Assessing the Utility of Syndromic Surveillance Systems during Extreme Weather Conditions

James B. Daniel[1], Kristina Kishonti[2], Janos Bovos[3], Dawn Heisey[1], Anna Paldy[2]

[1]Massachusetts Department of Public Health, [2]National Institute of Environmental Health, Budapest, Hungary, [3]Capital Institute of the National Public Health Service, Budapest, Hungary

OBJECTIVE

The specific objectives of the study are to evaluate the usefulness of syndromic surveillance data to monitor heat-related morbidity and mortality during extreme weather conditions. During such conditions, real time data monitoring could potentially help drive interventions to reduce morbidity and mortality.

BACKGROUND

Recent extreme weather events have caused serious health and social problems across Europe (WHO and EEA, 2004). During the summer heat waves of 2003 across Europe, France recorded an excess of over 14,000 deaths contributed to heat related causes. Other countries such as Italy and Portugal experienced over 3,000 and over 2,000 excess deaths respectively (Kovats, 2004). The extreme rises in mortality were initially unobserved by traditional public health surveillance techniques; morbidity related to heat-related exposures also went initially unnoticed by public health authorities.

Real-time monitoring of clinical data has been proposed as one method of surveillance that may be used to alert public health authorities during extreme weather conditions when heat-related morbidity may be higher than expected. Previous studies have shown increased ambulance calls during heat alert conditions in Canada (Dolney, 2005). These potential data sources, including electronic medical records for emergency department visits, are already in existence in many of the countires affected by the heat waves of 2003. Syndromic surveillance methods such as those described by Mandl et al (Mandl, 2004) could be applied to these data to help detect when heat-related morbidity and possibly heat-related mortality begins to rise.

METHODS

Considering the expense of implementing real-time syndromic surveillance systems, retrospective data from areas where the heat waves were most severe will be used to evaluate how the systems may have performed during the actual events across Europe. Syndromic groupings defining heat-related morbidity will be developed considering both initial chief complaints and final diagnoses. Anecdotal evidence suggests that many patients presented with initial diagnoses of infection and fever, so the syndromic groupings must be carefully defined. SATSCAN analysis will be employed to identify geographic and temporal clusters of disease. The ability of the systems to help monitor increased mortality and morbidity during heat events can then be evaluated by comparing these identified clusters to both environmental conditions and mortality data from the same areas.

RESULTS

Results are not available as of the abstract submission deadline. Data sources have been identified from multiple sources across several European countries affected by the heat waves of 2003 that may be utilized for this retrospective analysis. The ability of the data to perform as part of a real-time surveillance system during extreme weather events will be evaluated.

CONCLUSIONS

Although weather prediction models can certainly predict the risk for heat related morbidity (McGregor, 2004), syndromic surveillance data could help refine these models to increase their sensitivity and timeliness. During an event with predicted severity from both models, public health authorities may choose a more aggressive form of intervention. The ability of syndromic surveillance systems to identify geographic clusters of disease may also allow interventions to focus on specific communities or vulnerable populations. At a minimum, the situational awareness provided by real –time data monitoring could prove useful for governments responding to extreme weather conditions.

REFERENCES

Dolney TJ, Sheridan S, et al (2005): "The relationship between extreme heat and ambulance response call for the city of Toronto, Ontorial, Canada. *Environmental Research:*101

Kovats, S, Wolf , T, Benne, B, (2004): "Heatwave of Augusts 2003 in Europe: provisional estimates of the impact on mortality" *Euro Surveill*:8(11)

Mandl, K, Overage, JM, et al (2003): "Implementing syndromic surveillance: a practical guide informed by the early experience" JAMAI:11

McGregor, GR, Watkins, H, Cox, M (2004): "The relationship of the seasonality of temperature and ischaemic heart disease mortality: implications for climate based health forecasting" Climate Research:25

WHO and EEA (2004) "Report of the meeting 'Extreme weather and climate events and public health responses'" February 2004. Copenhagen: World Health Organization