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ABSTRACT

Public health surveillance after the Haiti earthquake: the Florida experience

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Objective
To describe the public health surveillance efforts designed to measure syndromic and disease-specific conditions in patients who were in Haiti during or after the earthquake, and evacuated to Florida.

Introduction
On 12 January 2010 at 1652 hours local time, an earthquake measuring 7.0 on the Richter scale struck near the Haitian capital of Port-au-Prince and created enormous devastation. Florida, as the state closest to Haiti, became an initial focal point for assisting the federal repatriation and humanitarian parolee efforts. Florida supported shipments of personnel and relief supplies into Haiti, and served as the point of entry for repatriated U.S. citizens and those evacuated from Haiti for medical care. As of 9 February 2010, there were ~22 500 arrivals in Florida from Haiti related to repatriation and medical humanitarian missions. These patients primarily arrived in Miami, Tampa and Orlando areas. Approximately 650 people arrived in Florida during this period as medical evacuees, and were transported to and often directly admitted to hospitals for treatment of severe or complicated injuries. Some of these patients also generated emergency department (ED) visits on arrival.

Methods
Two Florida disease surveillance systems were used to monitor the impact of the Haitian earthquake. (1) ED chief complaint data captured in the statewide Electronic Surveillance System for the Early Notification of Community-Based Epidemics (ESSENCE). On 15 January 15 2010, the Florida Department of Health, Bureau of Epidemiology, requested that hospitals reporting to ESSENCE add the word 'Haiti' to chief complaints of visits to EDs in persons who were in Haiti on or after the earthquake. Free text queries were then written to categorize chief complaints with either 'Haiti' or 'earthquake', along with the reason for visit, into appropriate syndrome categories. The intent of this surveillance was to capture data on all persons presenting to the ED for care, including care provided for U.S. citizens returning from Haiti as well as any foreign nationals who present to Florida EDs for care. (2) A request was made to county health department (CHD) staff to document cases of reportable diseases in the state web-based reportable disease surveillance system (Merlin) for all persons (regardless of whether they were Florida residents). For this event, a case of disease in a person returning from Haiti after the earthquake was defined as: a person (including relief workers) with a reportable disease per Rule 64D-3 Florida Administrative Code, who was in Haiti on 12 January 2010 or had been in Haiti since that date.

Results
From 15 January 2010 to 1 March 2010, 30 hospitals in 11 counties reported 239 patients where Haiti or earthquake was mentioned in the chief complaint. ED visits that were injury-associated accounted for 47.7%, and another 23.8% were classified as possibly infectious disease related. Of these, 57.9% were categorized as gastrointestinal illness, 19.3% included fever, 17.5% as respiratory illness and the remaining 5% fell outside of those categories. In all, 28% of the ED visits with Haiti or earthquake mentioned were not categorized.

In all, 42 reportable diseases were reported to the Florida Department of Health among people returning from Haiti after the earthquake. More than a third of the illnesses were malaria (16). Other diseases and conditions reported include lead poisoning (8), giardiasis (5), dengue fever (2), hepatitis A (2), possible exposure to rabies (2), shigellosis (2), tetanus (2), cryptosporidiosis (1), *Haemophilus influenzae* invasive disease (1) and salmonellosis (1). In several instances these illnesses were identified in individuals who originally presented for care for trauma or injuries. When compared with reportable disease reports associated with travel to Haiti in 2009, these data show a small increase in reports of malaria and lead poisoning.

Conclusions
The findings from these two surveillance systems underscore previous knowledge that earthquakes cause injuries because of the impact and because of the rescue and clean-up

activities. In addition, the findings also indicate that due to the pre-earthquake water and sanitation and other environmental issues, persons with travel to Haiti or who are from Haiti are at risk of vectorborne and waterborne diseases such as malaria and giardia. Relatively minor modifications to surveillance systems enabled FDOH to monitor the impact of this event on their communities. This surveillance approach did not cover those persons who were medically evacuated on life-flights and directly admitted to facilities for life-threatening care.

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