


## COMMENTARY

# Are less aggressive national lockdowns in COVID-19 associated with enhanced economic activity?

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## Background

During the coronavirus disease 2019 (COVID-19) pandemic caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), most countries introduced strong infection control measures such as nationwide lockdowns, but some prioritized economic activity over infection control assuming a trade-off between them. Actually, Japan focused on only finding clusters and tracing strategy without rigorous testing for the public, did not enforce a lockdown with penalties, and promoted domestic travel through “Go to Travel and Eat campaigns” to mitigate economic damage until the end of 2020. Also, Sweden did not close bars, restaurants, and other public spaces, and actively discouraged people from wearing face masks, which some experts described as a “herd immunity” strategy.

In this context, a previous study reported that stronger regulation indicated by the Oxford University’s Stringency Index is related to greater reductions in gross domestic product (GDP).<sup>1,2</sup> However, the subject of the study was 37 Organisation for Economic Co-operation and Development (OECD) countries plus China, which raises questions about comparability among them. Therefore, we compared infection control measures, infection status and economic damage of Japan and Sweden with only those of respective neighboring countries to evaluate whether lenient infection control measures have more economic advantage than otherwise.

## Methods

Among the OECD countries plus China, we selected countries in East Asia and Nordic region as subjects (i.e., Japan vs. South

Korea and China, and Sweden vs. Finland, Denmark, and Norway), considering the impact of industrial structure, race and virus strain type.

The Oxford University’s Stringency Index (SI) measures the strength of a country’s regulations, including school and workplace closures, and travel bans.<sup>2</sup> Consistent with the previous study,<sup>1</sup> we used the maximum value of SI during January–September, 2020, as an indicator of strictness of infection control measures.

The studied periods were the second (Q2) and third quarter (Q3) of 2020. For infection status, we calculated the number of deaths per 100 000 population, because it is less sensitive to differences in SARS-CoV-2 testing policies for asymptomatic individuals.<sup>3,4</sup> For economic damage, we used the percentage change of quarterly GDP from the same period in 2019.<sup>5</sup>

## Results

As shown in [Table 1](#), the maximum SI in Japan and Sweden were 47.2 and 46.3, respectively, the lowest in their regions. Japan and Sweden had the highest number of deaths during Q2 (0.7/100 000 and 51.3/100 000, respectively) and Q3 (0.5/100 000 and 3.0/100 000, respectively) in their regions. Notably, Japan’s GDP changes in Q2 and Q3 were –10.1 and –7.7%, the lowest in East Asia. For Sweden, the GDP changes in Q2 and Q3 were –7.7 and –2.8%, lower among the Nordic countries.

## Discussion

During the ongoing COVID-19 pandemic, Japan and Sweden did not tighten their infection control measures deliberately, and

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**Table 1.** Maximum stringency index, number of deaths, and GDP change in east Asia and Nordic region

Regions	Countries	Maximum Stringency Index <sup>a</sup>	Q2 2020		Q3 2020	
			Number of deaths (per 100,000 Population)	GDP change from Q2 2019 (%)	Number of deaths (per 100 000 population)	GDP Change from Q3 2019 (%)
East Asia	Japan	47.2	0.7	-10.3	0.5	-5.9
	South Korea	82.4	0.2	-2.8	0.3	-1.1
	China	81.9	0.1	3.2	0.01	4.9
Nordic Region	Sweden	46.3	51.3	-7.4	3.8	-2.7
	Denmark	72.2	9.1	-8.1	0.8	-4.0
	Norway	79.6	4.1	-4.6	0.5	-0.1
	Finland	67.6	5.7	-6.1	0.3	-2.8

<sup>a</sup>Maximum value of stringency index during January-September, Q2 = second quarter, Q3 = third quarter.

had the lowest maximum SI among the respective regions as well as among 37 OECD countries during the study period. Therefore, it is not surprising that both countries had the highest number of deaths per population in their regions. Nonetheless, no economic advantage was observed in the two countries compared to neighboring countries. Thus, our study indicates that the economic benefits of lenient infection control measures would not be worth enough as to offset the increase in the number of infections and deaths.

One of the most notable factors that should be considered concerning the economic damage is the public's fear of COVID-19. The self-perceived risk of contracting SARS-CoV-2 has been reported to affect public health-compliant behaviors.<sup>6</sup> For example, in a study in East Asia, the percentage of university students who perceived that they had a high probability of contracting SARS-CoV-2 was 77.3% in Japan, while only 33.1% in South Korea and 19.9% in China.<sup>7</sup> Furthermore, the rate of people who refrained from going out in Japan was 21.4% at maximum, which is higher than that in Korea (10.4%).<sup>8</sup>

Notably, in Sweden, the drop in consumer spending during the pandemic among 70 or older age groups was 44%, which was larger than among 18–59 age group (21–24%).<sup>9</sup> This suggests that the elderly preferentially refrain from economic activities due to fear of SARS-CoV-2 infection. Although such data in Japan is not available, the country has the most advanced aging population in East Asia, which might be responsible for the serious economic damage. Therefore, lenient infection control measures may have limited economic benefits in countries with aging populations like Japan and Sweden.

Meanwhile, China, with its draconian infection control measures kept the COVID-19 pandemic under control as of the end of 2020, and GDP is expected to expand by 7.9% by 2021.<sup>10</sup> This is in contrast to countries with relatively lenient infection control measures, such as Japan, the USA, and the UK, where infections are spreading again and regulations are being tightened in January, 2021. Although it is too early to be conclusive, it can be expected at this point that strong infection control measures have greater long-term economic benefits.

Our study has several limitations. First, small sample size did not allow a detailed analysis of confounding factors. Second, the highest number of deaths in Japan might be attributed to the aging of the population. Third, the Swedish people have the lowest trust in the government among Nordic countries, which may have led the public to underestimate the government's public health interventions and refrain from economic activities.

Still, our study suggests that lenient infection control measures would not be justified by the economic benefit, and strict infection control should be implemented to aim economic growth.

**Conflict of interest:** Dr. Tanimoto reports personal fees from Medical Network Systems, MNES Inc. and Bionics Co., Ltd. Dr. Kami reports personal fees from SBI Biotech Co., Ltd. Dr. Ueda and Ms. Yamashita declares no competing interests.

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