

Implementing Promising Strategies to Reduce the Risk for Viral Hepatitis and Liver Cancer Among People Who Inject Drugs

American Journal of Health Promotion

2023, Vol. 0(0) 1–6

© The Author(s) 2023

Article reuse guidelines:

sagepub.com/journals-permissions

DOI: 10.1177/08901171231182873

journals.sagepub.com/home/ahp

Behnoosh Momin, DrPH, MS, MPH¹ , Jennifer Mezzo, MPH², Danielle Nielsen, MPH², Ayasha Richardson, MPH², and Erin E. Conners, PhD, MPH³

Abstract

Purpose: To describe a 3-year demonstration project with selected Centers for Disease Control and Prevention National Comprehensive Cancer Control Program (NCCCP) award recipients to build partnerships with local organizations to improve knowledge and awareness of the association between injecting drugs and the risk for viral hepatitis and liver cancer, improve delivery of viral hepatitis services, and implement comprehensive syringe services programs.

Design: A mixed-methods descriptive evaluation of selected evidence-based interventions or promising strategies that each award recipient implemented based on the needs of their population.

Setting: Selected provider and patient populations served by NCCCP award recipients in Iowa, Minnesota (American Indian Cancer Foundation), Mississippi, and West Virginia.

Subjects: Four award recipients that implemented individually-tailored strategies and activities.

Measures: Processes were assessed through monitoring and tracking tools. Challenges, lessons learned, and recommendations were collected via qualitative interviews.

Analysis: We used descriptive statistics to analyze quantitative data. We analyzed award recipient interviews using thematic analysis.

Results: Activities were implemented across four strategies. Strong public-private partnerships, ongoing technical assistance, a deep understanding of individual populations, and a shared commitment to remaining flexible were main factors.

Conclusion: While challenges existed, award recipients implemented key strategies and activities in their populations. Findings contribute to the scaling of best practices to the larger cancer control community especially those whose populations are at higher risk for viral hepatitis.

Keywords

awareness, strategies, specific populations, underserved populations, specific populations, clinical, specific settings, community, specific settings

Purpose

Hepatitis B and hepatitis C are contributing factors to liver cancer.¹ Liver cancer has high mortality rates, especially among certain populations including Hispanic or Latino, Asian Pacific Islanders, and American Indian or Alaskan Native persons.² The risk of hepatitis B virus (HBV) and hepatitis C virus (HCV) transmission is particularly high among people who inject drugs (PWID).^{3,4} The rise in PWID during the current opioid crisis in the U.S. may in part explain the rise in liver cancer.^{5,6}

¹Division of Cancer Prevention and Control, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, Atlanta, GA, USA

²ICF, Fairfax, VA, USA

³Division of Viral Hepatitis, National Center for HIV, Viral Hepatitis, STD, and TB Prevention, Centers for Disease Control and Prevention, Atlanta, GA, USA

Corresponding Author:

Behnoosh Momin, DrPH, MS, MPH, Health Scientist, Centers for Disease Control and Prevention, 4770 Buford Highway, MS F-76, Atlanta, GA 30341, USA.

Email: bmomin@cdc.gov

Vaccination against HBV, and HBV and HCV testing and treatment are strategies to help prevent liver cancer.⁵ The Centers for Disease Control and Prevention (CDC) funds the National Comprehensive Cancer Control Program (NCCCP) to create, implement, and evaluate plans to prevent and control cancer.⁷ Increasing incidence and death rates between 2006 and 2015 made liver cancer an NCCCP priority.⁸

We designed a demonstration project with NCCCP award recipients whose populations include PWID, to implement strategies to reduce viral hepatitis infections, with the goal of reversing liver cancer trends. We describe the implementation process of these award recipients in Iowa, Minnesota, Mississippi, and West Virginia.

Methods

Design

We planned for a mixed-methods descriptive evaluation to assess implementation (i.e., planning and delivering interventions) and outcomes. Based on their capacity for planning, implementation, and evaluation and the needs of their specific populations, each NCCCP award recipient selected evidence-based interventions and promising strategies (hereinafter, referred to as strategies) and activities derived from two sources: *A National Strategy for the Elimination of Hepatitis B and C: Phase Two Report* and *Evidence-Based Strategies for Preventing Opioid Overdose: What's Working in the United States*.^{5,9} Strategies implemented included a hybrid of online (e.g., webinar) and in-person (e.g., outreach) activities. Each award recipient was paired with a technical assistance (TA) liaison from CDC's contactor, ICF, to receive guidance and support throughout the demonstration period. Each pair met monthly to discuss project requirements and report on progress, challenges, and solutions. Through these meetings, we discovered that outcomes data would not be available as planned for some award recipients given shorter implementation periods as a result of the COVID-19 pandemic and lower than anticipated data collection response rates. We continued with the demonstration project with a focus on describing the process of planning and delivering strategies and activities.

Upon conclusion of the project, TA liaisons conducted four 90-minute, virtual closeout interviews, one with each award recipient. This research was reviewed and approved by the ICF Institutional Review Board (IRB) (FWA00002349, expires October 13, 2025). This project was determined by CDC not to be human subjects research requiring CDC's IRB approval.

Sample

NCCCP award recipients were selected based on their description of needs and experience working with PWID to prevent viral hepatitis infections as a strategy for reducing liver cancer incidence in their populations. Capacity of award recipients to implement strategies and activities was assessed

through completion of a worksheet and additional context during an informational call. Four NCCCP award recipients in Iowa, Minnesota, Mississippi, and West Virginia, including one tribal organization, (American Indian Cancer Foundation in Minnesota) were selected.

Measures

Each award recipient assessed process measures (e.g., reach, number of materials developed) through monitoring and tracking tools. The data monitoring and tracking tools used by award recipients included electronic medical records, Microsoft Excel, and web-based surveys (e.g., Mail Chimp, SurveyMonkey). We also assessed challenges, lessons learned, and recommendations from each award recipient during the qualitative closeout interview. Implementation and data collection occurred over an 18-month period.

Analysis

We used descriptive statistics (i.e., frequencies and ranges) to analyze quantitative process data. Qualitative data was analyzed by three team members using notes-based thematic analysis. As there were only four transcripts, the team manually coded each transcript, developing and assigning codes as we reviewed the transcripts. The team conducted the review and coding process together as a team, discussing the findings, determining the data that were relevant, and what codes to develop and use. We also synthesized contextual data from monthly reports, final reports, and closeout interviews to glean learnings across award recipients and understand ways to apply lessons to other NCCCP award recipients.

Results

The award recipients implemented different activities based on four strategies (Table 1): provider education, patient education, improving delivery of viral hepatitis services, and implementing comprehensive syringe services programs. Across these four recipients, five partners were engaged. The audience for each activity in the four strategies varied and included primary care and behavioral health providers, public health professionals, residential patients, community focused providers, and community members actively engaging in injection drug use. Across the award recipients, more than 600 providers and 40 patients participated in activities to increase knowledge and awareness of the association between injection drug use and the risk for viral hepatitis and liver cancer, improve delivery of viral hepatitis services, and implement comprehensive syringe services programs. Additionally, 99 case presentations and outreach to 145 shelters and encampments for people experiencing homelessness were conducted to increase HBV/HCV testing and HBV vaccination among individuals at increased risk for liver cancer.

Table 1. Process Measures and Results by Strategy.

| Strategy | Activity | Audience | Process Measures and Outputs |
|--|-----------------------------------|---|---|
| Provider education | Webinar (2) | Health care providers and public health professionals | First webinar - Number of registrants: 94 - Number of participants: 54 - Number of participants planning to request CEUs: 48 Second webinar - Number of participants: 12 of 14 invited - Number of materials developed: 8 - Number of providers who received materials: More than 300 |
| | Develop and distribute materials | Health care providers | - Number of sessions: 8 - Number of participants: 251 ^a - Number of sessions approved for CME credit: 6 - Number of participants awarded CMEs: 85 |
| | ECHO didactic sessions | Primary care and behavioral health providers | - Number and type of materials developed: 2 infographics - Number of sessions conducted: 2 - Number of participants: 41 |
| Patient education | In-person education sessions | Residential patients | - Number of ECHO case presentation sessions: 14 - Number of cases presented: 99 - Number of providers presenting cases: 52 unique - Number of HAV and HBV vaccinations administered following case presentations: 42 HAV, 48 HBV |
| Improving delivery of viral hepatitis services | Case presentations | Community-focused providers | - Number of shelters and encampments visited in conducting outreach: 145 - Number of harm reduction materials distributed (e.g., syringes, condoms, wound care kits, hygiene supplies): More than 100,000 - Number of harm reduction materials collected: 40,000 - Number screened for HBV and HCV: 28 HBV, 38 HCV |
| Implementing comprehensive syringe services programs | Community engagement and outreach | Community members actively engaging in injection drug use | |

^aIt is likely some providers attended multiple sessions over the course of the project. This number does not represent the number of unique participants.

The strategies conducted by each award recipient are described below. [Table 1](#) further details the audience, process measures, and outputs for each strategy.

Provider Education

All four award recipients implemented provider education activities. Two conducted webinars on the association between opioid use, viral hepatitis, and liver cancer. Two developed and electronically distributed materials, including fact sheets, a news brief email, three infographics, and a data brief. Additionally, one award recipient implemented Project Extension for Community Healthcare Outcomes (ECHO), a model of education that brings together providers to increase access to specialty treatment in rural and underserved areas,¹⁰ didactics to educate primary care, medication-assisted treatment, substance use disorder, and behavioral health providers on the association between opioid injection use, viral hepatitis, and liver cancer. Eight educational sessions were delivered via two separate ECHO platforms (HCV and behavioral health ECHOs).

Patient Education

One award recipient implemented activities to increase knowledge, awareness, ability, and intent focusing on the association between opioid use, increased rates of viral hepatitis, and liver cancer. Activities included distributing two infographics and conducting two in-person education sessions to educate residential patients at a substance abuse treatment center.

Improving Delivery of Viral Hepatitis Services

As part of one award recipient's HCV ECHO activity, existing case presentation forms were updated, in conjunction with CDC, so that providers could better assess for risk factors, including opioid and injection drug use and current and past HBV infection status. With this modification, community-focused providers could virtually present cases of patients with HBV infection with more comprehensive information and consult on an appropriate course of treatment.

Implementing Comprehensive Syringe Services Programs

One award recipient partnered with a local community clinic to conduct community engagement and provide harm reduction, outreach, rapid testing, and medical services to build relationships with and bridge services for patients who decide to engage in recovery services. This award recipient also developed a data collection system to track hepatitis testing and, treatment, and for distributing and collecting harm reduction distribution materials (e.g., syringes, condoms, wound care kits, hygiene supplies).

Several themes emerged from the closeout interviews, including the need to engage partner contract offices often and early to avoid implementation delays. Conducting frequent, regularly scheduled calls and simultaneously planning implementation and evaluation of strategies and activities aided in successful execution of strategies. Additionally, award recipients learned that adapting existing materials is less burdensome than developing original content. Lastly, when working with partners, flexibility and the ability to change plans when challenges arose were key.

Discussion

Summary

Despite challenges encountered, award recipients successfully implemented their strategies and activities. Strategy implementation required strong public-private partnerships, ongoing TA, a deep understanding of award recipients' individual populations, and a shared commitment to remaining flexible throughout the demonstration period.

These award recipients adopted strategies from past efforts of two other NCCCPs and expanded on the number and types of strategies and activities.^{11,12} While the current four award recipients implemented provider and patient education, they expanded their focus to include two new strategies: improving delivery of viral hepatitis services and implementing comprehensive syringe service programs. Conducting these two new strategies led to additional local partnerships, which in turn led to a broader reach of the intended audience. The addition of the viral hepatitis service strategy expanded the Project ECHO activities by including case presentations which resulted in more specialized treatment for patients with HBV and HCV infection. The addition of the comprehensive syringe service program strategy allowed for a specific focus on engagement with community members that were actively injecting drugs. These four strategies are promising practices that can be scaled¹³ and adopted by other NCCCPs.

Award recipients encountered several challenges. The project launched shortly before the onset of the COVID-19 pandemic, which strained the capacity of the award recipients, especially ones that were planning education activities since they had to transition to delivering content virtually. Some

award recipients experienced staffing changes, which made developing presentation materials and pre-post assessments across strategies burdensome, and some found it challenging to develop new content for their activities. The TA in planning and executing strategies and developing content for presentations alleviated the burden for award recipients and allowed them to use and adapt content accordingly. Finally, providers' competing priorities were a barrier to completing pre- and post-assessments for provider education activities. Offering incentives such as CME credits or an hour of administrative time were believed to be useful in addressing this challenge.¹³

Limitations

Findings are based on a small number of award recipients and may not be generalizable to all NCCCP award recipients and populations. Also, award recipients had difficulty collecting adequate data to evaluate outcomes across strategies. Finally, the implementation period was too short to allow measuring of reductions in liver cancer diagnosis among PWID.

Significance

We identified key components for implementation of the strategies and activities described. These findings contribute to the scaling of best practices to the larger cancer control community and, in particular, will benefit other NCCCP award recipients whose populations live or work in settings that put them at increased risk for viral hepatitis or experiencing health disparities. Several new resources were developed as a result of this project which can be used by other award recipients interested in conducting similar work. These resources are publicly available at <https://www.cdc.gov/cancer/liver/opioid-users/index.htm>.

SO WHAT?

What is Already Known on This Topic?

The Centers for Disease Control and Prevention provides funding and technical assistance to National Comprehensive Cancer Control Program award recipients to create, implement, and evaluate cancer plans. Vaccination and testing for viral hepatitis are strategies that can help prevent liver cancer among people who inject drugs.

What Does This Article Add?

We describe strategies and activities to promote vaccination and testing for viral hepatitis among people who inject drugs implemented by National Comprehensive Cancer Control Programs whose populations are disproportionately affected by viral hepatitis and liver cancer. We also highlight successes and challenges in this work that may be useful for programs seeking to implement similar strategies.

What are the Implications for Health Promotion Practice or Research?

The award recipients expanded on the number and types of strategies and activities from past efforts. The addition of the two new strategies expanded the Project ECHO activities by including case presentations and allowed for a specific focus on engagement with community members that were actively injecting drugs. These additional strategies are promising practices that can be scaled and adopted by other NCCCPs. Future studies that explore readiness factors that contribute to successful implementation and measure longer-term outcomes in behavior change and vaccination and testing rates can provide information on the effectiveness and sustainability of these strategies.

Acknowledgments

The authors would like to acknowledge staff from the following award recipients who implemented the demonstration project: American Indian Cancer Foundation in St. Paul, Minnesota, Iowa Department of Health and Human Services, Mississippi State Department of Health, and West Virginia Bureau for Public Health.

Author Contributions

Behnoosh Momin: Project and article lead, conceptualized the project, provided oversight and leadership throughout the project period, led the interpretation of the data, drafted key components of the article, and approved the submitted article for review.

Jennifer Mezzo: Contributed to the methods and results, contributed to the revisions, and approved the submitted article for review.

Danielle Nielsen: Contributed to the methods and results, contributed to the revisions, and approved the submitted article for review.

Ayasha Richardson: Contributed to the methods and results, contributed to the revisions, and approved the submitted article for review.

Erin Connors: Contributed to the overall concept, contributed to the revisions, and approved the submitted article for review.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

Disclosure

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

ORCID iD

Behnoosh Momin  <https://orcid.org/0000-0003-0717-4102>

References

- Centers for Disease Control and Prevention. Liver cancer. Liver cancer | CDC. Accessed November 16, 2022.
- Cronin KA, Scott S, Firth AU, et al. Annual report to the nation on the status of cancer, part 1: National cancer statistics. *Cancer*. 2022;128:1-34. DOI: [10.1002/cncr.34479](https://doi.org/10.1002/cncr.34479)
- Centers for Disease Control and Prevention. Hepatitis B surveillance in the United States. <https://www.cdc.gov/hepatitis/statistics/2019surveillance/HepB.htm>. Accessed October 17, 2022.
- Centers for Disease Control and Prevention. Hepatitis C surveillance in the United States. <https://www.cdc.gov/hepatitis/statistics/2019surveillance/HepC.htm>. Accessed October 17, 2022.
- National Academies of Sciences, Engineering, and medicine; health and medicine division; board on population health and public health practice; committee on a national strategy for the elimination of hepatitis B and C. In: Strom BL, Buckley GJ, eds. *A National Strategy for the Elimination of Hepatitis B and C: Phase Two Report*. Washington DC: National Academies Press (US); 2017.
- Zibbell J, Asher A, Patel R, et al. Increases in acute hepatitis C virus infection related to a growing opioid epidemic and associated injection drug use, United States, 2004 to 2014. *Am J Publ Health*. 2018;108(2):175-181. doi:[10.2105/AJPH.2017.304132](https://doi.org/10.2105/AJPH.2017.304132)
- Centers for Disease Control and Prevention. National comprehensive cancer control program. <https://www.cdc.gov/cancer/ncccp/index.htm>. Accessed July 28, 2022.
- U.S. Cancer Statistics Working Group. U.S. Cancer. *Statistics Data Visualizations Tool, Based on 2021 Submission Data (1999-2019)*. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute www.cdc.gov/cancer/dataviz. released in June 2022.
- Centers for Disease Control and Prevention. Evidence-based strategies for preventing opioid overdose: What's working in the United States. Available at: <https://www.cdc.gov/drugoverdose/>

- [pdf/pubs/2018-evidence-based-strategies.pdf](https://www.cdc.gov/drugoverdose/pdf/pubs/2018-evidence-based-strategies.pdf) <https://www.cdc.gov/drugoverdose/pdf/pubs/2018-evidence-based-strategies.pdf>. Accessed October 4, 2022.
10. Project ECHO, The university of New Mexico. A revolution in medical education and care delivery: <https://hsc.unm.edu/echo/>. Accessed October 27, 2022.
 11. Momin B, Mera J, Essex W, et al. Implementation of liver cancer education among health care providers and community coalitions in the Cherokee nation. *Prev Chronic Dis.* 2019;16: E112. doi:10.5888/pcd16.180671
 12. Momin B, Nielsen D, Schaff S, Mezzo JL, Cariou C. Promising interventions to prevent liver cancer in Idaho. *Health Promot Pract.* 2023;24(0):373-379. doi:10.1177/15248399211057154
 13. Frieden TR. Six components necessary for effective public health program implementation. *Am J Publ Health.* 2014; 104(January 1):17-22.