



## Association of a promotional campaign for local dining facilities with the occurrence of COVID-19 in Asahikawa City, Japan, in November 2021

Sakiko Tabata Kuribayashi<sup>a</sup>, Takuya Yamagishi<sup>b,\*</sup>, Naoki Suzuki<sup>c</sup>, Go Asari<sup>c</sup>, Rieko Abo<sup>c</sup>, Harumi Yamamoto<sup>c</sup>, Kazunori Yasutomi<sup>c</sup>, Tsukasa Ohara<sup>d</sup>, Yasuko Tachibana<sup>d</sup>, Tomoe Shimada<sup>e</sup>, Tomimasa Sunagawa<sup>e</sup>

<sup>a</sup> Field Epidemiology Training Program, National Institute of Infectious Diseases, Tokyo, Japan

<sup>b</sup> Antimicrobial Resistance Research Center, National Institute of Infectious Diseases, Tokyo, Japan

<sup>c</sup> Asahikawa City Public Health Office, Hokkaido, Japan

<sup>d</sup> Hokkaido Government Department of Health and Welfare, Hokkaido, Japan

<sup>e</sup> Center for Field Epidemiology Intelligence, Research, and Professional Development, National Institute of Infectious Diseases, Tokyo, Japan

### ARTICLE INFO

#### Keywords:

COVID-19  
Food industry  
Promotion campaign

### ABSTRACT

**Objectives:** As social restrictions of COVID-19 are being eased worldwide, preventing SARS-CoV-2 transmission among staff members and customers in dining facilities is essential to continuously running business because restaurants and bars are high-risk locations for COVID-19 outbreaks. In 2021, COVID-19 outbreaks occurred at restaurants or bars in Asahikawa city, Japan two weeks after the launch of a promotional campaign for local dining facilities. We investigated this event to assess the association between the promotional campaign and the occurrence of SARS-CoV-2 infection.

**Study design:** Cohort study.

**Methods:** We assessed the association between the occurrence of COVID-19 cases in the restaurants and bars and their participation in the campaign by calculating risk ratio and 95% confidence interval.

**Results:** Cases were identified among workers or customers in 4.0% (4/101) of the participating restaurants or bars and in 1.2% (39/3257) of the non-participating restaurants or bars. The risk ratio was 3.3 (95% confidence interval 1.2–9.0).

**Conclusion:** The association between the occurrence of SARS-CoV-2 infection in the restaurants or bars and participation in the campaign is undeniable. Promotional campaigns to vitalize dining facilities should be accompanied by enhanced infection prevention measures, especially ventilation.

### 1. Introduction

As social restrictions of COVID-19 are being eased worldwide, preventing SARS-CoV-2 transmission among staff members and customers is essential to continuously running a business in the restaurant industry because restaurants and bars are high-risk locations for COVID-19 outbreaks [1–3]. In October 2021, the incidence of COVID-19 was low after the wave of B.1.617.2 (Delta) variant in Asahikawa city, Hokkaido, Japan. This city boasted a total of 3358 restaurants and bars, with approximately 1000 of them situated in the downtown area. On October 16, 101 restaurants and bars in the area launched a promotional campaign that offered discounts or gifts to customers who visited two or more of participating restaurants and bars during the campaign period. Two weeks after the start of this campaign, COVID-19 outbreaks were

reported among the customers and workers of multiple dining facilities in the city. The campaign was subsequently canceled on November 6, and a public appeal was made for vaccination and a temporary free-testing site was set up. In this study, we aimed to assess the association between participation in the promotional campaign and the occurrence of SARS-CoV-2 infection.

### 2. Methods

A case was defined as an individual who tested positive for SARS-CoV-2 by antigen test or RT-PCR between October 6 and November 24, 2021, and who was either a worker or customer of restaurants or bars in Asahikawa city. We conducted a review of the epidemiological investigation records of COVID-19 patients reported by medical

\* Corresponding author. Antimicrobial Resistance Research Center, National Institute of Infectious Disease, 1-23-1 Toyama, Shinjuku, Tokyo, 162-8640, Japan.

facilities or the free testing site to the Asahikawa public health center. We identified the patients and collected their information such as sex, age, vaccination history, occupation, and name of the restaurant or bar they visited or worked at. Additionally, we obtained a list of the restaurants and bars participating in the promotional campaign along with the total number of restaurants and bars in the entire city from the Asahikawa city and Hokkaido prefectural government.

The Asahikawa city public health center selected three dining facilities in the downtown area, with which they had personal communication and which agreed to accept our visits. We visited these facilities before their opening hours to assess their size, structure, and air ventilation measures, including windows, doors, and built-in systems. We conducted interviews with facility employees regarding the infection prevention (IP) measures implemented and the compliance of employees and customers.

The risk for having one or more cases was separately calculated for the entire set of restaurants and bars, participating restaurants and bars, and non-participating restaurants and bars, using the following formula: (number of restaurants and bars with one or more cases)/(total number of restaurants and bars in the city). To evaluate the association of having cases with participation in the campaign by the restaurants and bars, we calculated the risk ratio and 95% confidence interval.

This report was exempt from the requirement for institutional ethics review as the entire activity was conducted as part of public health responses under Japan's Infectious Disease Control Law, and informed consent was not obtained from the study population.

### 3. Results

During the study period, 157 patients with SARS-CoV-2 were reported in the entire city, of whom 76 met the case definition. The median age of the patients was 39 years (interquartile range [28–44], 19–68 years), and 43 patients (57%) were male. Forty-seven of the patients (62%) were workers in the restaurants or bars, and 29 (38%) were customers. Four patients were working at healthcare facilities or nursing care homes, which resulted in secondary infection and a significant number of close contacts in each workplace. Only 11 patients (15%) had been vaccinated with two doses until two weeks before symptom onset among the symptomatic cases or sampling day among the asymptomatic cases. The outbreak started at a bar that workers at other dining facilities often visited after their own opening hours, resulting in 10 cases including two in staff and eight in customers. Seven of these eight customers were employees at other restaurants or bars, and they also triggered outbreaks in their own workplaces.

Forty-three restaurants or bars (4 participating/39 non-participating) were used by the identified patients during their incubation period. The risk of participating restaurants or bars having one or more cases was 4.0% (4/101 restaurants), with the median number of cases per facility being 1 (range, 1–2). That of non-participating restaurants or bars was 1.2% (39/3257), with the median number of cases per facility also being 1 (range, 1–10). The risk ratio of having one or more cases was 3.3 (Table 1).

As is typical for downtown restaurants and bars in Japan, the three bars we observed were situated in multi-tenant buildings that lacked windows or had a poor ventilation system. Prior to entering these establishments, both customers and workers underwent body temperature checks, and hand hygiene was requested with the use of alcohol sanitizers.

**Table 1**

Number of restaurants and bars by participation in the campaign in Asahikawa city and risk of occurrence of COVID-19.

Promotional campaign	Total number in city	Occurrence of COVID-19 cases	Risk of occurrence of COVID-19 cases	Risk ratio	95% confidence interval
Non-participating restaurants/bars	3257	39	1.2%	reference	
Participating restaurants/bars	101	4	4.0%	3.3	1.2–9.0
Total	3358	43			

### 4. Discussion

We assessed the risk for the occurrence of COVID-19 cases at restaurants or bars after a promotional campaign that was held in Asahikawa City, Hokkaido, Japan during the low epidemic period of COVID-19 in November 2021, and revealed the possible contribution of the campaign to COVID-19 outbreaks in the city.

Based on a relative risk greater than 1, the association between participation in the campaign and the occurrence of SARS-CoV-2 infection in the restaurants or bars appears undeniable. Previous studies analyzing the association between the “Eat-Out-to-Help-Out” campaign and new COVID-19 clusters in the United Kingdom also suggested that such a campaign may significantly worsen progression of the pandemic [4,5]. Two components influence the occurrence of SARS-CoV-2 infection in restaurants or bars: the risk of virus introduction into the restaurants or bars and the risk of transmission thereafter, although it is difficult to distinguish between them. The former may be affected by the prevalence of SARS-CoV-2 infection in the local community, the number of visitors, and their background characteristics, whereas the latter may be affected by transmissibility of the virus, risk behavior of the visitors, and environmental factors of the restaurants or bars. A promotional campaign is likely to have an influence on the increasing risk of the introduction of SARS-CoV-2 among staff members or customers due to frequent customer visits while decreasing the risk of transmission among them by ensuring basic IP measures. Also, previous studies from Japan revealed that the participants of promotional campaigns for dining were more likely to be extroverts and to exhibit risky behaviors for infection [6]. When local governments launch campaigns to promote dining at indoor restaurants or bars, which are at high risk for COVID-19 outbreaks [1], it is prudent to implement rigorous IP measures including intensive health checks in advance.

The absolute risk of occurrence of COVID-19 was low both in the participating and non-participating restaurants or bars. Hokkaido prefecture and Asahikawa city had established a certification program for the dining facilities to prove the quality of their IP measures and offered some financial support for the certified facilities in late September 2021. To obtain this certification, the facilities needed to implement recommended IP measures [7–9]. These included proper wearing of face masks for both workers and customers when not actively eating or drinking, health monitoring of staff, frequent ventilation, promoting hand hygiene and environmental disinfection, keeping physical distance, and capacity restriction in addition to vaccination. This program might have contributed to their low absolute risk for COVID-19 occurrence although we cannot precisely assess this effect of the certification program.

Nursing home workers ended up causing secondary infection in their workplaces in which a population at high risk for severe COVID-19 exists. A COVID-19 outbreak in a nursing home can result in devastating outcomes: death or severe illness for the residents, financial burden on the facilities, and social and emotional distress for the residents, care workers, and their families [10]. To prevent these problems, we need not only to strengthen the response capacity of nursing homes but also keep the prevalence and incidence of COVID-19 low in the local community.

Our study has several limitations. First, the number of COVID-19 cases might be underestimated because it was difficult to identify other customers who used the facilities at the same time as the reported cases unless they also tested positive with symptoms. Second, we could not obtain detailed information on the behavior of the workers and

customers in the facilities, which made it challenging to distinguish between exposure at the restaurants and bars and potential exposure elsewhere, nor could we compare behaviors between participating restaurants and non-participating ones. Third, our results should be carefully applied to the current situation as SARS-CoV-2 variants and vaccine coverage have changed since this outbreak.

## 5. Conclusions

A promotional campaign to facilitate customer visits to restaurants or bars can potentially affect the occurrence of SARS-CoV-2 in the community. When local governments plan such campaigns to revitalize the local economy, they should be accompanied by appropriate IP measures to protect vulnerable populations in the community.

### What this study adds

- The association between the occurrence of SARS-CoV-2 infection in the restaurants or bars and participation in the campaign was undeniable.

### Implications for policy and practice

- Preventing SARS-CoV-2 transmission in dining facilities is essential to continuously running a business.

### Funding source

This work was supported by the Grants from the Ministry of Health, Labour and Welfare, Japan [grant number 21HA2013, 23HA1004].

### Ethic approval

This report was exempt from the requirement for institutional ethics review as the entire activity was conducted as part of public health responses under Japan's Infectious Disease Control Law, and informed consent was not obtained from the study population.

## Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

## References

- [1] N. Zhang, X. Chen, W. Jia, et al., Evidence for lack of transmission by close contact and surface touch in a restaurant outbreak of COVID-19, *J. Infect.* 83 (2) (2021) 207–216, <https://doi.org/10.1016/j.jinf.2021.05.030>.
- [2] Y. Chen, T. Aldridge, C. Ferraro, F.M. Khaw, COVID-19 outbreak rates and infection attack rates associated with the workplace: a descriptive epidemiological study, *BMJ Open* 12 (7) (2022), e55643, <https://doi.org/10.1136/BMJOPEN-2021-055643>.
- [3] M. Nakashita, Y. Takagi, H. Tanaka, et al., Singing is a risk factor for severe acute respiratory syndrome Coronavirus 2 infection: a case-control study of karaoke-related Coronavirus disease 2019 outbreaks in 2 cities in Hokkaido, Japan, linked by whole genome analysis, *Open Forum Infect. Dis.* 9 (5) (2022) ofac158, <https://doi.org/10.1093/OFID/OFAC158>.
- [4] T. Fetzer, Subsidising the spread of COVID-19: evidence from the UK'S eat-out-to-help-out scheme, *Econ. J.* 132 (643) (2022) 1200–1217, <https://doi.org/10.1093/EJ/UEAB074>.
- [5] N. González-Pampillón, Nunez-Chaim, K. Ziegeler, Recovering from the first Covid-19 lockdown: economic impacts of the UK'S Eat Out to Help out scheme, Published, <https://cep.lse.ac.uk/pubs/download/cepcovid-19-018.pdf>, 2021. (Accessed 6 December 2022).
- [6] T. Okubo, Traveling and eating out during the COVID-19 pandemic: the Go to campaign policies in Japan, *Jpn. World Econ.* (2022), <https://doi.org/10.1016/j.japwor.2022.101157>. Published online.
- [7] L.F. Moriarty, M.M. Plucinski, B.J. Marston, et al., Public health responses to COVID-19 outbreaks on cruise ships — worldwide, February–March 2020, *MMWR Morb. Mortal. Wkly. Rep.* 69 (12) (2020) 347–352, <https://doi.org/10.15585/mmwr.mm6912e3>.
- [8] A. Christie, J.T. Brooks, L.A. Hicks, E.K. Sauber-Schatz, J.S. Yoder, M.A. Honein, CDC COVID-19 Response Team, Guidance for implementing COVID-19 prevention strategies in the context of varying community transmission levels and vaccination coverage, *MMWR Morb. Mortal. Wkly. Rep.* 70 (30) (2021) 1044–1047, <https://doi.org/10.15585/MMWR.MM7030E2>.
- [9] G.P. Guy Jr., G.M. Massetti, E. Sauber-Schatz, Mask mandates, on-premises dining, and COVID-19, *JAMA* 325 (21) (2021) 2199, <https://doi.org/10.1001/JAMA.2021.5455>.
- [10] J.G. Ouslander, D.C. Grabowski, COVID-19 in nursing homes: calming the perfect storm, *J. Am. Geriatr. Soc.* 68 (10) (2020) 2153–2162, <https://doi.org/10.1111/JGS.16784>.