Exception Reporting Systems for 'Flu Like' Syndromes in Scotland.

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OBJECTIVE

Public Health consultants at Health Protection Scotland (HPS) monitor routine data from the NHS24 telephone helpline to provide information on possible epidemics of flu or other infectious diseases in Scotland. Within this paper the exception reporting system (ERS) run at HPS is described and the adaptations made to the classification system as a response to the change of data recording patterns at NHS24 are described.

BACKGROUND

The syndromic surveillance system in Scotland was implemented in response to Gleneagles hosting the G8 summit in July 2005. Part of this surveillance system used data from NHS24, a nurse led telephone help line that is the means of access to out of hours general practice services for the Scottish population. This data was processed by the ERS system and reports generated for 10 syndromes considered relevant to possible bio-terrorism or disease outbreaks. These syndromes are; colds and flu, difficulty breathing, fever, diarrhoea, coughs, double vision, eye problems, rash, lumps and vomiting. Following the G8 summit the ERS has been updated weekly using data pre-catagorised into syndromes at NHS24 (known as protocolled data). The proportion of calls processed by the protocol at NHS24 over this time has however fallen to around 40%. This change has given the impetus to create a free text searching algorithm which can classify all calls received by NHS 24 into one of the 10 syndromes or "other". This therefore allows all calls to be analysed by the ERS.

METHODS

A free text searching algorithm was devised to interrogate the call reason field for each telephone call. Each call is classified by searching for words associated with the syndromes, excluding certain combinations and accounting for common misspellings.

By using postcode district as a proxy for the caller's location, calls are classified as originating from one of the 14 health boards. This allows for surveillance at both the national and health board level.

The prediction model of the syndromic surveillance is based upon the approach of Farrington [1]. Adaption of this model to include separate effects for weekdays and weekends and public holidays (where the number of calls naturally increases) allows for the generation of alarms where the level of calls observed for that syndrome exceeds what would be expected 99% of the time.

RESULTS

The model is run for all calls from October 2006. The output in figure 1 illustrates an increase in the reporting of all colds and flu during the Christmas holiday period. This was reflected at the health board level and other syndromes related to influenza-like illness.

The ERS output produced alarms one week prior to the peak count for all influenza-like illness related syndromes; colds and flu, coughs, difficulty breathing and fever.

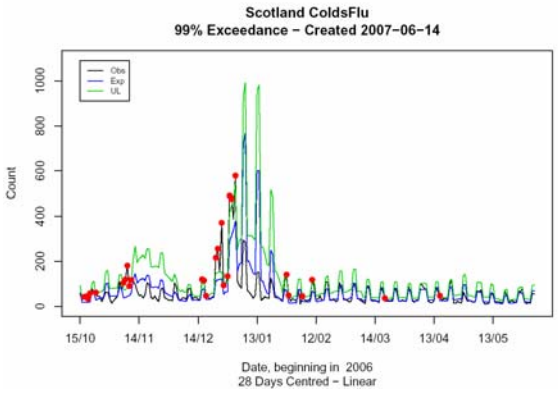

Figure 1 – ERS output of Colds and Flu syndrome for Scotland from 15th October 2006 – 3rd June 2007. The red markers show alarms, the black line the number of observed calls, the blue line is the expected number of calls and the green line indicates the expected number of calls on 99% of occasions.

CONCLUSIONS

The ERS successfully detected an outbreak of influenza-like illness in Scotland, both at a national and health board level, over the Christmas holiday period. The passing of these results to the consultants at HPS, allows for any action if required, to be taken.

There is potential for other syndromes to be classified and monitored due to the flexibility of the call reason interrogation algorithm.

If required, for example during an influenza pandemic, output could be generated on a daily basis.

REFERENCES

[1] Farrington CP, et al. A Statistical Algorithm for Early Detection of Outbreaks of Infectious Disease. *Journal of the Royal Statistical Society Series A* 1996; 159:547-563.

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