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**Severe acute respiratory infections associated with influenza and non-influenza viruses - Yemen, 2011-2014**



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**Background:** In 2010, influenza surveillance started in Yemen after H1N1 influenza outbreak. Ministry of Health (MoH) established two sentinel sites for Severe Acute Respiratory Infection (SARI) at the two main public hospitals in Sana'a and Aden with the support of NAMRU3, where SARI samples tested for influenza and non-influenza viruses by the Real-Time-PCR assay. The aim is to describe the SARI severity as indicated by admission to intensive care unit (ICU) and fatality as well as associated influenza and non-influenza viruses among hospitalized patients of the two sentinel sites in order to provide recommendations for improving influenza surveillance

**Methods & Materials:** Data of hospitalized patients of the two sites who meet WHO SARI case definition during 2011 to 2014 was obtained from MoH. Data was cleaned and analyzed using SPSS program where P value < 0.05 was the cut point for significance

**Results:** 1,665 met SARI cases definition during 2011 to 2014, of which 64% from Aden, two thirds were below the age of two years, 48% were males, 24% has chronic diseases and 33% was admitted to the ICU. Overall fatality rate was 10% which significantly higher among patients from Aden than Sana'a (14% vs. 3%, P < 0.001). 1299 (78%) samples were tested where influenza viruses were confirmed in 67 (5%); of which 41 (61%) was type A and 27 (39%) was type B. Non-influenza viruses were detected in 39% (509) of samples including 246 (48%) Respiratory Syncytial Virus and 99 (19%) was Adenovirus. The influenza viruses was significantly higher in Sana'a than Aden (63% vs 37% P value < 0.01) while the Non-influenza virus was significantly higher in Aden than Sana'a (54% vs. 46%, P value < 0.01). The case fatality rate among non-influenza was 11% compared to 6% among influenza cases but the difference was not statistically significant.

**Conclusion:** Our findings showed that most SARI cases was of non-influenza type with high mortality that necessitate prompt diagnosis and treatment of suspected cases. Expanding SARI surveillance to include more public and private hospitals in different governorates is recommended to give more comprehensive picture. Further studies to better understand the geographical differences are needed

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**M health technology for surveillance of infectious diseases: Challenges and learning for scale up and replication**



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**Background:** Smart Phone based infectious disease surveillance has the potential to provide real-time, high quality, validated data for early response and investigation. However, little evidence is available on practical use of m health technology and challenges in infectious disease surveillance in lower and middle income countries. The objective of this paper is to examine the practical challenges in using m health technology in surveillance of infectious diseases and share the learning for replication and scale up of m health in surveillance of infectious diseases.

**Methods & Materials:** An electronic search was conducted for research articles on mobile phone based infectious diseases surveillance and the articles published only in peer reviewed journals after year 2008 were considered for including in this paper. A total of 11 research papers were selected based on this criteria and thematic analysis was done to understand challenges and learning.

**Results:** There were challenges in diseases surveillance using m health technologies. These were mainly technology related, financial, political and social, ethical and cultural. Technological issues were mainly - touch screen interface, application errors, and change in settings of the device. A training program in local language and handholding support in the field was found effective. Financial issues were related to procurement of smart phones, annual maintenance, repair, lost and damaged phones, software cost including application development and maintenance. Locally available hardware and open source software options should be explored. Political issues were including continued resource support and interests. Ensuring their participation from the design phase of the project has been useful for aligning the project with their priorities. Ethical, societal and cultural issues were related to data security, use of data, resistance to change and operating on mobile devices and scepticism in the community about the new technology. Building data security system, setting forth purpose of data collection and involving community in the process was useful.

**Conclusion:** The disease surveillance using m health technology possesses several challenges including technology related, financial, political and social. For scale up and replication, training and handholding, local technology providers, open source software and involvement of multiple stakeholders from the design phase of the project should be considered.

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