

## 令和 2 年度厚生労働行政推進調査事業費

## 分担研究報告書

## 新型コロナウイルス感染症患者に対する医療提供体制の国際比較

研究分担者  
研究協力者橋爪 真弘  
坂元 晴香東京大学 大学院医学系研究科 教授  
東京大学 大学院医学系研究科 特任研究員

新型コロナウイルスは世界中の社会経済状況に甚大な影響を及ぼしたが、とりわけこれまで強固な医療提供体制を有すると思われてきた先進諸国において多くの死者数を出した。これまで、感染症の予防と対応（pandemic preparedness and response）に対してはWHOをはじめとして各国が様々な取り組みを行ってきたところであるが、実際に大量の患者が発生した際に、そうした患者に対してどのような医療提供体制が望ましいのか、その検証については十分に行われてこなかった。本研究では、日本を含めたG7に加えて、オーストラリア、台湾、韓国を対象とし各国がどのように急増する新型コロナウイルス患者に対応したのか、主に医療提供体制に焦点を当てて分析を行った。各国の調査結果からは、迅速かつ柔軟な病床確保、重症例から軽症例までに対応できる医療人材の確保、病床再編や人材確保に必要な財源を迅速に用意すること、またこれらを可能とするために中央政府と地方政府のガバナンスのあり方、また地域内における医療機関や関連行政機関の連携が、急増する患者に対して医療提供体制を柔軟に対応させるための重要な教訓として得られた。今回の研究成果についてはこれまでに日本国際保健医療学会、日本熱帯病学会、大和日英基金等が主宰するシンポジウムで発表されており、国内外の国際保健・国際感染症・公衆衛生分野の関係者に広く共有されている。また、研究成果については今後、JICA緒方貞子研究所から日英双方の言語で発表予定であるが、JICAを通じて世界各国の関係者に共有される予定であり、今回得られた知見は未だに収束の見通しが立たない新型コロナウイルス感染症に各国が対峙するために重要な示唆を与えるものとなる。

## A. 研究目的

今般、新型コロナウイルス感染症の拡大及びそれらに伴う医療提供体制の変化など様々な要因により、人々の受療行動にも大きな変化があり、受診や健診等の頻度が減少していることが指摘されている。これによる健康影響として、治療が遅れて重症度が高くなったり、死亡率が上昇したりするなどの可能性も指摘されており、今後の対策において、一般医療と新型コロナウイルス感染症の医療を高いレベルで両立させるためにも、新型コロナウイルス感染症における直接的な健康影響のみならず、他の疾患の医療に与えた影響についても調査する必要が生じた。これらの調査を行わない場合、治療の遅れ等の国民の健康への悪影響を与え続ける可能性があり、早急な調査研究の開始が必要である。また、

中長期的な影響を見るためには一定期間を特定の集団などの経過を観察していくことが必要であり、そのための計画や体制を確保していく必要がある。

さらに、国内における調査について、海外との比較をする観点から海外における新型コロナウイルス感染症の一般医療に対する影響についても同様のデータがないかについて併せて至急調査を行う必要がある。以上を踏まえ、本研究では、とりわけ諸外国との比較において、我が国の医療提供体制を中心に新型コロナウイルスにどのように対応したのかを分析し、そこから次なるパンデミックに向けて教訓を整理し必要な対応策について提言することを目的とする。

## B. 研究方法

本研究では、医療提供体制の中でもとりわけ、病床再編、人材の確保、病床・人材配置に必要な財源、ガバナンスに焦点を当てて合計 30 の質問を作成した。対象国は日本を含めた G7 各国並びに韓国、中国、オーストラリア、台湾とし、それぞれの国の担当者に質問表を配布した。多様な視点からの分析を可能とするため、各国最低 2 名以上からの回答を依頼した。

## C. 研究結果

### 1. COVID-19 summary statistics

Japan has experienced a total of six epidemics since the first case of COVID-19 was reported in Japan on January 16, 2020. The first wave peaked in early April 2020, with XX and XX infected cases and XX deaths per million population, respectively. Subsequently, expansion of the infection was recorded in August 2020 (second wave), January 2021 (third wave), March 2021 (fourth wave), and July 2021 (fifth wave), respectively. In particular, the expansion in the summer of 2021, combined with the outbreak of the delta variant, resulted in the largest number of deaths per population to date, XX. Most recently, the epidemic entered its sixth wave of expansion in early 2022. As of February 6, 2022, the cumulative number of infected people and the cumulative number of deaths per capita in Japan are XX and XX, respectively. Although the number of deaths in Japan is low compared to other countries, the number of deaths per population is high among Asian countries mainly due to the aging of the population.

The following table shows the number of cumulative confirmed total cases, cumulative confirmed deaths, daily new cases at the peak, and daily new deaths at

the peak by COVID19 as of February 2022 (per million population). Ageing is said to be the greatest risk factor for COVID-19<sup>1,2</sup>, and the number of infections and deaths in high-income countries with the world's most aged populations has been unprecedented in recent years.

### 2. Excess death

The enormous number of infected people in COVID-19 has strained the health care delivery system in most countries and affected non-COVID-19 care. In fact, many countries around the world have reported more deaths in 2020 and 2021 than in previous years. Therefore, in order to examine the impact of COVID-19 on the healthcare delivery system, it is essential to comprehensively evaluate not only the number of cases and deaths caused by COVID-19, but also the increase or decrease in deaths caused by other diseases and total excess deaths.

Japan: Estimates of excess deaths in Japan are estimated to range from 11,578 to 73,054 since the outbreak of COVID-19 in 2020<sup>3</sup>. However, the increase has not been uniform; rather, in 2020, for the first time in 11 years, there was a decrease in the total number of deaths. This decrease is attributed to a decrease in other infectious diseases due to thorough countermeasures against infectious diseases. However, since 2021, excess deaths have been reported, especially in May and June, when the number of newly infected people of COVID-19 increased rapidly.

USA: Between 3/1/20 and 1/2/21, the US experienced 22.9% more deaths than expected (522,368 excess

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<sup>1</sup> Systematic review (May 2021)

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0250602>

<sup>2</sup> CDC -- COVID-19 Recommendations for Older Adults

<https://www.cdc.gov/aging/covid19-guidance.html>

<sup>3</sup> <https://exdeaths-japan.org>

deaths). Deaths attributed to COVID-19 accounted for 72.4% of US excess deaths. Mortality due to non-COVID diseases also increased during this time period: heart disease, Alzheimer disease/dementia, and diabetes<sup>4</sup>. Another study estimates 766,611 deaths due to COVID using an excess mortality analysis between 3/8/2020 and 5/29/2021<sup>5</sup>.

Germany: Excess mortality measurement depends on an estimated of expected deaths in 2020-2021 had the COVID19 pandemic not occurred. One of the measures to assess excess death is P-score, which is (Deaths period 2020-2021) - (Average Death Period 2015-2019) divided by average deaths period 2015-2019 multiplied by 100. A P-score of 100% in a given week in 2020 means that the death count for that week was 100% higher than the average death count in the same week over the previous five years<sup>6</sup>. When using this measure, Excess mortality P-Score in Germany was -2% (Jan 5, 2020), +12% (May 2, 2021) with a relative change of +597%. When it comes to Japan, Excess mortality P-Score was -1% (Jan 5, 2020), 2% (May 2, 2021) with a relative change of +297%.

Taiwan: The mortality in Taiwan from 2008 to 2020 decreased gradually. The mortality of 2020 is 399.8 per 100,000, which is even lower than the previous years. Therefore, the probability of excess mortality is very low<sup>7,8</sup>. Furthermore, the recent data of Taiwan showed

the similar death numbers in corresponding months from 2015 to 2019<sup>9</sup>. The article “Tracking COVID-19 excess death across countries” of the Economist also showed the excess mortality rate was negative twenty per 100,000 people and the highest number of 2.1 per 100,000 people at June, 2020<sup>10</sup>.

Even if there is an increase or decrease in the overall number of deaths, the impact will vary by type of disease. The following is a summary of the changes in the number of surgeries and cancer screening rates during the COVID-19 epidemic, as well as the positive and negative effects on other diseases in each country.

### *The changes in the waiting list for hospitalization and surgery during the COVID-19 pandemic (Question 12)*

Japan: While there is no survey that covers all hospitals in the country, several surveys have reported a decrease in the number of surgeries, especially in FY2020 compared to previous years.

USA: Elective surgeries were canceled in many large hospital systems during the peaks of COVID-19 activity. In March 2020, the American College of Surgeons published guidelines for triaging non-emergent surgeries<sup>11</sup>. Surgery waiting times increased compared to previous years<sup>12</sup>.

<sup>4</sup> [https://drive.google.com/drive/u/0/folders/1C4HsPVeMmw-XZ\\_mqEVirmef0Sn869bvl](https://drive.google.com/drive/u/0/folders/1C4HsPVeMmw-XZ_mqEVirmef0Sn869bvl)

<sup>5</sup> [https://www.thelancet.com/journals/lanam/article/PIIS2667-193X\(21\)00011-9/fulltext](https://www.thelancet.com/journals/lanam/article/PIIS2667-193X(21)00011-9/fulltext)

<sup>6</sup> Article of Aron, J. and J. Muellbauer (2020), “Measuring excess mortality: the case of England during the Covid-19 Pandemic.” INET Oxford COVID-19 Research, Economics Department, Oxford University

<sup>7</sup> Gao and Sanna et al., 2021, Annals of Internal Medicine

<sup>8</sup> Chen et al., 2021, JFMA

<sup>9</sup> Chen et al., 2021, JFMA

<sup>10</sup> <https://www.economist.com/graphic-detail/coronavirus-excess-deaths-tracker>

<sup>11</sup> <https://www.facs.org/covid-19/clinical-guidance/triage>

<sup>12</sup>

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0253>

Italy: All elective interventions were postponed depending on the epidemiologic situation (to avoid overcrowding during the acute phases), on the availability of rooms (wards were repeatedly converted for hosting COVID-19 patients). The backlog of such elective procedures has not been resolved yet, but the identification of COVID-free hospitals helped to attenuate it<sup>13</sup>.

Taiwan: Initially, the government's policy was "every person with COVID-19 PCR (+) should be hospitalized" and "1 person in 1 room" and thus the waiting list for hospitalization increased dramatically during the pandemic. Gradually the policy changed to "each room could have 2 patients," "mild cases under 60 years old go to Centralized quarantine station instead of hospital" and things are getting better. Still, though there is no specific dataset, but the central government announced to decrease the service volume of hospitals and postpone the not acute and non-necessary clinic visits (e.g., health examination, cosmetic clinics, scheduled surgery, examination, physical therapy and rehabilitation program)

- Decline (%) in cancer screening and health checkup (Question 13). It is not disease categorized data.

In Japan, there was a significant decline in screening rates for all major cancer screenings from 2019 to 2020. 2021 saw a return to higher screening rates, but all

were lower than 2019 levels: -22% for stomach cancer, -20% for lung cancer, -17% for breast cancer, -15% for colorectal cancer, and -11% for cervical cancer<sup>14</sup>.

In Taiwan, in 2020, there was only a small COVID-19 peak in March. It still impacted the cancer screening volume. The screening numbers of mammography, oral cancer, and colon cancer decreased from March to May in 2020 compared to the corresponding period of 2019. The service volume recovered to normal in June 2020. Compared with 2019, The referral rates of above three cancers did not decrease a lot. However, the COVID-19 outbreak happened in May 2021 and nationwide Level 3 epidemic alert was announced. There was a huge impact afterwards. Compared with the corresponding periods, the screening number of May 2021 decreased significantly. Furthermore, the screening numbers in June and July were lower than 50% of those in 2020. In July 2021, the screening number began to increase gradually. The referral rates were still low compared with the corresponding periods of 2020.

It has been reported that cancer will be diagnosed at a more advanced stage at the time of initial diagnosis after 2022 due to a decrease in the cancer screening rate<sup>15</sup>. Since it will take several years for the COVID-19-induced decrease in cancer screening rate to affect cancer mortality, it will be necessary to continue to monitor this closely.

<sup>13</sup> Circular n° 0011408, 1st June 2020. "Guidelines for the reorganization of deferrable elective activity during the COVID-19 emergency", Ministry of Health. Available at: <http://www.trovanorme.salute.gov.it/norme/renderNormsanPdf?anno=2020&codLeg=74374&parte=1%20&serie=null> Accessed on

<sup>14</sup> <https://www.jcancer.jp/news/12360>

<sup>15</sup>

<https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2784394>

**Actions that have been taken to minimize the impact on other health services (Q15 and 16)**

In Japan, the National Institute of Infectious Diseases (NIID) reports excess and under mortality on a weekly basis. It reports not only the overall excess and under deaths, but also those deaths by major diseases and by prefecture. In addition, the Japan Hospital Association, a voluntary organization of medical institutions in Japan, publishes quarterly reports on the business conditions of hospitals, including the number of outpatient visits, hospitalizations, and surgeries. Although it does not cover all medical institutions, it is possible to get some idea of the trends in Japan as a whole. In some cases, academic societies and other organizations report the number of surgeries and other related information, but since these are on a voluntary basis, there is wider variety in disseminating that information.

In Taiwan, the National Health Insurance (NHI) started to cover some health services during the COVID-19 outbreak, including online counseling and phone consulting for ophthalmology, ENT, dermatology, and emergency medicine, and to increase prescription amounts so that patients do not need to come to clinics often. Need to note that these measures were discussed in 2020 but did not launch until June 2021 when the COVID-19 widely disseminated among the community.

## **2. Governance: the roles of the central government and regional governments in pandemic situations. (Mainly question 5, 6, and**

## **7. Question 4 is also applicable here if needed)**

The infectious disease control measures during ordinal time can be broadly divided between centralized models (Japan, Italy) and decentralized models (USA). For example, in Japan, the Ministry of Health, Labour and Welfare regulates and controls nearly all aspects of the health care system in the country, while the actual service delivery is hugely decentralized, and the local governments have the strong responsibilities on it. Across the 47 prefectures in Japan, there are a total of 1718 municipalities and they are further divided into three types of municipalities based on their population size: cities, towns and villages. Similarly in Italy, the national government lays out the essential health care services which must be provided to all Italian citizens, while the actual provision of services is organized at the regional level (21 Regions and Autonomous Provinces). Both prevention and cure of communicable diseases, therefore, are managed by the Regional Health Care Systems, each with their preferred modalities<sup>16</sup>.

The situation of pandemic preparedness was at a high level in most high-income countries. For example, the GHS index (Global Health Security Index) shows the following scores for each country. In addition, the IHR-JEE (International Health Regulation - Joint External Evaluation) scores are as follows. More specifically, the status of advance preparation for each country is shown in the figure below.

**Roles and responsibilities between central and local government during the COVID-19 pandemic**

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<sup>16</sup> Decree of the President of the Council of Ministers. Definition and update of the essential care levels. January 12 2017. Available at:

<https://www.gazzettaufficiale.it/eli/id/2017/03/18/17A02015/s>  
g. Accessed on 05.28.2021

In Japan, in principle, the national government decides on the general framework of infectious disease control measures, while the prefectures were given a considerable amount of autonomy in taking detailed measures related to infectious disease control. However, in the case of an infectious disease of unprecedented scale such as COVID-19, it is true that there has been confusion between the central government and local governments over where authority and responsibility lie<sup>17</sup>.

For example, one of the grounds for non-pharmaceutical intervention in Japan was the declaration of a state of emergency (not equal to so-called "lockdowns" seen in many Western countries). When the government declares a state of emergency, the governor of each prefecture has the authority to 1) request residents to refrain from going out of their homes, 2) enforce the use of land and buildings for temporary medical facilities, and 3) prevent the use of schools and welfare facilities, (4) requesting and ordering the sale, expropriation, and storage of medical supplies, masks, and food, and other daily commodities, (5) requesting and instructing the restriction of music, sports, and other events, and (6) requesting and instructing transportation companies to provide emergency supplies.

However, since the national government has the authority to declare a state of emergency, while the governor of the prefecture has the authority to request the suspension of business, it is unclear whether either the national or prefectural government is responsible for how to compensate for the suspension of business. In addition, it is said that timely decision-making was

neglected by the fact that the prefectural governor must make a request to the national government to declare a state of emergency and that the governor must also apply to the national government in advance to request a business closure.

In Italy, the national government imposed strict regulations concerning non-pharmaceutical prevention measures, such as lockdowns, curfews, school suspensions, limitations to the opening of public places and to the use of public transport. It is important to note that in a country with such a decentralized healthcare delivery system, the extraordinary character of the pandemic legitimized state intervention. It also allowed the activation of the Department of Civil Protection to support regions in the procurement of pharmaceuticals, medical devices, human resources, and infrastructure, in tight collaboration with the 'Extraordinary Commissioner', nominated on 18th March. While, in normal circumstances, regions enjoy a great deal of autonomy in decision-making, central government decisions cannot be derogated by regional and local bodies, especially when they are issued through legislative decrees, unless they result in more restrictive measures. Notwithstanding the increased role of the central government, regions still retain decision-making autonomy regarding the delivery and organization of health services, such as whether to conduct COVID-19 tests on the regional entire population. Indeed, hospital care, home visits, contact tracing, and vaccines provision were instead managed entirely by the Regions, which had to provide timely data to the national government for continuous monitoring. Of course, the central government provided updated definitions of 'infected cases', and of the period from

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<sup>17</sup> <https://www.nhk.or.jp/politics/articles/statement/52665.html>

which to start contact tracing<sup>18</sup>. In the case of Italy, those changes in roles and responsibility between central and local government was not based on any legal amendment. As according to Italian legislation, in urgent or extraordinary situations, the government can decide to centralize - or increase - administrative authority to a chosen delegate, for a fixed period. In this case, the role of "Extraordinary Commissioner for the implementation and coordination of measures to contain and combat the epidemiological emergency COVID-19 ", was assigned to the CEO of Invitalia, the national Agency for inward investment and economic development. All the decrees produced by the national government provided the general guidelines regions had to confirm to, consistently with the pre-existing roles and responsibilities. However, all regions must provide SARS-CoV-2 surveillance data daily to the central government, which has set thresholds for indicators (such as ICU bed occupancy) entailing different levels of restrictions for provinces and regions<sup>19</sup>.

### 3. Building improvement capacity in the medical facilities

Traditional infectious disease control measures have focused mainly on surveillance, monitoring, quarantine, laboratory capacity, and testing systems. On the other hand, infectious disease outbreaks do not end when they are detected, and how to provide treatment afterward is also very important. In particular, when the number of patients increases

exponentially, as in the case of COVID-19, the operation of the healthcare delivery system during normal times will not be sufficient, and it will be necessary to quickly and flexibly increase the number of hospital beds and medical personnel available to treat infectious diseases. In this section, we will look at how countries have restructured their hospital beds during COVID-19.

Although high-income countries generally have an ample number of hospital beds, for infectious diseases that increase exponentially, such as COVID-19, the number of hospital beds in normal times alone will not be enough to cope with the situation, and it is necessary to increase the number of hospital beds that can rapidly deal with infectious diseases and critically ill patients. When considering the hospital capacity during the pandemic, the keys are 1) whether a plan for reorganizing hospital beds existed in advance, 2) whether there is a legal basis for implementing hospital bed reorganization, and 3) where the authority for reorganizing hospital beds lies. Table XX below summarizes these situations for each country.

Based on the above, we would like to look at how each country has actually restructured its hospital beds. The responses of each country can be categorized into the following: 1) transformation of words into ICU, 2) creation of field hospitals, 3) transfer of patients to localities with spare capacity, 4) partnership with private hospitals, and 5) financial support for bed

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<sup>18</sup> COVID-19 Health System Response Monitor. Policy responses for Italy - Governance. Available at: <https://www.covid19healthsystem.org/countries/italy/livinghit.aspx?Section=2.1%20Physical%20infrastructure&Type=Section>. Accessed on 28.05.2021

<sup>19</sup> COVID-19 Health System Response Monitor. Policy responses for Italy - Governance. Available at: <https://www.covid19healthsystem.org/countries/italy/livinghit.aspx?Section=2.1%20Physical%20infrastructure&Type=Section>. Accessed on 28.05.2021



transformation.

In Italy, on 1st March 2020 the Ministry of Health issued a circular requiring all regions to take action according to the following recommendations:

- Increase by 50% the number of intensive care beds
- Increase by 100% the number of beds in pneumology and infectious diseases wards (these beds should be equipped with adequate assisted pulmonary ventilation systems)
- Mainly use private contractors (private hospitals accredited with the NHS) for non-COVID-19 patients; however, in Lazio and Lombardy, private contracted hospitals increased their capacity also for COVID-19 patients

Also, field hospitals were set up next to hospitals which were on the brink of being overwhelmed by COVID-19 inpatients.<sup>20</sup> In the subsequent epidemic peaks, each region could re-organize hospital capacity autonomously. Depending on the epidemiologic situation, the regional coordination decided which hospitals had to remain COVID-19 free, and which had to dedicate more wards to COVID-19 patients, with only general directives provided by the central government.<sup>21</sup>

There is some financial support from the central

government. However, medical institutions are not direct recipients of additional funding. Regions receive funds for healthcare from a national fund, and for the COVID-19 emergency, they were awarded with additional funding for hiring more personnel. There are two main channels of additional funding for the emergency:

1. State funding in accordance with the “Cure Italy” Legislative Decree approved on 17th March 2020, which provides for an allocation of EUR 3.2 billion to the National Health Service and the Department of Civil Protection, out of the total 25 billion emergency fund approved by the government (as of April 2nd).
2. Philanthropic activities of individual citizens and large companies in support of regions, municipalities and health care providers (a total of EUR 425.6 million donated as of 29th March 2020).

In Taiwan, In April 2021, they prepared 970 Negative-pressure Isolation rooms, and 1711 COVID-19 isolation rooms Nationwide<sup>22</sup>. When community spread started on May 11, 2021, their government asked all hospitals with over 500 beds to transfer 10% of the acute disease ward into COVID-19 isolation room. They also cancel the restriction of 1 person in 1 room and accept 2 people in a room, and COVID-19

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<sup>20</sup> COVID-19 Health System Response Monitor. Policy responses for Italy - Planning services. Available at: <https://www.covid19healthsystem.org/countries/italy/livinghit.aspx?Section=2.1%20Physical%20infrastructure&Type=Section>. Accessed on 28.05.2021

<sup>21</sup> Circular n° 20A06144 5<sup>th</sup> November 2020. “Further urgent measures

concerning the containment and management of the epidemiologic emergency COVID-19.” Ministry of Health. [https://www.gazzettaufficiale.it/eli/id/2020/11/05/20A06144/sg\\_](https://www.gazzettaufficiale.it/eli/id/2020/11/05/20A06144/sg_) Accessed on 28.05.2021

<sup>22</sup> <https://www.mohw.gov.tw/cp-4633-52628-1.html>



isolation beds increased to 9015 in total.

#### *Restriction for ICU bed* (Question 18)

If the number of patients increases and beds are not available in time, ICU admission restrictions may be considered. However, aside from countries that have established some sort of regulation on ICU admission in normal times, it is not easy from an ethical standpoint to introduce such a new regulation in times of crisis. In fact, in Japan, such discussions were not even held at the national level, and the decision was left to each healthcare facility. In Taiwan as well, there are no such restrictions during normal time. Though they started to talk about prioritization during pandemics when medical resources are limited, however, till now, there are no criteria or new restrictions introduced yet.

#### *Coordination between public and private health facilities* (Question 24 and 25)

As mentioned above, during the pandemic, the central or local government took the lead in issuing various instructions to medical institutions regarding the reorganization of hospital beds. However, the situation differs greatly from country to country as to whether these instructions from the government are enforceable against private medical institutions. In addition, the role that private medical institutions play in the healthcare delivery system during normal times, especially the extent to which private medical institutions can provide treatment for infectious diseases, also greatly affects the reorganization of hospital beds. In this section, we will focus on the relationship between public and private medical institutions, especially during the pandemic, in each country.

In Italy, on March 17<sup>th</sup> 2020, the national government issued Legislative-Decree n° 18 (“Cure Italy decree”) which focused on the capacity of the National Health Service in terms of physical infrastructure, financing an increase of beds in ICUs, Pneumology and Infectious Diseases in derogation from budget limits. The decree also requests that for the duration of the emergency, private facilities should make available their healthcare professionals, facilities, equipment and transport vehicles, designating EUR 340 million for this purpose. Private healthcare providers played a fundamental role especially during peak times when urgent interventions were needed in response to hospital overcrowding. In many regions, COVID-19 patients were hosted by private clinics, easing the pressure on public facilities, thanks to special agreements with Regional Health Systems that checked structural and safety requirements. Such collaboration was also fundamental later on, during Phase II, for the progressive resumption of ordinary activities as it allowed for the continuation of undeferrable surgical services.

#### **4. Human resources for Health**

In Italy, during March 2020, the Department of Civil Protection issued two Ordinances to establish a Specialist Medical Unit and a Technical-Nursing Unit through online calls. A total of 300 physicians and 500 nurses (from the National Health Service, private clinics and freelancers) were selected on the basis of specific requirements by the Head of the Department of Civil Protection. Participation is voluntary and volunteers will be sent to areas facing greater difficulty in the COVID-19 emergency. The hosting regions reimburse transfer and accommodation. In addition to their normal salary, each professional will receive a flat-rate solidarity premium of EUR 200 for each day

of work, paid by the Department of Civil Protection. Almost 7,000 doctors and 10,000 nurses have applied as candidates. Other than this, regional health authorities were in charge of personnel reallocation. Regions increased their number of physicians by about 3-4% and of nurses by about 6-7%<sup>23</sup>. When asking medical professionals who are not normally engaged in acute care were assigned to respond to COVID-19, all healthcare professionals assigned to services for COVID-19 patients and infected cases were trained for their respective functions. The content and modalities of training were organized by the single healthcare facilities, or in some cases were performed by professionals from NGOs (like *Medicins Sans Frontieres*), while the Ministry of Health and the Superior Institute of Health provided the general guidelines for example on when to start contact tracing, or the management of the various stages of COVID-19. For incentives, no specific incentives were provided to the personnel which were already employed by the healthcare facilities, except of course for the pay of additional working hours. Very high salaries, however, were given to the resident physicians or the new medical graduates who accepted fixed-term positions to help with hospital management and contact tracing. This often-produced widespread dissatisfaction among the stable personnel.

In Taiwan, based on the Communicable Disease Control Act, the central government can regulate the medical personnel. Meanwhile, the government also recruited the retired medical personnel to combat

COVID-19. All physicians in Taipei were rotated to care COVID-19 ward regardless of their specialties. When mobilizing those personnel, the central and regional government will provide acute training. Meanwhile, the different physician association also provided online courses for all medical personnel, including infection control guideline, Management guideline for COVID-19, and guideline for severe COVID-19, etc. Based on the Special Act for Prevention, Relief and Revitalization Measures for Severe Pneumonia with Novel Pathogens, the government, CEC provided the incentive for medical personnel. The amounts were as follows; physician NT 10,000 per person per shift or day, Nurse: NT 10,000 per person per shift or day, medical radiation technologist: NT 10,000 per month, and infection control coordinator: NT 10,000 per month<sup>24</sup>. Besides, when conducting PCR testing, they receive NT\$500/time.

### Overseas physicians and medical students

One way to fill the shortage is to mobilize overseas medical personnel. However, the situation also differs greatly from country to country. For example, in Italy, many medical teams from other countries came for humanitarian missions during the first wave, for example from Ukraine, Albania, Tunisia, China, Cuba, Poland and Russia, Norway, and Romania. Such help was organized by the National Civil protection upon receiving requests of help from Italian regions<sup>25</sup>.

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<sup>23</sup> COVID-19 Health System Response Monitor. Policy responses for Italy - Workforce. Available at: <https://www.covid19healthsystem.org/countries/italy/livinghit.aspx?Section=2.1%20Physical%20infrastructure&Type=Secti> on. Accessed on 28.05.2021

<sup>24</sup> <https://www.cdc.gov.tw/File/Get/ipZWx3CNyAY-SfmyKk3Yog>

<sup>25</sup> COVID-19 Health System Response Monitor. Policy responses for Italy - Workforce. Available at: <https://www.covid19healthsystem.org/countries/italy/livinghit.aspx?Section=2.1%20Physical%20infrastructure&Type=Secti>

## Reallocation of human resources and its consequences (Question 31)

Various measures were taken to compensate the medical personnel, especially infectious disease control and critical care. The pros and cons of such efforts should be appropriately evaluated, especially in terms of medical outcomes. Still, almost no country actually evaluates such outcomes properly, partly because it is a time of crisis and challenging to get any data set. In Japan, there was a public opinion that a similar approach should be taken in Japan, using the example of other countries' participation of non-specialists and medical students in COVID-19 management. On the other hand, many health care professionals in Japan were negative about such measures because mobilizing non-specialized health care professionals may not improve patient outcomes. While we need to fully consider the ethical aspect of such an issue, future work should include evaluating which of the various measures for compensating the medical personnel shortage were truly effective (i.e., whether they contributed to improved patient outcomes for COVID-19 patients and other diseases).

## Considerations of the medical workforce during a pandemic in the future

It may seem obvious now that we have experienced COVID-19 that there will be a shortage of medical personnel, especially when the number of infected people increases exponentially, but in reality, few countries had prepared any specific plan for supplementing human resources before COVID-19. In this survey, only Taiwan had prepared a plan in advance, but many other countries had not prepared

any specific plan in advance. In Taiwan, after SARS in 2003, the Government amended the Communicable Disease Control Act accordingly. It authorizes the Ministry of Health and Welfare to have CECC if the epidemic occurs as the highest center for organizing human resources during the epidemic. In this plan, the government, and medical centers host training programs for hospitals annually. Each year, each hospital will identify 1 physician and 2-3 nurses as a support team, and if a pandemic happens that year, those people will relocate to a responsible hospital and support the disease control.

In addition, regarding human resources, we should not forget the mental health of medical personnel. With the prolonged COVID-19 epidemic, it is desirable that appropriate mental health support be provided to healthcare workers who are engaged in front-line care. However, the response to this situation also varies greatly from country to country. In Taiwan, the Ministry of Health and Welfare established guidelines and directed health care organizations to maintain the mental health of medical staff. The approach includes: 1) Establish the task force and management algorithm, 2) Education and policy communication, 3) Monitor Mental and physical health statuses, 4) Provide Help, 5) Support from the executive hospital administrators. Besides, the Ministry of Health and Welfare also provides the reimbursement for psychological consultation fee: NT 2,000 per consultation per person, 6 times per year, up to NT 12,000 during a year<sup>26</sup>.

## 5. Healthcare Financing

There is a universal health insurance system in Japan, and all residents living in Japan, regardless of their nationalities, are required to join. If you join the

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[on](#). Accessed on 28.05.2021

<sup>26</sup> [J Formos Med Assoc.](#) 2021 Mar; 120(3): 923–925

universal health insurance system, you can receive all medical services (both outpatient and inpatient) with a co-payment of 0-30%, depending on your age and income. In addition, for certain infectious diseases designated by infectious diseases control law, all medical expenses related to testing and treatment are covered by public expenses. In the case of COVID-19, all tests, vaccines, outpatient care, and inpatient care are covered at public expense according to the aforementioned Infectious Diseases Control Law. However, if a person is NOT a close contact or DO NOT have symptoms such as fever and then visits a medical institution for testing purposes, tests are not covered by public insurance, and the patient must pay the price set by the medical institution on their own.

In Taiwan, the government administered an insurance-based national health insurance (NHI) system, single payer, insurance-premium based on payroll tax. NHI covers the majority (99%) of the public and private hospitals and clinics. Co-payments are very little. For example, for outpatient specialist care range from TWD 50 (USD 1.65) to TWD 170 (USD 5.61) when the patient has a referral from a physician, and TWD 50 to TWD 420 (USD 13.86) without a referral, and NT\$550 for a tertiary medical center ER visit; For a patient hospitalized in an acute disease ward, coinsurance rates are 10%. Copayments for outpatient prescription drugs covered under NHI are capped at TWD 200 (USD 6. 6) per outpatient visit, regardless

of how many drugs are prescribed during that visit. There is no annual cap on drug copayments. Under this scheme, for normal infectious disease (ex: pneumonia, Adenovirus infection ect.), it's covered in NHI; for COVID-19, it's a special fund controlled by Taiwan CDC to cover testing, health care and so on and patients do need to pay anything.

#### E. 結論

#### F. 健康危険情報 特になし

#### G. 研究発表

##### 1. 論文発表

Yamasaki L, Nomura S. Global warming and the Summer Olympic and Paralympic games: a perspective from the Tokyo 2020 Games. *Environmental Health and Preventive Medicine* 27 (2022): 7-7.

##### 2. 学会発表

特になし

#### H. 知的財産権の出願・登録状況 (予定を含む。)

##### 1. 特許取得

特になし

##### 2. 実用新案登録

特になし

##### 3.その他

特になし