# Has the 'Go To Travel' Campaign Spread COVID-19 in Japan? Applicability of Analytics in Response to Global Crisis Management During the COVID-19 Pandemic

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#### Abstract

In the summer of 2020, the Japanese government carried out a new campaign called 'Go To Travel', which some believe has spread COVID-19 in Japan. This study examines the impact of the newly launched governmental campaign on the spread of COVID-19. Data for this study was collected from open data that is published daily by the Ministry of Health, Labour and Welfare, and the 41 days during the campaign period were compared with the 41 days that followed. The results show that the number of deaths due to COVID-19 did not change statistically, and it was determined that the Go To Travel Campaign could not be said to have spread the spread of COVID-19. Next, we propose a model for predicting the number of deaths that is created from the data from the Ministry of Health, Labour and Welfare from February 2020 to the end of February 2021. This model is straightforward, as it uses publicly available data from professional organisations. We believe that it can be used by medical institutions and many organisations like local governments.

Keywords: COVID-19, Go To Travel campaign, modelisation, multi-regression analysis

#### 1. Introduction

To stop the spread of COVID-19, on 7 April, the Japanese government first officially declared a state of emergency with measures like school closures, which have loosened day-to-day since 1 June 2021 (Table 1). Figure 1 demonstrates the trend of deaths of COVID-19 per day since 5 February 2020 to 28 February 2021.

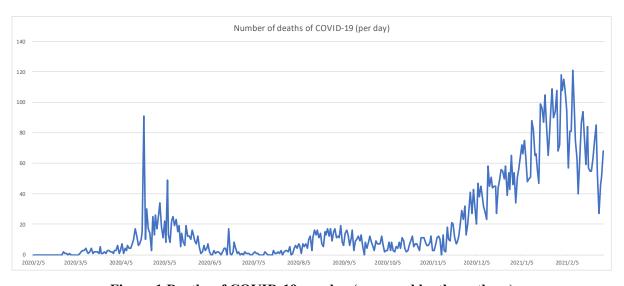


Figure 1 Deaths of COVID-19 per day (arranged by the authors)

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16-Apr   20-Apr   2				
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Solve of the content of the conten	4-M ay		1-M ay	The concept of "New Normal" begins to flow in the EU
PCR test insurance coverage started		The words "three dense" and "social distance" are popular	4-M ay	Italian government announces gradual relaxation of lockdown
Ministry of Health, Labor and Welfare approves remdesivir as a treatment	5-M ay	Governor Yoshimura of Osaka Prefecture announces "Osaka model" to judge		
Other than cancellation of leave request (specific earlier) prefectures   10-May   Frinch government announces mitigation of lockdown	7-M ay			
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Announcement of "gradual mitigation" government policy after full cancellation			11-May	French government announces relaxation of outing restrictions
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Many universities continue to be closed and distance classes are held   3-Jun   Italy lifts entry restrictions from EU	1-Jun			
18-Jun   Cancellation of self-restraint of movement across prefectures   17-Jun   Taiwan relaxes entry restrictions   19-Jun   Professional baseball unattended game started   19-Jun   Professional baseball unattended game started   19-Jun   Relaxed restrictions on holding events. Maximum of 5000 people such as   18-Jul   Relaxed restrictions on holding events. Maximum of 5000 people such as   18-Jul   Relaxed restrictions on holding events. Maximum of 5000 people such as   18-Jul   Relaxed restrictions on holding events. Maximum of 5000 people such as   18-Jul   Relaxed restrictions on holding events. Maximum of 5000 people such as   18-Jul   Relaxed restrictions on holding events. Maximum of 5000 people such as   18-Jul   Relaxed restrictions on holding events. Maximum of 5000 people such as   18-Jul   Relaxed restrictions on holding events. Maximum of 5000 people such as   18-Jul   Relaxed restrictions on holding events. Maximum of 5000 people such as   18-Jul   Relaxed restrictions on holding events. Maximum of 5000 people such as   18-Jul   Relaxed restrictions on holding events. Maximum of 5000 people such as   18-Jul   Relaxed restrictions on holding events. Maximum of 5000 people such as   18-Jul   Relaxed events of the people such as   18-Jul   Rel			3-Jun	Italy lifts entry restrictions from EU
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Table 1. COVID-19 Timeline (assorted by the authors)

However, from a legal perspective, Japan cannot enforce extreme policies like urban lockdowns, as was the case in other countries. However, most shops and the tourism industry cooperated in refraining from business – except for pharmacies and grocery stores – due to the peculiar qualities of Japanese people to willingly cooperate with the government. Likewise, the lockdown has particularly affected the travel industry, hotels and eateries. The government tried to increase demand for travel. The government aided travellers' transportation costs with an upper limit of 50% or 20,000 JPY (Japan Tourism Agency, 2020a).

The first 'Go To Travel' campaign (after this, 'Go To Travel') was held for 41 days from 22 July to 31 August 2020, which coincided with students' summer vacation period. According to the survey on travel accommodations that was released by the Japan Tourism Agency on 30 September 2020, the total number of overnight guests in August 2020 (the first preliminary report) was 26.28 million, which was a decrease of 58.4% from the same month in the previous year. Japanese tourists decreased by 51.5% (26.05 million people), and the number of foreign tourists decreased by 97.6% (230,000 people).

While international travel to Japan was almost completely cut off, domestic travel decreased by 47.9% in July (second bulletin), which was an improvement of 3.6 points from 21.35 million bookings, and the number of nights increased by 4.7 million. While international travel to Japan was almost completely cut off, domestic travel decreased Okinawa, which had the worst drops in May and June, decreased by 66.7% (1,089,410 people). In terms of people per night, Hokkaido dropped to 1,475,290 people per night, which was down 59.4%. Next, Osaka decreased by 75% (1,047,330 people), and Shizuoka decreased by 53.4% (959,560 people). Resort trips to Hokkaido and Okinawa were allowed in the Go To Travel campaign, and as such, people sought to travel to hot springs inns more, and it was even suggested that travellers should bring their children with them (Tourism Agency, 2020b).

However, as Figure 1 shows, although it has somewhat recovered in comparison to the catastrophic downturn in April and May, the effect seems limited.

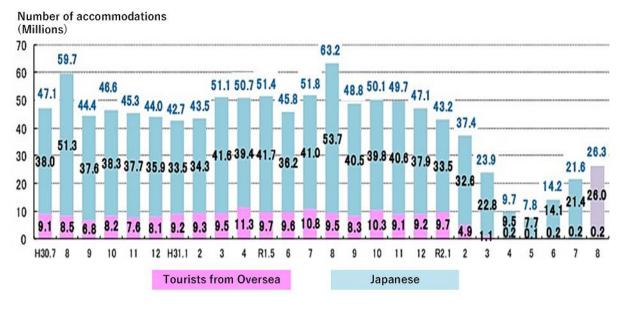


Figure 1. Changes in the total number of inbound and domestic tourists in Japan (adapted from Japan Tourism Agency, 2020b)<sup>1</sup>

Based on he preliminary discussion as above, this study examines the impact of the 'Go To Travel'

<sup>&</sup>lt;sup>1</sup> H30 indicates the year of Heisei 30, which is the year 2018. R1 indicates the year of Reiwa 1, which is the year 2019. Figure 1 demonstrates the statistic data of inbound tourists and domestic tourists from July 2018 to August 2020.

campaign on the spread of COVID-19, which Anzai and Nishiura (2021) discussed and confirmed in their study. However, our research indicates a different result that implies that this campaign has not significantly affected the spread of COVID-19 nor has it increased death rates.

## 2. Methodology

We will compare 41 days from 22 July to 31 August 2020 when 'Go To Travel' was implemented and 41 days from 1 September to 11 October. Five types of data will be used for comparison: 1) the number of PCR tests that were performed (single day), 2) the positive case numbers from the PCR tests (single day), 3) the number of hospitalisations (cumulative), 4) discharges number (cumulative) and 5) the number of deaths (cumulative): We used the exact number of deaths that was reported by each local government to the Ministry of Health, Labour and Welfare for statistical processing. Additionally, we used the data of temperature in Tokyo as potential indicators for Covid-19 influence (Goo weather, 2021). IBM SPSS Version 26 was used for statistical analysis.

# 3. Findings and Analysis

# 3.1 Scope of the Descriptive Analysis

Table 2 shows the data profile that was used for this analysis. Period 1 covers 41 days from 22 July to 31 August, and Period 2 covers 41 days from 1 September to 11 October. The number of positive cases from PCR tests was 41,814 and 20,800, respectively. Also, the total number of deaths was 306 and 322, respectively. The number of deaths per day in Period 1 and Period 2 were 7.46 and 7.85, respectively.

Perio ds	Days	Number of PCR positive	Total number of deaths	Number of deaths per day	Std. Dev.	Std. Error Mean
Period 1: 22 July to 31 August during Go To Travel	41	41,814	306	7.46	5.445	0.850
Period 2: 1 September to 11 October after Go To Travel	41	20,800	322	7.85	4.373	0.633

Table 2. Data in the Target Period

Next, we will test the data for these two periods using a t-test and discuss the impact of 'Go To Travel'.

								95% Confidence Interval of the Difference	
	F	Sig.	t	df	Sig. (2-tailed)	M ean Difference	Std. Error Difference	Lower	Upper
Number of deaths per day	5.307	0.024	-0.224	76.440	0.824	-0.244	1.091	-2.416	1.928

**Table 3. Target Period T-Test Results** 

As Table 3 demonstrates, the two-tailed significance value is 0.824, which means that there is not a significant difference between the two periods in terms of the number of deaths per day.

### 3.2 Regression Analysis

Although professional models for forecasting this pandemic like the SEIR model (Hokkaido University, 2020) may be accurate, the underlying data is only available to specialised institutions and cannot be cross-

examined by non-medical statisticians. Therefore, we will try to create a regression equation using open data that anyone can obtain and determine whether analysing feasible data in the pandemic era is useful for predicting the number of COVID-19 deaths. We propose a model for predicting the number of deaths that is created from the data from February 2020 to the end of February 2021, which was a period of 390 days and was disclosed by the Ministry of Health, Labour and Welfare. We use three variables: the daily number of positive cases using PCR tests, the cumulative number of patients and the lowest temperature in Tokyo. If the minimum temperature increases, the number of deaths is reduced, which leads to negative results.

Furthermore, the R square of the estimation formula here is remarkably high (adjusted R2 = 0.770), and the explanatory power of the data is sufficient. Also, ANOVA shows that the logic is robust (Table 5). Table 6 gives us the requisite data for predicting the model. From the analysis, the formula below is attained:

Number of deaths per day = 11.290 - 0.010 (Number of PCR positive) + 0.002 (Number of patients) - 0.588 (the lowest temperature)

		Adjusted R		Std. Error of the
Model	R	R Square	Square	Estimate
1	.878a	0.770	0.768	13.340

a. Predictors: (Constant), Lowest temperature, Number of PCR positive, Number of patients

**Table 4. Regression Model Summary** 

Model	Sum of Squares	df	Mean Square	F	Sig.	
Regression	230164.063	3	76721.354	431.103	.000b	
Residual	68694.614	386	177.965			
Total	298858.677	389				

a. Dependent Variable: Number of deaths per day

Table 5. ANOVA

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	В	Std. Error	Beta		
(Constant)	11.290	1.689		6.685	0.000
Number of PCR positive	-0.010	0.001	-0.524	-8.360	0.000
Number of patients	0.002	0.000	1.237	19.371	0.000
Lowest temperature	-0.588	0.092	-0.178	-6.367	0.000

a. Dependent Variable: Number of deaths per day

Table 6. Coefficients

# 4. Conclusion

#### 4.1 Overall discussion

The results of this study imply that the 'Go To Travel' campaign has not significantly influenced, has not significantly influenced or even increased the number of COVID-19 deaths. It also demonstrates that it is possible to estimate the number COVID-19 deaths using the raw data that is available the raw data that is made available from official sources with a regression model. In fact, at the citizen level, it is important for

b. Dependent Variable: Number of deaths per day

b. Predictors: (Constant), Lowest temperature, Number of PCR positive, Number of patients

people to heed warnings so that they can protect themselves in this brutal pandemic. Increased awareness of these issues is critical in the post-pandemic period as well. This research has discussed and presented on application analytics in response to global crisis management during the pandemic. As Oe et al. (2020) suggested, increasing awareness and preparedness of the crisis of pandemic especially for the public sectors in supporting vulnerable citizens is a critical topic. The outcome of this pilot study could be a useful reference for those stakeholders and researchers who are sustaining the safety net for the society in the era with COVID-19.

## 4.2 4.2 Limitation and further research opportunities

With respect to the influence of the Go To Travel campaign, we acknowledge that we need to enhance our analytical scope focusing on the fact that the number of deaths during two consecutive periods (during the Go To Travel campaign and after the campaign, each period spanning 41 days) should be re-examined and the dataset should be rearranged. In fact, given the time that passes between infection and death, some of the deaths registered during the second period (no campaign) might very well be the result of infections during (and hence possibly due to) the campaign. This should be accounted for in the future research.

Regarding the predictor for the number of deaths per day which was used in a regression analysis, it would be required for the researchers to examine if the predictor meant to predict the number of deaths on a given day, or if it predicts a mean over a given time span. From our preliminary analysis demonstrated in this paper, the number of deaths (a given day or in a given period) is correlated to the number of PCR positives in that same period, but we also need to analyse if the deaths would amount to infections that have occurred (and tested/diagnosed) well before that date. It is needed for the researchers to investigate into the facts and data so that we can produce a more robust implications with practical analysis framework for further discussion.

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