

Surveillance for Radiation-Related Exposures Reported to the National Poison Data System

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Objective

To describe radiation-related exposures of potential public health significance reported to the National Poison Data System (NPDS).

Introduction

For radiological incidents, collecting surveillance data can identify radiation-related public health significant incidents quickly and enable public health officials to describe the characteristics of the affected population and the magnitude of the health impact which in turn can inform public health decision-making. A survey administered by the Council of State and Territorial Epidemiologists (CSTE) to state health departments in 2010 assessed the extent of state-level planning for surveillance of radiation-related exposures and incidents: 70%–84% of states reported minimal or no planning completed. One data source for surveillance of radiological exposures and illnesses is regional poison centers (PCs), who receive information requests and reported exposures from healthcare providers and the public. Since 2010, the Centers for Disease Control and Prevention (CDC) and the American Association of Poison Control Centers (AAPCC) have conducted ongoing surveillance for exposures to radiation and radioactive materials reported from all 57 United States (US) PCs to NPDS, a web-based, national PC reporting database and surveillance system.

Methods

We collaborated with the American Association of Poison Control Centers (AAPCC), Poisindex® and Thomson Reuters Healthcare to develop an improved coding system for tracking radiation-related exposures reported to US PCs during 2011 and trained PC staff on its usage. We reviewed NPDS data from 1 September 2010 – 30 June 2012 for reported exposures to pharmaceutical or nonpharmaceutical radionuclides; ionizing radiation; radiological or nuclear weapons; or X-ray, alpha, beta, gamma, or neutron radiation. CDC medical toxicology and epidemiology staff reviewed each reported exposure to determine whether it was of potential public health concern (e.g. exposures associated with an ongoing public health emergency, several reported exposures clustered in space and time). When further information was needed to classify the potential public health importance of a call, CDC and AAPCC staff contacted the regional PC where each call originated. When exposures were spatially and temporally clustered, we reviewed news stories in the public media for evidence of an associated radiation incident.

Results

Of 419 exposures reported during the study period, 25 were associated with a radiation-related incident. Of these, 4 were related to an exposure to x-ray radiation from an industrial radiography incident, 11 were related to a transportation accident involving potential contamination with radioactive material, and 10 were related to the Fukushima Daiichi Japan nuclear reactor disaster. Public health, hazardous materials, or hospital radiation safety staff were involved in responding to each of these events. We also identified 26 reported exposures associated with a regional radiation anti-terrorism exercise. The reported exposures were followed-up and removed from analysis once we determined they were part of the exercise. The remaining (n=368; 88%) were either requests for information, confirmed non-exposures, or exposures deemed unrelated or non-significant.

Conclusions

The capability to monitor self- or clinician-reported exposures to radiation and radioactive materials is available in NPDS for state and local public health use in collaboration with their regional PC and may improve public health capacity to identify and respond to radiological emergencies. Next steps include testing the system's capability to accurately classify and rapidly respond to a cluster of calls to PCs reporting radiation exposures associated with a "dirty bomb" exercise during July, 2012.

Keywords

Surveillance; Poison center; radiation

References

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