

## FROM THE JOURNALS

Section Editors:

Soraya Azmi, MBBS, MPH, Beigene, California, USA; Agnes Benedict, MSc, MA, Evidera, Budapest, Hungary

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#### **Optimal Design of Population-Level Financial Incentives of Influenza Vaccination for the Elderly**

Mu Yue, Yi Wang, PhD, Chng Kiat Low, Joanne Su-yin Yoong, Alex R. Cook

Influenza (or the flu) is caused by 3 types of influenza virus. It is a rapidly evolving virus, causing 3 to 5 million severe cases per year and approximately 260,000 to 560,000 deaths per year.<sup>1</sup> The case fatality is highest among high-risk patients (ie, children, the elderly, and people with other comorbidities). It is a seasonal disease mostly occurring in the winter but can happen any time along the equator. Flu vaccines are developed twice a year to match the predicted mix of types of viruses for the coming season. Vaccination is recommended annually for the high-risk groups, but several countries recommend it to everyone. There are some countries where it is offered free of charge (United Kingdom), or at a relatively low cost.<sup>1</sup> However, uptake of the flu vaccination is variable.

In the United Kingdom, where a universal vaccine program for school children was introduced in 2013, a retrospective observational study of 500 primary care practices (~700,000 children) showed an increase in vaccination uptake from 2012–2013 to 2013–2014 in targeted children aged 2 to 3 years, both in children with a high-risk medical conditions (from 40.7% to 61.1%) and those without (from 1.0% to 43.0%).<sup>2</sup> According to the United Kingdom's official statistics on seasonal flu vaccines, the uptake among individuals over 65 years of age was 71.3% in 2018, and among those at high risk, 46.9%.<sup>3</sup> In Singapore (Yue et al),<sup>4</sup> the current uptake of the flu vaccine is around 15% among school children and 17% among the elderly, despite recommendations for vaccination from the local ministry of health. We review the article by Yue et al studying the impact of a financial incentives among the elderly in Singapore.

The authors invited 4000 individuals, who all participated in a population-

based health study and indicated they would be available for future studies. Participants were randomized into 4 groups. People in Group 1 received a survey regarding their thoughts about the flu vaccine (which was to be completed in 2 months), and a SGD \$10 (US \$6.90) shopping voucher (this served as the control group). In the 3 intervention groups, people were asked to fill in the survey and also to go for the vaccine (at their own cost, at SGD \$32 [US\$22.08]), in return for a small compensation of SGD \$10, \$20, or \$30 (US \$6.90, \$13.80, and \$20.69) in the form of shopping vouchers. The outcome measured was “participation within 2 months,” corresponding to returning the survey in Group 1 and returning both the survey and vaccination certificate dated within the study period. Letters returned from unknown addresses and those vaccinated within the previous 6 months were excluded from the denominator for calculating the participation.

Overall response was 9.3%, with highest in Group 1 (16.9%) and extremely low values in the 3 other groups (4.5%, 7.5, and 9.2%, respectively). Nevertheless, the increase in the total incentive from SGD \$10 to \$20 (US \$6.90, \$13.80) in shopping voucher value was statistically significant; further increase was not. However, in terms of trends, both males and females were more likely to participate if SGD \$30 (US \$20.69) was offered versus SGD \$10 (US \$6.90), while some other demographic factors mattered: Chinese elderly were more sensitive to incentives, as well as the nonworking elderly, and those over 75 years responded much more strongly to the incentives. The authors looked for the “optimal” financial incentive but considered the vaccine uptake as an external variable. Therefore, this is not a true optimization along multiple parameters. Their key finding is that considering transmission dynamics, an incentive between SGD \$10 and \$20 (US \$6.90 and \$13.90) minimizes the cost per completed vaccination from a health system perspective.

In terms of the survey results, of those who responded, vaccinations that took place in a general practitioner's office

or polyclinic were preferred by 85% of respondents; few preferred vaccinations in their own home or other options. Importantly, 76% perceived the vaccine as safe, but few people considered themselves being at risk of infection without the vaccine (35%).

Circumstances related to the flu vaccine are unique in Singapore in many ways: there is less seasonality due to its equatorial location, the funding of healthcare is based on medical savings account, and it is a developed yet small country. However, the topic of the paper is very important, especially considering the current COVID-19 virus pandemic. Flu is a potentially deadly disease among high-risk groups and that can put additional strain on the health system given the presence of COVID-19. Although a vaccine is available for the flu, the awareness of the severity of the disease and the uptake of the vaccine are very low. Direct financial incentives may have an important role in targeting the high-risk groups. However, more ideas will be needed to substantially increase the number of patients showing up for their annual flu shots. •

#### **References**

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