

Understanding newsworthiness of an emerging pandemic: International newspaper coverage of the H1N1 outbreak

Katherine C. Smith,^{a,b} Rajiv N. Rimal,^{a,b} Helena Sandberg,^c John D. Storey,^{a,b} Lisa Lagasse,^a Catherine Maulsby,^a Elizabeth Rhoades,^a Daniel J. Barnett,^{b,d} Saad B. Omer,^{e,f} Jonathan M. Links^{b,d}

^aDepartment of Health, Behavior and Society, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD, USA. ^bJohns Hopkins Preparedness and Emergency Response Research Center, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD, USA. ^cDepartment of Communication and Media, Lund University, Lund, Sweden. ^dDepartment of Environmental Health Sciences, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD, USA. ^eDepartment of International Health, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD, USA. ^fDepartment of Global Health, Emory University, Atlanta, Georgia, USA.

Correspondence: Katherine C. Smith, Department of Health, Behavior and Society, Johns Hopkins Bloomberg School of Public Health, 624 N. Broadway, Baltimore, MD 21205, USA.
E-mail: kasmith@jhsph.edu

Accepted 29 November 2012. Published Online 24 December 2012.

Background and Objectives During an evolving public health crisis, news organizations disseminate information rapidly, much of which is uncertain, dynamic, and difficult to verify. We examine factors related to international news coverage of H1N1 during the first month after the outbreak in late April 2009 and consider the news media's role as an information source during an emerging pandemic.

Methods Data on H1N1 news were compiled in real time from newspaper websites across twelve countries between April 29, 2009 and May 28, 2009. A news sample was purposively constructed to capture variation in countries' prior experience with avian influenza outbreaks and pandemic preparation efforts. We analyzed the association between H1N1 news volume and four predictor variables: geographic region, prior experience of a novel flu strain (H5N1), existence of a national pandemic plan, and existence of a localized H1N1 outbreak.

Results H1N1 news was initially extensive but declined rapidly (OR = 0.85, $P < .001$). Pandemic planning did not predict newsworthiness. However, countries with prior avian flu experience had higher news volume (OR = 1.411, $P < .05$), suggesting that H1N1 newsworthiness was bolstered by past experiences. The proportion of H1N1 news was significantly lower in Europe than elsewhere (OR = 0.388, $P < 0.05$). Finally, coverage of H1N1 increased after a first in-country case (OR = 1.415, $P < .01$), interrupting the pattern of coverage decline.

Conclusions Findings demonstrate the enhanced newsworthiness of localized threats, even during an emerging pandemic. We discuss implications for news media's role in effective public health communication throughout an epidemic given the demonstrated precipitous decline in news interest.

Keywords Agenda setting, H1N1, international news media, pandemic influenza, preparedness communication.

Please cite this paper as: Smith *et al.* (2013) Understanding newsworthiness of an emerging pandemic: International newspaper coverage of the H1N1 outbreak. *Influenza and Other Respiratory Viruses* 7(5), 847–853.

Background

In the face of an emerging infectious disease such as H1N1, effective health promotion requires public cooperation with public health initiatives.¹ Emerging diseases are challenging in terms of public engagement, as risks are not necessarily immediately evident to the public nor is the right plan of action necessarily known.¹ Thus, information dissemination as to the nature of the threat and the desired response via pertinent communication channels is critical.²

On March 18, 2009, Mexico began to identify cases of influenza-like illness (ILI). This illness became known as

pandemic H1N1 2009 or 'swine flu.' By April 23, 2010 [a year following the designation of H1N1 as a public health emergency by the World Health Organization (WHO)], 214 countries and overseas territories or communities had reported laboratory-confirmed cases, including at least 17 853 deaths.³ The toll that the H1N1 epidemic would take was initially uncertain, and public health agencies, scientists, and journalists made rapid decisions about informing the public regarding unfolding events. Analyzing news coverage during the outbreak period provides insight into the role of the media in creating and disseminating public information and shaping the discourse on emerging

threats. In addition to its commercial interests, mass media's civic function includes informing citizens as to significant health threats.⁴

The 2009 H1N1 outbreak occurred in the global context of recent avian influenza (H5N1) outbreaks. By April 2009, H5N1 had been identified in poultry globally, and in countries where the disease had been found in humans, it carried high case fatality rates. Given events such as H5N1, governments and international entities have focused on the potential for a novel influenza virus A subtype to trigger a pandemic; WHO has urged member states to produce national influenza pandemic preparedness plans. Planning in low-resource countries, however, has proven challenging given limited resources and competing problems and priorities.⁵

News media and emergency preparedness

In terms of preparing for an influenza pandemic, the public has been found to underestimate mortality risks.⁶ News media are a key resource for informing the public as to risks related to new and emerging health issues,⁶ although communication challenges arise as issue novelty wanes.⁴ Understanding the nature of media attention during a recent influenza pandemic is important to plan for effective communication, should a new strain emerge.⁵ News media influence the public in a number of ways, including through an agenda-setting function. News media populate the menu of items covered during a particular news cycle.⁷ They also shape how issues are commonly understood by their framing of the story.⁸ News coverage can link medical and public conceptualizations of health, turning medical findings into public knowledge,⁹ and revealing risks not otherwise apparent.¹⁰ Media can, however, both represent and produce trauma¹¹ and are routinely criticized for creating public fear and potential panic in the face of emerging health threats.^{4,12} News is not a mere representation of an external reality, but is rather a social product; news volume frequently does not neatly parallel scientific risk assessments.¹³ Moreover, media's role is distinct from that of institutions (including government agencies) more directly involved in producing and controlling risks.¹⁰

Washer and Joffe⁹ called for research around media influence on public construction of emerging infectious diseases, specifically how coverage develops over time. Here, we analyze international media attention to a new infectious disease in humans (H1N1 2009). The extent of news attention (volume) to health topics has been identified as pertinent for public health promotion,¹⁴ both in relation to health-related knowledge² and behaviors.¹⁵ This study fills a gap in the literature on media coverage of international health issues, particularly threats that may spread rapidly within and between countries.

The determination of newsworthiness is complex^{13,16} and includes event- and country-specific factors.¹⁷ One aspect of

this complexity is that international news outlets do not cover events occurring in all nations equally; rather, some nations and regions are consistently highlighted, while others are repeatedly ignored.^{18,19} During an evolving health crisis like H1N1 2009, journalists face significant challenges, including determining and subsequently conveying issue relevance for their intended audience. To make new threats comprehensible, news media can and do routinely draw upon prior experiences as 'anchoring events'^{9,20} that then shape public understanding of current issues.¹³ Potential anchors include similar prior incidents and any subsequent individual and institutional reactions and resolutions. Avian flu (H5N1) serves as a potential 'anchor' for H1N1 establishing saliency for both journalists and audiences. In addition to prior experience, proximity can also be a factor in determining newsworthiness.^{21,22} Thus, we might expect coverage of H1N1 to be greater when and where the story is somehow 'local.'⁴

In this article, we assessed H1N1 newsworthiness from newspaper home pages in 12 countries during the initial outbreak month. Our primary research question focused on factors predicting news coverage volume following the outbreak. H1N1 news volume is considered as a proportion of the overall 'news hole,' examining the relationship with proximity, prior 'anchoring' experiences, and the existence of national influenza plans. 'News hole' is the available, non-advertising space in a given news outlet.

Methods

News source sample

Data were gathered from home page content of 12 newspapers published in the month following the Pandemic Phase Alert being raised to Phase 5 (April 28, 2009–May 28, 2009). The newspaper sample was purposively constructed to capture variation by global region as well as country-level differences in formal pandemic planning and avian flu (H5N1) experiences (see Table 1).

Home pages of leading daily newspapers serve as a rough proxy for national news environment. Websites were captured in 'real time' using a single daily screenshot of each home page. English language news sources were prioritized given the research team's capacity so as to allow the innovative capture of 'live' international news content. Two non-English newspaper home pages (*Prese Libre* in Guatemala and *Tribune de Geneve* in Switzerland) were included because no English language newspaper website was identified from the sampled country, and the research team had the capacity to code Spanish and French content.

H1N1 coverage in relation to the overall 'news hole'

Newspaper websites differed considerably in terms of complexity, and it was therefore important to consider H1N1

Table 1. Sample newspapers, country features, and measures of H1N1 news volume

Newspaper	Country	Region	1st reported case	Published pandemic plan	H5N1 experience	Average daily # of H1N1 stories (SD)	Average % of daily news hole on H1N1 (SD)
Buenos Aires Herald	Argentina	Americas	5/9/09	Yes	No	2.6 (1.9)	5 (4)
Sydney Morning Herald	Australia	Asia/Oceania	5/9/09	Yes	No	4.7 (5.3)	3 (3)
People's Daily	China	Asia/Oceania	5/1/09	No	Yes	7.6 (4.1)	8 (4)
Egyptian Gazette	Egypt	Africa	No cases during data capture	Yes	Yes	2.4 (1.1)	14 (7)
Prese Libre	Guatemala	Americas	5/6/09	No	No	4.4 (3.9)	11 (9)
Times of India	India	Asia/Oceania	5/18/09	No	Yes	0.3 (2.9)	2(2)
The Daily Nation	Kenya	Africa	No cases during data capture	Yes	No	1.6 (1.2)	3 (2)
The Guardian	Nigeria	Africa	No cases during data capture	No	Yes	1.8 (1.1)	3 (2)
Moscow Times	Russia	Europe	5/23/09	No	Yes	1.9 (0.8)	2 (1)
Tribune de Geneve	Switzerland	Europe	4/30/09	Yes	Yes	6.7 (4.3)	7 (4)
UK Times	United Kingdom	Europe	4/27/09	Yes	Yes	3.3 (1.7)	5 (3)
New York Times	USA	Americas	4/23/09	Yes	No	5.6 (5.6)	4 (4)

news volume as a proportion of available online 'space.' The 'news hole' serves as a standardizing denominator in comparison with volume across newspaper websites.²³ Whereas the news hole is traditionally operationalized as a measure of available space (e.g., column inches) or time (minutes of a broadcast), the dynamic nature of virtual space on websites (that is not bound to a single page) led to us adopting a different approach. A news hole measure was created by averaging the number of available links on three randomly selected days' home pages from each publication. The measure included opinion polls and images (which sometimes included H1N1 content), but excluded advertisements. Home pages' 'news holes' ranged from 17.75 (*Egyptian Gazette*) to 185.89 links (*Sydney Morning Herald*).

Determining H1N1 home page content

Volume H1N1-related headlines and links (H/L) were identified using the following key words: 'flu,' 'influenza,' 'swine,' 'H1N1,' and 'pandemic.' All H/L that included a key word or that appeared under a key word subheading that included a key word were coded as separate, individual stories. A daily 'H1N1 proportion of news hole' score was created for each home page. For example, the denominator for the *Sydney Morning Herald* was 185.89 (the coverage number of links per home page on this newspaper), and on May 3, the newspaper had 12 H1N1 links. Hence, for that day, the H1N1 news hole proportion was 0.065 (6.5%).

Intercoder reliability (Cohen's kappa) was measured on five percent of all links; substantial agreement ($k > 0.6$) was established for all variables.

Predictor variables

The *date of the first domestic case* of H1N1 in each sample country³ was used to classify home pages as either prior to or following localized outbreak. For some sample countries, the first case occurred outside of the sample time frame [Table 1]. In addition, each country was classified as to *the existence of a published pandemic plan*³ and *prior experience with avian flu* (H5N1) in either birds or humans.²⁴

Analytic approach

Analysis began with a description of news volume during the outbreak month, followed by a bivariate analysis of the relationship between in-country outbreak status and newspaper coverage volume. Linear regression models were then used to examine the relationship between the predictor variables (national pandemic plan, prior experience with H5N1, a first 'localized' case) and flu news volume as a proportion of the 'news hole.' Generalized estimating equation (GEE) models were used, with binomial distribution assumption, to account for data clustering within newspapers. Given the non-linear nature of the data, a spline model was subsequently run with an individual change point at the day of domestic flu outbreak within each country

within the sample time frame. Data were analyzed using SAS 9.2 (SAS Institute, Cary, NC).

Results

The analysis demonstrates that H1N1 was internationally newsworthy during the initial outbreak month; 1079 home page headline links and images were generated across the 12 newspaper home pages; the average number of H1N1 stories per home page was 3.95 (SD = 3.91). H1N1 news volume varied considerably between newspapers, with the highest average daily links (7.6 per day) in China's *People's Daily* and the lowest average (fewer than one per day) in the *Times of India*. Taking H1N1 coverage volume as a proportion of overall 'news hole,' on average 5.3% (SD = 5.4) of home page headlines/links related to H1N1. The highest proportion of coverage was found in the *Egyptian Gazette* (14%), followed by Guatemala's *Prese Libre* (11%), *People's Daily* of China (8%), and *Tribune de Geneve* from Switzerland (7%). In comparison, H1N1 accounted for only 2% of stories in the *Moscow Times* and the *Times of India*.

At its peak on May 1, 2009, H1N1 accounted for 11% of all of home page headlines/links. Over the month coverage declined relatively steadily, although coverage 'spiked' somewhat in mid-May. By month's end, approximately 3% of home page content was H1N1 related. (see Figure 1).

Modeling relative H1N1 newsworthiness and time since classification of H1N1 as a public health emergency revealed significance for both the linear [OR = 0.85 (0.799, 0.903)] and quadratic [OR = 1.003 (1.001, 1.005)] terms. Flu story volume as a proportion of news hole was initially high, then decreased, and then increased again. A spline model was therefore conducted with a break point (knot) at the day of each country's first confirmed domestic H1N1 case for

countries for which this occurred during the sample time frame.

Having a national pandemic plan was not associated with H1N1 newsworthiness. However, national experience with avian flu (H5N1) was significantly associated with H1N1 newsworthiness; newspapers from countries that had experienced H5N1 had a significantly greater proportion of their overall news hole dedicated to H1N1 [OR = 1.411 (1.03, 1.93)] (Table 2). The proportion of the news hole dedicated to H1N1 was significantly lower in European home pages than in other regions [OR = 0.388 (0.16, 0.97)].

H1N1 newsworthiness was greater on home pages published after a first domestic case [OR = 1.415 (1.116, 1.794)]; coverage within a given country spiked following the first 'in-country case.' The magnitude of spike in coverage following an 'in-country case' decreased over time, but the interaction between time since initial outbreak and magnitude of the increase in coverage following the domestic outbreak was not significant.

Discussion

To the extent that the news media attend to an emerging pandemic, they have potential to serve as an effective partner in informing the public about risks and prevention and containment strategies. Pandemic flu made it onto the international news agenda; the raw volume of H1N1 online news stories clearly indicates newsworthiness, even in countries not (yet) experiencing their own outbreak. Media attention is, however, fleeting, such that by a month after initial designation of a public health emergency, attention to the pandemic was already waning. This decline mirrors that experienced following H5N1.⁴ To better understand the overall newsworthiness of H1N1, we conducted an informal review of several news archives of global events from the time. This process revealed no *major* global news events

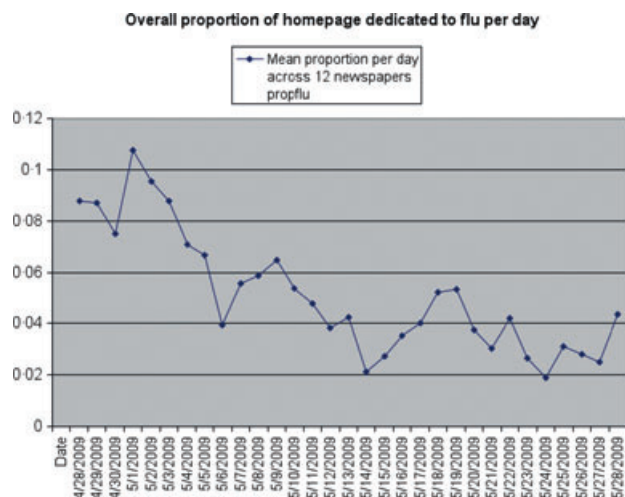


Figure 1. Timeline of proportional H1N1 coverage across all newspapers.

Table 2. Multivariate predictors from GEE regression equations

Predictors	Odds ratio (CI)	Beta
Days overall ^a	0.85 (0.799, 0.903)	-0.165***
Days overall – curvilinear	1.003 (1.001, 1.005)	0.003**
Prior pandemic plan	1.03 (0.579, 1.821)	0.026
Prior avian flu experience	1.411 (1.03, 1.93)	0.344*
Outbreak of H1N1 in country	1.415 (1.116, 1.794)	0.347**
Region: Africa ^b	0.881 (0.284, 2.733)	-0.127
Region: Asia/Oceania ^b	0.719 (0.418, 1.237)	-0.330
Region: Europe ^b	0.388 (0.155, 0.973)	-0.946*

^aTime since initial outbreak.

^bAmericas region used as the reference.

* $P < .05$, ** $P < .01$, *** $P < .001$.

during this time period, nor any events that impacted more than one of our sample countries. It is possible that the level of attention afforded this topic would have been less at a time when more significant global events were unfolding.

While H1N1 was newsworthy as a global issue, attention was intensified in the context of a country having had a domestic outbreak. Thus, while it is not sufficient to say that 'all news is local,' when it comes to emerging infectious illnesses at the level of a pandemic, close proximity and national relevance were associated with media attention. Domestic cases create potentially newsworthy events, including governmental responses, local resources, and personal experiences. The proximity of risk has been found to be relevant to news content,^{4,12,20} and this study adds the perspective that even under pandemic conditions, localized risk yields greater newsworthiness. Domestically focused news coverage need not necessarily convey greater information, but may reflect existence of debate and controversy on an issue.

Overall news coverage of H1N1 declined fairly rapidly, and even the magnitude of individual country 'spikes' after a first local case diminished in size over the study period – although this decline was not statistically significant. To use a crude analogy, if the high point of coverage was 11% of the total news hole on May 1 2009, then the attention 'half-life' was only about 5–7 days, as coverage had dropped to approximately 5% by May 6–8. Coverage during the earliest days of outbreak is likely to include a high level of uncertainty and focus on the spread of the virus, rather than on any systemic or individual level response. These data illustrate a need for public health systems to be ready with communication messages and campaigns to be implemented within the earliest hours of an emerging pandemic event, so as to potentially utilize news media to communicate personal efficacy messages or at least counterbalance potentially alarmist messages during a period of uncertainty. Hooker *et al.*⁴ also warn that as time passes after an initial outbreak, journalists may prioritize their duties as government critics over notions of civic duty to inform. Moreover, once the initial window of high newsworthiness has closed, it is important to identify strategies to advocate for continued media attention. Given that the possibility of generating media coverage potentially wanes as an epidemic matures, countries experiencing a localized outbreak later in an unfolding pandemic may face additional barriers to garnering sufficient attention at critical communication junctures. Generating news coverage may necessitate educating newsmakers on the newsworthiness of various elements of institutional responses to an emerging illness, beyond simply the rising case/death toll.

We found no association between pandemic planning and H1N1 newsworthiness; a country's official readiness did not

seemingly either dampen or spark attention. To the extent that media serve as an important source of health information for the public, the media's role in preparedness communication during an emergency event should be considered further. Public health has typically assumed an instrumental view of news media in shaping public understanding of risk¹⁰; media are conceptualized as mere channels facilitating the delivery of knowledge and meaning from experts to laypersons. This conceptualization of close alignment between news media and official information may fail to give appropriate consideration to the idea that media coverage of risk is as much about discursive power as about education or information.¹³ From a more critical perspective, the news media may not seek or serve to simply represent risks in accordance with expert assessments, and in fact, there may be considerable power and value in journalists maintaining a separate and critical perspective.¹⁰

Whereas pandemic planning did not predict H1N1 newsworthiness, there was a significant relationship between a country's prior experience with avian flu (H5N1) and H1N1 news; volume was greater in countries with recent infectious disease outbreak experiences. In such countries, avian flu may have been a highly accessible and salient 'anchor event' to which stories on the current outbreak could be linked. The availability of anchoring events promotes news attention, presumably due to an assessment of salience of the issue to the news audience. Prior studies of news coverage of infectious diseases have identified 'anchoring events' (such as the 1918 Spanish flu) as an important part of making new threats (such as H1N1 2009) comprehensible to the public.^{9,20} Similar events in the past may not only provide a narrative anchor, but also institutional capacity and efficacy in reporting on a topic. It is possible that journalists will have developed interests, expertise, and contacts in the area in question that facilitate enhanced reporting on the current event. To the extent that the planning process for emerging infectious diseases includes a media engagement component, identification, and engagement with possible relevant anchor events for a given country may help to promote newsworthiness of new threats alongside efficacious messaging about appropriate systemic and individual responses.

The proportion of the news hole dedicated to H1N1 was lower in Europe than in other regions. This finding is somewhat perplexing, given that Europe was neither most distal nor proximal to the unfolding pandemic. We note that the proportion of coverage in the Russian newspaper was very low, and Russia did not see any domestic cases until close to the end of the study period. The finding may be an artifact of the small sample of countries in this study. It is noteworthy that unlike other regions, all of the home pages in Europe have sizable news hole availability (more complex home pages), such that similar raw numbers of stories would have translated into lower proportion in this region than in

the others. It is also possible, however, that there is something about Europe and European news media that we have not accounted for that made H1N1 less dominant as a news story during this initial outbreak month.

While news volume potentially increases awareness, it does not necessarily build response efficacy or capacity. Indeed, an important next step would be to consider the nature of messages conveyed in such coverage. Future research would also benefit from analyses of media attention to other public health emergencies within the all-hazards continuum. Such analyses could identify the influence of scenario (e.g., naturally occurring events versus terrorism modalities) and severity on media coverage, as well as the possible impact of nations' sense of cultural proximity⁴ as well as spatial proximity on perceived relevance.

Limitations

This analysis of 12 newspaper home pages poses novel and important research questions pertaining to the relationship between an emerging pandemic's newsworthiness and proximity to the outbreak, prior experience with similar outbreaks, or national pandemic preparedness. We developed a new approach to measuring 'news hole' that reflects the format of online newspaper home pages, but does not fully capture story prominence in terms of font size or length of headline or link. The 'real time' nature of the data collection facilitated a consideration of H1N1 news in the context of the available news hole in a way that would not have been possible using online archives. However, this approach also resulted in several limitations. First, we captured only a single daily screenshot from each website, which does not reflect the dynamic nature of web content in terms of the fact that content is potentially in near constant flux. We resorted to this method both for pragmatic reasons and because more frequent capture would have made comparisons between outlets more difficult as frequency of content updates differs. Second, during the first few days of data collection (before May 1, 2009), some home pages were omitted; it is therefore possible that the extent to which newsworthiness of the outbreak was concentrated in the earliest days has been underestimated. The reliance on English-medium newspapers also potentially limits the applicability of the findings; in China, for example, coverage in the *People's Daily* (included in our sample) may be a less appropriate proxy for the overall news environment than (for example) the largest circulation newspaper *Canako Xiaoxi* (not included). Moreover, the extent to which online newspapers are representative of the overall news media environment in any given country is likely to differ, with some countries having a more diverse news media environment than others.

Finally, this analysis is limited to the initial outbreak month, and it did not capture later newsworthy events such

as the elevation of H1N1 to WHO Pandemic Level 6 on June 11, 2009 nor issues around vaccine manufacture and distribution. International media attention is likely to have spiked again at these points, and this interpretation of the decline in coverage cannot account for later events that may have generated interest and attention.

Conclusions

This analysis provides a snapshot of news coverage from the earliest days of an incipient pandemic. The findings have implications for understanding the news media's role in emerging public health crises, such as a new influenza strain. A consideration to the nature of media attention during an emerging influenza pandemic is germane to planning for effective communication, should a new strain emerge for which the human population is highly vulnerable.⁵ It is critical to understand how the public is informed and empowered during public health emergencies. Media advocacy strategies that have proven effective in gaining and retaining media attention²⁵ should be adapted for emerging infectious illnesses.

Acknowledgements

This research is funded by the Johns Hopkins Preparedness and Emergency Response Research Center (PERRC) through the Centers for Disease Control (CDC) grant no. P01TP000288 and partially funded by the Emory University PERRC through CDC grant no. 5P01TP000300. The funders had no role in the study design, data collection, analysis, decision to publish, or preparation of the manuscript. The authors would like to thank Ms. Jiangxia Wang for her assistance with the analysis of these data.

Reference

- 1 Holmes B. Communicating about emerging infectious disease: the importance of research. *Health, Risk and Society* 2008; 10:349–360.
- 2 Sorenson S, Manz J, Berk R. News media coverage and the epidemiology of homicide. *Am J Public Health* 1998; 88:1510–1514.
- 3 World Health Organization. Global Alert and Response: Situation Updates Pandemic (H1N1) 2009. Available at: <http://www.who.int/csr/disease/swineflu/updates/en/index.html> (Accessed 15 March 2012).
- 4 Hooker C, King C, Leask J. Journalists? views about reporting avian influenza and a potential pandemic: a qualitative study. *Influenza Other Respir Viruses* 2012; 6:224–229.
- 5 World Health Organization. Comparative analysis of national pandemic preparedness plans. Geneva, Switzerland: World Health Organization, 2011.
- 6 Kristiansen I, Halvorsen P, Gyrd-Hansen D. Influenza pandemic: perception of risk and individual precautions in a general population. Cross sectional study. *BMC Public Health* 2007; 7:48.
- 7 McCombs ME, Shaw DL. The agenda-setting function of mass media. *Public Opin Q* 1972; 36:176–187.

- 8 Scheufele DA. Framing as a theory of media effects. *J Commun* 2006; 49:103–122.
- 9 Washer P, Joffe H. The “hospital superbug”: social representations of MRSA. *Soc Sci Med* 2006; 8:2141–2152.
- 10 Tulloch JC, Zinn JO. Risk, health and the media. *Health Risk Soc* 2011; 02/01; 2012/05; 1:1–16.
- 11 Pollard J. Seen, seared and sealed: trauma and the visual presentation of September 11. *Health Risk Soc* 2011; 02/01; 2012/05; 1: 81–101.
- 12 Ungar S. Hot crises and media reassurance: a comparison of emerging diseases and Ebola Zaire. *Br J Sociol* 1998; 49:36–56.
- 13 Kitzinger J. Researching risk and the media. *Health, Risk and Society* 1999; 1:55–69.
- 14 Chapman S, Lupton D. *The Fight For Public Health: Principles and Practice of Media Advocacy*. London, UK: BMJ Publishing Group, 1994.
- 15 Dasgupta N, Mandi KD, Brownstein JS. Breaking the news or fueling the epidemic? Temporal association between news media report volume and opioid-related mortality *PLoS ONE* 2009; 4:e7758.
- 16 Wu HD. Investigating the determinants of International news flow. *Int Commun Gazette* 1998; 6:493–512.
- 17 Golan G. Inter-media agenda setting and global news coverage. *Journalism Studies* 2006; 04/01; 2012/057:323–333.
- 18 Chang T. International communication bulletin. *Commun Res* 1998; 25:528.
- 19 Golan G. America’s narrow window to the World: an analysis of network global coverage. *Int Commun Bulletin* 2003; 38:2–10.
- 20 Nerlich B, Halliday C. Avian flu: the creation of expectations in the interplay between science and the media. *Social Health Illn* 2007; 29:46–65.
- 21 Bell A. *The Language of News Media*. Oxford, UK: Blackwell Publishers, 1991.
- 22 Greer C. *Sex Crimes and the Media: Sex Offending and the Press in a Divided Society*. Cullumpton, UK: Willan Publishing, 2003.
- 23 Jones RL, Carter RE. Some procedures for estimating “News Hole” in content analysis. *Public Opin Q* 1959; 3:399–403.
- 24 World Health Organization. H5N1 avian influenza: Timeline of major events. 2011; Available at: http://www.who.int/influenza/human_animal_interface/avian_influenza/H5N1_avian_influenza_update.pdf (Accessed 15 March 2012).
- 25 Wallack L. Media advocacy: a strategy for empowering people and communities. *J Public Health Policy* 1994; 2:420–436.