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National Diabetes Month — November 2012

November is National Diabetes Month. In 2010, nearly 26 million persons in the United States had diabetes, and an estimated 79 million adults had prediabetes (*1*). 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 (*1,2*).

Diabetes can occur at any age (*1*). To address the burden of diabetes among U.S. youths, CDC and the National Institute of Diabetes and Digestive and Kidney Diseases at the National Institutes of Health support the SEARCH for Diabetes in Youth study (http://www.searchfordiabetes.org). The study provides estimates of the incidence and prevalence of diabetes in young persons in the United States.

Persons with diabetes might be exposed to bloodborne viruses through contaminated equipment. Insulin pens and similar devices for delivery of diabetes medications are meant for one person only and should never be shared. New resources include print materials (http://www.oneandonlycampaign.org/content/print-materials) to raise awareness about the basics of injection safety. Because adults with diabetes are at increased risk for developing kidney disease (*1*), CDC also is launching the National Chronic Kidney Disease Surveillance System (http://www.cdc.gov/ckd) to monitor chronic kidney disease trends in the United States.

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Diabetes Death Rates Among Youths Aged ≤19 Years — United States, 1968–2009

Although diabetes mellitus most often is diagnosed in adulthood, it remains one of the most common serious chronic diseases of childhood (*1*). Youths with diabetes are at risk for diabetes-related mortality because of acute complications that can result from the condition (*2*), including diabetic ketoacidosis and hypoglycemia (*3*). In the United States in 2010, an estimated 215,000 persons aged ≤19 years had diagnosed diabetes (*3*). Medical care for diabetes has improved considerably in recent decades, leading to improved survival rates. However, recent trends in diabetes death rates among youths aged <10 years and 10–19 years in the United States have not been reported. To assess these trends, CDC analyzed data from the National Vital Statistics System for deaths in the United States with diabetes listed as the underlying cause during 1968–2009. This report highlights the results of that analysis, which found that diabetes-related mortality decreased 61%, from an annual rate of 2.69 per million for the period 1968–1969 to a rate of 1.05 per million in 2008–2009. The percentage decrease was greater among youths aged <10 years (78%) than among youths aged 10–19 years (52%). These findings demonstrate improvements in diabetes mortality among youths but also indicate a need for continued improvement in diabetes diagnosis and care.

INSIDE

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To produce stable estimates, annual diabetes death rates among youths aged ≤19 years in the United States were calculated from National Vital Statistics System data for 2-year or 3-year periods from 1968 to 2009. Three-year periods were preferred except when the years would have included different *International Classification of Diseases* (ICD) codes. Diabetes-related mortality is based on information from death certificates filed in all 50 states and the District of Columbia and collected by CDC. The numbers of deaths for the study periods where diabetes was listed as the underlying cause of death were obtained from CDC Wonder.* Denominators were based on U.S. census estimates for each year.

A diabetes death was defined as a death with an underlying ICD-8 cause of death code of 250.0 or 250.9 for the years 1968–1978; ICD-9 codes of 250.0–250.9 for the years 1979–1998, and ICD-10 codes of E10–E14 for the years 1999–2009. Previous analyses of comparability between ICD-8 and ICD-9† and between ICD-9 and ICD-10§ found little difference in definitions between the coding methods (*5,6*). Joinpoint regression was used to analyze trends for youths aged <10 years and 10–19 years. Joinpoint regression uses permutation tests to identify points (joinpoints) where linear trends change significantly in direction or magnitude (e.g., zero joinpoints indicate a straight line).¶ The rate of change for each trend is tested to determine whether the change is significantly different from zero, and each trend in the final model is described by an annual percentage change (APC) with a 95% confidence interval (CI). If the CI does not contain zero, the APC is considered significantly different from zero.

From 1968–1969 to 2008–2009, the death rate from diabetes among youths aged ≤19 years decreased 61%, from 2.69 per million to 1.05 per million (Table). The death rate among youths aged <10 years decreased 78%, from 1.80 per million to 0.39 per million, and the death rate among youths aged 10–19 years decreased 52%, from 3.56 per million to 1.71 per million.

The trends for diabetes death rates for youths aged <10 years and youths aged 10–19 years indicate different patterns of decrease (Figure). For youths aged <10 years, a steady decrease in diabetes death rates was observed from 1968 to 1995, with an APC of -5.7 (CI = -6.6 to -4.7). However, from 1995 to 2009, the APC was -0.3 (CI = -3.5 to 4.3). For youths aged 10–19 years, a decrease in diabetes death rates occurred from 1968 to 1984, with an APC of -6.5 (CI = -7.9 to -5.1), followed by an increase in rates with an APC of 1.6 (CI = 0.8 to 2.4) from 1984 to 2009.

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*Available at http://wonder.cdc.gov.
†Comparability ratio of ICD-8 to ICD-9 for diabetes deaths was 0.9991.
§Comparability ratio of ICD-9 to ICD-10 for diabetes deaths was 1.0082.
¶Additional information available at http://srab.cancer.gov/joinpoint.

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TABLE. Annual death rates from diabetes* per 1 million youths aged ≤19 years, <10 years, and 10–19 years, by period — United States, 1968–1969 to 2008–2009

	Age group (yrs)					
	≤19		<10		10–19	
Period	Rate	(95% CI)	Rate	(95% CI)	Rate	(95% CI)
1968–1969	2.69	(2.43–2.95)	1.80	(1.50–2.10)	3.56	(3.14–3.98)
1970–1972	2.67	(2.46–2.88)	1.89	(1.64–2.15)	3.38	(3.05–3.70)
1973–1975	1.89	(1.71–2.07)	1.28	(1.06–1.50)	2.39	(2.12–2.66)
1976–1978	1.43	(1.27–1.59)	1.05	(0.73–1.47)	1.80	(1.56–2.04)
1979–1980	1.33	(1.14–1.51)	0.89	(0.68–1.15)	1.69	(1.41–1.98)
1981–1983	1.27	(1.12–1.42)	0.86	(0.69–1.06)	1.63	(1.39–1.86)
1984–1986	1.00	(0.87–1.14)	0.62	(0.47–0.79)	1.38	(1.16–1.60)
1987–1989	1.08	(0.94–1.22)	0.70	(0.55–0.88)	1.47	(1.24–1.70)
1990–1992	0.94	(0.82–1.07)	0.54	(0.41–0.70)	1.37	(1.15–1.60)
1993–1995	0.84	(0.73–0.96)	0.41	(0.30–0.55)	1.30	(1.09–1.51)
1996–1998	0.92	(0.79–1.04)	0.40	(0.29–0.53)	1.44	(1.23–1.66)
1999–2001	1.13	(0.99–1.26)	0.44	(0.33–0.57)	1.80	(1.56–2.04)
2002–2004	1.13	(0.99–1.26)	0.38	(0.28–0.51)	1.84	(1.60–2.08)
2005–2007	1.13	(1.00–1.27)	0.41	(0.30–0.54)	1.83	(1.59–2.07)
2008–2009	1.05	(0.89–1.20)	0.39	(0.26–0.54)	1.71	(1.43–1.99)

Abbreviation: CI = confidence interval.

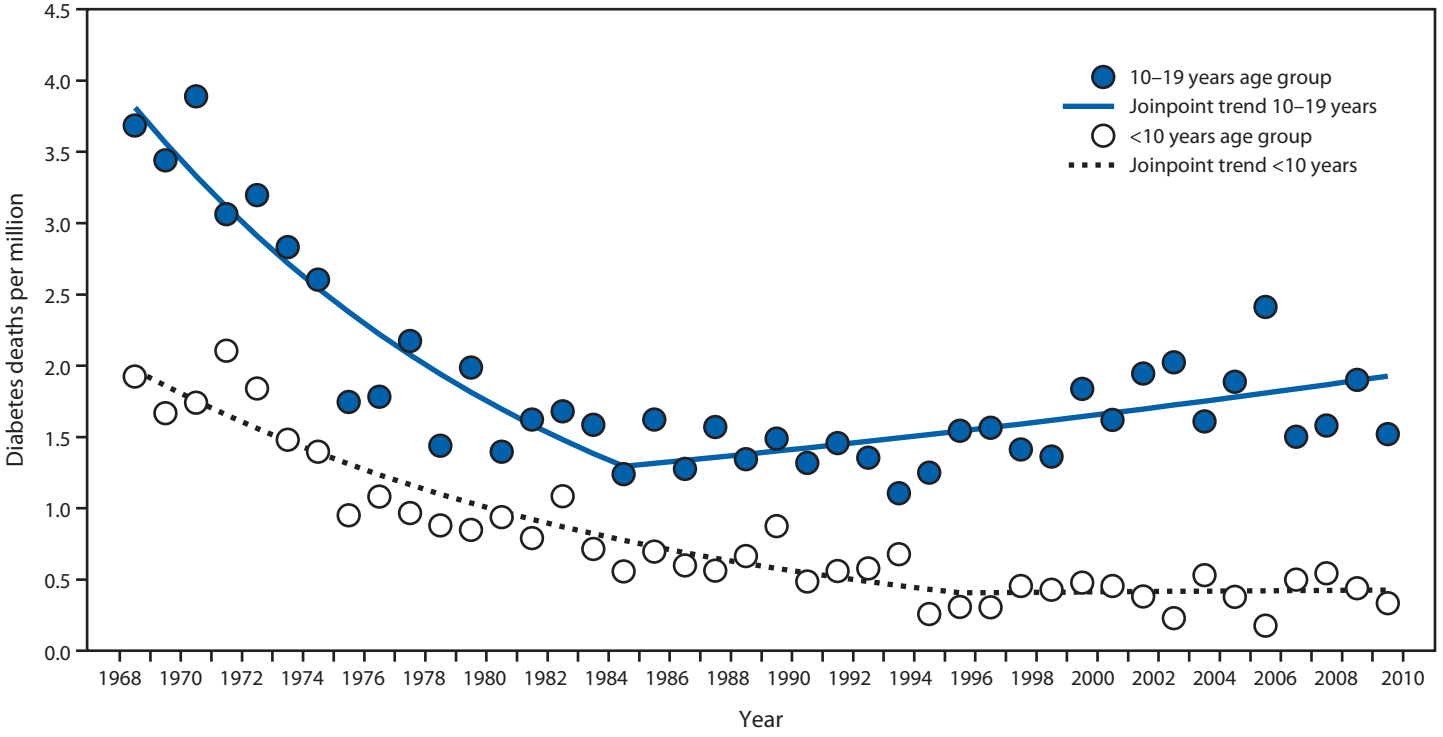
* Based on diabetes as underlying cause of death, using *International Classification of Diseases* (ICD) codes as follows: for years 1968–1978, ICD-8 codes 250.0 or 250.9; for years 1979–1998, ICD-9 codes 250.0–250.9; and for years 1999–2009, ICD-10 codes E10–E14.

Editorial Note

The decline in diabetes death rates noted from 1968–1969 to 2008–2009 occurred despite indications of an increase in the last 3 decades in the incidence of type 1 diabetes among U.S. youths (*4*). Although national data on incidence of diabetes in youth are not yet available, among Colorado youths aged <17 years, the incidence of type 1 diabetes increased from 14.8 per 100,000 for the period 1978–1988 to 23.9 per 100,000 for the period 2002–2004 (*4*). The prevalence of diabetes among youths is determined by a number of factors, including the incidence of new cases and the number of deaths among youths with diabetes. The findings in this report that the overall death rate from diabetes has decreased among U.S. youths aged ≤19 years might contribute to an overall increase in prevalence of diabetes among youths.

Among youths, diabetes deaths are more likely to result from direct acute complications of diabetes such as ketoacidosis or hypoglycemia (*7*). In these cases, diabetes is listed as the underlying cause. These causes of diabetes deaths largely are preventable. Possible reasons for the reduction in diabetes-related deaths among persons aged <10 years since 1968–1969

FIGURE. Annual death rates from diabetes* per 1 million youths aged <10 years and 10–19 years — United States, 1968–2009



* Based on diabetes as underlying cause of death, using *International Classification of Diseases* (ICD) codes as follows: for years 1968–1978, ICD-8 codes 250.0 or 250.9; for years 1979–1998, ICD-9 codes 250.0–250.9; and for years 1999–2009, ICD-10 codes E10–E14.

What is already known on this topic?

Diabetes in youths is a serious chronic disease. Youths with diabetes are at a risk for mortality caused by acute complications of the disease.

What is added by this report?

In 2008–2009, the rate of diabetes deaths was 1.05 per million persons aged ≤19 years, a decline of 61% from 1968–1969. Diabetes mortality decreased among youths aged <10 years and youths aged 10–19 years by 78% and 52%, respectively. However, for youths aged 10–19 years an annual percentage increase of 1.6 occurred from 1984 to 2009.

What are the implications for public health practice?

Deaths from diabetes in young persons are potentially preventable. The recent increase in diabetes-related mortality among youths aged 10–19 years shows a need for improved diabetes diagnosis and care in this age group and research to better understand these deaths.

and among persons aged 10–19 years from 1968–1969 to 1986–1986 include improved diabetes care and treatment, (e.g., improved technology for blood glucose monitoring and insulin administration, such as insulin pumps) and increased awareness of diabetes symptoms, possibly resulting in earlier recognition and treatment. Other possible reasons include advances in education regarding diabetes and management of diabetic ketoacidosis.

Previous analysis of diabetes death rates among youths found a steady decline from 1968 to 1985 and no change from 1986 to 1998 (*8*). Reasons for the increase in diabetes-related mortality among youths aged 10–19 years since 1984–1986 are unknown. One possibility is that youths who had diabetes diagnosed before age 10 years and who previously might have died before reaching age 10 years are living longer and dying at ages 10–19 years. Similar findings have been observed in other studies. For example, during 1977–2000, in a Swedish cohort of youths with type 1 diabetes, the majority of deaths occurred at approximately age 15 years (*9*).

The findings in this report are subject to at least three limitations. First, CDC Wonder does not distinguish between diabetes types in ICD-8 or ICD-9 mortality codes. However, type 2 diabetes rarely is diagnosed in youths aged ≤10 years, and diagnosed in only 20% of youths aged 10–19 years. Second, because of the small number of deaths, assessing whether the age group trends varied by race/ethnicity or geographic region was not possible. However, a previous report highlighted disparities in diabetes mortality by race among youths in the United States (*10*). Finally, these data do not permit differentiating between deaths occurring in persons with known diabetes and deaths occurring in persons with diabetes diagnosed only at the time of death.

CDC, along with the National Institute of Diabetes and Digestive and Kidney Disease at the National Institutes of Health, supports the SEARCH for Diabetes in Youth study.** This study will provide estimates of trends in the incidence and prevalence of diabetes among youths in the United States and will look at all-cause and diabetes-related mortality among youths with diabetes. Although the findings in this report demonstrate improvement in diabetes mortality among youths, particularly among those aged <10 years, deaths resulting from diabetes in youths potentially are preventable, and these findings indicate a need for improved diabetes diagnosis and care, especially among youths aged 10–19 years, whose risk for diabetes-related mortality appears to have increased in recent years.

** Additional information available at http://www.cdc.gov/diabetes/pubs/pdf/search.pdf.

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Evaluation of 11 Commercially Available Rapid Influenza Diagnostic Tests — United States, 2011–2012

Accurate diagnosis of influenza is critical for clinical management, infection control, and public health actions to minimize the burden of disease. Commercially available rapid influenza diagnostic tests (RIDTs) that detect the influenza virus nucleoprotein (NP) antigen are widely used in clinical practice for diagnosing influenza because they are simple to use and provide results within 15 minutes; however, there has not been a recent comprehensive analytical evaluation of available RIDTs using a standard method with a panel of representative seasonal influenza viruses. This report describes an evaluation of 11 Food and Drug Administration (FDA)–cleared RIDTs using 23 recently circulating influenza viruses under identical conditions in a laboratory setting to assess analytical performance. Most RIDTs detected viral antigens in samples with the highest influenza virus concentrations, but detection varied by virus type and subtype at lower concentrations. Clinicians should be aware of the variability of RIDTs when interpreting negative results and should collect test samples using methods that can maximize the concentration of virus antigen in the sample, such as collecting adequate specimens using appropriate methods in the first 24–72 hours after illness onset. The study design described in this report can be used to evaluate the performance of RIDTs available in the United States now and in the future.

As part of a collaboration between CDC, the Biological Advanced Research and Development Authority, and the Medical College of Wisconsin (MCW), CDC provided 16 influenza A and seven influenza B viruses to MCW to evaluate RIDTs commercially available during the 2011–12 influenza season (Table). Stock viruses were representative of viruses circulating in the United States since 2006 and were characterized by their 50% egg infectious dose (EID_{50}/mL, a measure of virus infectivity). In addition, the concentration of influenza virus NP antigen (the antigen detected by RIDTs) was measured as μg/mL using isotope dilution tandem mass spectrometry (*1*). EID_{50}/mL values were at least as high as those reported in human clinical specimens (*2–4*). MCW prepared swab samples or mock nasal wash specimens from several dilutions of each virus in saline. For nine of 11 RIDTs, 50 μL of virus dilution was applied to swabs provided in the test kit or swabs described in the manufacturer's instructions for use. Two RIDTs (both manufactured by SA Scientific) require use of nasal wash specimens. Therefore, for the SA Scientific tests, 50 μL from each virus dilution first was added to saline. All samples, either prepared swabs or liquid, were added to RIDTs and incubated, with results interpreted as described in the instructions for use. Three separate tests were performed for each combination of virus and RIDT.

The numbers of RIDTs that were positive (defined as at least two positive results of the three tests performed) at each dilution for each of the 23 influenza viruses were compared (Table). RIDTs overall had fewer positive results with viruses that had the lowest stock NP concentrations (<2 μg/mL). Each influenza virus had variable levels of positivity with RIDTs, suggesting that several viruses of each type and subtype should be evaluated with each RIDT on a regular basis. NP levels of influenza B virus stocks generally were higher, and the first two dilutions were detected more uniformly than for influenza A viruses. No significant performance differences were noted for B/Victoria or B/Yamagata lineages of influenza B viruses.

The numbers of positive test results for each of the 11 RIDTs by influenza virus type and influenza A subgroup were compared (Figure). One RIDT (SAS FluAlert Influenza A [SA Scientific]) did not uniformly detect influenza A (H1N1)pdm09 (pH1N1) viruses or other influenza A viruses at high concentrations. Four RIDTs detected the majority of influenza B viruses in third dilution samples, whereas only one RIDT (BD Directigen EZ Flu A+B [Becton, Dickinson and Co.]) detected at least 50% of all influenza A viruses in third dilution samples.

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Editorial Note

Before the emergence of influenza A (H1N1)pdm09 viruses in 2009, published reports showed variable performance of RIDTs, with reported sensitivities ranging from 27% to 61% when compared with real-time reverse transcription–polymerase chain reaction (PCR) testing (*5*). During the A (H1N1)pdm09 pandemic, clinicians, researchers, and

TABLE. Number of positive RIDT results, by virus subtype/lineage and dilution — United States, 2012

Subtype/Lineage	Virus stock (log_{10} EID_{50}/mL)	Stock NP concentration (μg/mL)	No. of positive RIDT results* at each dilution†				
			$10^{-1.0}$	$10^{-1.5}$	$10^{-2.0}$	$10^{-2.5}$	$10^{-3.0}$
A/California/7/2009 (pH1N1)	7.7	2.9	9	7	1	0	0
A/California/8/2009 (pH1N1)	8.2	3.6	10	5	1	0	0
A/Mexico/4108/2009 (pH1N1)	7.3	1.0	9	4	0	0	0
A/New York/18/2009 (pH1N1)	8.2	5.7	10	7	2	0	0
A/Hong Kong/2652/2006 (H1N1)	9.2	ND	10	7	0	0	0
A/Cambodia/371/2007 (H1N1)	8.4	ND	10	10	4	0	0
A/Florida/3/2006 (H1N1)	8.1	ND	9	3	0	0	0
A/South Dakota/06/2007 (H1N1)	8.9	ND	10	9	5	0	0
A/Brisbane/59/2007 (H1N1)	9.2	ND	11	10	8	1	0
A/Solomon Islands/3/2006 (H1N1)	8.4	ND	7	2	0	0	0
A/Brisbane/10/2007 (H3N2)	7.6	5.4	11	9	6	0	0
A/Perth/16/2009 (H3N2)	8.0	1.4	9	5	0	0	0
A/Wisconsin/15/2009 (H3N2)	6.8	1.6	10	5	0	0	0
A/Santiago/7981/2006 (H3N2)	8.9	3.6	10	7	5	0	0
A/Uruguay/716/2007 (H3N2)	8.9	7.2	10	8	5	0	0
A/Henan/Jinshui/147/2007 (H3N2)	8.7	3.3	10	8	3	1	0
B/Bangladesh/5278/2006 (Victoria lineage)	8.5	4.2	10	6	1	0	0
B/Pennsylvania/5/2007 (Victoria lineage)	8.3	7.9	11	11	4	0	0
B/Brisbane/60/2008 (Victoria lineage)	8.0	5.4	11	10	4	1	0
B/Victoria/304/2006 (Victoria lineage)	8.9	9.6	11	11	7	0	0
B/Brisbane/3/2007 (Yamagata lineage)	7.3	4.5	11	9	5	0	0
B/Florida/4/2006 (Yamagata lineage)	8.8	9.7	11	11	8	3	0
B/Pennsylvania/7/2007 (Yamagata lineage)	7.5	6.3	11	10	6	0	0

Abbreviations: RIDT = rapid influenza diagnostic test; NP = nucleoprotein; ND = not determined.
* Having at least two of three replicates positive.
† A maximum of 11 test kits could be positive for each dilution.

regulators questioned whether RIDTs could detect the newly emerging virus. CDC reported that 1) sensitivities of three commonly used RIDTs ranged from 40% to 69% with influenza A (H1N1)pdm09 archived clinical specimens compared with CDC's A (H1N1)pdm09 PCR assay and 2) higher virus loads led to a greater likelihood of a positive result (*6*). These findings prompted recommendations for clinicians to use caution when interpreting results of RIDTs. Recently, the performances of selected RIDTs for detecting the influenza A (H3N2) variant virus were evaluated and were found to vary considerably (*7*).

Previous reports of RIDT performance often used different volumes or amounts of virus propagated under different conditions and did not evaluate the majority of commercially available, FDA-cleared RIDTs. For the evaluation described in this report, efforts were made to 1) use identical viral concentrations for each kit tested, 2) use all 11 commercially available, FDA-cleared RIDTs for the 2010–11 influenza season, and 3) use a diverse collection of 23 more recent influenza viruses to allow for a more finely detailed characterization of test performance. The analytical sensitivity of the evaluation varied across test kits as well as with different influenza viruses, indicating that test performance for some RIDTs drops significantly with decreasing virus concentration.

The findings in this report further emphasize the importance of collecting respiratory specimens when the amount of influenza virus is at its peak (within 24–72 hours of symptom onset). The high virus concentrations at which the evaluated FDA-cleared RIDTs detected recent circulating viruses might exceed levels expected in clinical specimens, even those collected at the peak of virus load in the specimen (*2–4*). Although all RIDTs were able to detect virus at the highest virus concentrations, some were unable to detect certain viruses at any subsequent dilution. Manufacturers use different antibodies in their RIDTs to capture NP antigen, and this difference in antibody selection might account for some of the variation in performance. Periodic evaluation of RIDT performance in detecting current or recently circulating influenza viruses might identify needed updates in antibodies used in commercial RIDTs. In addition, given the narrow range of virus concentrations that can be detected by the majority of RIDTs, clinicians should follow best practices for specimen collection and timing to maximize the number of influenza viruses per specimen and improve the clinical utility of the test.

These findings do not reflect the RIDTs' performance in clinical settings. Ideally, RIDT performance should be evaluated using respiratory specimens from patients with influenza-like illnesses; however, performing a study to evaluate the performances of 11 RIDTs using specimens collected in a standard manner from enough patients with influenza-like illness to include 23 circulating influenza viruses presents a tremendous challenge. The methods described in this report

FIGURE. Number of positive samples in each dilution and percentage of positive samples in each virus group, by RIDT kit — United States, 2012

RIDT kit (Company)	A (pH1N1)*					A (H1N1)†					A (H3N2)§					Influenza B¶				
	10^{-1}	$10^{-1.5}$	$10^{-2.0}$	$10^{-2.5}$	$10^{-3.0}$	10^{-1}	$10^{-1.5}$	$10^{-2.0}$	$10^{-2.5}$	$10^{-3.0}$	10^{-1}	$10^{-1.5}$	$10^{-2.0}$	$10^{-2.5}$	$10^{-3.0}$	10^{-1}	$10^{-1.5}$	$10^{-2.0}$	$10^{-2.5}$	$10^{-3.0}$
SAS FluAlert Influenza A&B (SA Scientific)	3	0	0	0	0	15	9	0	0	0	18	6	0	0	0	21	21	9	0	0
SAS FluAlert Influenza A**; FluAlert Influenza B** (SA Scientific)	6	0	0	0	0	3	0	0	0	0	3	0	0	0	0	21	18	3	0	0
3M Rapid Detection Flu A+B Test (Response Biomedical Corp. for 3M Healthcare)	12	9	0	0	0	18	13	7	0	0	18	16	10	0	0	21	21	19	5	0
BinaxNOW Influenza A&B** (Inverness Medical)	12	0	0	0	0	12	6	0	0	0	15	0	0	0	0	20	9	0	0	0
Remel X/pect Flu A&B (Thermo Fisher Scientific)	9	0	0	0	0	18	11	3	0	0	18	9	3	0	0	21	21	15	0	0
TRUFLU (Meridian Bioscience, Inc.)	12	9	0	0	0	18	12	3	0	0	18	18	6	0	0	21	18	5	0	0
OSOM Influenza A&B (Sekisui Diagnostics)	12	9	0	0	0	15	9	4	0	0	18	9	0	0	0	21	18	2	0	0
QuickVue Influenza A+B** (Quidel Corp.)	12	12	0	0	0	18	12	9	0	0	18	18	12	0	0	21	21	21	3	0
QuickVue Influenza** (Quidel Corp.)	12	9	0	0	0	18	12	9	0	0	18	18	6	0	0	21	21	18	3	0
BD Directigen EZ Flu A+B (Becton, Dickinson and Co.)	12	12	9	0	0	18	18	9	0	0	18	18	9	0	0	21	21	3	0	0
Status Flu A+B (Princeton BioMeditech Corp.)	12	9	3	0	0	18	18	9	3	0	18	15	9	3	0	18	15	9	0	0

% positivity within virus group	100	70–95	40–70	10–40	0

Abbreviation: RIDT = rapid influenza diagnostic test.

* Four influenza A (H1N1) 2009 pandemic (pH1N1) viruses with three samples at each dilution (12 possible positive samples for each dilution).

† Six pre-pandemic "seasonal" influenza A (H1N1) viruses with three samples at each dilution (18 possible positive samples for each dilution).

§ Six influenza A (H3N2) viruses with three samples at each dilution (18 possible positive samples for each dilution).

¶ Seven influenza B viruses with 3 samples at each dilution (21 possible posiive samples for each dilution).

** CLIA-waived (i.e., exempt from all regulatory procedures typically required under Clinical Laboratory Improvement Amendments).

avoid the variability in the quality and virus concentration of specimens inherent in clinical studies. This evaluation also provides a baseline for assessing analytical variability with RIDTs over time as human seasonal influenza viruses evolve, and for rapidly determining RIDT performance as novel influenza viruses emerge.

Clinicians and laboratorians should be aware of the limitations of RIDTs. Performance reported in analytical studies depends on the characteristics of selected viruses and their growth characteristics as well as the affinity of antibodies used in RIDTs. These findings highlight the need for clinicians and laboratorians to use RIDTs cautiously for diagnostic, treatment, and infection control decisions in clinical settings. Because of variability in RIDT performance, especially at lower viral concentrations, negative RIDT test results might not exclude influenza virus infection in patients with signs and

What is already known on this topic?

Accurate diagnosis of influenza is critical for clinical management, infection control, and public health actions. Rapid influenza diagnostic tests (RIDTs) are widely used in clinical practice, but their abilities to detect a range of influenza viruses in recent circulation have not been evaluated comprehensively.

What is added by this report?

Eleven Food and Drug Administration–cleared RIDTs were evaluated using a panel of 23 recently circulating influenza viruses. Most tests detected viral antigen in samples at the highest concentrations, but detection varied by test and viral type and subtype at lower concentrations.

What are the implications for public health practice?

Clinicians should be aware of the variability of RIDTs when interpreting negative results and should collect test samples using methods that can maximize the concentration of virus antigen in the sample by collecting specimens with appropriate methods within 24–72 hours after illness onset. The use of these tests for clinical management and public health practice can be improved by continually updating guidance, educating clinicians on best practices, and enhancing test design for better performance. The study design described in this report can be used for future evaluations of the sensitivity and performance of rapid influenza tests available in the United States.

symptoms suggestive of influenza. Therefore, antiviral treatment, if indicated, should not be withheld from patients with suspected influenza because they have a negative RIDT test result (*8*). Clinicians and laboratorians can take measures to improve detection of influenza, such as 1) collecting specimens early in the course of illness, 2) ensuring that the appropriate type and highest quality of respiratory specimen is collected, and 3) using the current local prevalence of influenza activity to raise or lower the suspicion of influenza and to assess the benefit of testing (*9*).

The use of RIDTs in clinical management and public health practice can be improved by continually updating guidance, educating clinicians on best practices, and enhancing test design for better performance. To this end, the Joint Commission, in its role to improve clinical practice, is offering two Internet-based courses, including a continuing education course, on Strategies for Improving Rapid Influenza Testing in Ambulatory Settings. Course descriptions and registration information are available at http://www.jointcommission.org/siras.aspx, as are a number of links to online resources on the use and interpretation of RIDTs. In addition, a dedicated YouTube channel for Strategies for Improving Rapid Influenza Testing in Ambulatory Settings features several instructional videos on the subject (available at http://www.youtube.com/playlist?list=PLNQfL_CJ36fK08KEPjxu1ZKJn7GuFtn-N&feature=plcp).

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Current Tobacco Use and Secondhand Smoke Exposure Among Women of Reproductive Age — 14 Countries, 2008–2010

Tobacco use and secondhand smoke (SHS) exposure in reproductive-aged women can cause adverse reproductive health outcomes, such as pregnancy complications, fetal growth restriction, preterm delivery, stillbirths, and infant death (*1*–*3*). Data on tobacco use and SHS exposure among reproductive-aged women in low- and middle-income countries are scarce. To examine current tobacco use and SHS exposure in women aged 15–49 years, data were analyzed from the 2008–2010 Global Adult Tobacco Survey (GATS) from 14 low- and middle-income countries: Bangladesh, Brazil, China, Egypt, India, Mexico, Philippines, Poland, Russia, Thailand, Turkey, Ukraine, Uruguay, and Vietnam. The results of this analysis indicated that, among reproductive-aged women, current tobacco smoking ranged from 0.4% in Egypt to 30.8% in Russia, current smokeless tobacco use was <1% in most countries, but common in Bangladesh (20.1%) and India (14.9%), and SHS exposure at home was common in all countries, ranging from 17.8% in Mexico to 72.3% in Vietnam. High tobacco smoking prevalence in some countries suggests that strategies promoting cessation should be a priority, whereas low prevalence in other countries suggests that strategies should focus on preventing smoking initiation. Promoting cessation and preventing initiation among both men and women would help to reduce the exposure of reproductive-aged women to SHS.

GATS is a nationally representative household survey conducted among persons aged ≥15 years using a standardized questionnaire, sample design, data collection method, and analysis protocol to obtain measures of key tobacco control indicators.* GATS was conducted once in each of the 14 countries during 2008–2010. In each country, a multistage cluster sample design was used, with households selected proportional to population size. Data were weighted to reflect the noninstitutionalized population aged ≥15 years in each country. Overall response rates ranged from 65.1% in Poland to 97.7% in Russia. For this analysis, the study sample included 91,190 female respondents ages 15–49 years, representing 35.8% of the population sample aged ≥15 years. Analyses were conducted separately for each country, with sample sizes ranging from 1,570 female reproductive-aged respondents in Uruguay to 28,482 in India. Data on current pregnancy status of the survey respondents were not collected; therefore, the number of pregnant women included in the sample of reproductive-age women is unknown. Based on total fertility rates in each of the 14 countries, ranging from 1.17 children per woman in Poland to 3.58 in the Philippines (*4*), the proportion of respondents pregnant when interviewed likely was low.

Prevalence and 95% confidence intervals (CIs) of current tobacco smoking,† current smokeless tobacco use,§ SHS exposure at home,¶ and SHS exposure at work** were calculated for reproductive-aged women by country. SHS exposure at home and work were included in the analysis because these locations are where the majority of women spend their time in an average day. SHS exposure at work was calculated among women who worked outside of the home and who usually worked indoors or both indoors and outdoors; this subgroup ranged from 5.4% of women in Bangladesh to 74.7% in Russia. By country, prevalence of each of the four tobacco indicators was stratified by age group (15–24, 25–34, and 35–49 years), residence (urban versus rural), and education level. When a country's overall tobacco prevalence among women of reproductive age was >3%, differences in prevalence by each characteristic were assessed with a z-test at significance level of $p<0.05$.

Current tobacco smoking prevalence among reproductive-aged women ranged from 0.4% in Egypt to 30.8% in Russia (Table). Prevalence of current smoking was ≤2.3% in Bangladesh, China, Egypt, India, Thailand, and Vietnam and >10% in Brazil, Poland, Russia, Turkey, Ukraine, and Uruguay.

Among countries with current smoking prevalence >3%, demographic subgroups with higher smoking prevalence varied by country (Table). In Brazil, Philippines, and Poland, for example, current smoking prevalence was significantly higher among women aged 35–49 years compared with other age groups, but in the other countries, prevalence was higher among younger women. Current smoking prevalence was significantly higher among women living in urban areas in Mexico, Poland, Russia, Turkey, and Ukraine.

Prevalence of current smokeless tobacco use in reproductive-aged women was <1% in almost all GATS countries, with the exception of Bangladesh (20.1%) and India (14.9%) (Table). For Bangladesh and India, prevalence of current smokeless tobacco use was significantly higher among women aged 35–49 years,

* Additional information and GATS country reports are available at http://www.cdc.gov/tobacco/global.

† Respondents who reported currently smoking any tobacco products on a "daily" or "less than daily" basis. The term "smokers" in this report refers to current smokers of manufactured cigarettes and of other tobacco products, such as bidis, kreteks, hand-rolled cigarettes, cigars, pipes, and waterpipes.

§ Respondents who reported currently using smokeless tobacco on a "daily" or "less than daily" basis.

¶ Respondents who reported SHS exposure in the home if anyone smoked in the house on a daily, weekly, monthly, or less than monthly basis.

** Respondents who reported SHS exposure at work in the past 30 days among those who work outside of the home and who usually work indoors or both indoors and outdoors.

TABLE. Prevalence of current tobacco smoking, smokeless tobacco, and secondhand smoke (SHS) exposure among women aged 15–49 years, by selected characteristics — Global Adult Tobacco Survey (GATS), 14 countries, 2008–2010

	Bangladesh (N = 4,288)								Brazil (N = 14,772)							
	Tobacco smoking		Smokeless tobacco		SHS at home		SHS at work		Tobacco smoking		Smokeless tobacco		SHS at home		SHS at work	
Characteristic	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)
Overall	**0.8**	**(0.4–1.3)**	**20.1**	**(18.3–22.1)**	**52.0**	**(49.4–54.6)**	**30.5**	**(23.4–38.6)**	**12.7**	**(12.0–13.3)**	**0.1**	**(0.0–0.1)**	**27.1**	**(26.1–28.1)**	**19.4**	**(18.1–20.7)**
Age group (yrs)																
15–24	0.4	(0.1–1.0)	4.0	(2.9–5.6)*	50.3	(46.0–54.6)	23.6	(12.9–39.1)*	6.4	(5.6–7.4)*	0.0	(0.0–0.1)	30.4	(28.6–32.3)*	16.9	(14.3–19.9)
25–34	0.7	(0.3–1.7)	18.1	(15.7–20.9)*	53.2	(49.4–56.9)	24.1	(14.1–38.1)*	12.6	(11.6–13.8)*	0.1	(0.0–0.2)	24.6	(23.1–26.1)*	19.5	(17.6–21.5)
35–49	1.3	(0.7–2.5)	40.2	(36.0–44.5)*	52.7	(48.9–56.4)	46.2	(34.5–58.4)*	17.6	(16.4–18.9)*	0.1	(0.0–0.2)	26.3	(24.9–27.8)*	20.7	(18.9–22.6)
Residence																
Urban	0.4	(0.2–0.8)	17.5	(15.2–20.1)*	42.1	(38.9–45.4)*	22.1	(16.2–29.5)*	12.8	(12.1–13.5)	0.1	(0.0–0.1)	25.6	(24.6–26.6)*	19.2	(17.9–20.5)
Rural	0.9	(0.5–1.7)	21.1	(18.9–23.6)*	55.6	(52.4–58.7)*	40.9	(28.1–55.1)*	12.0	(10.4–13.9)	0.1	(0.0–0.3)	36.5	(33.8–39.4)*	23.2	(18.0–29.3)
Education																
No formal education/ less than primary	1.7	(1.0–2.9)	32.9	(29.5–36.6)*	60.0	(56.5–63.5)*	37.4	(28.0–48.0)	NA	—	NA	—	NA	—	NA	—
Completed primary/ less than secondary	0.1	(0.0–0.3)	11.8	(9.9–14.1)*	47.7	(44.1–51.3)*	22.2	(10.4–41.5)	NA	—	NA	—	NA	—	NA	—
Completed secondary/ high school	NR	—	4.3	(2.6–6.9)*	39.1	(32.6–46.0)*	23.3	(8.6–49.5)	NA	—	NA	—	NA	—	NA	—
Completed college/ university or above	NR	—	3.8	(1.7–8.2)*	26.1	(14.6–42.2)*	29.6	(14.7–50.7)	NA	—	NA	—	NA	—	NA	—

See table footnotes on page 881.

TABLE. (*Continued*) Prevalence of current tobacco smoking, smokeless tobacco, and secondhand smoke (SHS) exposure among women aged 15–49 years, by selected characteristics — Global Adult Tobacco Survey (GATS), 14 countries, 2008–2010

	China (N = 3,835)								Egypt (N = 8,466)							
	Tobacco smoking		Smokeless tobacco		SHS at home		SHS at work		Tobacco smoking		Smokeless tobacco		SHS at home		SHS at work	
Characteristic	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)
Overall	**1.5**	**(1.0–2.1)**	**0.0**	**(0.0–0.1)**	**65.1**	**(61.1–68.9)**	**52.6**	**(47.4–57.8)**	**0.4**	**(0.2–0.7)**	**0.2**	**(0.1–0.4)**	**65.2**	**(63.6–66.9)**	**53.0**	**(48.7–57.3)**
Age group (yrs)																
15–24	0.7	(0.2–1.9)	0.1	(0.0–0.4)	64.6	(57.6–71.0)	48.9	(41.7–56.1)	0.2	(0.1–0.6)	0.2	(0.1–0.6)	66.7	(64.1–69.3)	55.9	(45.0–66.3)
25–34	0.3	(0.1–0.7)	NR		62.7	(58.2–66.9)	50.0	(41.6–58.4)	0.2	(0.1–0.5)	0.0	(0.0–0.2)	63.6	(61.4–65.8)	48.1	(41.7–54.5)
35–49	2.5	(1.7–3.8)	0.0	(0.0–0.2)	66.5	(63.0–69.9)	57.1	(47.8–65.9)	0.8	(0.4–1.5)	0.4	(0.2–0.7)	64.8	(62.4–67.1)	54.6	(48.9–60.3)
Residence																
Urban	1.7	(1.1–2.9)	0.1	(0.0–0.3)	55.6	(50.9–60.2)*	50.2	(43.7–56.6)	0.4	(0.3–0.7)	0.3	(0.1–0.5)	60.9	(58.9–62.9)*	52.7	(48.0–57.3)
Rural	1.3	(0.8–2.1)	0.0	(0.0–0.2)	72.8	(67.5–77.6)*	57.3	(48.9–65.4)	0.4	(0.1–1.0)	0.1	(0.0–0.4)	68.8	(66.3–71.1)*	53.7	(44.7–62.4)
Education																
No formal education/ less than primary	3.2	(1.7–6.0)	NR	—	66.2	(58.8–72.9)	64.6	(43.4–81.3)	0.7	(0.3–1.5)	0.3	(0.1–0.7)	70.8	(68.4–73.1)	64.0	(48.7–76.9)
Completed primary/ less than secondary	1.0	(0.5–2.0)	NR	—	72.0	(65.4–77.7)	50.0	(37.4–62.6)	0.2	(0.0–1.4)	0.2	(0.0–1.4)	69.6	(64.2–74.5)	DS	—
Completed secondary/ high school	1.4	(0.8–2.4)	0.1	(0.0–0.2)	66.3	(60.3–71.9)	55.0	(49.4–60.5)	0.1	(0.0–0.3)	0.1	(0.0–0.3)	63.6	(61.4–65.7)	53.1	(46.5–59.7)
Completed college/ university or above	1.2	(0.4–3.7)	0.1	(0.0–0.6)	51.5	(44.4–58.5)	47.5	(38.8–56.3)	0.4	(0.1–0.9)	0.3	(0.1–0.9)	48.7	(44.8–52.6)	51.1	(45.4–56.8)

See table footnotes on page 881.

those who lived in rural areas, and those who had "no formal education/less than primary" compared with their counterparts.

SHS exposure at home ranged from 17.8% in Mexico to 72.3% in Vietnam (Table). In Brazil, prevalence of SHS exposure at home was significantly higher among women aged 15–24 years than among older women. In Bangladesh, Brazil, China, Egypt, India, Philippines, Thailand, Turkey, and Vietnam, the prevalence of SHS exposure at home was significantly higher among women living in rural areas compared with those living in urban areas. SHS exposure at work ranged from 11.0% in Uruguay to 53.0% in Egypt. In Bangladesh, India, and Philippines, prevalence of SHS exposure at work was significantly higher among women living in rural areas, whereas in Russia, prevalence of SHS at work was higher among women living in urban areas.

TABLE. (*Continued*) Prevalence of current tobacco smoking, smokeless tobacco, and secondhand smoke (SHS) exposure among women aged 15–49 years, by selected characteristics — Global Adult Tobacco Survey (GATS), 14 countries, 2008–2010

	India (N = 28,482)								Mexico (N = 5,546)							
	Tobacco smoking		Smokeless tobacco		SHS at home		SHS at work		Tobacco smoking		Smokeless tobacco		SHS at home		SHS at work	
Characteristic	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)
Overall	**1.6**	**(1.4–2.0)**	**14.9**	**(13.9–16.0)**	**39.3**	**(37.7–41.0)**	**19.0**	**(16.0–22.4)**	**8.3**	**(7.1–9.7)**	**0.4**	**(0.2–0.7)**	**17.8**	**(15.9–19.9)**	**13.9**	**(11.2–17.1)**
Age group (yrs)																
15–24	0.3	(0.2–0.6)	8.2	(7.1–9.5)*	39.2	(36.9–41.6)	13.9	(9.9–19.2)	7.5	(5.8–9.6)	0.5	(0.1–1.8)	19.9	(17.2–22.8)	14.1	(9.3–20.6)
25–34	1.3	(0.9–1.8)	14.8	(13.4–16.4)*	39.0	(36.9–41.2)	20.8	(16.2–26.1)	8.9	(7.1–11.0)	0.3	(0.1–1.0)	16.4	(13.7–19.6)	13.7	(9.6–19.1)
35–49	3.3	(2.7–4.1)	22.4	(20.8–24.1)*	39.7	(37.7–41.8)	21.7	(17.5–26.5)	8.7	(6.8–11.1)	0.2	(0.1–0.6)	17.0	(14.4–19.9)	14.0	(10.1–19.1)
Residence																
Urban	0.7	(0.5–1.0)	8.4	(7.5–9.5)*	29.0	(26.9–31.1)*	11.4	(8.9–14.3)*	10.0	(8.5–11.6)*	0.4	(0.2–0.9)	19.5	(17.2–22.1)*	14.0	(11.1–17.5)
Rural	2.0	(1.7–2.5)	17.6	(16.2–19.0)*	43.5	(41.4–45.7)*	26.5	(21.4–32.3)*	2.3	(1.6–3.2)*	0.1	(0.0–0.3)	11.5	(9.7–13.7)*	13.1	(8.0–20.7)
Education																
No formal education/ less than primary	3.2	(2.6–3.8)	23.4	(21.8–25.1)*	47.8	(45.7–49.9)*	31.8	(25.7–38.6)*	3.6	(2.2–5.8)	0.2	(0.0–1.2)	12.2	(9.4–15.8)	9.8	(4.2–21.1)
Completed primary/ Less than secondary	0.4	(0.3–0.8)	11.0	(9.8–12.3)*	39.4	(37.0–41.8)*	21.9	(15.6–29.8)*	7.2	(5.4–9.5)	0.7	(0.2–2.8)	17.3	(13.9–21.3)	15.1	(9.2–23.9)
Completed secondary/ high school	0.2	(0.1–0.3)	4.2	(3.5–5.1)*	26.1	(23.8–28.6)*	9.9	(6.7–14.4)*	9.0	(7.5–10.8)	0.2	(0.1–0.4)	19.1	(16.7–21.7)	14.6	(11.0–19.2)
Completed college/ university or above	0.1	(0.0–0.3)	1.2	(0.8–1.9)*	17.4	(14.6–20.7)*	11.8	(8.3–16.5)*	12.9	(8.7–18.7)	1.0	(0.2–3.7)	18.2	(12.8–25.1)	12.1	(6.7–21.1)

See table footnotes on page 881.

TABLE. (*Continued*) Prevalence of current tobacco smoking, smokeless tobacco, and secondhand smoke (SHS) exposure among women aged 15–49 years, by selected characteristics — Global Adult Tobacco Survey (GATS), 14 countries, 2008–2010

	Philippines (N = 3,683)								Poland (N = 2,195)							
	Tobacco smoking		Smokeless tobacco		SHS at home		SHS at work		Tobacco smoking		Smokeless tobacco		SHS at home		SHS at work	
Characteristic	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)
Overall	**6.5**	**(5.6–7.6)**	**0.4**	**(0.3–0.8)**	**50.9**	**(48.4–53.3)**	**24.4**	**(20.9–28.2)**	**26.9**	**(24.9–28.9)**	**0.1**	**(0.0–0.5)**	**45.4**	**(42.7–48.1)**	**24.3**	**(21.2–27.8)**
Age group (yrs)																
15–24	3.0	(2.0–4.7)*	0.1	(0.0–0.6)	49.1	(44.8–53.3)	24.7	(18.1–32.8)	20.2	(16.3–24.7)*	0.3	(0.0–2.0)	47.8	(42.3–53.5)	24.6	(16.2–35.5)
25–34	6.7	(5.0–8.9)*	0.3	(0.1–0.9)	53.2	(49.4–57.0)	21.3	(16.0–27.6)	25.4	(21.9–29.2)*	0.1	(0.0–0.9)	41.1	(37.0–45.3)	24.2	(19.7–29.5)
35–49	10.1	(8.4–12.2)*	0.9	(0.5–1.6)	51.0	(47.7–54.3)	26.4	(21.5–32.0)	32.8	(29.6–36.3)*	NR	—	47.1	(43.4–50.9)	24.3	(20.2–29.0)
Residence																
Urban	7.0	(5.6–8.6)	0.2	(0.1–0.7)	41.4	(37.8–45.1)*	19.1	(15.2–23.7)*	28.7	(26.1–31.4)*	0.2	(0.0–0.9)	43.5	(39.9–47.2)	23.7	(19.7–28.2)
Rural	6.0	(4.8–7.4)	0.7	(0.4–1.3)	61.0	(57.7–64.2)*	33.7	(27.6–40.4)*	24.0	(21.1–27.1)*	NR	—	48.5	(44.7–52.3)	25.8	(21.2–30.9)
Education																
No formal education/ less than primary	15.4	(11.8–19.9)*	2.3	(1.2–4.3)	68.7	(62.8–74.1)	37.4	(25.1–51.7)	NR	—	NR	—	NR	—	NR	—
Completed primary/ less than secondary	7.2	(4.7–10.9)*	0.5	(0.1–2.3)	62.6	(56.6–68.2)	36.3	(23.0–52.1)	35.6	(26.8–45.4)	NR	—	65.5	(54.3–75.1)*	DS	—
Completed secondary/ high school	4.7	(3.6–6.0)*	0.1	(0.0–0.3)	50.1	(46.7–53.5)	25.6	(19.9–32.2)	28.1	(25.8–30.5)	0.1	(0.0–0.8)	48.1	(45.1–51.2)*	26.7	(22.8–30.9)*
Completed college/ university or above	4.2	(2.9–6.0)*	NR	—	36.3	(32.3–40.4)	18.0	(14.0–22.9)	22.0	(18.1–26.5)	0.2	(0.0–1.3)	33.1	(28.4–38.2)*	19.4	(15.2–24.4)*

See table footnotes on page 881.

Reported by

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TABLE. (*Continued*) Prevalence of current tobacco smoking, smokeless tobacco, and secondhand smoke (SHS) exposure among women aged 15–49 years, by selected characteristics — Global Adult Tobacco Survey (GATS), 14 countries, 2008–2010

	Russia (N = 2,937)								Thailand (N = 6,412)							
	Tobacco smoking		Smokeless tobacco		SHS at home		SHS at work		Tobacco smoking		Smokeless tobacco		SHS at home		SHS at work	
Characteristic	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)
Overall	**30.8**	**(27.8–34.0)**	**0.3**	**(0.1–0.7)**	**38.1**	**(35.2–40.9)**	**26.4**	**(23.4–29.6)**	**2.3**	**(1.9–2.7)**	**0.7**	**(0.5–1.1)**	**29.8**	**(27.7–32.0)**	**18.2**	**(16.0–20.6)**
Age group (yrs)																
15–24	32.6	(27.7–38.0)	0.3	(0.1–1.2)	37.5	(32.9–42.2)	25.4	(20.3–31.2)	1.4	(0.9–2.3)	NR	—	33.5	(28.8–38.6)	15.3	(9.8–23.0)
25–34	32.1	(28.1–36.4)	0.0	(0.0–0.2)	38.8	(34.4–43.3)	28.3	(23.6–33.5)	1.5	(1.0–2.1)	0.5	(0.2–1.2)	29.8	(26.4–33.4)	16.0	(12.9–19.7)
35–49	28.9	(24.9–33.2)	0.4	(0.1–1.5)	38.0	(33.9–42.2)	25.9	(22.0–30.3)	3.2	(2.5–4.1)	1.3	(0.9–2.0)	27.6	(25.4–30.0)	21.6	(18.1–25.7)
Residence																
Urban	33.5	(29.8–37.4)*	0.3	(0.1–0.9)	39.7	(36.3–43.2)*	27.7	(24.1–31.6)*	3.0	(2.4–3.6)	0.1	(0.0–0.4)	22.1	(20.4–23.8)*	17.7	(15.5–20.2)
Rural	22.2	(19.2–25.5)*	0.1	(0.0–0.3)	32.6	(28.8–36.7)*	21.7	(18.0–26.0)*	1.9	(1.5–2.6)	1.0	(0.7–1.6)	33.6	(30.5–36.7)*	18.5	(15.1–22.5)
Education																
No formal education/ less than primary	NR	—	NR	—	NR	—	NR	—	5.9	(4.4–7.8)	3.0	(1.9–4.9)	37.9	(33.8–42.2)	26.3	(19.0–35.2)
Completed primary/ less than secondary	DS	—	DS	—	DS	—	NR	—	2.3	(1.6–3.2)	0.6	(0.3–1.2)	33.0	(29.7–36.4)	27.7	(20.9–35.7)
Completed secondary/ high school	31.8	(28.6–35.1)	0.3	(0.1–1.0)	39.6	(36.3–42.9)	27.9	(24.3–31.8)	1.4	(1.0–2.0)	0.2	(0.0–0.7)	28.6	(25.4–32.1)	15.9	(12.8–19.6)
Completed college/ university or above	29.1	(24.3–34.3)	0.2	(0.0–1.2)	35.5	(31.0–40.2)	24.7	(20.4–29.5)	0.5	(0.1–1.8)	NR	—	15.0	(11.7–19.0)	14.5	(11.2–18.6)

See table footnotes on page 881.

TABLE. (*Continued*) Prevalence of current tobacco smoking, smokeless tobacco, and secondhand smoke (SHS) exposure among women aged 15–49 years, by selected characteristics — Global Adult Tobacco Survey (GATS), 14 countries, 2008–2010

	Turkey (N = 3,258)								Ukraine (N = 1,940)							
	Tobacco smoking		Smokeless tobacco		SHS at home		SHS at work		Tobacco smoking		Smokeless tobacco		SHS at home		SHS at work	
Characteristic	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)
Overall	**17.8**	**(16.3–19.4)**	**NA**	—	**61.0**	**(58.5–63.4)**	**28.9**	**(23.9–34.5)**	**17.7**	**(15.5–20.0)**	**0.0**	**(0.0–0.1)**	**26.4**	**(23.8–29.2)**	**22.2**	**(18.7–26.1)**
Age group (yrs)																
15–24	11.6	(9.1–14.6)	NA	—	65.0	(60.8–69.1)	32.7	(21.8–45.8)	15.4	(11.1–20.8)*	0.0	(0.0–0.3)	27.4	(22.1–33.5)	26.4	(17.4–37.8)
25–34	22.6	(20.0–25.4)	NA	—	58.3	(54.5–62.0)	26.9	(19.9–35.3)	23.4	(19.4–28.0)*	NR	—	24.7	(20.9–29.1)	21.7	(16.5–28.0)
35–49	19.0	(16.4–22.0)	NA	—	60.0	(56.6–63.2)	28.7	(21.3–37.4)	15.1	(12.4–18.4)*	NR	—	26.9	(23.0–31.1)	21.1	(16.9–26.1)
Residence																
Urban	20.9	(19.0–23.0)*	NA	—	58.9	(55.8–61.9)*	27.7	(22.1–34.1)	21.9	(19.0–25.0)*	NR	—	26.5	(23.2–30.1)	22.3	(18.2–27.0)
Rural	9.7	(7.8–12.0)*	NA	—	66.7	(62.6–70.5)*	34.9	(24.9–46.5)	7.2	(5.6–9.2)*	0.0	(0.0–0.4)	26.2	(22.8–30.0)	21.9	(16.9–27.9)
Education																
No formal education/ less than primary	11.7	(8.2–16.5)	NA	—	70.7	(65.6–75.4)*	27.6	(12.3–50.8)	DS		DS	—	DS	—	NR	—
Completed primary/ less than secondary	15.3	(13.3–17.6)	NA	—	62.2	(58.7–65.5)*	32.9	(24.1–43.0)	20.1	(6.2–49.0)	NR	—	34.6	(17.1–57.4)	DS	—
Completed secondary/ high school	26.3	(22.5–30.4)	NA	—	55.7	(51.2–60.2)*	31.6	(23.0–41.6)	18.1	(15.6–20.9)	0.0	(0.0–0.2)	29.7	(26.5–33.2)	23.4	(19.1–28.3)
Completed college/ university or above	20.3	(15.6–26.0)	NA	—	52.2	(44.9–59.3)*	22.7	(15.7–31.6)	15.6	(12.2–19.8)	NR	—	17.5	(13.6–22.2)	20.2	(15.1–26.5)

See table footnotes on page 881.

Editorial Note

This report examined current tobacco use and SHS exposure among women of reproductive age in 14 low- and middle-income countries during 2008–2010 using GATS data. These results indicate a wide variation by country in current tobacco smoking prevalence in reproductive-aged women. Study countries in Central and Eastern Europe and South America (Brazil, Poland, Russia, Turkey, Ukraine, and Uruguay) had the highest current tobacco smoking prevalences among reproductive-aged women. Only in Bangladesh and India was current smokeless tobacco use prevalent among women of reproductive age. In countries where tobacco use among reproductive-aged women was high, strategies are warranted

TABLE. (*Continued*) Prevalence of current tobacco smoking, smokeless tobacco, and secondhand smoke (SHS) exposure among women aged 15–49 years, by selected characteristics — Global Adult Tobacco Survey (GATS), 14 countries, 2008–2010

	Uruguay (N = 1,570)								Vietnam (N = 3,806)							
	Tobacco smoking		Smokeless tobacco		SHS at home		SHS at work		Tobacco smoking		Smokeless tobacco		SHS at home		SHS at work	
Characteristic	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)
Overall	**24.7**	**(21.8–27.8)**	**NR**	—	**36.6**	**(33.6–39.8)**	**11.0**	**(8.3–14.5)**	**0.8**	**(0.5–1.4)**	**0.3**	**(0.2–0.7)**	**72.3**	**(70.3–74.2)**	**40.7**	**(36.3–45.4)**
Age group (yrs)																
15–24	20.2	(15.6–25.8)	NR	—	42.0	(35.7–48.5)	16.0	(8.7–27.7)	0.3	(0.0–1.4)	NR	—	74.6	(70.9–78.0)	34.5	(26.4–43.6)
25–34	29.3	(24.5–34.7)	NR	—	35.5	(30.6–40.7)	11.4	(6.6–19.0)	0.4	(0.2–1.0)	0.1	(0.0–0.4)	71.3	(67.9–74.4)	41.2	(34.9–47.8)
35–49	24.8	(20.9–29.3)	NR	—	33.4	(28.8–38.3)	8.8	(5.9–12.9)	1.5	(0.9–2.7)	0.8	(0.4–1.8)	71.0	(68.3–73.6)	46.3	(39.7–52.9)
Residence																
Urban	25.0	(22.0–28.3)	NR	—	36.5	(33.3–39.9)	10.9	(8.1–14.6)	0.4	(0.2–0.9)	NR	—	60.8	(57.6–63.9)*	40.4	(35.6–45.3)
Rural	20.7	(15.3–27.3)	NR	—	38.1	(31.8–44.9)	13.7	(9.2–19.9)	1.0	(0.5–1.8)	0.5	(0.2–1.0)	77.6	(75.1–79.9)*	41.1	(33.7–48.9)
Education																
No formal education/ less than primary	47.0	(29.7–65.0)*	NR	—	47.4	(31.5–63.9)	DS	—	3.3	(1.7–6.1)	1.5	(0.6–3.8)	82.3	(78.3–85.7)*	41.5	(27.5–57.1)
Completed primary/ less than secondary	27.4	(22.9–32.5)*	NR	—	40.0	(35.1–45.1)	12.5	(7.0–21.3)	0.8	(0.3–1.9)	0.1	(0.0–0.4)	73.5	(70.1–76.7)*	45.0	(35.3–55.2)
Completed secondary/ high school	23.6	(19.7–27.9)*	NR	—	35.0	(31.0–39.3)	11.7	(8.3–16.2)	0.1	(0.0–0.3)	0.1	(0.0–0.5)	71.1	(68.4–73.7)*	40.5	(34.5–46.8)
Completed college/ university or above	16.3	(11.0–23.3)*	NR	—	32.2	(22.1–44.3)	5.2	(1.9–14.0)	0.5	(0.1–1.9)	NR	—	50.2	(45.0–55.5)*	36.8	(31.1–42.7)

Abbreviations: CI = confidence interval; DS = data suppressed because cell size <25; NR = no reported cases; NA = not applicable (GATS countries have varying educational systems. Based on the questionnaire categories used in each country, four approximately comparable categories were created. However, Brazil's educational categories were not comparable. No question about smokeless tobacco use was asked in Turkey.).
* Statistical signficance with z-test at p<0.05.

to increase tobacco cessation and to prevent initiation. In countries where tobacco use was low (≤2%), preventing smoking initiation among reproductive-aged women can play an important role in maintaining low prevalence of use.

In countries where most women are nonsmokers, such as Bangladesh, China, Egypt, India, and Vietnam, prevalence of SHS exposure at home was high. The highest prevalence of exposure was in Vietnam, where nearly three in four women reported SHS exposure at home. This high prevalence of SHS exposure is largely the result of high smoking prevalence among men (*5*). Population-based interventions that decrease tobacco smoking and SHS exposure among men, as well as women, might play an important role in reducing overall SHS exposure. For example, studies conducted in high-income countries have shown that implementation of comprehensive national smoke-free laws have changed social norms toward avoiding SHS and have resulted in increases in the percentage of households that have adopted smoke-free rules (*6*).

The findings in this report are subject to at least three limitations. First, all tobacco exposure data were self-reported and might be subject to misclassification. Second, this analysis included only use of traditional tobacco products and did not assess use of novel tobacco products, such as snus[††] or dissolvables, which might be appealing for young and female smokers (*7*). Finally, other potential locations where SHS exposure could occur, such as in public places other than work and in passenger vehicles, were not included.

Among women of reproductive age, current tobacco smoking prevalence varied by country, current smokeless tobacco use was prevalent in only two countries, and SHS exposure at home and at work was prevalent in all countries. In the sample countries, 92 million women were current tobacco users (smoked or smokeless), and approximately half of reproductive-aged women, representing 470 million women, were exposed to SHS in the home. An estimated 62 million births occur annually in these 14 study countries (*4*), highlighting the need to protect reproductive-aged women from the harms of tobacco and to promote their health and the well-being of their children (*8*). In 2010, the United Nations passed a resolution encouraging member states to implement effective tobacco control programs to protect the health of children and pregnant women.[§§] Evidence-based tobacco control strategies outlined in the WHO MPOWER framework, as part of the WHO Framework Convention on Tobacco Control (an international treaty that presents a blueprint for countries to reduce both supply of and demand for tobacco),[¶¶] can prevent or reduce tobacco use and SHS exposure in reproductive-aged women (*9*). These strategies include monitoring tobacco use

[††] Snus is a small pouch of smokeless tobacco. Unlike traditional or other forms of smokeless tobacco, snus does not require those who use it to dip or spit the tobacco.

[§§] Resolution 2010/8. Tobacco use and maternal and child health. Available at http://www.un.org/en/ecosoc/docs/2010/res%202010-8.pdf.

[¶¶] Additional information about MPOWER is available at http://www.who.int/tobacco/mpower/en. Additional information about the WHO Framework Convention on Tobacco Control is available at http://www.who.int/fctc/en.

What is already known on this topic?

Tobacco use and secondhand smoke (SHS) exposure in reproductive-aged women can cause adverse reproductive health outcomes.

What is added by this report?

Among reproductive-aged women in 14 low- and middle-income countries participating in the 2008–2010 Global Adult Tobacco Survey, current tobacco smoking prevalence ranged from 0.4% in Egypt to 30.8% in Russia. Current smokeless tobacco use was <1% in most countries, but common in Bangladesh (20.1%) and India (14.9%), and SHS exposure at home was common across all countries, ranging from 17.8% in Mexico to 72.3% in Vietnam.

What are the implications for public health practice?

Levels of exposure of pregnant women to SHS in many countries are sufficient to threaten the health of their unborn children. Implementation of evidence-based tobacco control strategies recommended by the World Health Organization Framework Convention on Tobacco Control can help reduce tobacco use and SHS exposure in reproductive-aged women and promote their health and the well-being of their children.

and prevention policies; offering assistance to quit; protecting persons from exposure to SHS; warning about the dangers of tobacco; enforcing bans on advertising, promotion, and sponsorship; and raising prices and taxes on tobacco products.

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Global Routine Vaccination Coverage, 2011

In 1974, the World Health Organization (WHO) established the Expanded Programme on Immunization (EPI) to ensure all children had access to routinely recommended vaccines. Initially, those vaccines were limited to bacille Calmette-Guérin vaccine (BCG), diphtheria-tetanus-pertussis vaccine (DTP), oral poliovirus vaccine, and measles-containing vaccine (MCV). Global coverage with the third dose of DTP (DTP3) increased from <5% in 1974 to 79% by 2005. However, one fifth of the world's children, especially those in low-income countries, still were not fully vaccinated during the first year of life with the four traditional EPI vaccines (*1*). In 2005, WHO and the United Nations Children's Fund (UNICEF) developed the Global Immunization Vision and Strategy (GIVS) to improve national immunization programs and decrease vaccine-preventable disease–associated morbidity and mortality (*2*). A goal was to reach a sustained national DTP3 coverage of 90% in all countries. This report summarizes global routine vaccination coverage during 2011. An estimated 83% of infants worldwide received at least 3 doses of DTP in 2011, similar to coverage in 2009 (82%) and 2010 (85%). Among 194 WHO member states, 130 (67%) achieved ≥90% national DTP3 coverage. More than half of all incompletely vaccinated children (i.e., those who did not receive DTP3) lived in one of three countries: India (32%), Nigeria (14%), and Indonesia (7%). Strengthening routine immunization services, especially in countries with the greatest number of undervaccinated children, should be a global priority to help achieve the fourth Millennium Development Goal of reducing mortality among children aged <5 years by two thirds from 1990 to 2015.

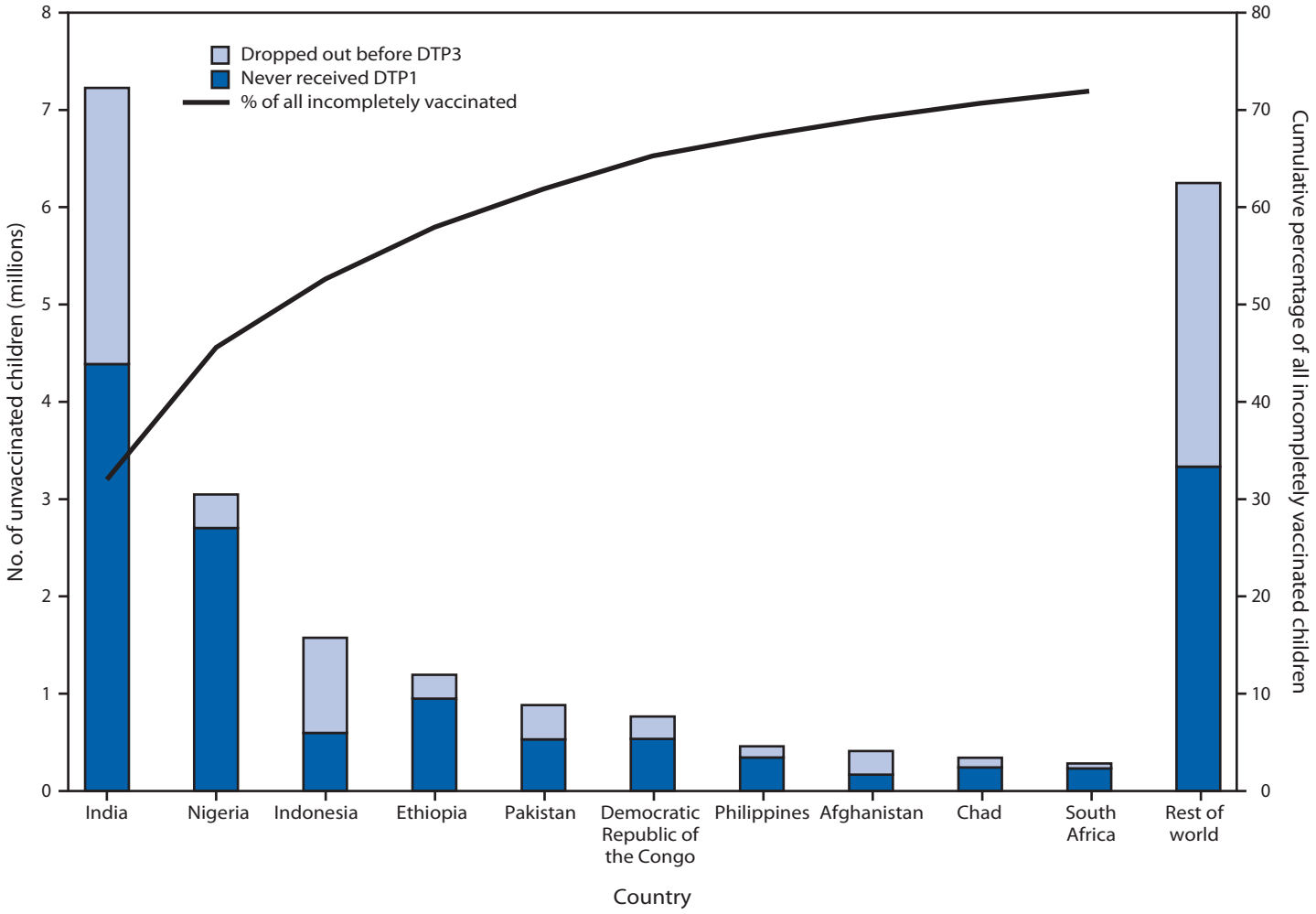
Vaccination coverage is calculated as the percentage of those in the target age group who received a dose of a recommended vaccine by a given age. DTP3 coverage by age 12 months is a key indicator of immunization program performance, but coverage with other vaccines, such as the third dose of polio vaccine (Polio3) or first dose of measles-containing vaccine (MCV1), also are indicators. Administrative coverage estimates are derived by dividing number of vaccine doses administered to children in the target age group by the estimated target population. These are reported annually to WHO and UNICEF by 194 WHO member states through the Joint Reporting Form (*3*). More precise estimates of vaccination coverage can be obtained from coverage surveys of a representative sample of households to identify children in the target age group. Dates of receipt of vaccine doses are copied from the child's vaccination card. If the card is not available, a caregiver is asked to recall whether the child received a particular vaccine dose. WHO and UNICEF derive national estimates of vaccination coverage through an annual country-by-country review of all available data, which can lead to revision of past coverage estimates (*4*). These estimates are updated and published annually on the WHO website (*5*).

Estimated global DTP3 coverage among children aged <12 months in 2011 was 83%, ranging from 71% in the African Region to 96% in the Western Pacific Region, and representing 106.8 million vaccinated children (Table). Estimated global coverage for BCG, Polio3, and MCV1 was 88%, 84%, and 84%, respectively. During 2011, 130 (67%) countries achieved ≥90% national DTP3 coverage, and 46 (24%) achieved the GIVS goal of ≥80% DTP3 coverage in every district or equivalent administrative unit. DTP3 coverage was 80%–89% in 32 (17%) countries, 70%–79% in 13 (7%) countries, and <70% in 19 (10%) countries.

Among the 22.4 million children who did not receive 3 DTP doses during the first year of life, 11.8 million (53%) lived in three countries, India (32%), Nigeria (14%), and Indonesia (7%), and 16.2 million (72%) lived in 10 countries (Figure). Nearly 14 million (62%) of these children did not receive the first dose of DTP, whereas 8.4 million (38%) started, but did not complete the 3-dose DTP series.

Beyond the traditional four EPI vaccines, several newer vaccines are increasingly utilized by national immunization programs. By the end of 2011, hepatitis B vaccine had been introduced into routine childhood vaccination schedules in 180 (93%) countries; 94 (52%) countries recommended the first dose within 24 hours of birth to prevent perinatal transmission. Worldwide coverage (including countries that have not yet introduced the vaccine) with 3 doses of hepatitis B vaccine was 75% and ranged from 56% in the South-East Asia Region to 91% in the Western Pacific Region (Table). Coverage with 3 doses of *Haemophilus influenzae* type b vaccine, which had been introduced into 177 (91%) countries by 2011, was 43% globally, ranging from 11% (South-East Asia Region) to 90% (Americas Region). By 2011, rotavirus vaccine had been introduced in 31 (16%) countries, and pneumococcal conjugate vaccine (PCV) in 73 (39%) countries. Coverage with completed rotavirus vaccination series was 9% globally, but reached 66% in the Americas Region. Coverage with 3 doses of PCV was 12% globally and was highest (43%) in the Americas Region.

FIGURE. Estimated number of children who, during the first year of life, did not receive the first dose of diphtheria-tetanus-pertussis vaccine (DTP1) or dropped out before completing the 3-dose series (DTP3), among the 10 countries with the largest numbers of incompletely vaccinated children, and the percentage of all incompletely vaccinated children worldwide represented by the 10 countries, 2011



Reported by

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Editorial Note

In 2011, nearly 107 million infants (83%) worldwide received at least 3 doses of DTP vaccine; however, approximately 22.4 million failed to receive 3 doses, leaving large numbers of children susceptible to vaccine-preventable diseases and death. Two thirds of countries achieved the GIVS target of 90% national DTP3 coverage; however, high national coverage might mask suboptimal coverage at lower administrative levels. Only 24% of countries achieved the GIVS goal of >80% DTP3 coverage in every district.

Administrative coverage estimates are convenient and timely, but might overestimate or underestimate coverage if inaccuracies occur in the numerator (number of doses administered) or denominator (populations based on census data). Although coverage surveys are not dependent on knowing target population size or on other administrative data sources, they are costly, and because they are retrospective, they are not timely. However, coverage surveys are useful for validating administrative data and for monitoring coverage at different administrative levels, to aid in identifying areas of low coverage. WHO recommends that countries conduct regular vaccination coverage surveys to validate reported administrative coverage (*6*). A WHO advisory committee recommends validation of vaccination coverage estimates, ideally using multiple external data sources such as serosurveys and morbidity and mortality data (*6*).

TABLE. Vaccination coverage estimates, by vaccine and World Health Organization (WHO) region* — worldwide, 2011

WHO region	Vaccination coverage (%)							
	BCG	DTP3	Polio3	MCV1	HepB3	Hib3	PCV3	Rota last†
Worldwide	**88**	**83**	**84**	**84**	**75**	**43**	**12**	**9**
African	80	71	76	75	71	61	12	2
Americas	95	92	93	92	90	90	43	66
Eastern Mediterranean	86	85	83	83	83	57	10	6
European	94	94	94	94	77	76	30	0
South-East Asia	88	75	74	79	56	11	—	—
Western Pacific	97	96	96	96	91	14	1	1

Abbreviations: BCG = bacille Calmette-Guérin; 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, PCV3 = 3 doses of pneumococcal-containing vaccine; Rota last = last dose of rotavirus series (2-dose or 3-dose series).
* Weighted regional average.
† Second or third dose of rotavirus vaccine, depending on the vaccine presentation.

Among all incompletely vaccinated children worldwide, 14 million (62%) had not received the first DTP dose. Nearly 8.4 million received at least 1 DTP dose, but dropped out before completing the 3-dose series. Factors associated with undervaccination might be different from those associated with nonvaccination (*7*). For example, immunization system issues are reported more commonly with undervaccination, whereas access to services, parental attitudes, knowledge, and practices appear to play a greater role among children who have not received any vaccination. For improvements in global vaccination coverage to occur, multifaceted and tailored strategies will be required by countries to address factors contributing to incomplete infant vaccination, particularly in countries with the largest numbers of unvaccinated children.

More than half of incompletely vaccinated children live in three countries (India, Nigeria, and Indonesia). Focusing routine immunization efforts in countries with the highest number of unvaccinated children might substantially reduce the number of susceptible children worldwide and limit the occurrence and spread of vaccine-preventable disease outbreaks. In May 2012, as part of the Decade of Vaccines launched in 2010, a global vaccine action plan was endorsed by all WHO member states at the World Health Assembly (*8*). Meeting routine vaccination coverage targets in every region, country, and community worldwide is a major goal of this plan.

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 2011, estimated global coverage with the third dose of diphtheria-tetanus-pertussis vaccine (DTP) was 83%. Three countries (India, Nigeria, and Indonesia) accounted for 53% of the 22.4 million children who had not received 3 doses of DTP during the first year of life. Global coverage with other recommended vaccines was 88% for bacille Calmette-Guérin vaccine, 84% for the third dose of poliovirus vaccine, 84% for the first dose of measles-containing vaccine, 75% for the third dose of hepatitis B vaccine, and 43% for the third dose of *Haemophilus influenzae* type b vaccine. Among all incompletely vaccinated children, 62% had never received the first dose of DTP vaccine.

What are the implications for public health practice?

Although progress continues to be made, 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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Errata

Vol. 61, No. RR-4

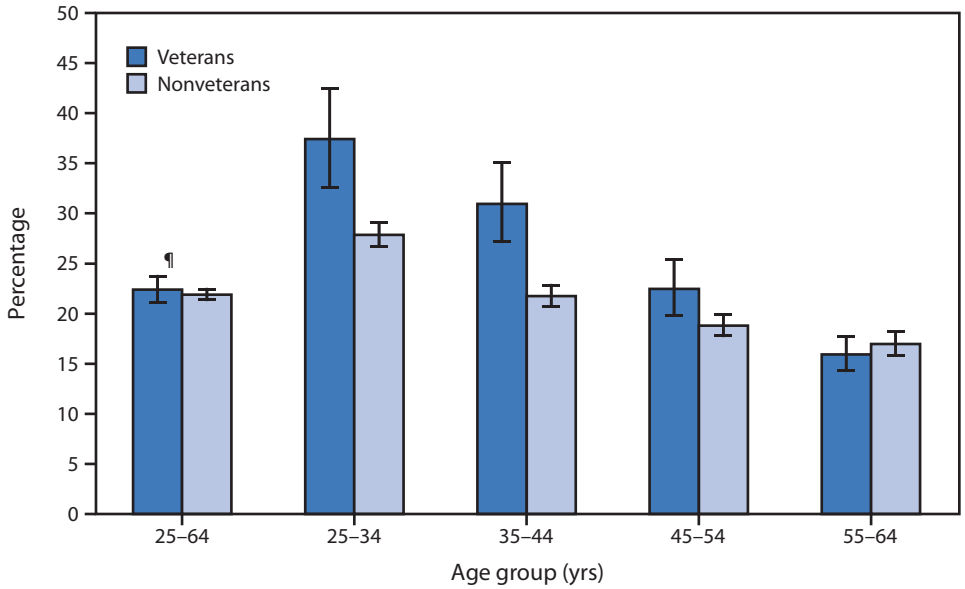
In the *MMWR* Recommendations and Reports, "Recommendations for the Identification of Chronic Hepatitis C Infection Among Persons Born During 1945–1965," two errors occurred on page 10. Under the heading "All-Cause Mortality," 10 lines from the bottom, the parenthetical wording should read: "**(Genotype 1 only: relative risk [RR] = 0.7; 95% CI = 0.59–0.83).**" The original text erroneously presented the results from a post-hoc pooled analysis conducted by CDC. The correction reflects the findings of the cited study.

Under the heading "Sustained Virologic Response," the third sentence should read: "**Newer direct-acting antiviral agents increase the chance of SVR from an average of 41.3% for pegylated interferon and ribavirin therapy to approximately 70% with triple therapy (pooled risk difference: 28%; 95% CI = 24%–32%).**" The original text erroneously presented the findings of the cited studies as a relative risk. This correction accurately describes the findings as a pooled risk difference.

QuickStats

FROM THE NATIONAL CENTER FOR HEALTH STATISTICS

Leisure-Time Physical Activity* Among Men Aged 25–64 Years, by Age Group and Veteran Status† — National Health Interview Survey, United States, 2007–2010§



* Defined as participating in aerobic and muscle-strengthening activities that meet the federal 2008 Physical Activity Guidelines for Americans; available at http://www.health.gov/paguidelines.
† Veterans identified themselves by responding yes to the question: "Have you ever been honorably discharged from active duty in the U.S. Army, Navy, Air Force, Marine Corps, or Coast Guard?"
§ Estimates are based on household interviews of a sample of the civilian, noninstitutionalized U.S. population and are derived from the National Health Interview Survey sample adult component.
¶ 95% confidence interval.

During 2007–2010, higher percentages of male veterans than nonveterans aged 25–34 years (37% versus 28%), 35–44 years (31% versus 22%), and 45–54 years (22% versus 19%) participated in leisure-time physical activities that met the federal 2008 Physical Activity Guidelines for Americans. Little difference was observed between veterans and nonveterans in the 55–64 years age group. Levels of leisure-time physical activity decreased with age among both veterans and nonveterans.

Source: National Health Interview Survey, 2007–2010. Available at http://www.cdc.gov/nchs/nhis.htm.

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

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