

UCLA

UCLA Previously Published Works

Title

Financial Incentives for COVID-19 Vaccines Among People Experiencing Homelessness

Permalink

<https://escholarship.org/uc/item/7s88b8d8>

Journal

American Journal of Preventive Medicine, 65(1)

ISSN

0749-3797

Authors

Rosen, Allison D
Howerton, Isabelle
Brosnan, Hannah K
[et al.](#)

Publication Date

2023-07-01

DOI

10.1016/j.amepre.2023.01.020

Peer reviewed



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.

Financial Incentives for COVID-19 Vaccines Among People Experiencing Homelessness



Allison D. Rosen, PhD,^{1,2} Isabelle Howerton, MPH,¹ Hannah K. Brosnan, MPH,³
Andrei Stefanescu, PhD,^{3,4} Ayodele Gomih, PhD, MSPH,³ Cathy Ngo, MPH,³
Alicia H. Chang, MD, MS,^{3,5} Anh Nguyen, MD, MBA,¹ Emily H. Thomas, MD, MS¹

Introduction: Novel strategies are needed to address barriers to COVID-19 vaccination among people experiencing homelessness (PEH), a population that faces increased COVID-19 risk. Although growing evidence suggests that financial incentives for vaccination are acceptable to PEH, their impact on uptake is unknown. This study aimed to assess whether offering \$50 gift cards was associated with the uptake of the first doses of COVID-19 vaccine among PEH in Los Angeles County.

Methods: Vaccination clinics began on March 15, 2021; the financial incentive program was implemented from September 26, 2021 to April 30, 2022. Interrupted time-series analysis with quasi-Poisson regression was used to evaluate the level and slope change in the number of weekly first doses administered. Time-varying confounders included the weekly number of clinics and the weekly number of new cases. Demographic characteristics were compared for PEH vaccinated before and after the implementation of the incentive program using chi-square tests.

Results: Offering financial incentives was associated with the administration of 2.5 times (95% CI=1.8, 3.1) more first doses than would have been expected without the program. Level (−0.184, 95% CI= −1.166, −0.467) and slope change (0.042, 95% CI=0.031, 0.053) were observed. Individuals who were unsheltered, aged <55 years, and identified as Black or African American accounted for a higher percentage of those vaccinated during the post-intervention period than during the pre-intervention period.

Conclusions: Financial incentives may be an effective tool for increasing vaccine uptake among PEH, but important ethical considerations must be made to avoid coercion of vulnerable populations.

Am J Prev Med 2023;65(1):12–18. © 2023 American Journal of Preventive Medicine. Published by Elsevier Inc. All rights reserved.

INTRODUCTION

People experiencing homelessness (PEH) have been disproportionately affected by the coronavirus disease 2019 (COVID-19) pandemic. Limited access to risk mitigation practices such as masks, hand washing, and social distancing places PEH at increased risk of acquiring COVID-19.^{1,2} In Los Angeles (LA) County specifically, 21,935 COVID-19 cases and 363 deaths were recorded among the over 60,000 PEH countywide between February 2020 and October 2022.^{3,4} From March 1, 2020 to February 28, 2021, PEH

From the ¹Housing for Health, Los Angeles County Department of Health Services, Los Angeles, California; ²Department of Family Medicine, David Geffen School of Medicine, University of California Los Angeles, Los Angeles, California; ³Acute Communicable Disease Control, Los Angeles County Department of Public Health, Los Angeles, California; ⁴Gies College of Business, University of Illinois Urbana-Champaign, Champaign, Illinois; and ⁵Community and Field Services Division, Los Angeles County Department of Public Health, Los Angeles, California

Address correspondence to: Allison D. Rosen, PhD, Department of Family Medicine, David Geffen School of Medicine, University of California Los Angeles, 10880 Wilshire Boulevard Suite 1800, Los Angeles CA 90024. E-mail: a.rosen@ucla.edu.

0749-3797/\$36.00

<https://doi.org/10.1016/j.amepre.2023.01.020>

had a 20% higher mortality rate than the general population in LA County.⁵

When the unhoused population was last counted in LA County in early 2020, over 63,000 people were experiencing homelessness.⁴ Approximately 30% of PEH resided in homeless shelters, where crowded congregate living increases the likelihood of COVID-19 exposure and infection.^{2,4,6} The remaining 70% of PEH in LA County were unsheltered, meaning that they lived on the street, in makeshift shelters, in tents, or in vehicles, with especially limited access to hygiene and healthcare resources.^{4,6}

Despite high infection risk and frequent outbreaks among PEH, vaccine uptake remains relatively low in this population.⁷ Challenges in accessing traditional vaccination sites, mistrust in the healthcare system because of historic mistreatment and racism, and competing priorities to meet basic needs such as food and housing significantly contribute to lower vaccine uptake among PEH.^{8–10} Thus, novel strategies tailored to the unique barriers faced by PEH are needed to promote uptake and ensure equitable access to vaccination.

One such strategy is offering financial incentives for vaccination. The research team conducted a feasibility and acceptability study during the roll out of a financial incentive program for PEH in LA County; through open-ended conversations about vaccination with PEH, we found that being offered a \$50 gift card was the mostly commonly cited reason for being ready to get the COVID-19 vaccine; in addition, fewer than 2% of those who did not want to get vaccinated felt that the incentive was coercive.¹⁰ Findings from multiple qualitative studies also suggest that PEH are interested in incentives for COVID-19 testing and vaccination and that financial incentives can positively impact health and well-being by easing financial stress and enabling deeper attention to individual health needs.^{11–13}

Although growing evidence suggests that PEH find financial incentives to be acceptable, the extent to which financial incentives may translate to increasing COVID-19 vaccine uptake among PEH is unknown.¹⁴ An RCT in Sweden found that \$24 financial incentives increased vaccination rates by 4.2% in the general population, and a pilot program for the general population in North Carolina showed that providing a \$25 incentive for COVID-19 vaccination did not lead to an increase in uptake but did reduce the rate of decline in uptake that had been observed before implementation.^{15,16} Financial incentives were also associated with increased H1N1 influenza vaccine uptake among people living in homeless shelters in France and hepatitis B vaccine uptake among people who inject drugs.^{17,18} This study aimed to identify the

impact of a financial incentive program on COVID-19 vaccine first-dose uptake among PEH in LA County.

METHODS

Study Population

Housing for Health (HFH), a division of the LA County Department of Health Services, began holding COVID-19 vaccination clinics for PEH in LA County in February 2021.¹⁹ The program first offered the 2-dose Moderna vaccine and added the single-dose Johnson & Johnson vaccine when it became available in early April 2021; the 2-dose Pfizer vaccine was added in May 2021. Because it was difficult for PEH to access traditional vaccination centers, up to 90 clinics per week were held at homeless shelters, homeless services centers, encampments, parks, and other public spaces. Teams revisited clinic locations every 2–4 weeks to provide second and booster doses until saturation was reached, and they gave out prepaid cell phones so that they could contact clients about upcoming clinics. Clinics served PEH living in shelters as well as those who were unsheltered, meaning that they lived on the street, in makeshift shelters, in tents, or in vehicles. Over the course of HFH's vaccination program, the times of day, lengths, and geographic reach of clinics remained similar, but the number of clinics held per week changed as the size of outreach teams fluctuated.

In addition to offering vaccinations, teams of homeless services staff, community health workers, and clinicians provided PEH with COVID-19 education, masks, food, hygiene kits, harm reduction supplies, general health screenings, and referrals to healthcare providers such as federally qualified health centers and HFH's street medicine team. Clients had access to any resource or service regardless of whether they got vaccinated.

Measures

HFH began offering \$50 gift cards to PEH who received a first dose of Moderna, Pfizer, or Johnson & Johnson COVID-19 vaccine on September 26, 2021. Although not the focus of this analysis, HFH also offered \$25 gift cards for second, additional, and booster doses. The program launched at this time because HFH received additional funding to implement financial incentives; all PEH in LA County were eligible to receive a financial incentive regardless of immigration status. The amount of \$50 for the first doses was chosen on the basis of recommendations of key homeless services stakeholders in LA County and in alignment with the state of California's Vax for the Win program, which had provided \$50 gift cards through text or e-mail to Californians aged ≥12 years who got vaccinated in California between May 27, 2021 and July 18, 2021.²⁰ HFH's delivery of first doses of COVID-19 vaccine is contextualized in a timeline of the COVID-19 pandemic and vaccine roll out in [Figure 1](#).

This quasi-experimental study was conducted to determine whether implementation of the gift card program was associated with the number of COVID-19 vaccine first doses administered by HFH. This study was approved by the LA County Department of Public Health IRB.

The pre-intervention period was March 15, 2021 (when all unhoused adults became eligible for vaccination in LA County) until the financial incentive program was implemented on September 26, 2021. The post-intervention period began on

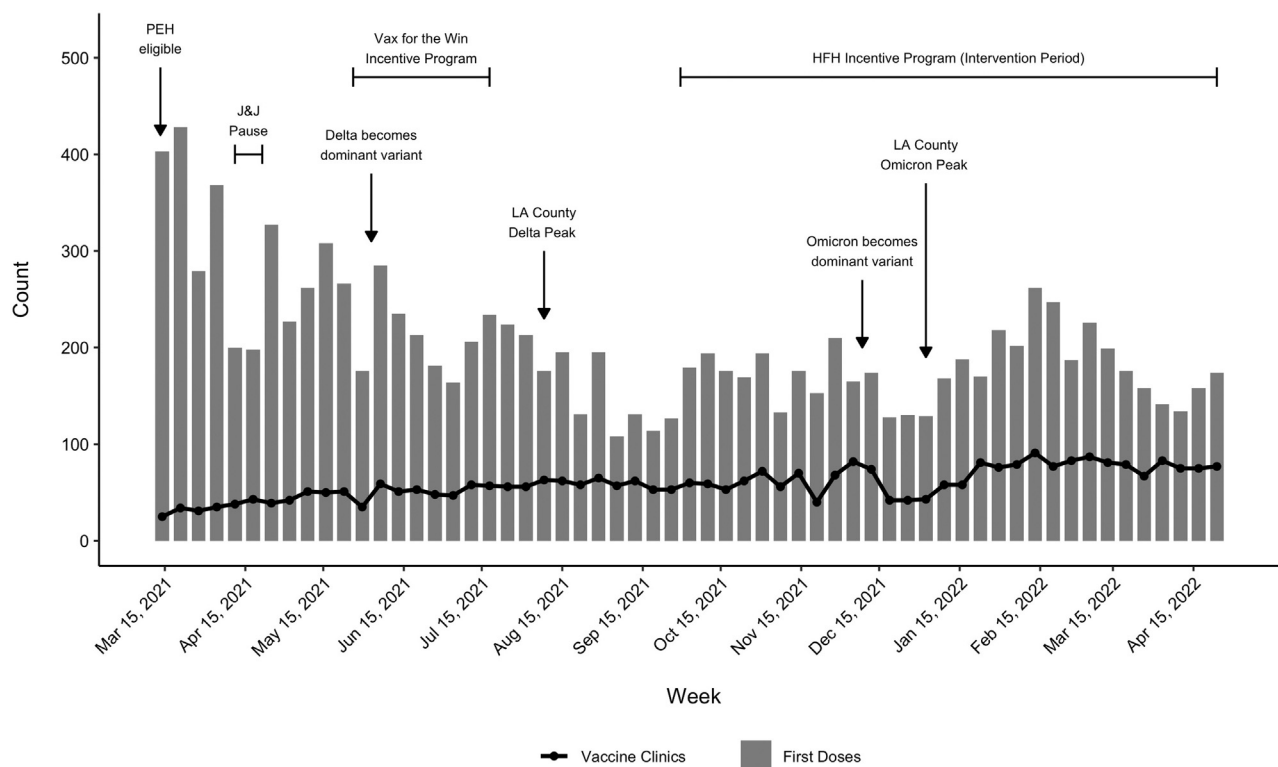


Figure 1. Weekly number of first doses of COVID-19 vaccine administered and vaccine clinics hosted by Housing for Health with relevant time points related to the COVID-19 pandemic and COVID-19 vaccination delivery, March 15, 2021–April 30, 2022.

Apr, April; Aug, August; Dec, December; Feb, February; HFH, Housing for Health; J&J, Johnson & Johnson; Jan, January; Jul, July; Jun, June; LA, Los Angeles; Mar, March; Nov, November; Oct, October; PEH, people experiencing homelessness; Sep, September.

September 26, 2021 and ended on April 30, 2022. The model outcome was the weekly number of first doses administered by HFH. Time-varying confounders included the number of clinics held by HFH each week and the number of new COVID-19 cases in LA County each week. The weekly case counts were sourced directly from the LA County Department of Public Health.

Statistical Analysis

Interrupted time series (ITS) analysis with a quasi-Poisson regression model was used to estimate changes in the number of first doses administered before and after the implementation of the financial incentive program. The model proposed both level and slope change and thus included a coefficient for the number of weeks since all PEH became eligible for vaccination, a coefficient indicating pre-intervention or post-intervention period, and an interaction term between time and the indicator of before or after the intervention.²¹ The data were tested for autocorrelation before fitting the model. Pre-intervention and post-intervention trends were plotted using loess smoothing.

The number of first doses HFH would have expected to administer had the financial incentive program not been implemented was calculated using the pre-intervention trend estimated by the model. This number was subtracted from the observed number of first doses administered after the implementation of the financial incentive program, resulting in an estimate of the number of

additional first doses administered owing to the financial incentive program. A 95% CI for this point estimate was generated using 1,000 bootstrap samples. The expected number of first doses administered was also divided by the observed number of first doses administered to compute a ratio, and a 95% CI for this point estimate was generated using 1,000 bootstrap samples.

Demographic characteristics were compared for PEH vaccinated before and after the implementation of the incentive program using chi-square tests. All analyses were conducted in July 2022 using R, Version 4.0.1, and a $p < 0.05$ was considered statistically significant.

RESULTS

Between March 15, 2021 and April 30, 2022, HFH administered 13,576 first doses of COVID-19 vaccine to PEH in LA County; 8,131 (59.9%) were administered during the pre-intervention period, and 5,445 (40.1%) were administered during the post-intervention period. During the 28-week pre-intervention period and the 31-week post-intervention period, the median number of first doses administered per week were 213 (IQR=180–269) and 174 (IQR=156–194), respectively. Implementation of the financial incentive program was

Table 1. Interrupted Time Series Quasi-Poisson Regression Model Results

Coefficient	Estimate (95% CI)	p-value
Intercept	5.469 (5.24, 5.695)	<0.001
Weeks since PEH became eligible (pre-intervention trend)	-0.049 (-0.06, -0.038)	<0.001
Post-versus pre-intervention (level change)	-0.814 (-1.166, -0.467)	<0.001
Weeks x post versus pre (slope change)	0.042 (0.031, 0.053)	<0.001
Clinics per week	0.012 (0.006, 0.018)	<0.001
New cases per week	0.000 (0.000, 0.000)	0.54

Note: Boldface indicates statistical significance ($p < 0.05$). PEH, people experiencing homelessness.

associated with an immediate 40.9% increase in the number of first doses administered (127 first doses were administered the week before implementation, and 179 were administered the week after implementation) (Figure 1).

Results of the interrupted time series regression model are presented in Table 1 and Figure 2. Statistically significant level change ($p < 0.001$) and slope change ($p < 0.001$) were observed (Table 1). Relative to the pre-intervention trend, the post-intervention trend increased significantly, represented by the significant positive value of the interaction term in the model.

Had the financial incentive program not been implemented and the pre-intervention trend continued, HFH

would have expected to administer 2,168 first doses between September 26, 2021 and April 30, 2022. Subtracting the expected number of first doses from the 5,445 first doses actually administered reveals 3,277 (95% CI=2,434, 3,710) more first doses administered than would have been expected. Taken as a ratio, this amounts to 2.5 times (95% CI=1.8, 3.1) as many first doses administered as would have been expected.

First-dose uptake differed by shelter status at the time of the first dose, age group, and race/ethnicity before versus after the implementation of the financial incentive program (Table 2). Those who were unsheltered at the time of their first dose, were aged <55 years, and were identified as Black or African American accounted for a higher percentage of those vaccinated during the post-intervention period than during the pre-intervention period in their respective demographic categories.

DISCUSSION

This study found that providing financial incentives was associated with higher first-dose COVID-19 vaccine uptake among PEH in LA County. Offering \$50 gift cards was associated with an immediate increase in the weekly number of first doses administered, and this increase was sustained through the end of the program. The interrupted time series model estimated that the program led to 3,277 more—or 2.5 times as many—first doses administered than expected had the program not been implemented.

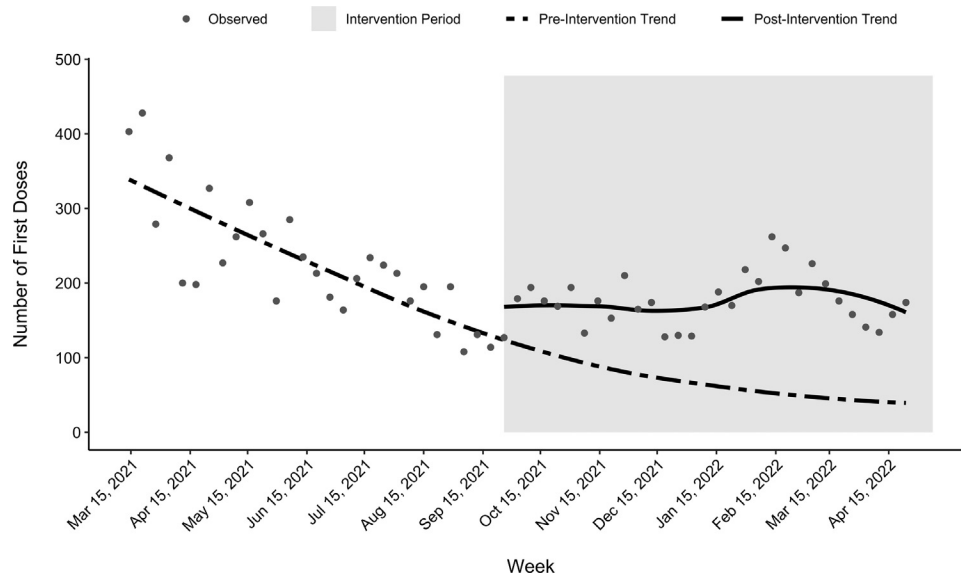


Figure 2. Weekly number of first doses of COVID-19 vaccine administered by Housing for Health, March 15, 2021–April 30, 2022. Apr, April; Aug, August; Dec, December; Feb, February; Jan, January; Jul, July; Jun, June; Mar, March; Nov, November; Oct, October; Sep, September.

Table 2. Characteristics of PEH Who Received a First Dose From HFH, March 2021–April 2022

Demographics	Total (N=13,576)	Pre-intervention (n=8,131)	Post-intervention (n=5,445)	p-value
Shelter status ^a				<0.001
Sheltered	4,446 (32.7)	3,210 (39.5)	1,236 (22.7)	
Unsheltered	9,130 (67.3)	4,921 (60.5)	4,209 (77.3)	
Age group (years)				<0.001
17 or younger	223 (1.6)	55 (0.7)	168 (3.1)	
18–24	509 (3.7)	252 (3.1)	257 (4.7)	
25–54	7,895 (58.2)	4,256 (52.3)	3,639 (66.8)	
55–61	2,322 (17.1)	1,518 (18.7)	804 (14.8)	
≥62	2,627 (19.4)	2,050 (25.2)	577 (10.6)	
Gender identity ^b				0.58
Male	9,134 (68.5)	5,493 (68.9)	3,641 (68)	
Female	4,122 (30.9)	2,441 (30.6)	1,681 (31.4)	
Transgender	67 (0.5)	37 (0.5)	30 (0.6)	
Genderqueer	10 (0.1)	7 (0.1)	3 (0.1)	
Race/ethnicity				<0.001
American Indian or Alaska Native, NH	252 (1.9)	133 (1.6)	119 (2.2)	
Asian, NH	251 (1.8)	187 (2.3)	64 (1.2)	
Black or African American, NH	3,758 (27.7)	2,109 (25.9)	1,649 (30.3)	
Hispanic/Latino	5,576 (41.1)	3,357 (41.3)	2,219 (40.8)	
NHOPI, NH	96 (0.7)	60 (0.7)	36 (0.7)	
Other	916 (6.7)	568 (7)	348 (6.4)	
White, NH	2,727 (20.1)	1,717 (21.1)	1,010 (18.5)	

Note: Boldface indicates statistical significance ($p < 0.05$).

^aShelter status was measured at the time of the first dose.

^bA total of 243 individuals declined to report gender identity.

HFH, Housing for Health; NH, non-Hispanic; NHOPI, Native Hawaiian or Other Pacific Islander; PEH, people experiencing homelessness.

In addition, descriptive analyses suggest that HFH's financial incentive program may have contributed to more equitable uptake for previously undervaccinated groups in LA County.²² PEH who were unsheltered accounted for 60.5% of first doses before program implementation despite representing 72.3% of LA County's unhoused population at the time of the last homeless count in 2020; after implementation, they accounted for 77.3% of first doses administered by HFH. Similarly, after implementation, PEH aged <55 years went from accounting for 56.1% to accounting for 74.6% of first doses, and PEH who identified as Black or African American went from accounting for 25.9% to accounting for 30.3% of first doses; PEH aged <55 years represented 76.8% of LA County's unhoused population at the time of the last homeless count in 2020, and PEH who identified as Black or African American represented 33.8%. First-dose uptake was relatively equitable across gender identities before and after implementation, with 67.2% of PEH in LA County identifying as male, 32.4% identifying as female, and 0.4% identifying as transgender or genderqueer at the time of the 2020 count.⁴ Finally, the proportion of first doses administered to

PEH aged ≥62 years decreased from 25.2% to 10.6%, likely because much of this age group had been pursued before implementation owing to their high risk of COVID-19 morbidity and mortality.²³

Although growing evidence suggests that financial incentives for COVID-19 vaccination are acceptable to PEH, it is important to acknowledge their potential to be coercive.¹⁴ After implementation of the program, HFH conducted ongoing quality improvement studies and found that 56% of those who were ready to get vaccinated cited the gift card as a primary reason for readiness, and only 1.7% of those who did not want to get vaccinated felt the financial incentive program was coercive.¹⁰ In addition, the amount of \$50 was chosen to maintain equity with the state of California's incentive program and on the basis of recommendations from local homeless services advocates.²⁰ Still, important ethical considerations must be made when implementing programs of this nature among PEH. In HFH's vaccination program, financial incentives were employed in conjunction with extensive outreach and education efforts that provide individuals with the knowledge and resources

needed to make informed decisions about their own health.^{14,19,24,25}

Limitations

This analysis is limited by its definition of vaccine uptake as the weekly number of first doses administered by HFH rather than as the weekly percentage of eligible PEH vaccinated. The homeless population of LA County was last counted in January 2020, so reliable denominators were not available to model uptake as a rate and estimate coverage among PEH over time.⁴ Results are also limited by the strong assumptions made by ITS analysis, including the assumption that the pre-intervention trend would have remained the same over time had the financial incentive program not been implemented. Both the association between the financial incentive program and first-dose uptake as well as the descriptive analyses may also be subject to uncontrolled and residual confounding. In particular, the inclusion of weekly case counts as a covariate in the ITS model may not fully capture variation owing to factors such as emerging variants and the increased public health messaging around vaccination that comes with them.

Finally, owing to excess variability, stratified ITS models could not be used to examine changes in uptake across demographic groups. The population-level model may be concealing important heterogeneity within subgroups of PEH in LA; further research beyond the descriptive analyses is needed to better understand the acceptability of financial incentives in demographic subgroups, especially those who have experienced historic mistreatment and racism in the healthcare system. In addition, lack of reliable denominators made it impossible to estimate the number of PEH within demographic subgroups that were eligible for a first dose before and after program implementation; thus, differing rates of eligibility may explain some of the differences observed in descriptive analyses.

CONCLUSIONS

This study adds important knowledge to the growing body of evidence around the utility of financial incentives for COVID-19 vaccination and, to the best of authors' knowledge, is the first evaluation of a program specifically designed to promote uptake among PEH. The ability to account for both level and slope change as well as two time-varying confounders was a major strength of this analysis.

Ongoing research is needed to evaluate the impact of financial incentives on second and booster dose uptake among PEH. In addition, these findings open the door to investigating how financial incentives may be a meaningful tool for improving the uptake of other behavioral and health interventions in a variety of vulnerable populations.

Population-level public health interventions such as vaccination campaigns must be made available to everyone, including those who face barriers to accessing both the intervention and any incentives being offered along with it. HFH's program increased the accessibility for PEH by bringing vaccines directly to homeless shelters and encampments and by providing gift cards on the spot rather than requiring access to a phone or computer to redeem incentives. This study reinforces the idea that government and community organizations can promote equity in the implementation of public health interventions by investing in programs that adapt mass campaigns to the specific needs of under-resourced populations such as PEH.

ACKNOWLEDGMENTS

The authors would like to acknowledge the Housing for Health COVID-19 Response Team, whose dedication to developing meaningful, dignified, and innovative approaches to health care for people experiencing homelessness made this work possible. The authors wish to thank their government and community partners, including United Way for funding the gift card program and the Los Angeles County Department of Public Health for the funding, vaccines, technical support, and collaboration utilized in this project.

The study sponsor did not have any role in the study design; collection, analysis, and interpretation of data; writing of the report; and the decision to submit the report for publication. This study was approved by the Los Angeles County Department of Public Health IRB (IRB Project Number [2022-07-1005](#)).

All authors were supported by grants awarded to the Los Angeles County Department of Public Health (ELC Enhancing Detection—6 [NU50CK000498-01–09](#) and ELC Enhancing Detection Expansion—6 [NU50CK000498-02–04](#)) as supplemental funds for [CK19-1904](#) (ELC Enhancing Detection through Coronavirus Response and Relief).

No financial disclosures were reported by the authors of this paper.

CREDIT AUTHOR STATEMENT

Allison D. Rosen: Conceptualization, Formal analysis, Methodology, Software, Visualization, Writing — original draft. Isabelle Howerton: Data curation, Writing — original draft. Hannah K. Brosnan: Conceptualization, Methodology, Writing — review & editing. Andrei Stefanescu: Conceptualization, Methodology, Validation, Writing — review & editing. Ayodele Gomih: Conceptualization, Data curation, Methodology, Writing — review & editing. Cathy Ngo: Data curation, Writing — review & editing. Alicia H. Chang: Conceptualization, Funding acquisition, Supervision, Writing — review & editing. Anh Nguyen: Conceptualization, Supervision, Writing — review & editing. Emily H. Thomas: Conceptualization, Funding acquisition, Supervision, Writing — review & editing.

REFERENCES

1. Tsai J, Wilson M. COVID-19: a potential public health problem for homeless populations. *Lancet Public Health*. 2020;5(4):e186–e187. [https://doi.org/10.1016/S2468-2667\(20\)30053-0](https://doi.org/10.1016/S2468-2667(20)30053-0).
2. O'Shea T, Bodkin C, Mokashi V, et al. Pandemic planning in homeless shelters: a pilot study of a coronavirus disease 2019 (COVID-19) testing and support program to mitigate the risk of COVID-19 outbreaks in congregate settings. *Clin Infect Dis*. 2021;72(9):1639–1641. <https://doi.org/10.1093/cid/ciaa743>.
3. County of Los Angeles Public Health. Summary report on COVID-19 among people experiencing homelessness (PEH) in Los Angeles County. Los Angeles, CA: County of Los Angeles Public Health. http://publichealth.lacounty.gov/media/coronavirus/docs/SummaryReport_People_Experiencing_Homelessness.pdf. Published October 31, 2022. Accessed November 9, 2022.
4. Los Angeles Homeless Services Authority. Greater Los Angeles homeless count—data summary. Total point-in-time homeless population by geographic areas. Los Angeles, CA: Los Angeles Homeless Services Authority. <https://www.lahsa.org/news?article=726-2020-greater-los-angeles-homeless-count-results>. Published June 12, 2020. Accessed August 1, 2022.
5. Chang AH, Kwon JJ, Shover CL, et al. COVID-19 mortality rates in Los Angeles County among people experiencing homelessness, March 2020–February 2021. *Public Health Rep*. 2022;137(6):1170–1177. <https://doi.org/10.1177/00333549221115658>.
6. Mohsenpour A, Bozorgmehr K, Rohleder S, Stratil J, Costa D. SARS-Cov-2 prevalence, transmission, health-related outcomes and control strategies in homeless shelters: systematic review and meta-analysis. *EClinicalMedicine*. 2021;38:101032. <https://doi.org/10.1016/j.eclinm.2021.101032>.
7. Montgomery MP, Meehan AA, Cooper A, et al. Notes from the field: COVID-19 vaccination coverage among persons experiencing homelessness - six U.S. Jurisdictions, December 2020–August 2021. *MMWR Morb Mortal Wkly Rep*. 2021;70(48):1676–1678. <https://doi.org/10.15585/mmwr.mm7048a4>.
8. Feldman BJ, Kim JS, Mosqueda L, et al. From the hospital to the streets: bringing care to the unsheltered homeless in Los Angeles. *Healthc (Amst)*. 2021;9(3):100557. <https://doi.org/10.1016/j.hjdsi.2021.100557>.
9. Kuhn R, Henwood B, Lawton A, et al. COVID-19 vaccine access and attitudes among people experiencing homelessness from pilot mobile phone survey in Los Angeles, CA. *PLoS One*. 2021;16(7):e0255246. <https://doi.org/10.1371/journal.pone.0255246>.
10. Rosen AD, Beltran J, Thomas E, et al. COVID-19 vaccine acceptability and financial incentives among unhoused people in Los Angeles County: a three-stage field survey. *J Urban Health*. 2022;99(3):594–602. <https://doi.org/10.1007/s11524-022-00659-x>.
11. Knight KR, Duke MR, Carey CA, et al. COVID-19 testing and vaccine acceptability among homeless-experienced adults: qualitative data from two samples. *J Gen Intern Med*. 2022;37(4):823–829. <https://doi.org/10.1007/s11606-021-07161-1>.
12. Abramovich A, Pang N, Kunasekaran S, Moss A, Kiran T, Pinto AD. Examining COVID-19 vaccine uptake and attitudes among 2SLGBTQ + youth experiencing homelessness. *BMC Public Health*. 2022;22(1):122. <https://doi.org/10.1186/s12889-022-12537-x>.
13. McCosker LK, El-Heneidy A, Seale H, Ware RS, Downes MJ. Strategies to improve vaccination rates in people who are homeless: a systematic review. *Vaccine*. 2022;40(23):3109–3126. <https://doi.org/10.1016/j.vaccine.2022.04.022>.
14. Jecker NS. Cash incentives, ethics, and COVID-19 vaccination. *Science*. 2021;374(6569):819–820. <https://doi.org/10.1126/science.abm6400>.
15. Campos-Mercade P, Meier AN, Schneider FH, Meier S, Pope D, Wengström E. Monetary incentives increase COVID-19 vaccinations. *Science*. 2021;374(6569):879–882. <https://doi.org/10.1126/science.abm0475>.
16. Wong CA, Pilkington W, Doherty IA, et al. Guaranteed financial incentives for COVID-19 vaccination: a pilot program in North Carolina. *JAMA Intern Med*. 2022;182(1):78–80. <https://doi.org/10.1001/jamainternmed.2021.6170>.
17. Nougairède A, Lagier JC, Ninove L, et al. Likely correlation between sources of information and acceptability of A/H1N1 swine-origin influenza virus vaccine in Marseille, France. *PLoS One*. 2010;5(6):e11292. <https://doi.org/10.1371/journal.pone.0011292>.
18. Tressler S, Bhandari R. Interventions to increase completion of hepatitis B vaccination in people who inject drugs: a systematic review and meta-analysis. *Open Forum Infect Dis*. 2019;6(12):ofz521. <https://doi.org/10.1093/ofid/ofz521>.
19. Rosen AD, Senturia A, Howerton I, et al. A COVID-19 vaccination program to promote uptake and equity for people experiencing homelessness in Los Angeles County. *Am J Public Health*. 2023;113(2):170–174. <https://doi.org/10.2105/AJPH.2022.307147>.
20. Vax for the Win. COVID19.CA.GOV. <https://covid19.ca.gov/vax-for-the-win/>. Updated 2021. Accessed April 12, 2022.
21. Bernal JL, Cummins S, Gasparrini A. Interrupted time series regression for the evaluation of public health interventions: a tutorial [published correction appears in *Int J Epidemiol*. 2020;49(4):1414]. *Int J Epidemiol*. 2017;46(1):348–355. <https://doi.org/10.1093/ije/dyw098>.
22. COVID-19 vaccinations in LA County. Los Angeles County Department of Public Health. publichealth.lacounty.gov/media/coronavirus/vaccine/vaccine-dashboard.htm#interactive. Updated December 28, 2022. Accessed August 1, 2022.
23. Risk for COVID-19 infection, hospitalization, and death by age group. Centers for Disease Control and Prevention. <https://www.cdc.gov/coronavirus/2019-ncov/covid-data/investigations-discovery/hospitalization-death-by-age.html>. Updated December 28, 2022. Accessed March 23, 2022.
24. Spicker P. Social work and self-determination. *Br J Soc Work*. 1990;20(3):221–236. <https://doi.org/10.1093/oxfordjournals.bjsw.a055683>.
25. Willer B, Corrigan JD. Whatever it takes: a model for community-based services. *Brain Inj*. 1994;8(7):647–659. <https://doi.org/10.3109/02699059409151017>.