

BRIEF REPORT

Workplace measures against COVID-19 during the winter third wave in Japan: Company size-based differences

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Abstract

Objectives: Little is known about workplace measures against coronavirus disease 2019 (COVID-19) in Japan during the winter of 2020, especially in micro-, small-, and medium-sized enterprises (MSMEs). This study aimed to provide an overview of the current situation of anti-COVID-19 measures in Japanese enterprises during the winter, considering company size.

Methods: This study was an Internet-based nationwide cross-sectional study. Individuals who were registered as full-time workers were invited to participate in the survey. Data were collected using an online self-administered questionnaire in December 2020. The chi-squared test for trend was performed to calculate the *P*-value for trend for each workplace measure across company sizes.

Results: For the 27 036 participants, across company sizes, the most prevalent workplace measure was encouraging mask wearing at work, followed by requesting that employees refrain from going to work when ill and restricting work-related social gatherings and entertainment. These measures were implemented by approximately 90% of large-scale enterprises and by more than 40% of micro- and small-scale enterprises. In contrast, encouraging remote working was implemented by less than half of large-scale enterprises and by around 20% of micro- and small-scale enterprises.

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There were statistically significant differences in all workplace measures by company size (all $P < .001$).

Conclusions: We found that various responses to COVID-19 had been taken in workplaces. However, some measures, including remote working, were still not well-implemented, especially in smaller enterprises. The findings suggest that occupational health support for MSMEs is urgently needed to mitigate the current wave of COVID-19.

KEYWORDS

COVID-19, infection, occupational health, prevention, SARS-CoV-2, worksite

1 | INTRODUCTION

Coronavirus disease 2019 (COVID-19) is an infectious disease caused by SARS-CoV-2 that is easily transmitted between persons; therefore, infection prevention and control in the workplace are of a major concern.¹ A previous study in Japan reported that most companies had taken individual-level precautions, such as hand washing and cough etiquette, but lagged behind in terms of organizational-level initiatives such as remote working and staggered commuting, especially in micro-, small-, and medium-sized enterprises (MSMEs), because of limited resources to respond to COVID-19.²

A state of emergency was first declared in some areas of Japan on April 7, 2020; this declaration was later extended to the entire country until May 25, 2020.³ Although Japan did not impose a mandatory lockdown, many companies followed the voluntary-basis request from the government during the period, which included temporary closures and restrictions on business.⁴ One reason for the relatively low COVID-19 infection rate in Japan may be the corporate infection control efforts in the workplace.⁵ A previous cohort study suggested that the gap in implementation of preventive measures against COVID-19 according to company size was being bridged in May 2020, after the first state of emergency declaration.⁶

The numbers of COVID-19 infections and deaths in the winter of 2020 were much higher than in the previous waves; therefore, Japan was on maximum alert in the third wave. However, little is known about the situation regarding workplace measures during this wave. For example, was the gap filled in implementation of preventive measures by company size? Therefore, the purpose of this study was to provide an overview of the situation regarding measures against COVID-19 in Japanese enterprises during the third epidemic wave in the winter, taking company size into account.

2 | SUBJECTS AND METHODS

2.1 | Study design and participants

This study was a part of the Collaborative Online Research on the Novel-coronavirus and Work (CORoNaWork) Project. Fujino et al have introduced the details of the study protocol elsewhere.⁷ In brief, the CORoNaWork Project is an Internet-based nationwide prospective cohort study in Japan. The present cross-sectional study used data from the baseline survey, which was performed in December 2020, during the third wave of the COVID-19 pandemic. Individuals who were registered as a full-time worker were invited to participate in the survey, including dispatched workers, contract workers, and self-employed individuals. A total of 33 087 participants selected using cluster sampling with stratification by sex, region, and job type answered the online self-administered questionnaire. Panelists registered as health care workers or caregivers were not invited to participate in the survey. After excluding invalid responses, 27 036 participants were eligible for the analysis.

2.2 | Questionnaire

This study used questionnaire data on sex, age, postal code of workplace, job type, company size, and workplace measures. Postal code was used to identify the geographical region of each workplace. The participants reported their job type as mainly desk work, work involving communicating with people, or manual work. Company size was classified as micro-scale (<10 employees), small-scale (10-49 employees), medium-scale (50-999 employees), or large-scale (≥ 1000 employees).

An original list of workplace measures was developed. We first prepared an initial list based on relevant publications listing standard workplace measures against COVID-19 in

Japan.^{2,8,9} Subsequently, we developed the draft list in consultation with an expert panel on the basis of their practical experience. Finally, we selected nine prioritized items, and all authors approved the final list. The question assessing workplace measures was as follows: “Are any of the following measures against COVID-19 currently taken at your workplace?” For each measure listed, the response options were *yes* or *no*.

2.3 | Data analysis

The participants' demographic information is shown using counts and percentages. We compared the number and percentage for each of the nine workplace measures against COVID-19 by company size. Chi-square tests for trend were performed to calculate the *P*-values for trend for each workplace measure across company sizes. Post-hoc analyses according to job type were performed to evaluate the trend of company size for each workplace measure. Statistical significance was assessed at *P* < .05. Stata/SE 16.1 (StataCorp) was used for the statistical analysis.

3 | RESULTS

Of the 27 036 participants, approximately half were men (51.1%) and around half engaged in desk work (49.8%) (Table 1). Regarding company size, 22.8% of the participants worked at micro-scale companies, 16.2% worked at small-scale companies, 35.9% worked at medium-scale companies, and 25.1% worked at large-scale companies.

Table 2 displays the number and percentage of respondents reporting each workplace measure against COVID-19 by company size. For all company sizes, the most prevalent workplace measure was encouraging mask wearing at work, followed by requesting that employees refrain from going to work when ill and restricting work-related social gatherings and entertainment. These measures were implemented by approximately 90% of large-scale enterprises and by more than 40% of micro-scale enterprises. In contrast, encouraging remote working was implemented by less than half of large-scale enterprises and by around 20% of micro- and small-scale enterprises. There were statistically significant differences in all nine workplace measures across companies of different sizes (all *P* < .001).

Post hoc analyses showed that all nine workplace measures had statistically significant differences across companies of different sizes for each job type (all *P* < .001; see Supporting Information tables). Encouraging mask wearing at work was relatively prevalent among individuals whose work involved communicating with other people, especially in micro-scale enterprises (68.8% had work that involved

TABLE 1 Demographic characteristics of the participants

	n (%)
Sex	
Men	13 814 (51.1)
Women	13 222 (48.9)
Age (y)	
20-29	1905 (7.0)
30-39	4858 (18.0)
40-49	8011 (29.6)
50-59	9012 (33.2)
60-65	3250 (12.0)
Geographical region of workplace	
Hokkaido	695 (2.6)
Tohoku	2346 (8.7)
Kanto	6322 (23.3)
Chubu	4894 (18.1)
Kansai	3180 (11.8)
Chugoku and Shikoku	3379 (12.5)
Kyushu and Okinawa	2305 (8.5)
Unknown	3915 (14.5)
Job type	
Desk work	13 468 (49.8)
Work involving communicating with people	6927 (25.6)
Manual work	6641 (24.6)
Company size (number of employees)	
1-9	6165 (22.8)
10-49	4390 (16.2)
50-999	9703 (35.9)
≥1000	6778 (25.1)

communicating with other people, 46.1% had desk work, and 48.3% had manual work). In contrast, encouraging remote working was relatively prevalent among individuals with desk work, especially in large-scale enterprises (60.0% had desk work, 33.0% had work involving communication with other people, and 29.6% had manual work).

4 | DISCUSSION

The current study provides an overview of workplace measures against COVID-19 during the winter third wave in Japan, taking company size into account. We found that, especially in large-scale enterprises, various responses to COVID-19 had already been taken at workplaces, including encouraging mask wearing at work, requesting that employees refrain from going to work when ill, and restricting work-related social gatherings and entertainment. Our results are similar to those reported in a previous study on workplace

TABLE 2 Workplace measures against COVID-19 by company size

	Company size (number of employees)				P-value for trend
	1-9 n = 6165	10-49 n = 4390	50-999 n = 9703	≥1000 n = 6778	
Encouraging mask wearing at work, n (%)	3319 (53.8)	3303 (75.2)	8452 (87.1)	6149 (90.7)	<.001
Requesting that employees refrain from going to work when ill, n (%)	2972 (48.2)	3052 (69.5)	8103 (83.5)	6103 (90.0)	<.001
Restricting work-related social gatherings and entertainment, n (%)	2743 (44.5)	2838 (64.6)	7709 (79.4)	5924 (87.4)	<.001
Enforcing temperature measurement, n (%)	2068 (33.5)	2543 (57.9)	7308 (75.3)	5330 (78.6)	<.001
Installing partitions or changing the working environment (eg, desk layout or flow lines), n (%)	1908 (30.9)	2059 (46.9)	6457 (66.5)	5310 (78.3)	<.001
Restricting face-to-face meetings, n (%)	1835 (29.8)	1782 (40.6)	6036 (62.2)	5024 (74.1)	<.001
Stopping business trips, n (%)	1757 (28.5)	1836 (41.8)	6056 (62.4)	5011 (73.9)	<.001
Arranging health screenings for visitors, n (%)	1496 (24.3)	1498 (34.1)	5279 (54.4)	4026 (59.4)	<.001
Encouraging remote working, n (%)	1314 (21.3)	652 (14.9)	2556 (26.3)	3272 (48.3)	<.001

measures conducted in May 2020 (encouraging mask wearing at work: 94.2%; requesting that employees refrain from going to work when ill: 84.0%).⁶ These measures align with recommendations of the national campaign during the first state-of-emergency period, which included avoiding “the 3Cs” (closed spaces, crowded places, and close-contact settings).³ Thus, these types of workplace measures have been implemented since the early stage of the epidemic.

Another remarkable finding of this study is that smaller enterprises were less likely to have implemented workplace measures against COVID-19. The finding is consistent with previous studies conducted around the first state of emergency declaration.^{2,6} This finding therefore indicates that MSMEs did not make much progress in terms of measures against COVID-19 after the first state-of-emergency declaration. One possible reason for this lack of progress is that MSMEs often face difficulty in implementing occupational health activities because of a lack of financial, human capital, and technological resources.¹⁰ In Japan, the requirements for occupational health staff members depend on the number of employees in a workplace: ≥1000 employees—a full-time occupational physician, 50-999 employees—a part-time occupational physician, ≥50 employees—a health officer, and 10-49 employees—a health promoter.¹¹ Both health officers and health promoters are appointed by employees to implement occupational health activities in the workplace, but only health officers are licensed by the Director-General of the Prefectural Labour Bureau.¹¹ Therefore, the results of the present study may be attributed to the difference in occupational health staff members by company size. This finding suggests that occupational health support from external

resources is urgently needed for MSMEs. For example, the development of simple tools for infection prevention, mechanisms for external occupational health experts to offer advice, and financial support for workplace measures can be considered.

Some measures, especially remote working, had still not been implemented by the majority of companies—even large-scale enterprises. The implementation of remote working has not changed much, compared with the results of previous studies conducted around the first state of emergency period.^{2,4} The finding suggests potential obstacles for promoting remote working, such as cultural barriers and administrative difficulties.¹² Cultural barriers may exist for both employers and employees. For example, employers may excessively demand that work be carried out on site, while workers would be willing to work from office.¹³ Interestingly, the current study found that the frequency of encouraging remote work was lower in workplaces with 10-49 employees (14.9%) than in workplaces with nine or fewer employees (21.3%). We considered the possibility that administrative difficulties might be more likely to occur in small-scale enterprises than in micro-scale enterprises. However, remote working is effective not only during a pandemic but also during large earthquakes and other disasters.¹⁴ In terms of business continuity, future research is warranted on the further expansion of remote working, especially in small-scale enterprises.

This study has several limitations. First, the current study did not use random sampling or collect data from all companies. Consequently, the sample may not represent the national situation, and any generalization of the results should

be carried out with care. For example, there is a risk of overestimation if multiple study participants were from the same organization. To cope with these problems, the current study was conducted using cluster sampling with stratification by sex, region, and job type. Second, the current study did not evaluate all types of workplace measures; for instance, information dissemination and actions for confirmed COVID-19 cases were not considered. However, because we focused on preventive measures listed in guidelines and relevant publications in Japan,^{2,8,9} we believe that these items reflect the current situation of measures against COVID-19 at each company. Third, in the current study, we simply used univariate analysis and did not adjust for potential confounders, such as the type of industry. Therefore, the results should be carefully interpreted. We aimed to provide an overview of the current situation where people working in smaller-scale companies—which may have various biases such as industry, region, annual income, and educational background of staff—did not implement anti-COVID-19 measures in the workplace.

In conclusion, this study revealed the current situation regarding workplace measures against COVID-19 during the third wave of winter in Japan. We found that various responses to COVID-19 have been implemented at workplaces. However, some measures, including remote working, were still not well implemented, especially in relatively small enterprises. The findings suggest that occupational health support for MSMEs is urgently needed to mitigate the current wave of COVID-19.

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DISCLOSURE

Approval of the research protocol: This study was approved by the Ethics Committee of the University of Occupational and Environmental Health, Japan. *Informed consent:* Informed consent was obtained from all participants. *Registry and the registration no. of the study/trial:* N/A. *Animal studies:* N/A. *Conflict of interest:* N/A.

AUTHOR CONTRIBUTIONS

YF was the chairperson of the study group. TI conceived the research questions. All the authors designed the research protocol and developed the questionnaire. TI conducted the statistical analysis and drafted the initial manuscript with YF. All the authors revised and approved the final manuscript.

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section.

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