

# Bridging the gap: International efforts and behavioral strategies to combat COVID-19 vaccine wastage

Yudai Kaneda<sup>1,\*</sup>, Mira Namba<sup>2</sup>, Rei Goto<sup>3</sup>, Kurenai Takebayashi<sup>4</sup>, Masaki Takebayashi<sup>5</sup>

<sup>1</sup> School of Medicine, Hokkaido University, Hokkaido, Japan;

<sup>2</sup> School of Medicine, Keio University, Tokyo, Japan;

<sup>3</sup> Graduate School of Economics, Keio University, Kanagawa, Japan;

<sup>4</sup> Aomori Prefectural Government, Aomori, Japan;

<sup>5</sup> School of Sociology, Aomori University, Aomori, Japan.

**Abstract:** Highlighted by the G7 Hiroshima Summit and evident in Japan's complex vaccination program, the issue of novel coronavirus disease 2019 (COVID-19) vaccine allocation and utilization, particularly the dilemma of minimizing vaccine wastage, extends beyond national concerns. Various global strategies, such as using behavioral science principles like 'nudges', have been implemented to tackle the problem. However, scientific evaluation and international collaboration are insufficient; thus, analyzing successful case studies and innovative methods is crucial to pave the way for future preparedness and resilient responses to emerging pandemics.

**Keywords:** Novel coronavirus disease 2019 (COVID-19), vaccine wastage, nudge, Japan, international collaboration

As discussed at the G7 Hiroshima Summit held in May 2023, the appropriate allocation and utilization of vaccines for novel coronavirus disease 2019 (COVID-19) remain international challenges (1). This issue was underscored when, as of March 2022, a surplus of 1.4 billion doses of vaccines was reported within the G7 countries, triggering a complex dilemma regarding the minimization of vaccine wastage. In response, several nations, including the United States, China, and Germany, embarked on concerted efforts to donate these surplus vaccines to developing countries (2). Japan also aligned itself with this mission, offering 1.24 million doses to Taiwan. However, a disconcerting minimum of 77.83 million doses of expired vaccines were reported to be discarded (3).

The situation in Japan adds a layer of complexity to this international concern. The vaccine program in the country was orchestrated by local governments, with the central government shouldering the financial responsibility for vaccine administration and waste disposal (4). This organizational structure led to local governments lacking sufficient incentives and accountability to curtail waste through monitoring cancellation rates or bolstering community vaccination rates. Further complicating matters, opposition from local governments resulted in vaccination rates being withheld from public view in 60% of prefectures on a municipality-specific basis. This lack of transparency may have contributed to a deceleration of the vaccination

process, as competitive elements were absent, and the perception of scrutiny by others was limited.

It is evident that minimizing vaccine wastage transcends national concerns and emerges as an issue of paramount importance on the international stage. Potential strategies for addressing these issues could incorporate "nudges", which are behavioral science principles such as "loss aversion" and "social comparison" (5). Specifically, reassigning the financial burden of vaccine wastage to local governments and disclosing cancellation and wastage data to incite competition among municipalities. These 'nudges' have been validated in healthcare, demonstrating that cognitive bias-based strategies can be instrumental toward ideal public health policies (5).

Indeed, these strategies were used globally during the COVID-19 pandemic. In places like Oregon, United States, vaccines were administered in areas with high foot traffic, ensuring prompt accessibility for interested individuals (6). Waitlists and real-time cancellation disclosures were established in countries such as Germany, South Korea, and France, with France taking the lead through the "Covidliste" initiative (7). However, the scientific evaluation of these strategies is insufficient. With COVID-19 vaccine demand waning, the assessment of these efforts must become a priority in international collaboration (8).

In Japan, where the switch to effective pandemic countermeasures proved difficult amid social turmoil

over three years (9), the lessons from these strategies are particularly resonant. As people are often strongly inclined to maintain the status quo, especially during exhausting periods (10), understanding the benefits and limitations of nudge methods on a daily basis can help prepare for future pandemics.

In conclusion, the experiences from COVID-19 vaccine distribution necessitate a comprehensive review, moving beyond medical solutions to include an evaluation of successful case studies, innovative behavioral strategies, and international collaboration. This multifaceted approach to understanding vaccine wastage could pave the way for future preparedness and foster more resilient responses to emerging pandemics.

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*\*Address correspondence to:*

Yudai Kaneda, School of Medicine, Hokkaido University, Kita15, Nishi7, Kita-ku, Sapporo, Hokkaido 0608638, Japan.  
E-mail: nature271828@gmail.com