

Emerging and Re-emerging Infectious Diseases in Displaced Populations 1998 to 2016: An Analysis of ProMED-mail Reports

John W. Ramatowski

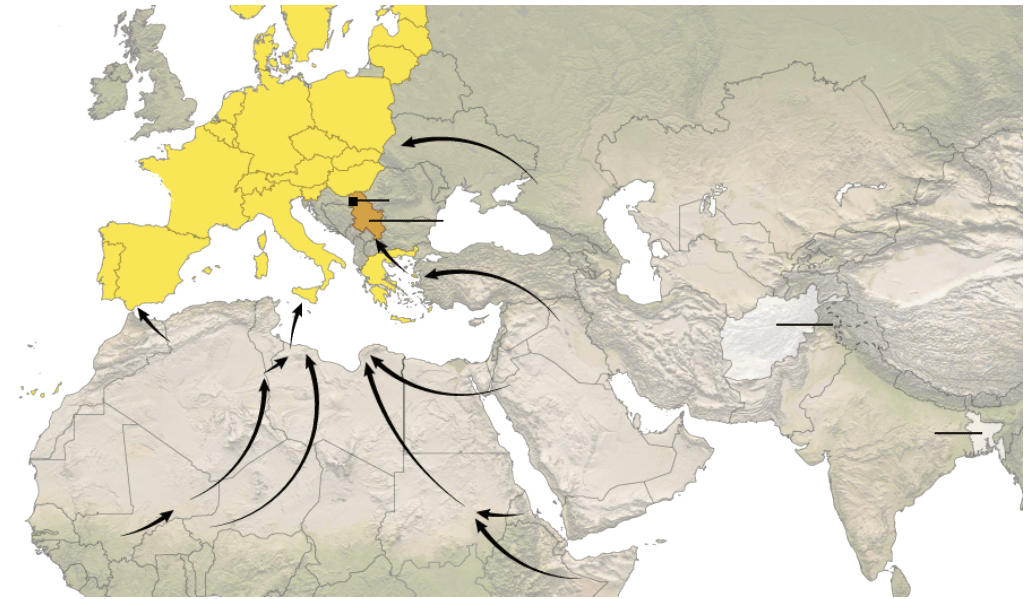
Britta Lassmann

Larry Madoff

Nina Marano

BACKGROUND

- Mass migration events pose a challenge to infectious disease outbreak control
- Preparedness enhanced by the availability of vaccines and medical screenings
- 2005 ~ 20.8 million population of concern¹
- 2015 ~ 65.3 million population of concern²

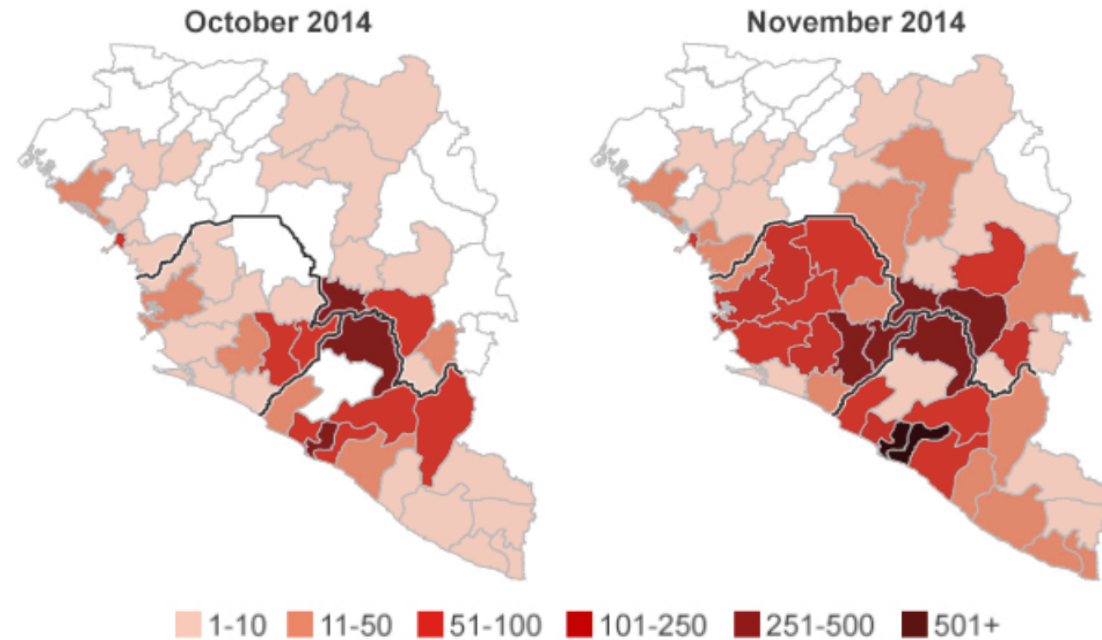


Common routes used to enter the European Union 2014 - 2015³

1. UN High Commissioner for Refugees. 2005 Global Refugee Trends. Published June 9, 2006.
2. UN High Commissioner for Refugees. 2015 Global Refugee Trends. Published June 20, 2016.
3. Nordland R. A Mass Migration Crisis, and It May Yet Get Worse. New York Times 2015 Oct. 31. http://www.nytimes.com/2015/11/01/world/europe/a-mass-migration-crisis-and-it-may-yet-get-worse.html?_r=0.

RESEARCH QUESTION

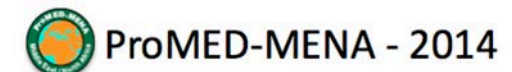
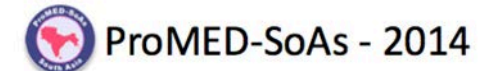
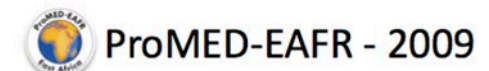
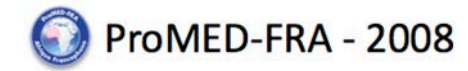
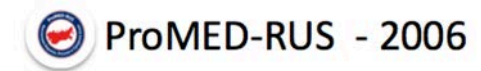
Are we seeing an increase in emerging and re-emerging infectious disease outbreaks as the size of the displaced population grows over time?



Change in Ebola Virus Disease total casualties in Sierra Leone and Liberia due to border mobility⁴

ProMED-mail

- Innovative Disease Surveillance Network
- Founded in 1994
- One Health core principle
- Archived database of 53,000+ infectious disease outbreak reports
- Used during:
 - SARS – 2002
 - MERS – 2012
 - Ebola – 2014
 - Zika – 2015

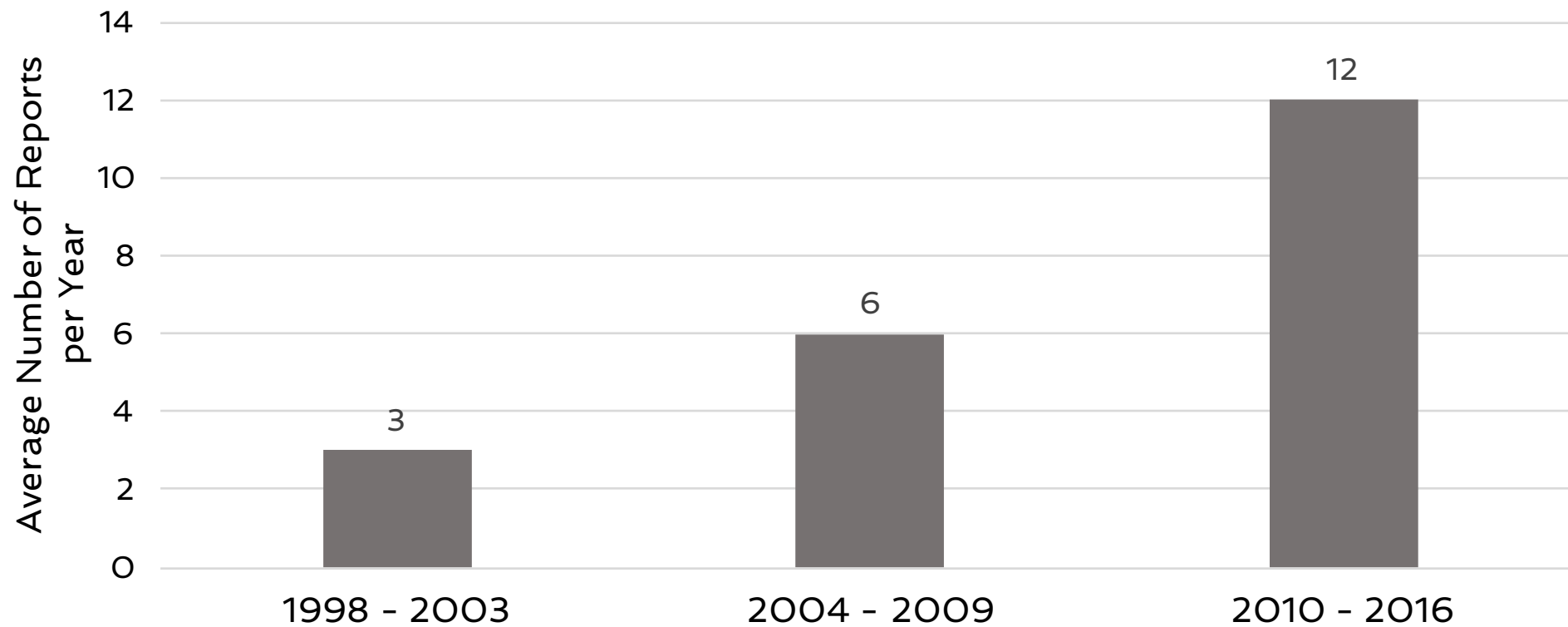


METHODS

- ProMED-mail archived data – 53,880 records
- Displaced populations search terms included:
 - Refugee
 - Asylum Seeker
 - Displaced
- Search yield – 618 records between 1998-2016
- Location of disease outbreak, pathogen, origin of displaced peoples, and number afflicted
- Multiple records tracking an outbreak → one outbreak event
 - Last record with pertinent data

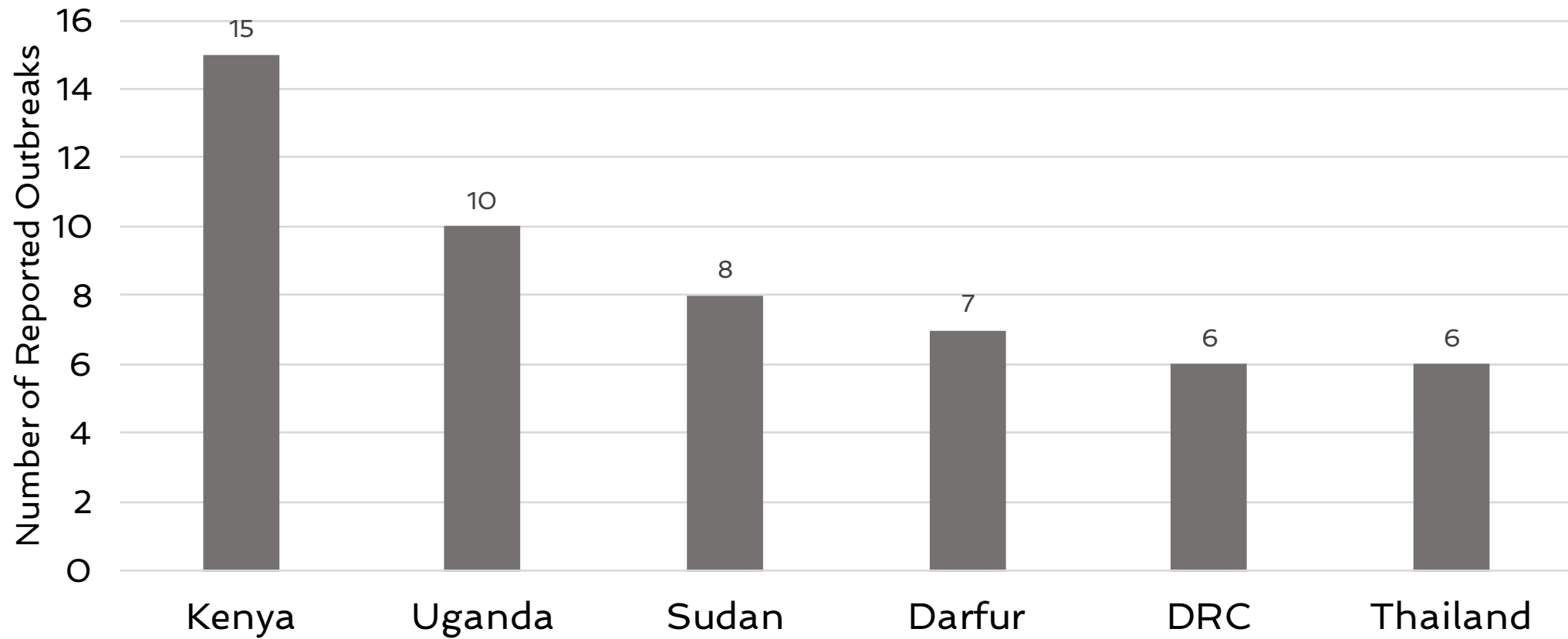
RESULTS

121 outbreak events between 1998 – 2016



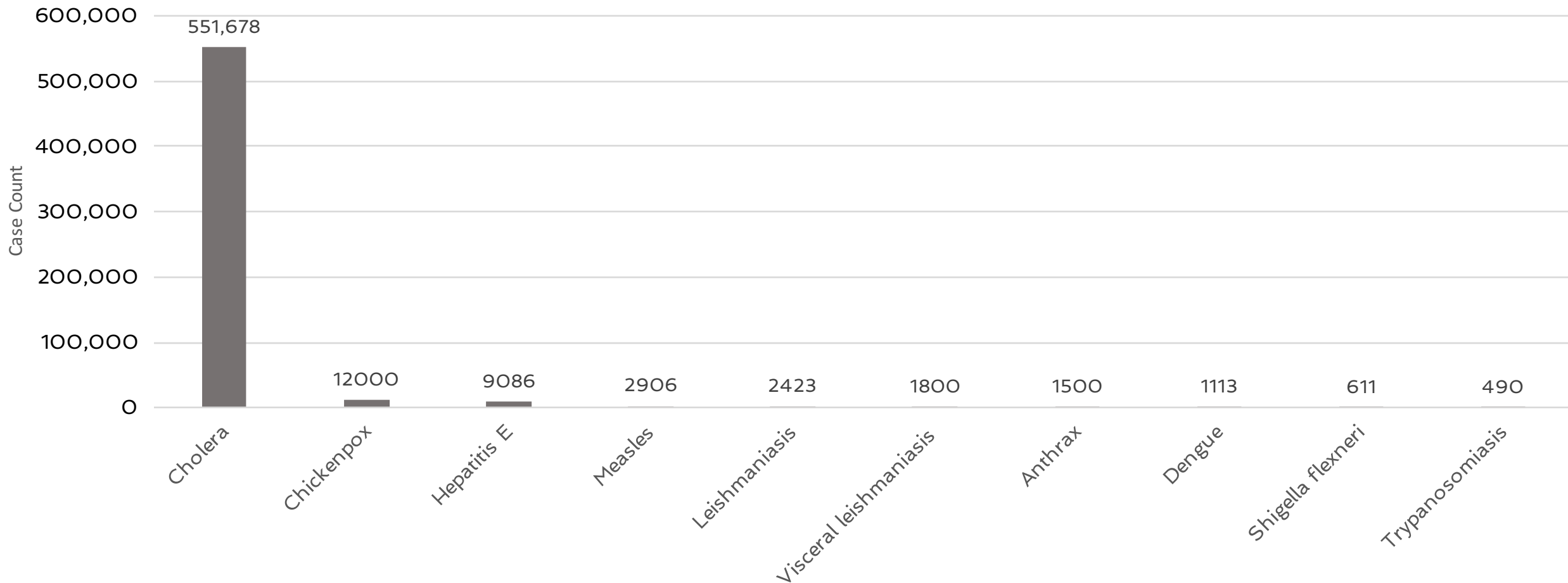
Average yearly number of ProMED-mail reports involving disease outbreaks in displaced populations per 6-year time intervals between 1998 and 2016

RESULTS



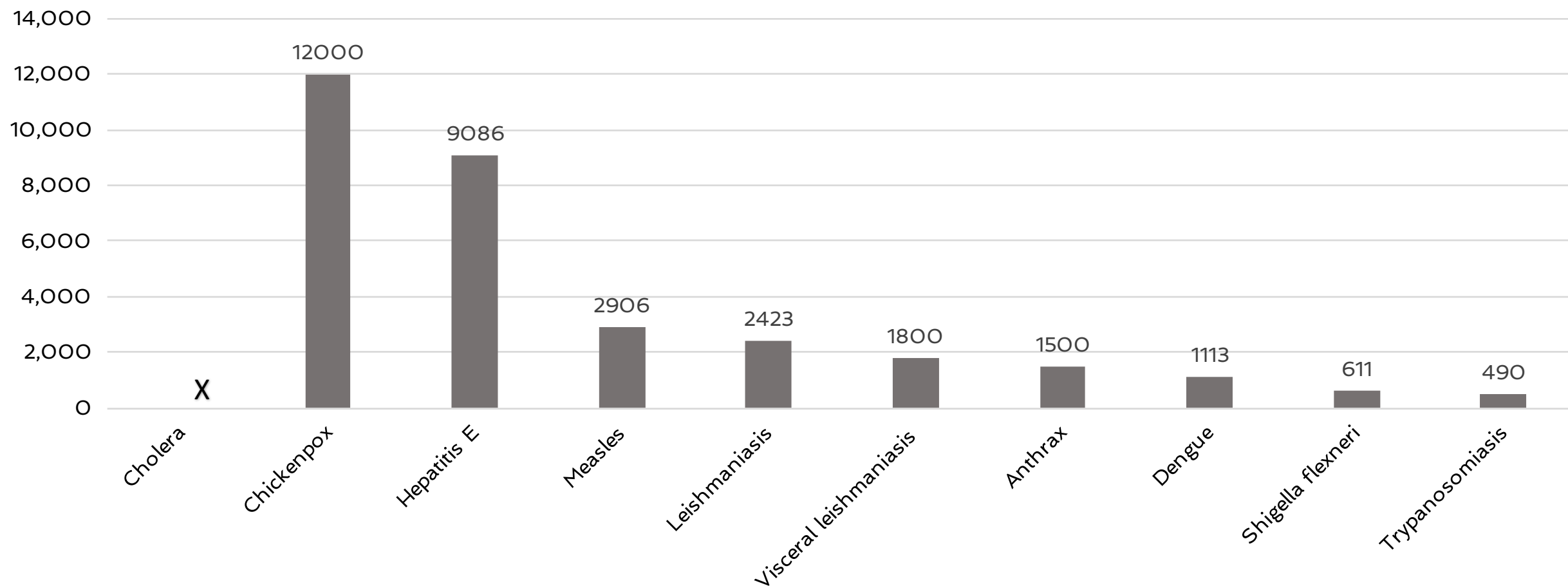
Countries with six or more ProMED-mail reported outbreak events affecting displaced populations between 1998 and 2016

RESULTS



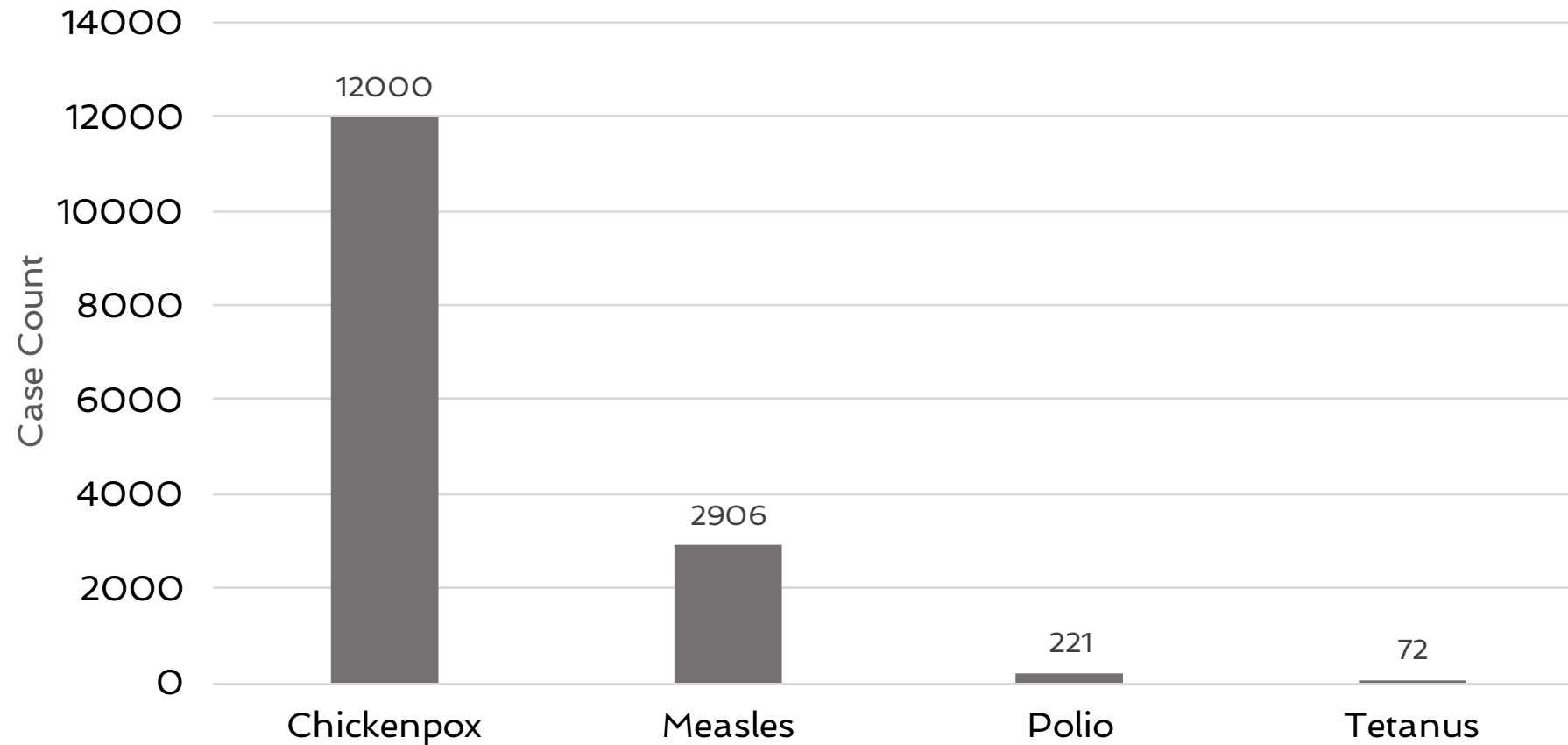
Total number of cases, by pathogen, in displaced populations
ProMED-mail reports 1998 - 2016. Top ten pathogens shown.

RESULTS



Total number of cases by pathogen in displaced populations
ProMED-mail reports 1998–2016. Top ten pathogens shown, **excluding cholera**.

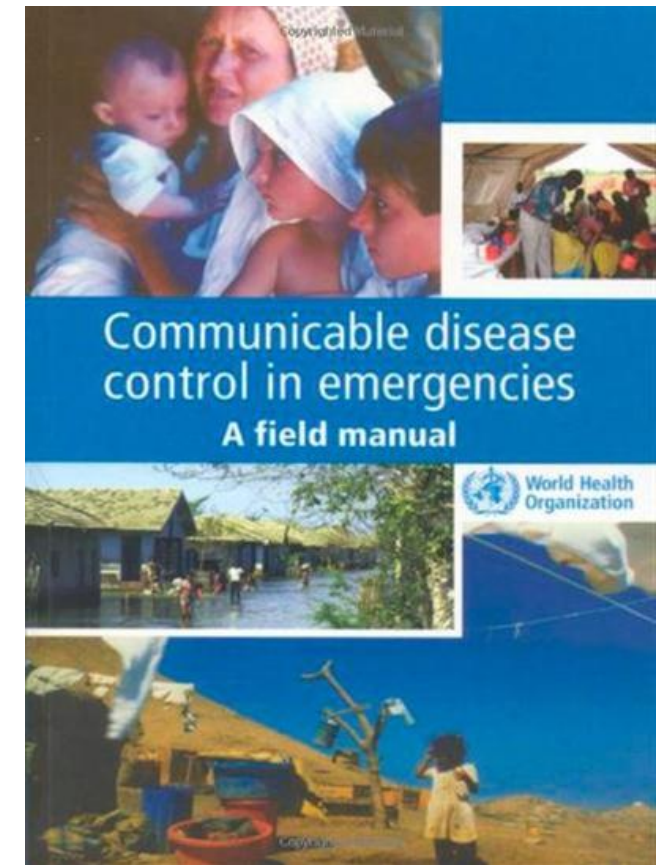
RESULTS



Case counts of vaccine-preventable conditions reported to ProMED-mail between 1998 and 2016 in displaced populations

DISCUSSION

- As the displaced population increased in size, there was a corresponding increase in the number of ProMED-mail reports linking displaced populations to infectious disease outbreak events.
- Additional resources are needed to prevent, identify, and contain outbreak events in displaced populations, including:
 - Adequate WASH infrastructure
 - Qualified and trained medical personnel
 - Improved healthcare infrastructure
 - Health education messaging to affected populations
 - Open channels of communication between healthcare workers and resource providers



ACKNOWLEDGMENTS

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- Larry Madoff, MD – ProMED-mail

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