Centers for Disease Control and Prevention
MMWR
Morbidity and Mortality Weekly Report
Weekly / Vol. 66 / No. 4
February 3, 2017

National Black HIV/AIDS Awareness Day — February 7, 2017

February 7 is National Black HIV/AIDS Awareness Day, an observance intended to raise awareness of human immunodeficiency virus (HIV) infection and acquired immunodeficiency syndrome (AIDS), and encourage action to reduce the disproportionate impact of HIV on blacks/African Americans (blacks) in the United States. From 2010 to 2014, the annual HIV diagnosis rate decreased for blacks by 16.2% (*1*); however, in 2015, blacks accounted for approximately half (45%) of all new HIV diagnoses (17,670), 74% of which were in men (*1*). The majority of these diagnoses were among gay and bisexual men.

The annual rate of HIV diagnosis among black women (26.2 per 100,000) was approximately 16 times the rate among white women (1.6) and approximately five times the rate among Hispanic women (5.3). Among blacks living with diagnosed HIV infection in 2013, 54% were receiving continuous HIV medical care (two or more CD4 or viral load tests ≥3 months apart) and 49% had a suppressed viral load (<200 copies/mL at most recent test) (*2*).

Additional information regarding National Black HIV/AIDS Awareness Day is available at https://www.cdc.gov/features/blackhivaidsawareness. Additional information about blacks and HIV is available at https://www.cdc.gov/hiv/group/racialethnic/africanamericans.

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HIV Care Outcomes Among Blacks with Diagnosed HIV — United States, 2014

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Since the release of the National HIV/AIDS Strategy (NHAS) (*1*) and the establishment of the federal Human Immunodeficiency Virus (HIV) Care Continuum Initiative (*2*), federal efforts have accelerated to improve and increase HIV testing, care, and treatment and to reduce HIV-related disparities in the United States. National HIV Surveillance System (NHSS)* data are used to monitor progress toward reaching NHAS goals,† and recent data indicate that blacks have lower levels of care and viral suppression than do persons of other racial and ethnic groups (*3*). Among persons with HIV infection diagnosed through 2012 who were alive at

* NHSS is the primary source for monitoring HIV trends in the United States. The system collects, analyzes, and disseminates information about new and existing cases of HIV infection.
† NHAS was updated in July 2015 to look forward to 2020. The NHAS goals to be accomplished by 2020 are as follows: 1) 85% of all persons with newly diagnosed HIV infection to be linked to care, 2) 90% of persons living with diagnosed HIV to be retained in care, and 3) 80% of persons living with diagnosed HIV to have a suppressed viral load.

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year-end 2013, 68.1% of blacks received any HIV medical care compared with 74.4% of whites (*3*). CDC used NHSS data to describe HIV care outcomes among blacks who received a diagnosis of HIV. Among blacks with HIV infection diagnosed in 2014, 21.9% had infection classified as HIV stage 3 (acquired immunodeficiency syndrome [AIDS]) at the time of diagnosis compared with 22.5% of whites; 71.6% of blacks were linked to care within 1 month after diagnosis compared with 79.0% of whites. Among blacks with HIV infection diagnosed through 2012 who were alive on December 31, 2013, 53.5% were receiving continuous HIV medical care compared with 58.2% of whites; 48.5% of blacks achieved viral suppression compared with 62.0% of whites. Intensified efforts and implementation of effective interventions and public health strategies that increase engagement in care and viral suppression among blacks (*1*,*4*) are needed to achieve NHAS goals.

All states, the District of Columbia, and U.S. territories report cases of HIV infection and associated demographic and clinical information to NHSS. CDC analyzed data for persons aged ≥13 years reported through December 2015 from 33 jurisdictions[§] with complete laboratory reporting.[¶] These jurisdictions accounted for 65.3% of blacks living with diagnosed HIV infection at year-end 2013 in the United States. Stage 3 classification and linkage to care were assessed among blacks living in any of the 33 jurisdictions at the time of HIV diagnosis in 2014. A stage 3 classification was defined as having a CD4 count of <200/μL, CD4 percentage of total lymphocytes of <14, or documentation of an AIDS-defining condition ≤3 months after a diagnosis of HIV infection. Linkage to care was defined as having documentation of ≥1 CD4 count or percentage or viral load (VL) tests ≤1 month after HIV diagnosis. Retention in care and viral suppression were assessed among blacks with HIV diagnosed by December 31, 2012, and who were alive and resided (based on the most recent known address) in any of the 33 jurisdictions as of December 31, 2013 (i.e., persons living with diagnosed HIV). Retention in HIV care, defined as having two or more CD4 or VL tests ≥3 months apart, and viral suppression, defined as a VL of <200 copies/mL at most recent test, were assessed for 2013. Data were statistically adjusted by using multiple imputation techniques to account for missing HIV transmission categories (*5*).

[§] The 33 jurisdictions were Alabama, Alaska, California, District of Columbia, Georgia, Hawaii, Illinois, Indiana, Iowa, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Nebraska, New Hampshire, New Mexico, New York, North Dakota, Oregon, South Carolina, South Dakota, Tennessee, Texas, Utah, Virginia, Washington, West Virginia, Wisconsin, and Wyoming.

[¶] The criteria for complete reporting were the following: 1) the jurisdiction's laws or regulations required reporting of all CD4 and viral load (VL) test results to the state or local health department, 2) ≥95% of all laboratory test results were reported by laboratories that conduct HIV-related testing for each jurisdiction, and 3) the jurisdiction reported to CDC ≥95% of CD4 and VL results received since at least January 2013.

The *MMWR* series of publications is published by the Center for Surveillance, Epidemiology, and Laboratory Services, Centers for Disease Control and Prevention (CDC), U.S. Department of Health and Human Services, Atlanta, GA 30329-4027.

Suggested citation: [Author names; first three, then et al., if more than six.] [Report title]. MMWR Morb Mortal Wkly Rep 2017;66:[inclusive page numbers].

Summary

What is already known about this topic?

Blacks living with diagnosed human immunodeficiency virus (HIV) infection have lower levels of care and viral suppression than do persons of other racial groups. National HIV/Acquired immunodeficiency syndrome (AIDS) Strategy goals include 85% linkage to care, 90% retention in care, and 80% viral load suppression by 2020.

What is added by this report?

In 2014, 21.9% of infections diagnosed among blacks were classified as stage 3 (AIDS) at the time of diagnosis and 71.6% of blacks with HIV diagnoses were linked to care within 1 month. Among blacks living with diagnosed HIV at year-end 2013, 53.5% were retained in care and 48.5% achieved viral suppression. The lowest levels of care and viral suppression were among persons with infection attributed to injection drug use and males with infection attributed to heterosexual contact; linkage to care and viral load suppression were lower among persons aged <35 years than persons aged ≥35 years.

What are the implications for public health practice?

Increasing the proportion of black persons living with HIV who are receiving care is critical for achieving the National HIV/AIDS Strategy 2020 goals to reduce new infections, improve health outcomes, and decrease health disparities. Tailored strategies for black subpopulations, including persons who inject drugs and young males with infection attributed to heterosexual contact, might be needed to achieve improvements in linkage and retention in care.

In the 33 jurisdictions, 12,269 blacks received a diagnosis of HIV infection in 2014. Among these, 21.9% had infections classified as stage 3 at diagnosis (Table 1). Among males, 20.9% had a stage 3 classification, compared with 24.8% of females. The highest percentage of infections classified as stage 3 among different age groups were reported in persons aged ≥55 years (38.2%); stage 3 classifications increased with age group. By transmission category, males with infection attributed to injection drug use (IDU) had the highest percentage (32.5%) of infections classified as stage 3, followed by males with infection attributed to heterosexual contact (32.2%).

Overall, 8,780 (71.6%) of the 12,269 blacks with HIV infection diagnosed during 2014 were linked to care ≤1 month after HIV diagnosis; the percentage of persons linked to care increased with increasing age group (Table 2). Overall, 70.0% of males and 76.2% of females were linked to care. By transmission category and age group, males aged 13–24 years with infection attributed to male-to-male sexual contact and IDU accounted for the lowest percentage of persons linked to care (54.9%), followed by males aged 25–34 years with infection attributed to heterosexual contact (63.0%).

Among 257,316 blacks aged ≥13 years living with diagnosed HIV in 33 jurisdictions on December 31, 2013, approximately half (53.5%) were retained in care (Table 3), including 52.4% of males and 55.6% of females. A lower percentage of persons aged 13–34 years were retained in care (50.3%) than were persons aged ≥35 years (54.4%). By transmission category and age group, males aged 25–34 years with infection attributed to IDU accounted for the lowest percentage retained in care (38.1%), followed by males aged 13–24 years with infection attributed to heterosexual contact (39.4%). VL suppression at the most recent test was achieved by 48.5% of persons (Table 3); a higher percentage of females had suppressed VL (49.8%) than did males (47.9%). Among all age groups, the lowest level of VL suppression was among persons aged 13–24 years (39.7%); VL suppression increased with increasing age group. Females aged 13–24 years with infection attributed

TABLE 1. Number and percentage of HIV infection diagnoses among blacks aged ≥13 years who were stage 3 (AIDS) at the time of diagnosis — National HIV Surveillance System, 33 jurisdictions,* United States, 2014

Characteristic	No. HIV diagnoses	Stage 3 (AIDS) at diagnosis† no. (%)
Sex		
Male	9,121	1,908 (20.9)
Female	3,148	780 (24.8)
Age group at diagnosis (yrs)		
13–24	3,539	362 (10.2)
25–34	3,832	700 (18.3)
35–44	2,106	630 (29.9)
45–54	1,642	557 (33.9)
≥55	1,150	439 (38.2)
Transmission category§		
Male-to-male sexual contact	7,393	1,374 (18.6)
Injection drug use		
Male	378	123 (32.5)
Female	276	74 (26.9)
Male-to-male sexual contact and injection drug use	187	37 (19.6)
Heterosexual contact¶		
Male	1,144	369 (32.2)
Female	2,859	700 (24.5)
Other**		
Male	19	6 (31.6)
Female	14	6 (41.2)
Total	**12,269**	**2,688 (21.9)**

Abbreviations: AIDS = acquired immunodeficiency syndrome; HIV = human immunodeficiency virus.

* The 33 jurisdictions were Alabama, Alaska, California, District of Columbia, Georgia, Hawaii, Illinois, Indiana, Iowa, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Nebraska, New Hampshire, New Mexico, New York, North Dakota, Oregon, South Carolina, South Dakota, Tennessee, Texas, Utah, Virginia, Washington, West Virginia, Wisconsin, and Wyoming.

† Stage of disease at diagnosis of HIV infection based on first CD4 test performed or documentation of an AIDS-defining condition ≤3 months after a diagnosis of HIV infection.

§ Data statistically adjusted to account for missing transmission categories.

¶ Heterosexual contact with a person known to have or to be at high risk for HIV infection.

** Includes persons with diagnosed infection attributed to hemophilia, blood transfusion, perinatal exposure, and risk factors not reported or not identified.

TABLE 2. Linkage to HIV medical care within 1 month after HIV diagnosis,* among blacks aged ≥13 years, by age group and selected characteristics — National HIV Surveillance System, 33 jurisdictions,† United States, 2014

Characteristic	Age group (yrs) 13–24 No. HIV diagnoses	13–24 No. linked§ (%)	25–34 No. HIV diagnoses	25–34 No. linked§ (%)	35–44 No. HIV diagnoses	35–44 No. linked§ (%)	45–54 No. HIV diagnoses	45–54 No. linked§ (%)	≥55 No. HIV diagnoses	≥55 No. linked§ (%)	Total No. HIV diagnoses	Total No. linked§ (%)
Sex												
Male	3,044	1,945 (63.9)	3,009	2,111 (70.2)	1,338	999 (74.7)	1,036	779 (75.2)	694	548 (79.0)	**9,121**	**6,382 (70.0)**
Female	495	353 (71.3)	823	624 (75.8)	768	584 (76.0)	606	465 (76.7)	456	372 (81.6)	**3,148**	**2,398 (76.2)**
Transmission category¶												
Male-to-male sexual contact	2,847	1,821 (64.0)	2,650	1,873 (70.7)	954	714 (74.8)	638	483 (75.7)	303	234 (77.2)	**7,393**	**5,124 (69.3)**
Injection drug use												
Male	30	21 (70.0)	69	51 (73.9)	67	53 (79.1)	93	66 (71.0)	119	88 (73.9)	**378**	**278 (73.6)**
Female	31	22 (71.0)	57	38 (66.7)	62	45 (72.6)	71	52 (73.2)	55	45 (81.8)	**276**	**203 (73.5)**
Male-to-male sexual contact and injection drug use	51	28 (54.9)	62	43 (69.4)	33	22 (66.7)	22	16 (72.7)	19	16 (84.2)	**187**	**125 (66.7)**
Heterosexual contact**												
Male	106	67 (63.2)	227	143 (63.0)	282	209 (74.1)	281	213 (75.8)	249	208 (83.5)	**1,144**	**841 (73.5)**
Female	455	323 (71.0)	764	584 (76.4)	705	539 (76.5)	534	412 (77.2)	400	326 (81.5)	**2,859**	**2,185 (76.4)**
Other††												
Male	9	8 (88.9)	2	1 (50.0)	2	1 (50.0)	2	1 (50.0)	4	3 (75.0)	**19**	**14 (73.2)**
Female	10	7 (70.0)	2	2 (100.0)	0	0 (0.0)	0	0 (0.0)	1	1 (100.0)	**14**	**10 (76.5)**
Total	**3,539**	**2,298 (64.9)**	**3,832**	**2,735 (71.4)**	**2,106**	**1,583 (75.2)**	**1,642**	**1,244 (75.8)**	**1,150**	**920 (80.0)**	**12,269**	**8,780 (71.6)**

Abbreviation: HIV = human immunodeficiency virus.

* Data include persons with a diagnosis of HIV infection, regardless of stage of disease at diagnosis.

† The 33 jurisdictions were Alabama, Alaska, California, District of Columbia, Georgia, Hawaii, Illinois, Indiana, Iowa, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Nebraska, New Hampshire, New Mexico, New York, North Dakota, Oregon, South Carolina, South Dakota, Tennessee, Texas, Utah, Virginia, Washington, West Virginia, Wisconsin, and Wyoming.

§ One or more CD4 or viral load tests performed within 1 month after HIV diagnosis during 2014.

¶ Data statistically adjusted to account for missing transmission categories.

** Heterosexual contact with a person known to have or to be at high risk for HIV infection.

†† Includes persons with diagnosed infection attributed to hemophilia, blood transfusion, perinatal exposure, and risk factors not reported or not identified.

to IDU had the lowest level of viral suppression (29.7%), followed by males aged 13–24 years with infection attributed to heterosexual contact (31.2%).

Discussion

In 2014, among blacks aged ≥13 years with diagnosed HIV, approximately one in five (21.9%) infections were classified as stage 3 (AIDS) at the time of diagnosis and 71.6% were linked to care within 1 month of diagnosis. Among all blacks living with diagnosed HIV at year-end 2013 in the 33 jurisdictions with complete laboratory reporting, 53.5% were retained in care and 48.5% had achieved viral suppression. These percentages are far below the NHAS 2020 goals of 85% linkage to care, 90% retention in care, and 80% VL suppression, and are also below the percentages of whites who were linked to care, retained in care and with VL suppression (79.0%, 58.2%, and 62.0%, respectively). Improving health outcomes for blacks living with HIV infection is necessary to reduce HIV in the United States. Prompt linkage to care after diagnosis allows early initiation of HIV treatment, which is associated with reduced morbidity, mortality, and transmission of HIV (*6*). Findings from CDC's report on monitoring selected HIV prevention and care objectives indicate blacks have lower HIV linkage (71.6%) and viral suppression (48.5%) percentages than do whites (79.0% and 62.0%, respectively) (*1*).

Consistent with findings from a previous report on the continuum of HIV care among blacks with diagnosed HIV based on data from 19 jurisdictions, males had lower levels of care and viral suppression than did females, and persons aged <35 years had lower levels of viral suppression than did persons aged ≥35 years (*7*). The lowest levels of care and viral suppression among blacks with HIV in these 33 jurisdictions were among persons with infection attributed to IDU and males with infection attributed to heterosexual contact. Results of analyses by sex, and transmission category and age group should be interpreted with caution because some subpopulations have small numbers. In addition to routine testing for HIV to identify persons with unrecognized infection, interventions are needed to ensure that all persons with HIV receive optimal care; tailored strategies for black persons

TABLE 3. Retention in HIV medical care and viral suppression among blacks aged ≥13 years with HIV infection diagnosed by December 31, 2012,* who were alive on December 31, 2013, by age group and selected characteristics — National HIV Surveillance System, 33 jurisdictions,† United States, 2014

Characteristic	Total no.	Retained in care in 2013§ No. (%)	Viral suppression¶ No. (%)
Age ≥13 yrs**			
Sex			
Male	**170,740**	89,475 (52.4)	81,816 (47.9)
Female	**86,576**	48,149 (55.6)	43,095 (49.8)
Transmission category††			
Male-to-male sexual contact	**103,681**	55,110 (53.2)	50,927 (49.1)
Injection drug use			
Male	**27,507**	13,187 (47.9)	11,914 (43.3)
Female	**18,806**	10,315 (54.8)	8,931 (47.5)
Male-to-male sexual contact and injection drug use	**11,691**	6,697 (57.3)	5,779 (49.4)
Heterosexual contact§§			
Male	**25,700**	13,333 (51.9)	12,359 (48.1)
Female	**65,385**	36,408 (55.7)	33,199 (50.8)
Other¶¶	**4,546**	2,576 (56.7)	1,803 (39.7)
Total	**257,316**	**137,624 (53.5)**	**124,911 (48.5)**
Age 13–24 yrs**			
Transmission category††			
Male-to-male sexual contact	**10,001**	5,059 (50.6)	4,102 (41.0)
Injection drug use			
Male	**127**	51 (40.2)	42 (33.1)
Female	**219**	102 (46.6)	65 (29.7)
Male-to-male sexual contact and injection drug use	**246**	120 (48.8)	96 (39.0)
Heterosexual contact§§			
Male	**378**	149 (39.4)	118 (31.2)
Female	**2,454**	1,319 (53.7)	953 (38.8)
Other¶¶	**3,222**	1,884 (58.5)	1,238 (38.4)
Total	**16,646**	**8,684 (52.2)**	**6,614 (39.7)**
Age 25–34 yrs**			
Transmission category††			
Male-to-male sexual contact	**25,031**	12,638 (50.5)	11,110 (44.4)
Injection drug use			
Male	**996**	379 (38.1)	326 (32.7)
Female	**1,381**	637 (46.1)	506 (36.6)
Male-to-male sexual contact and injection drug use	**1,178**	605 (51.4)	493 (41.9)
Heterosexual contact§§			
Male	**2,337**	1,006 (43.0)	895 (38.3)
Female	**11,754**	5,907 (50.3)	4,964 (42.2)
Other¶¶	**588**	299 (50.9)	218 (37.1)
Total	**43,265**	**21,471 (49.6)**	**18,512 (42.8)**
Age 35–44 yrs**			
Transmission category††			
Male-to-male sexual contact	**23,987**	12,680 (52.9)	11,909 (49.6)
Injection drug use			
Male	**3,204**	1,441 (45.0)	1,311 (40.9)
Female	**3,936**	2,016 (51.2)	1,679 (42.7)
Male-to-male sexual contact and injection drug use	**2,226**	1,220 (54.8)	1,028 (46.2)
Heterosexual contact§§			
Male	**5,835**	2,860 (49.0)	2,637 (45.2)
Female	**20,017**	10,482 (52.4)	9,549 (47.7)
Other¶¶	**132**	64 (48.5)	50 (37.9)
Total	**59,337**	**30,763 (51.8)**	**28,162 (47.5)**

See table footnotes on page 102.

TABLE 3. (*Continued*) Retention in HIV medical care and viral suppression among blacks aged ≥13 years with HIV infection diagnosed by December 31, 2012,* who were alive on December 31, 2013, by age group and selected characteristics — National HIV Surveillance System, 33 jurisdictions,† United States, 2014

Characteristic	Total no.	Retained in care in 2013§ No. (%)	Viral suppression¶ No. (%)
Age 45–54 yrs**			
Transmission category††			
Male-to-male sexual contact	**30,176**	16,801 (55.7)	15,967 (52.9)
Injection drug use			
Male	**10,168**	5,098 (50.1)	4,477 (44.0)
Female	**7,644**	4,370 (57.2)	3,720 (48.7)
Male-to-male sexual contact and injection drug use	**4,956**	3,003 (60.6)	2,584 (52.1)
Heterosexual contact§§			
Male	**9,815**	5,361 (54.6)	4,997 (50.9)
Female	**19,644**	11,535 (58.7)	10,802 (55.0)
Other¶¶	**287**	157 (54.7)	139 (48.4)
Total	**82,688**	**46,324 (56.0)**	**42,686 (51.6)**
Age ≥55 yrs**			
Transmission category††			
Male-to-male sexual contact	**14,486**	7,933 (54.8)	7,838 (54.1)
Injection drug use			
Male	**13,012**	6,219 (47.8)	5,758 (44.3)
Female	**5,626**	3,190 (56.7)	2,961 (52.6)
Male-to-male sexual contact and injection drug use	**3,086**	1,749 (56.7)	1,577 (51.1)
Heterosexual contact§§			
Male	**7,335**	3,956 (53.9)	3,713 (50.6)
Female	**11,517**	7,164 (62.2)	6,931 (60.2)
Other¶¶	**318**	171 (53.8)	159 (50.0)
Total	**55,380**	**30,382 (54.9)**	**28,937 (52.3)**

Abbreviation: HIV = human immunodeficiency virus.

* Data include persons with a diagnosis of HIV infection regardless of stage of disease at diagnosis. Data are based on address of residence as of December 31, 2013 (i.e., most recent known address).

† The 33 jurisdictions were Alabama, Alaska, California, District of Columbia, Georgia, Hawaii, Illinois, Indiana, Iowa, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Nebraska, New Hampshire, New Mexico, New York, North Dakota, Oregon, South Carolina, South Dakota, Tennessee, Texas, Utah, Virginia, Washington, West Virginia, Wisconsin, and Wyoming.

§ Defined as having two or more CD4 or viral load tests performed ≥3 months apart during 2013, among persons diagnosed through December 31, 2012, and alive on December 31, 2013.

¶ Defined as having a viral load result of ≤200 copies/mL at the most recent viral load test during 2013. The cutoff value of ≤200 copies/mL was based on the U.S. Department of Health and Human Services recommended definition of virologic failure.

** Age at year-end 2013.

†† Data statistically adjusted to account for missing transmission categories.

§§ Heterosexual contact with a person known to have or to be at high risk for HIV infection.

¶¶ Includes persons with diagnosed infection attributed to hemophilia, blood transfusion, perinatal exposure, and risk factors not reported or not identified.

who inject drugs, black youths, and black males who engage in heterosexual contact might be needed to achieve improvements in care outcomes. U.S. Department of Health and Human Services treatment guidelines recommend that all adults and adolescents living with HIV in the United States be offered treatment (*2*).

The findings in this report are subject to at least two limitations. First, analyses were limited to 33 jurisdictions with complete laboratory reporting of all levels of CD4 and VL test results; these 33 jurisdictions might not be representative of all blacks living with diagnosed HIV infection in the United States. Second, comparisons of numbers and percentages by sex, and transmission category and age group should be made cautiously because subpopulations vary in size and some have small numbers.

Because blacks account for a large percentage of persons living with HIV in the United States, and to address racial/ethnic disparities in HIV care outcomes, increasing the proportion of blacks living with HIV who receive optimal HIV care is critical for achieving the goals of NHAS. Through partnerships with federal, state, and local health agencies, CDC is pursuing a high-impact prevention approach to maximize the effectiveness of current HIV prevention and care methods (*8*). CDC supports projects focused on blacks to optimize outcomes along the HIV care continuum, such as HIV testing (the first essential step for entry into the continuum of care)

and projects that support linkage to, retention in, and return to care for all persons infected with HIV (*9*). Among blacks, tailored strategies for subpopulations, including persons who inject drugs and young males with infection attributed to heterosexual contact, might be needed to achieve the NHAS goal of 80% of persons living with diagnosed HIV having a suppressed viral load for all population segments.

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Changes in the Disparity of HIV Diagnosis Rates Among Black Women — United States, 2010–2014

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In 2015, black women represented 61% of human immunodeficiency virus (HIV) diagnoses among women (*1*). HIV diagnosis rates among women declined during 2010–2014 (*1*); however, whether the decline resulted in a decrease in the disparities between black women and Hispanic and white women was unknown. To assess whether a change in disparities occurred, CDC used three different measures of disparity: 1) the absolute rate difference (the difference between the group with the lowest rate and the group with the highest rate) (*2*); 2) the diagnosis disparity ratio* (the ratio of the difference between the group rate and the overall population rate to the overall rate); and 3) the Index of Disparity (the average of the differences between rates for specific groups and the total rate divided by the total rate, expressed as a percentage) (*3*). The absolute rate difference between black women and white women decreased annually, from 36.9 in 2010 to 28.3 in 2014. The diagnosis disparity ratio for black women decreased from 1.7 in 2010 to 1.2 in 2014. The Index of Disparity increased during 2010–2011, and then decreased each year during 2012–2014. Although disparities still exist, these findings indicate improvement. Expanding access to biomedical and behavioral interventions and research guided by social and structural determinants frameworks could close the remaining gap.

No standard test or broad consensus regarding the best single method for measuring and monitoring progress toward eliminating health disparities exists (*2*). Any assessment of a trend in health disparity needs to include both an absolute and a relative measure, and the assessment should use population-weighted measures to account for changes in the distribution of the population being monitored over time (*2*). In the absence of a statistical standard to measure HIV-related health disparities, CDC used three different measures to examine changes in the disparities of HIV diagnoses among black women during 2010–2014. The three measures were 1) the absolute rate difference, 2) the diagnosis disparity ratio, and 3) the Index of Disparity. The absolute rate difference and the diagnosis disparity ratio were selected because these measures are used by *Healthy People 2020*† and the *National HIV/AIDS Strategy for the United States 2020* (NHAS),§ respectively, to measure progress in the social determinants of health and HIV diagnosis indicators for these initiatives. The Index of Disparity was selected because it represents a summary measure of disparity across population groups (*2*,*3*).

The absolute rate difference is a simple arithmetic difference that measures the absolute disparity between two groups for the same health status indicators (i.e., difference between the group with the lowest rate and the group with the highest rate) (*2*). *Healthy People 2020* uses a similar measure to monitor progress toward the social determinants health indicator (high school graduation rates by race/ethnicity). The diagnosis disparity ratio, the disparity measure for NHAS 2020 is similar to the absolute rate difference, but is a relative measure of disparity that assesses year-to-year progress toward an annual target (for NHAS 2020) (*4*). The overall HIV diagnosis rate was calculated by dividing the total number of HIV diagnoses by the U.S. Census population and multiplying the results by 100,000 (*4*); the HIV diagnosis rate for black women was calculated by dividing the number of HIV diagnoses in black women by the U.S. Census population for that group and multiplying the result by 100,000 (*4*). The ratio increases as the difference widens between a selected group and the overall population and decreases as the difference narrows (*4*). The diagnosis disparity ratios presented were obtained from the 2016 HIV surveillance supplemental report (*4*).

The Index of Disparity, also a relative measure of disparity, was determined by calculating the average difference of each group rate from the total rate, dividing that number by the total rate, and expressing the result as a percentage (*2*,*3*). The HIV diagnosis rates were obtained from the National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention Atlas.¶

During 2010–2014, rates of HIV diagnosis among black women ranged from 30.0 per 100,000 (2014) to 38.7 (2010) per 100,000 population. Rates were lower among Hispanic women, ranging from 6.2 (2012) to 7.8 (2010) and were lowest

* National HIV/AIDS Strategy for the United States: Updated to 2020 Indicator Supplement. https://www.aids.gov/federal-resources/national-hiv-aids-strategy/nhas-2020-indicators.pdf.

† Healthy People 2020 Leading Health Indicators: Social Determinants of Health 2014. https://www.healthypeople.gov/sites/default/files/HP2020_LHI_Soc_Determ_0.pdf.

§ National HIV/AIDS Strategy for the United States: Updated to 2020. https://www.aids.gov/federal-resources/national-hiv-aids-strategy/nhas-update.pdf.

¶ https://www.cdc.gov/nchhstp/atlas/.

among white women, ranging from 1.6 (2012 and 2013) to 1.8 (2010) (Table).

The disparity in HIV diagnosis rates as measured by the absolute difference in rates between the group with the highest rate, black women, and the group with the lowest rate, white women, decreased annually, from 36.9 in 2010 to 28.3 in 2014 (Table). The diagnosis disparity ratio for black women also decreased annually, from 1.7 in 2010 to 1.2 in 2014 (*4*). The disparity in HIV diagnosis rates as measured by the Index of Disparity increased from 2010 to 2011, and then decreased each subsequent year from 2012 to 2014.

Discussion

In 2015, black women were approximately 16 times more likely to receive a diagnosis of HIV infection than were white women, and they accounted for 61% of HIV diagnoses among women, compared with whites, who accounted for 19% of diagnoses, and Hispanics, who accounted for 15% (*1*). However, data indicate progress in reducing both HIV diagnoses and disparities in HIV diagnosis rates. Strategies available through public health systems and health care can maximize prevention measures targeting black women to decrease HIV diagnoses and reduce disparities. These strategies include routine HIV screening without cost sharing (*5*), recommendations for treatment of all persons living with HIV to prolong life and reduce transmission (*6*), and preexposure prophylaxis for women at increased risk for HIV infection (*7*). HIV testing is the entry point into medical care for persons living with HIV and is needed to initiate linkage to care and access to treatment that can prevent HIV transmission (*8*). During 2007–2010, CDC initiated the Expanded Testing Initiative (ETI) (*9*) that facilitated HIV screening and increased HIV diagnoses and linkage to care for disproportionately affected populations, particularly blacks. The ETI found that blacks accounted for 60% of tests and 70% of new HIV diagnoses (*9*). Based on available data, among all HIV infections newly diagnosed through ETI, 75.3% were successfully linked to HIV primary care (*9*). Because of the success of this initiative, the focused testing activities were integrated into the CDC flagship HIV Prevention Cooperative Agreement with Health Departments funded in 2012.

Further studies are needed to identify factors associated with decreases in these disparities and to investigate whether the decreases are uniform or differ systematically (e.g., by geographical location) across the United States, and accelerate progress toward decreasing HIV infection and disparities among women. Future research needs to include a focus on access to testing and treatment for black women and men (the majority of women acquire HIV infection through sexual contact with men known to have or be at high risk for HIV infection) and social determinants of health, including poverty and suboptimal educational and employment opportunities that disproportionately affect some black communities and might impede HIV prevention programs. Theoretical frameworks that account for the interplay between interpersonal, social, and structural factors (*10*) might contribute to understanding the role of social determinants in reducing disparities.

The findings in this report are subject to at least two limitations. First, the measures used were selected based on their use in national indicators of progress toward reducing disparities and to provide summary measures of disparity across racial/ethnic groups of women. Use of other measures of disparity can be found in the scientific literature, and use of these other measures might have yielded different results. Second, the diagnosis estimates in this report are based on national surveillance data and are likely affected by some underreporting and reporting delays.

Commonly used measures of disparity indicate decreases in disparity of HIV diagnosis rates among black women compared with Hispanic and white women. However, disparities persist, and eliminating these HIV-related health disparities remains a national goal. Maintaining momentum in advances toward health equity could potentially include expanding access to biomedical and behavioral interventions and targeted, culturally sensitive research guided by social and structural determinants frameworks.

Summary

What is already known about this topic?

Human immunodeficiency virus (HIV) infection rates among women declined 40% between 2005 and 2014 with the largest decline, 42%, occurring in black women. Black women represented 59% of women living with HIV infection at the end of 2014 and 61% of HIV diagnoses among women in 2015.

What is added by this report?

The disparity in HIV diagnosis rates among black women compared with rates among Hispanic and white women, as calculated by three different measures (the absolute rate difference, the diagnosis disparity ratio and the Index of Disparity), decreased in 2014 compared with 2010.

What are the implications for public health practice?

This decrease in all three measures of disparity suggests that prevention measures targeting women might be reducing HIV infections in black women. Because black women remain disproportionately affected by HIV infection, additional interventions that are culturally tailored to them might aid in further reducing the prevalence of HIV among this group.

TABLE. Rates of human immunodeficiency virus (HIV) diagnosis among adult women and adolescents aged ≥13 years, by race/ethnicity and disparity measure — United States, 2010–2014

Year	HIV diagnoses No. (rate)			Overall rate	Absolute rate difference†	Diagnosis disparity ratio§	Index of Disparity¶
	Black	Hispanic	White				
2010	6,310 (38.7)	1,469 (7.8)	1,540 (1.8)	7.7	36.9	1.7	159.7
2011	5,856 (35.5)	1,351 (7.0)	1,506 (1.7)	6.9	33.8	1.5	164.5
2012	5,580 (33.4)	1,229 (6.2)	1,426 (1.6)	6.6	31.8	1.4	162.1
2013	5,227 (30.9)	1,279 (6.3)	1,418 (1.6)	6.3	29.3	1.3	155.6
2014	5,128 (30.0)	1,350 (6.5)	1,483 (1.7)	6.4	28.3	1.2	147.9

* Per 100,000 population.
† Highest rate (black women) - lowest rate (white women).
§ Data report are taken from the following source: CDC. Monitoring selected national HIV prevention and care objectives by using HIV surveillance data—United States and 6 dependent areas, 2014. https://www.cdc.gov/hiv/library/reports/surveillance/.
¶ ([Average of individual group rates - Total rate]/Total rate) x 100.

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Multiple Fentanyl Overdoses — New Haven, Connecticut, June 23, 2016

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On the evening of June 23, 2016, a white powder advertised as cocaine was purchased off the streets from multiple sources and used by an unknown number of persons in New Haven, Connecticut. During a period of less than 8 hours, 12 patients were brought to the emergency department (ED) at Yale New Haven Hospital, experiencing signs and symptoms consistent with opioid overdose. The route of intoxication was not known, but presumed to be insufflation ("snorting") in most cases. Some patients required doses of the opioid antidote naloxone exceeding 4 mg (usual initial dose = 0.1–0.2 mg intravenously), and several patients who were alert after receiving naloxone subsequently developed respiratory failure. Nine patients were admitted to the hospital, including four to the intensive care unit (ICU); three required endotracheal intubation, and one required continuous naloxone infusion. Three patients died. The white powder was determined to be fentanyl, a drug 50 times more potent than heroin, and it included trace amounts of cocaine. The episode triggered rapid notification of public health and law enforcement agencies, interviews of patients and their family members to trace and limit further use or distribution of the fentanyl, immediate naloxone resupply and augmentation for emergency medical services (EMS) crews, public health alerts, and plans to accelerate naloxone distribution to opioid users and their friends and families. Effective communication and timely, coordinated, collaborative actions of community partners reduced the harm caused by this event and prevented potential subsequent episodes.

Shortly after 4:00 p.m. on June 23, 2016, four patients with symptoms and signs of opioid overdose, characterized by central nervous system and respiratory depression, miosis (pinpoint pupil constriction), hypotension, and bradycardia, arrived in rapid succession at the York Street Campus (two patients) and St. Raphael Campus (two patients) EDs of Yale New Haven Hospital in downtown New Haven. Within 6 hours, seven additional patients arrived at the York Street Campus ED and one more at the St. Raphael ED; these patients included two who were pronounced dead on arrival and four critically ill patients requiring endotracheal intubation and ICU admission (Figure). The patients represented four geographic clusters (i.e., at least one other victim found in the same vehicle or parking lot, or in the same house or an adjacent house), and were transported by EMS crews responding to bystander 911 calls. All of the patients had clinical signs of opioid overdose and received at least one dose of naloxone from EMS (Table 1). Twelve patients met the case definition for suspected fentanyl exposure (i.e., clinical signs of opioid toxicity and response to naloxone, with laboratory confirmation of fentanyl or fentanyl metabolites in blood, or history of direct association with a laboratory-confirmed fentanyl exposure) (Table 1). Among the four patients admitted to the ICU, three required endotracheal intubation and mechanical ventilation for respiratory failure that was relatively refractory to large doses of naloxone, and one required a continuous naloxone infusion for 12 hours. Two of the three intubated patients suffered acute kidney injury and pulmonary or gastrointestinal hemorrhage, one of whom (patient K) died 3 days later from multisystem organ failure. The third patient survived with permanent cardiac injury. Other intoxicated patients who arrived at the ED with signs or symptoms of the opioid toxidrome were excluded from this analysis because of inconsistent history (e.g., patient reported using a nonfentanyl opioid) or toxicology test results that did not identify fentanyl.

Shortly after arrival in the ED, serum toxicology screens, designed to detect a panel of nonopioid toxins, were performed for all patients, and qualitative urine immunoassay toxicology screens for drugs of abuse were performed for nine patients (A, C, D, F, G, H, J, K, and L) (Table 2). The urine immunoassay screening tests cannot detect fentanyl and its analogs; however, all but one of the nine tested positive for cocaine. The one patient with a negative urine cocaine screen (patient A) acknowledged past cocaine use. Serum and urine specimens were later analyzed at the University of California, San Francisco (UCSF) using liquid chromatography high-resolution mass spectrometry (LC-HRMS) (*1*) to detect 215 common illicit and pharmaceutical drugs and metabolites, followed by additional analyses in attempts to identify 7,038 novel drugs and metabolites (*2*,*3*). Levels of fentanyl, cocaine, benzoylecgonine (a cocaine metabolite that persists in body fluids and is an indicator of cocaine use) and levamisole (a veterinary antihelminthic that has been used as a cocaine adulterant) were quantified. Nine patients (B, C, D, F, G, H, J, K, and L) had fentanyl detected in blood that was collected during their hospitalization and tested at UCSF (Table 2). One patient who reported cocaine use before symptom onset (patient A) and who was found in the vicinity of patients B, C, and D at the time of intoxication, was discharged before the full scope of the outbreak had been recognized and did not receive confirmatory toxicology testing. The Connecticut

FIGURE. Time of arrival for 12 fentanyl overdose patients at the St. Raphael Campus (n = 3) and York Street Campus (n = 9) emergency departments of Yale New Haven Hospital — New Haven, Connecticut, June 23, 2016

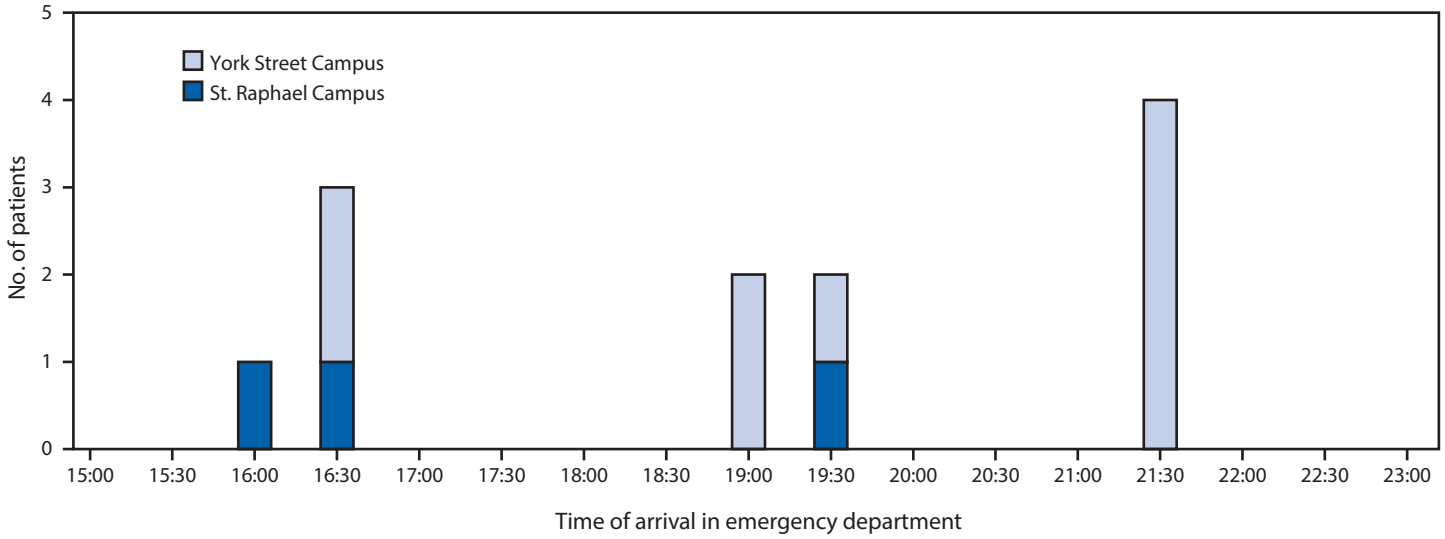

TABLE 1. Demographic characteristics, hospital arrival time, prehospital naloxone use, and disposition for 12 patients with fentanyl overdose — Yale New Haven Hospital, New Haven, Connecticut, June 23, 2016

Patient	Age (decade)	Sex	Arrival time	Emergency department	Naloxone (Administering provider, route) (EMS, IN)	(EMS, IV/IO)	(ED/IV)	Disposition
A	60s	Male	16:16	SRC	2 mg	0	0	Discharged
B	80s	Male	16:36	YSC	2 mg	1 mg	0	Observed and discharged
C	30s	Male	16:40	YSC	3 mg	0	0.4 mg	Intensive care unit
D	40s	Male	16:48	SRC	3 mg	0	0.4 mg	Observed and discharged
E	70s	Male	19:01	YSC	4 mg	2 mg*	0	Dead on arrival in ED
F	70s	Male	19:16	YSC	2 mg	2 mg	2 mg	Observed and discharged
G	60s	Male	19:33	YSC	2 mg	2 mg	0.4 mg	Observed and discharged
H	60s	Male	19:38	SRC	2 mg	2 mg	0.4 mg†	Intensive care unit
I	30s	Female	21:31	YSC	0	2 mg	2 mg	Dead on arrival in ED
J	50s	Female	21:32	YSC	2 mg	1 mg	0	Intensive care unit
K	60s	Male	21:39	YSC	0	0.5 mg	0	Intensive care unit§
L	50s	Female	21:41	YSC	2 mg	2 mg	0	Observed and discharged

Abbreviations: ED = emergency department; EMS = emergency medical services; IN = intranasal; IO = intraosseous; IV = intravenous; SRC = St. Raphael Campus; YSC = York Street Campus.
* Intraosseous injection.
† Naloxone drip 0.4 mg/hour for 12 hours in intensive care unit.
§ Patient died of multiorgan failure in intensive care unit 3 days later.

Medical Examiner's Office performed postmortem toxicology screens on specimens obtained from two patients who died en route to the hospital (patients E and I).

Serum samples from the hospitalized patients analyzed at UCSF demonstrated fentanyl levels of 0.5–9.5 ng/mL (Table 2) (therapeutic range for analgesia = 0.6–3.0 ng/mL) (*4*); postmortem levels in the first two patients who died were 11 ng/mL (patient E) and 13 ng/mL (patient I). Norfentanyl, a major metabolite of fentanyl, was detected in the serum of nine patients; norfentanyl was not detected in postmortem testing of patients E and I, presumably because death occurred before metabolism of fentanyl to norfentanyl. All hospitalized patients had detectable serum levels of cocaine, cocaine metabolites (benzoylecgonine and ecgonine methyl ester), cocaethylene (a compound formed in vivo when ethanol is ingested in the presence of cocaine), or levamisole by LC-HRMS confirmatory testing (Table 2), all suggesting recent cocaine use. The absence of other opioids, such as heroin, methadone, or oxycodone, in serum (only one patient [D] was hydrocodone positive) was consistent with reports by the patients that most were not habitual opioid users.

Additional substances detected in serum and urine were reported qualitatively (Table 2) and reflected nicotine (cotinine), cannabinoid (tetrahydrocannabinol), and hydroxyzine

TABLE 2. Serum and urine toxicology test results for 12 patients with fentanyl overdose — Yale New Haven Hospital, New Haven, Connecticut, June 23, 2016

Patient	Serum levels (ng/mL)				Other substances detected	
	Fentanyl	Cocaine	BE	Levamisole	Serum	Urine
A	—*	—	—	—	—	—
B	0.9	Not detected	1	1	BE, cotinine, levamisole, norfentanyl	Specimen not available
C	0.5	0	65	13	BE, cotinine, levamisole, norfentanyl, THC-COOH	BE, cocaethylene, cocaine, cotinine, EME, levamisole, lidocaine, naloxone, nicotine, norcocaine, norfentanyl
D	0.6	0	1	1	BE, cotinine, levamisole, norfentanyl, THC-COOH	BE, cocaethylene, cocaine, EME, ethylone, hydrocodone, levamisole, naloxone, norfentanyl, THC-COOH
E†	11	Not detected	Not detected	—	Ethanol	—
F	4.6	2	15	2	BE, cocaethylene, cocaine, cotinine, hydroxyzine, levamisole, naloxone, norfentanyl	BE, EME, cocaethylene, cocaine, cotinine, hydroxyzine, levamisole, naloxone, norfentanyl
G	2.3	1	63	4	Acetaminophen, BE, cocaine, cotinine, levamisole, midazolam, norfentanyl, THC-COOH	α-hydroxymidazolan, acetaminophen, BE, cocaine, cotinine, EME, levamisole, midazolam, naloxone, norcocaine, norfentanyl
H	1.9	26	144	5	Acetaminophen, BE, cocaethylene, cocaine, cotinine, levamisole, naloxone, norfentanyl	Acetaminophen, BE, cocaine, cotinine, EME, hydroxyzine, levamisole, naloxone, nicotine, norcocaine, norfentanyl
I†	13	79	680	—	Cocaethylene, ethanol	—
J	3	26	68	6	BE, cocaine, cotinine, levamisole, naloxone, norfentanyl, tramadol	BE, cocaine, cotinine, EME, desmethyltramadol, levamisole, naloxone, norcocaine, norfentanyl, tramadol
K§	9.5	3	172	2	BE, cocaine, levamisole, naloxone, norfentanyl, THC-COOH	BE, cocaine, EME, levamisole, norcocaine, norfentanyl
L	3.6	4	712	64	BE, cocaethylene, cocaine, cotinine, hydroxyzine, levamisole, lidocaine, naloxone, norfentanyl	BE, cocaethylene, cocaine, cotinine, EME, hydroxyzine, levamisole, lidocaine, naloxone, norfentanyl

Abbreviations: BE = benzoylecgonine; EME = ecgonine methylester; THC-COOH = 11-nor-9-carboxy- tetrahydrocannabinol.
* Test not performed.
† Postmortem specimens collected by medical examiner.
§ Died in intensive care unit.

(antihistamine) use, or receipt of naloxone. Postmortem toxicology screens identified fentanyl as a cause of death for patients E and I, both of whom arrived in the ED in cardiac arrest. In addition to the clinical specimens, one 32-mg forensic sample of the illicit drug material collected by law enforcement was tested at the Drug Enforcement Administration laboratory. Analysis of that product recovered from an involved crime scene found 6.6% (± 0.8%) fentanyl by weight with trace amounts of cocaine and an inert adulterant.

Within a few hours of recognition of the outbreak, a multiagency response involving the New Haven Office of Emergency Management, New Haven and Connecticut Departments of Public Health, the Drug Enforcement Administration, local police, Connecticut Poison Control Center, and the New Haven Mayor's Office was undertaken. Initial actions included 1) rapid notification of public health and law enforcement agencies by ED and EMS personnel; 2) real-time interviews of patients and family members in an attempt to trace and limit further use or distribution of the fentanyl; 3) advice to EMS crews to increase naloxone doses in treating suspected cases; 4) public health alerts regarding the event, including notices of the sale of a high potency opioid marketed as cocaine causing deaths in the region; and 5) plans to accelerate distribution of naloxone to opioid users and their friends and families. The high naloxone requirements necessitated both immediate naloxone resupply and augmentation for local EMS crews, including the transfer of 700 naloxone kits from the Connecticut Department of Public Health to hospitals and EMS crews the following morning. Actions of multiple partners led to the arrest 4 days later of three persons allegedly responsible for the illicit fentanyl sales.

Discussion

This explosive occurrence of multiple fentanyl overdoses triggered a rapid response by public safety and medical communities to identify the substance and its source. Federal, state, and local agencies responded to confine the outbreak quickly, save patient lives where possible, alert the public, and gather

additional information. The rapid medical, law enforcement, and public health actions likely limited the extent and impact of this outbreak.

These events highlight the intrinsic risks inherent in illicit drug use and support the broad distribution of naloxone. The urine toxicology screens suggest that most patients were cocaine users, but not chronic opioid users, and as such, would likely not have received any training in the identification or treatment of opioid overdose. This episode resulted in the formation of a partnership between the Connecticut Department of Public Health and Yale New Haven Hospital that facilitated implementation of a pilot program to provide overdose education and take-home naloxone kits to ED patients at risk for overdose. In addition, community opioid treatment programs and providers collaborated with the EDs to provide rapid access to treatment for patients with opioid use disorders.

Commonly available immunoassay toxicology screening tests are unable to detect fentanyl or its metabolites; the opiate screen is designed to detect codeine, morphine, and heroin, and with an expanded panel, oxycodone and methadone. Widespread use of toxicology screens unable to detect fentanyl or its analogs underscores the importance of recognizing the opioid toxidrome. Rescuers and clinicians should recognize the potential need to administer multiple or high doses of naloxone in cases of opioid overdose that do not respond to administration of a single standard naloxone dose where fentanyl or its analogs (highly potent opioids) might be responsible for unresponsiveness. The total dose of naloxone required for opioid reversal will depend on many factors, including the opioid dose, the potency of the opioid in binding receptors, the lipophilicity of the opioid in crossing into the central nervous system, the elimination half-life of the opioid, individual patient factors, and the route of administration of the naloxone (intranasal compared with intramuscular or intravenous) (*5*–*7*). Because of the persistent respiratory depression associated with fentanyl, additional doses of naloxone might be needed after initial reversal.*

Although illicit opioids often are mixed with harmful adulterants (e.g., fentanyl and its analogs blended with or deliberately substituted for heroin or mixed with the opioid analgesic combination of acetaminophen and hydrocodone [e.g., Norco]) (*8,9*), this outbreak was unique in representation of fentanyl as cocaine to an opioid-naïve population, which resulted in an outbreak of fatal and nonfatal overdoses.

Summary

What is already known about this topic?

Fentanyl and its analogs have been substituted for heroin and other opioids, and are usually marketed to persons seeking opioids. Because of fentanyl's high potency compared with heroin, methadone, and oxycodone, there is a high risk for fatal overdose associated with illicit use. Higher than normal doses of the opioid antagonist naloxone might be required to reverse fentanyl overdose.

What is added by this report?

On June 23, 2016, fentanyl marketed as cocaine resulted in an extraordinary opioid overdose outbreak in New Haven, Connecticut, resulting within 6 hours in at least 12 cases, marked by four intensive care unit admissions and three deaths. A rapid and coordinated public health response involving multiple partners likely reduced the impact of this outbreak.

What are the implications for public health practice?

A collaborative and timely multi-organization response can mitigate the consequences of an extraordinary public health event. Development and implementation of a screening test for fentanyl might inform clinicians about the presence of these particularly deadly opioids and prevent deaths. Opioid use education and naloxone administration kits and education should be extended to all persons at risk for illicit drug use, their families, and friends.

Lack of metabolism of fentanyl to norfentanyl might be the result of rapid death after fentanyl use (*10*). It has been suggested that rapid death might be caused by immediate onset of respiratory arrest or that fentanyl might cause rapid onset of chest wall rigidity, leading to death (*10*). This effect of fentanyl is well recognized by clinicians familiar with the drug, but is not likely to be known among illicit drug users. In addition, many users might be unaware that their expected substance of choice might be substituted by or adulterated with high doses of fentanyl.

Distribution of naloxone to persons at risk for opioid overdose, their families, and friends through prescriptions by practitioners, pharmacists, and other public health avenues might help prevent fatal fentanyl overdoses. In addition, this outbreak of severe opioid intoxication among patients who were cocaine users, but not chronic opioid users, suggests that distributing naloxone and offering training to all illicit drug users, their friends, and family members might prevent such opioid-associated morbidity and mortality. The swift coordinated multiagency response likely limited the impact of this outbreak, and the resultant strengthening of community partnerships has the potential to further limit the morbidity and mortality related to opioids in communities.

* FDA advisory committee on the most appropriate dose or doses of naloxone to reverse the effects of life-threatening opioid overdose in the community settings. September 2, 2016. http://www.fda.gov/downloads/AdvisoryCommittees/CommitteesMeetingMaterials/Drugs/AnestheticAndAnalgesicDrugProductsAdvisoryCommittee/UCM522688.pdf.

Acknowledgments

Drug Enforcement Administration, New Haven District Office; Office of the Chief Medical Examiner, State of Connecticut; Connecticut Department of Public Health; New Haven Department of Public Health; City of New Haven, Office of the Mayor; City of New Haven Department of Police Service; City of New Haven Fire Department; American Medical Response of Connecticut.

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Trends in Beverage Consumption Among High School Students — United States, 2007–2015

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Beverages play an important role in the diets of adolescents because they help to maintain hydration and can provide important nutrients, such as calcium, vitamin D, and vitamin C (*1*). However, some beverages, such as sugar-sweetened beverages (SSBs) (e.g., soda or pop), provide calories with no beneficial nutrients. Beverage consumption patterns among American youth have changed over time; however, little is known about differences in consumption of various beverages by demographic characteristics such as grade in school, free/reduced price lunch eligibility, and race/ethnicity (*2*). CDC analyzed data from the 2007–2015 national Youth Risk Behavior Surveys (YRBS) to assess whether the prevalence of drinking non-diet soda or pop (soda), milk, and 100% fruit juice (juice) has significantly changed over time among U.S. high school students. During 2007–2015, daily soda consumption decreased significantly from 33.8% to 20.5%. During 2007–2011, daily milk and juice consumption did not significantly change, but during 2011–2015 daily milk and juice consumption decreased from 44.3% to 37.4% and from 27.2% to 21.6%, respectively. Although a decrease in daily soda consumption is a positive change, soda consumption remains high. Although there is not a specific recommendation for sugar-sweetened beverage consumption, the Dietary Guidelines for Americans 2015–2020 recommend that U.S. residents reduce sugar-sweetened beverage and sweet consumption to reduce intake of added sugars to less than 10% of calories per day. The Dietary Guidelines for Americans 2015–2020 recommend that persons choose beverages with no added sugars, such as water, in place of sugar-sweetened beverages, as one strategy for achieving the added sugars recommendation. Adolescents might need additional support in choosing more healthful beverages, such as low-fat milk, in place of SSBs.

The national YRBS is a biennial cross-sectional, school-based survey that provides representative data on health behaviors among students in grades 9–12 from public and private schools in the United States. In each survey, independent samples of students complete an anonymous, self-administered questionnaire during one class period and record their responses on a computer-scannable booklet or answer sheet. Participation by schools and students is voluntary. Study protocols are designed to protect students' privacy. Detailed information about the national YRBS methodology has been described previously (*3*).

Questions about milk and juice consumption have been included on the national YRBS questionnaire since 1999; questions about soda consumption were added in 2007. Therefore, this analysis focuses on beverage consumption during 2007–2015 when sample sizes ranged from 13,583 to 16,410; overall response rates ranged from 60% to 71%.

Daily soda and juice consumption were assessed with the questions "During the past 7 days, how many times did you drink a can, bottle, or glass of soda or pop, such as Coke, Pepsi, or Sprite? (Do not count diet soda or diet pop)" and "During the past 7 days, how many times did you drink 100% fruit juices such as orange juice, apple juice, or grape juice? (Do not count punch, Kool-Aid, sports drinks, or other fruit-flavored drinks.)" Response options were "I did not drink soda or pop during the past 7 days" or "I did not drink 100% fruit juice during the past 7 days," "1 to 3 times during the past 7 days," "4 to 6 times during the past 7 days," "1 time per day," "2 times per day," "3 times per day," or "4 or more times per day." Students who selected "1 time per day," "2 times per day," "3 times per day," or "4 or more times per day" were categorized as daily soda or juice drinkers; all other students were categorized as non-daily soda or juice drinkers. Daily milk consumption was assessed with the question "During the past 7 days, how many glasses of milk did you drink? (Count the milk you drank in a glass or cup, from a carton, or with cereal. Count the half pint of milk served at school as equal to one glass.)" Response options were "I did not drink milk during the past 7 days," "1 to 3 glasses during the past 7 days," "4 to 6 glasses during the past 7 days," "1 glass per day," "2 glasses per day," "3 glasses per day," or "4 or more glasses per day." Students who selected "1 glass per day," "2 glasses per day," "3 glasses per day," or "4 or more glasses per day" were categorized as daily milk drinkers; all other students were categorized as non-daily milk drinkers.

Data from each survey were weighted to provide national estimates. Statistical software was used to account for the complex survey design of the YRBS. Prevalence estimates were computed overall and by school grade (9, 10, 11, 12), sex (male, female), and race/ethnicity (non-Hispanic white [white], non-Hispanic black [black], and Hispanic). Other and multiple racial/ethnic subgroups were excluded from the race/ethnicity subgroup analysis because the numbers were too small for meaningful analysis. Research indicates that income

plays a role in the dietary choices of adults; however, little research has been done on the impact of socioeconomic factors on adolescents' beverage choices (*4*). Therefore, a school-level variable, the percentage (low, middle, high*) of students in each school with free and reduced-price lunch (FRPL) eligibility, was assigned to each student record. Logistic regression analyses were used to assess linear and quadratic trends during 2007–2015 adjusting for grade, sex, race/ethnicity, and FRPL eligibility. When a significant quadratic trend was detected, the software Joinpoint† was used to determine the year in which the trend changed direction or leveled off, known as the inflection point. Logistic regression models were then used again to assess the linear trends occurring in each segment (i.e., before and after the inflection point).

During 2007–2015, daily soda consumption decreased from 33.8% to 20.4%. During 2007–2011, daily milk and juice consumption did not change; however, during 2011–2015 daily milk and juice consumption decreased from 44.4% to 37.5% and from 28.2% to 21.6%, respectively (Table).

Among students in grade 9, daily soda consumption decreased significantly during 2007–2011 and then further decreased significantly during 2011–2015 (Table). Among students in schools with low FRPL eligibility, daily soda consumption did not change significantly during 2007–2011, but decreased significantly during 2011–2015. Across all other subgroups, daily soda consumption decreased significantly during 2007–2015. Among both female and male students; students in grades 9, 10, and 11; white students; and students in schools with middle and high FRPL eligibility, daily milk consumption did not change significantly during 2007–2011, then decreased significantly during 2011–2015. Among Hispanic students and students in schools with low FRPL eligibility, daily milk consumption decreased significantly during 2007–2015. Among students in grade 12 and black students, daily milk consumption did not significantly change during 2007–2015. Across all subgroups except one, daily juice consumption did not change significantly during 2007–2011 and then decreased significantly during 2011–2015. Among students in schools with high FRPL eligibility, daily juice consumption decreased significantly during 2007–2015.

Discussion

Beverages contribute approximately 20% of calories to the diets of children and adolescents and can contain important nutrients (*2*). The 2015–2020 Dietary Guidelines for Americans recommend choosing beverages that are calorie free, (e.g., plain water) or that contribute beneficial nutrients (e.g., fat-free and low fat milk and 100% juice), instead of less nutritious options (*1*). The decline in milk consumption is a specific concern for adolescents because milk is a key source of calcium and vitamin D in the diets of persons in the United States; both are important for bone development, yet are under consumed (*1*).

Findings from this report and other recent studies indicate that adolescents are consuming less soda (*2*,*5*), which is encouraging because SSBs are one of the largest contributors of added sugars to adolescents' diets (*6*). Several factors might be contributing to the decrease in soda consumption. First, new federal Smart Snacks in School§ nutrition standards were required at the beginning of the 2014–2015 school year, which eliminated sale of non-diet soda in high schools. Even before this requirement, many states and local school districts adopted policies limiting the sale of soda and other SSBs.¶,** In addition, community-based educational campaigns focused on reducing SSB consumption were implemented as recently as 2012 (e.g., Rethink Your Drink,†† Soda Free Summer§§). Despite these declines in soda consumption, intake of other SSBs, including energy drinks and sports drinks, are increasing (*2*,*5*), and overall consumption of all SSBs, such as soda, fruit drinks, and sweetened coffees and teas, remains high (*7*). Although no recommended amount on SSB intake exists, the goal should be to limit SSB intake to reduce added sugar. As an example, some childhood obesity prevention programs use a 5-2-1-0 message, which include no SSBs as the goal.¶¶ A recent analysis of consumption of all SSBs found that during 2011–2014, 62.9% of youth consumed at least one SSB on a given day accounting for 9.3% of total daily calorie intake for boys aged 12–19 years, and 9.7% of total daily calorie intake for girls aged 12–19 years (*7*). Therefore, policy and educational approaches (e.g., health education classes, community-wide campaigns) should continue to address SSBs, and promote healthier beverage options in multiple settings, including schools and communities.

Recent analysis of national data also indicates a decrease in juice consumption (*8*). Although fruit juice can provide

* The percentage of students eligible for enrollment in free and reduced-price lunch (FRPL) in each school was divided into tertiles based on the overall distribution from http://www.schooldata.com/pdfs/MDR_Ed_catalog.pdf. FRPL categories were low = 0%–29%, medium = 30%–52%, high = 53%–100%.

† http://surveillance.cancer.gov/joinpoint/.

§ National school lunch program and school breakfast program: nutrition standards for all foods sold in school as required by the Healthy, Hunger-Free Kids Act of 2010, 7 CFR Section 210 and 220. https://www.gpo.gov/fdsys/pkg/FR-2013-06-28/pdf/2013-15249.pdf.

¶ http://foods.bridgingthegapresearch.org/#.

** http://www.bridgingthegapresearch.org/_asset/13s2jm/WP_2013_report.pdf.

†† https://www.cdph.ca.gov/programs/cpns/Pages/RethinkYourDrink.aspx.

§§ http://www.banpac.org/sugar_savvy_curr/banpac_soda_free_report_12_10_09.pdf.

¶¶ http://www.letsgo.org/

TABLE. Percentage of high school students who drink soda, milk, and juice daily by sex, grade, race/ethnicity, and free/reduced price lunch eligibility — National Youth Risk Behavior Surveys, United States, 2007–2015

Characteristic	2007	2009	2011	2013	2015	Linear change 2007–2015§	Quadratic change 2007–2015* (2007–2011)	Quadratic change 2007–2015* (2011–2015)
Soda†								
Overall	**33.8**	**29.2**	**27.8**	**27.0**	**20.4**	**Decreased**	**No change**	**No change**
School grade								
9	35.6	30.5	29.7	29.3	19.4	Decreased	Decreased	Decreased
10	33.2	29.2	27.3	25.4	20.8	Decreased	No change	No change
11	32.8	28.5	26.6	26.9	20.5	Decreased	No change	No change
12	33.1	28.3	27.0	26.0	21.0	Decreased	No change	No change
Sex								
Female	29.0	23.3	24.0	24.1	16.4	Decreased	No change	No change
Male	38.6	34.6	31.4	29.9	24.3	Decreased	No change	No change
Race/Ethnicity								
White, non-Hispanic	34.0	29.0	28.8	29.0	19.7	Decreased	No change	No change
Black, non-Hispanic	37.6	33.7	28.0	30.2	22.7	Decreased	No change	No change
Hispanic	33.4	28.1	27.0	22.6	21.7	Decreased	No change	No change
School-level FRPL eligibility§								
Low	27.0	24.3	24.9	21.0	15.6	Decreased	No change	Decreased
Mid	39.8	31.7	29.5	29.4	26.0	Decreased	No change	No change
High	38.3	37.8	35.4	33.2	24.5	Decreased	No change	No change
Milk¶								
Overall	**43.1**	**43.9**	**44.4**	**40.3**	**37.5**	**Decreased**	**No change**	**Decreased**
School grade								
9	45.4	45.9	46.8	42.1	38.6	Decreased	No change	Decreased
10	44.8	46.4	47.1	42.7	39.6	Decreased	No change	Decreased
11	40.3	41.7	42.5	37.5	35.8	Decreased	No change	Decreased
12	40.9	40.9	40.2	38.1	35.2	No change	No change	No change
Sex								
Female	35.0	34.2	34.8	31.7	28.2	Decreased	No change	Decreased
Male	51.1	52.8	53.4	49.0	46.2	Decreased	No change	Decreased
Race/Ethnicity								
White, non-Hispanic	47.8	49.9	48.8	44.5	41.2	Decreased	No change	Decreased
Black, non-Hispanic	28.1	26.0	29.0	26.2	25.1	No change	No change	No change
Hispanic	40.4	40.4	40.7	38.9	36.2	Decreased	No change	No change
School-level FRPL eligibility§								
Low	47.6	46.3	45.0	44.1	39.2	Decreased	No change	No change
Mid	41.5	41.3	43.4	38.8	34.3	Decreased	No change	Decreased
High	35.6	37.6	41.1	38.7	34.8	No change	No change	Decreased

See table footnotes on page 115.

important nutrients, including vitamin C and potassium, it is lower in fiber than whole fruit. Therefore, the 2015–2020 Dietary Guidelines for Americans emphasize primarily consuming whole fruit (*1*). Although most adolescents consume fewer than the recommended number of servings of fruit per day, they consume more whole fruit than 100% juice (*9*), and consumption of whole fruit has increased over time (*8*). In addition, only 10.2% of adolescents aged 14–19 years consume more than one 8-fl. oz. serving of juice per day (*9*). Multisector activities should continue to encourage youth to consume more whole fruit (*8*).***

The findings in this report are subject to at least three limitations. First, data are self-reported and might be subject to reporting and social desirability bias. A recent study showed that YRBS beverage questions underestimated the prevalence of daily non-diet soda intake but overestimated prevalence of daily milk and 100% juice intake compared with a 24-hour dietary recall interview (*10*). Second, these data apply only to adolescents who attend high school and are not representative of all persons in this age group. In 2012, approximately 3% of persons aged 16–17 years nationwide were not enrolled in a high school program and had not completed high school.†††

*** http://www.cdc.gov/vitalsigns/fruit-vegetables/index.html.

††† http://nces.ed.gov/pubs2015/2015015.pdf.

TABLE. (*Continued*) Percentage of high school students who drink soda, milk, and juice daily by sex, grade, race/ethnicity, and free/reduced price lunch eligibility — National Youth Risk Behavior Surveys, United States, 2007–2015

Characteristic	2007	2009	2011	2013	2015	Linear change 2007–2015[§]	Quadratic change 2007–2015* (2007–2011)	Quadratic change 2007–2015* (2011–2015)
Juice[†]								
Overall	**28.6**	**28.4**	**28.2**	**24.6**	**21.6**	**Decreased**	**No change**	**Decreased**
School grade								
9	29.4	29.1	27.7	25.1	22.5	Decreased	No change	Decreased
10	30.1	29.1	30.6	23.9	21.3	Decreased	No change	Decreased
11	26.6	27.4	27.4	25.5	21.9	Decreased	No change	Decreased
12	27.3	27.3	26.9	23.6	20.5	Decreased	No change	Decreased
Sex								
Female	24.3	24.3	23.9	20.9	17.7	Decreased	No change	Decreased
Male	32.7	32.0	32.2	28.3	25.3	Decreased	No change	Decreased
Race/Ethnicity								
White, non-Hispanic	25.6	26.9	26.3	21.0	19.0	Decreased	No change	Decreased
Black, non-Hispanic	35.0	33.3	33.2	32.8	27.6	Decreased	No change	Decreased
Hispanic	31.2	28.4	30.0	28.0	23.9	Decreased	No change	Decreased
School-level FRPL eligibility[§]								
Low	28.4	27.7	28.2	22.5	20.7	Decreased	No change	Decreased
Mid	27.4	29.0	26.5	26.3	20.1	Decreased	No change	Decreased
High	31.2	28.4	29.1	26.8	25.3	Decreased	No change	No change

Abbreviation: FRPL = free/reduced price lunch.
* Based on linear and quadratic trend analyses using logistic regression models controlling for grade, sex, race/ethnicity, and FRPL p <0.05.
† Non-diet soda (soda) or 100% fruit juice (juice) one or more times per day.
§ The percentage of students eligible for enrollment in FRPL program in each school was divided into tertiles based on the overall distribution from http://www.schooldata.com/pdfs/MDR_Ed_catalog.pdf. FRPL categories were low = 0%–29%, medium = 30%–52%, and high = 53%–100%.
¶ One or more glasses of milk per day.

Finally, trends in intake of other beverages frequently consumed by adolescents, such as water, could not be examined. Questions about water and sports drink consumption were added to the national YRBS questionnaire in 2015; questions about consumption of other SSBs, such as sweetened coffees and teas and fruit drinks, are not included at this time.

Multiple measures are needed to address adolescents' beverage consumption and should reach settings where adolescents spend their time, such as homes, schools, and the community at large. Parents can influence the home nutrition environment through their food purchases (*11*). Schools can ensure that students have access only to healthier foods and beverages, provide opportunities for students to learn about healthy eating (e.g., nutrition education, taste tests), and use marketing and promotion strategies to encourage healthy choices.[§§§] For example, schools can ensure students have access to free drinking water by having water fountains, dispensers, and hydration stations throughout the school, ensuring that water fountains are clean and properly maintained, and allowing students to have water bottles in class. Schools also can implement promotion campaigns to encourage students to drink water in place of SSBs.

[§§§] https://www.cdc.gov/healthyschools/npao/pdf/mmwr-school-health-guidelines.pdf.

Summary

What is already known about this topic?

Beverages contribute approximately 20% of calories to the diets of children and adolescents and can contain important nutrients, but beverages can also contribute to excess consumption of added sugars and calories. Previous research has indicated that daily consumption of milk, juice, and non-diet soda has been decreasing over time, but little is known about trends among subgroups of youth.

What is added by this report?

During 2007–2015, daily soda consumption among U.S. high school students decreased significantly from 33.8% to 20.4%. During 2007–2011, daily milk and juice consumption did not significantly change, and then during 2011–2015 daily milk and juice consumption decreased significantly from 44.4% to 37.5% and from 28.2% to 21.6%, respectively.

What are the implications for public health practice?

Although the significant downward trends in daily soda consumption suggest that interventions encouraging reduced consumption of soda are working, overall prevalence of daily soda consumption remains high. Policy and educational approaches should continue to promote healthier beverage options in place of sugar-sweetened beverages.

Community-based strategies also should be considered. For example, health care providers can screen and counsel patients and their families on decreasing SSB intake, and organizations can implement social marketing campaigns to promote consumption of healthier beverages. Although the results of this report indicate a decline in soda consumption, there is a continued need to help adolescents shift beverage consumption patterns to more healthful options.

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Notes from the Field

Knowledge, Attitudes, and Practices Regarding Yellow Fever Vaccination Among Men During an Outbreak — Luanda, Angola, 2016

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In January 2016, the Angola Ministry of Health reported an outbreak of yellow fever, a vaccine-preventable disease caused by a flavivirus transmitted through the bite of *Aedes* or *Haemagogus* species mosquitoes (*1*,*2*). Although endemic in rural areas of Angola, the last outbreak was in 1988 when 37 cases and 14 deaths were reported (*3*). Large yellow fever outbreaks occur when the virus is introduced by an infected person to an urban area with a high density of mosquitoes and a large, crowded population with little or no immunity (*2*). By May 8, a total of 2,267 suspected cases were reported nationally, of which 696 (31%) were laboratory confirmed; 293 (13%) persons died (*4*). Most (n = 445, 64%) confirmed cases lived in Luanda Province. As part of the public health response that included strengthened surveillance, vector control, case management, and social mobilization (*1*), mass vaccination campaigns were implemented in Luanda during February 2–April 16. Despite >90% administrative vaccination coverage (the number of vaccine doses administered divided by the most recent census estimates for the target population), the province continued to report cases (*4*). Field teams reported low numbers of men being vaccinated, which was a concern because of a preliminary analysis that indicated approximately 70% of confirmed yellow fever cases occurred in males. A rapid assessment to identify and address potential barriers to vaccination among men was designed, using a knowledge, attitudes, and practices survey.

During April 23–25, 2016, a knowledge, attitudes, and practices rapid assessment was administered to men at 10 sites in the four municipalities of Luanda with the greatest number of confirmed cases: Viana, Kilamba Kiaxi, Cacuaco, and Cazenga. The range for administrative vaccination coverage was 22%–137%. Survey sites included public transportation stops, public markets, main streets, and town squares. Interviewers consecutively sampled men of working age while walking in separate trajectories from the site center until the interviewers reached a target of 30 interviews. The questionnaire consisted of multiple choice and open-ended questions on demographics, disease knowledge, vaccination status, vaccination practices, and reasons for nonvaccination, as appropriate.

Overall, 302 men were interviewed. Median age was 30 years (range = 13–68 years); 61% (182) of the men were married or in a domestic partnership. The most frequent occupations reported were street vendor (68, 23%), private business employee (59, 20%), and self-employed (55, 18%). Education levels ranged from illiterate to higher education, with 56% (164) having ≤9 years of formal schooling.

Only 44% of men (133) correctly identified the mosquito as responsible for yellow fever transmission; 15% (48) stated trash/dirty environment, 12% (35) standing/dirty water, and 2% (five) other transmission routes.

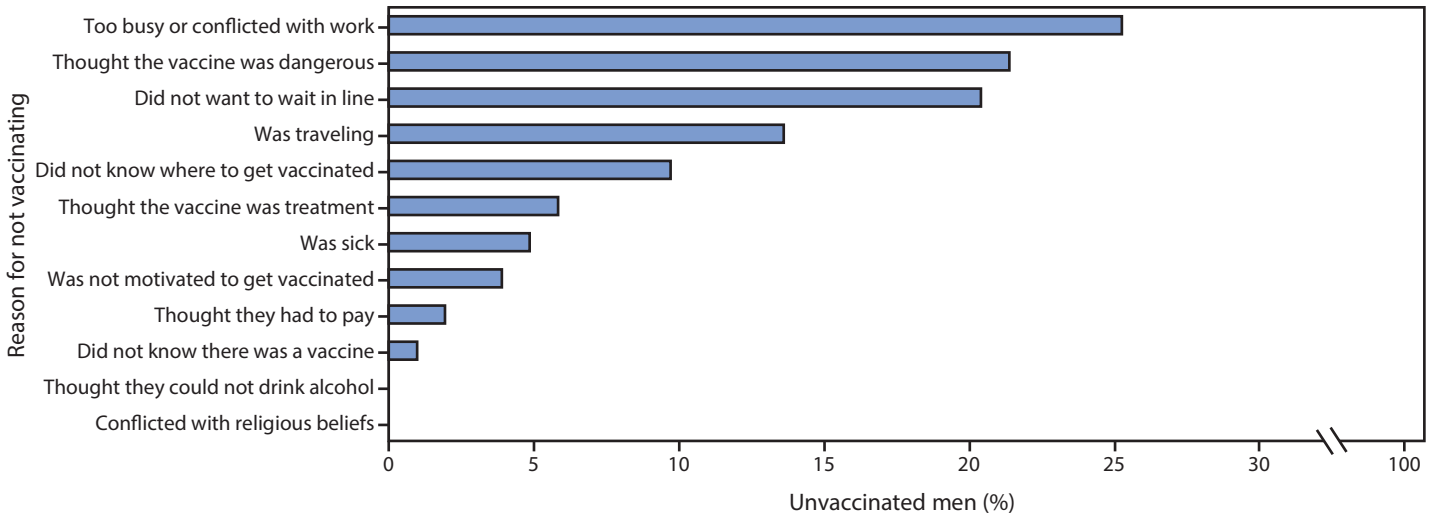
Among the 199 (66%) vaccinated men, the majority were vaccinated during the campaign (193, 96%) with events at churches, schools, and neighborhood meetings cited frequently. Among vaccinated men, the most frequently reported sources of information about vaccination were radio (80, 40%), television (78, 39%), and family and friends (64, 32%), with all other sources mentioned by <8%.

When the 103 (34%) unvaccinated men were asked whether they knew where to get vaccinated, 42% (42) answered no. When answering the open-ended question, the most common reasons reported for nonvaccination were lack of time or vaccination conflicting with working hours (26, 25%); thinking the vaccine was dangerous (22, 21%); and not wanting to wait in line (21, 20%) (Figure).

These results highlight several challenges. Most vaccine campaigns target children and women; although this yellow fever campaign needed to reach men, it was not well adapted to their needs. Men could not access vaccination posts during working hours, and those who did experienced long lines because persons from nontargeted municipalities sought vaccination. Lack of information caused many men to fear the vaccine, believing persons had died from the vaccine or that vaccines were fake. Some men did not understand whether the vaccine provided prevention or treatment.

Increased availability of clear information and adaptation of the vaccination activities to the target population's daily activities were needed. Vaccination campaigns in Luanda were modified to include the following recommendations: diversified modes of communication targeted to men, such as commercials with famous football players; campaigns programmed after working hours and on weekends; door-to-door vaccination in areas with suspected low vaccination coverage; and uniform clear messaging by partners about the critical protection provided by yellow fever vaccination. Messaging also included other ways to prevent infection, such as vector

FIGURE. Reasons stated by men for not getting vaccinated during an ongoing outbreak of yellow fever — Luanda, Angola, April 2016



control near dwellings and avoidance of mosquito bites. As of October 20, 2016, no confirmed yellow fever cases have occurred in Angola since June 23, and vaccination campaigns are ongoing in 10 provinces (*5*).

Acknowledgments

Ministry of Health, Angola; World Health Organization; Angola Yellow Fever Response Team, CDC.

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Announcement

Congenital Heart Defect Awareness Week — February 7–14, 2017

Congenital Heart Defect Awareness Week is observed each year during February 7–14 to promote awareness and education about congenital heart defects (CHDs). CHDs affect approximately one in 100 births every year in the United States and are the most common type of birth defect (*1*,*2*). Heart defects are conditions that persons live with throughout their lives; an estimated 1 million children and 1.4 million adults in the United States were living with a CHD in 2010 (*3*). CDC's website, Stories: Living with Heart Defects, includes personal stories by persons affected by CHDs (https://www.cdc.gov/ncbddd/birthdefects/stories/heartdefects.html).

CDC works to understand CHDs through initiatives that include working with state programs to improve newborn screening for critical CHDs, funding state programs to track birth defects, including CHDs, and launching projects focused on tracking children, adolescents, and adults with CHDs to make improvements in medical treatments and quality of life. CDC also provides funding for several research centers across the nation to help understand the causes of birth defects, including CHDs.

CDC-funded research recently reported associations for certain CHDs in infants of mothers who were exposed to pesticides at work (*4*) and a reduction in CHD risk for mothers with better diet quality (*5*). CDC research also found that children with CHDs receive special education more often than do children who do not have birth defects (*6*). CDC's congenital heart defects website has additional information about CHDs (https://www.cdc.gov/ncbddd/heartdefects).

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Erratum

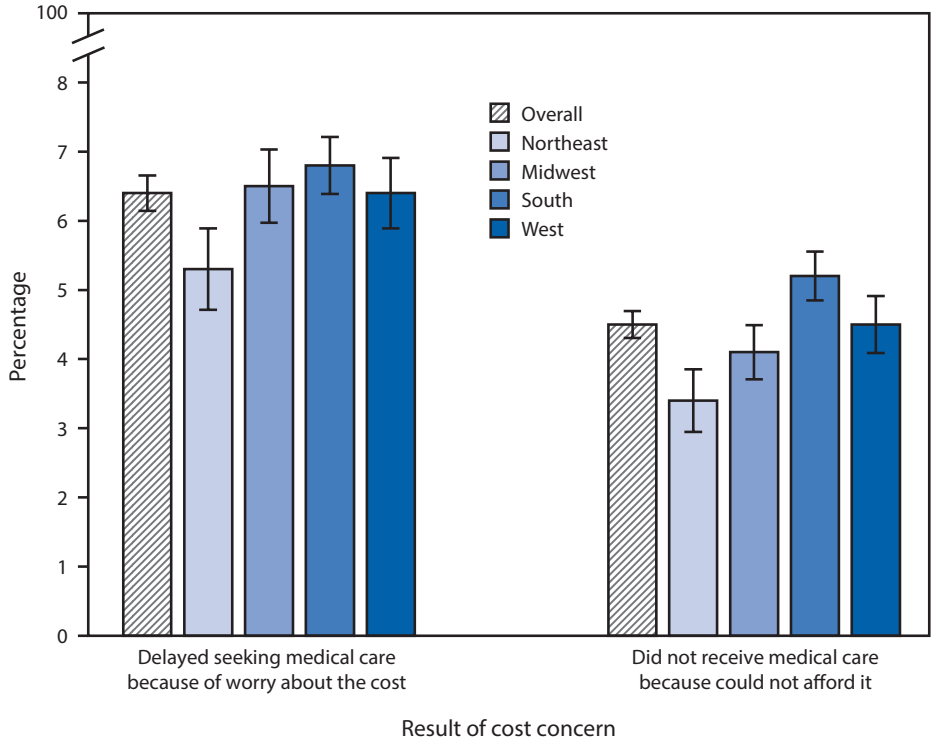
Vol. 66, No. 1

In the report "Prevalence of Perceived Food and Housing Security — 15 States, 2013," on page 15, the website in reference 3 should be https://www.surgeongeneral.gov/**priorities**/prevention/2012-npc-action-plan.pdf.

QuickStats

FROM THE NATIONAL CENTER FOR HEALTH STATISTICS

Percentage of Persons of All Ages Who Delayed or Did Not Receive Medical Care During the Preceding Year Because of Cost, by U.S. Census Region of Residence* — National Health Interview Survey, 2015†



* Percentages shown with 95% confidence intervals. Based on responses to the following questions: "During the past 12 months, has [person] delayed seeking medical care because of worry about the cost?" and "During the past 12 months, was there a time when [person] needed medical care but did not get it because [person] could not afford it?" Both questions excluded dental care. Respondents were asked questions regarding themselves and all other family members of all ages living in the same household. It was possible for a person to have both delayed seeking medical care because of worry about the cost and not received medical care because they could not afford it.

† Estimates were based on household interviews of a sample of the civilian, noninstitutionalized U.S. population and were derived from the National Health Interview Survey Family Core component. Unknowns were excluded from the denominators when calculating percentages.

In 2015, approximately 6% of persons of all ages (20.1 million) in the United States delayed medical care during the preceding year because of worry about the cost, and 4.5% (14.2 million) did not receive needed medical care because they could not afford it. Persons living in the Northeast were significantly less likely than persons living in the Midwest, South, or West to delay or not receive needed medical care. Persons living in the South were significantly more likely to not receive needed medical care than those in the Northeast, Midwest, or West.

Source: National Health Interview Survey, 2015. https://www.cdc.gov/nchs/nhis.htm.

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ISSN: 0149-2195 (Print)