

Success of mercury bans in reducing exposure to mercury in Illinois

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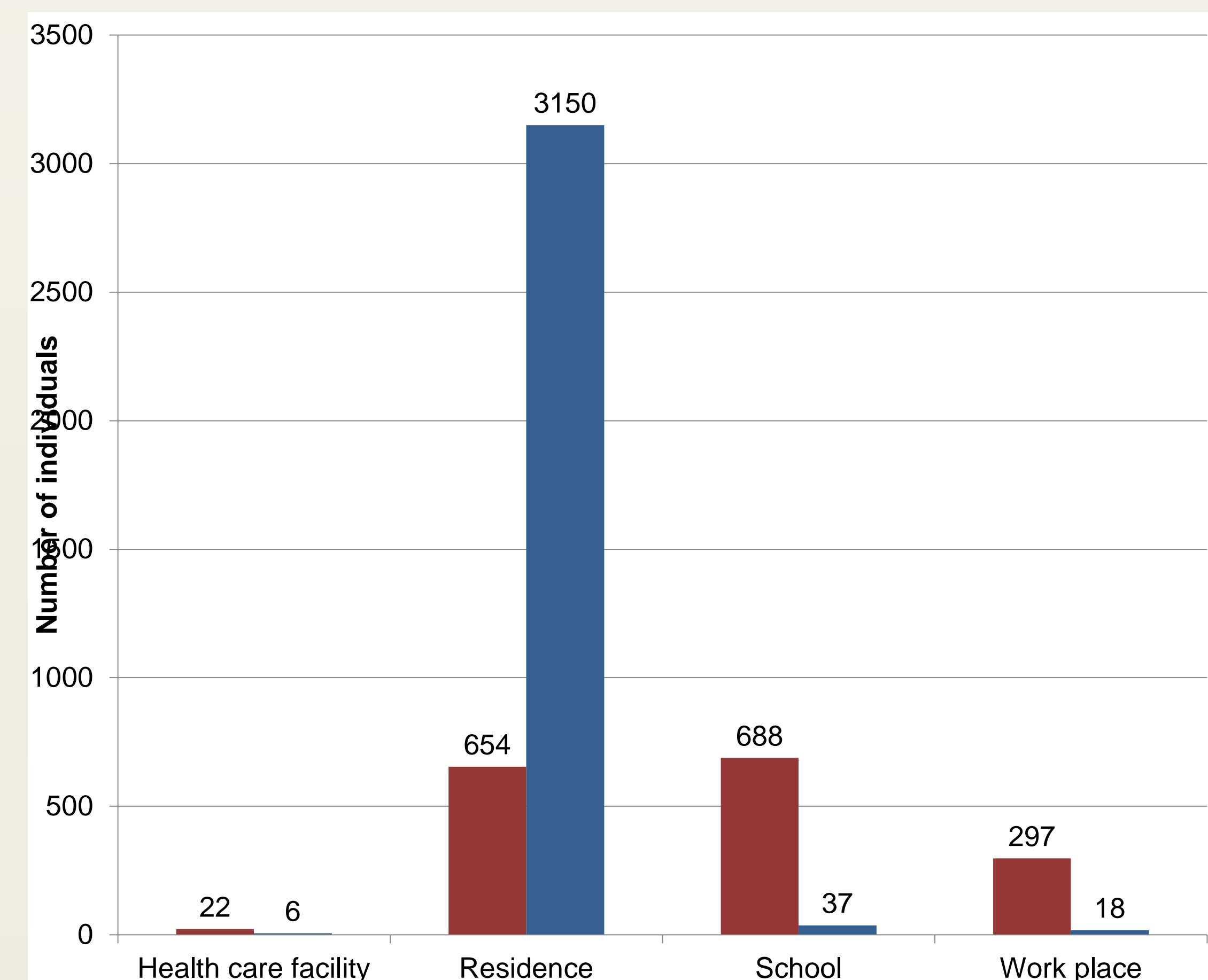
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Background

Elemental mercury has been used in many household medical and electrical devices. If spilled, mercury easily volatilizes and can be inhaled by occupants, usually this occurs when improper clean up procedures are used³. Elemental mercury is well absorbed by inhalation and can result in respiratory or nervous system disease². Children are especially sensitive to the effects of mercury¹. The objectives of this study were to estimate the prevalence of elemental mercury exposure in Illinois both prior to and after the ban of mercury thermometers in Illinois in July 2004, and to describe the epidemiologic characteristics of these cases.



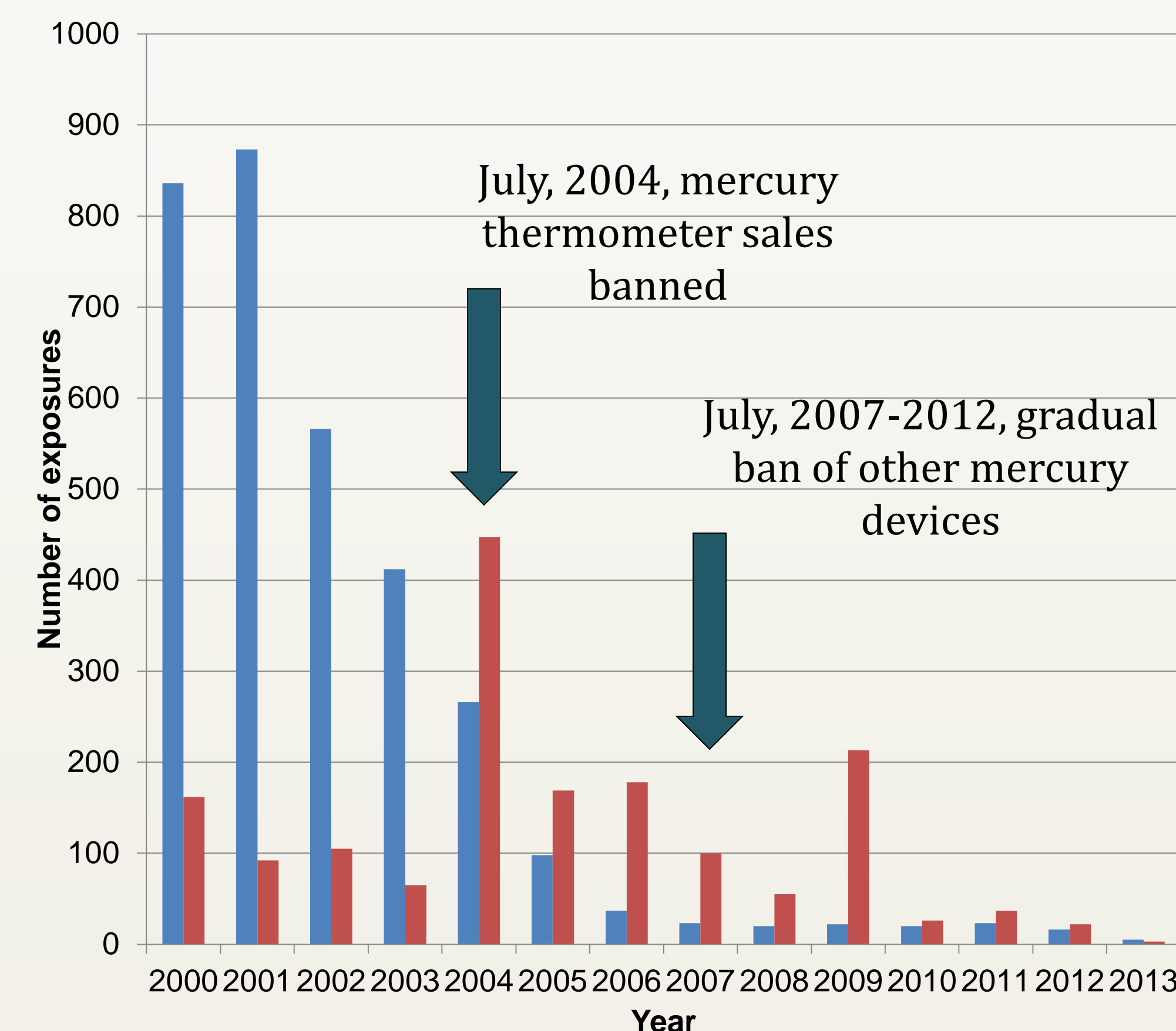
Contractor using Lumex mercury analyzer. Photo © to Aaron Martin



Location of mercury exposures in Illinois, 2000-3/2013
Blue= thermometers, Red=other mercury sources

Methods

The National Poison Data System was searched for exposure calls regarding elemental mercury from January/2000-March/2013. Only calls with elemental mercury as a single agent were included. Cases were excluded when it was deemed that the reported effects were unrelated to mercury or if the exposure was intentional. Excel® was used to summarize and evaluate the data, and to create tables, and ArcMap® was used to create maps.



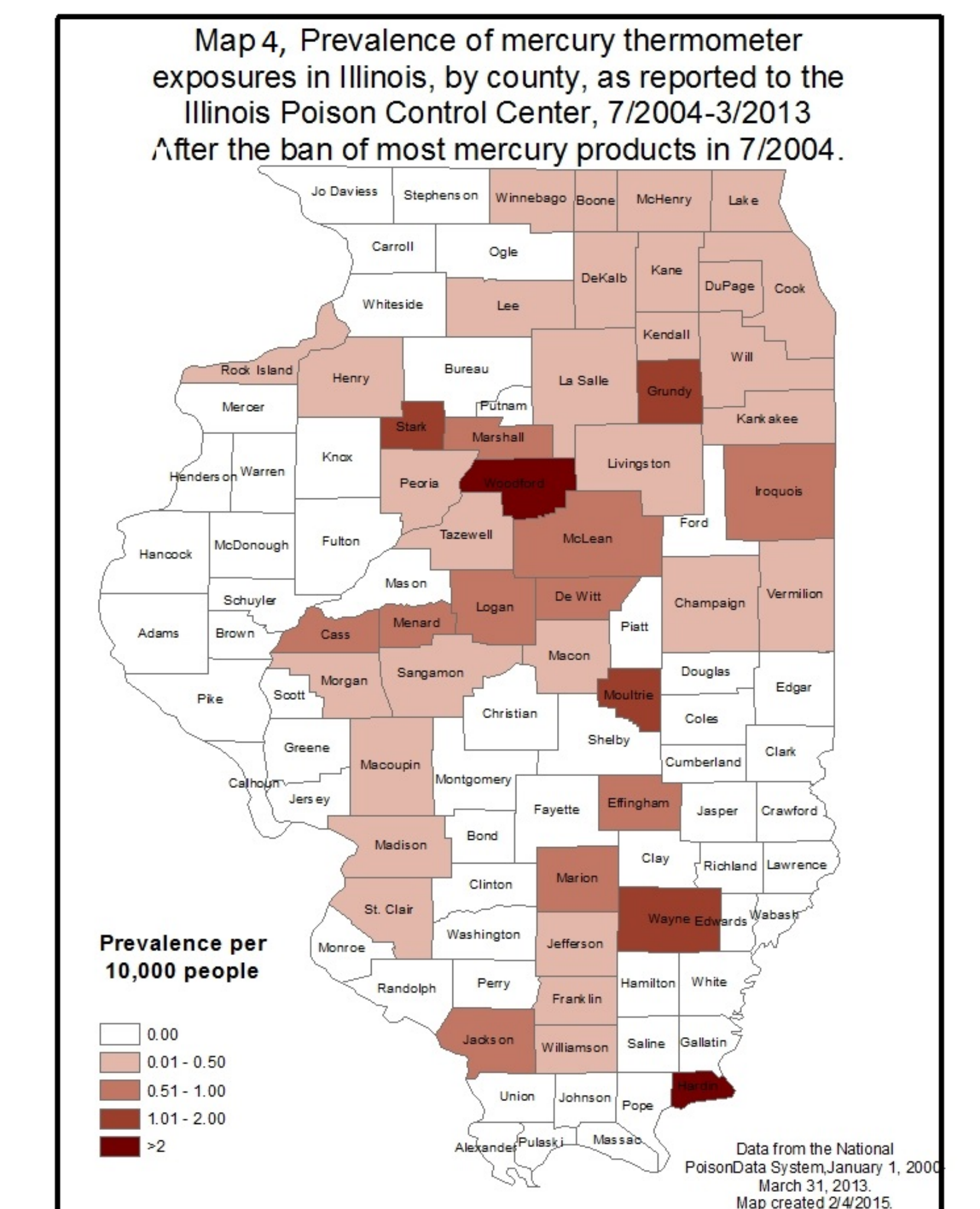
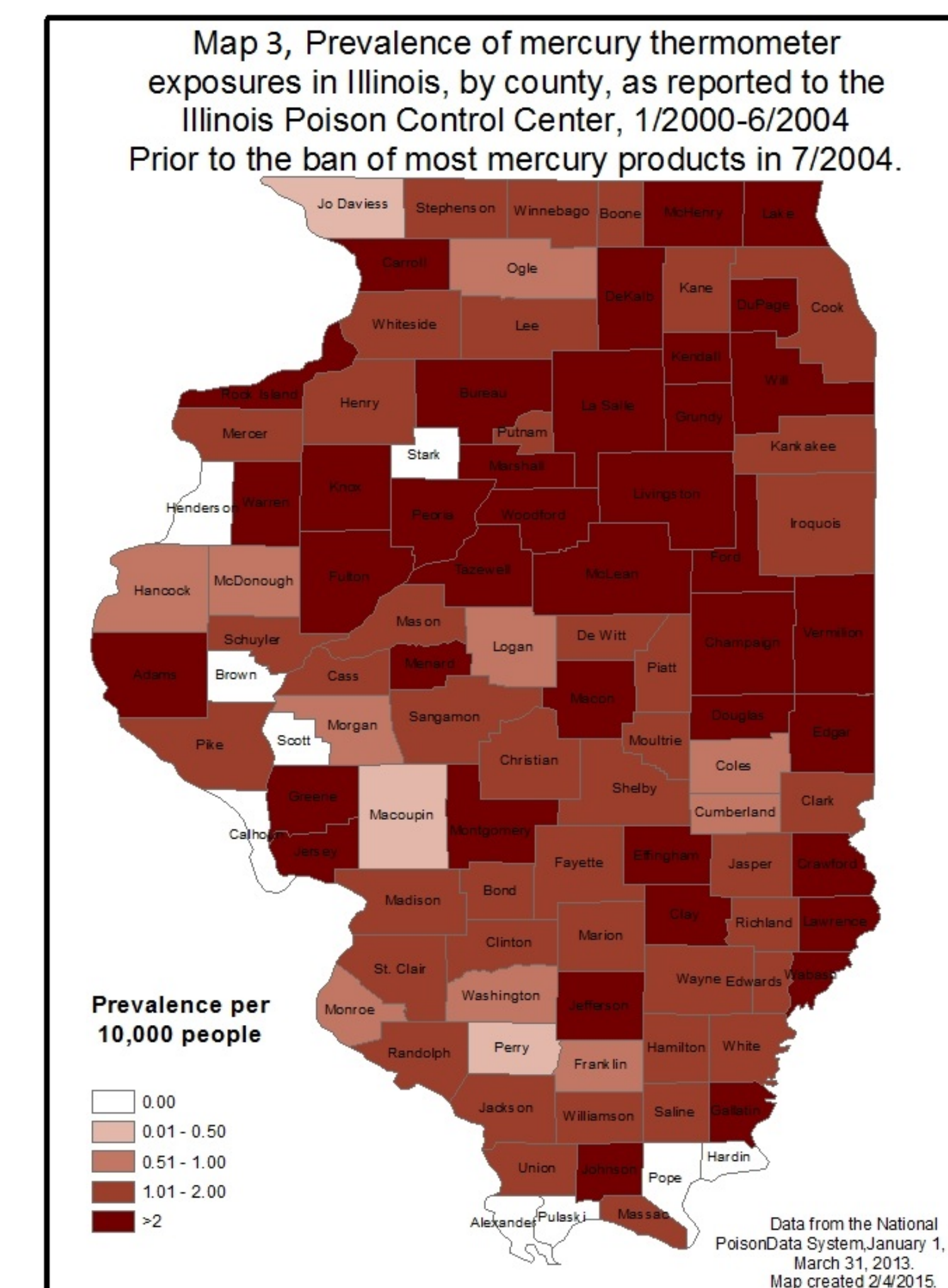
Number of mercury exposures in Illinois by year
Blue = thermometers, Red= other mercury sources



Mercury droplets in a home in Illinois, photo © to Aaron Martin

Results

- Significant decrease in prevalence of mercury thermometer exposure post-ban but no real change in exposure to other sources of mercury
- Only 1% of callers exposed to mercury thermometers were judged to be potentially toxic or developed signs. In contrast, almost 10% of callers with exposure to other sources of elemental mercury were potentially toxic or developed signs
- Exposure to thermometers occurred almost exclusively in residences
- Exposure to other mercury sources occurred most often in schools
- Exposure to thermometers was most frequently by ingestion, but inhalation was most frequent route for other sources of mercury
- Vomiting, ocular irritation, and dermal irritation were the most common signs seen with exposure to mercury thermometers, headache and vomiting were seen with other sources of mercury most frequently
- More females were exposed to mercury thermometers, but more males were exposed to other sources of mercury



Conclusion

The mercury thermometer ban appears to have been successful in reducing exposure to mercury from thermometers, however other sources of elemental mercury remain a problem in Illinois. Further work should be done to continue to raise awareness of caregivers about the risk of mercury and to provide opportunity to remove mercury from homes and schools.

References

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2. Caravati, E. M., Erdman, A.R., Christianson, G., Nelson, L.S., Woolf, A.D., Boozee, L.L., Troutman, W.G. (2008). Elemental mercury exposure: an evidence based consensus guideline for out-of-hospital management. *Clinical Toxicology*, 46, 1-21.
3. Lee, R., Middleton, D., Caldwell, K., Dearwent, S., Jones, S., Lewis, B., Watters, M. (2009). A review of events that expose children to elemental mercury in the United States. *Environmental Health Perspectives*, 117, 871-878.