

Hepatitis Awareness Month and National Hepatitis Testing Day — May 2014

In the United States, May is Hepatitis Awareness Month, and May 19 is National Hepatitis Testing Day. Although care and treatment can be life-saving, many of the estimated 800,000 to 1.4 million persons living with hepatitis B virus (HBV) infection and the estimated 3 million persons living with hepatitis C virus (HCV) infection are unaware of their infection and are not receiving necessary care and treatment (1). Guided by the goals of the 2014 U.S. Department of Health and Human Services *Action Plan for the Prevention, Care, and Treatment of Viral Hepatitis* (1), CDC is working to expand access to HBV and HCV testing, care, and treatment. This issue of *MMWR* reports on the progress of these CDC activities in reaching the national prevention goals.

The first report examines projects (based on the Project ECHO model of videoconference and case-based learning) to strengthen HCV primary care capacity in Arizona and Utah. In the second report, programs in three sites (New York City, Minneapolis-St. Paul, and San Diego) targeted HBV testing for persons born in countries where HBV infection is endemic ($\geq 2\%$ prevalence). Both programs were successful in reaching persons in underserved populations (in predominantly rural settings for hepatitis C and among foreign-born persons for hepatitis B) and linking them to appropriate care and treatment. Broader expansion of programs like these will help prevent HBV and HCV transmission and disease.

Reference

1. US Department of Health and Human Services. Combating the silent epidemic of viral hepatitis: action plan for the prevention, care, and treatment of viral hepatitis. Washington, DC: US Department of Health and Human Services; 2014. Available at <http://aids.gov/pdf/viral-hepatitis-action-plan.pdf>.

Expanding Primary Care Capacity to Treat Hepatitis C Virus Infection Through an Evidence-Based Care Model — Arizona and Utah, 2012–2014

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Hepatitis C virus (HCV) infection is the leading reason for liver transplantation and a common cause of hepatocellular carcinoma, the most rapidly increasing cause of cancer-related deaths in the United States (1,2). Of the approximately 3 million persons living with HCV infection in the United States, an estimated 38% are linked to care, 11% are treated, and 6% achieve cure (3). Recent development of highly effective and well-tolerated medications, such as sofosbuvir and simeprevir, to treat chronic HCV infection shows promise in curbing rising HCV-related morbidity and mortality, with the potential to cure >90% of patients. To fully benefit from these new treatments, improvement in linkage to care and treatment is urgently needed.* Lack of provider expertise in HCV treatment

*Information available at <http://www.hcvguidelines.org>.

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and limited access to specialists are well-documented barriers to HCV treatment (4,5). In September 2012, CDC funded programs in Utah and Arizona to improve access to primary care providers with the capacity to manage and treat HCV infection. Both programs were modeled on the Extension for Community Healthcare Outcomes (Project ECHO), developed by the University of New Mexico's Health Sciences Center in 2003 to build primary care capacity to treat diseases among rural, underserved populations through videoconferencing and case-based learning in "teleECHO" clinics. To assess the effectiveness of these programs in improving primary care provider capacity and increasing the number of patients initiating treatment, process and patient outcome data for each state program were analyzed. In both states, Project ECHO was successfully implemented, training 66 primary care clinicians, predominantly from rural settings. Nearly all (93%) of the clinicians had no prior experience in care and treatment of HCV infection. In both states combined, 129 (46%) of HCV-infected patients seen in teleECHO clinics received antiviral treatment, more than doubling the proportion of patients expected to receive treatment (3). These findings demonstrate Project ECHO's ability to expand primary care capacity to treat HCV infection, notably among underserved populations.

Project ECHO was designed to build primary care clinicians' capacity to treat chronic, common, and complex diseases through weekly teleECHO clinics called "Knowledge Networks," in which primary care clinicians present their cases, through videoconferencing, to specialists who provide advice

and clinical mentoring. Working together and supplemented with short didactic presentations (e.g., on HCV diagnosis and management) by interdisciplinary experts, the community-based providers and specialists manage patients following evidence-based protocols.

From September 30, 2012, to February 28, 2014, ECHO programs in Utah and Arizona recruited providers serving populations at increased risk for HCV infection (e.g., persons born during 1945–1965) and in areas with a shortage of HCV specialists. Providers with an interest in treating HCV infection and access to videoconferencing technology (e.g., access to a webcam and software provided by Project ECHO) were eligible to participate. Utah targeted community-based providers in seven neighboring states (Oregon, California, Idaho, Utah, Montana, Wyoming, and Colorado) with an estimated population of 10 million, 60% of whom resided in rural settings. Arizona recruited community-based providers within nine of Arizona's 15 counties, representing approximately 90% of the state's population of nearly 7 million.

Utah recruited providers throughout the project period via outreach at professional societies, departments of health, community-based organizations, and university-based referral clinics. Arizona recruited all providers within the first 3 months of the project through outreach at community health centers. In both states, Project ECHO staff initially visited providers to train them in HCV diagnosis and management and in the protocol for patient presentation. Providers then began weekly participation in teleECHO clinic sessions, following

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the Project ECHO format, and lasting about 1 to 1.5 hours. Providers were eligible to receive continuing medical education credits. Utah's team of specialists consisted of a hepatologist, psychiatrist, and pharmacist; Arizona's team consisted of a hepatologist and nurse practitioner. In Utah, teleECHO clinics were held once weekly.

After the initial case presentation, providers were encouraged to attend sessions at specific time intervals (4, 8, 12, 24, and 48 weeks, and 6 months post-treatment) based on standards for monitoring treatment; three to 14 primary care clinicians attended each session (median = six). In Arizona, teleECHO clinics were held once weekly and were site-specific; one to 21 primary care clinicians attended each session (median = seven). Providers at each site were asked to present every patient, those newly diagnosed and those on treatment, at the weekly teleECHO clinic sessions. A monthly synchronous cohort treatment initiation approach was followed, where patients at each site were started on treatment in like timeframes and managed together as a cohort to simplify monitoring. At larger provider sites, an HCV coordinator supported providers in patient management (i.e., medication adherence and insurance enrollment). In Utah, the program collaborated with the local health department to identify HCV-infected patients requiring linkage to care and those who were lost to follow-up. Data from each state Project ECHO program (e.g., types of providers,

practice settings, patient characteristics, and clinical outcomes) are summarized in this report.

Over the 17-month period (September 30, 2012–February 28, 2014), a total of 90 unique attendees participated in teleECHO clinics in the two states; of these, 66 (73%) were primary care clinicians with practices in predominantly rural settings and at community health centers (Table 1). A total of 280 unique cases of chronic HCV infection were presented in teleECHO sessions (Table 2). In both states, cases were predominantly among persons who were U.S.-born, non-Hispanic white, and born during 1945–1965. A history of injecting drug use was known for 41.4% (116 of 280) of patients. A total 136 of patients seen were known to have health-care coverage; Medicaid was the most common type of coverage (61.8%) followed by private insurance (23.5%). HCV genotype 1 infection was the most common type of infection (62.9%). Of patients with an available aspartate aminotransferase (AST) to platelet ratio index (APRI)[†] score, 41% (100 of 243) had a score ≥ 1 , indicating the presence of advanced fibrosis or cirrhosis. Among 129 (46.1% of 280) patients who started treatment, 70.5% (91 of 129) were treated with an interferon-based regimen, and 26.4% (34 of 129) were treated with a

[†] APRI calculated as (AST [IU/L] / upper limit of normal AST [IU/L]) / platelets [$10^9/L$] $\times 100$.

TABLE 1. Number and percentage of clinicians participating in Project ECHO case-based learning clinics (teleECHO clinics), by selected characteristics — Arizona and Utah, September 30, 2012–February 28, 2014

Characteristic	Total		Utah		Arizona	
	No.	(%)	No.	(%)	No.	(%)
Total no. of sessions	179		47		132	
Total no. of attendees	1,722		304		1,418	
No. of unique attendees	90		39		51	
Occupation of attendees						
Physician (MD or DO degree)	44	(48.9)	23	(59.0)	21	(41.2)
Other clinician (RN, PA, or NP degree)	24	(26.7)	12	(30.8)	12	(23.5)
Pharmacist	4	(4.4)	2	(5.1)	2	(3.9)
Medical assistant	12	(13.3)	0	—	12	(23.5)
Students (medical, pharmacy, or nursing)	4	(4.4)	1	(2.6)	3	(5.9)
Other	2	(2.2)	1	(2.6)	1	(2.0)
No. of unique primary care clinician attendees*	66	(73.3)	35	(89.7)	31	(60.8)
Practice setting of primary care clinicians*†						
Urban	15	(22.7)	14	(40.0)	1	(3.2)
Rural	51	(77.3)	21	(60.0)	30	(96.8)
Practice type of primary care clinicians*†						
Community health center (federally qualified health centers)	32	(48.5)	12	(34.3)	20	(64.5)
Private practice	8	(12.1)	8	(22.9)	0	—
Hospital-affiliated practice	16	(24.2)	8	(22.9)	8	(25.8)
Academic medical center	4	(6.1)	4	(11.4)	0	—
Indian Health Service	4	(6.1)	3	(8.6)	1	(3.2)
Church-sponsored indigent care clinic	2	(3.0)	0	—	2	(6.5)
Primary care clinician without prior experience in treating HCV*†	62	(93.3)	32	(91.4)	30	(96.8)

Abbreviations: ECHO = Extension for Community Healthcare Outcomes; HCV = hepatitis C virus.

* With an MD, DO, NP, or PA degree.

† Denominator is the number of unique primary care clinicians.

TABLE 2. Number and percentage of HCV-infected patients seen in Project ECHO case-based learning clinics (teleECHO clinics), by selected characteristics — Arizona and Utah, September 30, 2012–February 28, 2014

Characteristic	Total		Arizona		Utah	
	No.	(%)	No.	(%)	No.	(%)
Total no. of patients	280	(100.0)	159	(100.0)	121	(100.0)
Birth country						
U.S.-born	203	(72.5)	84	(52.8)	119	(98.3)
Foreign-born (Mexico)	5	(1.8)	3	(1.9)	2	(1.7)
Unknown/missing	72	(25.7)	72	(45.3)	0	—
Median age (range) (yrs)	55 (17–75)		55 (17–74)		52.75 (23–75)	
Birth year						
Before 1945	10	(3.6)	8	(5.0)	2	(1.7)
1945–1965	200	(71.4)	111	(69.8)	89	(73.6)
After 1965	70	(25.0)	40	(25.2)	30	(24.8)
Race/Ethnicity						
Non-Hispanic black	6	(2.1)	2	(1.3)	4	(3.3)
Non-Hispanic white	177	(63.2)	75	(47.2)	102	(84.3)
Hispanic	27	(9.6)	19	(11.9)	8	(6.6)
American Indian/Alaska Native	15	(5.4)	11	(6.9)	4	(3.3)
Unknown/missing	55	(19.6)	52	(32.7)	3	(2.5)
Health insurance						
Yes	136	(48.6)	76	(47.8)	60	(49.6)
No	35	(12.5)	14	(8.8)	21	(17.4)
Unknown/missing	109	(38.9)	69	(43.4)	40	(33.1)
Type of health-care coverage*						
Medicare	18	(13.2)	15	(19.7)	3	(5.0)
Medicaid	84	(61.8)	46	(60.5)	38	(63.3)
Private	32	(23.5)	15	(19.7)	17	(28.3)
Other public	2	(1.5)	0	—	2	(3.3)
None	35	(25.7)	14	(18.4)	21	(35.0)
Unknown/missing	109	(80.1)	69	(90.8)	40	(66.7)
HCV risk factor						
Known injection drug use ever	116	(41.4)	50	(31.4)	66	(54.5)
Known injection drug use within 12 mos	1	(0.4)	0	—	1	(0.8)
Unknown injection drug use	164	(58.6)	109	(68.6)	55	(45.5)
Known HIV infection	3	(1.1)	1	(0.6)	2	(1.7)
AST to platelet ratio index†						
<1	143	(51.1)	96	(60.4)	47	(38.8)
>1	100	(35.7)	47	(29.6)	53	(43.8)
Unknown/missing	37	(13.2)	16	(10.1)	21	(17.4)
Genotype						
1	176	(62.9)	94	(59.1)	82	(67.8)
2	39	(13.9)	20	(12.6)	19	(15.7)
3	36	(12.9)	20	(12.6)	16	(13.2)
4	3	(1.1)	2	(1.3)	1	(0.8)
Unknown/missing	26	(9.3)	23	(14.5)	3	(2.5)
Started on treatment for HCV infection	129	(46.1)	81	(50.9)	48	(39.7)
Treatment regimen‡						
Pegylated interferon + ribavirin	30	(23.3)	12	(14.8)	18	(37.5)
Pegylated interferon + ribavirin + telaprevir	54	(41.9)	39	(48.1)	15	(31.3)
Pegylated interferon + ribavirin + boceprevir	7	(5.4)	1	(1.2)	6	(12.5)
Sofosbuvir + simeprevir	6	(4.7)	6	(7.4)	0	—
Sofosbuvir + Pegylated interferon + ribavirin	18	(14.0)	13	(16.0)	5	(10.4)
Sofosbuvir + ribavirin	10	(7.8)	10	(12.3)	0	—
Unknown/missing	4	(3.1)	0	—	4	(8.3)

Abbreviations: ECHO = Extension for Community Healthcare Outcomes; HCV = hepatitis C virus; HIV = human immunodeficiency virus; AST = aspartate aminotransferase.

* Denominator is the number of patients with health-care coverage.

† Calculated as (AST [IU/L] / upper limit of normal AST [IU/L]) / platelets [10⁹/L] x 100.

‡ Denominator is number of patients who started treatment.

regimen containing sofosbuvir, a drug approved in December 2013. Arizona and Utah started treatment with a sofosbuvir-based regimen in 35.8% (29 of 81) and 10.4% (five of 48) of patients, respectively, during December 2013–February 2014.

Discussion

The implementation of the Project ECHO model in two states demonstrated the utility of this care model in expanding the capacity of primary care clinicians to treat HCV infection. By building collaborations with specialists facilitated by regular videoconferencing, both states recruited and trained clinicians from predominantly rural settings. Almost all (93.9%) of the primary care clinicians had no prior experience in managing HCV infection. Approximately 46% of all patients seen started treatment, a proportion that was more than twice that observed from a CDC study in which 14%–22% of those detected started treatment (3). In a study comparing care delivered by specialists in an HCV clinic at an academic medical center with HCV care and treatment delivered by primary care providers participating in teleECHO clinics, investigators found that care at both settings was equally safe and effective in achieving cure (6). Project ECHO also has been shown to develop knowledge and self-efficacy among participating primary care providers to deliver best-practice care for chronic HCV infection (7).

Each state adapted the Project ECHO model to fit expected needs of its program. In Utah, the health department played an important role in case finding, including those lost to follow up, whereas in Arizona, hepatitis C coordinators were hired to assist clinicians with case management. Arizona also had more frequent presentations (each patient was seen every week), and treatment initiations were synchronized by site.

The findings in this report are subject to at least four limitations. First, treatment completion among some patients who started treatment could not be assessed because patients were either on treatment or had completed therapy and had pending laboratory data at the time of this evaluation. Second, the reasons that treatment was not initiated for some patients could not be assessed. Third, the analysis did not compare differences between Project ECHO implementation in each state and patient treatment decisions. Finally, both Utah and Arizona had either developed a Project ECHO–based program or were in the process of developing it during the 1 year before September 2012; therefore, these state programs might not be representative of programs that might be earlier in development.

CDC and the U.S. Preventive Services Task Force recommend HCV testing for persons born during 1945–1965 and others at risk for HCV infection (8). Studies have revealed

What is already known on this topic?

In the United States, about 3 million persons are estimated to be living with hepatitis C virus (HCV) infection, which is an important cause of morbidity and mortality. However, there is a documented lack of expertise in HCV-related care and treatment among U.S. primary care providers and limited access to specialists, both of which serve as barriers to life-saving treatment for those who are infected. The Extension for Community Healthcare Outcomes project (Project ECHO) has been shown to be an effective model to overcome these barriers.

What is added by this report?

The Project ECHO model was successfully implemented in two states, training 66 primary care clinicians, predominantly from rural settings. Nearly all (93%) of the clinicians had no prior experience in care and treatment of HCV infection. In both states combined, 46% of HCV-infected patients seen in teleECHO clinics received antiviral treatment, a proportion that was more than twice that observed in a CDC study, further demonstrating the utility of this approach in expanding the capacity of primary care providers to treat HCV infection.

What are the implications for public health practice?

The Project ECHO model is an effective evidence-based model that can be used by state and local areas to enhance capacity to manage and treat HCV infection, especially among underserved populations.

that full implementation of these recommendations can avert approximately 120,000 HCV-associated deaths (9). However, limitations in care capacity, particularly in rural areas and other resource-constrained settings, are barriers to achieving the public health benefits of HCV testing, care, and treatment. With training and supervision by specialists, HCV antiviral treatment can be safely and effectively delivered in primary care settings (6,10). Additional safe and effective HCV therapies currently under development could provide new options for primary care clinicians to incorporate management of HCV infection into their practices. Collaborations with specialists will help primary care providers to begin to incorporate new treatments for HCV infection and will be an important measure for improving access and reducing barriers to treatment. The results of this evaluation demonstrate Project ECHO as a model that can enhance primary care provider capacity to treat HCV infection among underserved populations, including the use of newly approved medications.

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References

1. El-Serag HB. Epidemiology of viral hepatitis and hepatocellular carcinoma. *Gastroenterology* 2012;142:1264–73.
2. Freeman RB Jr, Steffick DE, Guidinger MK, Farmer DG, Berg CL, Merion RM. Liver and intestine transplantation in the United States, 1997–2006. *Am J Transplant* 2008;8:958–76.
3. Holmberg SD, Spradling PR, Moorman AC, Denniston MM. Hepatitis C in the United States. *N Engl J Med* 2013;368:1859–61.
4. Morrill JA, Shrestha M, Grant RW. Barriers to the treatment of hepatitis C: patient, provider, and system factors. *J Gen Intern Med* 2005;20:754–8.
5. McGowan CE, Monis A, Bacon BR, et al. A global view of hepatitis C: physician knowledge, opinions, and perceived barriers to care. *Hepatology* 2013;57:1325–32.
6. Arora S, Thornton K, Murata G, et al. Outcomes of treatment for hepatitis C virus infection by primary care providers. *N Engl J Med* 2011;364:2199–207.
7. Arora S, Kalishman S, Thornton K, et al. Expanding access to hepatitis C virus treatment—Extension for Community Healthcare Outcomes (ECHO) project: disruptive innovation in specialty care. *Hepatology* 2010;52:1124–33.
8. CDC. Recommendations for the identification of chronic hepatitis C virus infection among persons born during 1945–1965. *MMWR* 2012;61(No. RR-4).
9. Rein DB, Smith BD, Wittenborn JS, et al. The cost-effectiveness of birth-cohort screening for hepatitis C antibody in U.S. primary care settings. *Ann Intern Med* 2012;156:263–70.
10. Brew IF, Butt C, Wright N. Can antiviral treatment for hepatitis C be safely and effectively delivered in primary care?: a narrative systematic review of the evidence base. *Br J Gen Pract* 2013;63:e842–51.

Early Identification and Linkage to Care of Persons with Chronic Hepatitis B Virus Infection — Three U.S. Sites, 2012–2014

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In the United States, an estimated 0.8–1.4 million persons are living with chronic hepatitis B virus (HBV) infection. Among these persons, as many as 70% were born in countries of Asia, Africa, or other regions where HBV is moderately or highly endemic (hepatitis B surface antigen [HBsAg] prevalence $\geq 2\%$) (1). HBV-associated cirrhosis and liver cancer are major health problems for these populations (2,3). Most persons with HBV were infected at birth or during early childhood and are asymptomatic until advanced liver disease develops. To address these concerns, CDC recommends HBsAg testing for all persons born in these areas and linkage to medical care and preventive services for those who are infected (1). In 2012, CDC awarded funds to nine sites to implement this recommendation. This report describes programs at three sites (New York, New York; Minneapolis-St. Paul, Minnesota; and San Diego, California) that conducted HBV testing, in clinical or community settings, and referred for medical evaluation and care those persons whose HBsAg test results were positive. During October 2012–March 2014, the three sites tested 4,727 persons for HBV infection; 310 (6.6%) were HBsAg-positive. Among the HBsAg-positive persons, 94% were informed of their results, 90% were counseled, 86% were referred for care, and 66% attended their scheduled first medical visit. These projects demonstrate that community-based programs can identify infected persons among populations with a high prevalence of HBV infection and refer HBsAg-positive persons for care. Individualized efforts to assist patients with accessing and receiving health-care services (“patient navigation services”) can increase the number of persons who follow up on referrals and receive recommended care.

New York City: African Services Committee

The African Services Committee (ASC) is a community-based organization located in Harlem, serving a primarily uninsured West African immigrant population. Much of the work of the ASC is carried out by staff members speaking French and Wolof, a language widely used in Senegal and The Gambia. Community education efforts included outreach through mosques serving immigrants from Africa, visits to taxi garages to speak with drivers from West Africa, participating in French language “conference-call radio” shows, and issuing radio

public service announcements. Most testing was conducted in community outreach settings. To improve testing rates, ASC established relationships with Asian-American community-based organizations to conduct testing events in more distant areas of the city. Persons found to be HBsAg-positive received patient navigation services for initial evaluation (and treatment, if required) to liver clinics and patient assistance programs in academic and public medical centers with which ASC has strong relationships. During the reporting period, ASC tested 1,732 persons (54% born in Africa, 23% in Asia, and 23% in Latin America or the Caribbean); 145 (8.4%) were HBsAg-positive, with the highest prevalence seen among 880 persons born in West Africa (11.4%). For all HBsAg-positive persons, 131 (90%) received test results, 120 (83%) were counseled, 123 (85%) were referred for medical evaluation, and 81 (56%) attended the first medical visit (Table).

Minneapolis-St. Paul: Minnesota Department of Public Health Refugee Services

The Minnesota Refugee Health Program is responsible for assuring the initial health screening for communicable diseases among newly arrived refugees. Testing for HBsAg has been a routine screening activity for many years, but no resources were available to support counseling and referral for persons who were HBsAg-positive. In Minneapolis-St. Paul, the program partners with health departments serving Hennepin County and Ramsey County to provide refugees with HBsAg screening at their first medical visit, at a large health department clinic (Hennepin County), and at the offices of designated private providers (St. Paul-Ramsey County). With support through this CDC initiative, HBsAg-positive persons were informed of their test results at the second visit, counseled, and referred for further evaluation and medical care. Part-time workers who are fluent in Somali and in Karen, the language spoken by most of the refugees from Burma (Myanmar), played a critical role in the program. They provided education and counseling at the health clinic and patient navigation services for all HBsAg-positive refugees to ensure that those refugees were able to attend appointments made at a liver specialty clinic or with other primary care providers in the community. Navigation activities included scheduling cab rides to appointments,

TABLE. Results of programs at three selected sites funded by CDC to increase testing of foreign-born persons for hepatitis B and to link persons to medical care if they had positive hepatitis B surface antigen (HBsAg) test results, October 2012–February 2014

Project sites	HBsAg-positive										
	Tested	No.	%	Received results		Counseled		Referred		Attended medical visit	
				No.	(%)	No.	(%)	No.	(%)	No.	(%)
New York, New York	1,732	145	(8.4)	131	(90)	120	(83)	123	(85)	81	(56)
Minneapolis-St. Paul, Minnesota	1,800	117	(6.5)	111	(95)	111	(95)	106	(91)	106	(91)
San Diego, California	1,195	48	(4.0)	48	(100)	48	(100)	39	(81)	16	(33)
Total	4,727	310	(6.6)	290	(94)	279	(90)	268	(86)	203	(66)

making follow-up calls after referral, and locating patients lost to follow-up. Among 1,800 refugees tested, of whom 84% were from Burma and Somalia, 117 (6.5%) tested HBsAg-positive. Of these, 111 (95%) received test results and were counseled, and 106 (91%) were referred for a medical evaluation, of whom all were documented to have attended a medical visit.

San Diego: University of California at San Diego

At the University of California at San Diego site, medical specialists partner with the Asian Pacific Health Foundation and several other community-based organizations and clinics to provide HBsAg testing and referral services to a primarily Southeast Asian population. Education and testing were conducted at outreach events held in churches, temples, and festival venues, and at primary care centers serving foreign-born populations. Health profession students fluent in Tagalog played an important role in testing events in the Filipino-American community. Testing targeted specific neighborhoods in which large numbers of foreign-born persons reside. During the reporting period, 1,195 persons were tested, and 48 (4.0%) were HBsAg-positive. Testing was provided to persons born in 31 different counties; however, 67% of persons tested and 88% of persons who tested HBsAg-positive originated in either Viet Nam or the Philippines. Patient navigation services were provided by the community-based organization partner. Many of those persons who tested HBsAg-positive were referred to a gastroenterology practice with a large Asian-American patient population. To date, all 48 HBsAg-positive persons have been informed of their results and counseled, 39 (81%) were referred for medical evaluation, and 16 (33%) were documented to have attended a first medical visit.

Discussion

A total of 4,727 persons were tested at these three sites. Most persons (91%) who were screened were from countries of intermediate or higher HBV infection prevalence, consistent with the purpose of the initiative. Two of the sites used community-based outreach to educate and test foreign-born persons, and newly arrived refugees in Minnesota were already

What is already known on this topic?

In 2008, CDC recommended that all persons in the United States born in countries with a hepatitis B virus (HBV) infection prevalence $\geq 2\%$ be tested and that those infected receive preventive counseling, education, and referral for medical management. Almost two thirds of persons with chronic HBV infection in the United States originated from countries with HBV infection prevalence $\geq 2\%$, but an estimated one half or fewer of these persons are aware of their infection, and a smaller proportion are receiving recommended medical monitoring and care. Efforts to increase the early identification of persons with chronic HBV infection and link them to medical care are a public health priority.

What is added by this report?

During October 2012–March 2014, in three sites participating in a CDC-funded initiative to identify foreign-born persons with HBV infection and link them to care, 4,727 persons were tested and 310 (6.6%) persons were HBsAg-positive. Rates of documented attendance at a follow-up visit were significantly higher for those referred from the refugee program (91%) than from community-based testing sites (33% and 56%). For all three sites, intensive patient counseling and assistance efforts were needed to achieve these results.

What are the implications for public health practice?

Community-based and refugee clinic-based HBV testing initiatives can identify substantial numbers of persons with chronic HBV infection, inform them of their HBV infection, and provide preventive counseling. Strategies are needed to improve linkages from community-based testing sites to HBV-directed medical care.

being routinely screened for HBV at their first clinical visit. All three sites provided culturally and linguistically appropriate counseling and patient navigation services for persons who tested HBsAg-positive. A substantial proportion of persons found to be HBV-infected were informed of their test results (94%), counseled (90%), and referred for care (86%). Collaborations among community-based organizations serving different population groups were essential to efforts in New York City and San Diego. In the Minnesota refugee program, in which HBV testing was conducted during scheduled medical

visits at a clinical facility, patient education, counseling, and navigation efforts appeared to be an effective strategy to ensure that persons who were HBsAg-positive attended a medical referral appointment. At the two community-based screening sites, however, ensuring that medical referral visits were attended was more challenging, and the rates of documented follow-up were lower than those of the Minnesota program.

The findings in this report are subject to at least three limitations. First, the three participating sites were not representative of all projects in the initiative, and persons born in East Asia, who are a substantial proportion of the foreign-born population originating in countries with intermediate to high HBV infection prevalence, were underrepresented (3). Second, data regarding attendance at scheduled medical visits were self-reported by patients, and difficulty in contacting these persons for follow-up might have resulted in underreporting. Finally, although HBsAg test results have high specificity (4), follow-up testing is recommended during medical evaluation to confirm chronic HBV infection status (1).

In cities with large populations of persons born in Asia and Africa, community-based efforts to screen foreign-born persons from countries with intermediate or higher HBV infection prevalence can identify substantial numbers of persons with chronic HBV infection, and persons who test HBsAg-positive can be successfully informed, counseled, and referred to medical care. Culturally and linguistically specific approaches were necessary in all phases of these initiatives. Outreach, counseling, and patient navigation activities in these populations require intensive effort and use of human resources. In refugee screening programs in which HBV testing is occurring, counseling and patient navigation might be

effective in ensuring that those who are HBsAg-positive attend a first medical evaluation for chronic HBV infection. Linkage to a first medical visit from community-based testing venues is challenging, but can be accomplished with substantial patient navigation efforts. In this initiative, it was not possible to assess the quality or continuity of HBV-directed medical care for those persons who did attend a first referral appointment. Because routine and ongoing monitoring is the foundation for effective HBV medical management, future efforts to improve outcomes among foreign-born persons with chronic HBV infection should provide greater emphasis on this distal end of the process of “linkage to care” (5).

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References

1. CDC. Recommendations for identification and public health management of persons with chronic hepatitis B virus infection. *MMWR* 2008;57 (No. RR-8).
2. Chang ET, Yang J, Alfaro-Velcamp T, So SK, Glaser SL, Gomez SL. Disparities in liver cancer incidence by nativity, acculturation, and socioeconomic status in California Hispanics and Asians. *Cancer Epidemiol Biomarkers Prev* 2010;19:3106–18.
3. Mitchell T, Armstrong GL, Hu DJ, Wasley A, Painter JA. The increasing burden of imported chronic hepatitis B—United States, 1974–2008. *PloS One* 2011;6:e27717.
4. Scheiblauer H, El-Nageh M, Diaz S, et al. Performance evaluation of 70 hepatitis B virus (HBV) surface antigen (HBsAg) assays from around the world by a geographically diverse panel with an array of HBV genotypes and HBsAg subtypes. *Vox Sang* 2010;98:403–14.
5. Lok AS, McMahon, BJ. Chronic hepatitis B: update 2009. *Hepatology* 2009;50:661–2.

Primary and Secondary Syphilis — United States, 2005–2013

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In 2013, based on data reported as of April 28, 2014, the rate of reported primary and secondary syphilis in the United States was 5.3 cases per 100,000 population, more than double the lowest-ever rate of 2.1 in 2000. To characterize the recent epidemiology of syphilis in the United States, CDC analyzed data from the National Notifiable Diseases Surveillance System (NNDSS) for cases of primary and secondary syphilis diagnosed during 2005–2013 with a focus on states that reported the sex of sex partners during 2009–2012 to describe reported syphilis among gay, bisexual, and other men who have sex with men (collectively referred to as MSM). During 2005–2013, primary and secondary syphilis rates increased among men of all ages and races/ethnicities across all regions of the United States. Recent years have shown an accelerated increase in the number of cases, with the largest increases occurring among MSM. Among women, rates increased during 2005–2008 and decreased during 2009–2013, with different trends among different racial/ethnic groups. Racial/ethnic disparities in reported syphilis persisted during 2005–2013, likely reflecting social determinants of health, such as socioeconomic status, that might contribute to the burden of syphilis in a community (1). These findings underscore the need for continued syphilis prevention measures among MSM.

CDC analyzed notifiable disease surveillance data on reported syphilis, including patient demographics and stage of syphilis (i.e., primary and secondary, early latent, late, late latent, and congenital*) reported by health departments to NNDSS nationwide for cases diagnosed during 2005–2013. Trends in annual primary and secondary syphilis (representing more recently acquired infections, which usually are infectious) were analyzed for 2005–2013. Geographic trends were analyzed by U.S. census region, age group, and NNDSS racial/ethnic categories (white, black, Hispanic, Asian/Pacific Islander, and American Indian/Alaska Native, for which all racial groups were non-Hispanic). In addition, to describe syphilis among MSM, annual cases of primary and secondary syphilis among MSM that were reported during 2009–2012 were reviewed from 34 states and the District of Columbia, where the sex of sex partners was reported for ≥70% of male primary and secondary syphilis cases (CDC began collecting

data on the sex of sex partners in 2005). Rates were calculated using population denominators from the U.S. Census Bureau.

During 2005–2013, the number of primary and secondary syphilis cases reported each year in the United States nearly doubled, from 8,724 to 16,663; the annual rate increased from 2.9 to 5.3 cases per 100,000 population (Table). Men contributed an increasing proportion of cases, accounting for 91.1% of all primary and secondary syphilis cases in 2013. The rate among men increased from 5.1 in 2005 to 9.8 in 2013 (Figure 1). Increases occurred among men of all ages and races/ethnicities, but race/ethnicity shifts occurred in 2009. During 2005–2009, rate increases were greatest among black men (104.1%, from 14.6 in 2005 to 29.8 in 2009) compared with Hispanic men (52.0%, 5.0 to 7.6) and white men (19.4%, 3.1 to 3.7). During 2009–2013, rates increased among Hispanic men (52.6%, from 7.6 in 2009 to 11.6 in 2013) and white men (45.9%, 3.7 to 5.4), but decreased slightly among black men (6.4%, 29.8 to 27.9). From 2005 to 2009, men aged 20–24 years had the greatest percentage increase (149.4%, 8.1 to 20.2), and from 2009 to 2013, men aged 25–29 years (the same approximate birth cohort) had the greatest increase (48.4%, 18.2 to 27.0) (Table).

In 2012, primary and secondary syphilis cases in the 35 reporting areas that reported the sex of sex partners for ≥70% of male cases comprised 83.7% (13,113) of all nationwide cases. In those areas, the proportion of male primary and secondary syphilis cases attributed to MSM increased from 77.0% (6,366) in 2009 to 83.9% (8,701) in 2012. Increases in incidence occurred among MSM of all ages and races/ethnicities from all regions. The greatest percentage increases in cases occurred among Hispanics (53.4%, from 1,291 in 2009 to 1,980 in 2012) and whites (38.1%, 2,449 to 3,381), when compared with blacks (21.2%, 2,267 to 2,747) (Figure 2). By age group, the greatest percentage increases occurred among MSM aged 25–29 (53.2%, 1,073 to 1,644).

Among women, the reported primary and secondary syphilis rate increased from 0.9 to 1.5 per 100,000 population per year during 2005–2008 and decreased to 0.9 in 2013. This trend occurred among women in all age groups. Rates among white and Hispanic women remained stable; the trend among all women mostly reflected changes in rates among black women (from 4.2 to 7.9 during 2005–2009, decreasing to 4.0 in 2013) (Figure 1).

* Additional information available at <http://www.cdc.gov/nndss/script/casedef.aspx?condryid=941&datepub=1/1/2014>.

TABLE. Number and rate* of primary and secondary syphilis cases, by race/ethnicity, U.S. Census region,[†] age group, and sex — National Notifiable Diseases Surveillance System, United States, 2005–2013

Characteristic	2005		2006		2007		2008		2009		2010		2011		2012		2013 [§]	
	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
Males																		
Race/ Ethnicity																		
White, non-Hispanic	3,049	3.1	3,249	3.3	3,456	3.5	3,789	3.8	3,702	3.7	3,973	4.0	4,321	4.4	4,931	5.0	5,293	5.4
Black, non-Hispanic	2,607	14.6	3,086	17.1	3,952	21.7	4,876	26.7	5,535	29.8	5,236	27.8	5,074	26.6	5,369	27.8	5,383	27.9
Hispanic	1,111	5.0	1,304	5.7	1,627	6.9	1,844	7.6	1,904	7.6	2,119	8.3	2,182	8.3	2,889	10.7	3,118	11.6
A/PI	136	2.1	154	2.3	155	2.2	201	2.9	203	2.8	190	2.5	139	3.0	318	3.9	381	4.6
AI/AN	37	3.1	53	4.3	49	4.0	38	3.0	47	3.7	55	4.4	63	4.9	57	4.4	61	4.7
Region																		
Northeast	1,171	4.4	1,314	4.9	1,741	6.5	1,924	7.2	1,946	7.2	2,068	7.7	1,987	7.4	2,292	8.4	2,466	9.1
Midwest	1,059	3.3	1,020	3.1	1,113	3.4	1,485	4.5	1,638	5.0	1,944	5.9	1,926	5.8	1,987	6.0	2,311	7.0
South	3,170	6.0	3,619	6.8	4,378	8.1	5,008	9.1	5,657	10.2	5,029	9.0	5,164	9.1	5,904	10.3	5,933	10.3
West	1,983	5.8	2,340	6.7	2,537	7.2	2,838	8.0	2,523	7.0	2,940	8.2	3,376	9.3	4,007	10.9	4,465	12.2
Age group (yrs)[¶]																		
15–19	251	2.3	332	3.0	416	3.8	585	5.3	661	6.0	617	5.5	606	5.5	640	5.8	663	6.0
20–24	875	8.1	1,080	9.9	1,461	13.5	1,877	17.3	2,242	20.2	2,429	22.1	2,582	22.8	2,859	24.8	3,042	26.3
25–29	1,007	9.8	1,330	12.6	1,574	14.6	1,851	16.9	2,027	18.2	2,131	20.0	2,277	21.2	2,641	24.4	2,925	27.0
30–34	1,178	11.6	1,056	10.6	1,303	13.2	1,489	15.0	1,571	15.5	1,597	16.0	1,657	16.1	2,023	19.3	2,179	20.8
35–39	1,394	13.2	1,426	13.4	1,529	14.4	1,568	14.8	1,409	13.6	1,313	13.1	1,265	13.0	1,443	14.9	1,597	16.4
40–44	1,253	11.0	1,362	12.2	1,551	14.1	1,573	14.6	1,476	14.1	1,448	13.9	1,408	13.5	1,544	14.8	1,515	14.5
45–54	1,080	5.2	1,277	6.0	1,463	6.8	1,790	8.2	1,815	8.3	1,877	8.5	1,999	9.1	2,310	10.6	1,398	11.0
55–64	283	1.9	340	2.2	379	2.4	412	2.5	475	2.8	457	2.6	510	2.8	586	3.2	682	3.7
≥65	59	0.4	87	0.6	86	0.5	102	0.6	84	0.5	105	0.6	137	0.8	138	0.7	159	0.8
Total	7,383	5.1	8,293	5.6	9,769	6.6	11,255	7.5	11,764	7.8	11,981	7.9	12,453	8.1	14,190	9.2	15,175	9.8
Females																		
Race/ Ethnicity																		
White, non-Hispanic	263	0.3	295	0.3	370	0.4	474	0.5	418	0.4	299	0.3	261	0.3	274	0.3	293	0.3
Black, non-Hispanic	828	4.2	942	4.8	1,075	5.4	1,478	7.4	1,605	7.9	1,296	6.3	1,041	5.0	931	4.4	852	4.0
Hispanic	183	0.9	158	0.7	163	0.7	209	0.9	144	0.6	118	0.5	142	0.6	193	0.7	209	0.8
A/PI	11	0.2	10	0.1	7	0.1	9	0.1	15	0.2	11	0.1	12	0.1	14	0.2	21	0.2
AI/AN	19	1.5	22	1.7	32	2.5	18	1.4	12	0.9	9	0.7	6	0.5	8	0.6	13	1.0
Region																		
Northeast	91	0.3	86	0.3	96	0.3	100	0.4	130	0.5	125	0.4	116	0.4	125	0.4	115	0.4
Midwest	137	0.4	156	0.5	147	0.4	237	0.7	212	0.6	309	0.9	249	0.7	251	0.7	239	0.7
South	884	1.6	984	1.8	1,228	2.2	1,697	3.0	1,756	3.0	1,225	2.1	997	1.7	915	1.5	818	1.4
West	227	0.7	232	0.7	221	0.6	208	0.6	134	0.4	121	0.3	139	0.4	167	0.5	299	0.8
Age group (yrs)[¶]																		
15–19	192	1.9	233	2.2	248	2.4	318	3.0	344	3.3	313	2.9	258	2.5	238	2.3	202	1.9
20–24	305	3.0	299	2.9	356	3.5	520	5.1	570	5.5	474	4.5	403	3.7	417	3.8	429	3.9
25–29	205	2.1	241	2.4	265	2.6	404	3.9	377	3.6	322	3.1	268	2.5	266	2.5	272	2.6
30–34	150	1.5	163	1.7	193	2.0	244	2.5	286	2.9	197	2.0	187	1.8	182	1.7	164	1.6
35–39	179	1.7	154	1.5	191	1.8	241	2.3	203	2.0	140	1.4	115	1.2	120	1.2	121	1.2
40–44	164	1.4	153	1.4	192	1.7	202	1.9	167	1.6	104	1.0	91	0.9	70	0.7	101	1.0
45–54	111	0.5	165	0.8	200	0.9	236	1.0	218	1.0	176	0.8	120	0.5	128	0.6	122	0.5
55–64	20	0.1	35	0.2	30	0.2	46	0.3	42	0.2	36	0.2	43	0.2	27	0.1	36	0.2
≥65	5	0.0	2	0.0	9	0.0	9	0.0	8	0.0	6	0.0	3	0.0	5	0.0	12	0.0
Total	1,339	0.9	1,458	1.0	1,692	1.1	2,242	1.5	2,232	1.4	1,780	1.1	1,501	0.9	1,458	0.9	1,471	0.9
Overall total**	8,724	2.9	9,756	3.3	11,466	3.8	13,500	4.4	13,997	4.6	13,774	4.5	13,970	4.5	15,667	5.0	16,663	5.3

Abbreviations: A/PI = Asian/Pacific Islander; AI/AN = American Indian/Alaska Native.

* Per 100,000 population.

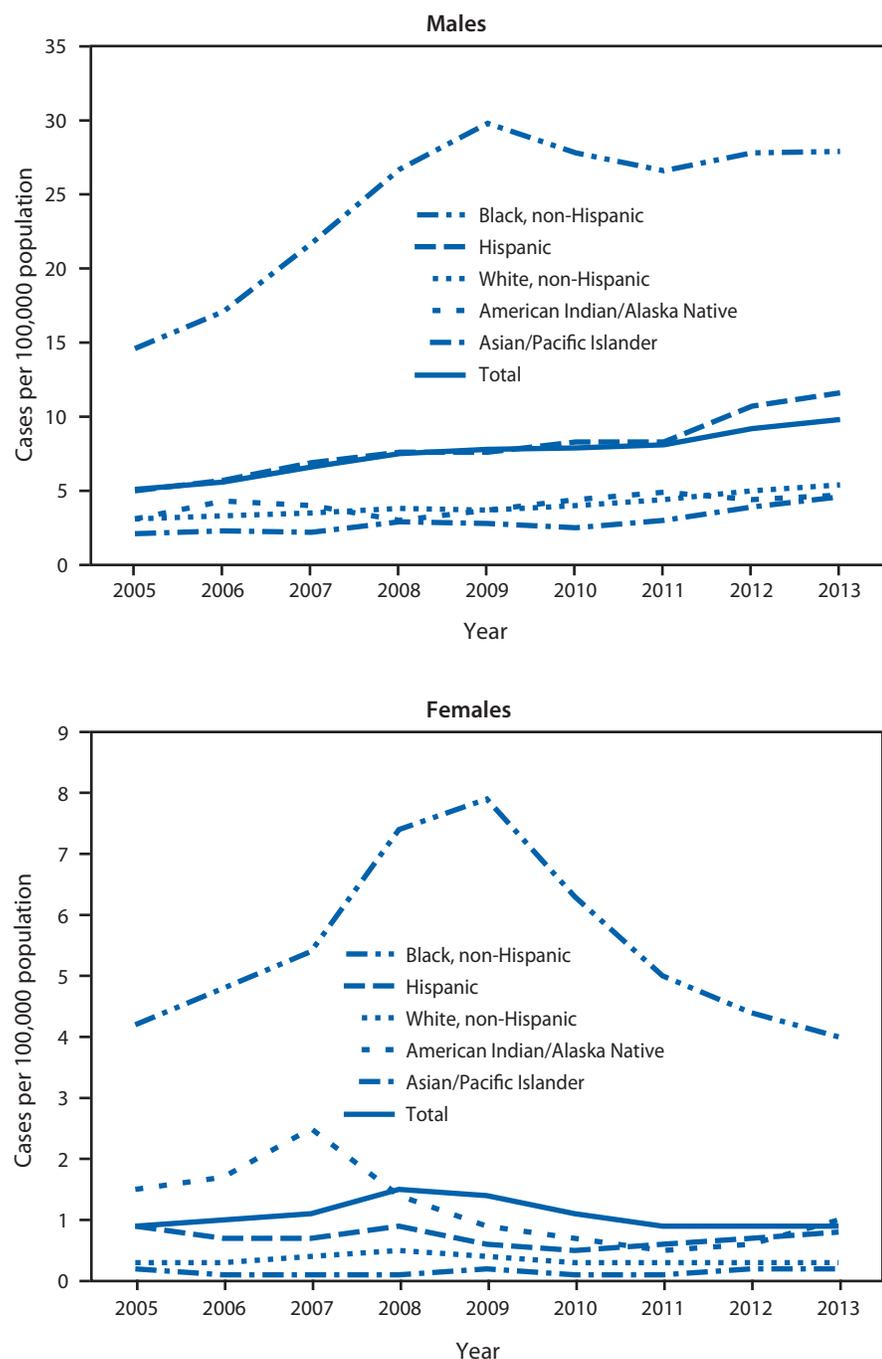
† *Northeast*: Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont; *Midwest*: Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin; *South*: Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia; *West*: Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, Wyoming.

§ Data are as of April 28, 2014.

¶ Includes persons aged ≥15 years.

** Cases among persons aged ≤14 years not shown.

FIGURE 1. Annual rate of primary and secondary syphilis cases among males and females, by race/ethnicity — National Notifiable Diseases Surveillance System, United States, 2005–2013



Racial/ethnic disparities in syphilis persisted. In 2013, the primary and secondary syphilis rate among black men was 5.2 times that among white men (27.9 versus 5.4 cases per 100,000 population); the rate among black women was 13.3 times that among white women (4.0 versus 0.3). The rate among Hispanic men was 2.1 times that among white men

(11.6 versus 5.4), and the rate among Hispanic women was 2.7 times that among white women (0.8 versus 0.3). These disparities were similar to disparities observed in 2005 (Table).

Across all four U.S. Census regions, primary and secondary syphilis rates were greater in 2013 than in 2005. In 2013, the highest overall regional rate (6.5 cases per 100,000 population) was in the West region. In 2013, for the first time in at least 50 years, the South did not have the highest overall syphilis rate among regions. Regional trends among men and women by race/ethnicity mirrored national trends except in the West region, where there was no decrease among black men during 2009–2013. Among women of all races/ethnicities in the West region, rates declined during 2005–2010 and increased during 2011–2013 (Table).

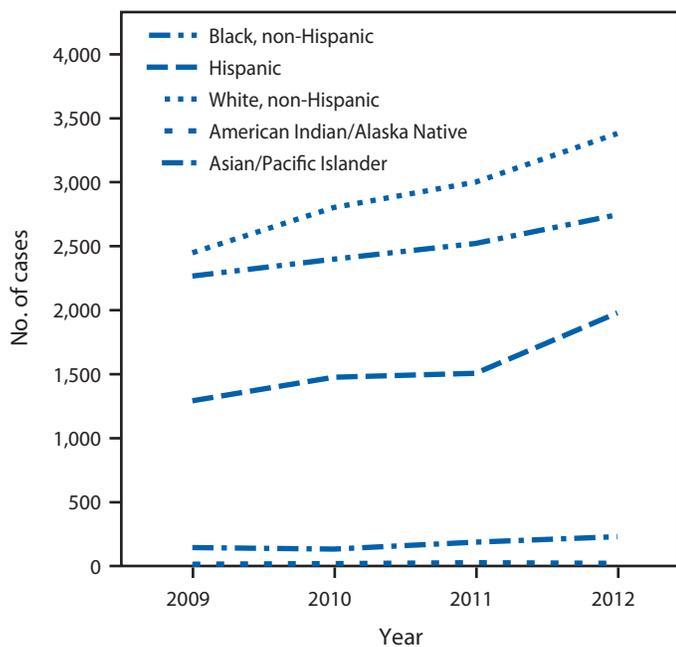
Discussion

After being on the verge of elimination in 2000 in the United States, syphilis cases have rebounded. Rates of primary and secondary syphilis continued to increase overall during 2005–2013; although rates stabilized during 2009–2010, rates have increased since 2011. Increases have occurred primarily among men, and particularly among MSM, who contributed the vast majority of male primary and secondary syphilis cases during 2009–2012.

The epidemiology of syphilis among men, including MSM, has shifted since 2009, with larger increases occurring among Hispanic and white men. Despite this increase, disparities in primary and secondary syphilis between black men and other racial/ethnic groups remain large. Many barriers to contacting and treating sex partners exist, including delays in reporting cases to the health department, anonymous partners, physicians who rely on patients to notify their partners (2), and the observed tendency of MSM to notify a smaller proportion of their sex partners than do heterosexuals (3).

These analyses indicate that syphilis prevention measures for MSM of all races/ethnicities need to be strengthened throughout the United States. This could be accomplished by working with private health-care providers because a substantial number of primary and secondary syphilis cases among MSM are reported by private physicians (1). Further, both private and

FIGURE 2. Number of primary and secondary syphilis cases among men who have sex with men, by race/ethnicity — National Notifiable Diseases Surveillance System, 34 states* and the District of Columbia with complete sex partner data,† 2009–2012



* Arkansas, California, Colorado, Connecticut, Florida, Hawaii, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, Nevada, New Hampshire, New Jersey, New York, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Vermont, Virginia, Washington, and West Virginia.

† Sex of partners reported for $\geq 70\%$ of cases of primary and secondary syphilis in males aged ≥ 15 years during 2009–2012.

public providers should be aware of the resurgence in syphilis and should be able to recognize the signs and symptoms of syphilis, conduct risk assessments, and screen all sexually active MSM for syphilis at least annually with syphilis serologic tests with confirmatory testing where indicated (4). More frequent screening (i.e., at 3–6 month intervals) is recommended for MSM who have multiple or anonymous sex partners. Disclosure of sexual practices remains difficult for some MSM (5); therefore, providers are encouraged to elicit sexual histories of their patients in a culturally appropriate manner, including recognition of sexual orientation, gender identity, and the sex of patients' sex partners. Additional resources and training for accomplishing this are available online.†

The increase in syphilis among MSM is a major public health concern, particularly because syphilis and the behaviors associated with acquiring it increase the likelihood of acquiring and transmitting human immunodeficiency virus (HIV) (6). There are reported rates of 50%–70% HIV coinfection

What is already known on this topic?

Rates of reported primary and secondary syphilis in the United States have increased since reaching historic lows in 2000. Cases of primary and secondary syphilis increasingly are among males, particularly men who have sex with men (MSM).

What is added by this report?

Primary and secondary syphilis rates increased among men of all ages and races/ethnicities during 2005–2013, from 5.1 cases per 100,000 population in 2005 to 9.8 in 2013, when men accounted for 91.1% of all cases reported in the United States. Although rates remain highest among black men (28.1), recent increases were greatest among Hispanic and white men. Currently, syphilis is predominantly an MSM epidemic.

What are the implications for public health practice?

Syphilis prevention measures for MSM of all races/ethnicities should be strengthened throughout the United States, including 1) encouraging safer sexual practices (e.g., reducing the number of sex partners, using latex condoms, and having a long-term mutually monogamous relationship with a partner who has negative test results for sexually transmitted diseases); 2) promoting syphilis awareness and screening as well as appropriate screening for gonorrhea, chlamydia, and human immunodeficiency virus infection; and 3) notifying and treating sex partners. In addition, efforts to prevent and treat syphilis among heterosexual men and women should continue in order to prevent congenital syphilis.

among MSM infected with primary and secondary syphilis (7) and high HIV seroconversion rates following primary and secondary syphilis infection (8). The resurgence of syphilis, coupled with its strong link with HIV, underscores the need for programs and providers to 1) urge safer sexual practices (e.g., reduce the number of sex partners, use latex condoms, and have a long-term mutually monogamous relationship with a partner who has negative test results for sexually transmitted diseases); 2) promote syphilis awareness and screening as well as appropriate screening for gonorrhea, chlamydia, and HIV infection; and 3) notify and treat sex partners.

Public health officials should seek to improve the quality of data regarding the sex of sex partners, share local MSM, sexually transmitted disease, and HIV data consistent with local laws and regulations with medical providers to increase their awareness of disease burden in their communities, and ensure that providers can recognize syphilis symptoms. Two CDC cooperative agreements are encouraging local and state participants to make MSM a priority population and direct resources to areas of greatest need based on local epidemiology (9,10). CDC, in collaboration with state and local partners, health-care providers, and MSM-oriented organizations, is also engaged in research to better understand risk factors for syphilis among MSM, develop improved care models to better reach

† Available at <http://www2a.cdc.gov/stdtraining/self-study/syphilis/default.htm>, <http://www.cdc.gov/std/syphilis/stdfact-msm-syphilis.htm>, and <http://nnptc.org/resourcetags/sexual-history>.

and serve MSM populations, assess whether MSM are being tested and treated appropriately, and determine what barriers exist in the diagnosis and treatment of syphilis among MSM.

The continued decline of primary and secondary syphilis rates among black women since 2008 is encouraging and might suggest that targeted efforts to reduce syphilis among certain populations have had some success. Although primary and secondary syphilis is currently a predominantly MSM epidemic, it is important that efforts to prevent syphilis among heterosexual men and women continue, especially given the severe consequences of syphilis infection acquired in utero, including stillbirths.

The findings in this report are subject to at least two limitations. First, primary and secondary syphilis case-report data likely underestimate the true number of syphilis infections in the United States because of underreporting of diagnosed cases, infected persons not accessing health care, misdiagnosis, and the fact that primary and secondary syphilis cases amounted to only 31.4% of all syphilis cases reported in 2012. Second, the findings for MSM included only data from 34 states and the District of Columbia, where the sex of sex partners was reported for 70% or more of male primary and secondary syphilis cases. For 12% of cases in these 35 reporting areas, the sex of sex partners was unknown.

Despite decreasing rates of primary and secondary syphilis in the late 1990s in the United States, the resurgence of cases in recent years highlights the fact that challenges remain, and the increases among MSM are particularly concerning. Public health practitioners might want to consider focusing on efforts to strengthen linkages with practicing physicians to improve case identification and reporting, partner-notification programs, and outreach to MSM.

References

1. CDC. Sexually transmitted disease surveillance 2012. Atlanta, GA: US Department of Health and Human Services, CDC; 2014. Available at <http://www.cdc.gov/std/stats12/default.htm>.
2. St Lawrence JS, Montano DE, Kasprzyk D, Phillips WR, Armstrong K, Leichliter JS. STD screening, testing, case reporting, and clinical and partner notification practices: a national survey of US physicians. *Am J Public Health* 2002;92:1784–8.
3. Kerani RP, Fleming M, Golden MR. Acceptability and intention to seek medical care after hypothetical receipt of patient-delivered partner therapy or electronic partner notification postcards among men who have sex with men: the partner's perspective. *Sex Transm Dis* 2013;40:179–85.
4. CDC. Sexually transmitted diseases treatment guidelines, 2010. *MMWR* 2010;59(No. RR-12).
5. Bernstein K, Liu KL, Begier E, Koblin B, Karpati A, Murrill C. Same-sex attraction disclosure to health care providers among New York City men who have sex with men: implications for HIV testing approaches. *Arch Intern Med* 2008;168:1458–64.
6. CDC. Guidelines for prevention and treatment of opportunistic infections in HIV-infected adults and adolescents: recommendations from CDC, the National Institutes of Health, and the HIV Medicine Association of the Infectious Diseases Society of America. *MMWR* 2009;58(No. RR-4).
7. Su JR, Weinstock H. Epidemiology of co-infection with HIV and syphilis in 34 states, United States—2009. In: proceedings of the 2011 National HIV Prevention Conference, August 13–17, 2011, Atlanta, GA.
8. Pathela P, Braunstein S, Shepard CS. Population-based HIV incidence among men diagnosed with infectious syphilis, 2000–2011. In: proceedings of the STI&AIDS World Congress 2013, July 14–17, 2013, Vienna, Austria.
9. CDC. Community approaches to reducing sexually transmitted diseases. Atlanta, GA: US Department of Health and Human Services, CDC; 2014. Available at <http://www.cdc.gov/std/health-disparities/foa-march-2011.htm>.
10. CDC. Improving sexually transmitted disease programs through assessment, assurance, policy development, and prevention strategies (STD AAPPs). Atlanta, GA: US Department of Health and Human Services, CDC; 2014. Available at <http://www.cdc.gov/std/foa/aapps/default.htm>.

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Vital Signs: Disability and Physical Activity — United States, 2009–2012

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Abstract

Background: Adults with disabilities are less active and have higher rates of chronic disease than the general population. Given the health benefits of physical activity, understanding physical activity, its relationship with chronic disease, and health professional recommendations for physical activity among young to middle-age adults with disabilities could help increase the effectiveness of health promotion efforts.

Methods: Data from the 2009–2012 National Health Interview Survey (NHIS) were used to estimate the prevalence of, and association between, aerobic physical activity (inactive, insufficiently active, or active) and chronic diseases (heart disease, stroke, diabetes, and cancer) among adults aged 18–64 years by disability status and type (hearing, vision, cognitive, and mobility). The prevalence of, and association between, receiving a health professional recommendation for physical activity and level of aerobic physical activity was assessed using 2010 data.

Results: Overall, 11.6% of U.S. adults aged 18–64 years reported a disability, with estimates for disability type ranging from 1.7% (vision) to 5.8% (mobility). Compared with adults without disabilities, inactivity was more prevalent among adults with any disability (47.1% versus 26.1%) and for adults with each type of disability. Inactive adults with disabilities were 50% more likely to report one or more chronic diseases than those who were physically active. Approximately 44% of adults with disabilities received a recommendation from a health professional for physical activity in the past 12 months.

Conclusions: Almost half of adults with disabilities are physically inactive and are more likely to have a chronic disease. Among adults with disabilities who visited a health professional in the past 12 months, the majority (56%) did not receive a recommendation for physical activity.

Implications for Public Health: These data highlight the need for increased physical activity among persons with disabilities, which might require support across societal sectors, including government and health care.

Introduction

Persons with disabilities experience limitations in hearing, vision, mobility, or cognition, or have emotional or behavioral disorders. These limitations can negatively impact self-care and activity levels if appropriate accommodations or supports are unavailable (1). The U.S. Census Bureau estimates that approximately 57 million persons of all ages live with a disability (2), and disability-associated health-care expenditures were estimated at nearly \$400 billion in 2006 (3). Although disability prevalence increases with age, most adults with disabilities are aged 18–64 years (1). This population is at greater risk for chronic disease and other adverse health outcomes than adults without disabilities (4–6). They are also more likely to see a health-care provider and have a usual source of care compared with those without disabilities (7,8).

Regular aerobic physical activity provides many benefits, including prevention of chronic disease such as coronary heart

disease, stroke, type 2 diabetes, and some types of cancer (9,10). The *2008 Physical Activity Guidelines for Americans* (the *2008 Guidelines*) recommend that all adults, including those with disabilities, get ≥ 150 minutes (2.5 hours) per week of moderate-intensity aerobic physical activity, or ≥ 75 minutes (1.25 hours) per week of vigorous-intensity aerobic activity, or an equivalent combination (11). Adults with disabilities unable to meet this guideline should regularly engage in physical activity according to their abilities and avoid inactivity (11). However, compared with adults without disabilities, adults with disabilities are more likely to be physically inactive (12–15).

These findings have important implications for promoting physical activity among adults with disabilities. Given the greater risk for chronic disease and higher prevalence of inactivity among persons with disabilities, there is a need to better understand their relationship at younger ages when chronic diseases are typically less prevalent (16) and can be prevented.

It is also important to understand if health professionals are recommending physical activity to this subpopulation. This report examines the association between aerobic physical activity and chronic disease for four disability types among adults aged 18–64 years using data from the 2009–2012 National Health Interview Survey (NHIS). Receiving a recommendation from a health professional for physical activity was also assessed using 2010 NHIS data.*

Methods

NHIS is a continuous, cross-sectional, in-person household survey that is nationally representative of the civilian, noninstitutionalized U.S. population.[†] The final response rate for the sample adult component ranged from 61%–66% during 2009–2012.

Disability was defined as having serious difficulty in at least one of the following functions: hearing; seeing, even when wearing glasses (vision); concentrating, remembering, or making decisions (cognitive); or walking or climbing stairs (mobility). Based on survey administration in a given year, either the sample adult respondent or the designated household or family member responded to the disability questions. More than one limitation could be reported. Because persons with a mobility limitation might have additional difficulty participating in physical activity, they were only included in the mobility limitation subgroup, even if they reported other limitations. Among persons without a mobility limitation, those with hearing, vision, or cognitive limitations were included in the subgroup for each reported limitation.

Aerobic physical activity levels were defined according to the *2008 Guidelines* using responses to questions on the frequency and duration of leisure-time aerobic physical activity (e.g., walking, bicycling, swimming, and dancing). Minutes of vigorous-intensity activity were multiplied by two when combining with light-intensity to moderate-intensity activities to calculate the moderate intensity-equivalent combination (11). Active (i.e., meeting the aerobic guideline) was defined as participating in ≥ 150 minutes of moderate-intensity equivalent aerobic activity per week. Insufficiently active was defined as reporting at least one bout of aerobic physical activity per week that lasted ≥ 10 minutes, but not enough total weekly activity to meet the guideline. Inactive was defined as reporting no bouts of aerobic physical activity per week that lasted ≥ 10 minutes.

Chronic disease status was determined by respondent report of ever having been told by a doctor or other health professional that he or she had diabetes, cancer, stroke, or heart disease.[§]

* Between 2009 and 2012, the NHIS question assessing doctor or health professional recommendation of physical activity was only asked in 2010.

[†] Additional information available at <http://www.cdc.gov/nchs/nhis.htm>.

[§] Heart disease was defined as coronary heart disease, angina, heart attack, myocardial infarction, or any other heart condition or heart disease.

Respondents were categorized as ever having one or more of these chronic diseases, or having none.

Recommendation of physical activity was defined as respondent report of receiving a recommendation from a doctor or other health professional in the past 12 months to begin or continue any type of exercise or physical activity. Analyses using this variable included only sample adult respondents from the 2010 NHIS survey who had seen a doctor or other health professional in the past 12 months.

Disability was assessed for 86,371 sample adult respondents aged 18–64 years. Respondents were excluded if they indicated they were unable to engage in aerobic physical activity ($n = 842$; 5.4% of adults with disabilities and 0.3% of adults without disabilities), or were missing data for physical activity ($n = 1,538$), disability status ($n = 409$), or chronic diseases ($n = 115$), resulting in an analytic sample of 83,467 adults.

Data were weighted to account for probability of selection and nonresponse, and to adjust for age, sex, and race/ethnicity. The weights were divided by four to account for combining 4 years of data. Prevalence estimates of select demographic and health indicators and receiving a recommendation for physical activity were stratified by disability status and type. Among adults with any disability, prevalence and population estimates of one or more and no chronic diseases were stratified by aerobic physical activity level. Logistic regression was used to calculate adjusted odds ratios (AOR) for the association between physical inactivity and chronic disease for adults with any disability and by disability type, adjusted for sex, age group, race/ethnicity, ratio of family income to poverty threshold, smoking status, and body mass index. Among adults with any disability, prevalence of physical activity levels stratified by receipt of physical activity recommendation, as well as the association between the two, was also estimated.

Results

Overall, 11.6% of U.S. adults aged 18–64 years, approximately 21.5 million persons, reported a disability. Prevalence estimates by disability type were 1.7% (vision), 2.2% (hearing), 3.0% (cognitive), and 5.8% (mobility). A significantly higher prevalence of adults with disabilities reported having one or more chronic diseases (40.5% versus 13.7%, $p < 0.001$), and being physically inactive (47.1% versus 26.1%, $p < 0.001$) compared with those without disabilities. A significantly higher prevalence of chronic disease and physical inactivity was also noted for each disability type compared with those without a disability (Table 1).

Among an estimated 10.1 million inactive adults with disabilities in the United States, 46.3% (approximately 4.7 million adults) reported one or more chronic diseases. Among 6.7 million active adults with disabilities, 31.1% (approximately

TABLE 1. Prevalence of selected demographic characteristics and health behaviors among adults aged 18–64 years (N = 83,467), by disability type* — National Health Interview Survey, United States, 2009–2012

Characteristic	No mobility limitation						Mobility limitation		Any disability		No disability	
	Hearing		Vision		Cognitive		%	(95% CI)	%	(95% CI)	%	(95% CI)
Total	2.2	(2.0–2.3)	1.7	(1.6–1.9)	3.0	(2.9–3.2)	5.8	(5.6–6.1)	11.6	(11.3–11.9)	88.4	(88.1–88.7)
Sex												
Male	64.1	(61.2–66.8)	48.9	(45.6–52.2)	50.9	(48.3–53.5)	43.5	(41.7–45.4)	49.1	(47.8–50.4)	49.3	(48.8–49.8)
Female	35.9	(33.2–38.8)	51.1	(47.8–54.4)	49.1	(46.5–51.7)	56.5	(54.6–58.3)	50.9	(49.6–52.2)	50.7	(50.2–51.2)
Age group (yrs)												
18–44	33.7	(30.9–36.7)	47.4	(43.8–51.0)	60.9	(58.3–63.5)	25.2	(23.6–26.8)	37.6	(36.3–38.9)	60.9	(60.4–61.5)
45–64	66.3	(63.3–69.1)	52.6	(49.0–56.2)	39.1	(36.5–41.7)	74.8	(73.2–76.4)	62.4	(61.1–63.7)	39.1	(38.5–39.6)
Race/Ethnicity												
White	75.2	(72.6–77.7)	59.3	(55.9–62.7)	64.9	(62.4–67.4)	64.4	(62.7–66.0)	65.9	(64.7–67.1)	65.0	(64.5–65.6)
Black	7.6	(6.2–9.4)	14.4	(12.3–16.7)	16.0	(14.1–18.0)	18.1	(16.8–19.4)	15.4	(14.5–16.4)	11.6	(11.3–12.0)
Hispanic	12.0	(10.2–13.9)	19.6	(17.0–22.5)	13.5	(11.9–15.4)	12.5	(11.5–13.7)	13.4	(12.6–14.3)	16.1	(15.6–16.5)
Other†	5.3	(4.1–6.6)	6.7	(5.3–8.6)	5.6	(4.7–6.7)	5.1	(4.4–5.9)	5.3	(4.7–5.8)	7.3	(7.0–7.6)
Family income to poverty threshold (ratio)												
<1.0	15.3	(13.2–17.6)	25.6	(22.8–28.7)	33.5	(30.8–36.2)	30.5	(28.8–32.2)	27.7	(26.5–29.0)	12.5	(12.2–12.9)
1.0 to < 2.0	16.1	(14.0–18.5)	23.8	(20.7–27.1)	25.3	(22.9–27.9)	25.0	(23.4–26.6)	23.4	(22.2–24.6)	15.5	(15.2–15.9)
≥2.0	68.7	(65.7–71.5)	50.6	(47.1–54.2)	41.2	(38.4–44.2)	44.6	(42.6–46.5)	48.9	(47.4–50.4)	71.9	(71.4–72.5)
Smoking status												
Current smoker	29.6	(26.8–32.6)	35.1	(31.8–38.4)	39.1	(36.5–41.7)	33.1	(31.4–34.8)	33.6	(32.4–34.9)	19.6	(19.2–20.0)
Former smoker	24.2	(21.7–26.9)	17.9	(15.5–20.7)	15.8	(14.0–17.8)	25.0	(23.5–26.6)	22.2	(21.2–23.3)	17.4	(17.1–17.8)
Never smoker	46.2	(43.2–49.1)	47.0	(43.7–50.3)	45.1	(42.4–47.8)	41.9	(40.1–43.7)	44.2	(42.9–45.5)	63.0	(62.5–63.5)
Body mass index												
Obese	34.5	(31.5–37.5)	39.0	(35.6–42.4)	34.8	(32.1–37.6)	54.5	(52.8–56.3)	45.0	(43.8–46.3)	28.6	(28.2–29.1)
Overweight	37.4	(34.2–40.7)	28.8	(25.9–31.8)	30.0	(27.5–32.6)	26.1	(24.5–27.7)	29.1	(27.9–30.2)	34.0	(33.5–34.5)
Normal or underweight	28.2	(25.4–31.1)	32.3	(29.3–35.4)	35.2	(32.6–37.9)	19.4	(18.0–20.9)	25.9	(24.8–27.1)	37.4	(36.9–37.9)
Chronic disease												
0 of 4	68.0	(65.0–70.8) [§]	67.2	(64.0–70.3) [§]	70.9	(68.4–73.3) [§]	48.6	(46.7–50.4) [§]	59.5	(58.2–60.8) [§]	86.3	(85.9–86.6)
≥1 of 4	32.0	(29.2–35.0) [§]	32.8	(29.7–36.0) [§]	29.1	(26.7–31.6) [§]	51.4	(49.6–53.3) [§]	40.5	(39.2–41.8) [§]	13.7	(13.4–14.1)
Diabetes	10.8	(9.0–12.8)	14.8	(12.5–17.4)	10.1	(8.6–12.0)	27.0	(25.4–28.6)	19.0	(18.1–20.0)	5.0	(4.8–5.2)
Cancer	10.2	(8.5–12.2)	8.0	(6.3–10.1)	8.2	(6.9–9.8)	11.5	(10.5–12.6)	10.0	(9.2–10.8)	4.3	(4.1–4.5)
Stroke	3.6	(2.5–5.1)	5.3	(3.9–7.1)	5.0	(4.0–6.3)	9.4	(8.4–10.4)	6.6	(6.1–7.3)	0.7	(0.7–0.8)
Heart disease	16.9	(14.7–19.3)	15.4	(13.1–18.1)	14.5	(12.6–16.6)	27.5	(25.9–29.1)	20.9	(19.9–22.0)	5.7	(5.5–6.0)
Aerobic physical activity[¶]												
Active	45.2	(42.2–48.2) [§]	40.9	(37.7–44.2) [§]	38.3	(35.6–41.1) [§]	20.6	(19.2–22.1) [§]	31.0	(29.7–32.2) [§]	53.7	(53.1–54.2)
Insufficiently active	21.7	(19.2–24.5)	22.7	(20.1–25.6)	21.6	(19.4–23.8)	22.0	(20.6–23.5)	21.9	(20.9–23.0)	20.2	(19.8–20.6)
Inactive	33.1	(30.3–36.1) [§]	36.4	(33.4–39.5) [§]	40.1	(37.5–42.9) [§]	57.4	(55.6–59.1) [§]	47.1	(45.8–48.5) [§]	26.1	(25.6–26.7)
Physical activity recommendation^{**}												
Yes	43.7	(34.4–53.4)	40.6	(31.2–50.9)	42.7	(35.1–50.6)	46.4	(41.2–51.6)	44.3	(40.4–48.2)	31.0	(29.5–32.4)

Abbreviation: CI = confidence interval.

* Respondents could report more than one limitation and were included in the analysis for each reported limitation. The only exception was that those with a mobility limitation, regardless of any additional limitations, were only included in the mobility limitation subgroup.

† Other includes American Indian/Alaska Native, Asian, multiple race, and “race group not releasable.”

§ p-value <0.001 when compared with no disability. Comparisons only made for aerobic physical activity and chronic disease.

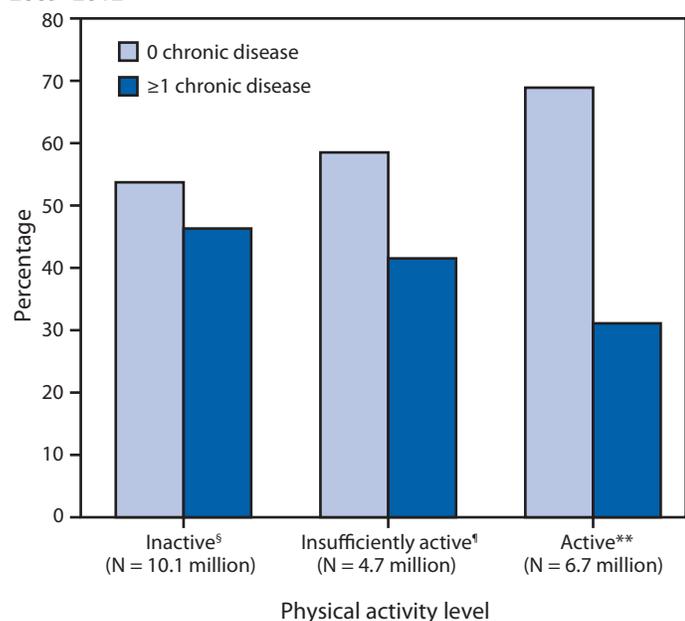
¶ Aerobic physical activity levels were categorized as active (≥150 minutes/week of moderate-intensity equivalent aerobic activity), insufficiently active (at least one bout of aerobic physical activity per week that lasted ≥10 minutes, but not enough total weekly activity to meet the guideline), or inactive (no bouts of aerobic physical activity per week that lasted at least 10 minutes).

** Data from 2010 only; the denominator for this variable also excludes those who have not seen a doctor or other health professional in the past 12 months.

2.1 million adults) reported one or more chronic diseases (Figure 1). The prevalence of reporting one or more chronic diseases by disability type among inactive adults was 36.0% (hearing), 36.2% (vision), 34.3% (cognitive), and 54.2% (mobility). The prevalence among active adults was 28.6% (hearing), 26.8% (vision), 24.1% (cognitive), and 42.6% (mobility).

Adults with any disability who were inactive were more likely than those who were active to report one or more chronic diseases (AOR = 1.50; 95% confidence interval [CI] = 1.30–1.72). Significant associations were also found for each disability type except hearing [vision (AOR = 1.52; CI = 1.07–2.14), cognitive (AOR = 1.45; CI = 1.07–1.96), and mobility (AOR = 1.32; CI = 1.09–1.61)] (Table 2).

FIGURE 1. Prevalence and weighted population estimates of the absence or presence of one or more chronic diseases* among adults aged 18–64 years with a disability (N = 10,690), by aerobic physical activity level† — National Health Interview Survey, United States, 2009–2012



* Chronic diseases include diabetes, cancer, stroke, and heart disease.

† Aerobic physical activity levels categorized as active (≥ 150 minutes/week of moderate-intensity equivalent aerobic activity), insufficiently active (at least one bout of aerobic physical activity per week that lasted ≥ 10 minutes, but not enough total weekly activity to meet the guideline), or inactive (no bouts of aerobic physical activity per week that lasted ≥ 10 minutes).

[§] 0 chronic disease: N = 5.4 million; ≥ 1 chronic disease: N = 4.7 million.

[¶] 0 chronic disease: N = 2.8 million; ≥ 1 chronic disease: N = 2.0 million; weighted population estimates do not add to the overall N of 4.7 million because of rounding.

^{**} 0 chronic disease: N = 4.6 million; ≥ 1 chronic disease: N = 2.1 million.

Among adults with a disability who had visited a health professional in the previous 12 months, 44.3% reported that they had received a recommendation for physical activity from a health professional (Table 1). The distribution of aerobic physical activity levels differed significantly by recommendation status ($X^2 = 5.3$, $df = 2$, $p = 0.006$), with a higher prevalence of inactivity among those not receiving a recommendation (54.8% versus 43.6%) (Figure 2). Compared with those who did not report receiving a physical activity recommendation, those who did had significantly higher odds of being active (AOR = 1.82; CI = 1.25–2.64) or insufficiently active (AOR = 1.84; CI = 1.25–2.71) than inactive, even after controlling for demographic characteristics, health behaviors, and the presence of one or more chronic diseases.

Discussion

Approximately 12% of adults aged 18–64 years reported a disability, and nearly half were inactive. For each disability type, a significantly higher proportion were inactive compared

with adults without disabilities; adults with mobility limitations had the highest prevalence of inactivity. Inactive adults with disabilities were 50% more likely to report one or more chronic diseases than adults with disabilities who were active. In 2010, only four in 10 adults with disabilities who visited a health professional in the past 12 months reported receiving a physical activity recommendation. Those who received a recommendation were more likely to be active compared with those who did not receive a recommendation.

Despite recognition of the importance of physical activity promotion among persons with disabilities (4,11,17,18), the prevalence of inactivity remains high, regardless of disability type. A small percentage of adults with disabilities (5.4%) was excluded from this study because they could not engage in physical activity. For other persons with disabilities who could be physically active, barriers exist that limit participation, including 1) limited information about accessible facilities and programs, 2) physical barriers in the built or natural environment, 3) physical or emotional barriers to participating in fitness and recreation activities, and 4) lack of training in accessibility and communication among fitness and recreation professionals (19).

Multisector approaches to improving physical activity are recommended in the *National Prevention Strategy* (18), the *National Physical Activity Plan* (20), and the *2008 Guidelines* (11). Sectors (e.g., government and health care) can each ensure that physical activity promotion efforts include persons with disabilities. CDC currently funds 18 state disability and health programs and five National Public Health Practice and Resource Centers[¶] to improve the health and wellness of persons with disabilities. Many of these have developed or used physical activity programs or resources^{**} to address the health needs of persons with disabilities.

The health-care sector is uniquely poised to promote physical activity (21). *Healthy People 2020* objective PA-11 calls for increasing the proportion of physician office visits that include counseling or education related to physical activity.^{††} This applies to all persons, including those with disabilities. This

[¶] Additional information available at <http://www.cdc.gov/ncbddd/disabilityandhealth/partners-and-programs.html>.

^{**} Examples include Health Matters (<http://www.rtcadd.org/blog/files/f964400825250eb9a0460f04d62d957d-45.html>), Living Well with a Disability (<http://livingandworkingwell.org>), Steps to Your Health (<http://scidh.com/materials>), Fit for Life (<http://www.health.ny.gov/publications/1228.pdf>), 14 Weeks to a Healthier You Program (<http://www.nchpad.org/14weeks>), Health Meet (<http://www.thearc.org/page.aspx?pid=3686>), Healthy Athletes (http://www.specialolympics.org/healthy_athletes.aspx), Limb Loss Resource Center exercise resources (<http://www.amputee-coalition.org/limb-loss-resource-center/resources-by-topic/exercise/index.html>), Paralysis Resource Center fact sheet on fitness and exercise (<http://www.christopherreeve.org/atf/cf/%7b173bca02-3665-49ab-9378-be009c58a5d3%7d/fitnessexercise6-13.pdf>), and EnhanceFitness (<http://www.projectenhance.org/enhancefitness.aspx>).

^{††} Additional information available at <http://www.healthypeople.gov/2020/topicsobjectives2020/objectiveslist.aspx?topicId=33>.

TABLE 2. Adjusted odds ratios* for reporting at least one of four chronic diseases† among adults aged 18–64 years (N = 10,690), by disability type‡ — National Health Interview Survey, United States, 2009–2012

Characteristic	No mobility limitation						Mobility limitation		Any disability	
	Hearing		Vision		Cognitive		AOR	(95% CI)	AOR	(95% CI)
	AOR	(95% CI)	AOR	(95% CI)	AOR	(95% CI)				
Sex										
Male	1.16	(0.85–1.59)	1.31	(0.95–1.82)	0.90	(0.69–1.17)	0.99	(0.85–1.17)	0.95	(0.84–1.07)
Female	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Age group (yrs)										
18–44	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
45–64	2.87	(2.02–4.09)	2.68	(1.94–3.71)	3.18	(2.44–4.14)	3.20	(2.67–3.85)	3.32	(2.91–3.78)
Race/Ethnicity										
White	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Black	0.92	(0.58–1.47)	1.07	(0.69–1.65)	0.76	(0.54–1.07)	1.08	(0.90–1.30)	1.02	(0.88–1.18)
Hispanic	0.71	(0.44–1.14)	0.97	(0.63–1.50)	0.86	(0.59–1.23)	1.02	(0.81–1.27)	0.95	(0.81–1.12)
Other¶	1.48	(0.83–2.61)	1.40	(0.82–2.39)	1.21	(0.74–1.99)	1.31	(0.93–1.85)	1.31	(1.03–1.67)
Family income to poverty threshold (ratio)										
<1.0	2.42	(1.62–3.60)	1.24	(0.83–1.86)	1.20	(0.88–1.65)	1.40	(1.16–1.68)	1.49	(1.30–1.71)
1.0 to <2.0	1.56	(1.03–2.37)	1.29	(0.87–1.91)	0.90	(0.65–1.23)	1.55	(1.27–1.88)	1.47	(1.27–1.69)
≥2.0	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Smoking status										
Current smoker	1.29	(0.92–1.82)	1.17	(0.83–1.64)	1.13	(0.84–1.51)	0.97	(0.81–1.17)	1.08	(0.95–1.24)
Former smoker	1.48	(1.04–2.10)	1.70	(1.13–2.56)	1.67	(1.18–2.36)	1.25	(1.02–1.52)	1.41	(1.22–1.63)
Never smoker	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Body mass index										
Obese	1.48	(1.02–2.16)	1.41	(0.96–2.08)	1.19	(0.87–1.64)	1.62	(1.31–2.00)	1.64	(1.42–1.90)
Overweight	1.17	(0.80–1.70)	1.18	(0.78–1.79)	0.95	(0.69–1.31)	1.16	(0.92–1.46)	1.13	(0.96–1.33)
Normal or underweight	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Aerobic physical activity**										
Active	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Insufficiently active	1.18	(0.79–1.76)	1.63	(1.08–2.45)	1.12	(0.80–1.57)	1.28	(1.00–1.62)	1.34	(1.13–1.58)
Inactive	1.25	(0.89–1.74)	1.52	(1.07–2.14)	1.45	(1.07–1.96)	1.32	(1.09–1.61)	1.50	(1.30–1.72)

Abbreviations: AOR = adjusted odds ratio; CI = confidence interval; Ref = referent.

* Odds ratios adjusted for sex, age, race/ethnicity, ratio of family income to poverty threshold, smoking status, and body mass index.

† Chronic diseases include diabetes, cancer, stroke, and heart disease.

‡ Respondents could report more than one limitation and were included in the analysis for each reported limitation. The only exception was that those with a mobility limitation, regardless of any additional limitations, were only included in the mobility limitation subgroup.

¶ Other includes American Indian/Alaska Native, Asian, multiple race, and "race group not releasable."

** Aerobic physical activity levels categorized as active (≥150 minutes/week of moderate-intensity equivalent aerobic activity), insufficiently active (at least one bout of aerobic physical activity per week that lasted ≥10 minutes, but not enough total weekly activity to meet the guideline), or inactive (no bouts of aerobic physical activity per week that lasted ≥10 minutes).

report shows a positive association between health professional physical activity recommendations and adults with disabilities being physically active. Adults with disabilities are more likely to see a health-care provider and have a usual source of care (7,8), and are encouraged to consult their health-care providers about physical activity appropriate for their abilities (11). These encounters provide multiple opportunities for the health-care sector to promote physical activity among this subpopulation.

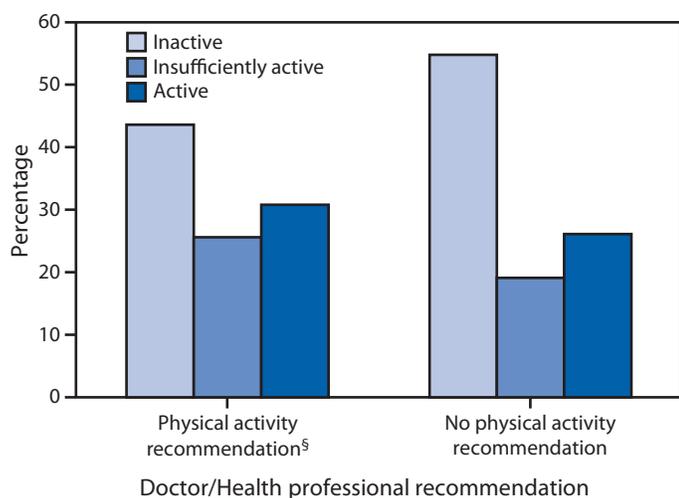
The 2008 Guidelines also apply to persons with disabilities. Doctors and other health professionals can promote physical activity by assessing their patients' current physical activity levels, emphasizing the importance of physical activity for health, and suggesting online resources and community or local

programs suitable for specific abilities.^{§§} Doctors and health professionals can also review specific resources designed to help them discuss physical activity with patients with disabilities.^{¶¶}

^{§§} Examples can be found at CDC's Disability and Physical Activity website (<http://www.cdc.gov/disabilities/pa>), Be Active Your Way: A Guide for Adults (<http://www.health.gov/paguidelines/pdf/adultguide.pdf>), Walk with Ease (<http://www.arthritis.org/resources/community-programs/walk-with-ease/>), and Go4life (<http://go4life.nia.nih.gov/>).

^{¶¶} Sample resources are available online at http://www.cdc.gov/ncbddd/disabilityandhealth/pdf/disabilityposter_photos.pdf, <http://exercisemedicine.org>, <http://www.ahrq.gov/professionals/quality-patient-safety/quality-resources/tools/literacy-toolkit/index.html>, <http://certification.acsm.org/acsm-inclusive-fitness-trainer>, and <http://www.cdc.gov/healthliteracy/developmaterials/plainlanguage.html>, and in print (Durstine JL, Moore GE, Painter PL, Roberts SO, eds. ACSM's exercise management for persons with chronic diseases and disabilities. Champaign, IL: American College of Sports Medicine; 2009).

FIGURE 2. Prevalence* of aerobic physical activity level† among adults aged 18–64 years with a disability (N = 1,090), by whether or not a doctor or health professional recommended exercise or physical activity in the past 12 months — National Health Interview Survey, United States, 2010



* The denominator for this variable also excludes those who have not seen a doctor or other health professional in the past 12 months.

† Aerobic physical activity levels categorized as active (≥ 150 minutes/week of moderate-intensity equivalent aerobic activity), insufficiently active (at least one bout of aerobic physical activity per week that lasted ≥ 10 minutes, but not enough total weekly activity to meet the guideline), or inactive (no bouts of aerobic physical activity per week that lasted ≥ 10 minutes).

§ $\chi^2 = 5.3$, $df = 2$, $p = 0.006$.

Communities can use strategies recommended in *The Guide to Community Preventive Services*,^{***} including those that use behavioral and social support approaches, to encourage individual health behavior change and increase physical activity among persons with disabilities.^{†††} Communities can also incorporate environmental and policy approaches such as following Americans with Disabilities Act design guidelines^{§§§} for fitness centers, worksites, schools, and playgrounds; maintaining safe and accessible parks and trails; and designing sidewalks and streets that are safe and accessible to all persons.^{¶¶¶} The findings in this report are subject to at least four limitations. First, because of the cross-sectional design of the NHIS, establishing causality or directionality between disability, physical activity, and chronic disease is not possible. Even so, physical activity has the potential to prevent chronic disease and to help manage and improve health for those already having a

*** Available at <http://www.thecommunityguide.org/pa/index.html>.

††† Examples include Health Matters (<http://www.rttcadd.org/blog/files/f964400825250eb9a0460f04d62d957d-45.html>), Living Well with a Disability (<http://livingandworkingwell.org/>), and Steps to your Health (<http://sciodh.com/materials>).

§§§ Available at <http://www.access-board.gov/guidelines-and-standards/buildings-and-sites/about-the-ada-standards/ada-standards>.

¶¶¶ Examples include using curb cuts to reduce barriers to walking or wheeling and audible traffic signals for persons with vision impairments.

Key Points

- Approximately 21.5 million adults (one in eight) aged 18–64 years have a serious limitation in their hearing, vision, cognition, or mobility.
- Among adults with a disability:
 - Nearly half (approximately 10.1 million) are inactive, meaning they do not get any aerobic physical activity.
 - Those who are inactive are 50% more likely to have a chronic disease than those who get the recommended amount of aerobic physical activity each week.
 - Approximately 5.4 million inactive adults with disabilities who do not currently have diabetes, stroke, heart disease or cancer, are missing opportunities to protect against these chronic diseases through physical activity.
 - Approximately 4.7 million inactive adults with disabilities who already have chronic disease are missing opportunities to manage or mitigate the effects of these diseases.
 - Approximately 44% of adults who saw a doctor or other health professional in the past 12 months received a physical activity recommendation and were more likely to be active than those who did not receive a recommendation.
- Doctors and health professionals can promote physical activity among their patients with disabilities.
- Additional information is available at <http://www.cdc.gov/vitalsigns>.

chronic disease, regardless of directionality. Second, disability estimates are likely conservative because they do not include adults whose disability was considered moderate, those who were unable to engage in aerobic physical activity, and those living in congregate care or institutional settings. However, other datasets using broader definitions of disability show similar disparities in the prevalence of physical activity and inactivity by disability status (12,13,15). Third, the data were either self-reported or provided by a designated household or family member and might be subject to reporting or recall bias. Finally, the NHIS response rates of 61%–66% might have resulted in nonresponse bias.

Approximately half of adults aged 18–64 years with disabilities (approximately 10.1 million adults) are missing the opportunity to protect or improve their health and potentially delay or prevent chronic disease onset through physical activity.

Providing safe, appropriate, and accessible physical activity options to persons with disabilities requires support across sectors, including health-care, to help persons with disabilities more easily engage in this essential health behavior.

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References

1. CDC. CDC grand rounds: public health practices to include persons with disabilities. *MMWR* 2013;62:697–701.
2. Brault MW. Americans with disabilities: 2010. Washington, DC: US Census Bureau; 2012. Available at <http://www.census.gov/prod/2012pubs/p70-131.pdf>.
3. Anderson WL, Armour BS, Finkelstein EA, Wiener JM. Estimates of state-level health-care expenditures associated with disability. *Public Health Rep* 2010;125:44–51.
4. US Department of Health and Human Services. The Surgeon General's call to action to improve the health and wellness of persons with disabilities. Rockville, MD: US Department of Health and Human Services, Office of the Surgeon General; 2005. Available at <http://www.surgeongeneral.gov/library/calls/index.html>.
5. Institute of Medicine. The future of disability in America. Washington DC: The National Academies Press; 2007. Available <http://www.iom.edu/reports/2007/the-future-of-disability-in-america.aspx>.
6. Dixon-Ibarra A, Horner-Johnson W. Disability status as an antecedent to chronic conditions: National Health Interview Survey, 2006–2012. *Prev Chronic Dis* 2014;11:130251.
7. Iezzoni LI, Frakt AB, Pizer SD. Uninsured persons with disability confront substantial barriers to health care services. *Disabil Health J* 2011;4:238–44.
8. Sommers AS. Access to health insurance, barriers to care, and service use among adults with disabilities. *Inquiry* 2006;43:393–405.
9. Physical Activity Guidelines Advisory Committee. Physical Activity Guidelines Advisory Committee report, 2008. Washington, DC: US Department of Health and Human Services; 2008. Available at <http://www.health.gov/paguidelines/report>.
10. Ballard-Barbash R, Friedenreich CM, Courneya KS, Siddiqi SM, McTiernan A, Alfano CM. Physical activity, biomarkers, and disease outcomes in cancer survivors: a systematic review. *J Natl Cancer Inst* 2012;104:815–40.
11. US Department of Health and Human Services. 2008 physical activity guidelines for Americans. Washington, DC: US Department of Health and Human Services; 2008. Available at <http://www.health.gov/paguidelines/guidelines/default.aspx>.
12. CDC. Physical activity among adults with a disability—United States, 2005. *MMWR* 2007;56:1021–4.
13. Fitzmaurice C, Kanarek N, Fitzgerald S. Primary prevention among working age USA adults with and without disabilities. *Disabil Rehabil* 2011;33:343–51.
14. Pharr JR, Bungum T. Health disparities experienced by people with disabilities in the United States: a Behavioral Risk Factor Surveillance System study. *Glob J Health Sci* 2012;4:99–108.
15. CDC. Disability and Health Data System (DHDS). Atlanta, GA: US Department of Health and Human Services, CDC; 2013. Available at <http://dhds.cdc.gov>.
16. Ward BW, Schiller JS. Prevalence of multiple chronic conditions among US adults: estimates from the National Health Interview Survey, 2010. *Prev Chronic Dis* 2013;10:E65.
17. US Department of Health and Human Services. Physical activity and health: a report of the Surgeon General. Atlanta, GA: US Department of Health and Human Services; 1996. Available at <http://www.cdc.gov/nccdphp/sgr/index.htm>.
18. National Prevention Council. National prevention strategy. Washington, DC: US Department of Health and Human Services; 2011. Available at <http://www.surgeongeneral.gov/initiatives/prevention/strategy/index.html>.
19. Rimmer JH, Riley B, Wang E, Rauworth A, Jurkowski J. Physical activity participation among persons with disabilities: barriers and facilitators. *Am J Prev Med* 2004;26:419–25.
20. US National Physical Activity Plan Coordinating Committee. National physical activity plan. Columbia, SC: National Physical Activity Plan; 2010. Available at <http://www.physicalactivityplan.org/NationalPhysicalActivityPlan.pdf>.
21. Patrick K, Pratt M, Sallis RE. The healthcare sector's role in the U.S. national physical activity plan. *J Phys Act Health* 2009;6(Suppl 2):S211–9.

Announcement

Healthy Vision Month — May 2014

May is Healthy Vision Month, a national observance to promote prevention and early detection of eye diseases to reduce avoidable vision impairment, defined as the best-corrected visual acuity less than 20/40 in the better-seeing eye (1). CDC's Vision Health Initiative partners with the National Eye Institute's National Eye Health Education Program in encouraging everyone to make vision and eye health a priority.

Early detection, timely treatment, and use of protective eyewear are the best ways to keep eyes healthy and to prevent or delay vision impairment. In 2010, approximately 4.2 million persons in the United States aged ≥ 40 years had vision impairment (2). Vision impairment is the third most common chronic condition among those aged ≤ 17 years, the ninth most common for those aged 50–64 years, and the seventh most common for persons aged ≥ 65 years (3,4). Vision impairment is associated with an increased risk for falls, fall-related injuries, depression, and reduced overall health and quality of life (5–7).

Many common eye diseases have no early signs; therefore, regular, comprehensive dilated eye examinations to detect and treat vision problems and eye diseases early are recommended for all persons aged ≥ 65 years and for younger persons with diabetes or risk factors for glaucoma (8). Additional information about activities to promote prevention, early detection, and treatment of eye diseases and vision impairment is available at <http://www.cdc.gov/visionhealth> and <http://www.nei.nih.gov/healthyeyes>.

References

1. CDC. Enhancing public health surveillance of visual impairment and eye health in the United States. Atlanta, GA: US Department of Health and Human Services, CDC; 2012. Available at http://www.cdc.gov/visionhealth/pdf/surveillance_background.pdf.
2. Prevent Blindness America. Vision problems in the U.S.: prevalence of adult vision impairment and age-related eye disease in America. Chicago, IL: Prevent Blindness America; 2012. Available at <http://www.visionproblemsus.org/blindness/blindness-definition.html>.
3. Anderson G. Chronic care: making the case for ongoing care. Princeton, NJ: Robert Wood Johnson Foundation; 2010. Available at <http://www.rwjf.org/files/research/50968chronic.care.chartbook.pdf>.
4. Martin LG, Freeman VA, Schoeni RE, Andreski PM. Trends in disability and related chronic conditions among people ages fifty to sixty-four. *Health Aff (Millwood)* 2010;29:725–31.
5. Li Y, Crews JE, Elam-Evans LD, et al. Visual impairment and health-related quality of life among elderly adults with age-related eye disease. *Qual Life Res* 2011;20:845–52.
6. Wood JM, Lacherez P, Black AA, Cole MH, Boon MY, Kerr GK. Risk of falls, injurious falls, and other injuries resulting from visual impairment among older adults with age-related macular degeneration. *Invest Ophthalmol Vis Sci* 2011;52:5088–92.
7. Zhang X, Bullard KM, Cotch MF, et al. Association between depression and functional vision loss in persons 20 years of age or older in the United States, NHANES 2005–2008. *JAMA Ophthalmol* 2013;131:573–81.
8. American Academy of Ophthalmology Preferred Practice Patterns Committee. Comprehensive adult medical eye evaluation. San Francisco, CA: American Academy of Ophthalmology; 2010. Available at <http://www.guideline.gov/content.aspx?id=25644#section420>.

Announcements

Drinking Water Week — May 4–10, 2014

The United States has one of the safest public drinking water supplies in the world (1). Tap water not only provides water for daily household activities such as drinking, bathing, and cooking, it also benefits the entire community by providing water to serve businesses, schools, and hospitals, and to promote overall health (2). May 4–10, 2014, is Drinking Water Week, an annual observance whose theme (“What Do You Know About H₂O?”) underscores the many ways in which all consumers can get to know their water (3).

Disinfection and treatment practices, as well as the environmental regulation of water pollutants, have substantially improved domestic water quality during the past century and have led to a marked decrease in the incidence of waterborne diseases such as typhoid fever (4–6). Despite these improvements, sources of drinking water still can become contaminated, resulting in adverse health effects (7).

New challenges to the U.S. water supply include aging drinking water infrastructure, the potential impact of climate change on water availability and quality, chemical contamination of water sources, emerging pathogens, and the development of new ways to obtain and use water. Drinking Water Week is a time to highlight the importance of safe drinking water and recognize that protecting water infrastructure is crucial to the health of persons living in the United States.

References

1. US Environmental Protection Agency. Water on tap: what you need to know. Washington, DC: US Environmental Protection Agency; 2009. Available at http://water.epa.gov/drink/guide/upload/book_waterontap_full.pdf.
2. CDC. Achievements in public health, 1900–1999: changes in the public health system. MMWR 1999;48:1141–7.
3. American Water Works Association. Drinking Water Week 2014 materials: what do you know about H₂O? Denver, CO: American Water Works Association; 2014. Available at <http://www.awwa.org/resources-tools/public-affairs/public-affairs-events/drinking-water-week/dww-materials.aspx>.
4. CDC. Achievements in public health, 1900–1999: safer and healthier foods. MMWR 1999;48:905–13.
5. CDC. Summary of notifiable diseases—United States, 2010. MMWR 2012;59(53).
6. Cutler D, Miller G. The role of public health improvements in health advances: the 20th century United States. Cambridge, MA: National Bureau of Economic Research; 2004. Available at <http://www.nber.org/papers/w10511.pdf>.
7. US Environmental Protection Agency. Drinking water contaminants. Washington, DC: US Environmental Protection Agency; 2011. Available at <http://www.epa.gov/safewater/contaminants/index.html>.

Erratum

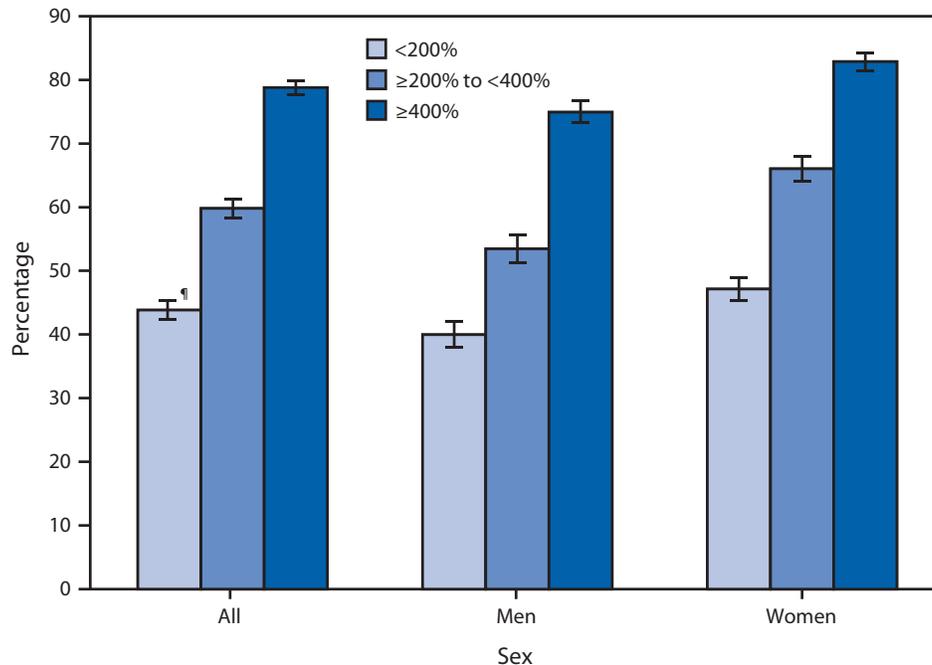
Vol. 63, No. 16

In the report, “Occupational Ladder Fall Injuries — United States, 2011,” an error occurred in the first sentence of the first paragraph. The sentence reads, “Falls remain a leading cause of unintentional injury mortality nationwide, and 43% of fatal falls in the last decade have involved a ladder (*I*).” The last part of the sentence should be deleted, and the sentence should read, “Falls remain a leading cause of unintentional injury mortality nationwide (*I*).”

QuickStats

FROM THE NATIONAL CENTER FOR HEALTH STATISTICS

Percentage of Adults Aged 18–64 Years Who Have Seen a Dentist Within the Past Year,* by Family Income Group[†] and Sex — National Health Interview Survey, United States, 2012[§]



* Based on response to the question, "About how long has it been since you last saw a dentist? Include all types of dentists, such as orthodontists, oral surgeons, and all other dental specialists, as well as dental hygienists."

[†] Family income groups were defined based on family income as a percentage of the federal poverty threshold. Poverty thresholds, which are published by the U.S. Census Bureau, vary by family size and the number of children in the family. Family income was imputed when missing using multiple imputation methodology.

[§] Estimates are based on household interviews of a sample of the civilian, noninstitutionalized U.S. population and are derived from the National Health Interview Survey sample adult component.

[¶] 95% confidence interval.

In 2012, the percentage of adults with a dental visit within the past year increased with increasing income. Approximately 44% of adults with family income <200% of the poverty threshold had a dental visit in the past year, increasing to 60% of those with family income from ≥200 to <400% and 79% for those with family income of ≥400% of the poverty threshold. The percentage of women with a dental visit in the past year was higher than men within each income group.

Source: National Health Interview Survey, 2012. Available at <http://www.cdc.gov/nchs/nhis.htm>.

Reported by: Brandy Lipton, PhD, blipton@cdc.gov, 301-458-4318; Sandra Decker, PhD.

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The *Morbidity and Mortality Weekly Report (MMWR)* Series is prepared by the Centers for Disease Control and Prevention (CDC) and is available free of charge in electronic format. To receive an electronic copy each week, visit *MMWR*'s free subscription page at <http://www.cdc.gov/mmwr/mmwrsubscribe.html>. Paper copy subscriptions are available through the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402; telephone 202-512-1800.

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