

# Pediatric Exposure to Biological/Repellent Pesticides Reported to the National Pesticide Information Center



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## BACKGROUND

The National Pesticide Information Center (NPIC) provides objective, science-based information about pesticides to enable people to make informed decisions about pesticides and their use. One of NPIC's primary objectives is to serve as a recognized place for the public and health professionals to report pesticide incidents nationwide. The purpose of this study is to identify trends related to products and active ingredients that may not be tracked elsewhere. In this way, we demonstrate the utility of NPIC's data in understanding factors associated with pediatric pesticide exposure

In this study, we examined pediatric pesticide exposures of children ages 0-14 reported from 2000 to 2009. 2631 pediatric exposure incidents were reported during this time. In comparing pesticide types we found an increasing trend in the percentage of biological/repellent exposures from 1.5 % of total pediatric exposures in 2000 to 13.1% in 2009. Capsaicin, denatonium benzoate, and allyl isothiocyanate were involved in the highest number of pediatric exposures with 94, 73 and 39 incidents, respectively. (See Figure 1).

Denatonium benzoate is used as a bittering agent to deter feeding. "FOOEY" is a product containing denatonium benzoate, which is used to discourage animals from eating garden plants. During the time the product was registered, NPIC's phone number was located on the label. Although this product accounted for a significant portion of the total number of biological/repellent incidents, we were unable to find another source of data tracking incidents from this specific active ingredient. Thus we investigated two specific questions: 1) What ages (0-14) were most commonly reported? 2) Did regulatory actions limiting use of Denatonium Benzoate have an impact on the number of reported incidents?

## METHODS

Incident data reported to NPIC was stratified by age 0-14, type of pesticide and active ingredient over a span of 10 years between 2000-2010. Incidents involving denatonium benzoate were grouped by age of victim and incident year. Incidents may involve more than one product and/or active ingredient. As such, the sum of incidents by active ingredient is greater than the number of incidents reports (Figure 1)

## RESULTS

Figure 1: Top fifteen biological/repellent pesticides reported to the National Pesticide Information Center

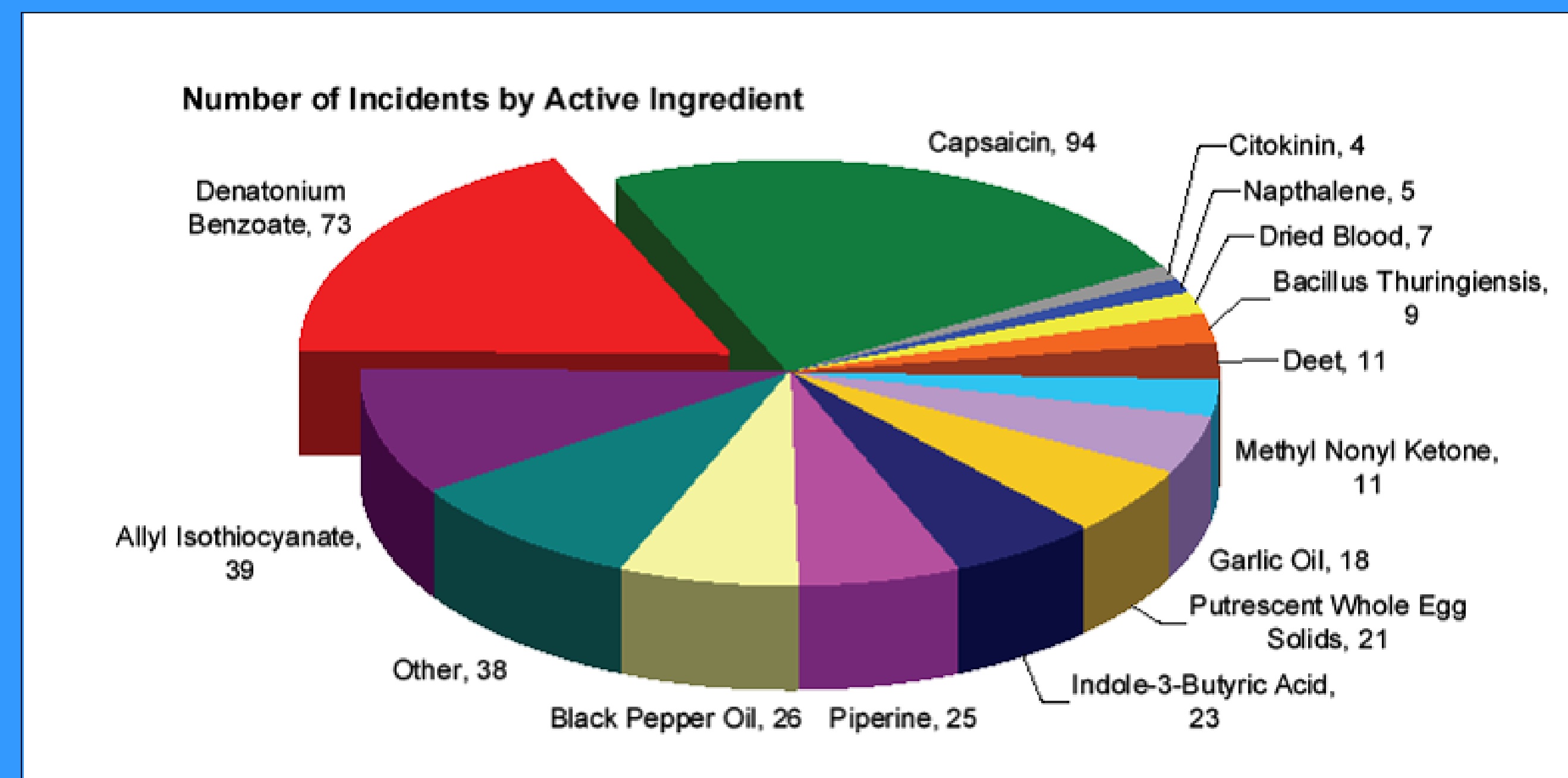
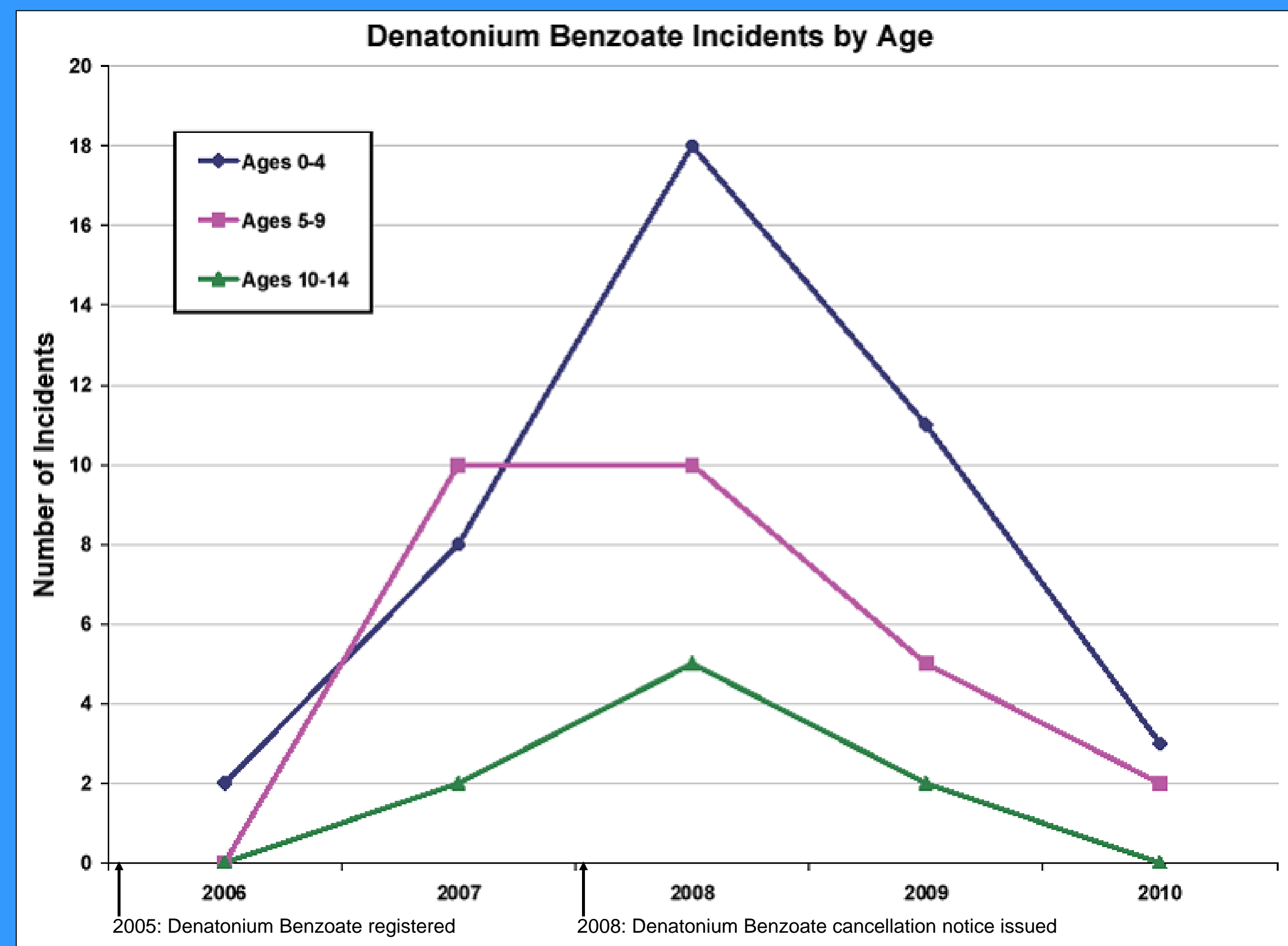


Figure 2: Examining age and date of exposure to year and regulation status



Denatonium benzoate incidents steadily increased from when the product was registered in 2005 through 2007 when it began decrease after the product was taken off the market. The increase was most markedly noticed in children age 0-4. This supports the notion that limiting product availability will reduce incidents, similar to the phase-out of organophosphate pesticides for home use (Stone, 2009).

## CONCLUSION

1. This study finds that part of the increase in biological/repellent incidents among children reported to our center can be attributed in large part to denatonium benzoate (see Figure 2).
2. Among children 0-14, more incidents were reported for young children age 0-4 than any other age group. This could potentially be attributed to greater hand-to-mouth behavior in this age group.
3. The denatonium benzoate case study demonstrates NPIC's effectiveness in: (1) recording incident reports from a product's real world use 2) tracking specific demographics affected by a product and (3) Identifying specific active ingredients trends that may pose public health issues for the general public.
4. It is hoped that by further utilization of NPIC's data, public health professionals can track childhood pesticide exposures trends in certain products in order to understand how children are being affected and what interventions may need to be targeted to reduce exposure.

## LIMITATIONS

Our study is limited by the self reporting nature of the data, and the inability to confirm the accuracy of the data collected. Public awareness of NPIC on any give year could also influence fluctuation in our data. Lastly, because NPIC's phone number was on the Denatonium Benzoate label and may or may not be listed on it labels, this could have resulted in an unrepresentative reporting level for that active ingredient.

## FURTHER RESEARCH

Since 2009, NPIC has been characterizing the severity of reported symptoms in pesticide incidents. Further study of childhood exposures in relation to severity of health outcomes would be useful to understand which products may pose the greatest risk to children.

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