Ebola outbreak in Uganda: What we can and can not see from query trends

To the Editor: In July 2012, Uganda's Minister of Health notified the World Health Organization (WHO) of an outbreak of Ebola. Even though some cases were reported later, the end of the outbreak was declared in October 2012.[1]

Current studies have assessed the use of internet tools to identify trends in queries regarding communicable diseases,[2] which have been used for early identification of a potential outbreak.[2,3] This can be done through many tools including Google Trends (http://www.google.com/trends/), a service that presents information about terms that people have entered into the Google search engine. The results can be filtered by year or country, and are presented in graphic form as the search volume (i.e. number of hits) over time. Despite its potential as an early warning system, this approach has not been applied to neglected diseases such as Ebola, despite the number of outbreaks in the last few years.[1]
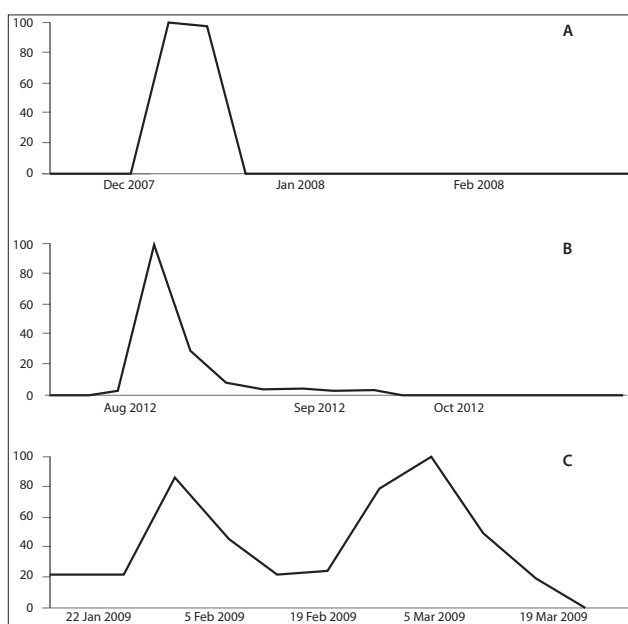

Fig. 1. Google Trends results for the term 'Ebola', filtered by country and date as follows: A: Uganda, November 2007 - February 2008; B: Uganda, July - October 2012; C: Philippines, January - March 2009 (source: http://www.google.com/trends/).

The 2012 Ebola outbreak in Uganda showed similar Google Trends results in comparison with an outbreak reported in 2008, when filtering by country: almost no hits, followed by an exponential increase, and then a clear decrease (Fig. 1). On the other hand, when exploring the Google Trends results for Philippines in the year 2009, during the notification of some cases,[1] there is a different trend (Fig. 1). It is important to point out that there was a higher trend in the Philippines, even though there were few Ebola cases, while in Uganda we present information of 2 outbreaks.

The dissimilar patterns for these countries could be due to a different rate of use of the internet. The Philippines had 9 internet users per 100 population, while this information regarding Uganda was not available from the WHO.[4] The different rates could also be explained by its different wealth index. According to the World Bank, Uganda is a low-income country whereas the Philippines is a middle-income country, so its citizens may have more resources to access the internet.

Our results suggest that new internet-based tools, along with query trends, are probably more useful in high- or middle-income countries. However, they are not necessarily useless in low-income settings. On the contrary, while a country continues its path towards being a middle-income country, these technologies might be used extensively and will become a tool for health matters as has recently been proven by the successful use of the internet in Uganda for telepathology diagnoses.[5]

The internet and other information and communication technologies are powerful tools for epidemiological purposes especially where surveillance systems are not well established.[3] It is important for researchers and for public health officials worldwide to improve access to these technologies as they may be useful. These tools will most likely be useful in the future, as long as health officials acknowledge them.

Rodrigo M Carrillo-Larco
Alberto Hurtado School of Medicine, Cayetano Heredia University, Lima, Peru
rodrigo.carrillo@upch.pe

Mariana Ramos
Mental Health Working Group, Cayetano Heredia University, Lima, Peru

1. World Health Organization. Global Alert and Response. Geneva: World Health Organization, 2012. http://www.who.int/csr/don/archive/disease/ebola_haemorrhagic_fever/en/ (accessed 2 August 2012).
2. Ginsberg J, Mohebbi MH, Patel RS, Brammer L, Smolinski MS, Brilliant L. Detecting influenza epidemics using search engine query data. Nature 2009;457:1012-1014. [http://dx.doi.org/10.1038/nature07634]
3. Althouse BM, Ng YY, Cummings DA. Prediction of dengue incidence using search query surveillance. PLoS Negl Trop Dis 2011;5:e1258. [http://dx.doi.org/10.1371/journal.pntd.0001258]
4. World Health Organization. Global Observatory for eHealth - Philippines. Geneva: World Health Organization, 2012. http://www.who.int/goe/publications/atlas/phl.pdf (accessed 2 August 2012).
5. Wamala D, Katamba A, Dworak O. Feasibility and diagnostic accuracy of internet-based dynamic telepathology between Uganda and Germany. J Telemed Telecare 2011;17:222-225. [http://dx.doi.org/10.1258/jtt.2010.100609]