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Respiratory Syncytial Virus Activity — United States, July 2011–January 2013

Respiratory syncytial virus (RSV) causes lower respiratory infections among infants and young children worldwide (*1*). During 1997–2006, an estimated 132,000–172,000 children aged <5 years were hospitalized for RSV infection annually in the United States (*2*). In temperate climate zones, RSV generally circulates during the fall, winter, and spring (*3*), but the exact timing and duration of RSV seasons vary by region and year. To determine seasonal trends in the circulation of RSV at national and regional levels, data collected by the National Respiratory and Enteric Virus Surveillance System (NREVSS) were analyzed. For 2011–12, the RSV season onset ranged from late October to mid-January and season offset ranged from early March to early May in all 10 U.S. Department of Health and Human Services (HHS) regions, excluding Florida. Florida is reported separately because it has an earlier season onset and longer duration than the rest of the country. For data reported as of January 7, 2013, RSV onset for the 2012–13 season occurred in all but one of the HHS regions by December 15, 2012. Seasonal patterns remained consistent with previous years and demonstrated the usual differences in RSV circulation among HHS regions. Healthcare providers and public health officials can use information on RSV circulation to guide diagnostic testing and timing of RSV immunoprophylaxis for children at high risk for severe respiratory infection.

NREVSS records U.S. laboratory-based specimen data on RSV and other viral pathogens. Each week, participating laboratories voluntarily report weekly aggregated results of RSV tests. For consistency, only results of antigen detection methods are included in the analysis. Antigen detection was used by 94.1% of participating laboratories during 2011–12. Season onset, offset, duration, and peak* are reported for each HHS region,† the state of Florida, and nationally, with and without Florida. This allows geographic variation in RSV activity to be described and accommodates the unusually early and sometimes long RSV season observed in Florida (*3*).

During July 2011–June 2012, a total of 522 laboratories reported at least 1 week of RSV testing by any detection method to NREVSS. CDC limited this analysis to 174 (33.3%) laboratories in 42 states that met the following criteria: 1) reported RSV antigen testing results for ≥30 weeks during the NREVSS season and 2) averaged ≥10 tests per week during the NREVSS season. Qualifying laboratories reported a total of 270,441 tests, of which 41,299 (15.3%) were positive.

* In NREVSS, the onset week in an area (national, regional, or state) is defined as the first of 2 consecutive weeks when the weekly mean of the percentages of specimens testing positive for RSV antigen in all reporting laboratories in the area is ≥10%. The offset is the last of 2 consecutive weeks when the mean percent positive drops below this threshold. The season duration is the onset week, the weeks between onset and offset, and the offset week. The peak is the week when the mean percentage of positive RSV antigen tests is the highest.

† Listed with headquarters city for each region; territories not included. *Region 1* (Boston): Connecticut, Maine, Maryland, New Hampshire, Rhode Island, and Vermont; *Region 2* (New York): New Jersey and New York; *Region 3* (Philadelphia): Delaware, District of Columbia, Maryland, Pennsylvania, Virginia, and West Virginia; *Region 4* (Atlanta): Alabama, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, and Tennessee; *Region 5* (Chicago): Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin; *Region 6* (Dallas): Arkansas, Louisiana, New Mexico, Oklahoma, and Texas; *Region 7* (Kansas City): Iowa, Kansas, Missouri, and Nebraska; *Region 8* (Denver): Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming; *Region 9* (San Francisco): Arizona, California, Hawaii and Nevada; *Region 10* (Seattle): Alaska, Idaho, Oregon, and Washington. Maine, Rhode Island, Vermont, New Mexico, Nebraska, Utah, Wyoming, and Idaho did not have any laboratories that met the inclusion criteria for the 2011–12 season analysis.

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U.S. Department of Health and Human Services
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What is already known on this topic?

In the United States, respiratory syncytial virus (RSV) begins circulating in the fall, peaks in the winter, and ends during spring. A network of U.S. laboratories reports results of specimens tested for RSV to the National Respiratory and Enteric Virus Surveillance System, which summarizes national, regional, and state-level RSV activity.

What is added by this report?

For the 2011–12 season, RSV circulation began nationally in mid-November and ended in early April. Circulation peaked at 26% of tests positive in late January. During the 2012–13 RSV season, onset occurred in all but one of the 10 U.S. Department of Health and Human Services regions by December 15, 2012. These patterns in national RSV circulation were similar to those observed previously. Onset, offset, and duration varied among the regions and Florida.

What are the implications for public health practice?

RSV surveillance alerts public health officials and clinicians to times when respiratory infections might be attributed to RSV and when patients at high risk for severe complications of infection might need RSV immunoprophylaxis.

Nationally, RSV onset occurred the week ending November 19, 2011, and lasted 21 weeks, until the week ending April 7, 2012 (Table). The proportion of specimens positive for RSV by antigen detection reached a season high of 26.2% during the week ending January 28, 2012. With Florida excluded, the national onset occurred 1 week later (November 27, 2011), and the season duration decreased by 1 week. Onset for the 10 HHS regions (excluding Florida) ranged from late October to mid-January, and season offset ranged from early March to early May. The season peak ranged from mid-January to mid-March, and the duration ranged from 14–23 weeks, with a median of 19 weeks. Region 7 had the shortest season and Region 3 had the longest. The season onset for Florida occurred the week ending August 13, 2011, and the season continued through the week ending March 3, 2012.

The 2012–13 RSV onset analysis is limited to laboratories that reported results for at least 1 week of the NREVSS season and at least one antigen test on average per week during the NREVSS season. Preliminary analysis of these data included a total of 135,849 RSV antigen tests and 19,903 (14.7%) positive results reported by 462 eligible laboratories from the 50 states and the District of Columbia. The season onset occurred in nine of the 10 HHS regions by December 15, 2012. As of January 7, 2013, onset had not occurred in Region 8, but additional cases were being reported in other regions.

Nationally, RSV onset occurred the week ending October 27, 2012; however, when Florida is excluded from analysis, the national onset occurred 1 week later (week ending November 10, 2012) (Table). Weekly updates of RSV national, regional, and state RSV trends are available from NREVSS at http://www.cdc.gov/surveillance/nrevss. Additional information regarding Florida RSV trends is available from the Florida Department of Health at http://www.doh.state.fl.us/disease_ctrl/epi/rsv/rsv.htm.

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TABLE. Summary of 2011–12 respiratory syncytial virus season and 2012–13 season onset, by U.S. Department of Health and Human Services (HHS) Region* and Florida† — National Respiratory and Enteric Virus Surveillance System, June 2011–January 2013

HHS region or state	2011–12 season					2012–13 season	
	No. of laboratories reporting	Onset week ending	Peak week ending	Offset week ending	Season duration (wks)	No. of laboratories reporting	Onset week ending
National	**174**	**11/19**	**1/28**	**4/7**	**21**	**462**	**10/27**
National without Florida	156	11/26	1/28	4/7	20	432	11/10
Florida	18	8/13	12/3	3/3	30	30	7/21
Region 3	17	10/22	1/7	3/24	23	52	10/27
Region 2	17	11/12	12/17	3/17	19	28	11/3
Region 6	30	11/19	1/28	3/31	20	58	10/27
Region 1	6	12/3	1/7	3/10	15	27	11/24
Region 4§	20	12/3	12/31	3/31	18	66	11/10
Region 5	22	12/10	3/17	4/28	21	72	11/24
Region 9	19	12/17	2/25	5/5	21	46	11/3
Region 10	8	12/24	3/3	4/21	18	25	12/15
Region 8	7	1/7	2/18	5/12	19	28	—¶
Region 7	10	1/14	3/17	4/14	14	30	11/24

* Ranked by 2011–12 onset week ending date. Listed with headquarters city for each region; territories not included. *Region 1* (Boston): Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont; *Region 2* (New York): New Jersey and New York; *Region 3* (Philadelphia): District of Columbia, Delaware, Maryland, Pennsylvania, Virginia, and West Virginia; *Region 4* (Atlanta): Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, and Tennessee; *Region 5* (Chicago): Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin; *Region 6* (Dallas): Arkansas, Louisiana, New Mexico, Oklahoma, and Texas; *Region 7* (Kansas City): Iowa, Kansas, Missouri and Nebraska; *Region 8* (Denver): Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming; *Region 9* (San Francisco): Arizona, California, Hawaii and Nevada; and *Region 10* (Seattle): Alaska, Idaho, Oregon, and Washington. Maine, Rhode Island, Vermont, New Mexico, Nebraska, Utah, Wyoming, and Idaho did not have any participating laboratories in the 2011–12 season analysis.
† Florida is reported separately because it has an earlier onset and longer duration than other states.
§ Excludes data from Florida.
¶ As of January 7, 2013, the 2012–13 season onset had not occurred.

Reported by

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Editorial Note

During July 2011–June 2012, national and regional RSV trends were similar to patterns previously reported for 2010–11. Florida's season onset occurred 5 weeks earlier than the previous season, and each HHS region differed in onset, offset, and duration. Florida's earlier onset has been well documented, as have differences in activity from year-to-year in the same geographic location (*3*). Social and demographic factors, population density, pollution, and climate each might influence RSV activity (*3–6*).

NREVSS surveillance data can be used to identify RSV activity and coordinate timing of RSV immunoprophylaxis with palivizumab. Palivizumab is a monoclonal antibody against RSV recommended by the American Academy of Pediatrics (AAP) to be administered to children at high risk for severe RSV disease (*7*). AAP also provides guidelines for identifying infants and young children likely to benefit from immunoprophylaxis (e.g., certain infants with congenital heart disease or chronic lung disease, and those born prematurely) and for timing of RSV immunoprophylaxis by region (*7*). NREVSS provides timely data on RSV activity at the national, regional, and state levels, which have been correlated with numbers of RSV-associated hospitalizations in select regions (*8*). Consequently, health-care providers and public health officials use NREVSS data to guide diagnostic testing and to assess possible causes of regional respiratory infection outbreaks.

The findings in this report are subject to at least four limitations. First, reporting to NREVSS is voluntary and might be biased to more active reporters. Second, the percent positive detections reflect not only disease burden (i.e., number of cases per capita or severity of seasonal outbreaks) but also the volume of tests ordered. Third, although NREVSS data can be used to approximate regional RSV seasonal characteristics, they cannot be used to estimate RSV activity in every state or county because participation varies from year-to-year and between states. Finally, periods of low RSV activity might not be captured by the NREVSS onset and offset definitions. Despite these limitations, NREVSS provides useful guidance to physicians ordering diagnostic tests and planning to initiate immunoprophylaxis.

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Secondary and Tertiary Transmission of Vaccinia Virus After Sexual Contact with a Smallpox Vaccinee — San Diego, California, 2012

On June 24, 2012, CDC notified Public Health Services, County of San Diego Health and Human Services Agency, of a suspected case of vaccinia virus infection transmitted by sexual contact. The case had been reported to CDC by an infectious disease specialist who had requested vaccinia immune globulin intravenous (VIGIV) (Cangene Corporation, Berwyn, Pennsylvania) for a patient with lesions suspicious for vaccinia. The patient reported two recent sexual contacts: one with a partner who recently had been vaccinated against smallpox and a later encounter with an unvaccinated partner. Infections resulting from secondary transmission of vaccinia virus from the smallpox vaccinee to the patient and subsequent tertiary transmission of the virus from the patient to the unvaccinated partner were confirmed by the County of San Diego Public Health Laboratory. The smallpox vaccine had been administered under the U.S. Department of Defense smallpox vaccination program. The vaccinee did not experience vaccine-associated complications; however, the secondary and tertiary patients were hospitalized and treated with VIGIV. No further transmission was known to have occurred. This report describes the epidemiology and clinical course of the secondary and tertiary cases and efforts to prevent further transmission to contacts.

Secondary Vaccinia Case

On June 24, a man went to a private hospital in San Diego County with a painful perianal rash of 3 days' duration and more recent onset of a lesion on the upper lip. The patient reported having had sexual intercourse on June 15 with a man who had recently been vaccinated against smallpox. The patient recalled feeling moisture on an uncovered area of his partner's left upper arm and was concerned that his rash might have been caused by this exposure.

In addition to the rash, the patient reported experiencing fever, malaise, nausea, and vomiting before seeking medical attention. He also reported a history of psoriasis and a possible history of eczema. Atopic dermatitis (i.e., eczema) can be a risk factor for adverse reactions to vaccinia infection (*1*,*2*). While performing the physical examination, the infectious disease specialist noted seven 5-mm umbilicated lesions in the perianal area and a similar lesion on the upper lip. The County of San Diego Public Health Laboratory detected nonvariola *Orthopoxvirus* by polymerase chain reaction (PCR) on swab specimens from the lesions.

The patient was hospitalized for continued care and observation. Human immunodeficiency virus and other sexually transmitted infections were ruled out during his hospitalization. VIGIV was requested from CDC and administered intravenously on June 25 because of concerns about the location and extent of lesions and the potential for further spread. The patient experienced mild, transient chest pains the morning after hospitalization. To assess the possibility of postinfection myocarditis (*3*), an electrocardiogram was performed and the cardiac troponin level was measured. Both tests were normal, and the patient was discharged from the hospital on June 27. By July 6, when the patient had a follow-up examination, his lesions had healed without complication.

Tertiary Vaccinia Case

The patient with the secondary vaccinia virus infection reported having experienced the perianal rash at the time he had sexual intercourse with a different male partner on June 22. The second male partner reported experiencing lesions on June 24. When interviewed, he reported no other recent sexual partners and said he had never been vaccinated against smallpox.

The second male partner sought care on June 25 from the same infectious disease specialist who had evaluated the secondary patient. He reported experiencing malaise, sore throat, and nasal congestion the day after sexual contact with the secondary patient. On physical examination, eight raised papular lesions were noted on his penis, and one was observed on the right forearm, all suspicious for vaccinia virus infection. Swab specimens of the lesions tested positive by PCR for nonvariola *Orthopoxvirus* by the County of San Diego Public Health Laboratory.

On initial evaluation and interview, the patient with tertiary infection reported no history of skin disease; however, three days later he recalled having had eczema as a child. By this time, his lesions had become more numerous and progressively painful. Re-examination on June 28 revealed 11 umbilicated lesions: eight previously noted on the penis, one previously noted on the arm, and two new lesions on the groin. In light of the number, location, and extent of lesions and the recently recalled history of eczema, CDC released VIGIV for the patient with tertiary infection, and he was admitted to the hospital. VIGIV was administered in the hospital on June 29 with no adverse effects. Two days later, five additional lesions developed on the penis and scrotum. No further lesions developed after

July 1, and the patient was discharged from the hospital on July 2. At a follow-up examination on July 11, the lesions were found to have healed without further complication.

Confirmation of Antivaccinia Antibodies

A serum specimen was drawn from each of the two patients before and 48 hours after VIGIV administration to ensure detectable levels of immune globulin. The secondary patient had detectable antivaccinia antibodies in the pre-VIGIV serum specimen, and the tertiary patient did not. Both patients had detectable antivaccinia antibodies in post-VIGIV serum specimens.

Smallpox Vaccinee

The vaccinee was identified as a civilian who had received his first smallpox vaccine in June 2012 under the Department of Defense smallpox vaccination program. At a routine follow-up examination to check the inoculation site on June 13, the vaccinee reported not having kept the site covered as instructed. Clinic staff members again instructed him to keep the lesion covered and repeated the instructions provided previously to reduce the risk for vaccinia transmission to others. The vaccinee experienced the expected pustular lesion at the inoculation site on his left upper arm and did not experience any secondary lesions or complications. The vaccinee was interviewed on July 9, during epidemiologic investigation of the secondary and tertiary patients. He confirmed that no secondary lesions had occurred and reported that the secondary patient was his only sexual contact during the infectious window, days 2–30 after receiving the smallpox vaccine.

Prevention Recommendations

Interviewed at the time of illness, neither patient reported having additional sexual contacts or living with persons who might be at risk for complications from vaccinia infection. Persons at risk include those who are immunosuppressed, pregnant women, or persons with a history of atopic dermatitis (*2*). The patient with tertiary infection did not go to work on the day he experienced symptoms and returned when his lesions were healed adequately. Both patients wore contact lenses, which can pose a hazard for ocular autoinoculation with the virus. Neither patient wore eyeglasses in lieu of contact lenses. Extensive patient instructions were provided to prevent autoinoculation and further transmission to contacts. Recommendations focused on refraining from sexual or other intimate contact until lesions had healed completely, the importance of hand hygiene (especially when handling contact lenses), managing infectious fomites (e.g., clothing, bedding, and towels), and lesion care. The military clinic that administered the smallpox vaccine was contacted to ensure vaccinees were provided the required instructions regarding preventing virus transmission to others (*1*). No further transmission of vaccinia virus by the smallpox vaccinee or the secondary or tertiary patient has been reported.

What is already known on this topic?

Unintended transmission of vaccinia virus can occur through contact with civilian and military personnel vaccinated under the U.S. Department of Defense smallpox vaccination program.

What is added by this report?

Sexual contact with a civilian recently vaccinated against smallpox resulted in secondary and tertiary transmission of vaccinia virus. Virus transmission resulted in illness, multiple lesions in the genital and perianal areas, and singular lesions in other sites. Vaccinia immune globulin intravenous (VIGIV) was administered to both the secondary and tertiary patient to prevent worsening and spread of lesions. Both patients recovered.

What are the implications for public health practice?

This report highlights the potential for further transmission of vaccinia virus beyond direct sexual contacts of smallpox vaccinees and the importance of vaccinee compliance with covering the inoculation site. VIGIV might be indicated in patients with vaccinia lesions in genital areas to prevent further lesion spread.

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Editorial Note

In 2002, the U.S. Department of Defense resumed smallpox vaccination for designated military personnel, civilian employees, and contractors. The smallpox vaccine licensed for use in the United States contains live vaccinia virus. The CDC Laboratory Response Network supports a nonvariola *Orthopoxvirus* test that can identify vaccinia and other nonvariola orthopoxviruses in clinical specimens. Since the Department of Defense resumed smallpox vaccination, cases of secondary transmission of vaccinia virus from military smallpox vaccinees have been reported among intimate (*4–6*), sports-related (*7*), and household contacts (*4*). Tertiary transmission

has been reported among household and sports contacts (*4,8*) and from mother to child through breastfeeding (*9*). This case report is the first reported instance of tertiary vaccinia transmission through sexual contact.

Contraindications for routine, nonemergency vaccination against smallpox include presence of atopic dermatitis or any history of atopic dermatitis, other exfoliative skin conditions, pregnancy, immunosuppression, or living in a household with a person who has any of these conditions (*2*). Eczema vaccinatum is an immune-mediated adverse reaction to vaccinia virus that can occur in persons with ongoing or past history of atopic dermatitis (*10*). Because the term eczema often is applied to different dermatologic diseases, assessing whether a patient has a history of atopic dermatitis versus another eczematous skin condition can be difficult (*10*).

VIGIV is the only licensed treatment available for complications from vaccinia virus infection. Indications for its use include treatment or mitigation of aberrant vaccinia infections that pose a particular hazard (e.g., inadvertent inoculation of the eyes or mouth) as well as eczema vaccinatum, progressive or severe generalized vaccinia infections, and other skin conditions.* The majority of adverse vaccinia reactions do not require treatment beyond supportive care. VIGIV is reserved for patients with serious clinical disease or for those at risk for experiencing severe disease. CDC is the sole source of VIGIV for civilians. All suspected cases of contact-transmitted vaccinia should be reported to state or local health departments and to the Vaccine Adverse Events Reporting System (http://vaers.hhs.gov).

The secondary and tertiary patients in this investigation experienced symptoms of systemic illness, localized proliferation of vaccinia lesions, and singular lesions at locations remote from the principal inoculation sites. Lesions in the genital and perianal areas are challenging for preventing autoinoculation and further local inoculation by clothing and other fomites. A possible history of atopic dermatitis was concerning; however, the major reason why the decision was made to administer VIGIV to both patients was because of lesion location, number, and progression.

Both patients sought medical care early in the course of disease, which also contributed to the decision to administer VIGIV. Early presentation provided an opportunity to supply antivaccinia antibodies when the patients' immune systems were beginning to respond to the infection. These case reports describe secondary and tertiary transmission of vaccinia virus through sexual contact, highlighting the potential for vaccinia infections to spread beyond immediate intimate contacts of smallpox vaccinees. The illness experienced by the two patients and the potential for further contact transmission underscores the importance of smallpox vaccinee compliance with covering the inoculation site and instruction regarding the particular hazards of vaccinia transmission to genital and perianal areas.

* Additional information available at http://www.fda.gov/biologicsbloodvaccines/bloodbloodproducts/approvedproducts/licensedproductsblas/fractionatedplasmaproducts/ucm179513.htm.

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Impact of an Innovative Approach to Prevent Mother-to-Child Transmission of HIV — Malawi, July 2011–September 2012

Antiretroviral medications can reduce rates of mother-to-child transmission of human immunodeficiency virus (HIV) to less than 5% (*1*). However, in 2011, only 57% of HIV-infected pregnant women in low- and middle-income countries received a World Health Organization (WHO)–recommended regimen for prevention of mother-to-child transmission (PMTCT), and an estimated 300,000 infants acquired HIV infection from their mothers in sub-Saharan Africa; 15,700 (5.2%) of these infants were born in Malawi (*2*). An important barrier to PMTCT in Malawi is the limited laboratory capacity for CD4 cell count, which is recommended by WHO to determine which antiretroviral medications to start (*3*). In the third quarter of 2011, the Malawi Ministry of Health (MOH) implemented an innovative approach (called "Option B+"), in which all HIV-infected pregnant and breastfeeding women are eligible for lifelong antiretroviral therapy (ART) regardless of CD4 count (*4*). Since that time, several countries (including Rwanda, Uganda, and Haiti) have adopted the Option B+ policy, and WHO was prompted to release a technical update in April 2012 describing the advantages and challenges of this approach as well as the need to evaluate country experiences with Option B+ (*5*). Using data collected through routine program supervision, this report is the first to summarize Malawi's experience implementing Option B+ under the direction of the MOH and supported by the Office of the Global AIDS Coordinator (OGAC) through the President's Emergency Plan for AIDS Relief (PEPFAR). In Malawi, the number of pregnant and breastfeeding women started on ART per quarter increased by 748%, from 1,257 in the second quarter of 2011 (before Option B+ implementation) to 10,663 in the third quarter of 2012 (1 year after implementation). Of the 2,949 women who started ART under Option B+ in the third quarter of 2011 and did not transfer care, 2,267 (77%) continue to receive ART at 12 months; this retention rate is similar to the rate for all adults in the national program. Option B+ is an important innovation that could accelerate progress in Malawi and other countries toward the goal of eliminating mother-to-child transmission of HIV worldwide.

Antiretroviral medications can be provided to improve a patient's own health, prevent vertical HIV transmission from mother to infant, and/or prevent horizontal transmission to an uninfected sex partner. In most resource-limited settings, ART eligibility is based on CD4 cell count or clinical staging. For pregnant women with CD4 ≤350 cells/mm^3 or at WHO clinical stage 3 or 4, the 2010 WHO PMTCT recommendations include lifelong ART. For HIV-infected pregnant women not eligible for ART, either of two prophylaxis options (called "Option A" and "Option B") is recommended. Option A involves prophylaxis with a single drug, zidovudine (AZT), during pregnancy, and additional antiretroviral medications during labor, delivery, and the postpartum period. Option B involves triple-drug ART during pregnancy and breastfeeding. Both options include additional antiretroviral medications for infants (*1*).

In Malawi, the MOH determined the health sector did not have the laboratory and infrastructure capacity to provide universal access to CD4 cell count testing needed to successfully implement either of the two recommended options. Instead, they proposed a modified Option B (called "Option B+"), in which all confirmed HIV-infected pregnant and breastfeeding women are offered lifelong ART regardless of CD4 count or clinical stage. This policy streamlined the process of ART initiation and had the potential to improve maternal health, facilitate access to PMTCT and ART, reduce HIV transmission risk to uninfected male partners, and provide protection against vertical HIV transmission in future pregnancies (*4,6*). Implementation of Option B+ also required integration of ART into all antenatal care (ANC) settings, training of nearly all health-care workers in a new integrated curriculum, and a change in the adult first-line ART regimen to one that included the antiretroviral medication efavirenz.* Implementation was facilitated by existing task-shifting policies that allow clinical officers, medical assistants, and nurses to start ART (*4*).

Every integrated PMTCT/ART site in Malawi is visited quarterly by members of a nationally coordinated supervision team composed of MOH service providers, supervisors, supporting partners, and CDC-Malawi staff. Direct supervision of every site in every quarter is the key feature of the national HIV program. Innovative patient registers have been created to permit longitudinal follow-up and cohort analyses for patients receiving antenatal and HIV care. Data collected during these supervision visits include the number of persons started on ART, the reason for starting ART, and, of those started on ART in previous quarters, the number of patients retained in care. These facility-level aggregated data are returned to the central-level MOH, entered into a database, cleaned, and then analyzed to produce MOH's *Quarterly HIV Programme Reports*,† on which this report is based.

* The MOH chose to use efavirenz as a part of its first-line regimen for all adults, including pregnant and breastfeeding women, because a growing body of evidence indicates that efavirenz has superior efficacy and tolerability compared with nevirapine. Although concerns exist that efavirenz is potentially teratogenic in the first trimester based on animal models, the limited data available on the use of efavirenz during pregnancy do not demonstrate any adverse effect. Additional information on use of efavirenz in pregnancy is available at http://whqlibdoc.who.int/publications/2012/9789241503792_eng.pdf.

† Available at http://www.hivunitmohmw.org/Main/AntiretroviralTherapy.

Implementation of Option B+ required training of 4,839 health-care workers and resulted in decentralization of ART to all health centers with ANC, with an increase from 303 ART sites in June 2011 to 641 integrated PMTCT/ART sites in September 2012 (Figure 1). After implementation of Option B+ began in July 2011, the total number of all persons started on ART per quarter increased by 61%, from 18,442 in the second quarter of 2011 to 29,707 in the third quarter 2012.

Implementation of Option B+ resulted in a 748% increase in the number of pregnant and breastfeeding women starting ART, from 1,257 in the second quarter of 2011 (representing 5% of all new ART initiations) to 10,663 in the third quarter of 2012 (35% of all new ART initiations) (Figure 2).

Of the women starting ART in the third quarter of 2011 (the first quarter of Option B+ implementation) who did not transfer care during follow up, 77% continue to receive ART at 12 months (Figure 3). This rate is similar to the 80% 12-month ART retention rate observed among adults who initiated ART in the second quarter of 2011 (the last quarter before Option B+ implementation).

FIGURE 1. Number of new antiretroviral treatment (ART) initiations among all adults and number of ART sites, by year and quarter — Malawi, 2005–2012

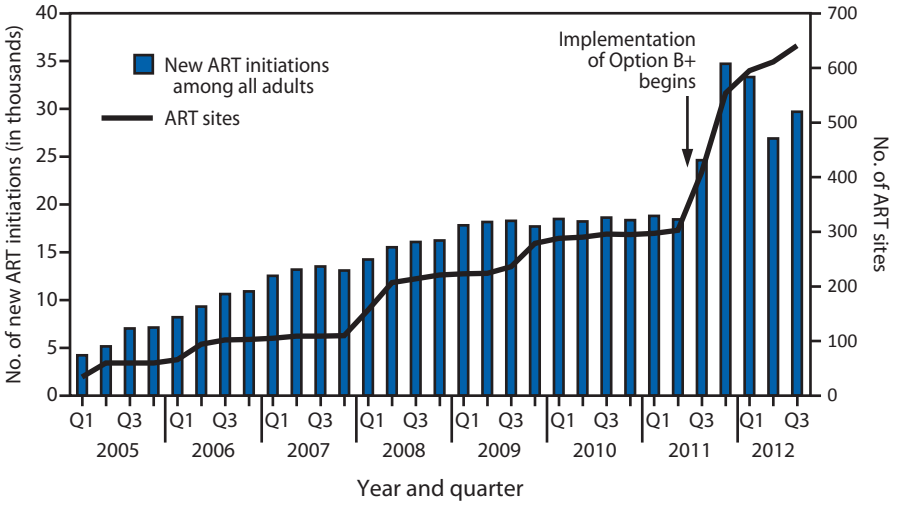
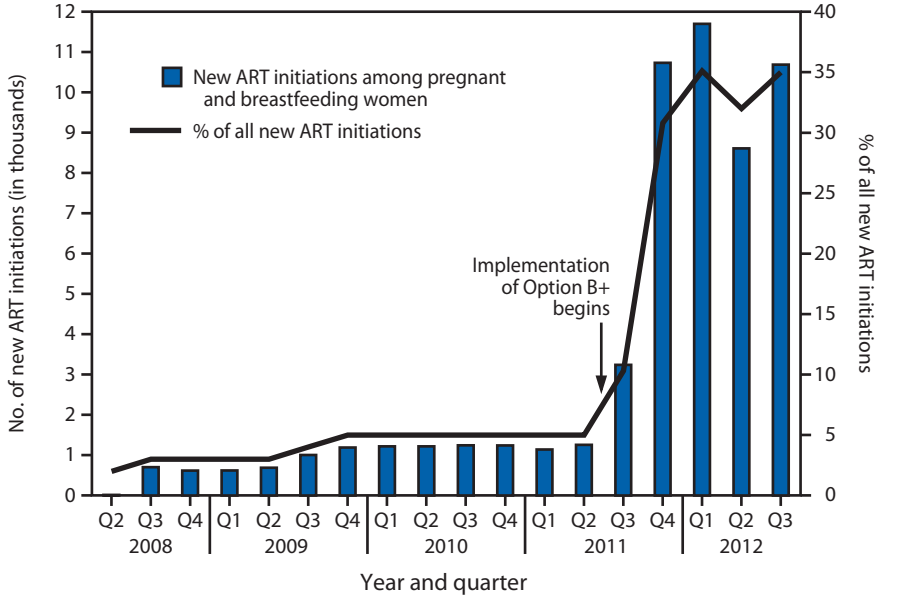


FIGURE 2. Number of new antiretroviral treatment (ART) initiations among pregnant and breastfeeding women, and percentage of all new ART initiations attributed to this population — Malawi, 2008–2012



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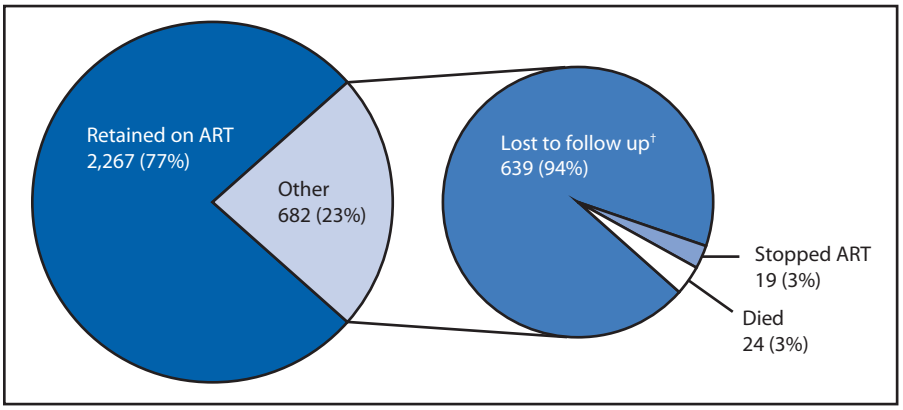
Editorial Note

In June 2011, PEPFAR (under the leadership of OGAC) and the Joint United Nations Program on HIV/AIDS launched a global plan to virtually eliminate mother-to-child transmission of HIV with the goal of reducing new HIV infections in children by 90% by 2015.[§] In Malawi, under the new policy, the number of pregnant and breastfeeding women started on ART has increased and the retention rate has remained similar

[§] Additional information available at http://www.unaids.org/en/media/unaids/contentassets/documents/unaidspublication/2011/20110609_jc2137_global-plan-elimination-hiv-children_en.pdf.

FIGURE 3. Twelve-month outcomes for women initiating antiretroviral treatment (ART)* — Malawi, third quarter of 2011



* N = 2,949. A total of 3,241 women initiated ART in the third quarter of 2011. However, 315 women were excluded from this analysis because they were documented to have transferred care from the clinic where they were initiated on ART and outcomes could not be verified. An additional 23 women were excluded because of incomplete information regarding the reason for starting ART.
† Some women labeled as lost to follow up might be deceased 12 months after initiating ART.

to the rate for adults continuing to receive ART at 12 months before Option B+ implementation. Option B+ is an important innovation that could accelerate progress in Malawi and other countries toward the goal of eliminating mother-to-child transmission of HIV worldwide.

Barriers to ART provision for pregnant women in resource-limited settings include the need for CD4 cell count, distance between ANC sites where HIV diagnosis is made and ART sites where treatment is started, transportation costs, and human resource constraints that lead to long waiting times and scheduling difficulties (*3*). The removal of the barrier of CD4 cell count, decentralization of ART into all ANC sites, and the training of nearly all nurses and clinical officers on the new integrated PMTCT/ART guidelines facilitated the increase in the number of pregnant and breastfeeding women started on ART. Implementation of Option B+ in Malawi enabled women to receive ART and ANC services in the same clinic and from the same provider without adversely affecting retention in care.

The seven-fold increase in the number of pregnant and breastfeeding women started on ART per quarter during the first year of Option B+ has multiple potential benefits to mothers, their partners, and their children. For women, ART provides protection for their own health and, therefore, with expansion of ART coverage, a substantial reduction in mortality through the postpartum period can be expected (*7,8*). For HIV-uninfected sexual partners, ART offers protection from HIV transmission. In Malawi, one third of HIV-infected women are estimated to be in stable relationships with HIV-uninfected partners; studies suggest a substantial reduction in HIV transmission within these relationships in the setting of effective ART (*6,9*). For children of current and future pregnancies, ART provides protection from HIV infection during pregnancy and breastfeeding. The mother-to-child transmission rate for women on ART is expected to be reduced, from approximately 40% without intervention to less than 5%. With PEPFAR funding, CDC is supporting a nationally representative prospective evaluation to estimate the mother-to-child transmission rate in Malawi (*1*).

Important challenges and questions remain. Evaluations to assess the cost-effectiveness of this approach are needed, and although 12-month retention rates are reassuring, lifelong ART adherence will need to be maintained. Although high-quality HIV testing is accepted by nearly all women at ANC in resource-limited settings, the Malawi MOH estimates that failure to ascertain maternal HIV status at ANC is now responsible for 54% of new infant infections in Malawi, likely as a result of irregular availability of test kits and poor quality assurance of rapid testing at ANC sites. (*10*; Frank Chimbwandira, Malawi MOH, personal communication, 2012). With PEPFAR funding, CDC is supporting birth defects surveillance in Malawi and elsewhere because limited data currently are available on the possible adverse effects of efavirenz-based ART regimens on infants exposed in early gestation (*5*).

The success of Option B+ in increasing ART coverage demonstrates the combined effect of streamlined ART initiation, decentralized and integrated service delivery, policy changes to allow nurses to start ART, and direct supervision of every site. Continued progress in Malawi demands consistent provision of high-quality HIV testing in ANC and continuing efforts to ensure lifelong ART adherence among women started on ART through Option B+.

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What is already known on this topic?

Mother-to-child transmission of human immunodeficiency virus (HIV) can be reduced to less than 5% with antiretroviral medications. However many HIV-infected pregnant and breastfeeding women in sub-Saharan Africa still do not receive services to prevent transmission to their infants. An important barrier is the limited laboratory capacity for CD4 cell count, which is recommended by the World Health Organization to determine which antiretroviral medications to start in pregnant and breastfeeding women.

What is added by this report?

In 2011, Malawi implemented a new policy (Option B+) to provide all HIV-infected pregnant and breastfeeding women with lifelong antiretroviral therapy (ART) regardless of CD4 count. The number of pregnant and breastfeeding women started on ART increased by 748%, from 1,257 in the second quarter of 2011 (before Option B+ implementation) to 10,663 in the third quarter of 2012 (1 year after implementation).

What are the implications for public health practice?

Option B+ is an important innovation that could accelerate progress in Malawi and other countries toward the goal of eliminating mother-to-child transmission of HIV worldwide.

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Announcements

National Kidney Month — March 2013

March is designated National Kidney Month to raise awareness about the prevention and early detection of kidney disease. In 2011, kidney disease was the ninth leading cause of death in the United States (*1*). More than 10% (>20 million) of U.S. adults aged ≥20 years have chronic kidney disease (CKD), and most of them are unaware of their condition (*2,3*). If left untreated, CKD can lead to kidney failure, requiring dialysis or transplantation for survival (*2,4*).

CDC's Chronic Kidney Disease Initiative, in collaboration with partner agencies and organizations, has developed the CKD Surveillance System website (http://www.cdc.gov/ckd/surveillance) to document and monitor the burden of CKD and its risk factors in the United States. The website also provides the means for tracking progress toward achieving *Healthy People 2020* objectives to prevent, detect, and manage CKD and for evaluating, monitoring, and implementing quality improvement efforts by federal and nonfederal agencies.

Diabetes and high blood pressure are major risk factors for CKD, but controlling diabetes and blood pressure can prevent or delay CKD and improve health outcomes (*2*). Information about preventing and controlling kidney disease is available at http://www.nkdep.nih.gov. Information about CDC's Chronic Kidney Disease Initiative is available at http://www.cdc.gov/ckd.

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National Sleep Awareness Week — March 3–10, 2013

During March 3–10, 2013, National Sleep Awareness Week will be observed in the United States. The National Sleep Foundation recommends that adults get 7–9 hours of sleep per night (*1*). Receiving less sleep can pose serious consequences to health and safety. In a population-based community study, those who reported an average sleep duration of ≤6 hours (6.7%) were significantly more likely to also report that they had fallen asleep while driving than were those who reported average sleep duration of 7–9 hours (2.6%) (*2*).

In addition to creating a risk to public safety, self-reported insufficient sleep has been associated with adverse health behaviors, such as smoking, physical inactivity, and obesity (*3*). The origins of insufficient sleep can, in certain cases, begin early in life and pose lasting consequences. A retrospective cohort study found that self-reported instances of neglect or abuse during childhood (i.e., adverse childhood experiences [ACEs]) were associated with frequent insufficient sleep decades after their occurrence. Specifically, the odds of frequent insufficient sleep were 2.5 times (95% confidence interval = 2.1–3.1) greater among respondents reporting five or more ACEs than among those reporting no ACEs (*4*). Such findings suggest the importance of sleep as a measure of both public health and safety, as well as a marker of potential household dysfunction. Additional information regarding sleep is available at http://www.cdc.gov/sleep.

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In Memoriam

Stephen B. Thacker, MD, MSc — 1947–2013

Stephen B. Thacker, MD, MSc, a retired Assistant Surgeon General in the U.S. Public Health Service, and recent Director of the Office of Surveillance, Epidemiology, and Laboratory Services at CDC, died on February 15, 2013, in Atlanta, Georgia. He was 65. Dr. Thacker served with distinction in key CDC positions, including Deputy Director (Acting), during a career that spanned more than 36 years. He was the recipient of two of the U.S. Public Health Service's highest individual honors, the Distinguished Service Medal and the Surgeon General's Medal. Throughout his public service, he provided essential support to the *Morbidity and Mortality Weekly Report* (*MMWR*) series of publications.

Born in Independence, Missouri, Dr. Thacker was educated at Princeton University and the Mt. Sinai School of Medicine. He completed a residency in Family Medicine at Duke University and obtained an MSc degree at the London School of Hygiene and Tropical Medicine. He was board-certified in Family Medicine and Public Health and General Preventive Medicine. During his career, he published over 240 articles and book chapters on public health and health care.

Dr. Thacker joined CDC's Epidemic Intelligence Service (EIS) Program in 1976 and was assigned to the Washington, DC, health department. Beginning with an early leadership role as director of CDC's public health surveillance office and continuing throughout his career, he made substantive contributions to the public health practice of surveillance that have been institutionalized in the United States and globally. One example is the enduring effect of his influence on the *MMWR* series: in 1983, Dr. Thacker conceived and helped to launch the Surveillance Summary component of the *MMWR* series to advance the science and effectiveness of this essential function in U.S. public health practice.

Dr. Thacker in 2005, leading the Symposium on Diversity, Leadership Development, and Succession Planning.

In addition to his contributions to *MMWR* through surveillance, Dr. Thacker provided ongoing, routine, senior-level review of the contents of each issue of the *MMWR* weekly throughout most of his career. His expertise in epidemiology, public health practice, and related disciplines, and his knowledge of and insights about CDC history were highly valued by *MMWR* editors and added substantially to the quality, accuracy, and integrity of the publication.

Errata

Vol. 61, Nos. 51 & 52

On page ND-719, in "Table I. Provisional cases of infrequently reported notifiable diseases (<1,000 cases reported during the preceding year) — United States, week ending December 29, 2012 (52nd week)," in the row "Diphtheria," under the column heading "Cum 2012," the value should read, "**1**."

On page ND-730, in "Table II. (*Continued*) Provisional cases of selected notifiable diseases, United States, weeks ending December 29, 2012, and December 31, 2011 (52nd week)," multiple errors occurred under the heading, "*Streptococcus pneumoniae*, invasive disease." The corrected table section, with new values shown in **bold**, is as follows.

TABLE II. (*Continued*) Provisional cases of selected notifiable diseases, United States, weeks ending December 29, 2012, and December 31, 2011 (52nd week)*

	Streptococcus pneumoniae,† invasive disease									
	All ages					Age <5				
Reporting area	Current week	Previous 52 weeks Med	Previous 52 weeks Max	Cum 2012	Cum 2011	Current week	Previous 52 weeks Med	Previous 52 weeks Max	Cum 2012	Cum 2011
United States	106	241	803	**13,160**	**17,138**	7	20	58	**1,002**	**1,273**
New England	3	11	24	579	807	—	1	4	50	54
Connecticut	1	5	13	280	354	—	0	2	14	14
Maine	—	2	7	94	136	—	0	1	3	4
Massachusetts	—	1	3	42	38	—	0	2	26	19
New Hampshire	—	1	5	62	110	—	0	1	6	5
Rhode Island	—	0	5	42	97	—	0	1	1	5
Vermont	2	1	4	59	72	—	0	0	—	7
Mid. Atlantic	17	36	157	1,902	2,598	—	2	11	102	138
New Jersey	—	7	26	408	680	—	0	3	23	43
New York (Upstate)	11	17	108	856	1,183	—	1	10	55	56
New York City	6	13	24	638	735	—	0	2	24	39
Pennsylvania	N	0	0	N	N	N	0	0	N	N
E.N. Central	27	54	101	2,694	3,283	1	4	10	174	186
Illinois	N	0	0	N	N	—	0	0	—	—
Indiana	—	12	33	570	819	—	1	2	33	40
Michigan	2	12	25	529	694	—	0	3	31	36
Ohio	20	21	46	1,150	1,278	—	2	6	86	83
Wisconsin	5	8	29	445	492	1	0	2	24	27
W.N. Central	—	14	58	679	**835**	—	1	4	53	**77**
Iowa	N	0	0	N	N	N	0	0	N	N
Kansas	N	0	0	N	N	N	0	0	N	N
Minnesota	—	9	22	455	580	—	0	3	31	47
Missouri	N	0	0	N	**N**	—	0	0	—	—
Nebraska	—	2	8	106	121	—	0	2	10	12
North Dakota	—	0	38	30	91	—	0	2	1	4
South Dakota	—	1	5	88	**43**	—	0	2	11	**14**
S. Atlantic	32	56	193	**2,968**	4,009	4	4	21	232	343
Delaware	—	0	3	31	52	—	0	1	1	—
District of Columbia	—	0	4	45	55	—	0	1	3	6
Florida	30	18	48	989	1,324	4	1	8	80	138
Georgia	—	15	42	866	1,173	—	2	4	76	94
Maryland	2	6	22	**331**	587	—	0	5	27	51
North Carolina	N	0	0	N	N	N	0	0	N	N
South Carolina	—	6	16	365	452	—	0	3	24	29
Virginia	N	0	0	N	N	—	0	0	—	—
West Virginia	—	5	83	341	366	—	0	8	21	25
E.S. Central	9	16	50	**1,180**	**1,408**	—	1	3	**91**	**121**
Alabama	—	0	0	**106**	**42**	—	0	0	**15**	**10**
Kentucky	—	3	9	179	226	—	0	1	9	23
Mississippi	—	0	0	**175**	**148**	—	0	0	**25**	**14**
Tennessee	9	12	47	720	992	—	1	3	42	74
W.S. Central	13	26	188	1,507	2,090	2	2	12	147	192
Arkansas	8	3	14	169	228	—	0	3	13	14
Louisiana	—	4	18	235	259	—	0	4	30	25
Oklahoma	N	0	0	N	N	—	0	0	—	—
Texas	5	20	156	1,103	1,603	2	2	11	104	153
Mountain	5	25	53	**1,442**	**1,963**	—	2	6	**125**	**150**
Arizona	2	11	27	**510**	767	—	1	3	**41**	55
Colorado	—	8	19	408	494	—	0	3	36	38
Idaho	N	0	0	N	N	—	0	0	—	—
Montana	—	0	0	**22**	**20**	N	0	0	N	N
Nevada	—	0	0	**78**	**124**	—	0	0	**8**	**6**
New Mexico	3	5	14	251	329	—	0	4	19	24
Utah	—	3	8	144	206	—	0	3	19	27
Wyoming	—	0	3	29	23	—	0	1	2	—
Pacific	—	4	10	209	145	—	1	2	28	12
Alaska	—	2	8	139	138	—	0	2	22	10
California	N	0	0	N	N	N	0	0	N	N
Hawaii	—	1	6	70	7	—	0	1	6	2
Oregon	N	0	0	N	N	N	0	0	N	N
Washington	N	0	0	N	N	N	0	0	N	N
Territories										
American Samoa	N	0	0	N	N	—	0	0	—	—
C.N.M.I.	—	—	—	—	—	—	—	—	—	—
Guam	—	0	0	—	—	—	0	0	—	—
Puerto Rico	—	0	0	—	—	—	0	0	—	—
U.S. Virgin Islands	—	0	0	—	—	—	0	0	—	—

C.N.M.I.: Commonwealth of Northern Mariana Islands.
U: Unavailable. —: No reported cases. N: Not reportable. NN: Not Nationally Notifiable. Cum: Cumulative year-to-date counts. Med: Median. Max: Maximum.

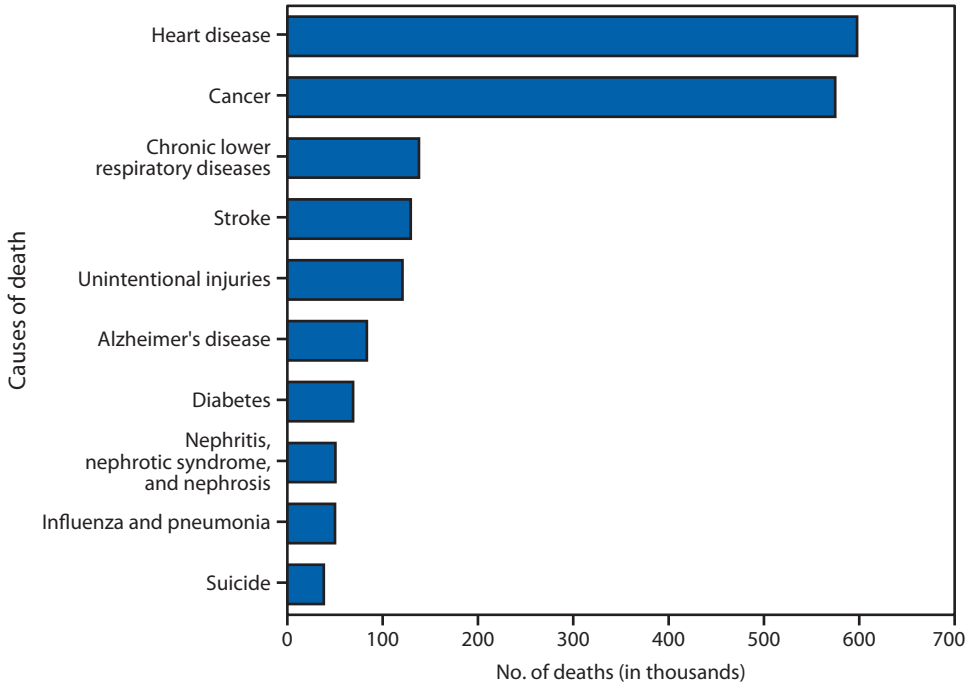
* Case counts for reporting year 2012 and 2013 are provisional and subject to change. For further information on interpretation of these data, see http://wwwn.cdc.gov/nndss/document/ProvisionalNationaNotifiableDiseasesSurveillanceData20100927.pdf. Data for TB are displayed in Table IV, which appears quarterly.

† Includes drug resistant and susceptible cases of invasive *Streptococcus pneumoniae* disease among children <5 years and among all ages. Case definition: Isolation of *S. pneumoniae* from a normally sterile body site (e.g., blood or cerebrospinal fluid).

QuickStats

FROM THE NATIONAL CENTER FOR HEALTH STATISTICS

Number of Deaths from 10 Leading Causes — National Vital Statistics System, United States, 2010



In 2010, a total of 2,468,435 deaths occurred in the United States. The first two leading causes of death, heart disease (597,689 deaths) and cancer (574,743), accounted for nearly 50% of all deaths. In contrast, the other leading causes accounted for much smaller percentages, ranging from 5.6% (138,080 deaths) for the third leading cause of death, chronic lower respiratory disease, to 1.6% (38,364) for suicide, the 10th leading cause of death. All other causes combined accounted for 25% of the deaths.

Source: Murphy SL, Xu JQ, Kochanek KD. Deaths: final data for 2010. Available at http://www.cdc.gov/nchs/data/dvs/deaths_2010_release.pdf.

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Data presented by the Notifiable Disease Data Team and 122 Cities Mortality Data Team in the weekly *MMWR* are provisional, based on weekly reports to CDC by state health departments. Address all inquiries about the *MMWR* Series, including material to be considered for publication, to Editor, *MMWR* Series, Mailstop E-90, CDC, 1600 Clifton Rd., N.E., Atlanta, GA 30333 or to *mmwrq@cdc.gov.*

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