

Abstract

# How Did Data Visualization Identify and Improve Response to an Enteric Fever Outbreak in Syria?

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## Abstract

**Background:** Population displacement and damage to infrastructure in Syria has contributed to an increase in water borne infectious diseases including enteric fever. The collection, presentation and analysis of data collected in real time is therefore vital for early identification of outbreaks. EWARN and EWARS are used in Syria for the reporting of communicable diseases however this is not always available to facilities in real time. As such, the prompt availability of diagnostics and treatment may be lacking. This is vital for enteric fever where morbidity and mortality without appropriate treatment is high.

**Objective:** In this study, we examine the utility of a data visualization tool to track cases of enteric fever in three facilities supported by the Syrian American Medical Society (SAMS).

**Methods:** All cases of enteric fever between March 2017 and July 2017 were tracked in near real time and presented using data visualization software, namely Tableau. Tableau is a visualization software generally used within the business sector, but its ability to visually express data has far reaching potential in the realm of public health. Sites in Daraa, Quneitra and Rural Damascus were included. Close communication with data personnel in SAMS country offices and health workers working in the facilities was maintained.

**Results:** In March 2017, there were 21 cases of enteric fever across the three governorates and in July 2017, this had increased to 784 cases. Close liaison with the teams on the ground identified that facilities were seeing a significant increase in cases and that there was a shortage of appropriate antibiotics to treat patients. It was also apparent that there was a shortage of microbiology facilities which could isolate the causative organisms (*Salmonella typhi* or paratyphi) and therefore limited ability to identify the susceptibility of the organisms resulting in empiric therapy where available. Using data visualization in real time can allow for preparedness and responsiveness to outbreaks of communicable diseases during the conflict.

**Conclusions:** Visualization should be integrated into online and offline data collection tools in order to create an early warning system on each device used in the field.

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