Surveillance for West Nile Virus in Overwintering Mosquitoes—New York, 2000

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FOLLOWING THE 1999 WEST NILE ENCEPHALITIS OUTBREAK IN NEW YORK, GUIDELINES WERE DEVELOPED TO DIRECT SURVEILLANCE, PREVENTION, AND CONTROL EFFORTS IN THE EASTERN UNITED STATES. AS RECOMMENDED IN THE GUIDELINES, THE NEW YORK CITY AND NEW YORK STATE DEPARTMENTS OF HEALTH DEVELOPED COMPREHENSIVE WEST NILE VIRUS (WNV) SURVEILLANCE AND CONTROL PROGRAMS, WHICH INCLUDED COLLECTING OVERWINTERING CULEX MOSQUITOES TO DETERMINE WHETHER WNV MIGHT PERSIST THROUGHOUT THE WINTER AND INITIATE A ZOO NOTIC TRANSMISSION CYCLE IN THE SPRING OF 2000. AS PART OF THIS SURVEILLANCE EFFORT, ADULT CULEX MOSQUITOES WERE COLLECTED FROM STRUCTURES IN NEW YORK CITY DURING JANUARY-FEBRUARY 2000 TO DETERMINE WHETHER OVERWINTERING MOSQUITOES WERE INFECTED WITH WNV. THIS REPORT SUMMARIZES THE RESULTS OF THIS ANALYSIS, WHICH DOCUMENTED WNV RNA IN SOME MOSQUITO POOLS.

Mosquitoes were sought from sites within the city's storm and sanitary sewer system, historic sites at Fort Totten in northeastern Queens, hangars and other locations at the abandoned Flushing Airport, and utility rooms under the Whitestone Bridge and under municipal swimming pools. Collection sites were selected based on location of WNV-infected humans and mosquitoes during the 1999 outbreak. Mosquitoes were pooled and then tested for the presence of WNV using vero cell plaque assay and a fluorogenic real-time polymerase chain reaction (PCR) assay (TaqMan, Perkin-Elmer Biosystems, Foster City, California) that focused on three different primer pairs: the envelope protein and the N-1 and NS-5 regions. No pools produced live virus isolates in the plaque assay. However, three of the 67 pools containing Culex spp. mosquitoes, all of which were collected from Fort Totten, reproducibly demonstrated low but detectable levels of WNV RNA.

The findings in this report demonstrate the value of continued vigilance in detecting the re-emergence of WNV. Counties where WNV transmission occurred in 1999 should monitor closely for WNV and conduct mosquito-control activities in the spring to reduce the potential for recurrence and amplification of WNV. Mosquito-control activities include reducing the number of mosquito breeding sites, particularly around homes and suburban and urban areas, and applying larvicide to Culex larval habitats early. In December 1999, CDC announced availability of funds to support WNV surveillance, prevention, and control programs. The 19 state and local health departments eligible to apply for these funds represent areas where WNV transmission already has occurred or where transmission would be more likely to occur based on bird migration patterns. The focus of these cooperative agreements enables state and local health departments to increase surveillance activities and enhance laboratory capacity for detecting WNV and other arboviral.
ruses. In 2000, surveillance activities will be focused on determining whether WNV survived the winter and, if so, to ascertain its geographic distribution along the Atlantic and Gulf coasts.

REFERENCES
7 available

*The use of trade names is for identification only and does not imply endorsement by CDC or the US Department of Health and Human Services.

Progress in Development of Immunization Registries—United States, 1999

MMWR. 2000;49:274-278
1 table, 1 figure omitted

Community-based and state-based immunization registries are confidential, population-based, computerized information systems that contain data about children’s vaccinations and represent an important tool to increase and sustain high vaccination coverage. Immunization registries consolidate vaccination records for children from multiple providers, provide a vaccination needs assessment for each child, generate reminder and recall vaccination notices, produce an official vaccination record, and provide practice-specific and community-based vaccination coverage assessments. One of the Healthy People 2010 national objectives is to increase to 95% the proportion of children aged less than 6 years who are enrolled in a fully operational population-based immunization registry.2 To assess the status of immunization registry development, CDC analyzed data from the 1999 Immunization Registry Annual Report (IRAR) of 64 jurisdictions (grantees) that receive federal immunization funds under section 317d of the Public Health Service Act. Findings from this analysis indicate that substantial progress has been made in the United States in developing and implementing community-based and state-based immunization registries.

The IRAR was a self-administered questionnaire, sent to immunization program managers, that measured the degree of enrollment of a registry’s target population (i.e., percentage of children in the catchment area with vaccinations recorded in the registry and percentage of public and private providers submitting records to the registry) and the implementation of 12 functional standards considered essential for immunization registry operation. The 12 standards were identified through a survey of immunization program managers and registry developers. Focus group research with the managers and developers was conducted to ensure consensus about the importance of these standards. Key elements associated with each standard then were identified and used to establish more sensitive registry development and implementation progress measures. In addition, the IRAR collected information on immunization registry links with other information systems.

In 1999, the 64 jurisdictions (50 states, the District of Columbia, Chicago, Houston, New York City, Philadelphia, San Antonio, American Samoa, Guam, Marshall Islands, Micronesia, Northern Mariana Islands, Palau, Puerto Rico, and the U.S. Virgin Islands) were mailed the questionnaire; 62 (97%) responded. Of the 62, three (5%) grantees (all commonwealths or territories) reported no registry activity, 16 (26%) grantees reported planning or pilot-testing of registries, and 43 (69%) grantees reported implementing registries.

Data from 37 of the 43 grantees implementing registries indicated that approximately 32% (mean = 50%; median = 54%) of estimated target children aged 0-5 years in the grantees’ catchment areas had at least two doses of vaccine recommended by the Advisory Committee on Immunization Practices and that the information was recorded in a registry’s database. Data from 42 grantees indicated that 46% (median = 96%) of public providers and 13% (median = 15%) of private providers had submitted records to a registry.

Of the 43 grantees, all had implemented at least one key element on four of the 12 registry functional standards (i.e., electronic data storage of core data elements, protection of confidential medical information, recovery of lost data, and consolidation of vaccination records from multiple providers). Three (7%) grantees reported implementing at least one key element in each standard. However, none had implemented all key elements of the 12 functional standards.

Forty-one (95%) of the 43 grantees reported immunization registry links with at least one other health-care program; of these, 25 (61%) were linked to their state’s vital records department. Links to birth certificates indicate that these registries are population-based (not provider-based or practice-based). The median number of weeks from birth to establishing a registry record was 5 weeks (range: 1-12 weeks).

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CDC Editorial Note: The 1999 IRAR represents the first attempt to quantify and evaluate state-based and community-based immunization registry development in the United States. These data suggest that substantial progress has been made in U.S. communities and states in enrolling children, recruiting providers, and implementing registry functional standards.

Substantial challenges remain in developing registries. One of the greatest challenges is balancing the need to protect the privacy of patients, providers, and other users of these systems with the need to gather and share information to protect the public health and provide clinical benefit to persons. In response to recommendations of the National Vaccine Advisory Committee (NVAC) 1999 report, Development of Community- and State-Based Immunization Registries,3 CDC developed specifications for privacy protection of registry participants and for the confidentiality of information contained in
a registry. These specifications were approved by NVAC in February 2000. They are consistent with privacy regulations required by the Health Insurance Portability and Accountability Act of 1996.3

Ensuring high levels of public and private provider participation in registries is a critical prerequisite to complete and accurate electronic vaccination records. In an increasingly mobile environment, where approximately 20% of children move by age 2 years,4 appropriate vaccination decision-making often depends on aggregating vaccination histories from multiple providers. Solving technical and operational challenges of sharing vaccination information between registries that may use different computer hardware and software is critical.

The findings in this report are subject to at least two limitations. First, because the IRAR relies on self-reported data, some bias is expected. On-site verification of these data is planned to ensure a more accurate assessment of registry development. Second, because only immunization program grantees were surveyed, these data underestimate the degree of registry activity occurring in the United States. Survey respondents reported 84 additional immunization registry objective.2 Additional information on immunization registries is available from CDC's immunization registry World-Wide Web site, http://www.cdc.gov/nip/registry; telephone (800) 799-7062; or e-mail, siisclear@cdc.gov.

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Age-Specific Excess Deaths Associated With Stroke Among Racial/Ethnic Minority Populations—United States, 1997

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1 table, 1 figure omitted

STROKE WAS THE THIRD LEADING CAUSE of death in the United States in 1997.1 During 1950-1996, age-standardized stroke death rates declined 70% for the entire U.S. population; however, the decline varied among racial/ethnic populations.1 The estimated number of stroke deaths by race/ethnicity and age illustrate the differences in stroke mortality that may be used to direct prevention efforts. This report presents an analysis of stroke mortality by age and racial/ethnic group; the findings indicate that for persons aged 35-64 years, excess stroke deaths and higher risk for stroke mortality occurred among members of U.S. racial/ethnic minority populations than among the non-Hispanic white population.

Excess death is the difference between the number of deaths observed in a racial/ethnic group and the number of deaths that would have occurred in that group if it had the same death rate as the non-Hispanic white population.2 Relative risk is the ratio of the stroke death rate of the minority group compared with that of the non-Hispanic white population accounting for differences in population size. The 1997 death certificate data were used to determine excess death and relative risk for stroke mortality by racial/ethnic group (non-Hispanic blacks, Hispanics, American Indians/Alaska Natives [AI/ANs], and Asians/Pacific Islanders [As/PIs]) and by age group (35-44, 45-54, 55-64, 65-74, 75-84, and 85 years). Non-Hispanic whites in each age group were the referent group. Observed stroke deaths were those for which the underlying cause of death listed on the death certificate by a physician, medical examiner, or coroner was International Classification of Diseases, Ninth Revision (ICD-9), codes 430-438. Demographics on death certificates (e.g., age, race, and ethnicity) are reported by funeral directors usually on the basis of observation or are provided by family members. National mortality statistics were based on information from death certificates filed in state vital statistics offices and were compiled by CDC.3 Expected deaths were calculated by multiplying the number of persons in each age-specific racial/ethnic group by the death rates in the corresponding non-Hispanic white group. Age-specific excess deaths were calculated by subtracting the observed deaths from the expected deaths for each age-specific group. Relative risks were calculated by dividing the death rate for each age-specific group by the corresponding death rate for non-Hispanic whites.
The number of excess stroke deaths was largest for non-Hispanic blacks and As/PIs aged 35-84 years (6370 and 220, respectively); no excess stroke deaths occurred among non-Hispanic blacks and As/PIs for persons aged ≥85 years. Hispanics and AIs/ANs aged 35-64 years had 242 and 41 excess stroke deaths, respectively; no excess stroke deaths occurred for Hispanics and AIs/ANs aged ≥65 years.

The relative risk for stroke mortality among racial/ethnic groups compared with non-Hispanic whites decreased with age. Non-Hispanic blacks had approximately four times the relative risk for persons aged 35-54 years, three times for persons aged 55-64 years, and approximately equal relative risk for persons aged ≥85 years. AIs/ANs had almost twice the relative risk for stroke mortality than non-Hispanic whites among persons aged 35-44 years and 1.3 times for persons aged 45-64 years; the risk was lower among persons aged ≥85 years. As/PIs had approximately 1.3 times the relative risk of stroke mortality among persons aged 35-64 years and a lower relative risk among persons age ≥85 years. Among Hispanics, the relative risk for stroke death was approximately 1.3 times higher among persons aged 35-64 years, and approximately equal to non-Hispanic whites among persons aged ≥65 years.

The data in this report are subject to at least four limitations. First, misclassification of race/ethnicity on death certificates and in the population census may result in understated reported death rates among AIs/ANs, As/PIs, and Hispanics for the same reason, death rates for black and white populations may be overstated. Second, although variations among subpopulations may exist, the burden of stroke deaths is not shown for subgroups within the larger racial/ethnic groups. Third, the smaller sizes of populations of As/PIs and AIs/ANs can result in unstable estimates and produce overstated or understated death rates from year to year. Finally, this analysis did not control for stroke risk factors.

Reducing stroke mortality among groups at highest risk largely depends on reaching them before unhealthy behaviors are adopted. Public health interventions can be community-based or can target persons at greatest risk. For example, in 1999, CDC began Racial and Ethnic Approaches to Community Health 2010 (REACH), community-based, culturally appropriate approaches to reduce cardiovascular disease and stroke among racial/ethnic populations. The national Brain Attack Coalition educates the public about the early warning symptoms of stroke to increase the likelihood of early diagnosis and prompt, effective treatment. Targeted research and evaluation among racial/ethnic populations may help identify differences among subpopulations related to lower socioeconomic or educational levels or related to adverse environmental factors. CDC is working with 11 state-based prevention and education programs that aim to reduce cardiovascular disease and stroke by improving nutrition, increasing physical activity, and promoting healthy behaviors.

REFERENCES
Adoption of Perinatal Group B Streptococcal Disease Prevention Recommendations by Prenatal-Care Providers—Connecticut and Minnesota, 1998

GROUP B STREPTOCOCCAL (GBS) infections are the leading bacterial cause of serious neonatal disease in the United States.1 In 1996, in collaboration with the American Academy of Pediatrics and the American College of Obstetricians and Gynecologists, CDC issued consensus guidelines for preventing perinatal GBS disease.2,3 These guidelines recommend using either a screening-based or a risk-based strategy to identify women who should receive intrapartum antimicrobial prophylaxis. To assess adoption of the GBS disease prevention guidelines, the Connecticut and Minnesota state health departments surveyed prenatal-care providers during January-April 1998. This report presents the survey findings, which indicate that most prenatal-care providers in Connecticut and Minnesota have adopted perinatal GBS disease prevention policies and that strategy choice may vary by state and provider type.

In Connecticut, surveys were mailed to all (n = 576) licensed obstetricians/gynecologists (OBs). Group practices were allowed to submit a single response for all members. A second mailing was sent to nonrespondents. A sample of nonrespondents was then contacted by telephone to determine reasons for nonresponse. After eliminating providers from the sample who did not deliver prenatal care and those who were represented by a response from another provider in their practice, the final response rate was 77% (250 of 323). In Minnesota, surveys were mailed to a random sample of approximately 50% of practicing OBs, a random sample of approximately 25% of family physicians (FPs) who indicated on their licensure application they provided prenatal care, and all certified nurse midwives (CNMs). After three mailings, 431 (77%) of those sampled responded. The response rate was similar for all three provider groups.

In 1998, most prenatal-care providers in Connecticut and Minnesota reported that their practices had a perinatal GBS disease prevention policy, although most practices did not have a written policy. Practices in Connecticut were more likely than those in Minnesota (P < .001) to have a GBS disease prevention policy, primarily because of the relatively low percentage of Minnesota family practices with a policy. More than 90% of individual providers from both states reported having a GBS disease prevention policy. Most providers in Connecticut chose a screening-based strategy (72%), and most in Minnesota chose a risk-based strategy (55%). When the analysis was limited to OBs in both states, OBs in Connecticut were more likely than OBs in Minnesota to choose a screening-based strategy (P < .001).

Of providers who used a screening-based strategy, 71% from Connecticut and 76% from Minnesota collected specimens from both the vagina and rectum, as recommended by the consensus guidelines. Providers using the screening-based strategy from Connecticut (82%) and Minnesota (80%) obtained cultures within 1 week of the recommended 35-37 weeks’ gestation. Of providers who used a risk-based strategy in Minnesota, 80% indicated that they would administer intrapartum prophylaxis for all five of the high-risk criteria (i.e., previous infant with invasive GBS disease, GBS bacteriuria during the current pregnancy, delivery at less than 37 weeks’ gestation, duration of rupture of membranes ≥18 hours, and intrapartum fever ≥100.4°F (≥38°C)) as specified in the consensus guidelines. Questions about indications for prophylaxis under the risk-based strategy were not asked in the Connecticut survey.

In Minnesota, differences were observed between the responses of FPs compared with OBs or CNMs. OBs and CNMs were more likely than FPs (P < .001) to report that their practices had a GBS disease prevention policy. Individual FPs were less likely to choose a risk-based strategy or to use penicillin for intrapartum prophylaxis (P <.001 for all comparisons except strategy choice between FPs and OBs). OBs were significantly more likely than either CNMs (91% vs 46%, P = .001) or FPs (91% vs 73%, P = .03) to report collecting specimens from both the vagina and rectum. FPs were less likely to respond that they would follow all five recommended indications than either OBs (69% vs 89%, P = .004) or CNMs (69% vs 84%, P = .04).

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CDC Editorial Note: Perinatal GBS disease is largely preventable through targeted use of intrapartum antibiotic prophylaxis.2 Since the release of the 1996 consensus prevention guidelines, the incidence of perinatal GBS disease has declined in the United States.7 Prenatal-care providers play a critical role in preventing GBS disease. The findings in this report suggest that most prenatal-care providers in Connecticut and Minnesota have adopted one of the two GBS disease prevention strategies recommended in the consensus guidelines and that strategy choice may vary by state and provider type. Pregnant women should discuss GBS disease prevention with their prenatal-care providers to optimize GBS disease prevention opportunities.

In Minnesota, FPs providing prenatal care were less likely than OBs or
CNMs to report that their practices have a GBS disease prevention policy and to report following all the guidelines within either the risk-based or screening-based strategy. These findings suggest that additional efforts are needed to inform FPs in Minnesota about GBS disease prevention recommendations. FPs also were less likely to use penicillin, the recommended intrapartum antibiotic. Although ampicillin is an acceptable alternative, penicillin is preferred because it has a narrower spectrum of activity and is therefore less likely to promote antimicrobial resistance. This study was conducted before the recent shortage of penicillin G for intravenous administration. A new supplier has been identified, and penicillin G should be more available for intrapartum prophylaxis.

In 1997, hospital obstetric departments were surveyed in both Connecticut and Minnesota about perinatal GBS disease prevention policies. In both states, the percentage of OBs providing prenatal care who reported adopting a perinatal GBS disease prevention policy was higher than the percentage of hospitals with a policy. Hospitals may leave decisions about GBS disease prevention activities to prenatal-care providers. Efforts to expand perinatal GBS disease prevention activities should be directed at both hospitals and prenatal-care providers.

Although the surveys presented in this report were not designed to measure provider practices, the results suggest that prenatal-care providers are aware of the recommendations outlined in the consensus guidelines. The screening-based strategy relies on appropriate and accurate specimen collection by prenatal-care providers. Most providers in Connecticut and in Minnesota using the screening-based strategy reported collecting specimens from both the vagina and rectum. Collection site is important because vaginal/rectal specimens improve group B Streptococcus isolation rates by 40% over vaginal specimens alone. At least 80% of prenatal-care providers using the screening-based strategy in both states also reported collecting specimens at appropriate times. The risk-based strategy depends on prenatal-care providers identifying and administering prophylaxis to women at increased risk for delivering an affected infant. In Minnesota, 80% of prenatal-care providers using the risk-based strategy reported following the recommended indications for intrapartum antibiotic prophylaxis.

The findings in this report are subject to at least two limitations. First, because the surveys were conducted in only two states, the results might not be generalizable to other states. Second, the surveys measured only the reported practices of prenatal-care providers and not the services actually rendered.

GBS disease prevention guidelines and order forms for other information for prenatal-care providers and patients are available on the World-Wide Web at http://www.cdc.gov/ncidod/dbmd/gbs or from CDC’s National Center for Infectious Diseases, Division of Bacterial and Mycotic Diseases, Respiratory Diseases Branch, Mailstop C-23, 1600 Clifton Road, NE, Atlanta, GA 30333.

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10 available

Measles Outbreak—Netherlands, April 1999–January 2000

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1 figure, 1 table omitted

On June 21, 1999, a cluster of five cases of measles was reported among the 390 students attending a religion-affiliated elementary school in the Netherlands. Persons belonging to this religious denomination routinely do not accept vaccination. Municipal health services (MHSs) investigated and found 160 suspected measles cases among children attending the school. By February 4, 2000, 2961 measles cases, including three measles-related deaths, had been reported by 35 MHSs to the national registry. This report summarizes the investigation of the measles outbreak in the Netherlands, which indicated that measles can be a severe disease among unvaccinated populations in the Netherlands.

Measles is a notifiable disease in the Netherlands, and cases that occurred during this outbreak were reported by physicians to the local MHS as part of routine surveillance. The vaccination status of ill persons was reviewed based on written records kept by reporting physicians and sent to the vaccination registry. In April 1999, the first cluster of measles cases occurred, followed by the reported elementary school outbreak in June. No cases of measles with onset in May were reported, and transmission was low during June and July. When schools reopened in August, the number of cases increased. The outbreak peaked during October-November, then decreased rapidly. As of February 4, the last reported cases had onset during the week of January 16. Since then, the number of reported cases has decreased substantially, suggesting that the outbreak is ending.

From April 15, 1999, to February 4, 2000, 2961 cases of measles were reported in 35 (67%) of the country’s 52 MHSs; 2317 (78%) were reported by 10 MHSs. All reporting municipalities have large communities affiliated with the religious group. Of the 105 case-patients tested for measles immunoglobulin type M, 100 (95%) had serologically confirmed measles.

Complications among acute measles case-patients were assessed by telephone follow-up with reporting physicians; 510 (17%) cases had one or more complications and/or hospitalizations. Three patients died as the result of measles complications: one child aged 2 years had an underlying cardiac disorder and subsequent cardiac failure, one child aged 3 years developed myocarditis, and one adolescent aged 17 years developed kidney failure and acute respiratory distress syndrome. Sixty-eight (2.2%) persons were reported hospitalized: 37 (1.2%) for pneumonia, seven
(0.2%) for dehydration, five (0.2%) for encephalitis, four (0.1%) for high fever, three (0.1%) for shortness of breath, two (0.1%) for severe otitis media, two (0.1%) for croup, and six (0.2%) for other reasons. Two persons developed measles while hospitalized for other reasons.

Of the 2882 patients whose ages were known, the median age was 6 years (range: 0-52 years): 95 (3%) were aged less than 1 year; 949 (33%) aged 1-4 years; 1282 (44%), aged 5-9 years; 382 (13%), aged 10-14 years; 87 (3%), aged 15-19 years; and 87 (3%), aged greater than or equal to 20 years. Information on vaccination status was available for 2907 persons; 2770 (95%) were unvaccinated and 137 (5%) were vaccinated children. Of the 137, 117 (85%) were aged less than 9 years and all had received one dose of measles, mumps, and rubella vaccine (MMR); in 20 (15%) children the number of doses was unknown. Based on data from the national registry, 2749 persons whose ages were known were unvaccinated: 2317 (84%) persons eligible for vaccination were not vaccinated for religious reasons and 173 (6%) for other reasons (e.g., lack of concern about measles or concern about adverse events); 187 (7%) were not eligible for vaccination: 160 (85%) were aged less than 14 months (the recommended age for administration of the first dose of measles vaccine), 20 (11%) were born before 1976 (the year measles vaccination was introduced), and seven (4%) had a contraindication for measles vaccination. For the remaining 72 (3%) unvaccinated persons, the reason for not being vaccinated was unknown.

In response to the outbreak in the Netherlands, on July 1, control activities were implemented, including (1) tracing contacts of cases, (2) offering vaccine or immunoglobulin to susceptible contacts, (3) alerting all secondary-care and tertiary-care hospitals about the measles outbreak, (4) requesting general physicians to report all suspected cases, (5) conducting catch-up vaccination sessions at MHSs and mother and child clinics, (6) increasing media attention about undervaccination, and (7) urging parents to complete vaccination of children.

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**CDC Editorial Note:** The three measles-related deaths and 68 hospitalizations that occurred among 2961 cases in the Netherlands indicate that measles can be severe and may result in death even in industrialized countries. Rates of complications reported in this outbreak are comparable with those in the United States and other industrialized countries.

Measles notification and vaccination began in 1976 in the Netherlands, where measles epidemics have occurred every 5-7 years: 1976, 1983, 1988, 1992-1993, and 1999-2000. Since 1987, two doses of MMR have been recommended at age 14 months and 9 years. Measles vaccination is not mandatory for entry into school in the Netherlands. The development of an elimination strategy based on the percentage of persons susceptible to measles in their population. In addition to these activities, increased commitment at the regional and national levels is needed to eliminate measles in the European Region.

Although measles is more severe in malnourished or immunosuppressed persons, severe disease or death may result in persons with no underlying illness. Measles vaccine is a highly effective method for preventing this disease, and lack of vaccination resulted in this outbreak. Similar to the outbreaks of poliomyelitis among religious communities in 1992, measles spread from the Netherlands to Canada through visiting relatives. The resulting outbreak in Canada was limited to 17 cases within the religious community possibly because stringent control measures were taken.

Until measles is eradicated worldwide, epidemics will continue to occur periodically in the Netherlands. The World Health Organization (WHO) has established goals to eliminate measles as an indigenous disease from the Region of the Americas by the end of 2000, the European Region by 2007, and the Eastern Mediterranean Region by 2010. To reach these goals, the WHO regional office for Europe has conducted workshops aimed at assisting participating countries to develop an elimination strategy based on the percentage of persons susceptible to measles in their population. In addition to these activities, increased commitment at the regional and national levels is needed to eliminate measles in the European Region.

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