Hepatitis C Virus Testing and Linkage to Care in North Carolina and South Carolina Jails, 2012–2014

Ben T. Schoenbachler, MPH[a]
Bryce D. Smith, PhD, MSSW[b]
Arlene C. Seña, MD, MPH[c,d]
Alison Hilton, MPH[c]
Sallie Bachman, LMSW[e]
Mulamba Lunda, MPH[f]
Anne C. Spaulding, MD, MPH[g,h]

ABSTRACT

Objective. We evaluated a hepatitis C virus (HCV) testing and linkage-to-care post-release program among detainees of small- to medium-sized jails in North Carolina and South Carolina as part of the Hepatitis Testing and Linkage to Care initiative.

Methods. An HCV testing and linkage-to-care program was implemented in selected jails in North Carolina and South Carolina from December 2012 to March 2014. Health-care workers not affiliated with the jails conducted HCV antibody (anti-HCV) and HCV ribonucleic acid (RNA) testing and linkage-to-care activities. The North Carolina jail provided universal opt-out testing for HCV; South Carolina jails initially targeted high-risk individuals before expanding to routine testing.

Results. Of 669 detainees tested for HCV in North Carolina, 88 (13.2%) tested anti-HCV positive, of whom 81 (92.0%) received an HCV RNA test, 66 (81.5%) of whom tested HCV RNA positive (i.e., currently infected). Of the 66 detainees with current HCV infection, 18 were referred to HCV medical care post-release and 10 attended their first appointment. Of 224 detainees tested for HCV in South Carolina, 18 (8.0%) tested anti-HCV positive, of whom 13 received an HCV RNA test. Nine of 13 detainees tested HCV RNA positive, seven detainees were referred to post-release medical care, and two detainees attended their first appointment. Overall, 106 of 893 (11.9%) detainees were anti-HCV positive.

Conclusion. This study demonstrated that HCV testing, identification of infection, and linkage to care are feasible among jail populations. The rate of anti-HCV positivity was lower than that found in national studies of incarcerated populations, suggesting that HCV infection prevalence in jails may vary across U.S. states or regions.

[a]Oak Ridge Institute for Science and Education, Oak Ridge, TN
[b]Centers for Disease Control and Prevention, Division of Viral Hepatitis, Atlanta, GA
[c]Durham County Department of Public Health, Durham, NC
[d]University of North Carolina at Chapel Hill, Division of Infectious Diseases, Chapel Hill, NC
[e]HopeHealth Inc., Orangeburg, SC
[f]HopeHealth Inc., Florence, SC
[g]Emory University, Rollins School of Public Health, Department of Epidemiology, Atlanta, GA
[h]Emory University School of Medicine, Department of Medicine, Division of Infectious Diseases, Atlanta, GA
Address correspondence to: Ben T. Schoenbachler, MPH, Centers for Disease Control and Prevention, 1600 Clifton Rd. NE, MS G-37, Atlanta, GA 30333; tel. 404-718-8532; fax 404-718-8595; e-mail <xmr7@cdc.gov>.

Hepatitis C is the most common blood-borne infection in the United States, with an estimated 1.6% of the U.S. population testing positive for the hepatitis C virus (HCV) antibody (anti-HCV).[1] Approximately three-quarters of people with HCV infection develop chronic infection, the leading cause of hepatocellular carcinoma and liver-related mortality.[2,3] Of those with chronic HCV infection, only about half are aware of their infection.[4] Furthermore, in a recent study of four of the largest U.S. health-care systems, 3,570 of 5,860 (61%) anti-HCV-positive people received a confirmatory HCV ribonucleic acid (RNA) test (indicating chronic infection) as recommended.[5] Effective treatment can prevent HCV-related morbidity and mortality if those with chronic HCV infection are identified and receive appropriate medical management and treatment.[6]

Because 10 million people are detained in U.S. jails or imprisoned annually,[7] and recent estimates have found that about 23% of incarcerated people are anti-HCV positive, a substantial proportion of the 4.6 million anti-HCV-positive Americans[8] may be currently incarcerated. Although all U.S. correctional facilities must provide basic medical care,[9] access to health care often ends after release into the community.[10] Identifying HCV infections within correctional settings and linking infected inmates to medical care may prevent new infections and help tens of thousands of infected people avoid HCV-associated morbidity and mortality.[11]

Correctional facilities include short-term jails, which detain people for about 2–5 days,[12] and prisons, which house people who have been convicted of a felony for ≥1 year. The administrative organization of correctional facilities differs, and screening programs in a small jail may not be the same or as feasible as one in a large jail. Although several studies of hepatitis C in correctional settings have been conducted in large prisons or jails housing >1,000 detainees, few have involved medium- to small-sized jails housing <99 inmates, which represent 59% of U.S. jails.[13] To better understand the problem of HCV infection in the correctional population nationally, smaller jails and prisons need to be examined. We evaluated an HCV testing program in small- to medium-sized jails in North Carolina and South Carolina funded by the Hepatitis Testing and Linkage to Care (HepTLC) initiative, which promoted viral hepatitis B and hepatitis C screening, posttest counseling, and linkage to care at 34 U.S. sites from 2012 to 2014.[14] We assessed whether or not detainees who were anti-HCV positive received HCV RNA testing, and whether or not those who were HCV RNA positive (i.e., currently infected) attended their first posttest medical appointment within a 90-day follow-up period.

METHODS

Project sites

In North Carolina, the Durham County Department of Public Health conducted testing at the state's 736-bed Durham County Jail. In 2012, the medium-sized jail had 8,673 admissions. Turnover in this population is high, with half of detainees staying fewer than two days, and most of the general-population inmates including young African American men (Unpublished data, Durham County Department of Public Health, 2014).

In South Carolina, HopeHealth, Inc. conducted testing in four small- to medium-sized jails: the Florence County Detention Center, Orangeburg County Jail, Marion Jail, and Darlington Jail. The sites reported capacities ranging from 96 to 512 beds. One of the jails reported that 65% of the total jail population had an average length of stay of <2 days. Similar to the Durham County Jail, the South Carolina general jail population comprised predominately young African American men (Unpublished data, HopeHealth, Inc., 2014). A testing model[15] was implemented in all South Carolina jails whereby health-care workers who were separate from the corrections staff (i.e., parallel staff members) conducted HCV testing alongside the jails' usual health-care staff members. This model contrasts with an integrated system[15,16] in which correctional health-care staff members perform testing as part of routine clinical care. The parallel staff members linked detainees identified with current HCV infection to community health-care services to receive treatment after release from jail.

North Carolina program

The Durham County Department of Public Health conducted HCV testing in North Carolina from December 2012 to March 2014. During the limited hours of their visits, personnel offered opt-out HCV testing to detainees in male and female housing units, regardless of birth year, injection drug use, and/or human immunodeficiency virus (HIV) infection. The health department also provided daily educational sessions (i.e., individual and group) in the housing units, followed by an offer of confidential testing for detainees not presenting proof of recent HCV testing in the jail. Detainees interested in the educational program were asked to provide written consent and then to complete a survey of risk factors and basic demographics.

Beginning in August 2013, using funding provided by the state and earmarked for minority health, staff members from the Durham County Department of Public Health began simultaneously drawing two vials of blood from minority (i.e., African American, Hispanic)

detainees. The first blood specimen was tested for anti-HCV. If positive, the second specimen was tested for HCV RNA. Non-minority detainees were offered HCV RNA testing via a second blood draw after receiving a reactive anti-HCV test result. Two health educators were trained in phlebotomy to provide anti-HCV and confirmatory HCV RNA testing, and provide posttest counseling to HCV RNA-positive detainees. Referrals were made to the patient navigator, who met with the detainees to help with their transition to HCV-related care in the community. Patient navigators located detainees who were released from jail prior to receiving their test results and provided additional posttest counseling on the disease, alcohol reduction, risk reduction, and linkage to HCV-related clinical care upon release.

During the project's initial phases, participants were referred to Duke University for their first medical appointment post-release. Later in the project period, individuals were referred to either the clinic at the University of North Carolina (UNC), Chapel Hill, or to a local physician who would schedule an appointment with them shortly after reentry into the community. This change was necessary because Duke University was able to accept only uninsured patients residing in Durham County, while UNC, as a state hospital, did not have a residence restriction. From September 2013 to March 2014, the state of North Carolina provided separate funding to supplement anti-HCV testing in the jail. During this later phase, all anti-HCV-positive inmates were integrated into the linkage-to-care portion of the program, thus providing them with access to HCV RNA testing and linkage-to-care services.

South Carolina program

In South Carolina, HopeHealth, Inc. conducted HCV testing with parallel staff members from January to September 2013. Initially, the South Carolina program targeted detainees born between 1945 and 1965 (i.e., the birth cohort)[17] or those who had obtained tattoos in non-professional or unregulated settings. Although people who inject drugs were not specifically targeted, risk-factor information was collected for every detainee assessed in the program. Seropositive detainees would then have a second vial of blood drawn for HCV RNA testing. Testing frequency varied based on how often the parallel staff members visited the jail.

HopeHealth, Inc. staff members visited Marion Jail monthly and the Florence County and Darlington jails bimonthly to conduct testing and linkage-to-care services. The Orangeburg County Jail also received monthly visits; however, after low participation rates, HopeHealth Orangeburg reevaluated testing policies and expanded testing to bimonthly. Testing was also expanded to include other detainees in addition to those born between 1945 and 1965 or with tattoos from unlicensed settings. Prior to release, detainees at all jails received anti-HCV test results and, when available, HCV RNA test results. Detainees who were identified with current HCV infection received HCV-related education as posttest counseling from HopeHealth staff members. Detainees in Marion, Florence, and Darlington jails who were currently infected were referred to HopeHealth Florence, a federally qualified health center, to receive HCV-related medical care. Parallel staff members assigned to the Orangeburg jail set up appointments for detainees with current HCV infection to see a health-care provider and receive medical care after their release from jail.

Data management and analysis

Data were collected and entered into EvaluationWeb®,[18] an Internet-based database customized for the HepTLC initiative. Each month from December 2012 through June 2014, staff members from the Durham County Department of Public Health and HopeHealth, Inc. submitted testing data (i.e., anti-HCV and HCV RNA test results) and follow-up information to allow this information to be included for those detainees entering care after March 2014. Follow-up information consisted of the number of detainees who received test results, participated in posttest counseling, were referred to care, and attended their first medical appointment post-release.

RESULTS

North Carolina program outcomes

The Durham County program tested 669 detainees for anti-HCV during 16 months in a jail that averages 723 monthly admissions (i.e., 11,500 admissions in 16 months), representing 5.6% of all people admitted. A total of 88 of 669 (13.2%) detainees who were tested were anti-HCV positive, of whom 81 (92.0%) were tested for HCV RNA. Of the 66 (81.5%) HCV RNA-positive detainees, 18 were referred to medical care post-release and 10 attended their first appointment (Table 1).

Among anti-HCV-positive detainees, 17 of 21 (81.0%) women and 49 of 67 (73.1%) men were HCV RNA positive. The prevalence of current infection was 76.5% (26/34) among non-Hispanic white detainees, 75.5% (37/49) among non-Hispanic black detainees, and 33.3% (1/3) among Hispanic detainees (Table 2). The median age was 33.5 years (interquartile range [IQR] = 23–39) for detainees who were tested, 43.0

Table 1. Care cascade among detainees tested for hepatitis C as part of the Hepatitis Testing and Linkage to Care (HepTLC) initiative, by testing program, North Carolina and South Carolina jails, December 2012 to March 2014

Location	Number tested for anti-HCV	Number testing anti-HCV positive (percent)[a]	Number tested for HCV RNA (percent of anti-HCV positive)[a]	Number testing HCV RNA positive (percent)[a]	Number receiving test results (percent)[a]	Number receiving posttest counseling (percent)[a]	Number referred to medical care (percent)[a]	Number attending first medical appointment (percent)[a]
Total	893	106 (11.9)	94 (88.7)	75 (79.8)	57 (76.0)	58 (77.3)	25 (33.3)	12 (48.0)
North Carolina	669	88 (13.2)	81 (92.0)	66 (81.5)	50 (75.8)	50 (75.8)	18 (27.3)	10 (55.6)
South Carolina	224	18 (8.0)	13 (72.2)	9 (69.2)	7 (77.8)	8 (88.9)	7 (77.8)	2 (28.6)

[a]Percentages are row percentages.

anti-HCV = antibody to hepatitis C virus

HCV = hepatitis C virus

RNA = ribonucleic acid

years (IQR=32–51) for those who were anti-HCV positive, and 46.0 years (IQR=35–52) for those with current infection (Table 2).

Among the 77 birth-cohort detainees tested, 35 (45.5%) were anti-HCV positive, of whom 31 (88.6%) were HCV RNA positive. Among 73 detainees reporting a history of drug use and/or HIV infection, regardless of birth year, 43 (58.9%) were anti-HCV positive, of whom 32 (74.4%) were currently infected with HCV. Of the 568 people without reported risk factors, regardless of birth year, 44 (7.7%) were anti-HCV-positive, of whom 34 (77.3%) had current HCV infection (Table 2).

South Carolina program outcomes

HopeHealth, Inc. tested 224 detainees for anti-HCV in the four participating South Carolina jails, of whom 18 (8.0%) were anti-HCV positive, 13 received an HCV RNA test, and nine tested HCV RNA positive. Of the nine detainees with current HCV infection, seven were referred to medical care and two attended their first medical appointment during a 90-day observation period (Table 1).

Five of the 68 non-Hispanic white detainees and three of the 146 non-Hispanic black detainees had current HCV infection (Table 2). The median age was 33.5 years (IQR=27–45) for detainees tested, 38.5 years (IQR=32–46) for anti-HCV-positive detainees, and 45.0 years (IQR=39–52) for HCV RNA-positive detainees. A total of 53 detainees self-reported having a risk factor for HCV infection at the time of enrollment, regardless of birth year; of these, 12 were anti-HCV positive and five were HCV RNA positive (Table 2).

DISCUSSION

This project demonstrated that HCV testing and linkage-to-care services can be conducted in a jail by non-correctional staff members in parallel with correctional health-care program staff members (i.e., parallel testing). To our knowledge, this is the largest study yet of parallel testing for HCV in a southeastern jail. Voluntary HCV testing in North Carolina and South Carolina jails identified a relatively high prevalence of HCV infection among detainees compared with estimates (i.e., 1.0%) in the general U.S. population,[4] although the 11.9% overall seroprevalence in these jail populations was lower than a recently published seroprevalence estimate (i.e., 23.1%) among incarcerated people nationally.[8] That national estimate reported by Edlin et al. was based on older studies with heightened estimates of prevalence compared with the current national prevalence for correctional institutions. Our lower prevalence supports a surveillance study by Varan et al., which showed that HCV prevalence in correctional populations is not geographically uniform and can vary by state and region; furthermore, HCV prevalence has declined in recent years.[10]

Through this study, we observed a higher prevalence of current HCV infection for people born between 1945 and 1965 in correctional settings, similar to the prevalence pattern found among the birth cohort in the general population. Targeted testing of the birth cohort and other people at risk (i.e., tattoo recipients) at the start of the program in South Carolina might have elevated the percentage who were anti-HCV positive; if this were the case, the true prevalence in the South Carolina jails may have been lower than 8.0%. Also, this study did not show how the parallel testing model, which tested 5.8% (669/11,500) of admissions

in the Durham County Jail, might compare with an integrated testing strategy; however, a program that involved rapid HIV testing in an Atlanta, Georgia, jail found that integrated serological testing permitted staff members to test 56.2% (17,035/30,316) of all detainees.[16]

In a study of the Pennsylvania Department of Corrections, Larney et al. demonstrated that as time passes, targeting the 1945–1965 birth cohort alone may fail to find an increasing percentage of hepatitis C infection among younger prisoners.[19] The declining contribution from the birth cohort is similar to trends that have been found in non-correctional settings where, in 2006, 36% of incident hepatitis C cases occurred among people <30 years of age and rose to 49% from 2007 to 2012.[20,21] The increase in new cases of HCV infection among young people has been attributed to the emergence of younger injection drug users who have transitioned from oral to injection opioid use.[20] People <30 years of age comprise a large proportion of the new cases of HCV infection among injection drug users.[22]

Because behaviors that place people at risk for HCV infection (e.g., injection drug use) are associated with incarceration, correctional facilities are strategic venues for HCV testing and linkage to care.[19,23–25] We found that detainees with self-reported risk factors and those born between 1945 and 1965 had a higher prevalence of HCV infection than those who had no risk factors and were not baby boomers. Nevertheless, considerably fewer detainees might have been detected had the program incorporated a strategy of testing only those in the birth cohort or those reporting high-risk behavior. If systems cannot implement routine testing of all detainees, as recommended by the U.S. Preventive

Table 2. Characteristics of detainees testing anti-HCV positive and HCV RNA positive during the Hepatitis Testing and Linkage to Care (HepTLC) initiative, North Carolina and South Carolina jails, December 2012 to March 2014

	North Carolina jail			*South Carolina jails*		
Characteristic	*Number tested for anti-HCV*	*Number testing anti-HCV positive (percent)*[a]	*Number testing HCV RNA positive (percent)*[a]	*Number tested for anti-HCV*	*Number testing anti-HCV positive (percent)*[a]	*Number testing HCV RNA positive (percent)*[a]
Total	669	88 (13.2)	66 (75.0)	224	18 (8.0)	9 (50.0)
Sex						
Female	134	21 (15.7)	17 (81.0)	34	6 (17.6)	1 (16.7)
Male	533	67 (12.6)	49 (73.1)	190	12 (6.3)	8 (66.7)
Transgender	2	0 (0.0)	0 (0.0)	0	0 (0.0)	0 (0.0)
Age, in years						
20–29	296	17 (5.7)	8 (47.1)	2	1 (50.0)	0 (0.0)
30–39	173	18 (10.4)	12 (66.7)	61	8 (13.1)	2 (25.0)
40–49	110	18 (16.4)	15 (83.3)	81	5 (6.2)	3 (60.0)
50–59	56	31 (55.4)	27 (87.1)	47	4 (8.5)	4 (100.0)
≥60	12	4 (33.3)	4 (100.0)	30	0 (0.0)	0 (0.0)
Not reported	22	0 (0.0)	0 (0.0)	3	0 (0.0)	0 (0.0)
Race/ethnicity						
Non-Hispanic black/African American	477	49 (10.3)	37 (75.5)	146	3 (2.1)	3 (100.0)
Non-Hispanic white	116	34 (29.3)	26 (76.5)	68	13 (19.1)	5 (38.5)
Hispanic	42	3 (7.1)	1 (33.3)	3	1 (33.3)	1 (100.0)
Not reported	34	2 (5.9)	2 (100.0)	7	1 (14.2)	0 (0.0)
Birth cohort vs. non-birth cohort						
1945–1965	77	35 (45.5)	31 (88.6)	40	4 (10.0)	4 (100.0)
Other	592	53 (9.0)	35 (66.0)	184	14 (7.6)	5 (35.7)
Reported risk factors[b]						
Risk factors	73	43 (58.9)	32 (74.4)	53	12 (22.6)	5 (41.7)
No risk factors	568	44 (7.7)	34 (77.3)	171	6 (3.5)	4 (66.7)
Not reported	28	1 (3.6)	0 (0.0)	0	0 (0.0)	0 (0.0)

[a]Percentages are row percentages.

[b]Risk is defined as any history of injection drug use and/or human immunodeficiency virus positive.

anti-HCV = antibody to hepatitis C virus

HCV = hepatitis C virus

RNA = ribonucleic acid

Services Task Force guidelines,[26] future studies in correctional institutions will be needed to gain a better understanding of the characteristics of those most likely to be infected with HCV within these settings who can then be targeted for testing.

To reduce both HCV transmission and complications of infection, all people with HCV infection need to be identified and linked to medical care. Those with current infection have a higher likelihood of morbidity and mortality. Identifying these individuals and linking them to care after their release is an important, yet challenging, task. In the future, HCV antigen testing could be more effective than anti-HCV testing for detecting viremia with a reflex to polymerase chain reaction testing, especially when conducting a second blood draw is inconvenient.

Efforts are also needed to ensure that currently infected detainees have a post-release medical appointment scheduled prior to their release and that attendance at these appointments is actively supported (i.e., via travel assistance and follow-up reminders). The first post-release medical appointment enables the detainee and his or her clinician to make an informed decision regarding the next steps in care, which could include counseling for alcohol use and risk reduction to prevent transmission to others, employing a wait-and-watch strategy to monitor the infection, or beginning treatment. More research is needed to determine the societal cost-effectiveness of HCV testing in jails.

Limitations

This study was subject to several limitations. The overall HCV infection prevalence that we found in these jails could have been overestimated because the program in South Carolina began by targeting those at higher risk of HCV infection, specifically detainees born between 1945 and 1965 and those with tattoos that were applied in non-professional and unregulated settings. Nevertheless, the HCV seroprevalence in these jails was similar to the 7.5% HCV seroprevalence found in an Atlanta jail.[9] Furthermore, because of programmatic changes during the evaluation process, we could not discern which components of the programs across the two states were most responsible for success in identifying people who were anti-HCV positive, who completed diagnostic testing, and who were linked to care.

Additionally, risk-factor data were collected through detainee self-report during enrollment. As such, the number of detainees with risk factors for HCV infection was potentially underrepresented because of fear of self-incrimination if revealing illicit activity resulted in additional charges being filed. Although the programs prioritized people who were unaware of their status, they did not collect information on the percentage of people testing positive or negative who were previously aware of their infection status. Finally, the number of detainees who were eventually referred to care and attended their first medical appointment may have been underreported because detainees may have had jail stays >90 days post-HCV diagnosis, the observational period in this study.

As a demonstration project, we did not collect data on people who were not tested or the reason why they did not test. In the absence of state health departments compiling complete name-based registries of people who are HCV infected, we could not determine what percentage of diagnoses were new and the length of time those who were viremic were infected. Nevertheless, the methods used were unlikely to result in a profound underestimate of the HCV prevalence for the population passing through these jails. Using prevalence as a proxy for positivity rate was also a limitation.

CONCLUSION

Our project demonstrated that HCV testing, identification of infection, and linkage to care are feasible in detainee populations. A substantial number of people with current HCV infection are incarcerated in correctional facilities in the southeastern United States. Future research might explore how individuals fall out of the HCV care cascade (i.e., from testing to medical care) and if gaps in the cascade vary by region.

The authors thank Jon Zibbell, PhD, Centers for Disease Control and Prevention (CDC), Division of Viral Hepatitis; Cecily Campbell, JD, Oak Ridge Institute for Science and Education (ORISE); and Andrea Brown, Tiffany Lemon, Nyiramugisha Niyibizi, and Samantha Luffy, Emory University Rollins School of Public Health, for assistance with research and editing.

The findings and conclusions in this article are those of the authors and do not necessarily represent the views of CDC.

This study describes public health practice. As it was not human subjects research, it did not require approval from an institutional review board.

REFERENCES

1. Kuncio DE, Newbern EC, Fernandez-Viña MH, Herdman B, Johnson C, Viner KM. Comparison of risk-based hepatitis C screening and the true seroprevalence in an urban prison system. J Urban Health 2015;92:379-86.
2. Chen SL, Morgan TR. The natural history of hepatitis C virus (HCV) infection. Int J Med Sci 2006;3:47-52.
3. Morgan RL, Baack B, Smith BD, Yartel A, Pitasi M, Falck-Ytter Y. Eradication of hepatitis C virus infection and the development of hepatocellular carcinoma: a meta-analysis of observational studies. Ann Intern Med 2013;158:329-37.
4. Denniston MM, Jiles RB, Drobeniuc J, Klevens RM, Ward JW, McQuillan GM, et al. Chronic hepatitis C virus infection in the United States, National Health and Nutrition Examination Survey 2003 to 2010. Ann Intern Med 2014;160:293-300.

5. Spradling PR, Tong X, Rupp LB, Moorman AC, Lu M, Teshale EH, et al. Trends in HCV RNA testing among HCV antibody-positive persons in care, 2003–2010. Clin Infect Dis 2014;59:976-81.
6. Rein DB, Wittenborn JS, Weinbaum CM, Sabin M, Smith BD, Lesesne SB. Forecasting the morbidity and mortality associated with prevalent cases of pre-cirrhotic chronic hepatitis C in the United States. Dig Liver Dis 2011;43:66-72.
7. Spaulding AC, Seals RM, Page MJ, Brzozowski AK, Rhodes W, Hammett TM. HIV/AIDS among inmates of, and releasees from, US correctional facilities, 2006: declining share of epidemic but persistent public health opportunity. PLoS One 2009;11:e7558.
8. Edlin BR, Echhardt BJ, Shu MA, Holmberg S, Swan T. Toward a more accurate estimate of the prevalence of hepatitis C in the United States. Hepatology 2015;62:1353-63.
9. *Estelle v. Gamble*. 429 U.S. 97 (1976).
10. Varan AK, Mercer DW, Stein MS, Spaulding AC. Hepatitis C seroprevalence among prison inmates since 2001: still high but declining. Public Health Rep 2014;129:187-95.
11. Davis GL, Alter MJ, El-Serag H, Poynard T, Jennings LW. Aging of hepatitis C virus (HCV)-infected persons in the United States: a multiple cohort model of HCV prevalence and disease progression. Gastroenterology 2010;138:513-21.
12. Spaulding AC, Perez SD, Seals RM, Hallman MA, Kavasery R, Weiss PS. Diversity of release patterns for jail detainees: implications for public health interventions. Am J Public Health 2011;101 Suppl 1:S347-52.
13. Stephan J, Walsh G. Census of jail facilities, 2006. Washington: Department of Justice (US); 2011. Also available from: http://www.bjs.gov/content/pub/pdf/cjf06.pdf [cited 2016 Mar 14].
14. Ramirez G, Cabral R, Patterson M, Schoenbachler BT, Bedell D, Smith BD, et al. Early identification and linkage to care for people with chronic HBV and HCV infection: the HepTLC initiative. Public Health Rep 2016;131(Suppl 2):5-11.
15. Spaulding A, Bowden C, Copeland B, Mustaafaa G, Heilpern K, Shah B. A tale of one city, two venues: comparing costs of routine rapid HIV testing in a high-volume jail and a high-volume emergency department, Atlanta, Georgia. Presented at the 20th Conference on Retroviruses and Opportunistic Infections; 2013 Mar 3–6; Atlanta, Georgia.
16. Spaulding AC, Kim MJ, Corpening KT, Carpenter T, Watlington P, Bowden CJ. Establishing an HIV screening program led by staff nurses in a county jail. J Public Health Manag Pract 2015;21:538-45.
17. Smith BD, Morgan RL, Beckett GA, Falck-Ytter Y, Holtzman D, Teo CG, et al. Recommendations for the identification of chronic hepatitis C virus infection among persons born during 1945–1965. MMWR Recomm Rep 2012;61(RR-4):1-32.
18. Luther Consulting LLC. EvaluationWeb®: Version 5. Carmel (IN): Luther Consulting LLC; 2013.
19. Larney S, Mahowald MK, Scharff N, Flanigan TP, Beckwith CG, Zaller ND. Epidemiology of hepatitis C virus in Pennsylvania state prisons, 2004–2012: limitations of 1945–1965 birth cohort screening in correctional settings. Am J Public Health 2014;104:e69-74.
20. Suryaprasad AG, White JZ, Xu F, Eichler BA, Hamilton J, Patel A, et al. Emerging epidemic of hepatitis C virus infections among young nonurban persons who inject drugs in the United States, 2006–2012. Clin Infect Dis 2014;59:1411-9.
21. Valdiserri R, Khalsa J, Dan C, Holmberg S, Zibbell J, Holtzman D, et al. Confronting the emerging epidemic of HCV infection among young injection drug users. Am J Public Health 2014;104:816-21.
22. Centers for Disease Control and Prevention (US). Surveillance for viral hepatitis—United States, 2013 [cited 2015 Dec 15]. Available from: http://www.cdc.gov/hepatitis/statistics/2013surveillance
23. Post JJ, Arain A, Lloyd AR. Enhancing assessment and treatment of hepatitis C in the custodial setting. Clin Infect Dis 2013;57 Suppl 2:S70-4.
24. Rich JD, Allen SA, Williams BA. Responding to hepatitis C through the criminal justice system. N Engl J Med 2014;370:1871-4.
25. Spaulding AC, Thomas DL. Screening for HCV infection in jails. JAMA 2012;307:1259-60.
26. Chou R, Clark EC, Helfand M; U.S. Preventive Services Task Force. Screening for hepatitis C virus infection: a review of the evidence for the U.S. Preventive Services Task Force. Ann Intern Med 2004;140:465-79.