

Acknowledgments

This report is based, in part, on contributions by staff members of the Georgia Dept of Corrections; D Crippen, D Duran, MPH, Georgia Dept of Human Resources, Div of Public Health; L Cohen, MD, F Kamara, MD, MT Morgan, MD, Dept of Community Health and Preventive Medicine, Morehouse School of Medicine, Atlanta; Recovery Consultants of Atlanta, Inc.; Stand, Inc., Decatur, Georgia; S Broadwell, PhD, JT Brooks, MD, M Clay, F Cowart, M Ed, M Durham, MS, A Edwards, MA, V Goli, MPH, D Gnesda, MPH, K Henny, PhD, M Kalish, PhD, S McDougal, MD, SM Owen, PhD, B Parekh, PhD, RH Potter, PhD, J Prejean, PhD, L Reid, MS, S Richard, MPH, S Watson, K Williams, PhD, C Yang, PhD, A Youngpairoi, Div of HIV/AIDS Prevention, National Center for HIV, Hepatitis, STD and TB Prevention; S Bartley, MMSc, D Hemmerlein, Serum Bank, Div of Scientific Resources, Center for Prevention, Detection, and Control of Infectious Diseases; F Forna, MD, EIS Officer, CDC.

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Monitoring Poison Control Center Data to Detect Health Hazards During Hurricane Season — Florida, 2003–2005

Eight hurricanes made landfall in Florida from August 13, 2004, through October 24, 2005.* Each hurricane caused flooding and widespread power outages (1–4). In the fall of 2004, the Florida Department of Health (FDOH) began retrospectively reviewing data collected by the Florida Poison Information Center Network (FPICN) during the 2004 hurricane season. During the 2005 hurricane season, FDOH, in consultation with FPICN, initiated daily monitoring of FPICN records of exposures that might reflect storm-related health hazards. Analysis of these data determined that 28 carbon monoxide (CO) exposures were reported to FPICN in the 2 days after Hurricane Katrina made its August 25, 2005, landfall in Florida, en route to a second landfall on the Gulf Coast. Data on CO and other exposures were used to develop and distribute public health prevention messages to Florida communities affected by hurricanes.

FPICN, created by the Florida legislature in 1989, consists of poison control centers in Jacksonville, Miami, and Tampa and a data analysis unit in Jacksonville. Health professionals and the public can contact FPICN by calling a toll-free hotline available 24 hours a day. Specialists in poison information at each center collect exposure and substance information from callers and enter it into a local database; this information is then uploaded to a statewide database.

The statewide database includes a case narrative and patient identification information provided by the individual caller or clinician from a health-care facility. Information is coded following American Association of Poison Control Centers (AAPCC) guidelines regarding harmful substances, circumstances of exposure, clinical findings, disposition, and follow-up.† FPICN defines exposure as contact with a substance that could be harmful to health via ingestion, inhalation, injection, or mucosal membrane/dermal exposure.

FDOH selected the following hurricane-related exposures for daily monitoring in 2005 and retrospective review of data from 2004: CO; hydrocarbon fuels; batteries and fire/matches/explosives; bites/stings and snake bites; contaminated, polluted, or sewage water; and food poisoning (Table). For this analysis, exposures to smoke or exhaust gas (e.g., from motor vehicles) were not included as CO exposures. FDOH compared exposures from 30 days before and up to 1 week

* Hurricanes Charley, Frances, Ivan, and Jeanne in 2004 and Dennis, Katrina, Rita, and Wilma in 2005. Although Rita did not make a direct landfall, the hurricane swept past the Florida Keys, causing flood damage and power outages.

† Available at <http://www.aapcc.org/poison1.htm>.

TABLE. Types and sources of exposures reported to the Florida Poison Information Center Network that were monitored by the Florida Department of Health during the 2005 hurricane season

Exposure type	Source of exposure
Carbon monoxide	Improper storage, ventilation, and maintenance of generators.
Hydrocarbon fuels	Gasoline siphoning for fuel and use of oil-based lamps for alternative light sources.
Batteries and fire/matches/explosives	Use of alternative power sources for lighting and electronics that result in dermal injuries.
Bites/stings and snake bites	Environmental exposure during power outages and property restoration.
Contaminated, polluted, or sewage water	Sewage overflows and spills resulting from sewer lift stations knocked out by storm surges, excessive rainfall, and power outages.
Food poisoning	Inadequate food refrigeration and storage; undercooked food products.

after a hurricane's landfall to determine whether increases in exposures occurred. Data for 2005 also were compared with 2003 hurricane-season data because no hurricane made landfall in Florida that year.

A major public health concern after storms is CO poisoning associated with the use of portable, gasoline-powered generators (5). The FDOH review of 2004 data indicated increased numbers of reported CO exposures in the days after Hurricanes Charley (38 reports), Frances (49), and Jeanne (42). In 2005, approximately 18 hours after the eye of Hurricane Dennis made landfall, FPICN received reports from health-care facilities of eight CO poisonings in two families. In the 2 days after Hurricane Katrina struck south Florida on August 25, 2005, FPICN received reports of 28 CO exposures (Figure 1), including 20 attributed to improper use and ventilation of generators. From October 24, 2005 through November 4, 2005, a total of 58 CO exposures occurred during power outages resulting from Hurricane Wilma.

In October 2005, FPICN detected an increase in exposures to hydrocarbon fuels after Hurricane Wilma, when prolonged widespread power outages were accompanied by a gasoline shortage (Figure 2). In September 2004, FPICN detected an increase in exposure to hydrocarbon fuels in the days before and after Hurricane Frances made landfall. Of 24 exposures to hydrocarbon fuels reported the day after landfall, 12 (50%) were directly related to persons siphoning gasoline, and three of

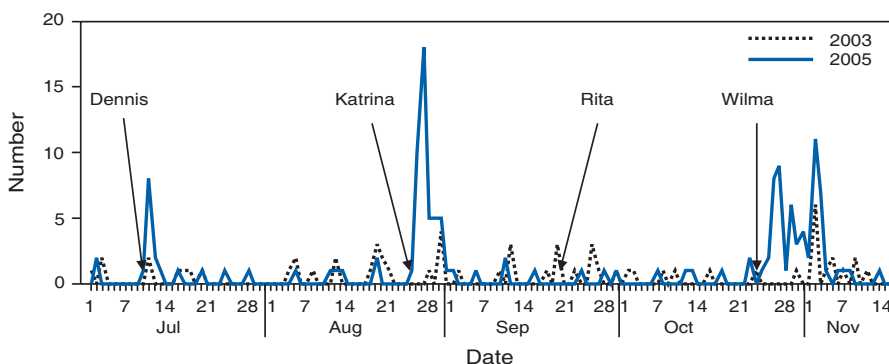
those 12 exposures occurred while persons were siphoning gasoline for portable generators. In both 2004 and 2005, the number of incidents involving other analyzed exposures (e.g., batteries, fire/matches/explosives, or bites/stings) after hurricanes did not differ substantially from baseline exposure data.

During the 2005 hurricane season, beginning the day after hurricane landfall and continuing for 3–10 days, daily graphs illustrating the frequency of exposures to harmful substances were posted on EpiCom, the secure information-sharing Internet site maintained by FDOH, and on the *Epidemic Information Exchange (Epi-X)*, the secure communications system for public health officials maintained by CDC. The graphs were also distributed to the Planning Section of the FDOH Incident Management Team. County officials used the information to foster awareness of possible health hazards before, during, and after landfall of each hurricane in 2005. Information about CO and hydrocarbon fuel exposures was used to alert the public to the hazards of improper use of portable, gasoline-powered generators. Public health announcements also described how to disinfect water for consumption and prevent foodborne illness by practicing safe food handling and spoiled food disposal.

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Editorial Note: In 2005, daily monitoring of detailed data from poison control centers in Florida enabled prompt atten-

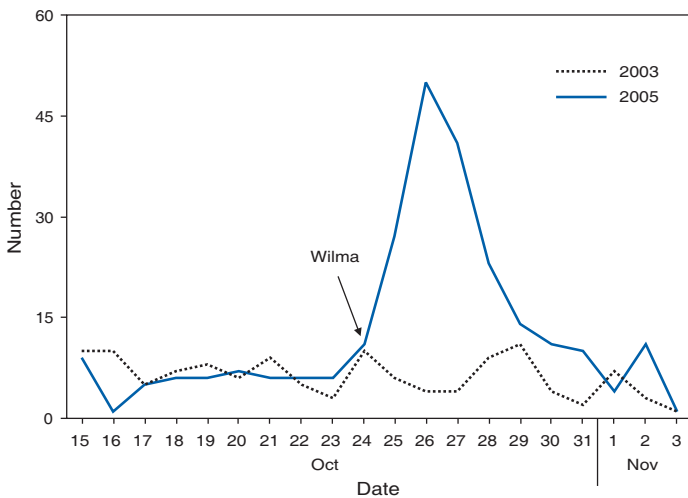
FIGURE 1. Number of reported carbon monoxide exposures* and landfalls of hurricanes, by date, July 1–November 13 — Florida, 2003† and 2005



* Exposures to carbon monoxide reported to the Florida Poison Information Center Network.

† In 2003, no hurricane made landfall in Florida.

FIGURE 2. Number of reported hydrocarbon fuel exposures* and hurricane landfall, by date, October 15–November 3 — Florida, 2003† and 2005



* Exposures to gasoline, lamp oil, and other fuels reported to the Florida Poison Information Center Network.

† In 2003, no hurricane made landfall in Florida.

tion to health hazards related to hurricanes. Use of on-line, real-time FPICN data enabled timely detection of increases in injury and illness events before, during, and after hurricanes, enhancing FDOH capacity for delivering important public health and safety measures. These capabilities potentially reduced morbidity and mortality in Florida from these events. This local monitoring activity is similar to the national Toxic Exposure Surveillance System (TESS), which is used by AAPCC and CDC to detect potential public health threats from reports received by 61 poison control centers in the United States. TESS has demonstrated its capability to provide surveillance to states and regions and to detect potential poisonings and biologic or chemical events (6–8). However, in Florida, although the data used for TESS surveillance is maintained by FPICN, the subset of data transferred to TESS contains no personal identifiers, case notes, or data specific to the state's own monitoring system.

To aid in detecting health hazards immediately before and after hurricanes, FDOH continues to use various statewide surveillance tools (e.g., hospital-based data, emergency medical services reports, and shelter surveillance). Hospital-based surveillance relies on chief complaints, disease and injury codes, and discharge data (9,10). However, in the aftermath of hurricanes, hospitals can experience structural damage, electric power loss, limitations in available personnel, or other factors that make routine functioning and surveillance difficult. In 2004, FPICN received telephone calls during four hurricanes from residents in their homes who were told by 911 emer-

gency operators not to go to health-care facilities because travel was too hazardous. After these hurricanes, FPICN received reports and inquiries from residents because travel was impaired, the nearby hospital was damaged, or wait times at the hospitals were excessive. Therefore, monitoring of local poison control center data provided a valuable supplement to the hospital-based surveillance system.

The findings in this report are subject to at least two limitations. First, underreporting to poison control centers (e.g., because of telephone service disruption) might have occurred. Second, delays might have occurred between exposures to a harmful substance and recognition by a person that their illness was related to that exposure (e.g., headache resulting from CO exposure).

During 2005, FDOH monitoring of FPICN data enabled timely detection of increases in CO and hydrocarbon fuel exposures before, during, and after hurricanes. Public health departments might consider collaborating with local or regional poison control centers to monitor for exposures after disasters. Evaluation of local and national poison center systems for detecting outbreaks of diseases and increases in injuries or poisonings should be an ongoing process to substantiate methods for collection, analysis, and decision-making based on these data.

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