Actionable data from difficult settings: end-to-end data management systems for surveillance in crisis-affected areas of the Middle East

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Introduction
Humanitarian responders need timely, accurate, and reliable information. The time-lag and quality issues surrounding existing models of field-based data use prompted the creation of the Health Surveillance Programme (HSP) to provide real-time, operational data to MSF and partners. The HSP, MSF’s first operational data programme, consists of a methods toolkit and a software platform (Dharma) to collect, store, analyse, and manage data. Solar chargers and secure offline data storage enable data collection in areas without reliable electricity or internet access. When WiFi or mobile services can be accessed, data are sent to a secure cloud then via an analytics pipeline to a user-facing results dashboard. Data quality can be assessed in real-time via a robust repository. HSP eliminates manual data entry, data cleaning, and tasks related to setting up servers or data repositories. The investigators analysed the performance and cost-effectiveness of the HSP in community assessments of health and essential service needs conducted by MSF in regions of the Middle East affected by the Syrian conflict.

Methods
Between February 2014 and March 2016, a total of eight community-level assessments were performed in Turkey, Iraq, and Lebanon, covering a total of 70,000 individuals. The cost, timeliness, and data quality of HSP were compared with paper-based methods in parallel during an initial feasibility trial in 2014.

Ethics
Institutional review for Iraq sites was performed by the University of Dohuk. Lebanese American University ethical review was granted for all Lebanon sites. The MSF OCBA Medical Director exempted the surveys in Turkey and Iraq in 2015 and 2016 from ethics review.

Results
In Najaf Governorate, Iraq, 2015, real-time identification of a scabies outbreak by MSF and Ministry of Health partners facilitated a rapid intervention and treatment of 19,000 patients. HSP data collection took 6-8 days/site, compared with 20-25 days/site for paper-based collection. HSP per-assessment costs averaged USD$15,000 and 18,000 vs 30-40,000 traditionally spent on similar paper-based programmes, respectively (40-50% reduction in cost).

Conclusion
Field and headquarters staff were able to understand conditions on the ground in near real time, which resulted in better decision making, resource allocation, and operations targeting compared with the
previous primarily anecdotal data model. The timeliness, cost savings, and accuracy of information delivered could improve programming and patient outcomes.

Conflicts of interest
Jesse, Thomas, Eric are the Director and employees of The Impact Lab, respectively, and are CEO and cofounders of Dharma Platform which developed and owns Dharma software. Impact Lab developed and provide ongoing support to the HSP under a consultancy agreement (non-profit). MSF owns the HSP methods toolkit.