

Crowdout: when do other events hinder informal disease surveillance?

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Objective

Reporting about large public health events may reduce effective disease surveillance by syndromic or informal surveillance systems. The goal is to determine to what extent this problem exists and characterize situations in which it is likely to occur.

Introduction

Informal surveillance systems like HealthMap (HM) are effective at the early detection of outbreaks (1, 2). However, reliance on informal sources such as news media makes the efficiency of these systems vulnerable to newsroom constraints, namely high-profile disease events drawing reporting resources at the expense of other potential outbreaks and diminished staff over weekends and holidays. To our knowledge, this effect on informal or syndromic surveillance systems has yet to be studied.

Methods

Using HM's English-language global infectious disease database events (3), we identified expected periods of decreased reporting of infectious disease due to newsroom constraints between July 1, 2008, and August 31, 2011. Crowdout events were defined as averaging greater than five events per day for at least 2 weeks, plus making up at least 50% of daily events. Meeting these criteria were H1N1/swine flu (two instances), Haiti's cholera epidemic, 2010, and the *E. coli* outbreak in Germany, 2011. The December holiday period, when most of the newsroom is off duty, was also tested. We examined whether the average number of noncrowdout events differed significantly from the average daily HM events at baseline, defined as similarly structured periods without holidays or high-profile epidemic events. Baselines were measured before and after the crowdout period, plus during the same time period in other applicable years. Means were compared using paired *t* tests with unequal variances.

Results

The two instances where H1N1 met inclusion criteria both resulted in average numbers of daily events significantly lower than similar periods before, after and parallel to the time period in question (Fig. 1). See Table 1 for more results. On average, the greatest number of daily events occurs on Thursdays, least on Sundays. The outbreaks of cholera in Haiti and *E. coli* in Germany showed no significant crowdout effect at both global and regional levels. A reduction in the average events per day during the December holiday period was not significant.

Conclusions

Informal surveillance has limitations that are exacerbated by newsroom constraints. During the global H1N1 pandemic, significantly fewer infectious disease events were recorded by HM's informal surveillance system. Crowdout poses a risk for epidemiological surveillance since decreased relative surveillance may postpone reporting of outbreaks. Moreover, crowdout during H1N1 showed that this phenomenon can endure for

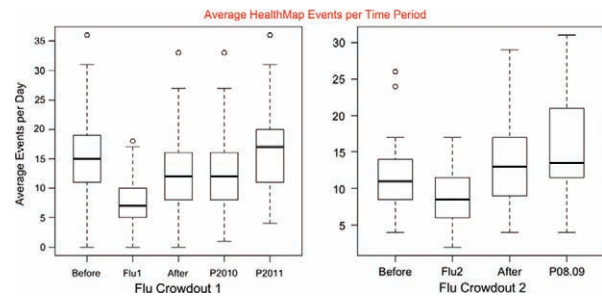


Fig. 1. Boxplots showing average daily HealthMap events during two separate periods when H1N1 met crowdout criteria. Flu1 and Flu2 represent respective crowdout periods. Before and after are of the same length and structure as the crowdout period. P2010, P2011 and P08.09 are parallel time periods, i.e., the same dates as the crowdout period but during different years.

Table 1. Means comparison of average daily events

Crowdout period	Period	Difference	95% CI (low)	95% CI (high)
Flu 1	Before	7.79	7.0	8.57
Flu 1	After	4.83	4.09	5.57
Flu 1	Parallel 1	4.89	4.24	5.54
Flu 1	Parallel 2	8.74	7.51	9.98
Flu 2	Before	2.81	1.06	4.56
Flu 2	After	4.56	2.55	6.57
Flu 2	Parallel	7.0	4.74	9.26

long time periods. However, regional outbreaks like cholera in Haiti or *E. coli* in Germany do not appear to affect informal surveillance on a global or regional scale.

Keywords

Informal surveillance; syndromic surveillance; infectious disease; epidemics; media

References

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