rotavirus vaccine coverage remains slightly lower than that of other established childhood vaccines and factors that might account for this difference should be examined. Following rotavirus vaccine introduction, rotavirus activity in US children has declined and disease seasonality has been altered compared with prevaccine years. Factors that might explain the regional differences in changes in rotavirus activity after vaccination should be explored.

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40.004

The epidemiology of rotavirus disease among children <5 years of age - Santa Rosa, Guatemala, 2007-2009

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Background: Diarrhea is the second leading cause of death in Guatemalan children <5 years of age. To evaluate the potential health benefits of new vaccines against rotavirus, we assessed the burden of rotavirus diarrhea in Guatemalan children ≤5 years of age - Santa Rosa, Guatemala, 2007-2009.

Methods: We examined data from an active population-based surveillance system in Santa Rosa, Guatemala from October 2007 through September 2009 among children <5 years of age presenting to the hospital or ambulatory clinics. Specimens were collected from patients with acute diarrhea (≥3 loose stools in 24 hours during last seven days) and tested for rotavirus via enzyme immunoassay. Genotyping via reverse-transcriptase polymerase chain reaction was performed on rotavirus positive specimens. Results were stratified by age group and setting.

Results: 906 patients identified with diarrhea during the study period provided a fecal specimen for rotavirus testing. Of the specimens tested, 291 (35%) were hospitalized and 615 (74%) were ambulatory patients. Rotavirus accounted for 90 (33%) hospitalizations and 57 (9%) ambulatory visits for diarrhea annually. Rotavirus confirmed episodes had a marked seasonality as 80% (N = 72) of cases occurred in January and February. During these months, rotavirus accounted for 59% of hospitalizations and 31% of ambulatory visits for diarrhea. More than 85% (N = 123) of children with rotavirus were <24 months. During the 2008 rotavirus season, the predominant rotavirus genotype identified in 15 of 27 (56%) samples tested was G1P8. Less common strains including 5 (19%) of the G12 genotype were also observed.

Conclusion: This analysis highlights the prominent role of rotavirus as a cause of severe diarrhea in children <5 years of age in Santa Rosa, Guatemala. Currently available vaccines against rotavirus have demonstrated high effectiveness in preventing severe disease caused by the predominant circulating strain (G1P8) identified in Guatemala during the 2008 season. Although many factors must be considered by a country prior to the decision to introduce vaccine nationally, these data underscore the substantial burden of rotavirus disease on the Guatemalan healthcare system. This active population-based surveillance system will provide a solid platform for the assessment of rotavirus vaccine impact after introduction.

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40.005

Surveillance for epidemic of enterovirus infections in Taiwan in 2008


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Background: The emergence of enterovirus 71 (EV71) in Taiwan in October, 2007 resulted in a large epidemic of hand-foot-and-mouth disease (HFMD) or herpangina in young children in 2008. EV71 patients may suffer from serious neurological complications or even deaths. The aims of this study were to describe the framework of the surveillance systems for enterovirus infections and to characterize this epidemic in Taiwan in 2008.

Methods: At Taiwan Centers for Disease Control (Taiwan CDC), there were four systems established for the surveillance of enterovirus infections. First, we used the sentinel surveillance with more than 650 clinics for reporting the number of HFMD or herpangina in outpatient weekly. Second, the National Notifiable Disease Surveillance System (NNDSS) was used for reporting the hospitalized cases with severe complications. Third, the laboratory surveillance consisted of 13 contract laboratories and 286 clinics for testing and collecting samples, respectively. Fourth, Taiwan CDC cooperated with the University of Pittsburgh to develop a syndromic surveillance, which is called the Real-time and Outbreak Surveillance (RODS) system, covering 80% of the emergency visits nationally. The Taiwanese ROTS system used the ICD-9-CM code of 074.0 and 074.3 to monitor enterovirus infections. A web-based decision support system for this epidemic was also developed for displaying the statistics and epidemic curves of the four systems in real time.

Results: The epidemic started in week 11, peaked in week 25, and was subsiding gradually. The sentinel physicians reported 72,610 visits in one epidemic wave, which represents 18% of the ones nationally. 373 cases of severe complications (including 14 deaths) were reported through the NNDSS. Among those, 347 cases (93%) were EV71. A web-based system with automated updates daily for the public to browse the statistics and epidemic curves of the reported cases in the NNDSS was also released then. There were 11,150 specimens tested and 3,724 (33%) enterovirus isolated in the laboratory surveillance. The three most isolated types were Coxsackie A2 (CA2), EV71 (B5 was the major subtype), and Coxsackie B4 (CB4). The real-time data from the RODS helped us better track the trend of the epidemic.

During the large epidemic of enterovirus infections, our established surveillance systems are helpful for informing...
decisions about control measures, resource allocation, and risk communication in real time.

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40.006
Epidemiology of varicella among passengers and crew on international conveyances, United States, 2005-2008

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Background: Although the incidence of varicella in the United States has decreased markedly since a national vaccination program was implemented in 1995, CDC Quarantine Stations continue to receive frequent reports of varicella among international travelers. However, few published reports are available on the epidemiology of varicella in travelers. Our objective was to describe the epidemiology of varicella on international conveyances and to identify risk factors associated with illness.

Methods: We reviewed reports of varicella captured by the CDC Quarantine Activity Reporting System (QARS) from June 2005 - December 2008. A stepwise backward elimination logistic regression model (inclusion criterion: alpha <0.05) was used to compare risk factors for varicella with those for all other illnesses in travelers during the same time period, including demographic characteristics, conveyance time (maritime versus air or land [pedestrian, car, bus, train]), season and year of report, and type of traveler (passenger or crew).

Results: Of 3908 illness reports during the study period, 446 (11.4%) met the case definition for varicella. Odds of reported varicella were higher on maritime conveyances (odds ratio [OR] = 38.3; 95% confidence interval [CI], 22.0 - 66.5) and in travelers born in tropical countries (OR = 2.3; CI, 1.4 - 3.6), males (OR = 1.5; CI, 1.02 - 2.3), and younger travelers (for a 1-year decrease in age, OR = 1.08; CI, 1.06 - 1.10). Odds of varicella reporting were lower in the fall (OR = 0.30; CI, 0.16 - 0.54). There were no statistical differences between varicella and non-varicella illnesses by type of traveler (crew member, passenger), race and ethnicity (Hispanic, non-Hispanic), or year of report.

Conclusion: The higher incidence of varicella reporting by maritime conveyances compared with other conveyances may be due to the large number of unvaccinated crew members originating from tropical countries where varicella commonly occurs in adults. Maritime vessels, compared with other conveyances, may also achieve more complete case finding because of the extended periods of time crew live aboard the vessels. The availability of a vaccine for varicella means that most cases could be prevented, and vaccination should be considered for crew members on maritime conveyances without documented immunity to varicella.

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40.007
Dengue fever outbreak in Lima, Peru 2009: Epidemiological changes in urban areas

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Background: Dengue fever is endemic in Peru. The epidemic potential for dengue transmission north of Lima city has spread alarmingly in the last four years. A dengue outbreak occurs during March to June 2009 in three districts of Lima. The 2005 and 2007 outbreaks of dengue fever occurred in these districts only one circulating serotype in each outbreak. Epidemiological investigation was conducted to determine the distribution of cases, serotype circulation, symptoms and signs of dengue fever in order to identify transmission and epidemic control measures.

Methods: Analysis of cases of the outbreak investigation conducted by the network of epidemiology at the Department of Health V Lima City. The information was collected and processed through software NotiSp. Suspected case was considered a person with a history of fever for 2 to 7 days and two or more of the following symptoms: headache, retroocular, myalgia, arthralgia, rash and hemorrhagic manifestations residing in the districts of Carabayllo, Comas and Independence. The cases were registered in epidemiological records, blood samples were taken to determine seroconversion and identification of circulating serotypes.

Results: Of 552 cases suspects, 148 (26.8%) were positive for IgM antibody detection of specific dengue indicating primary infection and 99 cases were obtained by PCR serotypes: DEN-3 (74%), DEN-1 (24%) and DEN-4 (2%). Most cases (45%) were adults between 20 and 59 years of age. The median age was 34 years. Women were more affected than men (56% and 44% respectively). The most frequent symptoms were fever (95%), headache (90%), body ache (86%), bone pain (75%) and pain retroocular (70%). The outbreak investigation revealed a cluster of four clusters that could be because they have areas favourable for breeding of the vector, such as presence of disposable plastic containers, clearing rocks, water shortages and the migration of people to Lima from dengue endemic areas.

Conclusion: The outbreak investigation confirmed the presence of dengue as an emerging public health problem in Lima, identifying the co-circulation of three serotypes, demonstrating dengue epidemiological changes, so it is important to strengthen surveillance actions epidemiological and vector control in these areas during the coming years.

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