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Hepatitis Outreach Network: A practical strategy for hepatitis screening with linkage to care in foreign-born communities

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Background & Aims: Many foreign-born persons in the US are at high risk of chronic hepatitis B (HBV) and C (HCV) infections, yet are not aware of their infection, and lack healthcare coverage or linkage to care.

Methods: A unique partnership, the Hepatitis Outreach Network, combines the expertise and resources of the Mount Sinai School of Medicine, the NYC Department of Health and Mental Hygiene, and community-based organizations, to provide education, screening and link to care in communities with high prevalence of chronic viral hepatitis. Comprehensive HBV and HCV screening identifies infected patients, who then receive further evaluation from either local or Mount Sinai physicians, combined with patient-navigators who organize follow-up visits.

Results: Of 1603 persons screened, 76 had HBV and 75 had HCV. Importantly, screening for HCV based on traditional risk factors would have missed 67% of those who tested positive. Of the 76 persons with HCV infection, 49 (64%) received a medical evaluation (26 with local providers and 23 at Mount Sinai). Of the 49 HCV-infected persons evaluated, treatment was recommended in 11 and begun in 8 (73%). Of the 76 persons with HBV infection, 43 (57%) received a medical evaluation (31 with local providers and 12 at Mount Sinai). Of the 43 HBV-infected persons evaluated, treatment was recommended and begun in 5 (100%).

Conclusions: Hepatitis Outreach Network has successfully established novel proof of concept for identifying HBV and HCV infections in foreign-born persons through use of several unique elements that effectively link them to care.

Introduction

Chronic infection with hepatitis B virus (HBV) and/or hepatitis C virus (HCV) can lead to cirrhosis, liver cancer, and death. In the US, HBV causes 3000–4000 deaths each year and HCV causes 8000–13,000 deaths each year [1,2]. Many of these deaths are preventable with early diagnosis and appropriate treatment [3–5].

Early diagnosis of persons with HBV and/or HCV infection has been difficult. Because 70% of new HBV infections and 80% of new HCV infections are asymptomatic [6,7], and more than 60% of persons with chronic HBV and/or HCV infection are asymptomatic [8], early diagnosis has relied on screening for asymptomatic disease. Screening recommendations for HBV and HCV infection by the Centers for Disease Control and Prevention (CDC) and the American Association for the Study of Liver Diseases (AASLD) target persons at high risk for these infections [2,8–12]. However, many persons at high risk for HBV and/or HCV do not have regular access to healthcare and 75% of infected persons remain unaware of their infection [1].

Many foreign-born persons at high risk of HBV and HCV infection are not enrolled in healthcare [1,13] and therefore unlikely to be screened for these infections. Reasons include low socioeconomic status, undocumented status, limited English proficiency, and lack of familiarity with the US health care system [14]. Many programs have offered screening outside the traditional medical system to overcome some of these barriers [15–18].

After diagnosis of HBV and/or HCV infection, infected persons must be evaluated within the traditional medical system to determine if medical treatment is appropriate. While many screening programs have diagnosed HBV and HCV infections in foreign-born persons, many of the persons with newly-diagnosed infection have not been linked to care or evaluated for treatment [16,19–21].

Members of the Mount Sinai School of Medicine Division of Liver Diseases designed an education and screening program outside the traditional medical system targeting foreign-born persons at high risk of HBV and/or HCV infection to provide services that simplify the process of linking to care.

Keywords: Epidemiology; Patient navigators; Viral hepatitis; Testing; Treatment.
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Abbreviations: HBV, hepatitis B virus; HCV, hepatitis C virus; CDC, Centers for Disease Control and Prevention; AASLD, American Association for the Study of Liver Diseases; HONE, Hepatitis Outreach Network; MSSM, Mount Sinai School of Medicine; NYC DOHMH, New York City Department of Health and Mental Hygiene; CBO, Community Based Organization; PN, Patient Navigator; FQHC, federally qualified health center; PSA, public service announcement; HBsAg, hepatitis B surface antigen; HBcAb, hepatitis B core antibody; HBsAb, hepatitis B surface antibody; HCV Ab, hepatitis C antibody; ALT, serum alanine transferase; DAA, direct acting antiviral; IDU, Injection Drug Use; HIV, Human Immunodeficiency Virus; HEALS, Hepatitis C Education and Liver Screening; IOM, Institute of Medicine; SFHBF, San Francisco Hep B Free.

Patients and methods

The Hepatitis Outreach Network (HONE) is a collaboration of the Mount Sinai School of Medicine (MSSM), the New York City Department of Health and Mental Hygiene (NYC DOHMH), and community-based organizations (CBOs), and was designed in 2009 by members of the MSSM Division of Liver Diseases to link foreign-born persons with HBV and/or HCV infection to care. The program provides education and screening events in communities with high prevalence of HBV and/or HCV infection in the New York Metropolitan Area, free HBV vaccine when appropriate, and facilitated linkage to care for persons with HBV and/or HCV infection.

The HONE collaboration was formed by first identifying communities of foreign-born persons with a high prevalence of HBV and/or HCV infection in the metropolitan New York City area using 2006 and 2007 surveillance report data and guidance from NYC DOHMH [22]. CBOs in the identified communities were invited to join the HONE team and assisted in choosing the event venues, identified and trained patient navigators (PNs) and collaborated with MSSM, NYCDOHMH, and federally-qualified health centers (FQHC) in developing a HONE provider list of local healthcare workers with expertise in evaluation and treatment of HBV and HCV infection. Venues were chosen based on "pedestrian-traffic" patterns and most were outside traditional health care settings (e.g., clinics and hospitals). Non-traditional venues included public schools, places of worship, YMCA's, public parks, hotels, business centers, and train stations.

Publicity for the education and screening events was targeted to foreign-born persons in each community by messaging in both English and the language of the country of origin. Printed advertisements were posted throughout the community. Radio stations, television stations, and newspapers presented public service announcements (PSA) with the time, date, and location of the events.

Bilingual health care providers gave the educational portion of each event, which was held either several weeks before, or on the day of the screening. Participants learned of the asymptomatic nature of HBV and HCV infection, the long-term complications of chronic infection including cirrhosis, liver cancer, and death, the benefits of early detection and treatment, and the opportunity for prevention with vaccination and condom use.

At the screening portion, bilingual volunteers navigated the informed consent process with each participant. All participants provided written informed consent and the study protocol conformed to the ethical guidelines of the Declaration of Helsinki as reflected in a priori approval by the MSSM Institutional Review Board. After providing consent, participants completed a self-administered, printed survey in English or in the language of their country of origin. The survey included questions on demographics, socioeconomic status, medical history, family history, and traditional risk factors for HBV and HCV infection. All surveys were written at a 6th grade reading level. To ensure survey accuracy in languages other than English, surveys were translated into the language of the country of origin, then back translated, and revised until the back translation was consistent with the original. After participants completed the survey, trained phlebotomists drew a single tube of their blood (<10 cc). The blood was tested at the MSSM Clinical laboratories for hepatitis B surface antigen (HBsAg), hepatitis B core antibody (HBcAb), hepatitis B surface antibody (HBsAb), hepatitis C antibody (HCV Ab) and serum alanine transferase (ALT). Persons with HBsAg in their serum were defined as having HBV infection, persons with HBcAb and/or HBsAb were defined as being immune to HBV infection, and persons without HBsAg, HBcAb, and HBsAb were defined as being HBV vaccine eligible. Persons with HCV Ab were defined as having HCV infection. Laboratory studies were completed within 3 days after each event.

PNs made at least six telephone calls at three different times of the day to reach participants, provide blood test results and provide follow-up recommendations. Persons not reached within six months were considered lost to follow-up. Participants who were HBV vaccine eligible were encouraged to get vaccinated. Free vaccines were available at the site of screening, the MSSM Liver Medicine Practice, and city immunization centers.

Participants with HBV or HCV infection were encouraged by PNs to receive a full medical evaluation from a health care provider. Initially, local primary care providers and subspecialty providers on the HONE provider list were recommended because their location in the communities made them easily accessible. A PN that was based in the community-based organizations, contacted participants and invited them to see local providers in their community. To help increase uptake into care by offering additional alternatives for attending follow-up appointments, in October 2010 this process was modified. A PN at MSSM was designated to make all phone calls and free full medical evaluations at MSSM were offered and recommended. PNs encouraged adherence to follow-up care by scheduling visits, providing reminders via telephone and postcards, and meeting the patient on the appointment day and escorting them throughout their visit at the medical center. Participants who came to the MSSM Liver Medicine Practice were reimbursed for transportation.

Table 1. HONE overall demographics.

Characteristic	n (%)	National average
Age		
Median (IQR)	51 (38, 61)	37.2
Sex, female	860 (54)	50.6%
Insurance	699 (44)	83.3%
Primary care physician	680 (43)	n.a.
Household income		$49,777 median
<15 K	393 (52)	
15-25 K	126 (17)	
25-50 K	123 (16)	
50-75 K	40 (5)	
>75 K	66 (9)	
Education		87% high school graduate
≤8th grade	613 (39)	
9-12	107 (7)	
Attended college	195 (12)	
Associate/ Bachelor's degree	370 (24)	
Post-graduate	284 (18)	

n.a., not available.

The full medical evaluation at the MSSM Liver Medicine Practice included a medical history and physical exam performed by a practicing hepatologist, a variety of blood tests (complete blood count including platelets, comprehensive metabolic panel, and coagulation profile) including those to measure the synthetic function of the liver to determine the available treatment options (HBV and/or HCV viral load, and HCV genotyping), and an abdominal ultrasound to screen for hepatocellular carcinoma.

Persons with HBV infection were recommended treatment based on the algorithm in the AASLD Treatment Guidelines [11]. Persons with HCV infection were recommended treatment based on HCV viral load per the AASLD Treatment Guidelines (i.e., patients with detectable virus were recommended for further evaluation and treatment) [9]. Given the timing of the HONE project and expected approval of the new direct acting antiviral (DAA) medication for treatment of HCV infection in May 2011, some HCV-infected patients received recommendations to wait for these approvals. Persons with undetectable HCV viral load, which suggests spontaneous viral clearance, were counseled that further treatment was not required.

MSSM Liver Medicine Practice did not offer care to participants after the full medical evaluation. Participants who received recommendations to start treatment immediately, or when new treatments would be available, were navigated to seek their primary care providers, if they had one, or to FQHCs, if they did not. Participants, particularly those without insurance, were directed to FQHCs and given information on how to try to obtain insurance and follow-up care. For these individuals, the MSSM-based PN called a previously-identified point person at a local FQHC in the borough of residence, scheduled an appointment, and later called participants to remind them of their FQHC appointment. Participants were contacted 6 months after their full medical evaluation to determine which recommendations were followed.

Results

As of July 30, 2011, 1603 persons were educated and screened at 25 events held in New Jersey and three boroughs of New York City, Manhattan, Brooklyn and Queens. There were 6 events targeting Chinese communities, 4 for Korean, 4 for Egyptian, 2 for Former Soviet Union, 2 for Dominican Republic, and 3 for African and Afro-Caribbean communities (Supplementary data). All events except for one, found persons with HBV and/or HCV infection.

The median age of the study sample was 51 years (IQR 38, 61) and 54% were women (Table 1). Study participants were born in 68 different countries. Compared to national US population

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Table 2. Demographic characteristics of Hepatitis Outreach Network (HONE), New York, NY, 2009–2011 (n = 1603).

Characteristic	HBsAg+ n = 76 (%)	HBsAg- n = 1516 (%)	*p* value	HCV Ab+ n = 75 (%)	HCV Ab- n = 1528 (%)	*p* value
History of liver disease						
Yes	35 (46)	118 (8)	<0.001*	33 (45)	118 (8)	<0.001*
No	41 (54)	1322 (92)		41 (55)	1322 (92)	
Age (mean, ± SD)	46.9 (± 14.7)	49.7 (± 15.3)	0.10#	52.2 (± 12.7)	49.5 (± 15.4)	0.08#
Sex						
Males	46 (61)	686 (45)	0.01*	51 (69)	681 (45)	<0.0001*
Females	30 (39)	830 (55)		23 (31)	837 (55)	
Country of origin with positive persons						
Brazil	0	5 (0.3)		1 (1)	4	
Burkina Faso	0	2 (0.1)		1 (1)	1	
China	38 (50)	238 (16)		3 (4)	273	
Dominican Republic	1 (1)	9 (0.6)		0	10	
Ecuador	0	9 (0.6)		1 (1)	8	
Egypt	0	191 (13)		29 (39)	162	
Haiti	0	12 (0.8)		1 (1)	11	
Hong Kong	1 (1)	18 (1)		0	19	
India	0	13 (1)		1 (1)	12	
Japan	7 (9)	98 (6)		5 (7)	100	
Malaysia	0	51 (3)		1 (1)	50	
Morocco	0	13 (0.9)		1 (1)	12	
Philippines	1 (1)	8 (0.5)		0	9	
Puerto Rico	0	15 (1)		4	11	
Russia	2 (3)	30 (2)		1	31	
Saudi Arabia	0	1 (0.1)		1 (1)	0	
Senegal	0	4 (0.3)		1 (1)	3	
Singapore	0	2 (0.1)		0	2	
South Korea	15 (20)	332 (22)		5 (7)	342	
Syria	1 (1)	0		0	1	
Taiwan	7 (9)	89 (6)		2 (3)	94	
Ukraine	0	23 (2)		2 (3)	21	
United States	1 (1)	141 (9)		15 (20)	127	
Uzbekistan	1 (1)	7 (0.5)		0	8	
Yemen	1 (1)	28 (2)		0	29	
Birth in a high prevalence country (>2% HBsAg+)						
Yes	75 (99%)	1382 (91%)	0.01∫			
No	1 (1%)	141 (9%)				
Birth in a high prevalence country (>2% HCV Ab+)**						
Yes				45 (60)	703 (46)	0.02*
No				30 (40)	822 (54)	
Born between 1945-1964						
Yes				41 (55)	724 (48)	0.24*
No				34 (45)	794 (52)	

*Chi-Square analysis.
∫Fisher's exact analysis.
#*T*-test.
**Data from WHO (1998) Burkina Faso, Egypt, Haiti, Japan, Saudi Arabia, Russia, Taiwan, and Ukraine.

estimates [23–25], the study sample had a lower percentage of high school graduates (54% compared to 87%), lower median household income (<15,000$ compared to 49,777$), and lower percentage of health insurance coverage (44% compared to 83%). Of the 1603 persons screened, 76 persons had HBV infection, 424 were previously vaccinated for HBV, 595 eligible for vaccination with HBV vaccine, and 75 had HCV infection.

Participants with HBV

HBV-infected participants were born in 12 different countries (Table 2). In this study sample, countries of origin with the highest prevalence of HBV infection were China (50%), South Korea (20%), Japan (9%), and Taiwan (9%). Of the 76 participants with HBV infection, 28 (37%) answered, "Yes" when asked, "Have

Table 3. Traditional risk factors for HBV+.

	HBsAg+ (n = 76)	HBsAg- (n = 1513)	Prevalence ratio	*p* value
Birth in high prevalence country (≥2% HBsAg+)				
Yes	75 (99)	1382 (91)	7.40 [1.04, 52.83]	0.01[∫]
No	1 (1)	141 (9)		
IDU				
Yes	1 (1)	54 (4)	0.37 [0.05, 2.61]	0.52[∫]
No	75 (99)	1431 (96)		
STD				
Yes	5 (7)	70 (5)	1.43 [0.59, 3.44]	0.43*
No	70 (93)	1410 (95)		
MSM				
Yes	0	28 (2)	n.d.	0.64[∫]
No	74 (100)	1446 (98)		
HIV				
Yes	2 (3)	7 (0.5)	4.79 [1.38, 16.59)	0.06[∫]
No	72 (97)	1479 (99.5)		
Inmate/correctional				
Yes	1 (1)	32 (2)	0.63 [0.09, 4.39]	1.00[∫]
No	73 (99)	1441 (98)		
Dialysis				
Yes	0	4 (0.3)	n.d.	1.00[∫]
No	75 (100)	1485 (99.7)		
Unprotected sexual intercourse				
Yes	24 (33)	681 (47)	0.59 [0.36, 0.95]	0.03*
No	48 (67)	782 (53)		
Family members with liver disease				
Yes	21 (40)	185 (14)	3.60 [2.12, 6.11]	<0.001*
No	32 (60)	1097 (86)		
Mother with hepatitis				
Yes	7 (9)	32 (2)	3.99 [1.96, 8.11]	<0.001*
No	68 (91)	1442 (98)		

*Chi-Square analysis.
[∫]Fisher's exact analysis.
n.d., not determined.

you ever been diagnosed with liver disease including viral hepatitis?"

In univariate analysis of traditional risk factors for HBV, birth in an HBV high prevalence country (prevalence of HBsAg $\geqslant$2%), family history of liver disease, unprotected sexual intercourse, and mother with viral hepatitis were significantly associated ($p \leqslant 0.05$) with HBV infection (Table 3). Of all traditional risk factors, birth in an HBV high-prevalence country captured the largest percentage (99%) of HBV-infected persons in our sample, with 48 (63%) having no other traditional HBV risk factors.

Of the 76 persons with HBV infection, 43 (57%) have received a full medical evaluation; 31 with their local providers and 12 with the MSSM team (Fig. 1). Of the 31 persons with HBV infection who were evaluated by a local provider, treatment was not recommended in 27 persons, and treatment was recommended and begun in 4 persons. Of the 12 persons with HBV infection who were evaluated at MSSM, treatment was not recommended in 11 persons, and treatment was recommended and begun in one person. Treatment was not recommended for persons who had low or undetectable viral loads.

HCV-infected participants were born in 17 different countries (Table 2). In this study sample, the countries of origin with the highest prevalence of HCV infection were Egypt (39%), United States (20%), South Korean (7%), and Japan (7%). Of the 75 participants with HCV infection, 29 (39%) answered "Yes" when asked "Have you ever been diagnosed with liver disease including viral hepatitis?"

In univariate analysis of traditional risk factors for HCV [26], injecting drug use (IDU), HIV infection, and prior blood transfusion were significantly associated ($p \leqslant 0.05$) with HCV infection (Table 4). If we had only screened for HCV in persons with traditional HCV risk factors [26] rather than all patients, only 25 (33%) of the 75 HCV-infected persons would have learned of their infection. If we had screened for HCV in persons with traditional HCV risk factors and/or persons who were born from 1945 to 1965 (consistent with recent CDC guidelines [12]), only 52 (69%) of the 75 HCV-infected persons would have been diagnosed. If we had screened for HCV in persons with traditional HCV risk factors and/or persons who born from 1945 to 1964 and/or persons who were born in countries in which the prevalence of HCV is >2% (data

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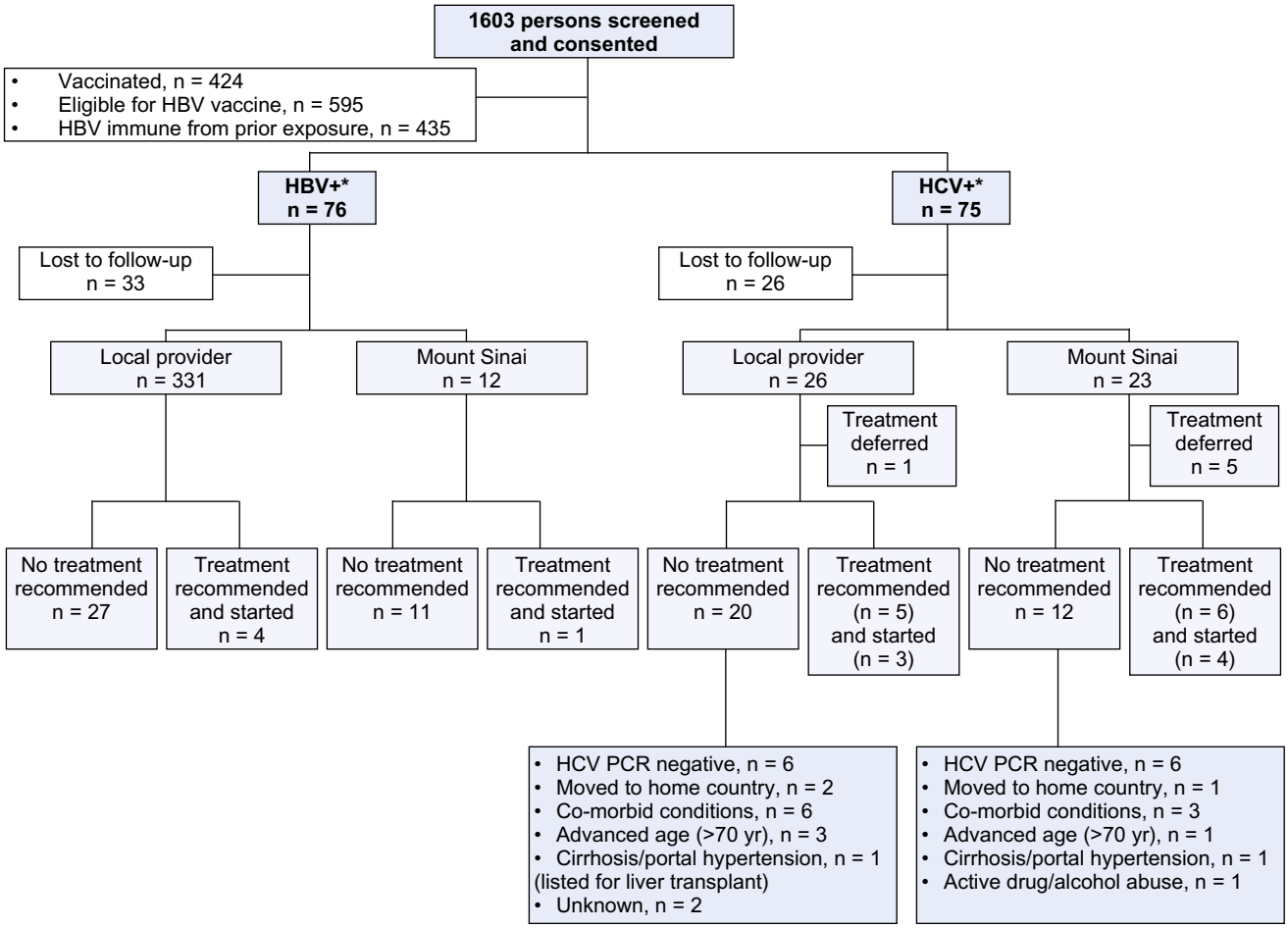

Fig. 1. HONE flow diagram. *Two persons were dual infected HBV-HCV.

from World Health Organization: China, Burkina Faso, Egypt, Haiti, Japan, Saudi Arabia, Russia, Taiwan, Ukraine) [27], 67 (89%) of the 75 HCV-infected persons would have been diagnosed.

Of the 75 persons with HCV infection, 49 (64%) had a full medical evaluation documented; 26 with their local health provider and 23 with the MSSM team (Fig. 1). Of the 23 persons with HCV infection evaluated at MSSM, treatment was not recommended for 12 persons, treatment was recommended in 6 persons and begun in 4 persons, and deferred treatment was recommended for 5 persons. Of the 26 persons with HCV infection evaluated by a local provider, treatment was not recommended in 20 and treatment was recommended for 5 patients and begun in 3 persons, and deferred treatment was recommended for 1 person. Persons who were recommended to receive deferred treatment were genotype 1 and encouraged to wait for FDA approval of DAAs. Reasons for not recommending treatment included HCV RNA PCR negative, planned move back to their country of origin, evidence of cirrhosis with portal hypertension, co-morbid conditions, and advanced age.

Discussion

HONE successfully screened foreign-born persons at risk of HBV and/or HCV infection and diagnosed HBV and HCV infections in persons unaware of their infection(s). This program has successfully linked newly diagnosed patients to medical care and treatment where appropriate.

HONE's successful recruitment into screening of foreign-born persons at high risk of HBV and/or HCV may be due to the engagement of CBOs and by employing languages of country of origin in publicizing the events. Other programs using these methods have also successfully recruited populations with a high prevalence of HBV and/or HCV. Since 2001, the Asian Liver Center at Stanford University's Jade Ribbon Campaign has engaged over 400 CBOs in targeting Chinese communities using PSAs in local Chinese newspapers [28]. Of 476 persons screened for HBV infection, 60 (13%) were infected. From 2004 to 2008, BFreeNYC engaged CBOs, FQHCs and academic institutions to target Chinese and Korean communities using radio and cable television PSAs [29]. Of 5077 persons newly screened for HBV infection, 601 (12%) were infected. In 2011, Vierling *et al.* engaged local CBO's and academic institutions in targeting Chinese and Vietnamese communities using PSAs [17].

HONE is the first group to our knowledge that has reached out to non-traditional venues for HBV and HCV screening. Non-traditional venues were chosen by partnering CBOs based on their knowledge and expertise of their community. Non-traditional venues included places that community members frequented often and trusted. While it is likely that use of local settings in

Table 4. Traditional risk factors for HCV+[**].

	HCVAb+ (n = 76)	HCVAb- (n = 1513)	Prevalence ratio	*p* value
IDU				
Yes	20 (27)	35 (2)	10.13 (6.55, 15.69)	<0.0001*
No	54 (79)	1451 (98)		
HIV				
Yes	3 (4)	6 (0.4)	7.28 (2.81, 18.86)	<0.007[∫]
No	71 (96)	1480 (99.6)		
Blood transfusion				
Yes	15 (20)	169 (11)	1.90 (1.10, 3.28)	0.02*
No	59 (80)	1315 (89)		
Dialysis				
Yes	0 (0)	4 (0.3)	n.d.	1.000[∫]
No	75 (100)	1485 (99.7)		
Health care professional				
Yes	5 (7)	93 (6)	1.06 (0.44, 2.58)	0.89*
No	70 (93)	1390 (94)		
Mother with hepatitis				
Yes	4 (5)	35 (2)	2.21 (0.85, 5.76)	0.11[∫]
No	70 (95)	1440 (98)		

*Chi-Square analysis.
∫Fisher's exact analysis.
**From CDC HCV screening guidelines (1998).
n.d., not determined.

non-traditional places overcomes barriers like inconvenience or fear of the traditional healthcare system, the success of this approach is not measureable. A high percentage of infected persons received a full medical evaluation in the HONE program. Currently, in the absence of patient navigation, less than half of persons infected with chronic viral hepatitis are referred for appropriate care [19]. Furthermore, less than 25% of CHB patients receive necessary drug treatment, out of an estimated 25–50% of diagnosed CHB patients who are eligible for treatment under accepted guidelines [19]. Additionally, in select populations, follow-up rates for HCV infected persons have been reported to be 20% or less [20]. PNs can provide a vital link between patients and medical providers by using a creative set of approaches including acting as a physical escort and point of contact, providing important health education to address disease and health beliefs, providing psychosocial support, and increasing adherence to care. PNs were originally suggested by Freeman and colleagues as a method to improve access to medical services for low-income minority patients [30]. For example, utilizing PNs was shown to effectively increase rates for breast and colon cancer screening. PNs have improved routine clinical follow-up in primary care practice and the Hepatitis C Education and Liver Screening (HEALS) program at MSSM [31].

At least 10% of persons with chronic HCV infection do not fall within the current high-risk groups to target for screening [32]. The National Health and Nutrition Examination Survey III data suggests that HCV prevalence is highest among US residents born from 1945 to 1965 (Baby Boomer Birth Cohort) [33]. In an effort to diagnose more infected persons, the CDC recently approved the addition of the Baby Boomer Birth Cohort to the list of groups at high risk for HCV infection. This study supports the addition of CDC's proposed Birth Cohort screening.

Like HBV infection, there are countries outside the US that have a higher prevalence of HCV infection yet, screening for HCV in foreign-born communities is currently not pursued. An Institute of Medicine (IOM) report states that screening of Egyptian immigrants to the US should be considered. HONE data supports the IOM's recommendation to consider screening in persons born in Egypt and also supports targeted screening in persons born in countries with HCV prevalence of >2%. Data from other studies is needed.

The HONE program continues to be refined. HONE is seeking better tracking methods to follow all persons diagnosed with infection or those identified as HBV vaccine-eligible. Several persons who sought screening reported previous liver infection. More data on these previous infections is needed. Additionally, more data is needed on barriers and facilitators for attending a full medical evaluation after being diagnosed and currently, a qualitative study is under way to help answer, identify, and understand these factors.

Finally, the HONE program has potential for replication in other communities outside of New York City. Through partnership of an academic medical institution, CBOs, federally qualified health centers and the local city departments of health, the HONE program has demonstrated the capacity and ability to educate, screen, and link HBV and HCV infected persons to care.

HONE was successful at recruiting foreign-born persons to screening events, diagnosing new cases of HBV and HCV infection, and linking persons with infection to care. The success of community-partnerships, use of language of origin in recruiting foreign-born persons to screening events, use of non-traditional venues for education and screening, and use of PNs to provide extra assistance may improve the success rate in other places with similar communities.

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Conflict of interest

Douglas Dieterich has received honoraria from and provided consulting for Merck, Vertex Pharmaceuticals, Gilead and Chronic Liver Disease Foundation

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Supplementary data

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