Centers for Disease Control and Prevention
MMWR
Morbidity and Mortality Weekly Report
Weekly / Vol. 61 / No. 50
December 21, 2012

CDC Grand Rounds: The Million Hearts Initiative

The Magnitude of the Problem

Cardiovascular disease, including heart disease and stroke, is the leading cause of death and disability in the United States. Every year, approximately 2 million persons in the United States have a heart attack or stroke and, as a result of these conditions, approximately 800,000 die from cardiovascular disease (*1*). For those persons who do survive a heart attack or stroke, many are faced with serious illness, disability, and decreased quality of life. The ongoing complications that result from cardiovascular disease greatly contribute to the economic burden on the health-care system and to society as a whole. In 2010, the cost in health-care expenditures and lost productivity in the United States from cardiovascular disease amounted to nearly $444 billion, and these costs are increasing every year (*2*). This is especially alarming because the primary risk factors for cardiovascular disease (i.e., high blood pressure, high cholesterol, smoking, type 2 diabetes, inactivity, and obesity) are largely preventable and have effective, low-cost treatments (*1*). If these risk factors were well-controlled through behavioral modification and/or treatment, the risk for death from heart attack and stroke could be reduced by more than half (*3,4*).

The Million Hearts Initiative

Launched in September 2011 by the U.S. Department of Health and Human Services (HHS), Million Hearts is a national initiative that aims to prevent 1 million heart attacks and strokes by 2017. This public-private partnership, co-led by CDC and the Centers for Medicare and Medicaid Services (CMS), will integrate proven and effective prevention activities to reduce cardiovascular disease. A key strategy of Million Hearts is to engage a broad set of stakeholders involved with health and health care, including clinicians, pharmacists, insurers, health-care systems, retailers, consumer groups, and others.

Better alignment and coordination of existing and new prevention and treatment efforts will accelerate translation into practice, resulting in decreased burden to society and greater population health improvements. The two primary goals of Million Hearts are 1) to reduce the need for treatment by empowering persons in the United States to make healthy choices (e.g., avoid tobacco, reduce sodium intake, and reduce artificial trans fat intake) and 2) to improve care for persons who need it through focus on the "ABCS" (i.e., appropriate aspirin use for those at risk, blood pressure control, cholesterol management, and smoking cessation).

Million Hearts is being implemented through parallel efforts aimed at clinical settings and communities (*3*). Community efforts will keep the population healthy and reduce the number of persons who need treatment in the first place. Million Hearts will focus community efforts on decreasing tobacco use and exposure to secondhand smoke, reducing sodium intake, and eliminating consumption of artificial trans fats (*3*). Examples

This is another in a series of occasional MMWR *reports titled CDC Grand Rounds. These reports are based on grand rounds presentations at CDC on high-profile issues in public health science, practice, and policy. Information about CDC Grand Rounds is available at http://www.cdc.gov/about/grand-rounds.*

INSIDE

1022 Serogroup A Meningococcal Conjugate Vaccine Coverage After the First National Mass Immunization Campaign — Burkina Faso, 2011
1025 Evaluation of Meningitis Surveillance Before Introduction of Serogroup A Meningococcal Conjugate Vaccine — Burkina Faso and Mali
1029 Notes from the Field: National Shortage of Isoniazid 300 mg Tablets
1030 Announcement
1031 QuickStats

Continuing Education examination available at http://www.cdc.gov/mmwr/cme/conted_info.html#weekly.

U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

include designated smoke-free public spaces, policies that reduce sodium and eliminate artificial trans fats in prepared food, workplace wellness programs, and media campaigns related to the hazards of smoking. These activities align with the *Healthy People 2020* targets and the goals of the Prevention and Public Health Fund, the National Quality Strategy, and the National Prevention Strategy (*3*).

Clinically based prevention efforts will improve quality of care, access to care, and improve outcomes through focus on the ABCS. These efforts will include drawing the attention of health-care professionals and the systems in which they work to the ABCS, increasing and improving the use of health information technology in clinical practice, and using clinical innovations to increase the use of effective ABCS care practices. Although high achievement in the ABCS has been shown to prevent more cardiovascular disease–related deaths than other clinical preventive services, overall performance in the ABCS by persons at risk and their health-care professionals generally is low (*3,5*). For example, less than half of persons (47%) with ischemic vascular disease are prescribed aspirin or other antiplatelet medication, less than half of persons (47%) with hypertension have their blood pressure under control, only one third of persons (33%) with high cholesterol are effectively managed, and approximately one fourth of persons (23%) who smoke get tobacco cessation counseling or medications (Table) (*6,7*). Consequently, the estimated number of persons who smoke or have uncontrolled hypertension or cholesterol totals approximately 100 million. Improving performance on the ABCS is the means by which the majority of lives can be saved and how the greatest health value can come out of current health-care investments (*3*).

National Prevention Efforts

CMS is the largest payer of health care in the world and provides health-care coverage to nearly 105 million beneficiaries in Medicare, Medicaid, and the Children's Health Insurance Program. CMS has a critical role at the federal level in building clinical prevention strategies with a focus on health information technology and innovation in health-care delivery. Technology and innovation are central to fostering a health-care system that delivers care that is safer, better coordinated, and patient-focused. CMS is working to standardize ABCS indicators as part of clinical quality reporting requirements among physician offices, hospitals, health departments, insurers, assisted-living facilities, and related health-care providers and systems (*3*). Standardization will improve reporting of the ABCS and reduce the burden of reporting while enabling more efficient communication of best practices to those providing care. These also will support quality-incentive programs focused on the ABCS, such as the Physician Quality Reporting System for clinicians and for Medicare health plans and prescription drug plans. In 2011, CMS initiated the Medicare and Medicaid Electronic Health Records Incentive Program, which will provide payments to eligible health professionals and hospitals as they adopt, implement, and demonstrate "meaningful use"

The *MMWR* series of publications is published by the Office of Surveillance, Epidemiology, and Laboratory Services, Centers for Disease Control and Prevention (CDC), U.S. Department of Health and Human Services, Atlanta, GA 30333.

Suggested citation: Centers for Disease Control and Prevention. [Article title]. MMWR 2012;61:[inclusive page numbers].

TABLE. Current status of the Million Hearts ABCS (aspirin therapy, blood pressure control, cholesterol control, and smoking cessation) to prevent cardiovascular disease in the United States, 2012

Prevention measure	Data source	Definition of measure	Estimate
Aspirin therapy	NAMCS and NHAMCS, 2007–2008	% of visits of patients aged ≥18 years with ischemic vascular disease who are prescribed aspirin or other antiplatelet medication	47%*
Blood pressure control	NHANES, 2003–2010	% of adults aged ≥18 years with hypertension who have adequately controlled blood pressure	47%†
Cholesterol control	NHANES, 2005–2008	% of adults aged ≥20 years with high cholesterol who have adequately controlled LDL-C	33%§
Smoking cessation	NAMCS, 2005–2008	% of outpatient visits of persons aged ≥18 years who screened positive for current tobacco use and for whom tobacco cessation counseling and/or cessation medications were provided	23%¶

Abbreviations: NAMCS = National Ambulatory Medical Care Survey; NHAMCS = National Hospital Ambulatory Medical Care Survey; NHANES = National Health and Nutrition Examination Survey; LDL-C = low-density lipoprotein cholesterol.

* Source: CDC. Recommended use of aspirin and other antiplatelet medications among adults—National Ambulatory Medical Care Survey and National Hospital Ambulatory Medical Care Survey, United States, 2005–2008. MMWR 2012;61(Suppl; June 15, 2012):11–8.

† Newer data released since CDC Grand Rounds presentation. Source: CDC. Vital signs: awareness and treatment of uncontrolled hypertension among adults—United States, 2003–2010. MMWR 2012;61;703–9.

§ Source: CDC. Vital signs: prevalence, treatment, and control of high levels of low-density lipoprotein cholesterol—United States, 1999–2002 and 2005–2008. MMWR 2011;60:109–14.

¶ Source: CDC, unpublished data, 2011.

of certified electronic health record (EHR) technology in ways that improve the quality of care delivered. Meaningful use is the use of certified EHR technology in a manner that provides for the electronic exchange of health information to improve the quality of care and submits information on quality of care and other measures.* Clinical decision support tools are being developed in conjunction with the EHR Incentive Program to further disseminate clinical guidelines and best practices, such as optimal medication prescribing support, screening prompts, and medication alerts. Broad use of EHR technology can improve provider communication, reduce medical errors, limit duplicate tests and screenings, and lower costs (*3*).

The Million Hearts initiative also has the opportunity to generate innovative ways to deliver health care and to improve patient adherence. CMS is working with the Medicare Quality Improvement Organizations and Federally Qualified Health Centers and others to develop and test new models of care, such as accountable care organizations† and learning and action networks.§ These initiatives have a patient-centered philosophy supported by knowledge management and real-time learning functionality (*3*). The interventions will focus on reducing the barriers to providing health care and continuous quality improvement. Tools and strategies emphasize a team-based approach to care that strives to enhance the role of pharmacists, advanced practice nurses, physicians' assistants, community health workers, cardiac rehabilitation teams, nurses, and peer wellness specialists, among others. CMS also supports innovative health-care models and structures, such as patient-centered medical homes and point-of-care counseling, and will implement payment reform initiatives that incentivize adherence to ABCS clinical quality metrics through programs such as value-based purchasing, new primary-care payment models, and accountable care organizations.

Local Prevention Efforts

San Diego, California. In addition to action at the federal level, communities also have a critical role in improving clinical care and reducing cardiovascular disease risk factors in the community. For example, the Department of Health and Human Services of the County of San Diego developed a county-wide prevention initiative, including an effort to reduce risk factors for cardiovascular disease. The initiative, Live Well, San Diego! is a comprehensive effort with partners from state, local, private, professional, and community-based groups. Live Well, San Diego! is organized on a "3-4-50" concept, referring to the notion that three behaviors (i.e., poor diet, physical inactivity, and tobacco use) lead to four diseases (i.e., cardiovascular disease, type 2 diabetes, cancer, and lung disease), which account for approximately 50% of deaths (*8*). In conjunction with local medical providers, the county adopted the goal of becoming a "Heart Attack and Stroke Free Zone" to capture public attention, extend the project to all citizens, convey ownership of the program to the public in addition to the medical community, and to capitalize on the strong sense of community pride. One specific feature of the Live Well, San Diego! initiative is the "Be There Campaign," which focuses

* Additional information available at http://www.cms.gov/regulations-and-guidance/legislation/ehrincentiveprograms/meaningful_use.html and http://healthit.hhs.gov/portal/server.pt?open=512&objID=2996&mode=2.

† Additional information available at http://innovations.cms.gov/initiatives/aco/index.html.

§ Additional information available at http://www.cfmc.org/provider/provider_lans.aspx.

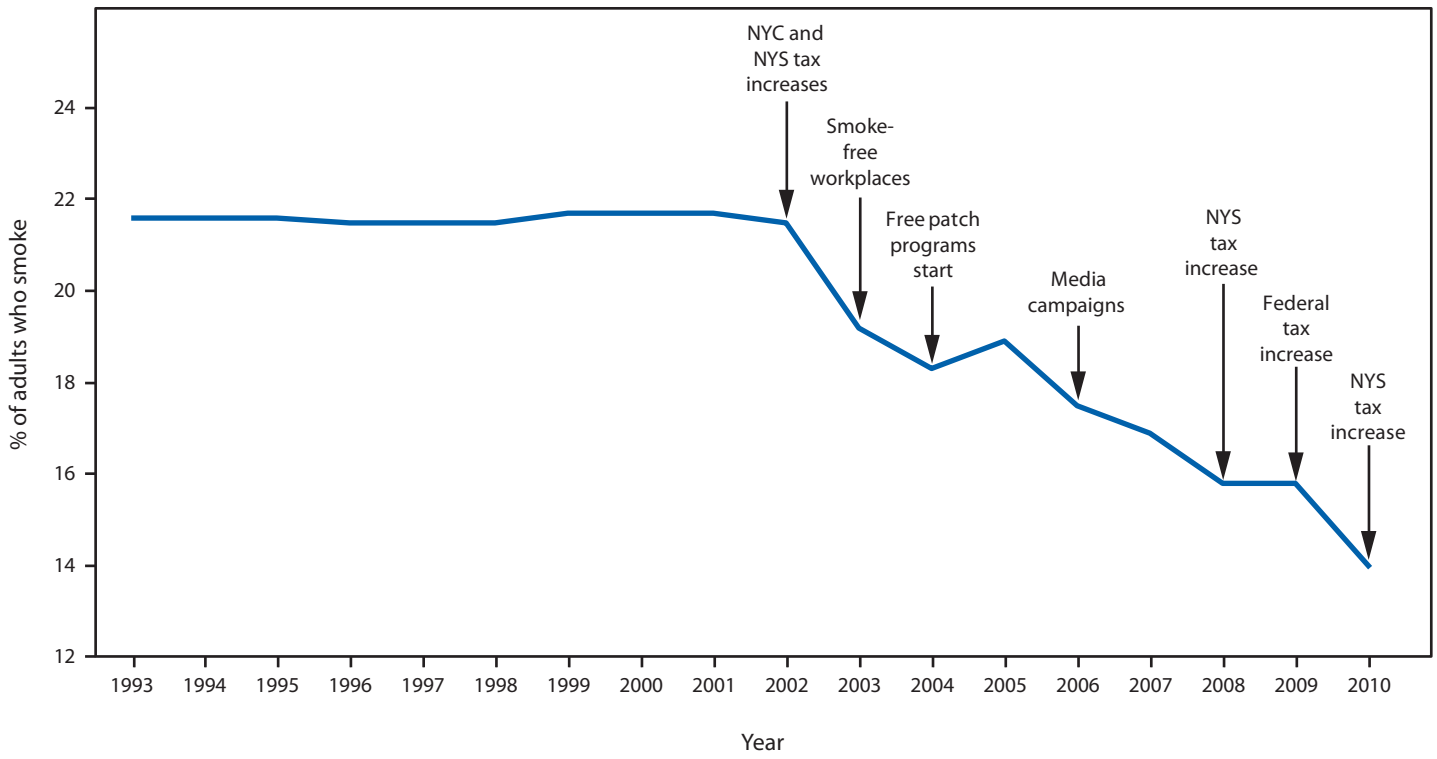
multimedia and social media strategies on heart attack and stroke prevention. It aims to motivate patients to reduce their risk factors to be there for loved ones. The campaign is based on risk-reduction tactics that are designed to actively engage persons in improving their own health as a way to be responsible to family and friends. One method for engaging persons and increasing their participation in the campaign is through the use of new technologies, such as wireless heart monitors, pill bottles designed to measure medication adherence, exercise frequency monitors, and smartphones to report vital signs. For the first time, the top 10 health-care systems in San Diego meet monthly, share data, and discuss how treatment goals are met. Through efforts focused on engagement of the entire medical community and the integration of health programs into the initiative, San Diego County intends to create an effective population health program that can be scaled to other communities throughout the United States.

New York City. New York City (NYC) established a cardiovascular disease prevention initiative focused on smoking cessation, reducing intake of artificial trans fats and sodium, and expanding the use of EHRs. In 2002, the NYC Smoke-Free Air Act was enacted, prohibiting smoking in workplaces, restaurants, bars, and nightclubs. In 2011, the smoke-free ordinance was expanded to parks, beaches, public plazas, and boardwalks, and by the end of 2012, all 23 campuses of the City University of New York will become tobacco free. In addition to the smoke-free law, NYC implemented an excise tax in 2003; when combined with subsequent tax increases at the state and federal levels, the total cost of a pack of cigarettes is now $11. Ongoing cardiovascular disease prevention efforts include a mass media campaign that delivers graphic images and testimonials about the long-term suffering and harmful effects caused by tobacco use. Data from the NYC Community Health Survey (CHS) have shown that during 2002–2010, the combination of changes to local laws, excise taxes, and media messages have resulted in approximately 450,000 fewer smokers in NYC (Figure) (*9*).

The NYC Board of Health restricts the use of artificial trans fat in restaurants, and approximately 90% of NYC restaurants were in compliance in 2008 (*10*). NYC also has led the National Salt Reduction Initiative (NSRI) to decrease sodium intake by 20% over the next 5 years.[¶] The initiative is promoted by a voluntary coalition that focuses on government-industry

[¶] Additional information available at http://www.nyc.gov/html/doh/html/cardio/cardio-salt-initiative.shtml.

FIGURE. Percentage of adults who smoke, by year — New York City Community Health Survey,* 1993–2010



Abbreviations: NYC = New York City; NYS = New York state.
* Additional information available at http://www.nyc.gov/html/doh/html/survey/survey.shtml.

collaboration. To date, 28 major packaged food companies and restaurants have committed to NSRI.

NYC also is supporting the ABCS through the implementation of the Primary Care Information Project (PCIP).** The goal of the project is to facilitate improvements to the quality of primary care delivered with enhancements to health information technology. Currently, approximately 3,000 primary-care providers serving nearly 3 million patients are using a prevention-oriented EHR capability that provides a clinical decision support system and monitors physician-reported patient data. PCIP delivers a personalized dashboard showing physicians their performance on the ABCS. It also provides prevention and treatment recommendations and reminders to address for future improvements. PCIP EHR enhancements exemplify the health information technology meaningful use improvements underway at CMS.

Summary

Million Hearts is a large-scale, public-private initiative that aims to change the cardiovascular health of the nation by preventing 1 million heart attacks and strokes by 2017. Success can be achieved by the implementation of proven, effective interventions, health technology and systems improvements, modifications in health-care coverage and reimbursement, and innovative strategies to improve performance on the ABCS by patients, health-care professionals, and health-care systems. System and environmental changes at the local and state levels will be important to create environments that facilitate healthy choices. Considerable commitments and dedication from various partners will make the difference in reaching the Million Hearts goal.

** Additional information is available at http://www.nyc.gov/html/doh/html/pcip/pcip.shtml.

Reported by

Thomas Farley, MD, New York City Dept of Health and Mental Hygiene. Anthony N. DeMaria, MD, Univ of California, San Diego. Janet Wright, MD, CDC/Center for Medicare and Medicaid Innovation (CMS Innovation Center). Patrick H. Conway, MD, Centers for Medicare and Medicaid Svcs. Amy L. Valderrama, PhD, Nicole A. Blair, MPH, Div for Heart Disease and Stroke Prevention, National Center for Chronic Disease Prevention and Health Promotion; Miriam Kelly PhD, Tanja Popovic, MD, PhD, Office of the Director, CDC. ***Corresponding contributor:*** *Amy L. Valderrama, avalderrama@cdc.gov, 770-488-8218.*

References

1. Roger VT, Lloyd-Jones DM, Benjamin EJ, et al. Heart disease and stroke statistics–2012 update: : a report from the American Heart Association. Circulation 2012;125:e2–e220.
2. Heidenreich PA, Trogdon JG, Khavjou OA, et al. Forecasting the future of cardiovascular disease in the United States. Circulation 2011; 123:933–44.
3. Frieden TR, Berwick DM. The "Million Hearts" initiative–preventing heart attacks and strokes. N Engl J Med 2011;365:e27.
4. Ford ES, Ajani UA, Croft JB, et al. Explaining the decrease in U.S. deaths from coronary disease, 1980–2000. N Engl J Med 2007;356:2388–98.
5. Farley TA, Dalal MA, Mostashari F, Frieden TR. Deaths preventable in the U.S. by improvements in use of clinical preventive services. Am J Prev Med 2010;38:600–9.
6. CDC. Million Hearts: strategies to reduce the prevalence of leading cardiovascular disease risk factors—United States, 2011. MMWR 2011; 60:1248–51.
7. CDC. Vital signs: awareness and treatment of uncontrolled hypertension among adults—United States, 2003–2010. MMWR 2012;61:703–9.
8. County of San Diego. Live well, San Diego! Building better health: a report on year two of a ten year initiative. San Diego, California: County of San Diego; 2012. Available at http://www.sdcounty.ca.gov/dmpr/gfx/Live_Well_Annual_Report. Accessed December 14, 2012.
9. New York City Department of Health and Mental Hygiene. Epi data brief: trends in cigarette use among adults in New York City, 2002–2010. New York, NY: New York City Department of Health and Mental Hygiene; 2011. Available at http://www.nyc.gov/html/doh/downloads/pdf/epi/databrief12.pdf. Accessed December 14, 2012.
10. Angell S, Silver LD, Goldstein CM, et al. Cholesterol control beyond the clinic: New York City's trans fat restriction. Ann Intern Med 2009;151:129–34.

Serogroup A Meningococcal Conjugate Vaccine Coverage After the First National Mass Immunization Campaign — Burkina Faso, 2011

In December 2010, Burkina Faso became the first country to introduce PsA-TT (MenAfriVac), a new serogroup A meningococcal conjugate vaccine developed to eliminate epidemic meningitis in sub-Saharan Africa, via a national mass-immunization campaign. This campaign targeted persons aged 1–29 years, approximately 70% of the 16 million residents of the country. More than 11 million vaccine doses were administered in a 10-day period, for an estimated administrative coverage* of 102.6% (*1*). Accurate vaccination coverage estimates are critical for programmatic evaluation, identification of undervaccinated subpopulations, and for measurement of the impact of PsA-TT on serogroup A disease and carriage. In December 2011, the Burkina Faso Ministry of Health, in collaboration with CDC, conducted a stratified cluster survey to obtain regional and age-group–specific vaccination coverage estimates among campaign-eligible persons. National coverage was 95.9% (74.3% with vaccination card, 21.6% by recall), and coverage in the 13 regions of Burkina Faso ranged from 90.8% to 98.3%. Coverage was 97.0% in children aged 2–5 years, 97.4% in those aged 6–15 years, and 93.4% in those aged 16–30 years. The results of this survey demonstrate successful introduction of a new vaccine in Burkina Faso through a mass immunization campaign, the first step in a strategy aimed at rapidly interrupting transmission and carriage of serogroup A *Neisseria meningitidis* before introduction of the vaccine into national routine immunization programs. With phased introduction of PsA-TT planned through 2016 (*2*) in Africa's "meningitis belt,"† lessons learned from the Burkina Faso experience will help guide successful introduction of serogroup A meningococcal conjugate vaccine elsewhere.

A national survey was conducted during December 17–27, 2011, using a stratified cluster sampling scheme to assess PsA-TT coverage achieved by the mass immunization campaign implemented during December 6–15, 2010, in Burkina Faso. The sampling frame for a target population of persons aged 2–30 years (those aged 1–29 years in December 2010) was derived from 2011 population estimates projected from the 2006 national census. Strata were defined by the 13 administrative regions. Twenty-five enumeration areas, which are the smallest geographic units into which the country is divided for the purposes of a census, were selected from each stratum in the first stage using probability proportional to size. In each enumeration area, field teams demarcated the boundaries of the enumeration area, enumerated all the households, and systematically selected 20 households by calculation of a sampling interval. All campaign-eligible persons residing in selected households were included. The sample size of 500 households per stratum was calculated to provide regional estimates for three age groups (2–5 years, 6–15 years, and 16–30 years) with +/-8% precision, assuming 80% coverage, 95% confidence intervals (CIs), a design effect§ of two, and a 5% nonresponse rate.

A questionnaire was administered to the head of each of the consenting retained households to capture demographic and socioeconomic information for the household. Vaccination status, modes of communication regarding the vaccination campaign, and reasons for nonvaccination were recorded by direct interview with eligible household members, or by head of household or other parent for children too young to respond. Receipt of vaccination was documented by a vaccination card designed specifically for this campaign, or by recall. Additionally, residency in Burkina Faso during the 2010 campaign was recorded to obtain campaign coverage estimates and 2011 population coverage estimates, accounting for migration to and from bordering countries. Before survey implementation, a pilot study and formal training of field teams were conducted. Each field team consisted of two interviewers and a supervisor who were under the direction of a regional supervisor. The sample was assumed to be self-weighting within each stratum. For the national estimates, stratum-specific weights were included. Variance estimates using Taylor series linearization to account for the survey design were used to calculate 95% CIs.

A total of 23,890 eligible persons from 6,455 households were surveyed; 6,434 (99.7%) of retained households consented to participation in the survey. Of enrolled consenting persons, 23,577 (99.2%) resided in Burkina Faso during the 2010 campaign. The 2011 estimated coverage among all surveyed persons did not differ significantly from estimated coverage among those residing in Burkina Faso during the 2010 campaign, and thus only results from those residing in Burkina

* Administrative coverage is the total number of doses administered to the target population, divided by the estimated target population.

† The incidence of meningitis worldwide is highest in the meningitis belt of sub-Saharan Africa, which extends from Senegal in the west to Ethiopia in the east.

§ The ratio of the design-based variance estimate divided by the variance estimate that would have been obtained from a simple random sample of the same size. Therefore, the design effect summarizes the effects of stratification, clustering, and unequal weighting on the variance of a complex sample design.

Faso during the campaign are reported. National coverage was estimated to be 95.9%, with coverage documented by vaccination card for 74.3% and by recall only for 21.6%. Estimated coverage was >90% in all regions, with the lowest coverage in the most populous Centre region (90.8%) and highest in the Centre-Ouest region (98.3%) (Table 1). Coverage was 97.0% in children aged 2–5 years, 97.4% in those aged 6–15 years, and 93.4% in persons aged 16–30 years. Coverage was 96.1% in females and 95.8% in males. Highest coverage was in females aged 2–5 years (97.7%), and lowest in males aged 16–30 years (93.0%) (Table 2). Among the 775 unvaccinated persons with a known reason for nonvaccination, the most commonly cited reasons were as follows: not informed (44.2%), absence (16.4%), no vaccine available at site (7.6%), and did not know the location of the vaccination clinic (6.4%). The most commonly reported modes of campaign communication were criers (social mobilizers) (36.8%), community health workers (24.0%), family (13.4%), and school (9.6%).

TABLE 1. Regional and weighted national PsA-TT serogroup A meningococcal conjugate vaccine coverage — Burkina Faso, 2011

Region	Target population size	Sample size	Coverage* (%)	(95% CI)
Centre-Ouest	889,975	2,134	98.3	(96.9–99.0)
Centre-Sud	464,731	1,585	98.2	(96.2–99.2)
Centre-Est	861,630	1,676	98.2	(96.7–99.0)
Cascades	436,411	1,655	98.1	(96.2–99.1)
Nord	889,517	1,918	97.3	(95.5–98.4)
Centre-Nord	922,309	1,892	96.9	(94.8–98.2)
Hauts-Bassins	1,174,646	1,938	96.7	(93.3–98.4)
Plateau Central	514,841	2,098	96.6	(94.9–97.8)
Boucle du Mouhoun	1,094,806	1,998	96.0	(92.6–97.9)
Sud-Ouest	452,547	1,700	95.9	(91.0–98.1)
Est	976,766	1,949	94.8	(89.2–97.5)
Sahel	749,382	1,526	94.5	(91.3–96.6)
Centre	1,458,605	1,508	90.8	(85.3–94.4)
Burkina Faso	10,886,166	23,577	95.9	(95.0–96.7)

Abbreviation: CI = confidence interval.
* Receipt of vaccination was documented by a vaccination card specifically designed for this campaign, or by verbal recall.

TABLE 2. Weighted national PsA-TT serogroup A meningococcal conjugate vaccine coverage, by age and sex — Burkina Faso, 2011

Age group (yrs)	Sex	Coverage* (%)	(95% CI)
2–5	F	97.7	(96.8–98.4)
	M	96.5	(95.0–97.5)
6–15	F	97.5	(96.6–98.2)
	M	97.3	(96.4–98.1)
16–30	F	93.6	(92.1–94.8)
	M	93.0	(91.2–94.5)

Abbreviations: F = female; M = male; CI = confidence interval.
* Receipt of vaccination was documented by a vaccination card specifically designed for this campaign, or by verbal recall.

Reported by

Isaïe Médah, MD, Dénis Yélbeogo, MD, Jean Ludovic Kambou, MD, Direction de la Lutte Contre la Maladie, Ministère de la Santé du Burkina Faso. Kathleen Wannemuehler, PhD, James L. Goodson, MPH, Brendan Flannery, PhD, Global Immunizations Div, Center for Global Health; Amanda Cohn, MD, Ryan T. Novak, PhD, Thomas Clark, MD, Nancy E. Messonnier, MD, Div of Bacterial Diseases, National Center for Immunization and Respiratory Diseases; Sarah A. Meyer, EIS Officer, CDC. ***Corresponding contributor****: Sarah A. Meyer, smeyer@cdc.gov, 404-639-3158.*

Editorial Note

In the meningitis belt of sub-Saharan Africa, serogroup A meningococcal meningitis is a major cause of death and disability. Major epidemics occur every 5–12 years, with hundreds of thousands of cases and a case-fatality ratio of >10% (*3*). During 2010–2011, PsA-TT was introduced into the hyperendemic countries of Burkina Faso, Mali, and Niger through mass campaigns, at a cost of $0.40 per dose. As of December 2012, 100 million persons had been vaccinated in 10 countries, and introduction is planned in a further 16 countries by the end of 2016.

As the first country to introduce PsA-TT on a national scale, Burkina Faso achieved >90% coverage in all regions, target age groups, and both sexes. These results demonstrate that mass vaccination of a large proportion of the population is an effective strategy to rapidly achieve high vaccine coverage. The scope of this campaign is unprecedented; previous measles and yellow fever campaigns have only targeted children aged <15 years or affected or at-risk districts, making this PsA-TT campaign the largest and most successful immunization activity in Burkina Faso's history (*1*). Particularly impressive is the high coverage in persons aged 16–30 years, especially among males, and the high card retention seen in all age groups 1 year after the immunization campaign.

Overall administrative coverage estimates in the six countries that introduced PsA-TT during 2010–2011 were >90% in each country (*4,5*). However, administrative coverage estimates do not reliably provide valid estimates of coverage; therefore, population-based coverage surveys are needed to identify areas of potential undervaccination and population susceptibility (*6*). The rigorous sampling methods and large sample size in this survey provide a representative and precise estimate of PsA-TT coverage in Burkina Faso. Although the survey was conducted 1 year after the immunization campaign, the majority of persons had proof of vaccination by card. The potential for recall bias among those who reported vaccination by recall only might be offset by the high-profile nature of the disease and the vaccination campaign in Burkina Faso. In addition,

What is already known on this topic?

Meningococcal meningitis epidemics are a major public health problem in the "meningitis belt" of sub-Saharan Africa. PsA-TT (MenAfriVac) is a new serogroup A meningococcal conjugate vaccine recently introduced in 10 of 26 target countries in this region.

What is added by this report?

This study documents PsA-TT coverage after a mass immunization campaign in Burkina Faso, the first country to introduce PsA-TT nationally. Results of this survey demonstrate high coverage (>90%) in all regions, targeted age groups, and sexes.

What are the implications for public health practice?

High PsA-TT vaccination coverage rates in Burkina Faso provide context for the observed reduction in meningitis disease rates. Maintenance of high levels of population immunity in Burkina Faso, and continued successful introduction of PsA-TT in other countries, will be important in the effort to eliminate epidemics of serogroup A meningococcal meningitis in sub-Saharan Africa. Rigorous coverage surveys will continue to be critical for monitoring introduction of this new vaccine.

because only the PsA-TT campaign was conducted during this period, vaccination with PsA-TT is unlikely to be confused with other vaccinations. Most persons living in Burkina Faso during the survey also reported living in Burkina Faso during the vaccination campaign; however, the campaign and survey were both during the start of the dry season in December, thus the effect of migration of potentially unvaccinated persons during other seasons is unknown.

A remarkable early impact of PsA-TT has been demonstrated in Burkina Faso. In the 2 years since vaccine introduction, enhanced meningitis surveillance has detected only one confirmed case of serogroup A meningococcal meningitis in an unvaccinated Burkina Faso resident and no cases in vaccinated persons, representing a 99.8% risk reduction (*7*) (Direction de la Lutte Contre la Maladie. Burkina Faso Ministry of Health, unpublished data, 2012). This substantial reduction in disease among all age groups, including the 30% of the population outside of the target age for vaccination, not only indicates excellent early vaccine effectiveness, but also is suggestive of herd immunity.

Achievement of high vaccination coverage in Burkina Faso demonstrates that coordinated preparation through microplanning, community engagement and mobilization, and development of a comprehensive communication plan are critical to successful vaccination campaigns (*1*). To eliminate epidemics of serogroup A meningococcal meningitis, high population immunity is necessary throughout the meningitis belt. After initial campaigns targeting persons aged 1–29 years, maintenance of high PsA-TT coverage through protection of each birth cohort is necessary, either by routine immunization services or periodic mass campaigns. When routine immunization or periodic mass campaigns will need to be initiated is not yet known. Reliable vaccination coverage estimates will continue to be needed to monitor and evaluate the introduction of this new vaccine, and to measure the impact of vaccination on achieving the goal of eliminating epidemic meningitis in the region.

Acknowledgments

Souleymane Sanou, MD, Maurice Hien, MD, Ministère de la Santé du Burkina Faso, Mamoudou Djingarey, MD, Fabien Diomande, MD, Meningitis Vaccine Project. Flavien Ake, CDC.

References

1. Djingarey MH, Barry R, Bonkoungou M, et al. Effectively introducing a new meningococcal A conjugate vaccine in Africa: the Burkina Faso experience. Vaccine 2012;30 (Suppl 2):B40–5.
2. Meningitis Vaccine Project. Vaccine introduction: subsequent campaigns. Seattle, WA: PATH; Geneva, Switzerland: World Health Organization; 2012. Available at http://www.meningvax.org/next-campaigns.php. Accessed December 7, 2012.
3. Greenwood B. Manson lecture. Meningococcal meningitis in Africa. Trans R Soc Trop Med Hyg 1999;93:341–53.
4. Meningitis Vaccine Project. Vaccine introduction and communication activities. MVP News Digest 2010;27:1–2.
5. Meningitis Vaccine Project. Vaccine introduction and communication activities. MVP News Digest 2011;31:1–2.
6. Haddad S, Bicaba A, Feletto M, Fournier P, Zunzunegui MV. Heterogeneity in the validity of administrative-based estimates of immunization coverage across health districts in Burkina Faso: implications for measurement, monitoring and planning. Health Policy Plan 2010;25:393–405.
7. Novak RT, Kambou JL, Diomandé FV, et al., Serogroup A meningococcal conjugate vaccination in Burkina Faso: analysis of national surveillance data. Lancet Infect Dis 2012;12:757–64.

Evaluation of Meningitis Surveillance Before Introduction of Serogroup A Meningococcal Conjugate Vaccine — Burkina Faso and Mali

Each year, 450 million persons in a region of sub-Saharan Africa known as the "meningitis belt" are at risk for death and disability from epidemic meningitis caused by serogroup A *Neisseria meningitidis* (*1*). In 2009, the first serogroup A meningococcal conjugate vaccine (PsA-TT) developed solely for Africa (MenAfriVac, Serum Institute of India, Ltd.), was licensed for persons aged 1–29 years. During 2010–2011, the vaccine was introduced in the hyperendemic countries of Burkina Faso, Mali, and Niger through mass campaigns. Strong meningitis surveillance is critical for evaluating the impact of PsA-TT because it was licensed based on safety and immunogenicity data without field effectiveness trials. Case-based surveillance, which includes the collection of epidemiologic and laboratory data on individual cases year-round, is recommended for countries that aim to evaluate the vaccine's impact. A key component of case-based surveillance is expansion of laboratory confirmation to include every case of bacterial meningitis because multiple meningococcal serogroups and different pathogens such as *Haemophilus influenzae* type b and *Streptococcus pneumoniae* cause meningitis that is clinically indistinguishable from that caused by serogroup A *Neisseria meningitidis*. Before the introduction of PsA-TT, evaluations of the existing meningitis surveillance in Burkina Faso and Mali were conducted to assess the capacity for case-based surveillance. This report describes the results of those evaluations, which found that surveillance infrastructures were strong but opportunities existed for improving data management, handling of specimens shipped to reference laboratories, and laboratory capacity for confirming cases. These findings underscore the need to evaluate surveillance before vaccine introduction so that activities to strengthen surveillance are tailored to a country's needs and capacities.

Before introduction of the meningococcal conjugate vaccine, meningitis surveillance in Burkina Faso and Mali included aggregate case counts only, enhanced by cerebrospinal fluid (CSF) collection from a subset of cases during the epidemic season to guide epidemic preparedness and choice of polysaccharide vaccine. In collaboration with the West Africa Inter-Country Support Team of the World Health Organization's Africa Regional Office, CDC evaluated 2007 meningitis surveillance data from Burkina Faso during 2007–2008 and from Mali in 2010. Surveillance was evaluated according to CDC guidelines (*2*). Each country's surveillance system was evaluated for compliance with standard operating procedures for enhanced meningitis surveillance and case-based surveillance in Africa developed by the World Health Organization (*3–5*). Meningitis surveillance data were analyzed, stakeholders were consulted, and surveillance databases, reports, and registers were examined. Data management was evaluated, along with data completeness, reporting completeness, and representativeness; specimen collection and transport; and laboratory confirmation.

Burkina Faso

In Burkina Faso in 2007, all 55 districts reported a total of 25,695 meningitis cases to the national surveillance office. Cases were reported weekly in aggregate, and reporting was supplemented with line lists of case-level data during the epidemic season. Multiple databases rather than a single database were used, and unique identifiers were not used to link epidemiologic and laboratory data; instead, hand-matching (i.e., by name, age, and residence) was attempted.

Completeness of case-level data was greater for demographic information (98%) than for vaccination status (81%). Reporting completeness of the surveillance system, defined as the 10,614 line-listed cases divided by the 25,695 total cases reported in aggregate, was 41%. Of the line-listed cases, 9,824 (93%) had CSF specimens collected. Population representativeness of surveillance data based on the proportion of districts submitting line lists and CSF specimens was 91% (50/55) and 85% (47/55), respectively; 4% (443/10,614) of line-listed cases and 4% (423/9,824) of specimens were from the Burkina Faso capital, Ouagadougou.

The proportion of all reported cases with a specimen reaching a national reference laboratory was 11% (2,898/25,695) for cases reported in aggregate and 27% (2,898/10,614) for line-listed cases. CSF macroscopic examination, Gram stain, and white blood cell count were performed routinely at district laboratories; results of these tests were suggestive of bacterial meningitis* in 35% (3,428/9,824) of specimens. Five reference laboratories in Burkina Faso performed culture or latex agglutination, and one of these performed conventional polymerase chain reaction (PCR) for pathogen confirmation. The proportion of specimens reaching a national reference laboratory that were confirmed as bacterial meningitis† was 24% (685/2,898).

* Suggestive of bacterial meningitis: any suspected case with gram-negative cocci; gram-negative rods or gram-positive cocci in cerebrospinal fluid (CSF) by direct microscopic examination; or a leukocyte count of >10 per μL; or turbid or purulent macroscopic appearance.

† Confirmed bacterial meningitis: isolation or detection in CSF by latex agglutination or polymerase chain reaction of *Neisseria meningitidis*, *Streptococcus pneumoniae*, *Haemophilus influenzae*, or other bacterial pathogens known to cause meningitis.

Mali

In Mali in 2007, all 59 districts reported a total of 978 meningitis cases to the national surveillance office. Cases were reported weekly in aggregate, but reporting was not supplemented with line-listed cases during the epidemic season. Multiple databases rather than a single database were used, and unique identifiers were not used to link epidemiologic and laboratory data. Case-level data were recorded for the 514 specimens that reached the national reference laboratory, but these data were not systematically entered into any database. Completeness of these case-level data was greater for demographic information and confirmatory laboratory results than for vaccination status and outcome (95% and 100% versus 11% and 30%).

In Mali, the total number of specimens collected was unknown and line lists were not available; therefore, measures of reporting completeness could not be evaluated. Population representativeness of surveillance data based on proportion of districts submitting CSF specimens was 61% (36/59); 63% (324/514) of specimens received at the reference laboratory were from the Mali capital, Bamako. The proportion of reported cases with a specimen reaching the national reference laboratory was 53% (514/978). The median interval between specimen collection and receipt at a reference laboratory was 2 days (range: <1 to 57 days). Although performed at district laboratories, CSF macroscopic examination, Gram stain, and white blood cell count results from district laboratories were not routinely collected nationally, but CSF findings from retesting at the national reference laboratory were collected. Results of these tests suggested bacterial meningitis in 39% (198/514) of specimens. At the one reference laboratory that performed culture and latex agglutination, the proportion of specimens that were confirmed as bacterial meningitis was 21% (106/514).

Reported by

Mamoudou Djingarey, MD, Denis Kandolo, MD, Clement Lingani, MSc, Fabien Diomandé, MD, World Health Organization West Africa Inter-Country Support Team, Burkina Faso. Isaïe Medah, MD, Ludovic Kambou, MD, Felix Tarbangdo, Ministère de la Santé, Burkina Faso. Seydou Diarra, MD, Kandioura Touré, MD, Flabou Bougoudogo, PhD, Ministère de la Santé, Mali. Sema Mandal, MD, Ryan T. Novak, PhD, Amanda C. Cohn, MD, Thomas A. Clark, MD, Nancy E. Messonnier, MD, Div of Bacterial Diseases, National Center for Immunizations and Respiratory Diseases, CDC. ***Corresponding contributor:*** *Sema Mandal, smandal1@cdc.gov, 404-639-3158.*

What is already known on this topic?

A new serogroup A meningococcal conjugate vaccine (PsA-TT) was introduced in the African meningitis belt with the goal of eliminating epidemic meningitis as a regional public health concern. Strong case-based surveillance with laboratory confirmation is essential in early-implementing countries to evaluate vaccine impact because the vaccine was licensed based on safety and immunogenicity data without field effectiveness trials.

What is added by this report?

Surveillance evaluations conducted in Burkina Faso and Mali before introduction of the vaccine revealed limitations in data quality and management, specimen collection and transport, and laboratory confirmation. Building on existing infrastructure and expertise, surveillance-strengthening activities, such as technology transfer, training, and mentorship, demonstrated measurable improvements. Compared with 2007, causative pathogen confirmation during 2011–2012 increased from 24% to 41% in Burkina Faso, and the proportion of districts submitting specimens increased from 61% to 80% in Mali.

What are the implications for public health practice?

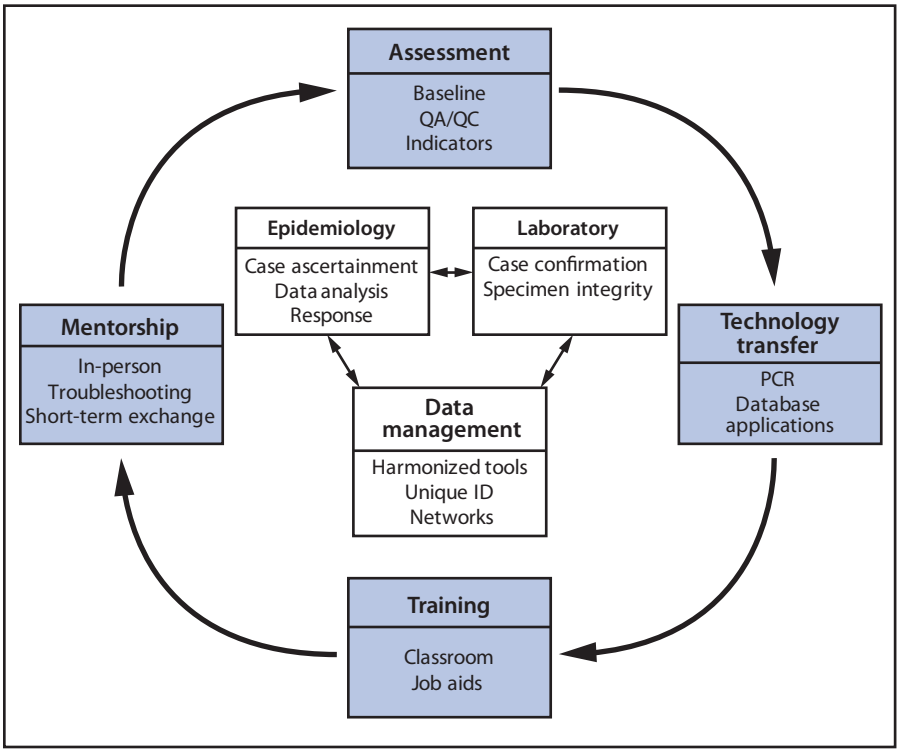
Countries implementing PsA-TT should evaluate their existing meningitis surveillance before vaccine introduction and create a surveillance system that is population-based at the national or subnational level and that generates case-level data appropriate to their needs and capacity.

Editorial Note

High-quality surveillance with laboratory confirmation is necessary to evaluate vaccine effectiveness, inform vaccination strategies to maintain population immunity, and monitor for changes in disease epidemiology. In this evaluation of meningitis surveillance in Burkina Faso and Mali, good organizational structures, capable staff, and clear protocols for collecting both aggregate and case-level data and collecting CSF specimens were found. However, a major gap was that case-level data and specimens often were not sent to the national level for analysis. Harmonized data management tools and linking case identifiers were lacking. Moreover, the ability of the reference laboratories to confirm cases was limited by the low number of submitted specimens, along with delayed specimen transport, and inadequate capacity for testing.

Based on the findings from the evaluation, recommendations were made to Burkina Faso and Mali to improve data management, epidemiology, and laboratory capacity. Since March 2008 in Burkina Faso and December 2010 in Mali, these surveillance domains have been strengthened through baseline assessments, technology transfer, training, and mentorship. This is the model for meningitis surveillance and capacity-building in the meningitis belt (Figure). Surveillance

FIGURE. Model for meningitis surveillance and capacity-building used in the "meningitis belt" — Africa



Abbreviations: QA = quality assurance; QC = quality control; PCR = real-time polymerase chain reaction; ID = identifier.

needs assessments were conducted and pilot projects for case-based surveillance were implemented in selected districts, which were subsequently scaled up to the appropriate level in each country. To improve case-level data reporting to the national level, district visits by supervision teams focused on introducing data management tools that included deploying a standardized surveillance database, introducing systemwide linking using unique case identifiers, and conducting training for surveillance officers. Additionally, national level surveillance epidemiologists and data managers were mentored in collating, analyzing, and interpreting data. To improve specimen transport, district visits focused on reconnecting the network and conducted training on appropriate transport conditions. To improve laboratory capacity for case confirmation, real-time PCR[§] and external quality-control programs were established at reference laboratories.

Preliminary data from Burkina Faso for 2011 show improvements in surveillance. Compared with 2007, in 2011 the proportion of line-listed cases doubled from 41% to 88%, and the proportion of all reported cases with a specimen reaching a reference laboratory increased from 11% to 85%. With implementation of real-time PCR in four national reference laboratories, causative pathogen confirmation increased from 24% to 41%. In Mali, most surveillance-strengthening activities are still in progress, but compared with 2007, early 2012 indicators are encouraging. Two of the first districts to introduce PsA-TT now send electronic line-list data to the national level, the proportion of districts submitting specimens has increased from 61% to 80%, and PCR has been introduced at the national reference laboratory (conventional PCR in 2009, real-time PCR in 2011). In Burkina Faso, high-quality surveillance data revealed the impact of PsA-TT 1 year after it was introduced, with significant decreases in the incidence of all bacterial meningitis, serogroup A–specific meningococcal disease, and bacterial meningitis mortality, with no outbreaks identified (*6*). In Mali, no meningitis outbreaks have occurred in 2012, and preliminary surveillance data have not identified serogroup A disease (*7*).

Burkina Faso and Mali differed in how they built on existing infrastructure to establish case-based surveillance. Depending on local capacity, populations at risk, disease incidence, and geographic distribution, subnational rather than nationwide population-based case-based surveillance might be appropriate. For example, although Burkina Faso and Mali are neighbors with similar sized populations (15–16 million) and a history of meningitis epidemics, disease epidemiology over the past decade has differed substantially. The incidence of meningitis disease in Burkina Faso is one of the highest in Africa, with a mean annual incidence of 90 per 100,000 during 2005–2009. The last major epidemic was in 2007, with 25,695 cases. Mali has a much lower mean annual incidence, seven per 100,000 during 2005–2009, and the last major epidemic was in 1997, with 11,228 cases.

Unlike Burkina Faso, which lies entirely within the meningitis belt, Mali's northern, sparsely populated desert regions do not. Therefore, Mali concentrated its surveillance-strengthening

[§] Advantages of real-time over conventional PCR include the following: 1) in real-time PCR, amplification products are measured quantitatively each amplification cycle by measuring the fluorescence of a dye, whereas in conventional PCR, amplification products are detected only after the last amplification cycle when the products are separated by gel electrophoresis and stained; 2) real-time PCR is more sensitive than conventional PCR; and 3) real-time PCR amplification is performed in a closed system, whereas amplification in conventional PCR is performed in an open system, allowing a greater chance of contamination.

efforts on the most populous districts in the meningitis belt to achieve a high proportion of laboratory-confirmed cases. The experience of case-based surveillance in Burkina Faso and Mali has shown that one size might not fit all, but key factors for achieving surveillance objectives are conducting baseline surveillance evaluations, placing a high priority on developing surveillance expertise (e.g., through staff training and development), and building on existing infrastructure.

The public health goal of introducing a serogroup A meningococcal conjugate vaccine is to eliminate meningitis epidemics in sub-Saharan Africa.[¶] Strong case-based surveillance with pathogen-specific laboratory confirmation is essential to enable accurate assessments of vaccine effectiveness, vaccine failures, duration of protection, and herd immunity. Assessment of all of these factors will help define a national vaccination strategy to maintain population immunity so that epidemics do not recur. Such surveillance also enables identification of susceptible populations that might emerge as a result of low vaccine coverage or loss of vaccine potency during vaccine storage and handling. Additionally, case-based surveillance is essential to detect other meningococcal serogroups and other meningitis pathogens with epidemic potential. Finally, case-based meningitis surveillance can be of even greater value in the many countries that have introduced *Haemophilus influenzae* type b vaccines and in those that plan to introduce pneumococcal conjugate vaccines, providing necessary information on vaccine effectiveness and changes in the epidemiology of meningitis following implementation of the vaccination programs.

[¶] Additional information available at http://www.meningvax.org/mission.php.

References

1. Lapeyssonnie L. Cerebrospinal meningitis in Africa. Bull World Health Organ 1963;28(Suppl).
2. CDC. Updated guidelines for evaluating public health surveillance systems: recommendations from the Guidelines Working Group. MMWR 2001;50(No. RR-13).
3. World Health Organization. Control of epidemic meningococcal disease. WHO practical guidelines. 2nd ed. Geneva, Switzerland: World Health Organization; 1998.
4. World Health Organization Regional Office for Africa. Standard operating procedures for enhanced meningitis surveillance in Africa. Geneva, Switzerland: World Health Organization; 2005.
5. World Health Organization Regional Office for Africa. Guide générique pour la surveillance cas par cas des méningites bactériennes dans la région Africaine de l'OMS. Geneva, Switzerland: World Health Organization; 2009.
6. Novak RT, Kambou JL, Diomande FV, et al. Serogroup A meningococcal conjugate vaccination in Burkina Faso: analysis of national surveillance data. Lancet Infect Dis 2012;12:757–64.
7. Mandal S, Diarra S, Touré KT, et al. Meningitis surveillance in Mali: monitoring the elimination of epidemic meningitis. Presented at the 2012 International Conference on Emerging Infectious Diseases, March 13, 2012, Atlanta, GA.

Notes from the Field

National Shortage of Isoniazid 300 mg Tablets

On November 16, 2012, the Illinois State tuberculosis (TB) program notified CDC's Division of Tuberculosis Elimination of a national shortage of 300 mg tablets of the antituberculosis medication isoniazid (INH). Subsequently, other state TB programs (e.g., California, Indiana, Maryland, New York, Virginia, and Wisconsin) reported difficulty obtaining INH 300 mg tablets. Other programs (e.g., San Diego) have experienced difficulties obtaining at least one of the commercially available anti-TB preparations containing the combination of rifampin and INH (IsonaRif [VersaPharm]).

INH and rifampin are the two most important drugs used to treat TB disease and latent TB infection (LTBI). For TB disease, patients currently take up to 11 tablets a day as part of a four-drug regimen (2 rifampin 300 mg, 1 INH 300 mg, 4 pyrazinamide 500 mg, and 4 ethambutol 400 mg tablets). Fixed-dose combinations decrease tablet numbers and minimize inadvertent omission of one or more required medications, which can lead to drug-resistant TB. A shortage of 300 mg INH tablets requires an increase in the daily tablet intake for TB disease from 11 to 13 tablets and for LTBI from 1 to 3 tablets. In the United States, the LTBI treatment completion rate is about 60% for 9 months of daily INH therapy (*1*); increasing the number of required tablets might decrease compliance. Because of the shortage of INH 300 mg tablets, some programs (e.g., Maryland) have restricted LTBI treatment to contacts of persons with TB disease.

Currently there are three U.S. suppliers of INH: Teva, Sandoz, and VersaPharm. According to Food and Drug Administration (FDA) reports, Teva is reporting low inventory and possible backorder of INH 300 mg because of a delay in receiving its shipment of INH. Sandoz is reporting a shortage of the active ingredient from its supplier and estimates it will be able to fill orders for INH 100 mg and 300 mg in late January 2013. VersaPharm estimates it will be able to fill orders in December 2012.

CDC and FDA are collaborating to identify solutions to ensure a continuous supply of anti-TB medication. TB programs experiencing any difficulties obtaining medications are encouraged to report them to Sundari Mase, smase@cdc.gov, at CDC or to their state TB program. At least one alternative of combination pills containing INH and rifampin, Rifamate (Sanofi-Aventis) is currently available. Programs should contact their pharmacy to coordinate obtaining alternative combination pills. Up-to-date information on drug availability is available at http://www.fda.gov/drugs/drugsafety/drugshortages/default.htm.

Reported by

Neha Shah, MD, Sundari Mase, MD, Terence Chorba, MD, Kenneth Castro, MD, Div of Tuberculosis Elimination, National Center for HIV, Hepatitis, STDs, and Tuberculosis Prevention, CDC. ***Corresponding contributor:*** *Neha Shah, nshah6@cdc.gov, 510-620-3056.*

Reference

1. CDC. Targeted tuberculin testing and treatment of latent tuberculosis infection. MMWR 2000;49(No. RR-6).

Announcement

State-Based, Work-Related Asthma Surveillance Data Online

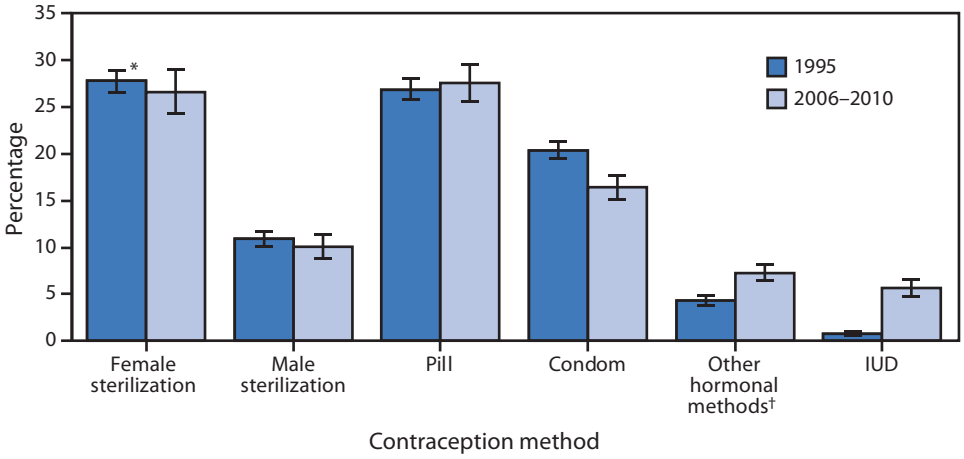
Surveillance data from four states on work-related asthma are now available online from the Work-Related Lung Disease Surveillance System (eWoRLD), developed and maintained by CDC's National Institute for Occupational Safety and Health. Work-related asthma data presented through this surveillance system include information on associated industry, occupation, and exposures.

Tables using data from California, Massachusetts, Michigan, and New Jersey for the period 1993–2006 now are available online from eWoRLD at http://www2a.cdc.gov/drds/worldreportdata/subsectiondetails.asp?archiveid=1&subsectiontitleid=23. More years of state-based work-related asthma data will be posted online as they become available. Additional information about the state-based work-related asthma program is available at http://www.cdc.gov/niosh/topics/surveillance/ords/statebasedsurveillance.html.

QuickStats

FROM THE NATIONAL CENTER FOR HEALTH STATISTICS

Use of Selected Contraception Methods Among Women Aged 15–44 Years Currently Using Contraception — National Survey of Family Growth, United States, 1995 and 2006–2010



Abbreviation: IUD = intrauterine device.
* 95% confidence interval.
† Other hormonal methods include Norplant implant and 3-month injectable Depo-Provera for 1995. For 2006–2010, other hormonal methods also include Implanon implant, 1-month injectable Lunelle, contraceptive patch, and contraceptive ring.

Little change occurred from 1995 to 2006–2010 in the percentage of women aged 15–44 years currently using contraception who were using female or male sterilization or the pill as their most effective method. A decrease occurred in the percentage of women relying on condoms, and increases occurred in the percentages of women using other hormonal methods and the IUD. The pill (28%) and female sterilization (27%) remained the most common contraceptive methods used.

Source: Jones J, Mosher W, Daniels K. Current contraceptive use in the United States, 2006–2010, and changes in patterns of use since 1995. Natl Health Stat Rep 2012(60). Available at http://www.cdc.gov/nchs/data/nhsr/nhsr060.pdf.

Reported by: Jo Jones, PhD, drv4@cdc.gov, 301-458-4838; Kimberly Daniels, PhD.

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

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.*

U.S. Government Printing Office: 2012-623-030/02043 Region IV ISSN: 0149-2195