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Letter to the Editor

Public health measures during COVID-19 pandemic reduced hospital admissions for community respiratory viral infections



Sir,

During the coronavirus disease 2019 (COVID-19) pandemic, Singapore implemented various measures to mitigate the transmission of the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). These included border controls, social distancing, community education, lockdown, and compulsory wearing of masks in public. We report that public health measures not only reduced SARS-CoV-2 transmission but that they also reduced transmission of endemic community respiratory viral infections.

The number of hospital admissions for respiratory viral infections since the beginning of the COVID-19 outbreak was compared with that of the preceding three years at Singapore General Hospital. All laboratory confirmed community onset (defined as a positive respiratory viral swab within 72 h of admission) respiratory viruses that were admitted to our hospital from January 1st, 2017 to July 1st, 2020 were studied. Patients with respiratory viral infections were confirmed using a 16-target respiratory viral polymerase chain reaction assay (respiratory syncytial virus A/B, influenza A/B, parainfluenza viruses 1–4, metapneumovirus, rhinovirus A/B/C, human coronavirus OC43/229E/NL63, adenovirus, human enterovirus, human bocavirus 1–4) on oropharyngeal specimens.

A significant decrease in hospital admissions was observed for both non-influenza respiratory viruses and influenza (Figure 1) from EW 7 onwards. Epidemiological weekly (EW) positive rates (positive swabs divided by total number of swabs) were compared. For non-influenza respiratory virus, the mean (\pm standard deviation) weekly positive rate from 2017 EW 1 to 2019 EW 52 was $16.2 \pm 3.9\%$. Comparatively, the mean weekly positive rate was 50% lower during EW 7–14, 2020 ($8.2 \pm 2.9\%$, $P < 0.001$), and 80% lower during EW 15–27, 2020 ($3.2 \pm 2.0\%$, $P < 0.001$). Influenza cases were also significantly lower. Mean weekly positive rates during EW 7–14, 2020, were 75–80% lower when compared individually to the same period in the preceding three years ($1.4 \pm 1.1\%$ vs $8.4 \pm 3.2\%$ in 2017, $8.1 \pm 3.1\%$ in 2018, and $5.6 \pm 2.7\%$ in 2019; $P < 0.001$). During the influenza season, instead of the usual rise in admissions,

our hospital experienced a decrease of $>90\%$ when again compared to the same period (EW 15–27) in the preceding three years ($0.6 \pm 0.4\%$ vs $18.6 \pm 6.6\%$ in 2017, $7.5 \pm 3.1\%$ in 2018, and $8.1 \pm 5.0\%$ in 2019; $P < 0.001$). Consequently, the number of intensive care unit admissions for respiratory viruses also decreased.

The implementation of public health measures to curb COVID-19 transmission had an unintended but beneficial consequence of reducing respiratory viral infection hospital admissions. Two other studies in Singapore had reported reduction in influenza cases as a consequence of COVID-19 public health measures, but both studies ended before the influenza season [1,2]. Our study reported the lowest rates in the past three years, even during the influenza season, strongly supporting the effectiveness of public health measures. This is consistent with national data which also reported the lowest ever influenza incidence in the community from EW 14 to EW 23 [3].

We demonstrated the chronological implementation of public health measures to match these measures with the decrease in weekly respiratory virus hospital admissions and we evaluated their individual effectiveness. The Global Influenza Programme had reported the effectiveness of various non-pharmaceutical measures to prevent influenza transmission [4]. In Singapore, the combination of public health measures effectively reduced community respiratory virus admissions. Unfortunately, it is difficult to accurately assess the effectiveness of each individual public health measure. Each sequential measure additively contributed to the reduction in respiratory viral admissions to our hospital. Our findings suggest that measures such as social distancing and public hygiene are indeed effective in reducing respiratory viral transmission, as demonstrated by the decrease in cases after EW 7. The lockdown helped to further halt transmission and reduce hospital admissions, though this would not be a feasible measure in the long run. The compulsory wearing of masks was implemented during the lockdown period (EW 15 onwards), and makes it difficult to assess the effectiveness of this measure alone in reducing transmission rates. However, when Singapore entered phase 2 of re-opening on June 19th (EW 25) and allowed social gatherings limited to five people while continuing to emphasize compulsory wearing of masks in public, the number of admissions remained low. As Singapore continues to re-open, allowing larger social gatherings, future studies will potentially be able to evaluate the true effectiveness of wearing face masks, as this measure is likely to continue.

Respiratory viruses will continue to circulate in the community and cause significant morbidity in at-risk populations [5]. Social distancing, though effective, may not be sustainable

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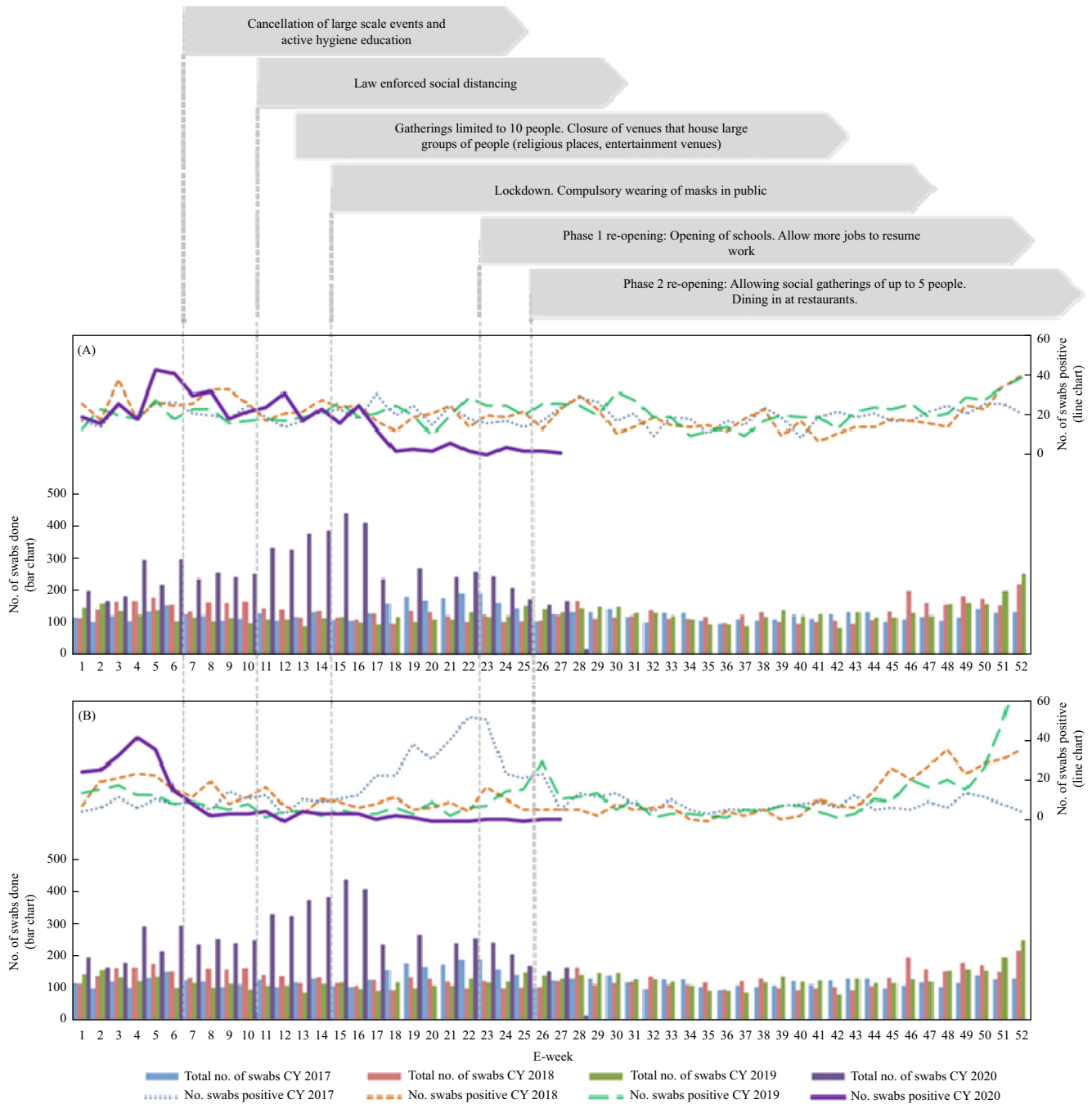


Figure 1. (A) Non-influenza respiratory virus cases and number of swabs done. (B) Influenza cases and number of swabs done.

as a long-term measure. Face masks, however, though of debateable effectiveness, are a simple and practical measure and can potentially help to reduce transmission rates. This has potential impact on current and future public health recommendations, especially for vulnerable groups such as the elderly, patients with chronic lung diseases, and the immunocompromised, who may suffer severe consequences from a run-of-the-mill respiratory viral infection.

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