57.026

Realtime intelligence for infectious disease prevention and control
C. Kara-Zaïtri*, R. Hamilton
inFact UK, Bradford, United Kingdom

Background: Infectious disease surveillance is complex, multi-disciplinary and high profile. The emergence of new diseases and their speed of onset, coupled with current bioterrorism threats have re-emphasised the urgent need for novel methods for harvesting and acting upon appropriate and timely surveillance data using intelligent information systems based on enhanced communication technologies.

Methods: The methodology developed is based on two secure web-based applications - HPZone and HP-Intelligence. HPZone is a decision support tool for infectious disease control at the local Health protection Unit level or Zone and has been deployed nationally in England and six regions in the Netherlands. HPZone captures a rich data set to support all the key business processes from the handling of routine Enquiries, through Case management and Contact tracing, right up to the management of Outbreaks and Incidents. HP-Intelligence is a data mining application which harvests surveillance data from each of the HP-Zones and persistently analyses all entries to provide alerts given a protocol of rules. Data mining functions include the detection of coincidences of events (time, place and scenario), associations (infection versus seasonal parameters), sequential patterns (behavioural trends), and ad-hoc queries. Rules can be entered on an individual zone, region, national or even international levels with individual users being able to subscribe to specific alerts.

Results: HP-Intelligence yielded positive results including the discovery of relationships, which were not obvious. Immediate outcomes include:
- Coincidence, incidence and threshold alerts at National, Regional and Locals levels.
- Rich data sets for scientific evaluation to forecast projections and prioritise options for control strategies.
- Timely assessment of the descriptive epidemiology of a major public health incident including progress and outcome.
- Capture of key contextual data including environmental information such as contact with animals, travel history and possible transmission mode.
- National Incident Board for viewing aggregate summary Situation, Case, Contact and laboratory data nationally using various means including GIS.

Conclusion: Immediate gains from HPZone and HP-Intelligence include an efficient early warning function for problems that are “bubbling away”, and the capture of individual, regional and national wisdom using easily sharable rules and protocols for enhanced intelligence in health protection.

doi:10.1016/j.ijid.2010.02.2109

57.027

The implement of airport fever screening for dengue sentinel in Taiwan, 2003-2008
M.-M. Kuan
Centers for Disease Control, Taipei, Taiwan, R.O.C

Background: This study aimed to examine the epidemiological trends of dengue as well as the impacts of the imported cases and airport fever screening on community transmission in Taiwan, a dengue non-endemic island.

Methods: All the data of dengue cases obtained from the surveillance system in Taiwan CDC were analyzed to present the relationship among cases or population factors by Pearson correlations, linear regression and/or GIS-based mapping. The comparison of the impact on whether implementing airport fever screening or not was evaluated the Student’s and the twoway ANOVA.

Results: Being a dengue non-endemic region, 44.6% (244/542; 99% CI: 33.1-57.8%) imported dengue cases with fever symptomatic was at airport rapid screened by non-contact infrared thermometer and subsequently confirmed by laboratory. A positive association of the imported dengue cases screened by airport fever screening with the total imported dengue cases was found i.e. number of total imported cases = 3.459 + 0.418 x number of imported cases detected by fever screening (n = 5, R = 0.890, R2 = 0.792) during 2003-2007. Moreover, by viewing of geographic heterogeneity, the southern Taiwan, supposed to be as the competent region for dengue endemics with tropic climate and existence of Aedes aegypti, where the imported dengue cases was positively associated with indigenous cases in 2003–2007 with the implementing airport fever screening i.e. the number of indigenous dengue cases= 53.398 x the number of imported dengue cases-169.283 (n = 25, R = 0.778, R2 = 0.605) whereas it was lesser association (n = 25, R = 0.312, R2 = 0.017) during 1998-2002 without this intervention in Southern Taiwan. On the other hand, in Northern (Subtropical) Taiwan, less association between the number of imported cases and the number of indigenous cases was shown.

Conclusion: It implicates first time that upon conducting of this border screening by airport fever screening followed by laboratory’s confirmation, the numbers of imported dengue cases could provide for early alert and sentinel of dengue to predict the the numbers of indigenous dengue cases in non-endemic but dengue competent (risk) region and therefore may help in targeting the controlling of local dengue transmission, while those undetected cases due to latent or asymptomatic infection would be the source of new dengue outbreaks each year.

doi:10.1016/j.ijid.2010.02.2110