MoH+: A Global, Integrated, and Automated View of Official Outbreak Reporting

The Harvard community has made this article openly available. Please share how this access benefits you. Your story matters

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Citable link</td>
<td><a href="http://nrs.harvard.edu/urn-3:HUL.InstRepos:11708637">http://nrs.harvard.edu/urn-3:HUL.InstRepos:11708637</a></td>
</tr>
<tr>
<td>Terms of Use</td>
<td>This article was downloaded from Harvard University’s DASH repository, and is made available under the terms and conditions applicable to Other Posted Material, as set forth at <a href="http://nrs.harvard.edu/urn-3:HUL.InstRepos:dash.current.terms-of-use#LAA">http://nrs.harvard.edu/urn-3:HUL.InstRepos:dash.current.terms-of-use#LAA</a></td>
</tr>
</tbody>
</table>
MoH+: A Global, Integrated, and Automated View of Official Outbreak Reporting

Chi Bahk*1,2, David Scales1, Sumiko Mekaru1,3, John S. Brownstein1,4,5 and Clark Freifeld1,6

1Children’s Hospital Informatics Program, Division of Emergency Medicine, Children’s Hospital Boston, Boston, MA, USA; 2Dept of Global Health and Population, Harvard School of Public Health, Boston, MA, USA; 3Dept of Epidemiology, Boston University School of Public Health, Boston, MA, USA; 4Dept of Pediatrics, Harvard Medical School, Boston, MA, USA; 5Dept of Epidemiology, Biostatistics and Occupational Health, McGill University, Montreal, QC, Canada; 6Dept of Biomedical Engineering, Boston University, Boston, MA, USA

Objective
To introduce MoH+, HealthMap’s (HM) real-time feed of official government sources, and demonstrate its utility in comparing the timeliness of outbreak reporting between official and unofficial sources.

Introduction
Previous studies have documented significant lags in official reporting of outbreaks compared to unofficial reporting (1,2). MoH+ provides an additional tool to analyze this issue, with the unique advantage of actively gathering a wide range of streamlined official communication, including formal publications, online press releases, and social media updates.

Methods
Outbreaks reported by official sources were identified through MoH+ (healthmap.org/mohplus), which collects surveillance data published globally by ministries of health (MoH), other related ministries, government portals, government-affiliated organizations, and international governing bodies (Fig. 1). Reporting of these outbreaks was also identified in unofficial sources using various HM feeds including Google News, ProMED, and participatory surveillance feeds.

Of the 109 outbreaks identified since May 2012, 65 were excluded as they started before data collection, 7 were excluded as they were not reported by unofficial sources, and 1 was excluded as it was a non-natural outbreak. For the remaining 36 outbreaks, the median difference in first date of report between official and unofficial sources was analyzed using a Wilcoxon sign rank test.

Results
Outbreak reporting in official sources lagged by a statistically significant median of 2 days (p=0.003). Among unofficial sources, online news most often (75%) was the fastest to report an outbreak, followed by ProMED (22%) and participatory surveillance (3%). Among official sources, national government affiliated institutes were most often (41%) the fastest, and repeatedly providing prompt outbreak reports were the US Centers for Disease Control and Prevention (CDC), Public Health Agency of Canada, Finnish Food Safety Authority, Health Protection Scotland, UK Health Protection Agency, and French Institute of Public Health Surveillance (FIPHS). Following such institutes were the European CDC (ECDC) with 22% of first reports of outbreaks; MoH’s (17%); and WHO (10%). There were 4 instances in which official sources reported before unofficial sources—3 by the ECDC and 1 by FIPHS.

Conclusions
Compared to the Chan study reporting a 16 day lag between non-government and government sources (2), the present study shows a much condensed lag of 2 days between unofficial and official sources. Because the two earlier studies cover a much broader historical time frame, one explanation for the reduced lag time is increased adoption of online communication by official government agencies. However, despite such improvements in communication, the lag persists, pointing to the importance of using informal sources for outbreak surveillance.

The present study was limited by small sample size, as the study is in its early stages. We will continue to gather data and all numbers will be updated in time for the presentation to reflect the larger database. Future directions of this study include characterization of official and unofficial reporting by region, language, disease, and source.

Keywords
disease surveillance; outbreak reporting; timeliness; MOH; official sources

References

*Chi Bahk
E-mail: cbahk@hsph.harvard.edu

Fig. 1. Interactive visualization of HealthMap MoH+, at healthmap.org/mohplus