ABSTRACT

Use of the National Poison Data System for surveillance of human health effects from the Deepwater Horizon Oil Spill

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Objective
The objective of this study was to describe how National Poison Data System (NPDS) was used for surveillance of human health effects associated with crude oil and dispersant exposures during the Deepwater Horizon Oil Spill.

Introduction
NPDS is the only source for national surveillance data regarding human exposures to hazardous substances and their health effects. It is a near real-time surveillance system operated by the American Association of Poison Control Centers (AAPCC) in cooperation with CDC's National Center for Environmental Health. The system receives, analyzes, and displays data from 60 regional Poison Centers (PCs). On 20 April 2010, an explosion occurred on the Deepwater Horizon oil rig, causing oil to be continuously spilled into the Gulf of Mexico. In response, AAPCC created a code that was sent to all 60 PCs, allowing the centers to identify and properly code all calls associated with the oil spill at the local level. This enabled CDC to track all spill-related exposure and information calls.

Methods
Beginning 30 April, CDC used NPDS to monitor daily oil spill-associated calls (identified by querying the system using the oil spill code) for trend analysis. CDC also used NPDS to identify anomalies through automated analyses of callers' self-reported clinical data, which include 131 pre-coded signs, symptoms, and laboratory abnormalities referred to as clinical effects (CEs). On 4 May, a CE definition was created for the Deepwater Horizon oil spill to identify statistically significant increases in the volume of CEs for the four affected Gulf States (Alabama, Florida, Louisiana, and Mississippi). This CE definition automatically monitored all 131 CEs for the Gulf States over a 24-h window and sent notifications when the observed number of calls for a CE exceeded the historical baseline plus two standard deviations. Anomalies triggered by the CE definition were then reviewed to determine whether they were related to the oil spill,

meaning that at least one call was related to the oil spill. We use descriptive statistics to summarize the findings.

Results
From 30 April to 31 July, NPDS identified 1675 calls in total with the oil spill code, 1028 of which were identified as calls reporting a potential exposure. The top 10 reported health effects included headache (247), nausea (165), coughing and choking (114), shortness of breath (109), throat irritation (108), vomiting (86), dermal irritation and pain (74), dizziness (60), diarrhea (52), and rash (40). Oil spill calls peaked for all four Gulf States during the week of 20 June to 26 June, after which there was a steady decline in calls. The percent of calls by state were Alabama (24.5%), Louisiana (24.0%), Mississippi (22.2%), and Florida (21.5%).

From 4 May to 31 July, NPDS identified 88 CE anomalies within the Gulf States. Of these 88, 44 (50%) were determined to be related to the oil spill. The most common of these was headache, which triggered the CE definition 16 times (36%).

Aggregate NPDS data were reported to CDC's Emergency Operations Center and state-specific NPDS case line lists were reported to state PH officials on a daily basis. Monitoring and trend analysis associated with the oil spill is still ongoing.

Conclusions
Summary analyses of oil spill data from NPDS were shared with federal, state, and/or local PH officials to improve situational awareness and inform decision making for interventions as necessary. Collaboration between PH and PC staff was crucial for surveillance success. During the response to the Deepwater Horizon oil spill, NPDS demonstrated utility for conducting near real-time human health effects surveillance associated with a known public health emergency affecting four states.