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Analysis of Medical-Related Radiation Alarms

Steven Barker, Western Governors University, Information Systems Security, 2013

Zachary Harris, Boise State University, Mechanical Engineering, 2014

Ivan Zhou, University of Maryland - College Park, Computer Science, 2014

Mentors:

Kristin Hertz, Org 8131 Rad/Nuc Detection Materials & Analysis

Edward Walsh, Org 8954 Quantitative Modeling & Analysis

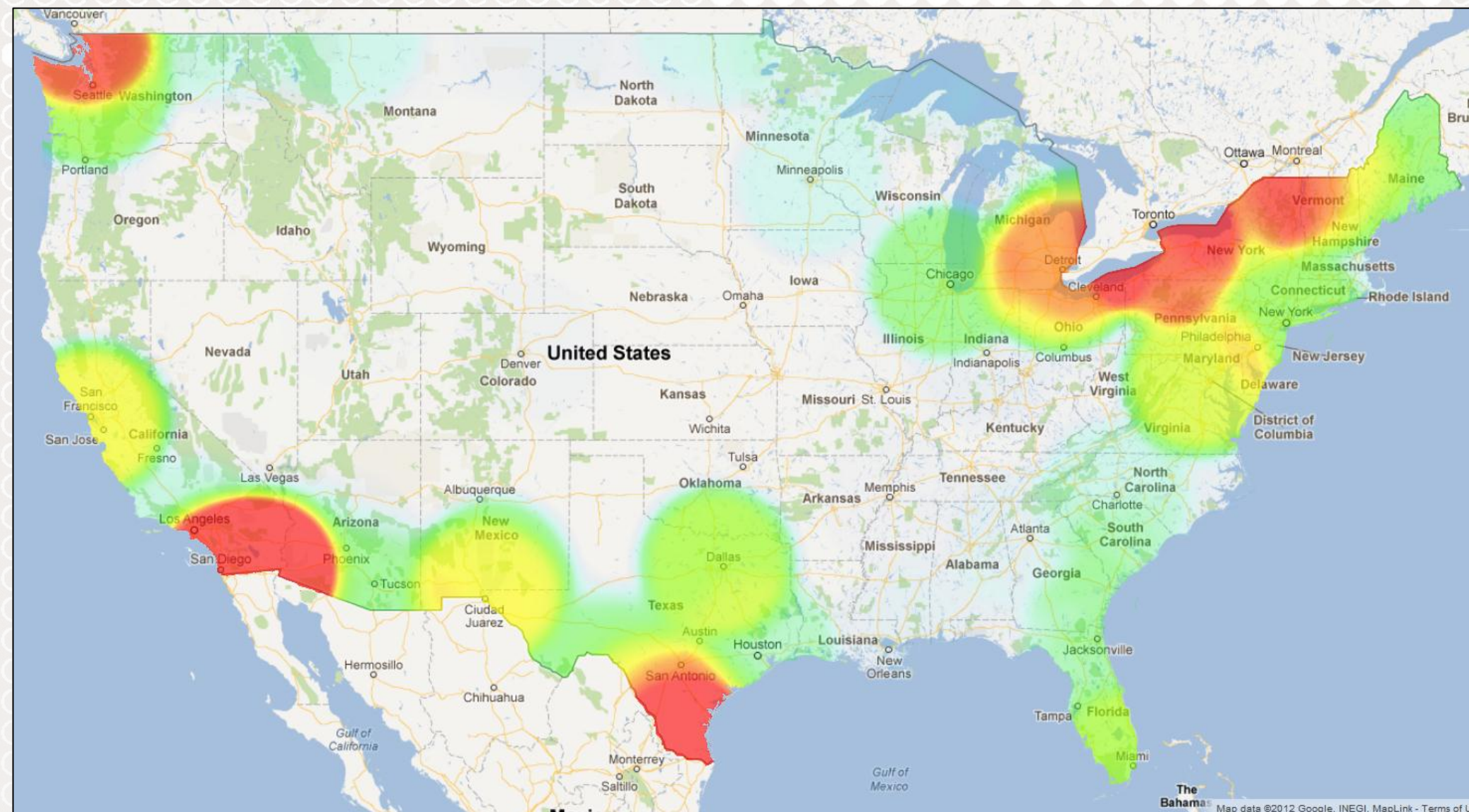
Abstract

The Secondary Reachback Project desired to better understand radiation alarms caused by medical patients at United States ports of entry. We completed a trend analysis on radiation alarm data related to medical patients, illustrate the results, and compile a report of our findings. Through the systematic evaluation of variables, we discovered meaningful trends between the type of port, the port's geographical location, the treatment that the patient underwent, and the isotopes identified by the detectors. The trends learned during our analysis will be used to develop situational awareness to aid in the future detection of anomalous alarms.

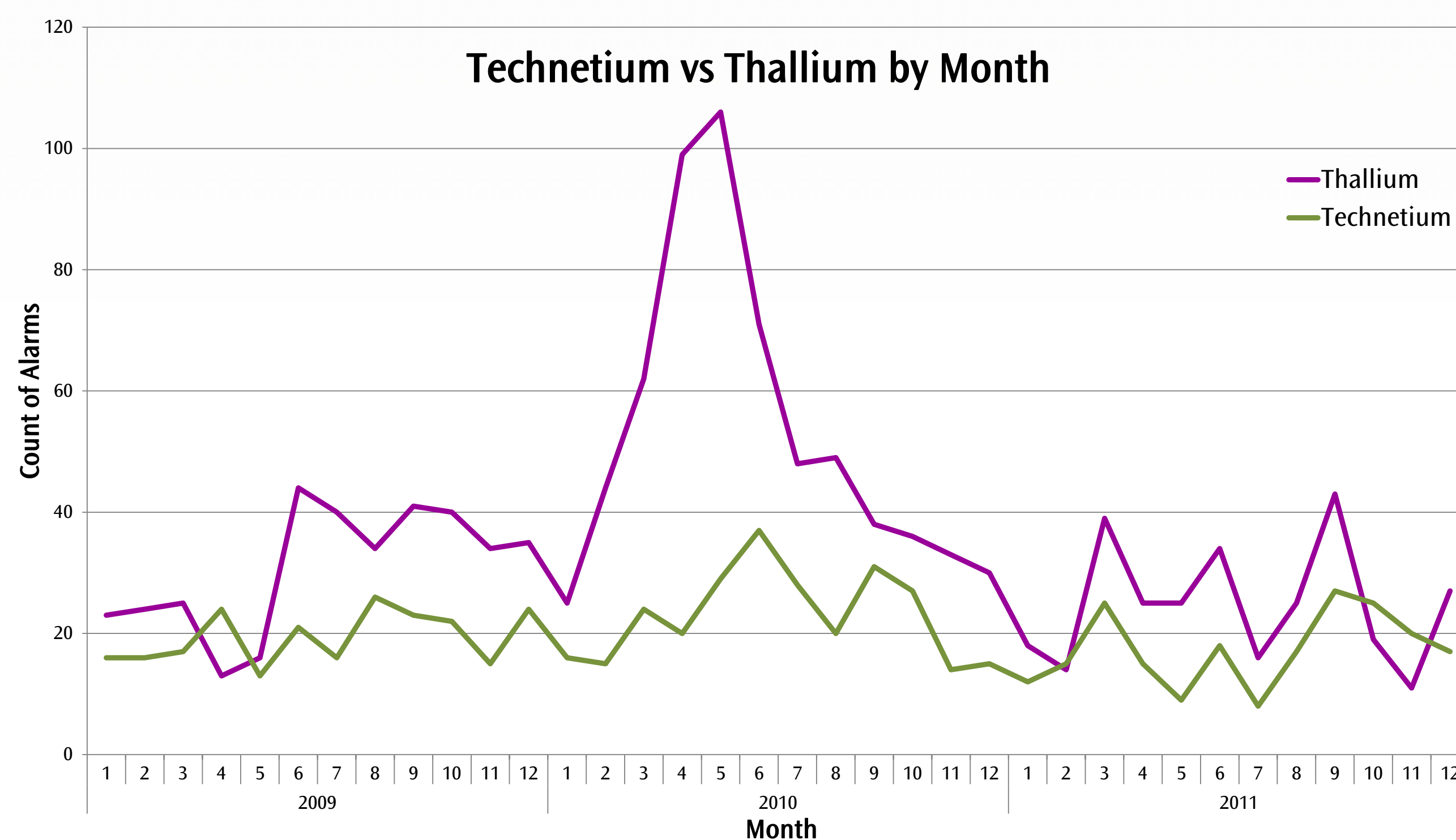
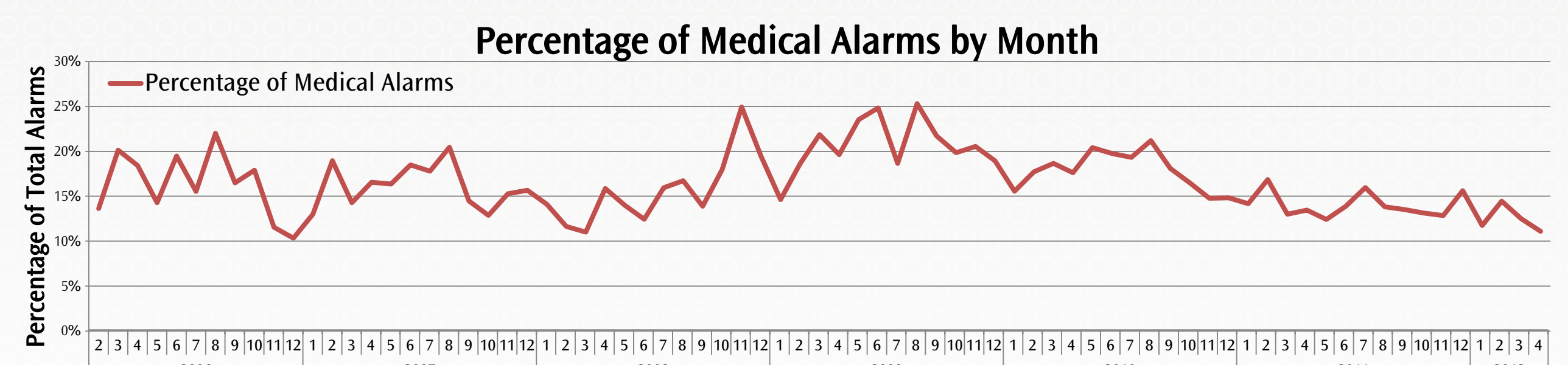
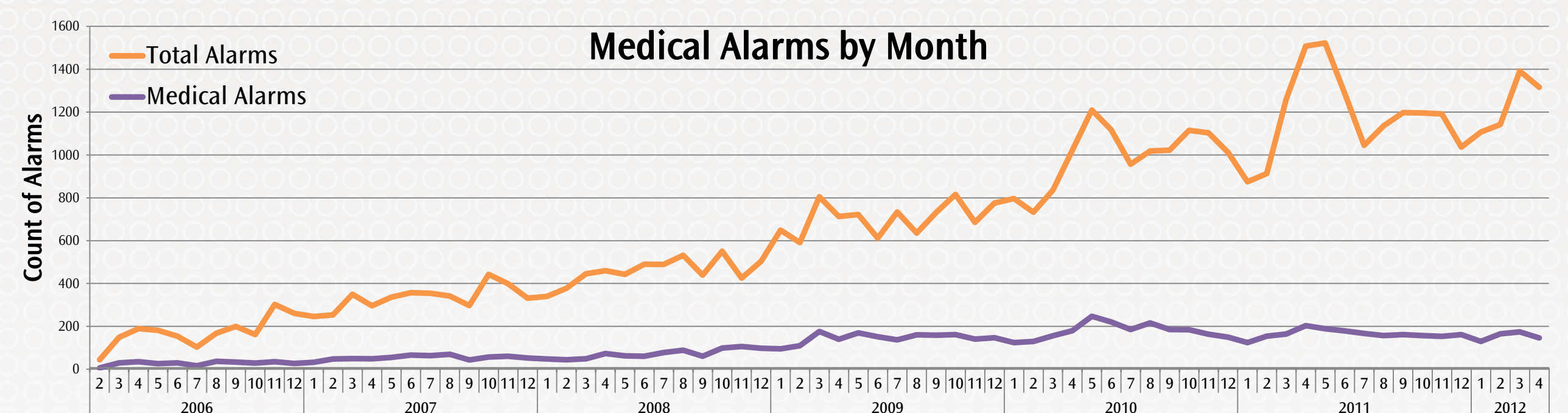
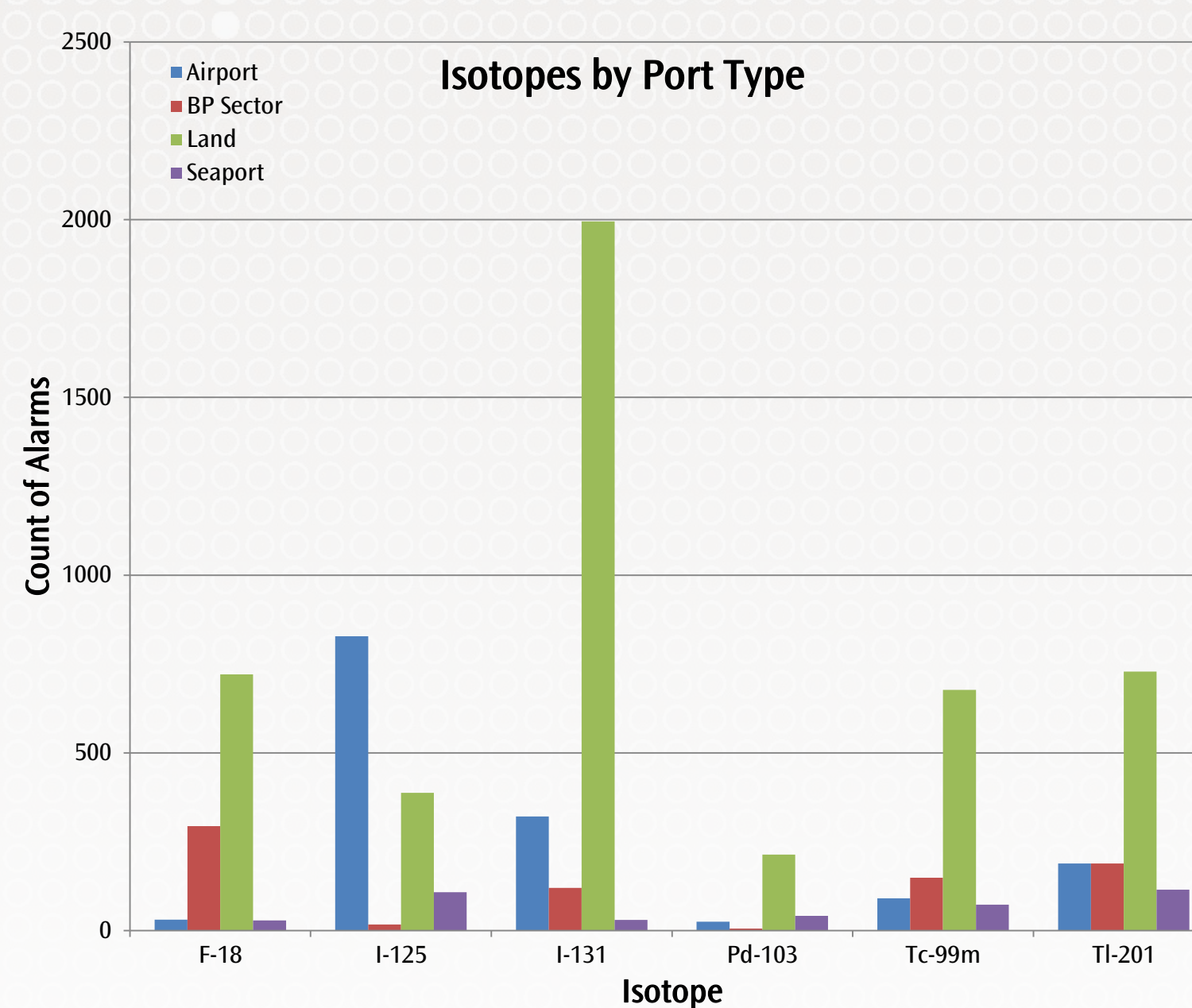
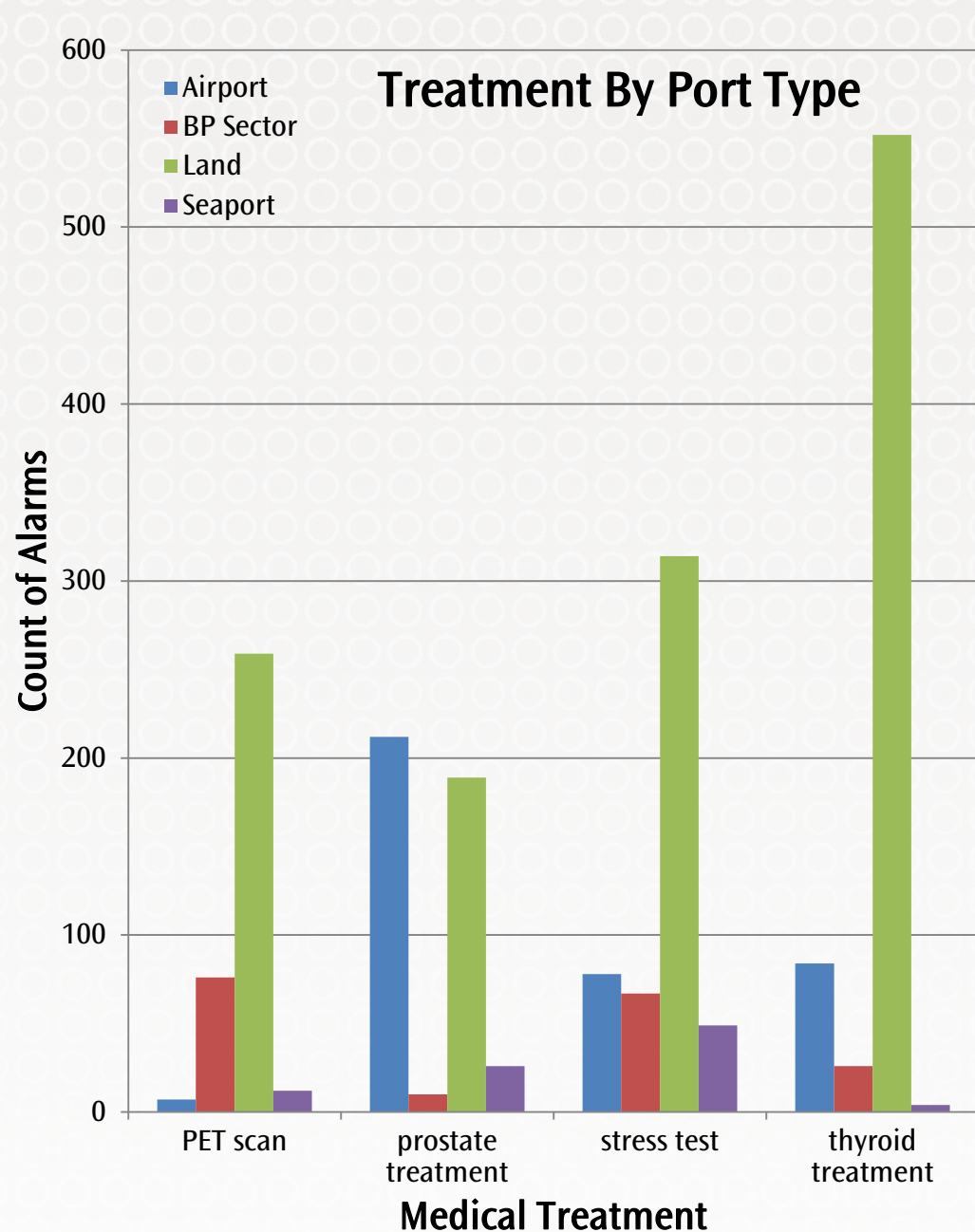
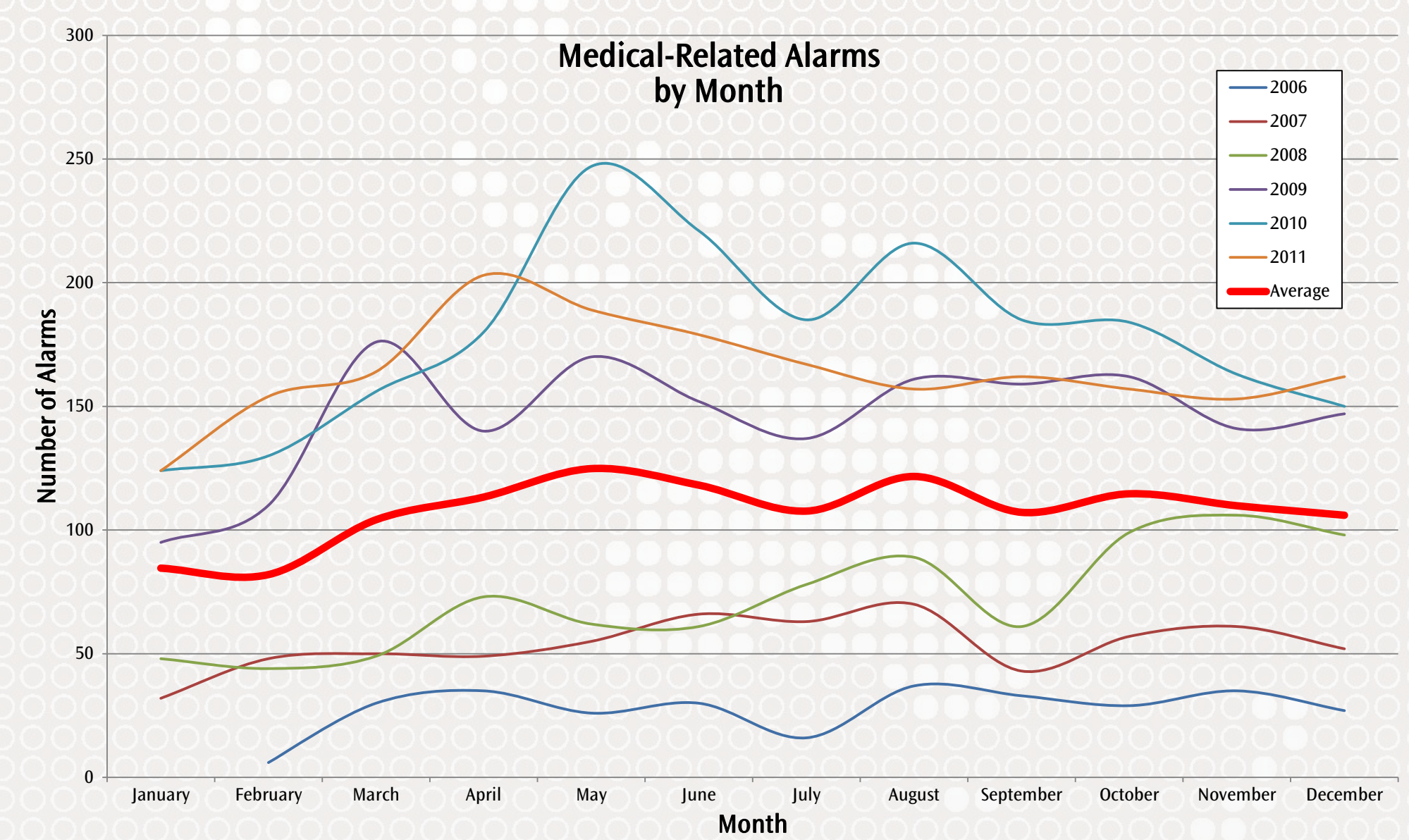
Common Radioisotope Treatments

Procedure	Isotopes Used
Thyroid treatment	I-131
Heart stress test	Tl-201, Tc-99m
Prostate treatment	Cs-131, Pd-103, I-125
PET scan	F-18
Bone treatment	Sr-89, Sm-153
Liver treatment	Y-90
Breast cancer treatment	Ir-192
Bone cancer treatment	Ir-192

Table showing isotopes used with specific treatments, verified by our data.



Heatmap showing the geographic spread of medical-related radiation alarms at United States ports of entry.



Graph showing the count of medical-related radiation alarms for Thallium and Technetium (used for heart stress test procedures) by month.

