Changes in the Number of Public Health Nurses Employed in Local Governments in Japan During the Covid-19 Pandemic: A Cross-Sectional Study

Kazuya Taira, PhD1, Rikuya Hosokawa, PhD1 and Misa Shiomi, PhD1

Abstract

Introduction: Prefectural public health centers in Japan conducted epidemiological surveys of all COVID-19 patients, which subsequently increased their workload as the infection rate increased. The survey was conducted by public health nurses (PHNs); therefore, an increase in their workload was expected. However, changes in the number of PHNs have not yet been examined. This study focused on recruiting PHNs to local governments in Japan during the COVID-19 pandemic.

Methods: This cross-sectional study of 150 local government public health centers was conducted from November to December 2021. The survey items included the number of full-time and part-time PHNs, number of PHNs who resigned or retired from the job, and number of PHNs recruitment examinations conducted between 2017 and 2021. For all variables, the mean, standard deviation, and minimum and maximum values for each municipality and year were calculated, and a one-way analysis of variance was performed.

Conclusion: The response rate of the questionnaires was 54.0% (81/150). The change in the employment status of PHNs from 2019 to 2020 was not statistically significant in 2020, which was the COVID-19 outbreak year. However, the number of full-time PHNs increased by 2.6, while part-time PHNs almost doubled from 5.2 ± 8.3 to 10.8 ± 9.6 (p = .61) for prefectures, from 13.6 ± 13.1 to 21.5 ± 34.8 (p = .23) for cities, and from 16.8 ± 26.8 to 52.3 ± 132.5 (p = .70) for wards. The survey revealed that since the COVID-19 pandemic, the ratio of part-time to full-time PHNs significantly increased. Current status reports of public health centers will encourage political decisions and research on the factors necessary to balance the supply and demand of full-time PHNs.

Keywords

public health nurse, employment, local government, Japan, COVID-19

Received 3 July 2022; accepted 6 November 2022

Introduction

Public health nurses (PHNs) in Japan are qualified (Ministry of Justice, 2009) and play a central role in public health measures. PHNs work in various sectors, such as local governments, hospitals, corporations, and schools, and more than 60% work for government bodies (Japanese Nursing Association, 2022). They work for local governments divided into prefectures and municipalities. Prefectures provide medical support to patients with mental illnesses, intractable diseases, and infectious diseases, and to children with chronic diseases. In contrast, municipalities provide resident services, such as health checkups for mothers and children, nursing care prevention, and lifestyle-related disease prevention (Katsuda et al., 2011). Prefectural public health centers have infectious disease control departments. These PHNs are rotated among other departments during staff reshuffling at the discretion of the human resources department every three to five years, regardless of PHNs’ age and background. Therefore, any prefectural PHNs may be assigned to infectious disease control department.

1Department of Human Health Sciences, Graduate school of Medicine, Kyoto University, Kyoto, Japan

Corresponding Author:

Kazuya Taira, Department of Human Health Sciences, Graduate School of Medicine, Kyoto University, 53, Shogoinkawara-cho, Sakyo-ku, Kyoto 606-8507, Japan.

Email: taira.kazuya.5m@kyoto-u.ac.jp
Since January 2020, Japan has witnessed a series of nationwide COVID-19 outbreaks (Ministry of Health, Labor and Welfare, 2022a, 2022b). The two laws, namely, the “Law Concerning Prevention of Infectious Diseases and Medical Care for Patients with Infections (Infectious Disease Control Law)” and “Act on Special Measures for Pandemic Influenza and New Infectious Diseases Preparedness and Response (the Corona Special Measures Act),” are used to classify disease severity on a scale of 1 (severe) to 5 (mild); COVID-19 is considered equivalent to level two on the severity scale (Hashimoto, 2021). PHNs working in prefectures with public health centers are responsible for conducting active epidemiological research, coordinating polymerase chain reaction testing, overseeing the admission and discharge of patients from the hospital, and managing patients recuperating at home. These measures are similar to those adopted in the management of other infectious diseases (Inoue, 2020; Katsuda et al., 2011). PHNs conducted telephonic surveys among COVID-19-positive patients, identified people in close contact with such patients, and assessed the health conditions of these patients at home. The Japan Medical Association and Prefectural Governors’ Association have suggested that the Minister of Health, Labor, and Welfare should take alternative measures to identify all COVID-19 patients and conduct epidemiological surveys (National Governors’ Association, 2022).

During the pandemic, the workload of healthcare professionals increased as the number of infected patients increased (National Institute of Infectious Diseases, 2021). However, its impact on the number of PHNs has not been investigated. This study aimed to investigate changes in the employment trends of PHNs in Japanese prefectural public health centers before and after the COVID-19 pandemic.

**Brief Review/Discussion of Topic**

Several studies have suggested that an increase in demand would lead to a shortage of health workers, such as doctors and nurses, in an aging society, creating an imbalance in their availability and demand in upper-middle-income and lower-income countries (Alghaith et al., 2021; Liu et al., 2017; McPake et al., 2019). Therefore, it is crucial to plan a global health workforce. Unlike physicians and nurses, PHNs from different countries have different titles. Additionally, there are no standards to define their roles and judge their competencies (Edgecombe & WHO Regional Office for Europe, 2001). Most PHNs in Japan are public servants with a tax-funded salary system, and salary increases are based on the level of seniority. Therefore, it is not possible to control the supply of PHNs through salary increases, as it is challenging to increase financial resources or deviate from the salary system. Private employment agency surveys reveal that the pandemic made public service positions more desirable, including PHNs, owing to low salary volatility and low risk of bankruptcy. Hence, the number of applicants increases during recessions, and job availability is greatly affected by Japan’s socioeconomic conditions (Mynavi Corporation, 2022). Nevertheless, owing to the shortage of PHNs, temporary staffing registries, such as the Infectious Disease Health Emergency Assistance Team (IHEAT), were introduced (Ministry of Health, Labor and Welfare, 2021). However, changes in employment conditions remain unknown.

**Methods**

A cross-sectional study was conducted on all 150-government-regulated prefectural public health centers in Japan: 47 prefectures, 80 cities, and 23 special wards in Tokyo. The survey was conducted between November and December 2021; it was sent via mail to the human resources department of each local government. It inquired about the number of full-time and part-time PHNs, the number of PHNs who resigned or retired from the job, and the PHN recruitment examinations conducted annually from 2017 to 2021. Unlike the national certification examination, the PHN recruitment examination is used to select the PHNs to be employed by each local government. Administrative PHNs are equivalent to civil servants. The examination includes a written test to ascertain acumen for natural science, social studies, economics, document reading, and numerical judgment knowledge, along with a personality test. This is followed by an interview. For all variables, the mean, standard deviation, and maximum and minimum values for each municipality and year were calculated, and a one-way analysis of variance was performed.

**Results**

The response rate was 54.0% (81/150). Focusing on the results from 2020, with the COVID-19 outbreak, the change in the number of full-time PHNs was as follows: from 112.3 ± 52.8 in 2019 to 112.6 ± 52.5 in 2020 (p = .99) for prefectures; from 106.0 ± 90.6 in 2019 to 107.6 ± 91.6 in 2020 (p = .99) for cities; and from 62.8 ± 23.5 in 2019 to 65.4 ± 25.3 in 2020 (p = .94) for wards (Table 1). Additionally, the change in the number of part-time PHNs was 5.2 ± 8.3 in 2019 to 10.8 ± 9.6 in 2020 (p = .61) for prefectures, 13.6 ± 13.1 in 2019 to 21.5 ± 34.8 in 2020 (p = .23) for cities, and 16.8 ± 26.8 in 2019 to 52.3 ± 132.5 in 2020 (p = .70) for wards. At the 5% level, differences in the number of PHNs resigning or retiring from work in all prefectures (p = .00), cities (p = .00), and wards (p = .02) were statistically significant. No significant differences were observed in the number of recruitment examinations performed.

**Conclusions/Importance of Nursing Profession**

While a statistically significant difference was not recorded in PHNs’ employment status, the number of full-time PHNs increased by 2.6 in the local government; the number of part-time PHNs almost doubled. The number of recruitment
The number of PHN Recruitment Examinations conducted did not increase, and the survey revealed a significant increase in the ratio of part-time to full-time PHNs since the COVID-19 pandemic. Traditionally, in Japan, since the employment period ends in the last month of the fiscal year, most employees retire at the end of March. For the fiscal year 2021, the survey was conducted mid-year; therefore, the number of retirees was statistically significant. External support and employment of part-time PHNs were among the measures to prevent dysfunction in public health centers (Yoshioka–Maeda et al., 2020); however, the availability of PHNs and their timely recruitment against rising infections are challenging. Furthermore, part-time PHNs find it challenging to ensure their quality of work. The main measures of prefectoral public health centers against COVID-19 included law restrictions on community people’s daily life and the assessment regarding who needed to be admitted to the hospital for COVID-19 treatment. Low-quality staff may err in determining the need for hospitalization or behavioral restrictions, leading to serious health problems, including death and human rights violations. Short-term turnover of part-time PHNs can lead to additional work, such as frequent paperwork, writing job descriptions, and training, which may cause burnout in full-time PHNs. Another factor related to the lack of an increase in the number of full-time PHNs can be the difficulty that employers, that is local governments, have in laying off full-time PHNs. Article 16 of Japan’s Labor Contract Law stipulates “Dismissal shall be invalid as an abuse of the right if it lacks objectively reasonable grounds and is not deemed reasonable under socially accepted.” “Under socially accepted” implies “within the bounds of common sense,” that is, when everyone is on the same page and reaches the same conclusion, in this case, regarding the PHNs’ termination. This effectively means that an employer cannot fire a person unless they have committed a crime or have been grossly negligent in their work, such as being repeatedly absent without leave. However, in Japan, because the number of full-time PHNs is associated with COVID-19 incidence rates (Tomiioka et al., 2022), an increase in the number of full-time PHNs is desirable.

This study has several limitations. First, in Japan, COVID-19 has not completely converged. Due to the absence of relevant changes in government measures, municipalities with high infection rates and a shortage of PHNs

Table 1. Changes in the Employment Status of Public Health Nurses by Type of Local Governments from 2017 to 2021.

| The number of full-time PHNs | 2017      | 2018      | 2019      | 2020      | 2021      | One-way ANOVA |
|-----------------------------|-----------|-----------|-----------|-----------|-----------|---------------|
|                            | F-value   | p-value   |           |           |           |               |
| The number of part-time PHNs|           |           |           |           |           |               |
| Wards Mean ± SD             | 58.8 ± 21.9 | 59.6 ± 23.3 | 62.8 ± 23.5 | 65.4 ± 25.3 | 67 ± 25.5 |               |
| (n = 9) (Min.-Max.)         | (34–92)   | (34–97)   | (40–102)  | (39–103)  | (40–107)  |               |

**Note.** Min = Minimum; Max = Maximum.
were not included in the survey. Second, because this survey was conducted in prefectural public health centers that implemented COVID-19 measures and excluded municipal public health centers, it was not possible to evaluate the supply and demand of PHNs holistically. Third, because the work of prefectural PHNs is not limited to infectious disease control, the ratio of PHNs working for COVID-19 control and the interference caused by COVID-19 in delegating their other duties is a matter of future investigation.

As of October 2022, Japan converged after recording the largest number of COVID-19 cases in the seventh wave caused by the highly infectious Omicron variant (B 1.1.529; MHLW, 2022a; World Health Organization, 2021). Furthermore, it is preparing for the possible eighth wave in winter. While the government has introduced more measures to prevent the collapse of public health centers and medical institutions by ceasing to monitor all COVID-19 cases and limiting the number of cases to those with severe conditions (MHLW, 2022b), the percentage of individuals who have been inoculated additional COVID-19 vaccinations (third or later) remained low (Prime Minister of Japan and His Cabinet, 2022). The challenges remain. Due to the possibility of PHNs burnout and the sharp increase in severe COVID-19 cases, quantitative reports are desirable. Current status reports of public health centers will encourage political decisions and research on the factors necessary to balance the supply and demand of full-time PHNs.

Acknowledgments
We would like to thank the local government officials who responded to our survey and Editage (www.editage.jp) for English language editing.

Declaration of Conflicting Interests
The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding
The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article. This work was supported by the Kyoto University (grant number FY 2021 Kusunoki 125 of Kyoto University 125th Ann and operating expenses of the authors’ affiliation).

ORCID iDs
Kazuya Taira https://orcid.org/0000-0002-1560-5454
Rikuya Hosokawa https://orcid.org/0000-0003-4239-8494

References
Alghaith, T., Liu, J. X., Alluhidian, M., Herbst, C. H., & Alazemi, N. (2021). A labor market assessment of nurses and physicians in Saudi Arabia. World Bank.

Edgecombe, G., & WHO Regional Office for Europe (Eds.). (2001). Public health nursing past and future. A review of the Literature. https://apps.who.int/iris/bitstream/handle/10665/108460/E74237.pdf?sequence=1

Hashimoto, M. (2021). Revision of the infectious disease control act and the Japanese constitution. https://www.chuo-u.ac.jp/english/features/2021/12/59796/

Inoue, H. (2020). Japanese strategy to COVID-19: How does it work? Global Health & Medicine, 2(2), 131–132. https://doi.org/10.35772/ghm.2020.01043, PMID: 33330791

Japanese Nursing Association (2022). Nursing statistics. https://www.nurse.or.jp/jna/english/statistics/index.html

Katsuda, N., Hinohara, Y., Tomita, K., & Hamajima, N. (2011). Structure and roles of public health centers (hokenjo) in Japan. Nagoya Journal of Medical Science, 73(1–2), 59–68. PMID: 21614938.

Liu, J. X., Goryakin, Y., Maeda, A., Bruckner, T., & Schefler, R. (2017). Global health workforce labor market projections for 2030. Human Resources for Health, 15(1), 11. https://doi.org/10.1186/s12960-017-0187-2

McPake, B., Dayal, P., & Herbst, C. H. (2019). Never again? Challenges in transforming the health workforce landscape in post-Ebola West Africa. Human Resources for Health, 17(1), 19. https://doi.org/10.1186/s12960-019-0351-y

Ministry of Health, Labour and Welfare (2021). About IHEAT [Japanese]. https://www.mhlw.go.jp/stf/seisakunitsuite/bunya/kenkou_iryou/kenkou/nettyuu/index_00015.html

Ministry of Health, Labour and Welfare (2022a). Visualizing the data: information on COVID-19 infections. https://covid19.mhlw.go.jp/extensions/publicen/index.html

Ministry of Health, Labour and Welfare (2022b). Review of notifications of all COVID-19 patients to the public health center for the transition to a new phase of with-corona era [Japanese]. https://www.mhlw.go.jp/content/000993000.pdf

Ministry of Justice (2009). Japanese Law Translation: Act on public health nurses, midwives, and nurses (act No. 203 of 1948). https://www.japaneselawtranslation.go.jp/en/laws/view/3993

Mynavi Corporation. Survey on image of civil servants for college students graduating in 2023 [Japanese] (2022). https://career-research.mynavi.jp/research/20220217_24658/20220217_24658/

National Governors’ Association (2022). Urgent request for an alternative measure to identify all COVID-19 infected persons [Japanese]. https://www.nga.gr.jp/data/activity/committee_pt/shingatakoronauirusukinkyutaisakukaigi/R4/1659487255105.html

National Institute of Infectious Diseases (2021). Guidelines for conducting proactive epidemiological surveillance of patients with new coronavirus infection (January 8, 2021 edition) [Japanese]. https://www.niid.go.jp/niid/ja/diseases/ka/coronavirus2019-ncov/2484-idsc/9357-2019-ncov-2.html

Prime Minister of Japan and His Cabinet (2022). COVID-19 Vaccines. https://japan.kantei.go.jp/ongoingtopics/vaccine.html

Tomioka, K., Shima, M., & Saeki, K. (2022). Number of public health nurses and COVID-19 incidence rate by variant type: An ecological study of 47 prefectures in Japan. Environmental Health & Preventive Medicine, 27, 18–18. https://doi.org/10.1265/ehpm.22-00013

World Health Organization (2021). News- classification of omicron (B.1.1.529): SARS-CoV-2 variant of concern. https://www.who.int/news/item/26-11-2021-classification-of-omicron-(b.1.1.529)-sars-cov-2-variant-of-concern

Yoshioka–Maeda, K., Iwasaki–Motegi, R., & Honda, C. (2020). Preventing the dysfunction of public health centres responding to COVID–19 by focusing on public health nurses in Japan. Journal of Advanced Nursing, 76(9), 2215–2216. https://doi.org/10.1111/jan.14409, PMID: 32363578