



# MMWR™

## Morbidity and Mortality Weekly Report

[www.cdc.gov/mmwr](http://www.cdc.gov/mmwr)

Weekly

January 25, 2008 / Vol. 57 / No. 3

### Influenza-Testing and Antiviral-Agent Prescribing Practices — Connecticut, Minnesota, New Mexico, and New York, 2006–07 Influenza Season

Influenza is a major cause of morbidity and mortality in the United States, with an average of 36,000 deaths attributed to the disease annually (1). Patients with influenza-like illness (ILI) often are evaluated by their primary-care physicians (PCPs). Antiviral therapy initiated within 48 hours of ILI symptom onset can shorten the course of influenza illness; antiviral therapy also is used as chemoprophylaxis for influenza, particularly in institutions and communities (2). Early laboratory diagnosis and knowing when influenza is circulating in the community can guide effective clinical management. To assess influenza-testing and antiviral-agent prescribing practices during the 2006–07 influenza season, personnel at four of 10 Emerging Infections Program (EIP) sites with influenza hospitalization surveillance surveyed PCPs. This report describes the results of that survey, which indicated that 69.0% of the PCPs administered influenza tests to patients who had ILI during the influenza season and 53.8% prescribed antiviral agents, including two (i.e., amantadine and rimantadine) no longer recommended by CDC. Health agencies, medical societies, and continuing medical education organizations should advance programs for physicians that increase awareness of recommendations regarding appropriate influenza testing and use of antiviral agents.

EIP is a network of state health departments, academic institutions, and local collaborators funded by CDC to assess the effect of emerging infections and evaluate methods for their prevention and control.\* EIP personnel identified PCPs (defined as physicians in family practice, internal medicine, obstetrics/gynecology, or pediatrics) via

state licensure databases. Random sampling was used to select a representative sample for each PCP type<sup>†</sup> from the following EIP sites: Connecticut (New Haven County); Minnesota (seven counties in the Minneapolis/St. Paul metropolitan area); New Mexico (four counties including the Albuquerque and Las Cruces metropolitan areas); and New York (15 counties in the Albany and Rochester metropolitan areas). A self-administered survey was mailed to PCPs in March–April 2007, with a second mailing to nonresponders in May–June, and a repeat mailing or fax in July–August. Participants were asked whether, since October 2006, they had evaluated patients with ILI (defined as a temperature of  $\geq 100.0^{\circ}\text{F}$  [ $\geq 37.8^{\circ}\text{C}$ ] with a cough or sore throat) and whether they provided direct patient care  $\geq 8$  hours per week. Participants were asked to indicate whether they tested patients for influenza and, if so, which test types were used (i.e., viral culture, serology, or rapid antigen) and which types of rapid antigen

<sup>†</sup> Sampling was conducted among physicians licensed in family practice, internal medicine, obstetrics/gynecology, or pediatrics, regardless of whether they also were licensed in other specialties. However, to better focus data analysis on practices among front-line, primary-care physicians, any physicians who reported other specialties or subspecialties in addition to or instead of any of the four designated PCP groups were excluded from the final analysis.

#### INSIDE

- 65 Knowledge and Practices of Obstetricians and Gynecologists Regarding Cytomegalovirus Infection During Pregnancy — United States, 2007
- 69 Multistate Outbreak of Human *Salmonella* Infections Associated with Exposure to Turtles — United States, 2007–2008
- 72 Notices to Readers
- 74 QuickStats

\* Additional information is available at <http://www.cdc.gov/ncidod/osr/site/eip/index.htm>.

The *MMWR* series of publications is published by the Coordinating Center for Health Information and Service, Centers for Disease Control and Prevention (CDC), U.S. Department of Health and Human Services, Atlanta, GA 30333.

**Suggested Citation:** Centers for Disease Control and Prevention. [Article title]. *MMWR* 2008;57:[inclusive page numbers].

### Centers for Disease Control and Prevention

Julie L. Gerberding, MD, MPH  
*Director*

Tanja Popovic, MD, PhD  
*Chief Science Officer*

James W. Stephens, PhD  
*Associate Director for Science*

Steven L. Solomon, MD  
*Director, Coordinating Center for Health Information and Service*

Jay M. Bernhardt, PhD, MPH  
*Director, National Center for Health Marketing*

Katherine L. Daniel, PhD  
*Deputy Director, National Center for Health Marketing*

### Editorial and Production Staff

Frederic E. Shaw, MD, JD  
*Editor, MMWR Series*

Suzanne M. Hewitt, MPA  
*Managing Editor, MMWR Series*

Douglas W. Weatherwax  
*Lead Technical Writer-Editor*

Catherine H. Bricker, MS  
Jude C. Rutledge  
*Writers-Editors*

Beverly J. Holland  
*Lead Visual Information Specialist*

Lynda G. Cupell  
Malbea A. LaPete  
*Visual Information Specialists*

Quang M. Doan, MBA  
Erica R. Shaver  
*Information Technology Specialists*

### Editorial Board

William L. Roper, MD, MPH, Chapel Hill, NC, Chairman

Virginia A. Caine, MD, Indianapolis, IN

David W. Fleming, MD, Seattle, WA

William E. Halperin, MD, DrPH, MPH, Newark, NJ

Margaret A. Hamburg, MD, Washington, DC

King K. Holmes, MD, PhD, Seattle, WA

Deborah Holtzman, PhD, Atlanta, GA

John K. Iglehart, Bethesda, MD

Dennis G. Maki, MD, Madison, WI

Sue Mallonee, MPH, Oklahoma City, OK

Stanley A. Plotkin, MD, Doylestown, PA

Patricia Quinlisk, MD, MPH, Des Moines, IA

Patrick L. Remington, MD, MPH, Madison, WI

Barbara K. Rimer, DrPH, Chapel Hill, NC

John V. Rullan, MD, MPH, San Juan, PR

Anne Schuchat, MD, Atlanta, GA

Dixie E. Snider, MD, MPH, Atlanta, GA

John W. Ward, MD, Atlanta, GA

tests were used (i.e., point-of-care testing or off-site testing<sup>§</sup>). Participants also were asked whether they had prescribed antiviral agents since October 2006 and, if so, which types of antiviral agents they prescribed. In addition, PCPs were asked their reason for testing patients for influenza. Finally, physicians who were not involved in direct patient care  $\geq 8$  hours per week, had not evaluated patients with ILI, reported any subspecialty, or reported a specialty other than family practice, internal medicine, obstetrics/gynecology, or pediatrics were excluded from the analysis. Chi-square tests were used to compare percentages by PCP type, practice setting (i.e., outpatient versus hospital based), years in practice, and state.

Of 2,679 physicians surveyed, 1,262 (47.1%) responded; of these, 730 (57.8%) met the inclusion criteria: 268 (36.7%) in family practice, 213 (29.2%) in internal medicine, 204 (27.9%) in pediatrics, and 45 (6.2%) in obstetrics/gynecology (Table 1). Overall, 504 (69.0%) PCPs ordered an influenza test during the 2006–07 influenza season; 444 (88.0%) ordered rapid antigen testing; 95 (18.8%) ordered viral culture; and 32 (6.3%) ordered serology. The most commonly cited reasons for ordering an influenza test were to determine etiology of the illness (56.5%) and to determine appropriateness for antiviral treatment (30.8%) (Table 1). The proportion of participants who ordered influenza testing varied by PCP type: pediatrics, 75.5%; internal medicine, 73.2%; and family practice, 69.8%. The number of participants in obstetrics/gynecology who ordered influenza testing was too small for a reliable estimate (Table 1). The proportion of participants who ordered influenza testing also varied by state: Minnesota, 87.1%; New York, 59.9%; Connecticut, 59.0%; and New Mexico, 55.0% (Table 2). PCPs in practice  $>10$  years were less likely (66.4%) to order an influenza test than PCPs in practice  $\leq 10$  years (76.0%) ( $p < 0.05$ ).

Among PCPs who ordered influenza testing, use of rapid antigen testing was highest in Minnesota, followed by New York, Connecticut, and New Mexico (93.4%, 86.4%, 84.7%, and 70.4%, respectively) (Table 2). Of the 504 PCPs who ordered influenza testing, 275 (54.5%) ordered off-site rapid antigen testing, and 250 (49.6%) ordered point-of-care rapid antigen testing (Table 1). Use of off-site rapid antigen testing was highest in New York (76.2%) and New Mexico (56.8%), followed by Minnesota (41.0%), and Connecticut (32.6%) (Table 2). For point-of-care rapid antigen testing, use was highest in Minnesota (75.9%) and

<sup>§</sup> Point-of-care testing occurs when a sample is collected and analysis is performed in a physician's office or clinic setting. Off-site testing occurs when a sample is collected in a physician's office or clinic setting but sent to a laboratory for analysis.

**TABLE 1. Influenza-testing and antiviral-agent prescribing practices, by primary-care physician (PCP)\* type — Emerging Infections Program survey, Connecticut, Minnesota, New Mexico, and New York, 2006–07 influenza season**

Characteristic	Family practice			Internal medicine			Obstetrics/Gynecology			Pediatrics			Total		
	No.	(%)	(95% CI) <sup>†</sup>	No.	(%)	(95% CI)	No.	(%)	(95% CI)	No.	(%)	(95% CI)	No.	(%)	(95% CI)
<b>Total<sup>§</sup></b>	<b>268</b>	<b>(100.0)</b>	<b>NA<sup>††</sup></b>	<b>213</b>	<b>(100.0)</b>	<b>NA</b>	<b>45</b>	<b>(100.0)</b>	<b>NA</b>	<b>204</b>	<b>(100.0)</b>	<b>NA</b>	<b>730</b>	<b>(100.0)</b>	<b>NA</b>
<b>Practice setting</b>															
Outpatient based <sup>§</sup>	181	(67.5)	(61.9–73.4)	123	(57.7)	(51.1–64.4)	30	(66.7)	(52.9–80.4)	146	(71.6)	(65.4–77.8)	480	(65.7)	(62.3–69.2)
Hospital based	47	(17.5)	(13.0–22.1)	28	(13.1)	(8.6–17.7)	7	— <sup>**</sup>	—	39	(19.1)	(13.7–24.5)	121	(16.5)	(13.9–19.3)
Other/Unknown <sup>§</sup>	40	(14.9)	(10.7–19.2)	62	(29.1)	(23.0–35.2)	8	—	—	19	(9.3)	(5.3–13.3)	129	(17.6)	(14.9–20.4)
<b>Test patients for influenza<sup>§</sup></b>	187	(69.8)	(64.3–75.3)	156	(73.2)	(67.3–79.2)	7	—	—	154	(75.5)	(69.6–81.4)	504	(69.0)	(65.7–72.4)
<b>Reason for testing patients for influenza</b>															
Decide on antiviral treatment <sup>§</sup>	66	(35.3)	(28.4–42.1)	56	(35.9)	(28.4–43.4)	2	—	—	31	(20.1)	(13.8–26.5)	155	(30.8)	(26.7–34.8)
Desire to know etiology <sup>§</sup>	100	(53.5)	(46.3–60.6)	79	(50.6)	(42.8–58.5)	3	—	—	103	(66.9)	(59.5–74.3)	285	(56.5)	(52.2–60.9)
Decide whether to admit to hospital	0	NA	NA	1	—	—	0	NA	NA	0	NA	NA	1	—	—
Other/Unknown	21	(11.2)	(6.7–15.8)	20	(12.8)	(7.6–18.1)	2	—	—	20	(13.0)	(7.7–18.3)	63	(12.5)	(9.6–15.4)
<b>Influenza test types (among those who tested)<sup>††</sup></b>															
Viral culture <sup>§</sup>	31	(16.5)	(11.3–21.9)	38	(24.3)	(17.6–31.1)	2	—	—	24	(15.5)	(9.9–21.3)	95	(18.8)	(15.4–22.3)
Serology	13	(6.9)	(3.3–10.6)	14	(8.9)	(4.5–13.5)	2	—	—	3	—	—	32	(6.3)	(4.2–8.5)
Rapid antigen <sup>§§</sup>	164	(87.7)	(83.0–92.4)	134	(85.8)	(80.4–91.4)	6	(85.7)	(59.8–100.0)	140	(90.9)	(86.4–95.5)	444	(88.0)	(85.3–90.9)
Off-site testing	104	(55.6)	(48.5–62.7)	90	(57.6)	(49.9–65.4)	5	(71.4)	(38.0–100.0)	76	(49.3)	(41.5–57.3)	275	(54.5)	(50.2–58.9)
Point-of-care testing	91	(48.6)	(41.5–55.8)	76	(48.7)	(40.9–56.6)	3	—	—	80	(51.9)	(44.1–59.8)	250	(49.6)	(45.2–54.0)
<b>Prescribe antiviral agent<sup>§</sup></b>	178	(66.4)	(60.8–72.1)	125	(58.7)	(52.1–65.3)	5	—	—	85	(41.7)	(34.9–48.4)	393	(53.8)	(50.2–57.5)
<b>Type of agent<sup>††</sup></b>															
Amantadine	34	(19.1)	(13.3–24.9)	22	(17.6)	(10.9–24.3)	2	—	—	12	(14.1)	(6.7–21.5)	70	(17.8)	(14.0–21.6)
Rimantadine	19	(10.7)	(6.1–15.2)	9	—	—	0	NA	NA	6	—	—	34	(8.7)	(5.9–11.4)
Oseltamivir	161	(90.4)	(86.1–94.8)	109	(87.2)	(81.3–93.1)	2	—	—	70	(82.4)	(74.3–90.5)	342	(87.0)	(83.7–90.3)
Zanamivir	8	—	—	8	—	—	1	—	—	4	—	—	21	(5.3)	(3.1–7.6)

\* PCPs were defined as those who were involved in direct patient care ≥8 hours per week, who evaluated patients with influenza-like illness, and who did not report a specialty or subspecialty other than family practice, internal medicine, obstetrics/gynecology, or pediatrics.

<sup>†</sup> Confidence interval.

<sup>§</sup> Significant differences among PCP types by chi-square test; p<0.05.

<sup>††</sup> Not applicable.

<sup>\*\*</sup> Relative standard error is >30%; point estimate is not reliable.

<sup>†††</sup> Respondents were asked to identify all that apply.

<sup>§§</sup> Respondents were asked about each type separately.

Connecticut (56.5%), followed by New York (29.5%), and New Mexico (20.0%) (Table 2).

Among all 730 eligible PCPs, 393 (53.8%) prescribed antiviral agents to at least some patients with ILI. Differences were observed by PCP type: family practice, 66.4%; internal medicine, 58.7%; and pediatrics, 41.7%. The number of participants in obstetrics/gynecology who prescribed antiviral agents was too small for a reliable estimate (Table 1). Differences also were observed by state: Minnesota, 62.0%; New York, 50.2%; Connecticut, 48.7%; New Mexico, 46.3% (Table 2); and practice setting (58% of outpatient-based PCPs versus 30% of hospital-based PCPs (p<0.001).

PCPs were asked to identify all antiviral agents they prescribed; 87.0% prescribed oseltamivir, 17.8% amantadine, 8.7% rimantadine, and 5.3% zanamivir (Table 1). Amantadine use was highest in New Mexico (43.2%), followed by Minnesota (16.6%) and New York (14.2%). Use of oseltamivir was highest in Connecticut (94.7%), followed by Minnesota, New York, and New Mexico (90.2%, 85.8%, and 70.3%, respectively) (Table 2).

**Reported by:** D Fazio, A Laufer, MPH, J Meek, MPH, J Palumbo, MS, Yale Univ, New Haven, Connecticut. R Lynfield, MD, C Morin, MPH, K Vick, Minnesota Dept of Health. J Baumbach, MD, M Mueller, MPH, New Mexico Dept of Health. R Belflower, C Long, MPH, Univ of Rochester, Rochester, New York. Emerging Infections Program; L Kamimoto, MD, Influenza Div National Center for Immunization and Respiratory Diseases, CDC.

**Editorial Note:** Influenza testing can aid in timely diagnosis and guide clinical management of patients with ILI by early identification of patients who might benefit from antiviral therapy. Diagnostic tests available for detecting influenza virus include viral culture, polymerase chain reaction, immunofluorescence, and rapid antigen testing. The number of rapid antigen tests for influenza has increased from six tests approved by the Food and Drug Administration in 2003 to 15 tests in 2007 (3,4). This survey determined that the majority of PCPs ordered influenza testing and among those who did, approximately 90% ordered rapid antigen testing.

Many rapid antigen tests for influenza can be performed by nonlaboratorians in office settings (3,4). This might explain why PCPs report such high usage of point-of-care rapid antigen tests. However, the benefit of obtaining results quickly must be weighed against the low sensitivi-

**TABLE 2. Influenza-testing and antiviral-agent prescribing practices of primary-care physicians (PCP),\* by state — Emerging Infections Program survey, Connecticut, Minnesota, New Mexico, and New York, 2006–07 influenza season**

Characteristic	Connecticut			Minnesota			New Mexico			New York			Total		
	No.	(%)	(95% CI) <sup>†</sup>	No.	(%)	(95% CI)	No.	(%)	(95% CI)	No.	(%)	(95% CI)	No.	(%)	(95% CI)
<b>Total<sup>§</sup></b>	<b>78</b>	<b>(100.0)</b>	<b>NA<sup>†</sup></b>	<b>263</b>	<b>(100.0)</b>	<b>NA</b>	<b>80</b>	<b>(100.0)</b>	<b>NA</b>	<b>309</b>	<b>(100.0)</b>	<b>NA</b>	<b>730</b>	<b>(100.0)</b>	<b>NA</b>
<b>Practice setting</b>															
Outpatient based <sup>§</sup>	53	(67.9)	(57.6–78.3)	179	(68.1)	(62.4–73.7)	38	(47.5)	(36.6–58.4)	210	(68.0)	(62.8–73.2)	480	(65.7)	(62.3–69.2)
Hospital based <sup>§</sup>	14	(17.9)	(9.4–26.5)	54	(20.5)	(15.7–25.4)	16	(20.0)	(11.2–28.8)	37	(12.0)	(8.4–15.6)	121	(16.6)	(13.9–19.3)
Other/Unknown <sup>§</sup>	11	(14.1)	(6.4–21.8)	30	(11.4)	(7.6–15.3)	26	(32.5)	(22.2–42.8)	62	(20.1)	(16.6–24.5)	129	(17.6)	(14.9–20.4)
<b>Test patients for influenza<sup>§</sup></b>	46	(59.0)	(48.1–69.9)	229	(87.1)	(83.0–91.1)	44	(55.0)	(44.1–65.9)	185	(59.9)	(54.4–65.3)	504	(69.0)	(65.7–72.4)
<b>Reason for testing patients for influenza</b>															
Decide on antiviral treatment <sup>§</sup>	11	(23.9)	(11.6–36.2)	84	(36.7)	(30.4–42.9)	14	(31.8)	(18.1–45.6)	46	(24.9)	(18.6–31.1)	155	(30.8)	(26.7–34.8)
Desire to know etiology	31	(67.4)	(53.8–80.9)	121	(52.8)	(46.4–59.3)	24	(54.5)	(39.8–69.3)	109	(58.9)	(51.8–66.0)	285	(56.5)	(52.2–60.9)
Decide whether to admit to hospital	0	NA	NA	0	NA	NA	0	NA	NA	1	—**	—	1	—	—
Other/Unknown	4	—	—	24	(10.5)	(6.5–14.5)	6	—	—	29	(15.7)	(10.4–20.9)	63	(12.5)	(9.6–15.4)
<b>Influenza test types (among those who tested)<sup>††</sup></b>															
Viral culture <sup>§</sup>	6	—	—	23	(10.0)	(6.2–13.9)	9	(20.4)	(8.5–32.4)	57	(30.8)	(24.2–37.5)	95	(18.8)	(15.4–22.3)
Serology	6	—	—	14	(6.1)	(3.0–9.2)	4	—	—	8	—	—	32	(6.3)	(4.2–8.5)
Rapid antigen <sup>§§</sup>	39	(84.7)	(74.4–95.2)	214	(93.4)	(90.3–96.7)	31	(70.4)	(57.0–83.9)	160	(86.4)	(81.6–91.4)	444	(88.0)	(85.3–90.9)
Off-site testing <sup>§</sup>	15	(32.6)	(19.1–46.2)	94	(41.0)	(34.7–47.2)	25	(56.8)	(42.2–71.5)	141	(76.2)	(70.1–82.4)	275	(54.5)	(50.2–58.9)
Point-of-care testing <sup>§</sup>	26	(56.5)	(42.2–70.9)	174	(75.9)	(70.5–81.5)	13	(29.5)	(16.1–43.0)	37	(20.0)	(14.2–27.8)	250	(49.6)	(45.2–54.0)
<b>Prescribe antiviral agent<sup>§</sup></b>	38	(48.7)	(37.6–59.8)	163	(62.0)	(56.1–67.9)	37	(46.3)	(35.3–57.2)	155	(50.2)	(44.6–55.7)	393	(53.8)	(50.2–57.5)
<b>Type of agent<sup>††</sup></b>															
Amantadine <sup>§</sup>	5	—	—	27	(16.6)	(10.9–22.3)	16	(43.2)	(27.3–59.2)	22	(14.2)	(8.7–19.7)	70	(17.8)	(14.0–21.6)
Rimantadine	1	—	—	10	(6.1)	(2.5–9.8)	4	—	—	19	(12.3)	(7.1–17.4)	34	(8.7)	(5.9–11.4)
Oseltamivir <sup>§</sup>	36	(94.7)	(87.6–100.0)	147	(90.2)	(85.6–94.8)	26	(70.3)	(55.5–85.0)	133	(85.8)	(80.3–91.3)	342	(87.0)	(83.7–90.3)
Zanamivir	2	—	—	7	—	—	2	—	—	10	—	—	21	(5.3)	(3.1–7.6)

\* PCPs were defined as those who were involved in direct patient care ≥8 hours per week, who evaluated patients with influenza-like illness, and who did not report a specialty or subspecialty other than family practice, internal medicine, obstetrics/gynecology, or pediatrics.

<sup>†</sup> Confidence interval.

<sup>§</sup> Significant differences among states by chi-square test; *p*<0.05.

<sup>††</sup> Not applicable.

\*\* Relative standard error is >30%; point estimate is not reliable.

<sup>†††</sup> Respondents were asked to identify all that apply.

<sup>§§</sup> Respondents were asked about each type separately.

ties of the tests (70%–75%) (3). Because rapid antigen tests produce incorrect results for 25%–30% of persons with influenza (3), PCPs should use clinical judgment and check reports of weekly influenza activity from CDC and their individual state health departments to guide their clinical decisions.

Antiviral treatment and chemoprophylaxis decrease the economic impact of influenza (2). Among PCPs in this survey, 92.3% listed oseltamivir and zanamivir among the antiviral agents they prescribed. However, 26.4% of PCPs also prescribed amantadine or rimantadine. Since January 2006, these agents have not been recommended because of the high rate of resistance among circulating influenza A strains (5). PCPs also should be aware of the proper usage and possible side effects of oseltamivir and zanamivir. Specifically, pediatric patients receiving oseltamivir should be monitored closely for signs of neuropsychiatric effects (e.g., hallucinations, delirium, or abnormal behavior) throughout their treatment period, and PCPs should not prescribe this agent for patients aged <1 year (6). Zanamivir can be administered to patients aged ≥7 years or as prophylaxis for those aged ≥5 years; however, this agent can cause bron-

chospasm and should not be prescribed to patients with underlying respiratory disease such as asthma or chronic obstructive pulmonary disease (7).

Certain women use obstetricians/gynecologists as their PCPs (8). Seasonal influenza might place pregnant women at increased risk for medical complications (9). However, insufficient data on oseltamivir and zanamivir are available to assess possible risks to the fetus during pregnancy. Use of these antiviral agents for chemoprophylaxis or treatment of pregnant women with influenza must be based on a careful risk assessment, and PCPs who provide care to women who are pregnant should be aware of current recommendations for influenza vaccine (10).

The findings in this report are subject to at least four limitations. First, the survey was conducted primarily among metropolitan-area PCPs, and the results might not represent practice patterns in rural areas. Second, the response rate was only 47.1%. Third, the self-reports of respondents are subject to recall bias and might not reflect the actual services provided. Finally, results do not reflect the health-care practices of primary-care providers who are not physicians (e.g., physician assistants or nurse practitioners).

A majority of the PCPs surveyed used rapid antigen tests to guide treatment decisions for patients with ILI. PCPs who rely on rapid antigen tests should understand the limitations of these tests when interpreting test results. Although the majority of PCPs reported use of recommended antiviral agents, some prescribed antiviral agents that are no longer recommended by CDC. More educational measures are needed to make PCPs aware of the current treatment recommendations. Tailoring educational programs to geographic locales and physician characteristics (e.g., PCP type or practice setting) might better guide PCP testing and antiviral-agent prescribing practices for influenza.

#### References

1. Thompson WW, Shay DK, Weintraub E, et al. Influenza-associated hospitalizations in the United States. *JAMA* 2004;292:1333–40.
2. Demicheli V, Jefferson T, Rivetti D, Deeks J. Prevention and early treatment of influenza in healthy adults. *Vaccine* 2000;18:957–1030.
3. CDC. Rapid diagnostic testing for influenza: information for clinical laboratory directors. Atlanta, GA: US Department of Health and Human Services, CDC; 2006. Available at <http://www.cdc.gov/flu/professionals/diagnosis/rapidlab.htm>.
4. Uyeki TM. Influenza diagnosis and treatment in children: a review of studies on clinically useful tests and antiviral treatment for influenza. *Pediatr Infect Dis J* 2003;22:164–77.
5. CDC. High levels of adamantane resistance among influenza A (H3N2) viruses and interim guidelines for use of antiviral agents—United States, 2005–06 influenza season. *MMWR* 2006;55:44–6.
6. Tamiflu® [package insert]. Nutley, NJ: Hoffman-LaRoche, Inc.; 2007. Available at <http://rocheusa.com/products/tamiflu/pi.pdf>.
7. Relenza® [package insert]. Research Triangle Park, NC: GlaxoSmithKline; 2007. Available at [http://us.gsk.com/products/assets/us\\_relenza.pdf](http://us.gsk.com/products/assets/us_relenza.pdf).
8. Scholle SH, Chang J, Harman J, McNeil M. Characteristics of patients seen in services provided in primary care visits in obstetrics/gynecology: data from NAMCS and NHAMCS. *Am J Obstet Gynecol* 2004;190:1119–27.
9. Irving WL, James DK, Stephenson T, et al. Influenza virus infection in the second and third trimesters of pregnancy: a clinical and seroepidemiological study. *BJOG* 2000;107:1282–9.
10. CDC. Recommended adult immunization schedule—United States, October 2007–September 2008. *MMWR* 2007;56(41):Q1–Q4.

## Knowledge and Practices of Obstetricians and Gynecologists Regarding Cytomegalovirus Infection During Pregnancy — United States, 2007

In the United States, congenital cytomegalovirus (CMV) infection occurs in approximately 1 in 150 live births (1), leading to permanent disabilities (e.g., hearing loss, vision loss, and cognitive impairment) in approximately 1 in 750 live-born children (2). A common mode of CMV transmission to a pregnant woman is through close contact with

infected bodily fluids such as urine or saliva, especially from young children (3). Because no vaccine is available and treatment options are limited, renewed attention has been given to prevention of CMV infections among pregnant women through traditional infection-control practices, such as good hand hygiene (3). These practices have been encouraged by organizations such as CDC and the American College of Obstetricians and Gynecologists (ACOG) (4), which recommend that obstetricians and gynecologists (OB/GYNs) counsel women on careful handling of potentially CMV-infected articles, such as diapers, and thorough hand washing after close contact with young children (Box). Despite this increased emphasis on avoiding infection during pregnancy, few women are aware of CMV infection and how it can be prevented (5). During March–May 2007, ACOG surveyed a national sample of OB/GYNs to assess their knowledge and practices regarding CMV infection prevention. This report describes the results of that survey, which indicated that fewer than half (44%) of OB/GYNs surveyed reported counseling their patients about preventing CMV infection. These results emphasize the need for additional training of OB/GYNs regarding CMV infection prevention and for a better understanding of the reasons

#### BOX. CDC and American College of Obstetricians (ACOG) recommendations for reducing risk for cytomegalovirus (CMV) infection

##### CDC recommendations for women who are pregnant or might become pregnant\*

- Wash hands often with soap and water, especially after contact with saliva of or diapers from young children. Wash well for 15–20 seconds.
- Do not kiss children aged <6 years on the mouth or cheek. Instead, kiss them on the head or give them a hug.
- Do not share food, drinks, or utensils (spoons or forks) with young children.

##### ACOG recommendations for obstetricians and gynecologists on counseling pregnant women†

- Advise careful handling of potentially infected articles, such as diapers.
- Advise thorough handwashing when around young children or immunocompromised persons.
- Explain that careful attention to hygiene is effective in helping prevent CMV transmission.

\*Available at <http://www.cdc.gov/cmV>.

† American College of Obstetricians and Gynecologists. Perinatal viral and parasitic infections. *ACOG Practice Bulletin* 20. 20th ed. Washington, DC: American College of Obstetricians and Gynecologists; 2000.