

# Decreased human respiratory syncytial virus activity during COVID-19 pandemic in Japan associated with non-pharmaceutical measurement compared to pre-pandemic period



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## BACKGROUNDS

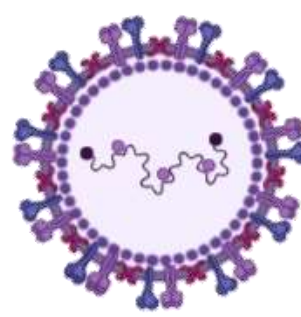
- ◆ Human respiratory syncytial virus (HRSV) activity was at very low level in 2020 in Japan.
- ◆ Non-pharmaceutical interventions (NPIs) such as sanitary measures and travel restrictions aimed against controls of coronavirus disease 2019 (COVID-19) may affect the transmission of HRSV.

## OBJECTIVES

- To compare HRSV activity in 2020 compared to the past 6 years from 2014 to 2019 in Japan.
- To evaluate association between the HRSV activity in 2020 and indicators for NPIs such as retails of hand hygiene, number of international and domestic airline passengers and meteorological conditions.

## METHODS

### 1. Data:



#### 1.1. National HRSV surveillance data

The weekly number of HRSV cases per sentinel site was extracted from the Infectious Disease Weekly Report (IDWR), sourced from the National Epidemiological Surveillance of Infectious Diseases (NESID) published by National Institute of Infectious Diseases (NIID) under the Ministry of Health, Welfare and Labour in Japan (MHLW) for epidemiologic weeks 1-53, in 2014-2020.

## METHODS

### 1.2. Travelers data



The monthly number of international and domestic passengers (per 1,000 peoples) were extracted from the statistics of air transport, Ministry of Land, Infrastructure, Transport and Tourism in Japan from Jan to Oct 2020.

### 1.3. Hygiene products



The monthly retails of hand hygiene (hand soap and ethyl alcohol) (billion) were extracted from the Statistics of Production of Chemical Industry of the Ministry of Economy and Industry in Japan from Jan to Nov 2020.

### 1.4. Meteorological data



The monthly mean temperature (°C) and relative humidity (%) were extracted from the Japan Meteorological Agency (JMA) from Jan to Dec 2020.

## 2. Statistical analysis:

### 2.1. Comparison analysis of the weekly HRSV activity

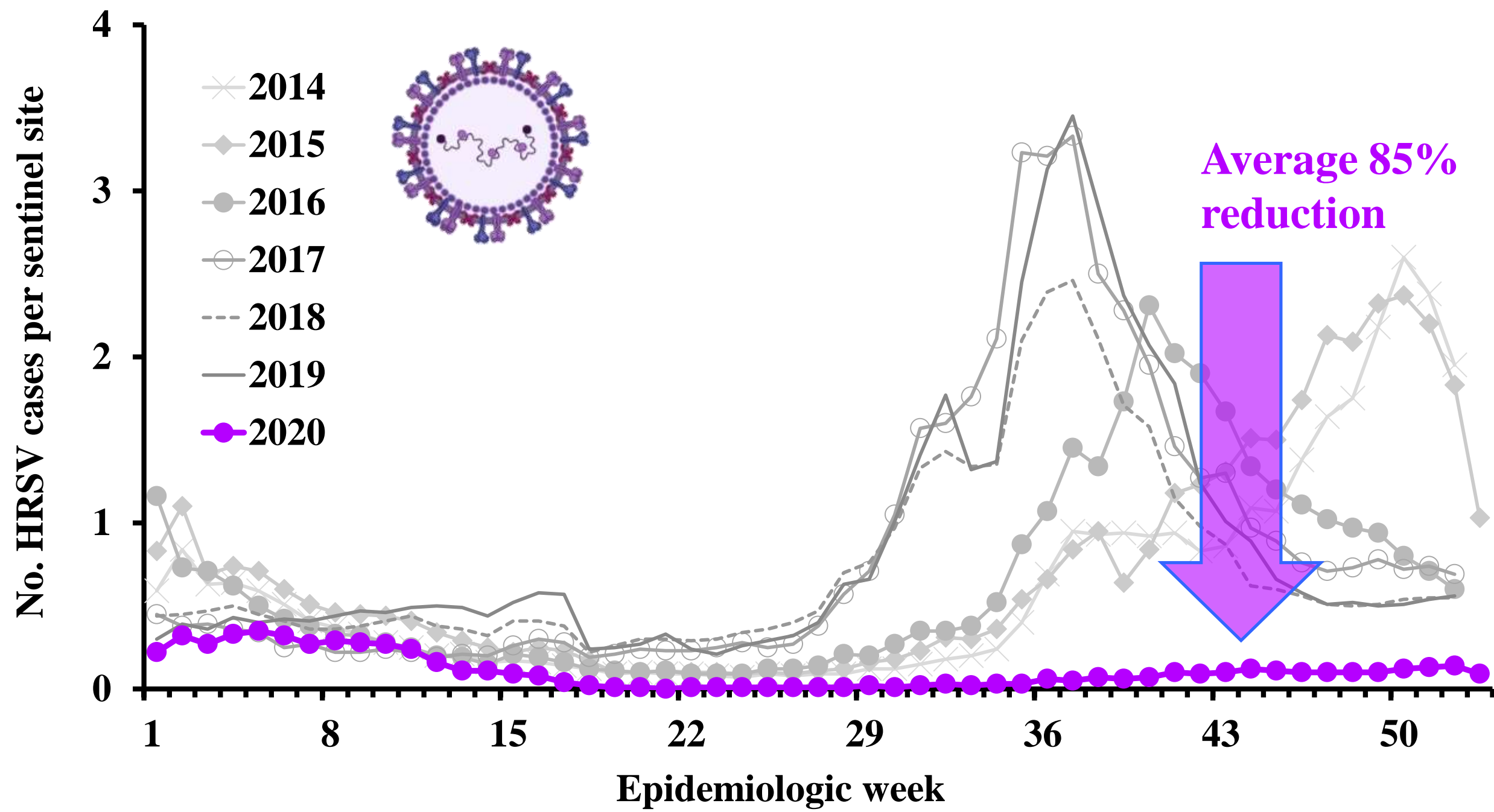
The weekly number of HRSV cases per sentinel sites for weeks 1-53 in 2020 was compared with the mean of the corresponding period in the previous 6 years (2014-2019) using a weekly paired difference *t*-test.

### 2.2. Correlation analysis between monthly HRSV activity and indicator of NPIs and meteorological conditions

For the correlation analysis, the weekly number of HRSV cases per sentinel sites was calculated on a monthly basis. Pearson's correlation coefficients between the monthly number of HRSV cases per sentinel site and retails of hand hygiene, number of international and domestic airline passengers and meteorological conditions between the corresponding periods in 2020 (see Figure 3).

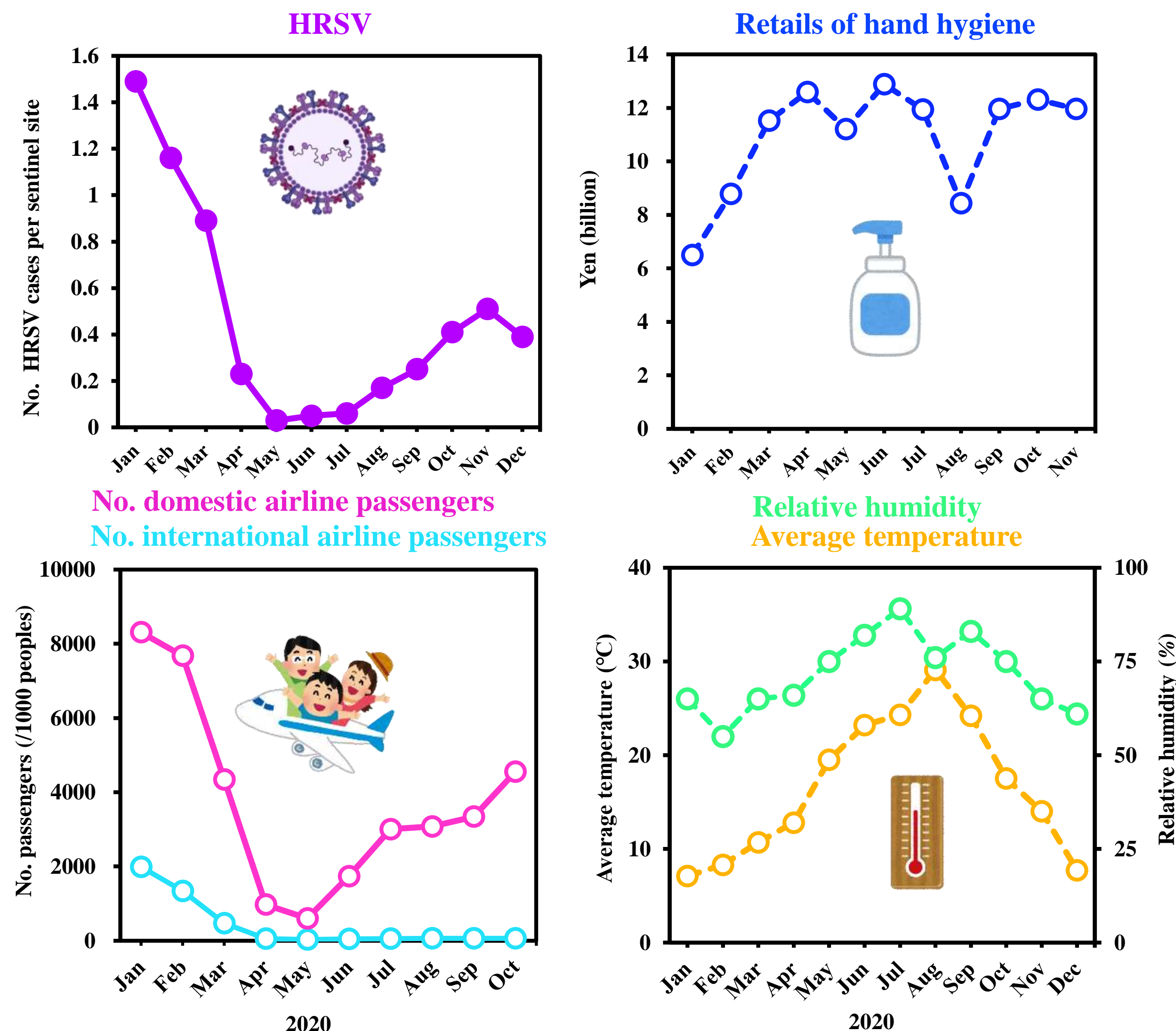
## RESULTS

Figure 1: Weekly HRSV activity based on national HRSV surveillance data, week 1, 2014 to week 53, 2020.



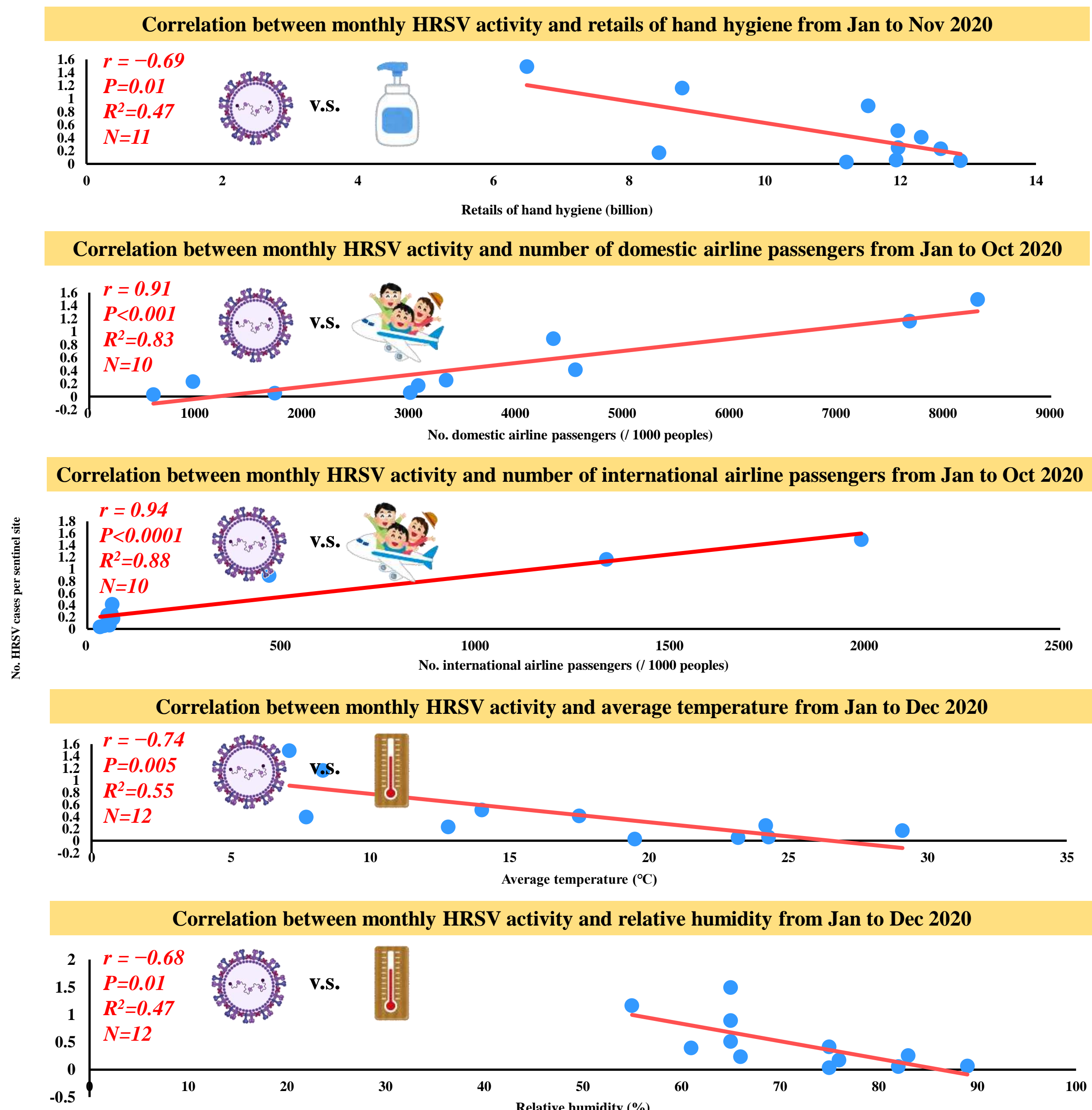
- The average number of HRSV cases per sentinel site for epidemiologic weeks 1–53 in 2020 decreased by almost 85% ( $P < 0.001$ ) compared to those in preceding 6 epidemiologic years from 2014 to 2019.

Figure 2: Monthly number of HRSV cases per sentinel site, retails of hand hygiene, number of international and domestic air passengers, and meteorological conditions in 2020.



## RESULTS

Figure 3: Correlation between the monthly number of HRSV cases per sentinel site (HRSV activity) and retails of hand hygiene, the number of international and domestic air passengers, and meteorological conditions between the corresponding periods in 2020.



## SUMMARY

- This study suggested possible association between decreased HRSV activity and sanitary measures / travel restrictions for COVID-19 in Japan, suggesting the NPIs can contribute to suppress HRSV activity.

## ACKNOWLEDGEMENTS

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