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## Editorial

## Technological forecasting plays a key role in mitigating the pandemic



It is important to analyze the COVID-19 pandemic from the viewpoint of leadership, political intervention against science and public health policy, social and cultural differences, who are advising to leaders [1]. However, such an analysis is ambiguous and the pandemic must be analyzed in terms of scientific evidence. In order to assess policies or technologies, the number of daily deaths per population (million) due to COVID-19 can be used for scoring the performance of individual policies [2].

In this paper, we analyze the digital fence technology by scoring the performance of individual policies of twelve countries.

Isolation against COVID-19 plays an important role in mitigating pandemics, but has been rarely studied due to the small number of countries that have adopted it [3–5].

It is crucial to isolate asymptomatic, presymptomatic and reinfected carriers of the severe acute respiratory syndrome 2 (SARS-CoV-2) and to prevent contact with uninfected persons.

In other words, there is not only pharmacological technology, including vaccines, but also digital fence technology to mitigate and end pandemics.

Testing infected carriers with the digital technology is called a digital fence [3] using mandatory smartphone coronavirus apps which reveals the remarkable achievement for mitigating pandemics.

Identified infected carriers must face mandatory two-week quarantines. The more infected carriers are discovered and isolated from uninfected persons, the better performance the digital fence can achieve.

The effectiveness of the physical isolation policy using the digital fence can be observed in the following countries: Taiwan, China, New Zealand, South Korea, Australia, Iceland and Saudi Arabia. The strongest policy is called a robust digital fence.

Table 1 shows scores of twelve countries including Australia, China, France, Germany, Iceland, Israel, New Zealand, Saudi Arabia, South Korea, Taiwan, United Kingdom, and United States, as of June 26, 2021. In Table 1, digital fence's shows effectiveness in twelve countries.

## Discussions

Seven countries including China, New Zealand, Taiwan, Australia, South Korea, Iceland, and Saudi Arabia have been successfully mitigating the pandemic without vaccines. Five countries - Israel, Germany, France, the United States, and the United King-

**Table 1**  
Scoring twelve countries on COVID-19 as of June 26, 2021 score = deaths/population (millions).

Country	Deaths	Population	Score	Digital fence
China	4636	1439.32	3.2	Yes
New Zealand	26	4.82	5.4	Yes
Taiwan	623	23.82	26.2	Yes
Australia	910	25.5	35.7	Yes
South Korea	2013	51.27	39.3	Yes
Iceland	29	0.34	85.3	Yes
Saudi Arabia	7760	34.81	222.9	Yes
Israel	6429	8.66	742.4	Beginning yes/later no
Germany	90,761	83.78	1083.3	No
France	111,113	65.27	1702.4	No
United States	603,886	331	1824.4	No
United Kingdom	128,353	67.89	1890.6	No

dom - do not use digital fence technology, only use vaccination technology.

There are three types of digital fences: a robust digital fence (mandatory Apps), a leaky digital fence (voluntary Apps), no digital fence. The more robust digital fence, the better score can be observed in digital fence countries.

Israel has utilized the surveillance technologies of the Israel Security Agency (ISA) to trace patients and those with whom they came into contact during the period from mid-March 2020 to early June 2020 [3]. However, in response to a ruling by the Israeli Supreme Court requiring the ISA activities to be defined in legislation and public criticism over privacy concerns, the government announced on June 8, 2020, that it would no longer utilize ISA surveillance for tracing COVID-19 patients [3].

Israel was the first country to be vaccinated, but it has not been able to completely mitigate the pandemic as of April 23, 2021. As of June 26, about 57 percent of the country's population has already been given two shots of COVID-19 vaccine. The total number of deaths in Israel is 6429. The score of Israel is 742.4.

However, according to New York Times, Israel, a world leader in vaccinations, faces a New Outbreak [6]. This means that vaccination alone cannot end the pandemic. According to the result of Israel, vaccines alone cannot end the pandemic while a robust digital fence is needed for mitigating and ending the pandemic.

Saudi Arabia has a population of 35.25 million and the number of deaths due to the COVID-19 is 7760. The score is 222.9, not too good, but not bad either. Because Saudi Arabia has been using a voluntary digital fence instead of a mandatory robust digital fence.

The effectiveness of the leaky digital fence is weaker than that of other digital fence countries.

Physicians must understand the digital fence with/without vaccine for mitigating the pandemic, in addition to about transmission, diagnosis, and treatment of COVID-19.

Because of testing backlog amid largest outbreak and a shortage of COVID-19 vaccine, Taiwan is now struggling. In digital fence technology, the COVID-19 testing plays an important role in its effectiveness. Testing backlog degrades the digital fence performance.

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