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National Epilepsy Month — November 2013

November is National Epilepsy Awareness Month. Epilepsy is a brain disorder characterized by recurrent seizures; it affects approximately 2.3 million adults in the United States (*1*).

The CDC Prevention Research Centers' Managing Epilepsy Well (MEW) Network includes U.S. universities, the Epilepsy Foundation, and other epilepsy groups (*2*). The MEW Network works to develop and test programs that improve self-management and quality of life for persons with epilepsy.

Several MEW Network programs are available. WebEase is an Internet-based program (https://www.epilepsyfoundation.org/livingwithepilepsy/webease/index.cfm) shown to improve some epilepsy self-management outcomes (*3*). UPLIFT is an Internet and telephone-based program to treat depression in adults with epilepsy (*4*), with training for health-care providers available at http://www.sph.emory.edu/ManagingEpilepsyWell/UPLIFT. PEARLS is a collaborative-care depression treatment program for adults with epilepsy (*5*) with training for health-care providers available at http://www.pearlsprogram.org. Additional information regarding the MEW Network and related resources (such as webinars and podcasts) is available at http://www.cdc.gov/epilepsy and @mewnetwork on Twitter.

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Comorbidity in Adults with Epilepsy — United States, 2010

Epilepsy, a spectrum disorder characterized by recurring seizures, affects approximately 2.3 million U.S. adults (*1,2*). Epilepsy poses challenges because of uncontrolled seizures, treatment complexity, social disadvantages (e.g., unemployment), and stigma (*2,3*). Persons with epilepsy are at increased risk for early mortality and for comorbidities that can complicate epilepsy management, increase health-care costs, and shorten the lifespan (*2,4–7*). Numerous studies have described higher rates of psychiatric comorbidity (e.g., depression and anxiety) in persons with epilepsy (*2,7*).* However, fewer studies have examined nonpsychiatric comorbidity in a nationally representative U.S. sample of adults with epilepsy. To assess the prevalence of nonpsychiatric comorbidities, CDC analyzed data from the 2010 National Health Interview Survey (NHIS). Adults with epilepsy had a higher prevalence of cardiovascular,

* For example, the prevalence of any mental health disorder in the past 12 months was found to be 23.5% among persons with epilepsy, compared with 10.9% among those without epilepsy, and the lifetime prevalence of suicidal ideation was 25.0% in persons with epilepsy, compared with 13.3 % in those without epilepsy (*7*).

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respiratory, some inflammatory, and other disorders (e.g., headache, migraine, and various other types of pain) than adults without epilepsy. Public health agencies can work with healthcare providers, the Epilepsy Foundation, and other partners to ensure that adults with epilepsy have access to health promotion resources and chronic disease self-management programs.

CDC analyzed data from adults aged ≥18 years who responded to NHIS, an annual cross-sectional survey of the civilian, non-institutionalized U.S. population.† The NHIS Sample Adult component included questions that determined epilepsy status. Adults who responded "yes" to ever having been told by a doctor or other health professional that they had a seizure disorder or epilepsy were considered as having "any epilepsy." Those with any epilepsy who either were currently taking medication to control it, had one or more seizures in the past year, or both were classified as having "active epilepsy" (*1*). Those with any epilepsy who were neither taking medication for epilepsy nor had a seizure in the past year were classified as having "inactive epilepsy" (*1*).§ All remaining adults were classified as having "no history of epilepsy." These case-ascertainment questions and case definitions meet standards for epidemiologic studies of epilepsy, including having acceptable positive predictive values for identifying clinical cases of epilepsy (*1*).

Nonpsychiatric conditions that were selected included some shown to be previously associated with epilepsy, and others not widely examined, but of interest to epilepsy providers (e.g., any liver condition). Statistical software was used to account for the complex NHIS survey design. Percentage estimates were age-adjusted to the 2000 U.S. Census population to account for age as a confounder and to facilitate comparisons.¶ Estimates were considered reliable if their relative standard errors were <30% and differences were considered statistically significant if their 95% confidence intervals did not overlap. All reported differences are statistically significant. The 2010 NHIS Sample Adult Component conditional response rate was 77.3%, and the final response rate was 60.8%.

Cardiovascular and metabolic disorders and their associated risk factors were common among adults with epilepsy (Table). The age-adjusted prevalence of any heart disease was higher among adults with any epilepsy (18.3%), including both active epilepsy (19.5%) and inactive epilepsy (16.7%), than among those without epilepsy (11.3%). Adults with any epilepsy were more likely to have been told they had high blood pressure (34.2%) than those without epilepsy (29.0%). More adults across all epilepsy groups (range: 8.8%–18.3%) had experienced a stroke than adults without epilepsy (2.4%). More adults with any epilepsy (7.1%) were told they had prediabetes

† Additional information available at http://www.cdc.gov/nchs/nhis.htm.

§ Five cases of epilepsy lacked information on medication usage or on seizure occurrence and could not be classified as either active or inactive.

¶ Age groupings used for age-adjustment were 18–44, 45–64, 65–74, and ≥75 years. Age-adjustment standards are available at http://seer.cancer.gov/stdpopulations/stdpop.singleages.html.

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TABLE. Percentage* of adults with selected nonpsychiatric conditions,† by epilepsy status — National Health Interview Survey, United States, 2010

Condition	No history of epilepsy			Any epilepsy			Active epilepsy			Inactive epilepsy		
	No.	%	(95% CI)	No.	%	(95% CI)	No.	%	(95% CI)	No.	%	(95% CI)
Total§	**26,659**	**98.2**	**(98.0–98.5)**	**480**	**1.8**	**(1.5–2.0)**	**277**	**1.0**	**(0.8–1.2)**	**198**	**0.8**	**(0.6–0.9)**
Any heart disease¶	3,218	11.3	(10.9–11.8)	98	18.3	(14.7–22.6)	61	19.5	(14.3–25.9)	35	16.7	(11.9–22.9)
Hypertension	8,647	29.0	(28.4–29.6)	194	34.2	(29.7–39.0)	124	34.7	(28.7–41.2)	68	32.2	(25.3–40.0)
Stroke	768	2.4	(2.2–2.7)	72	14.3	(11.1–18.2)	54	18.3	(13.4–24.4)	17	8.8	(5.6–13.6)
Diabetes mellitus	2,709	8.7	(8.2–9.1)	58	10.4	(7.7–14.0)	38	10.5	(7.3–14.9)	19	9.2	(5.3–15.4)
Prediabetes	1,071	4.3	(3.9– 4.6)	35	7.1	(4.7–10.4)	—	—**	—**	—	—	—
Normal/underweight	9,514	38.1	(37.3–38.9)	144	32.8	(27.5–38.6)	83	34.7	(27.0–43.3)	59	32.5	(25.5–40.4)
Overweight	8,938	34.5	(33.7–35.2)	153	33.1	(28.4–38.2)	94	37.1	(30.0–44.8)	57	27.2	(20.8–34.6)
Obese	7,247	27.5	(26.7–28.2)	163	34.1	(28.9–39.8)	89	28.2	(21.8–35.5)	74	40.3	(32.0–48.2)
Emphysema	500	1.7	(1.5–2.0)	30	5.5	(3.5–8.3)	20	6.2	(3.7–10.0)	—	—	—
Chronic bronchitis	1,171	4.1	(3.8–4.5)	42	7.5	(5.2–10.6)	27	8.5	(5.2–13.3)	—	—	—
Asthma	3,243	12.6	(12.0–13.2)	104	19.2	(15.2–24.0)	58	17.0	(12.3–23.0)	43	19.9	(14.1–27.4)
Current asthma	2,142	65.0	(62.8–67.0)	74	59.8	(47.2–71.1)	45	67.4	(48.4–82.0)	26	55.1	(38.8–70.4)
Asthma attack in past 12 mos	1,106	32.6	(30.7–34.6)	49	36.6	(25.9–48.7)	32	51.9	(34.8–68.6)	15	28.7	(18.8–41.3)
Hay fever	1,975	7.6	(7.1–8.0)	47	7.5	(5.4–10.4)	29	8.1	(5.0–12.8)	18	7.1	(4.1–11.9)
Sinusitis	3,418	12.6	(12.1–13.2)	86	15.6	(12.2–19.7)	48	14.7	(10.3–20.4)	37	16.3	(11.5–22.6)
Dermatitis	2,556	10.0	(9.4–10.5)	83	17.5	(13.5–22.3)	46	15.8	(11.3–21.7)	36	19.5	(13.7–27.0)
Arthritis	6,250	21.4	(20.8–22.0)	180	30.9	(27.3–34.8)	114	31.3	(26.1–37.0)	64	29.0	(23.1–35.5)
Pain or stiffness in a joint	8,832	31.9	(31.2–32.7)	257	47.5	(42.4–52.6)	158	49.1	(41.7–56.5)	96	44.9	(37.3–52.7)
Neck pain	4,240	15.2	(14.6–15.8)	143	25.7	(21.3–30.8)	89	28.5	(22.3–35.6)	51	22.7	(16.8–29.9)
Low back pain	7,736	28.2	(27.4–29.0)	219	40.1	(35.2–45.3)	129	40.9	(33.8–48.5)	87	39.9	(32.1–48.1)
Sciatica	2,883	34.3	(33.0–35.7)	124	58.3	(49.2–66.9)	73	60.8	(48.9–71.5)	49	54.1	(41.9–65.9)
Facial ache or pain in the jaw	1,256	4.8	(4.4–5.2)	73	14.2	(10.7–18.6)	43	13.4	(9.1–19.4)	28	14.2	(9.1–21.4)
Severe headache or migraine	4,277	16.2	(15.7–16.8)	174	34.7	(30.1–39.5)	104	35.5	(28.5–43.1)	69	33.7	(26.8–41.4)
Cancer	2,269	8.1	(7.7–8.5)	62	11.3	(8.6–14.9)	41	11.2	(7.9–15.8)	20	11.5	(7.0–18.5)
Ulcer	1,798	6.2	(5.8–6.6)	69	12.4	(9.2–16.5)	38	11.5	(8.0–16.2)	28	15.2	(9.8–22.9)
Ulcer in the past 12 mos	501	28.9	(25.8–32.1)	31	47.1	(32.7–61.9)	19	45.3	(28.4–63.4)	10	45.6	(27.9–64.5)
Liver condition	404	1.3	(1.1–1.5)	18	3.0	(1.7–5.0)	—	—	—	—	—	—

Abbreviation: CI = confidence interval.

* Tabulated percentages were age-adjusted to 2000 U.S. Population Census estimates. The age groups used for adjustment were 18–44, 45–64, 65–74, and ≥75 years.

† Based on reporting to a doctor or other health professional or being told by a doctor or other health professional. For different conditions, the time period asked differed (e.g., condition or symptoms in past 12 months, 3 months, or 30 days). Additional information available at http://www.cdc.gov/nchs/nhis/nhis_questionnaires.htm.

§ The number of respondents is unweighted; the percentage estimates are weighted.

¶ Includes coronary heart disease, angina pectoris, heart attack, or any other heart condition or disease.

** Relative standard error exceeded 30%.

than adults without epilepsy (4.3%). Adults with any epilepsy (34.1%) and inactive epilepsy (40.3%) were more likely to be obese than adults without epilepsy (27.5%).

Considering respiratory disorders, more adults with any epilepsy (5.5%) and active epilepsy (6.2%) had emphysema than those without the disorder (1.7%). More adults with any epilepsy (7.5%) and active epilepsy (8.5%) had chronic bronchitis in the past year than adults without epilepsy (4.1%). More adults with any epilepsy (19.2%) and inactive epilepsy (19.9%) had asthma than those without epilepsy (12.6%). However, adults with active epilepsy were more likely to have had an asthma attack in the past year (51.9%) than adults without epilepsy (32.6%).

Some disorders that can be caused or mediated by inflammation also were more common in adults with epilepsy. For example, significantly more adults across all epilepsy groups than adults without epilepsy had a history of dermatitis, arthritis, recent joint pain, and other types of pain including, neck, facial, and low back pain. Across all groups, more than twice as many adults with epilepsy than adults without epilepsy had experienced recent, severe headache or migraine.

Cancer was more common in adults with any epilepsy (11.3%) than adults without epilepsy (8.1%). Adults with any epilepsy were more likely to have had peptic ulcer disease and to have had ulcer symptoms in the past year than adults without epilepsy. More adults with any epilepsy had a liver condition than those without epilepsy. In addition, adults with epilepsy, especially active epilepsy, were more likely to report four or more medical comorbidities and less likely to report no other comorbidities than adults without epilepsy (Figure).

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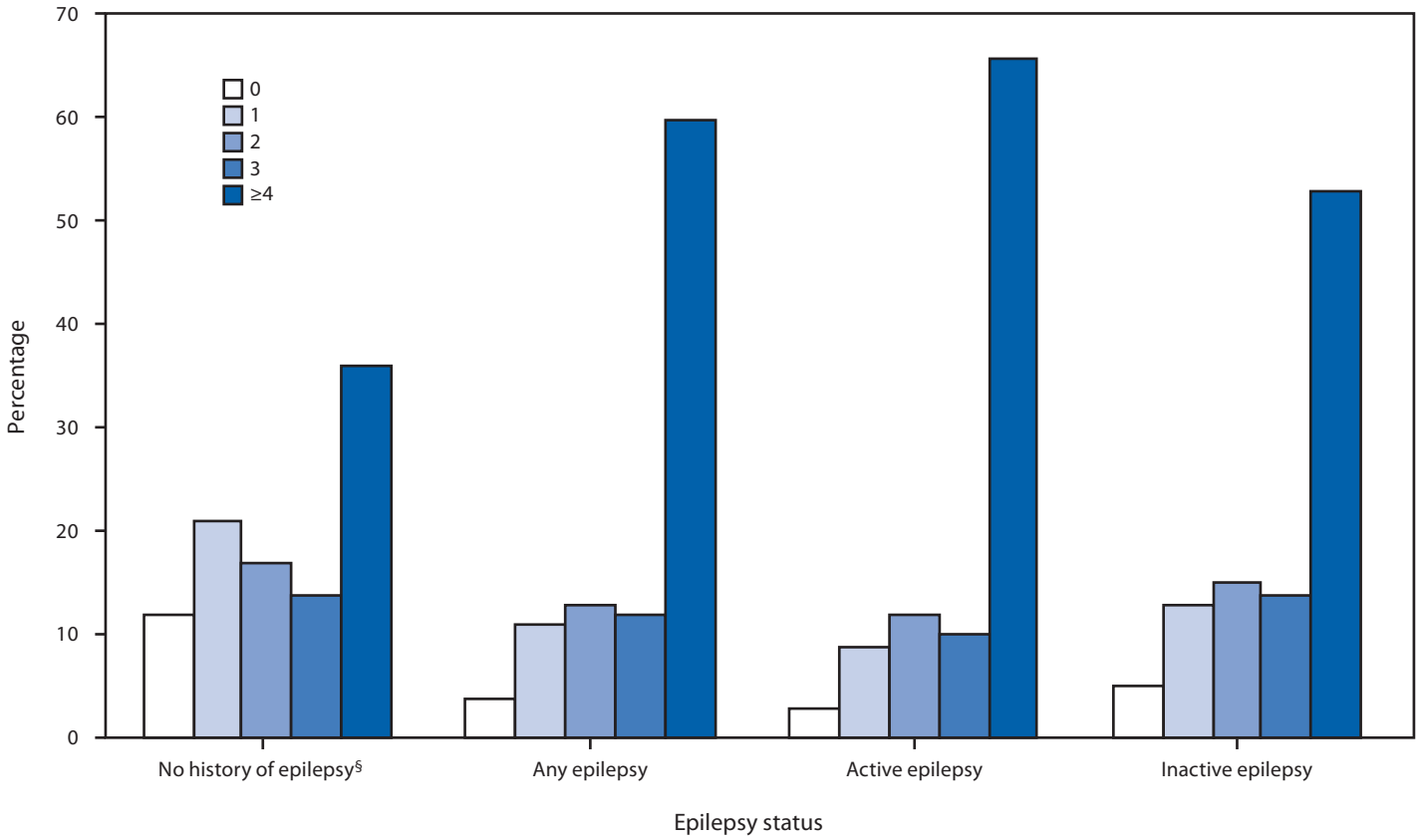
FIGURE. Percentage* of adults with selected nonpsychiatric conditions,† by number of conditions and epilepsy status — National Health Interview Survey, United States, 2010



* Unadjusted estimates.

† Includes self-reported heart disease (coronary heart disease, angina pectoris, myocardial infarction or any other heart disease); high blood pressure; stroke; diabetes mellitus; prediabetes; emphysema; chronic bronchitis; asthma; hay fever; sinusitis; dermatitis/eczema; arthritis; joint pain, aching, or stiffness; neck pain; low back pain; facial or jaw pain; severe headaches or migraine; cancer; ulcer; liver condition; and overweight/obesity (body mass index ≥25).

§ Because of different methodologies, estimates of comorbidities among adults with no history of epilepsy differ from those in a previously published report (Ward BW, Schiller JS. Prevalence of multiple chronic conditions among US adults: estimates from the National Health Interview Survey, 2010. Prev Chronic Dis. 2013;10:E65).

Editorial Note

In this study, many U.S. adults with epilepsy (especially those with active epilepsy) reported cardiovascular, respiratory, and other disorders and various types of pain, consistent with other U.S. and international reports (*2,4,6*). These disorders might result from shared disease mechanisms (e.g., migraine or stroke), social disadvantages associated with chronic disease (e.g., risk-factor clustering), treatment side effects (e.g., weight gain), or shared genetic, environmental, or other factors (*2,5,8*). Adults with epilepsy also report higher rates of smoking and physical inactivity (*3*), which increase risk for heart disease and respiratory disorders.

This study aligns with the U.S. Department of Health and Human Services Initiative on Multiple Chronic Conditions by identifying the burden of co-occurring conditions in adults with epilepsy to foster more encompassing approaches to address this burden (*9*). Although controlling seizures is a priority for epilepsy care, preventing, limiting, and reversing associated comorbidity remains critical to improving health and quality of life (*2,10*). The added challenges of managing multiple comorbidities among adults with epilepsy can further threaten their well-being and ability to function optimally (*5*). Thus, improved awareness and understanding among neurologists and primary-care providers regarding the common medical comorbidities reported with epilepsy along with better screening, diagnosis, and treatment of comorbidity in persons with epilepsy are necessary. A previous study found that most adults with epilepsy visited a general doctor in the preceding year, but only about one third saw a neurologist or epilepsy specialist (*1*). The extent to which evidence-based practice guidelines are used remains unclear (*2*), and health-care providers might focus only on one condition, ignoring care coordination (*9*). Managing comorbidity requires that primary and specialty-care providers work together to help patients with epilepsy manage both their epilepsy and other disorders, using appropriate clinical guidelines (*2*).

What is already known on this topic?

Persons with epilepsy might be at increased risk for some mental and physical disorders.

What is added by this report?

This study, based on the 2010 National Health Interview Survey, found that adults with epilepsy reported co-occurring cardiovascular, respiratory, some inflammatory, and other disorders more frequently than respondents without epilepsy.

What are the implications for public health practice?

Epidemiologic studies to show how epilepsy is related to these comorbid conditions could help identify preventable risk factors. Greater collaboration among public health agencies, health-care providers, the Epilepsy Foundation, and other partners might ensure that adults with epilepsy have access to chronic disease self-management programs and to general disease prevention and health promotion information and services.

The findings in this report are subject to at least eight limitations. First, because the estimates rely on self-reported data, they might be subject to reporting bias; however, comparable findings in other population surveys suggest bias is minimal (*3*). Second, the reported cases of epilepsy are not classified by seizure type, severity, or etiology. Third, certain acute seizures or nonepileptic seizures might have been misclassified as epilepsy, thus overestimating prevalence. However, significant skewing of results is unlikely because of the low incidence of nonepileptic seizures in the general population (*1,3*). Fourth, epilepsy prevalence might be underestimated because of underreporting associated with repercussions from disclosing epilepsy (*1,3*) and the exclusion of institutionalized adults from NHIS. Fifth, because the onset of epilepsy relative to that of the other co-occurring disorders is unknown, inferring causation or overlap between these disorders is difficult. Sixth, small sample sizes limited comparisons. Seventh, the low response rate could have understated or overstated these associations. Finally, because of different study methodologies, estimates of comorbidities differ from those in a previous report.**

Ensuring that adults with epilepsy are screened for common risk factors might help prevent onset of co-occurring disorders that can worsen quality of life over time. Preventing stroke, a common risk factor for epilepsy in adults, also might minimize epilepsy incidence in those at higher risk (e.g., adults who have experienced prior head trauma) (*2*). Future studies can look at mechanisms that relate epilepsy to these comorbid conditions. Evidence-based programs that can help adults with epilepsy learn effective self-management skills (e.g., medication adherence and emotional management) are available.†† Greater collaboration among public health agencies, health-care providers, local Epilepsy Foundation affiliates, and other community epilepsy groups might ensure that adults with epilepsy have access to chronic disease self-management programs and to health promotion resources (e.g., smoking cessation programs and interventions to reduce obesity).

** Ward BW, Schiller JS. Prevalence of multiple chronic conditions among US adults: estimates from the National Health Interview Survey, 2010. Prev Chronic Dis 2013;10:E65.

†† Information regarding epilepsy self-management programs is available at http://www.cdc.gov/epilepsy.

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Influenza Vaccination Among Pregnant Women — Massachusetts, 2009–2010

The emergence of the novel influenza A (H1N1) pdm09 (pH1N1) strain in 2009 required a coordinated public health response, especially among high-risk populations. Because pregnant women were at increased risk for influenza-related complications and hospitalization compared with the general population (*1*), the American College of Obstetricians and Gynecologists and the Advisory Committee on Immunization Practices recommended pregnant women receive both the pH1N1 vaccine and the annual seasonal vaccine during the 2009–10 influenza season as a safe and effective way of protecting both mother and infant (*2,3*). To describe acceptance, predictors, and barriers to influenza vaccination among pregnant women in Massachusetts during the 2009–10 influenza season, the Massachusetts Department of Public Health (MDPH) analyzed data from supplemental influenza questions on the Massachusetts Pregnancy Risk Assessment Monitoring System (PRAMS) survey. The results indicated that 67.5% of residents who had live births in Massachusetts during September 2009–May 2010 received the seasonal vaccine, and 57.6% received the pH1N1 vaccine. Women who were non-Hispanic blacks, aged <25 years, Medicaid beneficiaries, or lived in a household with an income at or below the federal poverty level were significantly less likely to receive the seasonal vaccine. For the pH1N1 vaccine, only being non-Hispanic black was associated with being less likely to have been vaccinated. Vaccination rates were significantly higher among women whose provider offered or recommended the seasonal (75.8%) and pH1N1 (68.1%) vaccines compared with those who did not receive a recommendation (32.4% and 8.6%, respectively). Coverage in Massachusetts was among the highest of 29 PRAMS sites (*4*) and might have reflected strategic efforts by MDPH to support vaccine education and equity across the state (*5*).

Massachusetts PRAMS is a collaborative surveillance project between CDC and MDPH that collects state-specific, population-based data on maternal attitudes and experiences before, during, and shortly after pregnancy. Since 2007, the survey has been distributed to Massachusetts residents 2–6 months after delivery. Approximately 2,400 women are randomly selected to participate annually, with an oversampling of minority women to ensure adequate representation.* For the 2009–10 influenza season, MDPH added supplemental questions to the survey to gather information on state influenza vaccination coverage. A total of 1,038 women with live births during September 2009–May 2010 responded to the survey, with a weighted survey response rate of 65.1% in 2009 and 62.7% in 2010. Those with missing information on seasonal or pH1N1 vaccination (n = 42) were excluded from the analysis. The final sample included 996 women, representing 52,131 residents who gave birth in Massachusetts during September 2009–May 2010.

Women who indicated "yes" to the following questions were considered vaccinated: "Since September 2009, did you get a seasonal flu shot?" and "During your most recent pregnancy, did you get an H1N1 flu shot?" Various demographic and health service characteristics from PRAMS and the birth certificate were examined for their association with influenza vaccination acceptance, including age, race/ethnicity, education, Medicaid coverage, household income, nativity (born in the United States or elsewhere), primary language, and parity. Wald chi-squared tests were used to evaluate the statistical significance of select associations, and 95% confidence intervals were used to identify significant differences. Responses were weighted to represent all live births in Massachusetts, and all analyses were conducted using statistical software to account for the complex survey design and weighting.

During the 2009–10 influenza season, an estimated 67.5% of residents who had live births in Massachusetts received the seasonal influenza vaccine, and 57.6% received the pH1N1 vaccine (Table 1). Seasonal coverage was significantly lower among non-Hispanic black women (53.7%) compared with non-Hispanic white (69.6%) or non-Hispanic Asian (70.4%) women, and women who were aged <25 years (51.6%) compared with women who were aged 30–34 years (73.7%) or ≥35 years (79.2%). Seasonal coverage also was significantly lower among women who were Medicaid beneficiaries (57.3% versus 73.7%) or had a household income at or below the federal poverty level (56.1% versus 70.5%). For the pH1N1 vaccine, non-Hispanic black women were significantly less likely to report being vaccinated than were non-Hispanic Asian women (50.4% versus 65.5%). In contrast, women who received a provider recommendation were significantly more likely to receive the seasonal vaccine (75.8% versus 32.4%) and pH1N1 vaccine (68.1% versus 8.6%). The majority of women (71.7%) reported receiving the pH1N1 vaccine at their obstetrician-gynecologist's office. Women also reported receiving the pH1N1 vaccine at their family doctor (11.7%), health department or clinic (8.0%), workplace, school, pharmacy (5.8%), or other locations (2.8%).

*Additional information on Massachusetts PRAMS is available at http://www.mass.gov/dph/prams.

TABLE 1. Seasonal influenza and influenza A (H1N1) pdm09 (pH1N1) vaccination among pregnant women, by selected characteristics — Pregnancy Risk Assessment Monitoring System (PRAMS), Massachusetts, 2009–10 influenza season

	Seasonal influenza vaccination				pH1N1 influenza vaccination			
Characteristic*	**No.**	**(%)†**	**(95% CI)**	**p-value**	**No.**	**(%)†**	**(95% CI)**	**p-value**
Total vaccinated	**648**	**(67.5)**	**(63.4–71.3)**		**585**	**(57.6)**	**(53.4–61.8)**	
Race				<0.001				0.012
White, non-Hispanic	183	(69.6)	(63.7–75.2)		149	(57.3)	(51.1–63.2)	
Black, non-Hispanic	139	(53.7)	(47.5–59.8)		129	(50.4)	(44.1–56.6)	
Hispanic	161	(65.6)	(59.4–71.3)		147	(58.9)	(52.6–64.9)	
Asian, non-Hispanic	147	(70.4)	(63.7–76.3)		141	(65.5)	(58.8–71.7)	
Age group (yrs)				<0.001				0.044
<25	125	(51.6)	(42.8–60.3)		124	(50.3)	(41.5–59.0)	
25–29	182	(66.0)	(57.9–73.3)		158	(54.0)	(45.7–62.1)	
30–34	200	(73.7)	(66.7–79.7)		196	(65.8)	(58.2–72.6)	
≥35	141	(79.2)	(68.7–85.1)		107	(57.9)	(48.0–67.2)	
Education (yrs)				0.038				0.185
<12	65	(56.6)	(45.0–67.5)		71	(67.4)	(57.5–75.9)	
12	166	(63.1)	(54.4–71.1)		156	(55.7)	(47.0–64.1)	
>12	417	(71.1)	(66.0–75.5)		357	(57.3)	(51.9–62.4)	
Medicaid				<0.001				0.667
Yes	252	(57.3)	(50.6–63.7)		252	(56.7)	(50.1–63.1)	
No	390	(73.7)	(68.6–78.3)		331	(58.6)	(52.9–64.0)	
Household income relative to federal poverty level§				0.004				0.504
≤100%	146	(56.1)	(47.5–64.3)		143	(55.0)	(46.4–63.2)	
>100%	444	(70.5)	(65.6–75.0)		392	(58.4)	(53.1–63.4)	
Nativity				0.452				0.216
Non–U.S. born	324	(65.6)	(60.3–70.5)		310	(61.4)	(55.9–66.5)	
U.S.–born	323	(68.3)	(63.0–73.2)		275	(56.5)	(51.0–61.9)	
Primary language				0.274				0.700
English	547	(67.8)	(63.3–71.9)		488	(57.4)	(52.8–61.9)	
Spanish	71	(61.0)	(51.8–69.5)		72	(61.6)	(52.4–70.0)	
Other	30	(74.4)	(57.1–86.4)		41	(56.2)	(33.9–76.2)	
Parity				0.947				0.124
Primiparous	311	(67.3)	(61.4–72.7)		279	(54.3)	(48.1–60.3)	
Multiparous	335	(67.6)	(61.7–72.9)		304	(60.9)	(54.9–66.6)	
Provider offered/ Recommended				<0.001				<0.001
Yes	589	(75.8)	(71.5–79.6)		573	(68.1)	(63.5–72.3)	
No¶	54	(32.4)	(23.9–42.3)		9	(8.6)	(4.1–17.4)	

Abbreviation: CI = confidence interval.

* The proportion of missing values were 3.0% (n = 30) for race, 0.2% (n = 2) for education, 0.2% (n = 2) for nativity, 1.0% (n = 10) for Medicaid, 8.7% (n = 87) for household income, 0.3% (n = 3) for parity, and 0.8% (n = 8) for provider offer/recommendation. Age, marital status, and primary language were not missing any observations.

† Weighted to adjust for complex survey design and nonresponse.

§ Household income relative to the federal poverty level was calculated using a combination of self-reported income and the number of dependent household members compared with 2009–2010 U.S. Department of Health and Human Services federal poverty guidelines. Because the exact dollar amount is not reported, the midpoint of each range was used to approximate household income.

¶ Small numbers (n <30) should be interpreted with caution.

Among women who did not receive the seasonal vaccine, the most commonly cited reason was they did not normally get a flu shot (70.5%) (Table 2). Women also indicated they were worried about harm to their baby (43.0%) and side effects to themselves (37.5%). Women who did not get the pH1N1 vaccine reported greater worry about harm to their baby (52.8%) and side effects for themselves (50.6%). Another 46.0% of women reported that the pH1N1 influenza shot was unavailable, and 53.7% said they did not normally get a flu shot.

Reported by

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Editorial Note

The findings in this report describe acceptance of vaccination by pregnant women in Massachusetts during the 2009–10

TABLE 2. Barriers to vaccination among pregnant women who did not receive the seasonal (n = 348) vaccine or the influenza A (H1N1) pdm09 (pH1N1) vaccine (n = 411) — Pregnancy Risk Assessment Monitoring System (PRAMS), Massachusetts, 2009–10 influenza season

	Did not receive seasonal influenza vaccine			Did not receive pH1N1 vaccine		
Response	No.	(%)†	(95% CI)	No.	(%)†	(95% CI)
Doctor didn't mention anything	80	(28.5)	(21.7–36.5)	72	(24.5)	(18.3–31.8)
Shot unavailable	—	—	—	114	(46.0)	(38.2–54.0)
Worried about side effects for me	106	(37.5)	(29.9–45.9)	166	(50.6)	(42.6–58.5)
Worried about harm to baby	118	(43.0)	(35.0–51.4)	157	(52.8)	(44.7–60.7)
I don't normally get a flu shot	187	(70.5)	(63.0–77.0)	145	(53.7)	(45.7–61.6)
Other	63	(33.5)	(25.0–43.2)	51	(25.0)	(17.6–34.1)

Abbreviation: CI = confidence interval.
* Women could check more than one option; therefore, percentage will not total 100.
† Weighted to adjust for complex survey design and nonresponse.

influenza season, along with predictors of and barriers to vaccination. Overall, Massachusetts had some of the highest rates of vaccination coverage among the 29 PRAMS states that collected this information. Compared with the median state coverage of 47.1% for seasonal and 40.4% for pH1N1, Massachusetts's coverage was 67.5% and 57.6% respectively (*4*). Consistent with previous studies, there were significant racial/ethnic and socioeconomic differences between women who did or did not receive the seasonal vaccine, with lower rates among non-Hispanics blacks, Medicaid beneficiaries, and lower income women (*6*). However, fewer differences existed between women who did or did not receive the pH1N1 vaccine, possibly indicating some improvement in the methods used to promote the pH1N1 vaccine compared with the routine seasonal vaccine.

Provider recommendation was a significant predictor of acceptance, both for the seasonal and pH1N1 vaccine, contributing to high coverage statewide. In a study of pregnant women from Massachusetts General Hospital, 67% of women who received the pH1N1 influenza vaccine cited provider recommendation as the key factor that influenced their decision (*7*). In addition, the findings of this report indicate that safety concerns are a significant barrier to influenza vaccination, especially with the pH1N1 vaccine. These findings are similar to other studies, including a national poll in which concerns about the safety risks to baby and self were cited as the top reasons for not choosing to be vaccinated (*8*).

Specific actions from MDPH might have contributed to higher coverage among all pregnant women and fewer disparities in pH1N1 coverage. Soon after the outbreak began, officials dedicated more than $1 million to community-based organizations to work with racial/ethnic and linguistic populations who traditionally have lower rates of vaccination. They also provided resources for providers and clinics to support and encourage recommendations surrounding influenza vaccination. Lastly, MDPH developed a comprehensive Flu Facts media campaign that provided accurate, culturally appropriate information about influenza. These efforts became part of an ongoing focus on immunization equity across the state (*5*).

The findings in this report are subject to at least four limitations. First, PRAMS is a self-reported survey administered 2–6 months after delivery; therefore, results might be subject to recall bias. Second, approximately 36% of women did not respond to the survey, and it is possible that weighting might not completely adjust for bias resulting from nonresponse. Third, the perceived availability of the seasonal vaccine was not included in the survey; therefore, no comparisons between seasonal and pH1N1 vaccine availability and the effect on coverage could be drawn. Finally, this analysis focused specifically on

What is already known on this topic?

Vaccination rates improved during the influenza A (H1N1) pdm09 (pH1N1) outbreak in 2009, with variation across states and among population subgroups. Median coverage among 29 Pregnancy Risk Assessment Monitoring System (PRAMS) states was 47.1% for seasonal and 40.4% for pH1N1 influenza.

What is added by this report?

Data from the Massachusetts PRAMS survey indicated that during the 2009–10 influenza season, 67.5% of residents who had live births in Massachusetts received the seasonal vaccine and 57.6% received the pH1N1 vaccine. Non-Hispanic black women were less likely to receive either vaccine. Women who were aged <25 years, Medicaid beneficiaries, or from low-income households were significantly less likely to receive the seasonal vaccine. Vaccination rates were higher among women whose provider offered or recommended vaccination.

What are the implications for public health practice?

Targeted education and equity campaigns from the MDPH might have contributed comparatively high vaccination coverage rates and fewer disparities in pH1N1 coverage compared with seasonal vaccine coverage. Further efforts to promote the importance and availability of the influenza vaccine and to specifically address safety concerns could improve vaccination rates among pregnant women. Continued monitoring of vaccination coverage among pregnant women is needed to evaluate progress toward greater coverage.

Massachusetts residents who had live births in Massachusetts and is not generalizable to pregnant women with different outcomes or in other states.

This report, using data from the PRAMS survey, presents a state-specific response to the emergence of a novel strain of influenza. Vaccination coverage in Massachusetts was high, with less variation among women who received the pH1N1 vaccine than among those who received the seasonal vaccine. Specific actions from MDPH to support vaccine education and equity across the state might have contributed to these patterns. These included supporting the role of providers, collaborating with community-based organizations, creating alternative sites to administer the vaccine, and developing culturally appropriate media campaigns. Efforts to promote the availability and importance of receiving the influenza vaccine and to specifically address safety concerns could further improve vaccination rates among pregnant women in Massachusetts. These findings can be used to encourage providers to recommend vaccination, address safety concerns, and engage community partners to increase vaccination acceptance in groups with low coverage. Continued monitoring of vaccination coverage among pregnant women is crucial to evaluate progress toward greater coverage.

Acknowledgements

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Global Routine Vaccination Coverage — 2012

In 1974, the World Health Organization (WHO) established the Expanded Programme on Immunization to ensure that all children have access to routinely recommended vaccines (*1*).* Despite improvement in global coverage with the third dose of diphtheria-tetanus-pertussis (DTP) vaccine (DTP3), from 5% in 1974 to 83% in 2011, almost one fifth of the world's children still had not received their third dose of the DTP series during their first year of life. In May 2012, the World Health Assembly endorsed the Global Vaccine Action Plan (GVAP) to guide the Decade of Vaccines' vision to extend benefits of immunization to all persons. GVAP's key indicators include achieving and sustaining 90% national DTP3 coverage and ≥80% DTP3 coverage in every district by 2015. During 2012, as in the 2 preceding years, an estimated 83% of infants worldwide received 3 doses of DTP vaccine; however, coverage varied among the WHO regions. Among 194 WHO member states, 131 (68%) achieved ≥90% DTP3 national coverage, and 59 (30%) achieved ≥80% DTP3 coverage in every district. However, 22.6 million children did not receive 3 DTP doses, a key indicator of immunization program performance. Strengthening national immunization systems, especially in countries with the greatest number of undervaccinated children, should be a global priority to reduce morbidity and mortality from vaccine-preventable diseases.

Vaccination coverage is calculated as the percentage of persons in the target age group who received a vaccine dose by a given age. Administrative coverage can estimate vaccination coverage as the number of doses of a specific vaccine dose administered through routine immunization services to those in the target age group divided by the estimated target population. DTP3 coverage by age 12 months is a major indicator of immunization program performance; coverage with other vaccines, such as a third dose of polio vaccine (Polio3) or first dose of measles-containing vaccine (MCV1) are also assessed. Countries report administrative coverage annually to WHO and UNICEF (*2*). Immunization coverage surveys also can be used to estimate vaccination coverage. A representative sample of households is visited to identify children in the target age group. Dates of vaccination are transcribed from the child's vaccination card or recorded based on caregiver recall. WHO and UNICEF derive national coverage estimates through an annual country-by-country review of all available data, including administrative and survey-based coverage; as new data are incorporated, revisions of past coverage estimates (*3*) and updates are published on their websites.† This report is based on these WHO and UNICEF estimates of vaccination coverage.

Estimated global DTP3 coverage among infants aged <12 months in 2012 was 83%, ranging from 72% in the WHO African Region to 97% in the Western Pacific Region, and representing 110.6 million vaccinated children (Table). Estimated global coverage with bacille Calmette-Guérin (BCG) vaccine, Polio3, and MCV1 were 89%, 84%, and 84%, respectively. During 2012, 131 (68%) countries achieved ≥90% national DTP3 coverage, and 59 (30%) achieved ≥80% DTP3 coverage in every district. DTP3 coverage was 80%–89% in 34 (18%) countries, 70%–79% in 13 (7%) countries, and <70% in 16 (8%) countries.

Among the 22.6 million children who did not receive three DTP doses during the first year of life, 16.3 million (72%) lived in 10 countries, among which 12.4 million (55%) lived in three countries: 30% in India (72% DTP3 coverage), 17% in Nigeria (41% DTP3 coverage), and 7% in Indonesia (64% DTP3 coverage) (Figure). An estimated 12.6 million (56%) children did not receive the first DTP dose, while nearly 10 million (44%) started but did not complete the 3-dose series.

Vaccines are increasingly being introduced into national immunization programs. By the end of 2012, hepatitis B vaccine was included in routine childhood vaccination schedules in 181 (93%) countries; 94 (52%) recommended administering the first dose within 24 hours of birth to prevent perinatal hepatitis B virus transmission. Worldwide, coverage with 3 doses of hepatitis B vaccine (including countries that have not introduced the vaccine) was 79%, ranging from 72% in the WHO South-East Asia Region and African Region to 91% in the Western Pacific Region (Table). Coverage with 3 doses of *Haemophilus influenzae* type b vaccine, which had been introduced into 184 (91%) countries by 2012,§ was 45% globally,¶ ranging from 11% in the South-East Asian Region to 91% in the Region of the Americas. By 2012, rotavirus vaccine was introduced in 41 (21%) countries, and pneumococcal conjugate vaccine (PCV) in 88 (45%) countries. Coverage with the completed rotavirus vaccination series (2 or 3 doses,

* Bacille Calmette-Guérin (BCG), diphtheria-tetanus-pertussis (DTP), polio, and measles vaccines.

† Estimates are available at http://www.who.int/entity/immunization_monitoring/data/coverage_estimates_series.xls and http://www.childinfo.org/immunization.html.

§ Includes parts of Belarus, India, Maldives, and Nigeria.

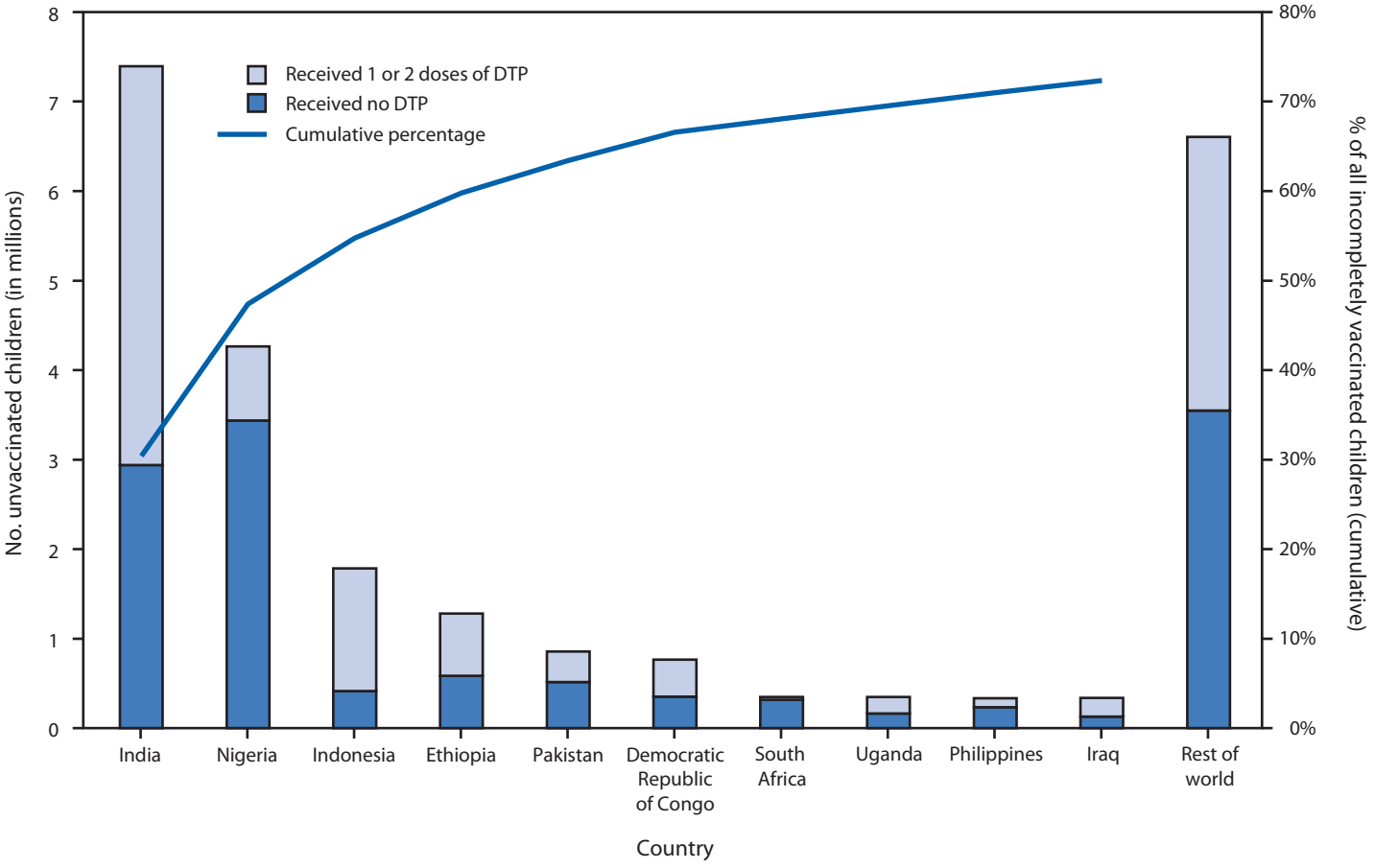
¶ Excludes India, which does not yet report coverage.

TABLE. Vaccination coverage, by vaccine and World Health Organization (WHO) region* — worldwide, 2012

WHO region	Vaccination coverage (%)							
	BCG	DTP3	Polio3	MCV1	HepB3	Hib3	Rota last	PCV3
Total (worldwide)	**89**	**83**	**84**	**84**	**79**	**45**	**11**	**19**
African	82	72	77	73	72	65	5	21
American	96	93	93	94	91	91	69	77
Eastern Mediterranean	88	83	82	83	81	58	14	13
European	93	95	96	94	79	83	2	39
South-East Asian	88	75	74	78	72	11	—	0
Western Pacific	97	97	97	97	91	14	1	1

Abbreviations: BCG = bacille Calmette-Guérin vaccine; DTP3 = 3 doses of diphtheria-tetanus-pertussis vaccine; Polio3 = 3 doses of polio vaccine; MCV1 = 1 dose of measles-containing vaccine; HepB3 = 3 doses of hepatitis B vaccine; Hib3 = 3 doses of *Haemophilus influenzae* type b vaccine; Rota last = last dose of 2- or 3-dose rotavirus vaccine series; PCV3 = 3 doses of pneumococcal conjugate vaccine.
* Weighted regional average.

FIGURE. Estimated number of children who had not received 3 doses of diphtheria-tetanus-pertussis vaccine (DTP) during the first year of life among 10 countries with the largest number of children incompletely vaccinated with DTP, by country, and cumulative percentage of all incompletely vaccinated children — worldwide, 2012



depending on vaccine used) was 11% globally, but reached 69% in the Americas. Coverage with 3 doses of PCV was 19% globally and was highest (77%) in the Americas. A second dose of MCV (MCV2) is recommended in 146 (75%) countries; however, because of difficulties with aggregating and compiling reported data on MCV2 coverage, WHO and UNICEF do not estimate global MCV2 coverage.

Reported by

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Editorial Note

In 2012, approximately 110 million infants (83%) worldwide received ≥3 doses of DTP vaccine, an indicator of overall vaccination coverage; however, approximately 22.6 million children did not receive 3 doses, leaving them susceptible to vaccine-preventable diseases and death. More than half of incompletely vaccinated children live in only three countries, underscoring the need to strengthen routine immunization systems in countries with the highest number of incompletely vaccinated children.

In 2010, the global health community launched the Decade of Vaccines Collaboration, with the vision of extending benefits of immunization to all persons. GVAP outlines steps to achieve this vision and includes an accountability framework requiring annual reporting of immunization indicators to the World Health Assembly. Although two thirds of countries achieved the GVAP target of 90% national DTP3 coverage, fewer than one third achieved >80% DTP3 coverage in every district, highlighting the need to reduce disparities in coverage within countries.

Administrative coverage estimates are convenient and timely, but they might overestimate or underestimate coverage if inaccuracies occur in the numerator (i.e., doses administered) or denominator (i.e., census data). In contrast, coverage surveys are not dependent on knowing target population size, nor are they subject to some limitations of administrative data sources (e.g., dependency on denominator data); however, they are costly and do not provide timely information to guide programs. In addition, coverage survey results for multidose antigens are increasingly subject to bias as vaccination card retention rates decline and reliance on maternal recall for more vaccines and multiple doses increases (*4*).

Vaccination coverage estimates in this report are based on doses provided to infants aged <12 months. GVAP's emphasis on equity of vaccination services across the life span, including children aged >12 months, means that the need for coverage estimates with vaccines offered after age 1 year will increase. Ascertaining coverage with the second dose of measles vaccine (MCV2) will become more important as measles elimination efforts continue, especially with increasing use of the MCV2 visit as a platform for delivery of other health services and vaccinations. Among countries where MCV2 is routinely recommended, 40% offer it during the second or third year of life, 54% at ages 3–7 years, and 6% at an age >7 years. In countries with high rates of measles transmission, MCV2 is recommended at age 15–18 months. This variability in the age of vaccination will create challenges in aggregating and compiling country data into global coverage estimates. Challenges immunization programs face in monitoring administrative MCV2 coverage estimates include difficulty monitoring vaccination coverage among children aged >1 year, the potential for misclassification of an MCV1 dose in a child age >1 year as an MCV2 dose, the misclassification of campaign doses as routine MCV1 or MCV2 doses, and inaccuracies in population estimates in older age groups. MCV2 coverage surveys are complicated by the low rate of vaccination card retention among parents of older children.

Among all incompletely vaccinated children worldwide, nearly 10 million received ≥1 DTP dose, but failed to complete the 3-dose series; however, 12.6 million (56%) never received the first DTP dose. Factors associated with undervaccination might differ from those associated with nonvaccination. For example, immunization system weaknesses (e.g., inadequate vaccine supply, poor health worker availability and knowledge, and insufficient political and financial support) are more commonly associated with undervaccination, whereas parental attitudes and knowledge about immunization appear to play a greater role among children who have not started vaccination (*5*). To achieve improvements in vaccination coverage globally, multifaceted and country-specific strategies will be required to address factors contributing to incomplete infant vaccination, especially in countries with the largest numbers of incompletely vaccinated children.

What is already known on this topic?

Substantial progress has been made in reducing vaccine-preventable morbidity and mortality since establishment of the global Expanded Programme on Immunization in 1974. However, millions of children, especially those in less developed countries, still are not being reached by the program.

What is added by this report?

During 2012, estimated global coverage with the third dose of diphtheria-tetanus-pertussis vaccine (DTP) was 83%. India, Nigeria, and Indonesia accounted for 55% of the 22.6 million children who had not received 3 doses of DTP by age 1 year. Worldwide coverage with other recommended vaccines was 89% for bacille Calmette-Guérin vaccine, 84% for the third dose of poliovirus vaccine, 84% for the first dose of measles-containing vaccine, 79% for the third dose of hepatitis B vaccine, and 45% for the third dose of *Haemophilus influenzae* type b vaccine. Among all incompletely vaccinated children, 56% had never received the first dose of DTP vaccine.

What are the implications for public health practice?

Many children, especially those in less developed countries, remain at risk for vaccine-preventable diseases. Strategies to improve vaccination coverage might differ for those children who have never been vaccinated, compared with those who have started but not completed the immunization series.

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Notes from the Field

Outbreaks of Cyclosporiasis — United States, June–August 2013

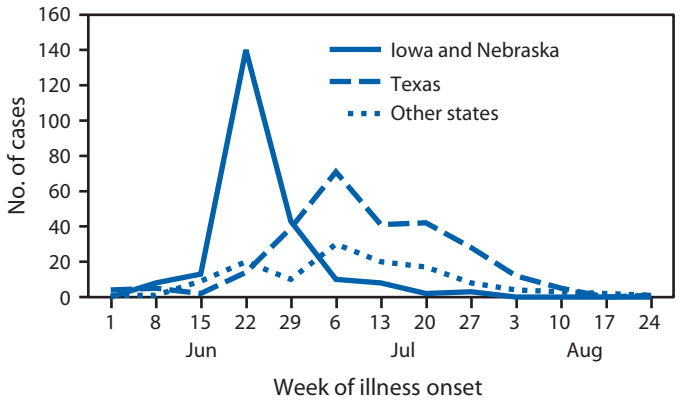
During June–August 2013, CDC, state and local public health officials, and the Food and Drug Administration (FDA) investigated an unusually large number of reports of cyclosporiasis (compared with annual reports to the National Notifiable Disease Surveillance System [e.g., 123 cases in 2012]), an intestinal infection caused by the parasite *Cyclospora cayetanensis* (*1*). By September 20, CDC had been notified of 643 cases from 25 states, primarily Texas (278 cases), Iowa (153), and Nebraska (86). Investigations in Iowa and Nebraska showed that restaurant-associated cases in these two states were linked to a salad mix that contained iceberg lettuce, romaine lettuce, red cabbage, and carrots (*2*). Most patients in Iowa and Nebraska became ill during June 15–29; cases reported during July and August were primarily from Texas (Figure).

CDC collaborated with state and local public health officials in Texas and the FDA to investigate a cluster of illnesses among patrons of a Mexican-style restaurant in Fort Bend County, Texas (restaurant A). A case of restaurant A–associated gastroenteritis was defined as gastrointestinal illness in a person who had eaten at restaurant A after June 1, 2013. Of 30 persons who ate at restaurant A, 22 had laboratory-confirmed *C. cayetanensis* infections, and eight had no laboratory confirmation. To identify the source or sources of the infections, a case-control study using 21 case-patients (15 laboratory-confirmed and six probable) with known meal dates and 65 controls matched by restaurant A meal date was conducted.

Case-patients and controls were asked about the meals they ate at restaurant A, using the menu. Ingredient-level analyses were conducted using meal consumption data and restaurant A recipes to identify four fresh produce ingredients with a statistically significant association with illness: fresh cilantro (matched odds ratio [mOR] = 19.8; 95% confidence interval [CI] = 4.0–>999), whole onions (mOR = 15.3; CI = 2.1–697.7), garlic (mOR = 10.7; CI = 1.5–475.4), and tomatoes (mOR = 5.5; CI = 1.1–54.1). Only fresh cilantro was consumed by all case-patients included in the study. In addition, of the four restaurant-produced salsas served at restaurant A, three containing fresh, uncooked cilantro were associated with illness: hot salsa (mOR 8.0; CI = 2.3–31.4), side salsa (mOR 5.7; CI = 1.6–23.7), and fire salsa (mOR 3.5, CI = 1.1–12.7). Case-patients also more commonly than controls reported eating salsa ranchera, which contained fresh cooked cilantro, but the association was not statistically significant: (mOR = 6.0; CI = 0.7–75.2).

Traceback information indicated that Puebla, Mexico, was a source of fresh cilantro served to ill persons at restaurant A.

FIGURE. Laboratory-confirmed cyclosporiasis cases by week of onset — United States, June 1–September 10, 2013



Lettuce served at restaurant A was neither sourced from the same producer implicated in the outbreak investigation in Iowa and Nebraska nor was it associated with illness. Additionally, restaurant A did not use red cabbage or carrots. Taken together, data from tracebacks and epidemiologic investigations in Texas, Iowa, and Nebraska indicate that more than one outbreak of cyclosporiasis occurred during summer 2013 in the United States, and that the food item associated with illness in Texas was different from that implicated in restaurant-associated cases in Iowa and Nebraska.

Reported by

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Notes from the Field

Salmonella Typhimurium Infections Associated with a Community College Microbiology Laboratory — Maine, 2013

On May 2, 2013, a case of salmonellosis was reported to the Maine Center for Disease Control and Prevention. The patient reported symptoms of diarrhea, fever, abdominal pain, and nausea, after attending a community college microbiology laboratory class. A second case was reported on May 8. Epidemiologic interviews conducted with both patients indicated common exposure at a community college, including one patient specifically naming the other patient.

On May 15, the Health and Environmental Testing Laboratory (HETL) determined that the clinical *Salmonella* isolates from stool specimens provided by outside hospital laboratories from both patients were indistinguishable by pulsed field gel electrophoresis (PFGE) analysis from a specimen used by the students during the microbiology class. The clinical isolates and laboratory class isolate all had a PFGE pattern indistinguishable from that of bacteria isolated during a national *Salmonella* Typhimurium outbreak in 2010 that was associated with clinical and teaching microbiology laboratories (*1*). No cases were reported from Maine during the 2010 outbreak.

On May 28, two members of HETL visited the college to assess laboratory practices and discuss PFGE results. On May 31, a survey on laboratory practices was e-mailed to 106 students enrolled in the microbiology laboratory course and was completed by 14 students. The low response rate was attributed to graduation and classes out of session. According to the survey results, only four of the 14 students said they always wore gloves, six said they sometimes wore gloves, and two said they rarely wore gloves. However, when they did wear gloves, 10 students said they washed their hands with soap and water after taking off the gloves.

The results of the PFGE analysis, case interviews, e-mail survey, and site visit suggested that the college laboratory was the source of the exposure, but it was unclear whether the exposure was the result of direct handling of the *Salmonella* culture, a spill, or contaminated equipment. Using *Salmonella* at this teaching level is contrary to the biologic safety guidelines issued in 2012 by the American Society for Microbiology (*2*), which clearly state that before biosafety level 2 (BSL-2) work, students should be competent performing BSL-1 activities. The laboratory practices survey and site visit identified several potential contamination hazards. These findings were similar to those from the 2010 national outbreak investigation (*1*): equipment in disrepair, inconsistent use of personal protective equipment, breakdowns in hand hygiene, inappropriate storage and handling of laboratory coats, and use in the laboratory of personal items not dedicated to the laboratory, including cell phones. This outbreak highlights a need to reinforce the specific recommendations for improvement that arose from the 2010 outbreak when working with infectious material in teaching laboratories (*1,3*).

Reported by

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3. CDC. Stay safe in the lab! What you work with can make you sick. Poster. Atlanta, GA: US Department of Health and Human Services, CDC Available at http://www.cdc.gov/salmonella/pdf/cdc_lai_prevention_poster_012313_508.pdf.

Announcements

National Diabetes Month — November 2013

November is National Diabetes Month. In 2010, approximately 26 million persons in the United States had diabetes, and an estimated 79 million adults had prediabetes (*1*). Testing for diabetes is recommended for adults with certain risk factors, including being aged ≥45 years, being overweight or obese, having a family history of diabetes or a history of gestational diabetes, and being physically inactive (*2*). Persons with diabetes can take steps to control the disease and prevent complications, and those with prediabetes can prevent or delay the onset of type 2 diabetes through weight loss and physical activity (*1,3*).

CDC and state and territorial public health programs, in collaboration with other partners, work to improve outcomes for persons with diabetes and to reduce the incidence of type 2 diabetes. For example, CDC's National Diabetes Prevention Program (http://www.cdc.gov/diabetes/prevention) supports the nationwide implementation of community-based lifestyle change programs for persons at high risk for type 2 diabetes. CDC's Native Diabetes Wellness Program (http://www.cdc.gov/diabetes/projects/diabetes-wellness.htm) assists 17 American Indian and Alaska Native communities in increasing access to traditional local foods and participation in physical activity. The program's series of *Eagle Books* for children aged 4–13 years teach respect for traditional ways of health, including drinking water, eating local foods, and being active. In addition, the National Diabetes Education Program (http://www.yourdiabetesinfo.org), jointly sponsored by CDC and the National Institutes of Health, provides tools and resources to help organizations and individuals address diabetes in their communities, health-care practices, and businesses.

References

1. CDC. National diabetes fact sheet: national estimates and general information on diabetes and prediabetes in the United States, 2011. Atlanta, GA: US Department of Health and Human Services, CDC; 2011. Available at http://www.cdc.gov/diabetes/pubs/factsheet11.htm.
2. American Diabetes Association. Standards of medical care in diabetes—2013. Diabetes Care 2013;36:S11–66.
3. Knowler WC, Barrett-Connor E, Fowler SE, et al. Reduction in the incidence of type 2 diabetes with lifestyle intervention or metformin. N Engl J Med 2002;346:393–403.

Environmental Microbiology: Control of Foodborne and Waterborne Diseases Course — January 6–11, 2014

CDC and Emory University's Rollins School of Public Health will cosponsor a 6-day course on Environmental Microbiology: Control of Foodborne and Waterborne Diseases at Emory University, Rollins School of Public Health. This course on the surveillance of foodborne and waterborne diseases is designed for public health practitioners and other students interested in the safety of food and water. It provides a broad overview of the major foodborne and waterborne diseases.

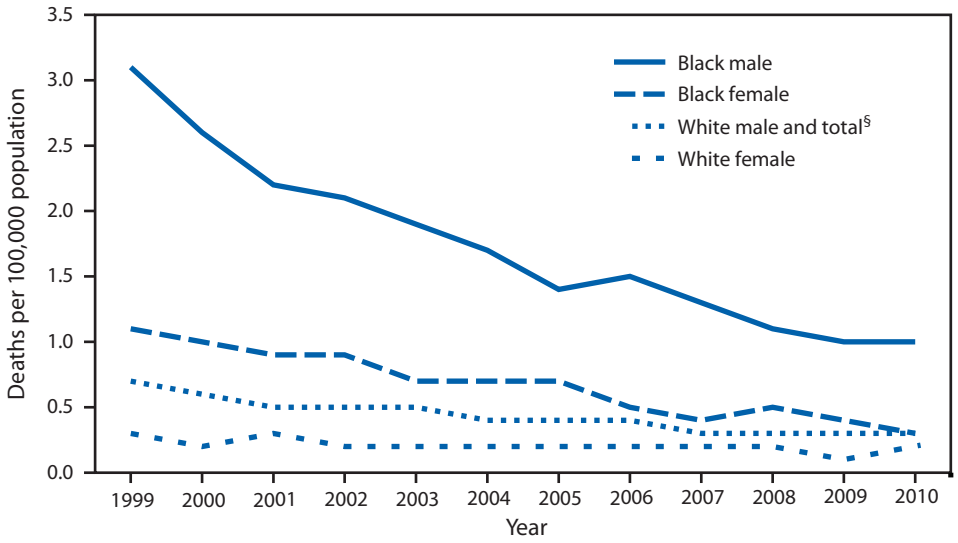
This course describes how information from surveillance is used to improve public health policy and practice in ways that contribute to food and water safety. Discussions focus on the microorganisms and chemical agents responsible for food and water-transmitted diseases, the diseases they cause, pathogenesis, clinical manifestations, reservoirs, modes of transmission, and surveillance systems. The transport, survival, and fate of pathogens in the environment, the concept of indicator organisms as surrogates for pathogens, and the removal and inactivation of pathogens and indicators by water and wastewater treatment processes will be analyzed. Examples of the public health impact of quality assurance programs, such as hazard analysis and critical control points, on control foodborne and waterborne diseases in industrialized and developing countries will be highlighted.

This course is offered to matriculating students at Emory University and to nonmatriculating public health professionals. Tuition will be charged. The application deadline is December 15, 2013, or until all slots have been filled. Additional information and applications are available by mail (Emory University, Hubert Department of Global Health [Attn: Pia Valeriano], 1518 Clifton Rd. NE, Rm. CNR Bldg., Room 7038, Atlanta, GA 303220), by telephone (404-727-3485), online (http://www.sph.emory.edu/epicourses), or by e-mail (pvaleri@emory.edu).

QuickStats

FROM THE NATIONAL CENTER FOR HEALTH STATISTICS

Age-Adjusted Death Rates* from Tuberculosis,† by Race and Sex — National Vital Statistics System, United States, 1999–2010



* The populations used for computing death rates were enumerated as of April 1 for 2000 and 2010, and estimated as of July 1 for all other years.
† Includes deaths from tuberculosis as underlying and contributing causes of death, which are coded to A16–A19, according to the *International Classification of Diseases, 10th Revision*.
§ The death rates for 1999 – 2010 for white males matched the rates for the total population at the single-digit level. Therefore, this line represents both groups in this figure.

From 1999 to 2010, age-adjusted death rates from tuberculosis decreased 57.1%, from 0.7 to 0.3 per 100,000 population for the total U.S. population. The rate decreased 67.7% for black males, 72.7% for black females, 57.1% for white males, and 33.3% for white females. Throughout the period, the rates for black males were the highest and at least 5 times higher than the rates for white females, the group with the lowest rates.

Source: National Vital Statistics System. Mortality public use data files, 1999–2010. Available at http://www.cdc.gov/nchs/data_access/vitalstatsonline.htm.

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

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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