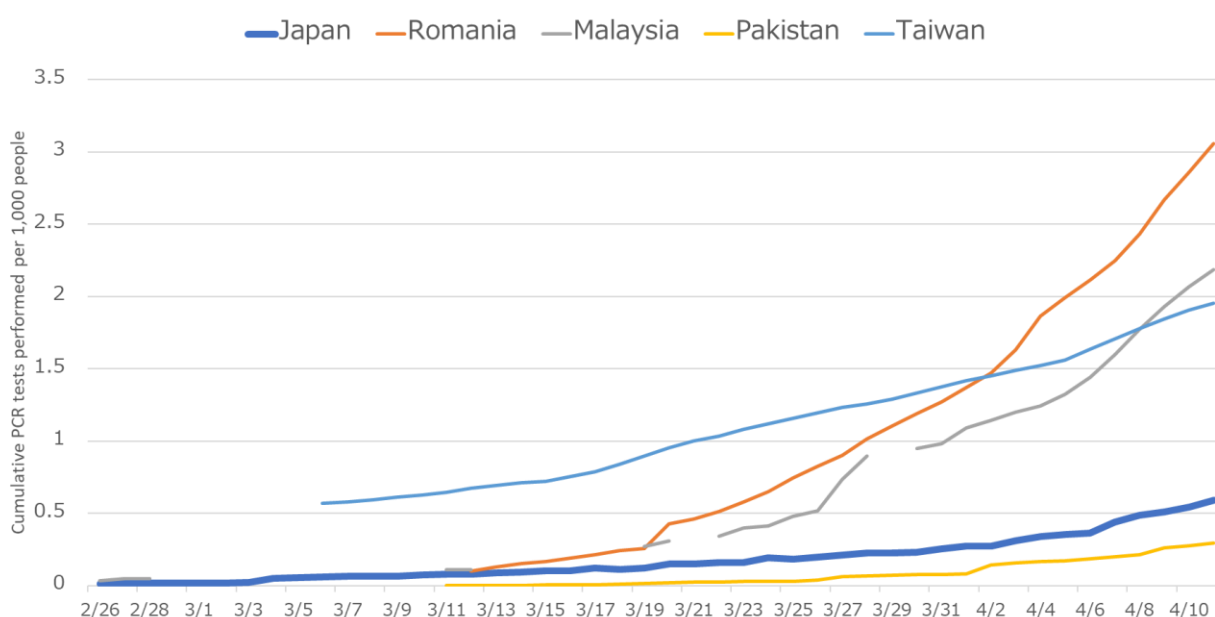


Figure 2. PCR test counts in countries with similar numbers of reported cases and fatality rates (2) February 26–April 11

According to our international comparison of countries with similar numbers of confirmed COVID-19 cases and fatality rates, Japan’s closest parallel at this moment in time is Pakistan—a country that scores a 43 out of 100 on the Healthcare Access and Quality (HAQ) Index, far below Japan’s mark of 89.<sup>15)</sup> In terms of PCR test count, therefore, Japan is currently operating on the same level as a developing nation with obvious limitations on medical resources.

The next report in the series will take a closer look at the situation in Japan, utilizing data from other countries with higher medical standards for a revealing comparison.

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