non-Polio AFP rate on Polio eradication.

Material and Methods: Published AFP surveillance data of India of 2006 and 2007.

Findings: The highest non-Polio AFP rate in India is seen in the polio hyper endemic state of Bihar. In 2006 the rate was 19 with an adequate stool rate of 82%. A total of 189 cases of Polio were reported from Bihar that year of which only 61 were confirmed. That means only 32% of Polio cases could be confirmed instead of 82% going by the adequate stool collection rate. In 2007 only 52% (22/42) of Polio cases could be confirmed even though adequate stool collection rate is 87% and non-Polio AFP rate 19.26 (as on 8th September 2007). Similar findings are found in the other hyper endemic state of Uttar Pradesh and Nationally though of lesser degree. Very high non-Polio AFP rate should have resulted in a marked increase in the proportion of Polio cases confirmed as the true indication of enhanced surveillance sensitivity, which did not happen in India.

Conclusion: Very high non-Polio AFP rate did not really increase the sensitivity of AFP surveillance in India as shown by the large proportion of compatible cases and could be potentially harmful for Polio eradication by masking the true rate of confirmation of Polio cases. There is a need to review AFP surveillance in those areas with very high non-Polio AFP rate.

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23.002

Application of Geographical information System (GIS) in Outbreak of Hand, Foot and Mouth Disease (HFMD) in Sarawak

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Background: HFMD surveillance data subsequent to a cluster of death involving 29 children in Sarawak state during a HFMD outbreak in 1997 indicated that HFMD is endemic in Sarawak with further major outbreaks occurring every three years in 2000, 2003 and 2006. Results of study on GIS application in HFMD surveillance done in a district in Sarawak in 2000 suggested that there could be spatial clustering of HFMD cases with some small areas with high incidence of HFMD cases in an outbreak which have low incidence in subsequent outbreak. In the outbreak in 2006, application of GIS in HFMD surveillance was extended to whole Sarawak with objectives to determine whether GIS is useful in complementing the existing conventional HFMD surveillance and for better documentation of outbreak to enable better control of outbreaks.

Methods: GIS enabled HFMD surveillance database was created and implemented statewide in 2006. Geographical residence location of HFMD cases were captured with Garmin Global Positioning System receiver and overlayed on basemaps. In areas with clustering of HFMD cases, analysed maps were overlayed on satellite images for refine visualization of outbreak areas and spread. Spatial analysis of data were regularly done during outbreak to assist decision makers to fine tune outbreak control decisions.

control measures for the HFMD outbreak. Spatial and spatio-temporal clustering analysis of HFMD cases which were done regularly during the outbreak enabled detected of hotspots areas with high incidence of HFMD and its geographical spread.

Conclusion: GIS data on spatial distribution of HFMD cases had been found to be useful in assisting decision making in outbreak control measures. Documentation of HFMD cases spatially in 2006 in Sarawak state will be helpful in the future outbreaks which is expected to be in 2009.

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23.003

Susceptibility of *H. influenzae* and *M. catarrhalis* in Asia and Europe: 2007 GLOBAL Surveillance Program

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Background: Haemophilus influenzae (HI) and *Moraxella catarrhalis* (MC) are among the most common etiological agents of community-acquired pneumonia (CAP). Regional differences in susceptibility can occur among these pathogens. The GLOBAL Surveillance initiative provides comprehensive in vitro susceptibility data for respiratory pathogens, particularly focused on widely used oral agents prescribed for the treatment of these pathogens.

Methods: During 2007, HI ($n = 492$) and MC ($n = 140$) were isolated from patient specimens collected from 4 regions in Asia (AS; Hong Kong [HK], South Korea [SK], China [CH], and Taiwan [TW]). Isolates were centrally tested by broth microdilution (CLSI M7-A7) against levofloxacin (LFX), ampicillin (AMP), amoxicillin-clavulanate (AC), azithromycin (AZI), clarithromycin (CLA), cefuroxime (CFX), and trimethoprim-sulfamethoxazole (SXT). Susceptibility (S) data were interpreted according to CLSI M100-S17 breakpoints (BP) and analyzed according to b-lactamase (BL) status.

Results: The current S rates (%) overall among the oral agents for HI were 99.6 for LFX; 69.1 for AMP; and 52.6 for SXT. For HI, the MIC90s (mg/L) were 0.03 for LFX; 2 for AC; 2 for AZI; 2 for CFX; >8 for AMP; and >4 for SXT. LFX-S, AZI-S, and AC-S rates among HI isolates were >97%, regardless of region. SXT-S (35.3% in TW to 61.5% in SK), AMP-S (37.6% in TW to 92.6% in CH), and CLA-S (58.8% in TW to 75.0% in SK) rates among HI varied substantially by region. The rate of HI that were BL positive (+) overall for AS was 30.1%; however, BL+ rates varied considerably by country (6.9% in CH to 61.2% in TW). The BL+ rate for MC was 99.3%. Against MC, all tested agents were highly active (>95% S with the exception of AMP (BP unavailable). MC were 100% S to both LFX and AZI which also had the lowest MIC90s (0.06 mg/L) of the tested agents. Regional variation in activity against MC was most notable for SXT (80.0% in TW to 100% in HK) and ERY (90% in TW to 100% in SK).

Conclusions: Susceptibility among HI in AS remained high (≥98%) for many of the commonly used oral agents (LFX, AZI, AC, and CFX), regardless of beta-lactamase production

which was found to vary by region. Though BL+ rates among MC have risen above 97% across AS, MC isolates remain >95% to most common CAP agents. Continued regional surveillance to monitor for any change in the susceptibility patterns among these pathogens to agents commonly utilized for empiric therapy is warranted.

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23.004

An Intelligent Web-Based Query System for Spatiotemporal Visualization of Infectious Diseases Surveillance Data in Taiwan

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Background: Beginning of 2005 Fall, the Taiwan Centers for Disease Control has activated a 3-year project to build an infectious disease data warehouse which obtains data with 15 different infectious diseases-related information systems. In order to better utilize these data and provide open public access, we have developed an integrated web-based query system featured in instant spatiotemporal analysis.

Methods: For security concerns, a 4-tiered architecture was adopted, with an independent server, which is assigned to store the pre-calculated secondary data from the data warehouse on a daily basis. Database tables for default selected query and reports were reproduced everyday before dawn. An user online analytical and querying interface was created using Microsoft ASP.NET.

Results: Visualization of notifiable disease surveillance data was the first developed web-based query system. Incidence trends are drawn on demand, which allow users to drill down the levels of geopolitical hierarchy, as well as different intervals and periods of time. Simultaneously, a swift Adobe Flash-embedded image map, instead of a clumsy geographic information system (GIS) server, provides users with geographical distribution of disease incidence accompanied with different colored legends. Automated year-to-year and age-group comparisons are also generated. The difference between traditional and intelligent web-based query system, new system saves at least 30 minutes for every query criterion and even saves the time required for raw data acquisition. Decreased paper-based surveillance reports and reduced budget on information distribution are anticipated.

Conclusion: With the merit of this timely spatiotemporal analytic system, disease trends and spatial distribution can be visualized easily; it also saves time for creating these tables, figures, and maps. Furthermore, the system cuts down the learning curve for new epidemic analysts and reduce the budget of training on statistical and GIS software.

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23.005

A Model for Diarrheal Diseases Surveillance System in Iran

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Background: Currently there is no systematic surveillance for diarrheal diseases in Iran other than cholera. To develop a diarrheal disease surveillance model, we conducted a study in two counties located in the east and southeast of Tehran province.

Methods: From March-June 2007, health workers at 14 health centers and rural health houses were asked to collect basic demographic and clinical information on patients presenting with symptoms of acute gastroenteritis (e.g., vomiting or diarrhea). We provided training to health workers, including an orientation to the project, instructions on use of a standardized data collection form, and specimen collection. Stool specimens were collected from willing patients, aliquoted to bacterial, viral, and parasitic transport solutions, and sent to our reference laboratory in Tehran, where they were screened for rotavirus, *Salmonella*, *Shigella*, Diarrheagenic *Escherichia coli*, *Vibrio*, *Yersinia*, and common parasites including *Giardia*, *Entamoeba histolytica* and *Cryptosporidium*. Bacterial isolates were further characterized.

Results: We received surveillance forms and stool specimens from 14 clinics for 133 patients, of whom 78 (58%) were male and 64 (48%) were <5 years old. No patients were hospitalized or died. Patients were treated with antibiotics (58%) oral rehydration solutions (47%), antimotility drugs (36%), and herbal medications (15%). A potential pathogen was identified in specimens from 89 patients (66%). The most common pathogen identified was rotavirus (46% of all patients, 50% of those <5). Other pathogens identified included STEC (5%), *Shigella* (4%) and ETEC (4%). No O157 serogroup isolates were found.

Conclusion: Rotavirus was the most common pathogen identified, although the surprisingly high prevalence seen in older patients may reflect a degree of background carriage in the population that in the absence of control specimens is difficult to assess. The high rate of antibiotic usage contrasts with the complete absence of pathogens for which antibiotic therapy is indicated, suggesting a need to review treatment protocols for acute gastroenteritis.

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