Incentives for COVID-19 vaccination

Lisa Flowers, Emory University
Saad Omer, Emory University
NT Brewer, The University of North Carolina at Chapel Hill
AM Buttenheim, University of Pennsylvania School of Nursing
CV Clinton, Mailman School of Public Health
MM Mello, Stanford University School of Medicine
RM Benjamin, Gulf States Health Policy Center
T Callaghan, Texas A&M University
A Caplan, NYU Grossman School of Medicine
RM Carpiano, University of California, Los Angeles

Only first 10 authors above; see publication for full author list.

Journal Title: The Lancet Regional Health - Americas
Volume: Volume 8, Number
Publisher: (publisher) | 2022-04-01
Type of Work: Article
Publisher DOI: 10.1016/j.lana.2022.100205
Permanent URL: https://pid.emory.edu/ark:/25593/vx6rc

Final published version: http://dx.doi.org/10.1016/j.lana.2022.100205
Accessed November 6, 2022 8:06 PM EST
Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.
As coronavirus disease-2019 (COVID-19) vaccine uptake plateaued in mid-2021, many countries began to experiment with incentives. The impact of the resulting patchwork of incentive programs is largely unknown. Rewards research on other health behaviors suggests that incentives for vaccination will be most effective when 3 criteria are met: (1) their receipt is certain, (2) they are delivered immediately, and (3) recipients value them (Table 1).1 Our commentary uses these criteria to highlight vaccination incentive programs most likely to have impact.

**Effectiveness of incentives**

The most promising incentive option is guaranteed cash payments, which meet all our criteria when

---

(Copyright © The Author(s), Published by Elsevier Ltd. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/))
implemented well. A systematic review of vaccine promotion interventions recommends guaranteed cash payments, with an estimate that they increase uptake of vaccines by 8%. A trial in Sweden found guaranteed payments provided by researchers increased COVID-19 vaccination uptake by 4%. In the United States (U.S.), North Carolina offered $25 incentives for adult vaccination or driving someone to get COVID-19 vaccine, a program that bolstered vaccine uptake. Guaranteed cash incentive programs elsewhere have included Ukraine and Serbia, though these programs’ impact has not been evaluated. Employers and insurers have also offered guaranteed cash payments, although these may be less effective because they are unlikely to be provided directly after vaccination.

Another promising option is guaranteed non-cash rewards, which may be the most common COVID-19 incentive globally. These rewards are available soon after vaccination, but the value people assign to them may vary substantially or not be enough to motivate the hesitant. For this reason, they may be less effective because they are unlikely to be provided directly after vaccination.

A less promising option is lotteries with cash prizes. Lottery incentives fail two of our criteria by being probabilistic rather than guaranteed and being awarded well after vaccination. People prefer sure things over gambles when receiving a benefit according to Prospect Theory. Lotteries can have some effect, however, if people overestimate their slim chances. In the U.S., Ohio offered a million-dollar lottery but evaluations have found null, mixed, or at best a small benefit early on. High-value lotteries in Canada, Latvia, and the Philippines have largely not been evaluated.

The least promising option is lotteries with non-cash prizes. These likely have the smallest impact of all the incentive options, given that they fail all our criteria. They have the weaknesses of cash lotteries as well as having a perceived value that varies considerably among members of the public. For example, Hong Kong’s lottery prizes of an apartment may have wide appeal but free motorcycles in the Philippines may not appeal to some residents.

Gaps in understanding of vaccination incentives include the optimal (1) amount; (2) recipient profile (e.g., people already open to vaccination); (3) behavior (e.g., childhood vaccination); and (4) setting (e.g., rural areas). Data are needed on intended and potential unintended consequences of vaccination incentives, and program design must balance projected impact, cost, equity, and other policy considerations.

### Additional policy considerations

Incentives preserve choice and thus may be more acceptable to the public than vaccine requirements. Cash incentives that reimburse for the time and effort to access COVID-19 vaccination can be productively framed as a benefit. Drawbacks of incentive programs include their cost and tradeoffs between fairness and cost control. Offering incentives to all those willing to be vaccinated promotes equity but expends resources on those who would have accepted vaccines without payment. Cash incentives so large they are coercive also raise equity concerns. Such payments may exploit financial insecurity in poor communities, with the risk of exploitation increasing with the incentive amount. Incentives may lead some people to express mistrust of vaccination, although this may be a justification by those already disinclined to vaccinate. Additionally, incentives prompt vaccination without changing what people fundamentally think about

*Table 1: Behavioral principles for effective vaccination incentives.*

<table>
<thead>
<tr>
<th>Incentive Type</th>
<th>Guaranteed cash payment</th>
<th>Guaranteed non-cash reward</th>
<th>Lottery with cash prize</th>
<th>Lottery with non-cash prize</th>
</tr>
</thead>
<tbody>
<tr>
<td>Example</td>
<td>$25 payment</td>
<td>T-shirt</td>
<td>Chance to win $1 million</td>
<td>Chance to win a truck</td>
</tr>
<tr>
<td>Principles</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Receipt is certain</td>
<td>●</td>
<td>●</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Delivered immediately</td>
<td>●</td>
<td>●</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Valued by recipient</td>
<td>●</td>
<td>○</td>
<td>●</td>
<td>○</td>
</tr>
<tr>
<td>Likely impact</td>
<td>●</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

*● = Stronger if program is implemented well; ○ = Moderate; ○ = Weaker.*
vaccination or social norms according to the Increasing Vaccination Model, and thus their behavioral impact likely wanes when discontinued. Finally, participants must know about incentives for them to increase vaccination uptake, but programs often did not publicize incentives due a lack of budget.

Conclusion
As countries plan promotions for COVID-19 vaccine boosters, well-designed and well-publicized incentive programs can support efforts to achieve coverage globally. However, the speed required to develop and implement COVID-19 vaccine programs has meant that many incentive schemes are ad hoc and remain unevaluated. Incentives based on guaranteed cash payments have the best chance of increasing vaccine uptake when compared to others, especially lotteries with non-cash incentives.

Contributors
Noel T. Brewer wrote the first draft of the manuscript. All authors participated in revising the draft manuscript for critical intellectual content. All authors had full access to the information described in the manuscript.

Funding
No funding to disclose.

Declaration of interests
The Lancet Commission on Vaccine Refusal, Acceptance, and Demand in the USA is co-hosted by the Yale Institute for Global Health and the Baylor College of Medicine. The Commissioners are Saad B Omer, Regina M Benjamin, Noel T Brewer, Alison M Buttenheim, Timothy Callaghan, Arthur Caplan, Richard M Carpiano, Chelsea Clinton, Renee DiResta, Jad A Elhak-ke, Lisa C Flowers, Alison P Galvani, Rekha Lakshmanan, Yvonne A Maldonado, Michelle M Mello, Douglas J Opel, Daniel A Salmon, Jason L Schwartz, Joshua M Shaf-stein, and Peter J Hotez.

PJH is a developer of a COVID-19 vaccine construct, which was licensed by Baylor College of Medicine to Biological E Ltd, a commercial vaccine manufacturer for scale-up, production, testing and licensure. NTB reports personal fees from WHO, CDC, and Merck outside the submitted work. RMC reports receiving research grant funding from Novo Nordisk Foundation (Denmark), outside the submitted work. RL reports grants from Pfizer, GlaxoSmithKline, Sanofi Pasteur, and Merck and personal fees from BIO, outside the submitted work. YAM is a member of a Data Safety Monitoring Board for Pfizer and a site PI for a Pfizer vaccine trial, outside the submitted work. MRM reports personal fees from law firms representing retail pharmacies and generic drug companies that have sued other drug companies for antitrust law violations, outside the submitted work, and serves as an advisor to Verily Life Sciences LLC on an app designed to facilitate safe return to work and school during COVID-19. DJO reports grants from the U.S. National Institutes of Health, outside the submitted work. DAS reports grants from Merck and personal fees from Pfizer and Janssen, outside the submitted work. The other authors declare no competing interests.

References
2 CDC community guide to community preventive services. Downloaded 8/6/21.