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Tablet-based participatory syndromic surveillance at Simhashta festival in India

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Objective

To develop, test and study tablet-based participatory syndromic surveillance system for common infectious disease conditions at community level in Simhashta religious mass gathering in Ujjain, India, 2016.

Introduction

Infectious disease surveillance for generating early warnings to enable a prompt response during mass gatherings has long been a challenge in India [1,2] as well as in other parts of the world [3,4,5]. Ujjain, Madhya Pradesh in Central India hosted one of the largest religious festival in the world called '*Simhasth kumbh mela*' on the banks of River Kshipra, where more than 50 million attendees came for holy dip during April 22 to May 21, 2016. The attendees included pilgrims (residents and visitors), observers, officials and volunteers. We developed an android application with automated summary reports and an interactive dashboard for syndromic surveillance during the gathering.

Methods

We established the participatory surveillance at all 22 sectors of the festival area, and at 20 out-patient hospitals and 12 pharmacies. We trained 55 nursing and social work graduate trainees to collect data from all these settings. The data collectors visited designated spots daily during a fixed time and collected age, gender, residence and self-reported symptoms from consenting attendees during the festival period. The application automatically added date, time and location of interview to each record and data was transmitted to a web server. We monitored the data in the interactive dashboard and prepared summary report on a periodic basis. Daily summary report of self-reported symptoms by time, place and person was shared daily evening with the festival surveillance authority.

Results

Of the total 93,020 invited pilgrims, 91% participated in the surveillance. Almost 90% of those were from outside the festival city, 60% were men and 57% were aged 15 to 44 years. Almost 50% of them self-reported presence of at least one symptom. Most frequently reported symptoms were dehydration due to heat (13%), cold (13%), fever (7%) and loose stool (5%). During the festival period of over one month, surveillance data indicated increasing trends of self-reported cough and fever and declining trends of self-reported dehydration (Figure-1). The designated public health authorities for the festival did make use of the information for appropriate action. This tablet-based application was able to collect, process and visualise around 2500 records per day from the community without any data loss.

Conclusions

To our knowledge, this is the first report from India documenting real-time surveillance of the community using hand-held devices during a mass gathering. Despite some implementation issues and limitations in the approach and data collected, the use of digital technology provided well-timed information avoiding tedious manual work and reduced a good amount of human resources and logistics involved in reporting symptoms with a traditional paper-based method in such a large population. In retrospect, the main utility of the surveillance output was that of giving reassurance to the officials, as no major outbreaks occurred during the event. We believe that this experience and further analyses will provide input for the establishment and use of such a surveillance system during mass gatherings. The team of investigators propose improving the methods and tools for future use.

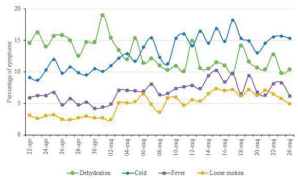

Figure 1: Major self-reported symptoms collected during Simhastha 2017 using participatory surveillance method

Keywords

Mass Gatherings; participatory; syndromic surveillance; India; Tablet based

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