Background: Diarrhoea globally causes an estimated 3.3 million deaths per year with a median infant mortality of 8.37 deaths per 1000 live births. In Pakistan it is responsible for 43.3% of all post-neonatal deaths. In North Western Frontier Province (NWFP) its prevalence in children under 5 is 15% & 16% in rural & urban areas respectively.

Objectives: To assess the performance of the existing diarrhoea surveillance system to identify strengths and weaknesses to make recommendations for improvement.

Methods: CDC Guidelines for Evaluating Public Health Surveillance Systems were followed. A questionnaire was developed, pretested & used for collecting data from identified stakeholders. A scoring system was evolved to compare the three existing surveillance systems as poor, average, and good.

Results: Existing surveillance systems are a) Health Management Information System (HMIS), b) National Programme for Family Planning & Primary Health Care (FP & PHC), c) Active surveillance (to PH section) during Monsoon. Active surveillance during monsoon is found to be better than the other two arrangements as it is simple, having good quality of data, acceptability & representative-ness with an average flexibility, sensitivity, positive predictive value (PPV) & timeliness. NP for FP & PHC was ranked second owing to its good score in simplicity, data quality & timeliness with an average sensitivity & stability. According to flexibility, data quality, PPV, representativeness & timeliness HMIS was labelled as the weakest.

Conclusion: HMIS although labelled as the weakest remains the main information system for the country. Review & modifications of the existing system including adding information from secondary & tertiary level health care facilities, vertical programs’ MIS e.g. NP for FP & PHC will improve the HMIS substantially.

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Evaluation of Internet-Based Informal Surveillance for Global Infectious Disease Intelligence

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Background: While traditional means of surveillance by governments, multi-national agencies, and institutional networks assist in reporting and confirming infectious disease outbreaks, these formal sources of information are limited in their geographic coverage and timeliness of information flow. In contrast, Internet-based resources such as discussion sites and online news sources have become invaluable sources for a new wave of surveillance systems. Despite widespread use of unstructured information, there has been little, if any, data evaluation.

Methods: Our analysis is informed by evaluation of HealthMap.org, an automated system for real-time monitoring of online information about emerging diseases. In our evaluation, we used officially confirmed outbreaks obtained from WHO Outbreak News, available in the public domain, as a “gold standard” as well as ProMED mail reports. We measured detection characteristics of Google News reports for outbreaks over the 12-month period (October 1 2006—September 30 2007) in both English and Spanish. We apply standard evaluation metrics (volume, geography covered, diseases captured, timeliness, sensitivity and specificity). In a second evaluation, we compared timing of official WHO reports of human avian influenza cases in 2007 with the corresponding reports in both ProMED and news aggregator sources.

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Results: HealthMap identified 11,194 news reports of infectious disease outbreaks (a mean of 38.6 per day, 95% CI, 33.1 to 44.1) covering 105 pathogens and 160 countries. Mean timeliness for news sources, defined as the time between detection by the surveillance source and report by the WHO, was 31 days. However, timeliness varied widely from 102 days earlier to 59 days after the WHO report. Sensitivity, defined as the proportion of WHO alerts detected by news data, was 88%. Compared to ProMED, news sources reported on outbreaks on average 6.5 days earlier but had a sensitivity of only 44%. In our evaluation of avian influenza surveillance, informal sources reported the case 8.8 days following onset, 2.3 days earlier (95% CI, 0.7, 3.9) than the official WHO report, indicating a significant time advantage for the use of informal sources. Despite important biases, news sources are shown to be especially valuable for monitoring spatial and temporal patterns of larger scale epidemics.

Conclusions: Overall, we find that online news sources are a promising tool for surveillance, public health communication and intervention. Future work should be directed at modeling and data integration, including improving risk assessment.

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23.016
The Global Health Monitor: A Bio-Geographic View of World Outbreak News

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Background: With recent studies confirming the Asia-Pacific region as a major source of future emerging diseases and international anxiety of a new type H5N1 influenza epidemic, health authorities are finding the need for improved information infrastructure. The BioCaster project aims to support public health experts by providing timely surveillance of disease outbreak rumours around the world 24/7 in 4 languages: English, Japanese, Thai and Vietnamese.

Methods: We employ text mining supported by background knowledge contained in a multi-lingual ontology to mine media reports, official reports, blogs and news lists from the Web. A traditional pipeline process architecture is used: source selection, data cleansing, topic classification, entity resolution, event extraction and final alert ranking. Pre-alerting news is automatically classified based on disease and location (country and province) for plotting on a publicly available portal called the Global Health Monitor (GHM). News is linked both to the multilingual ontology and to external reference sources such as Medline and HighWire. The results of applying more advanced analytics are available on email alerts to registered users.

Results: This study provides and outline of the system architecture and examined the coverage of 201 positively identified rumours in the GHM over between the 20th December 2008 and the 20th February 2008 and obtained data for the coverage by language, coverage by news source and publication type, as well as coverage by country and disease. The focal point for media attention during this period was found to be Indonesia (H5N1), India (H5N1, Polio, and Anthrax), USA (Measles, Influenza, and Salmonella) and Vietnam (H5N1).

Conclusion: Since its launch as a freely available service in November 2007 the GHM has had an average unique monthly user count of 1600 which is increasing steadily. We aim to make continuous improvements in news coverage and quality of automatic geo-coding and disease identification in the hope that it will enhance surveillance capabilities.

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23.017
Timely Monitoring Influenza Virus Activities and Influenza-Like Illnesses Through Syndromic Surveillance in Taiwan

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Background: Syndromic surveillance has been recognized as a public health tool for early detection of infectious diseases and prevention of outbreaks. We and the Taiwan Center for Disease Control established emergency-department based syndromic surveillance system (ED-SSS) with computer based automatic collection of patient’s data. The epidemiological data on incidence of ILI and virus isolation from the throat and gurgle samples of the patients were immediately analyzed to monitor the trends of epidemics. In this study the attack rates of influenza-like illness were calculated, and risk factors for the development of disease and complications were evaluated through the use of relative risks (RR) with 95% confidence intervals (CI). Also the typology of the influenza virus isolated from the nasal-pharyngeal samples collected through the surveillance system was elucidated.

Methods: Electronic data from emergency-departments of hospitals in the Taipei City, for the period September 2005- to March 2008, was analyzed to determine the number of patients presented with influenza-like illnesses (ILI) and isolation of influenza virus from throat swab samples from these patients using reverse transcriptase-polymerase chain reaction (RT-PCR) laboratory diagnosis.

Results: A total of 165,035 individuals were diagnosed with influenza like illnesses (ILI). The attack rate was highest among children 1 to 6 years of age (attack rate 22.4%). Almost half of the patients were male (50.6%) against 49.4% who were females. Multivariate analysis indicates that asthma was the major risk factor for influenza and ILI attack followed by COPD and diabetes mellitus.

Conclusion: Syndromic surveillance identified more cases than passive surveillance and is therefore more effective and efficient. Government should put more effort to expand the system to all parts of the country.

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