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## Background

The Association of Immunization Managers (AIM) Vaccine Storage and Handling Working Group advocates for science-based guidelines to help Immunization Programs (IPs) prevent storage failures and respond to them appropriately when they occur.

**Problem:** Vaccine storage failures often result in the decision to waste exposed vaccine because of doubt about viability.

**Need:** A better understanding of the scope, type and cost of storage failures resulting in waste of publicly funded vaccine in the U.S.

## Purpose of Study

1. Characterize the common types of events that result in vaccine waste identified during a defined period
2. Understand public sector cost of improper storage
3. Use results to advocate for science-based guidelines useful for responding to the common types of events

## Methods

**Participants:** IPs that receive grants from the Centers for Disease Control and Prevention (CDC) for Immunizations

**Data collection:** Online questionnaire completed by IP for each storage failure incident that resulted in vaccine waste (refrigerator, freezer incidents reported separately)

**Primary Data:** Type of unit, Tmax or min, duration of incident, number of publicly purchased doses of each vaccine wasted  
If vaccine wasted after more than one temperature excursion, IP reported details of most recent incident

**Study Period:** Incidents IP identified July 13 -- September 4, 2009

**Cost:** Calculated by investigators at end of study using published CDC contract prices in effect during study period

## Results: Participation

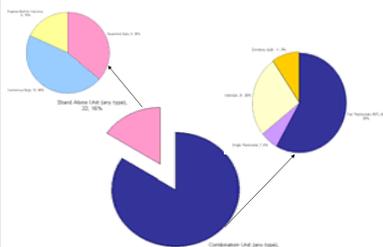
45 of 64 IPs participated: 39 of 50 state; 4 of 6 city; 2 of 8 territory  
Participating IPs represent 60% of US population

Total incidents reported = 318 (~40 per week)

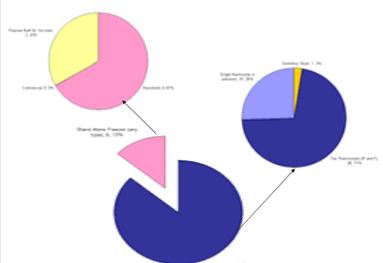
- 237 (75%) refrigerated vaccine incidents
- 81 (25%) frozen vaccine incidents
- 61 (19%) involved vaccine left outside a storage unit
- 74 (23%) involved multiple temperature excursions

## Results: Storage Units Involved in Waste

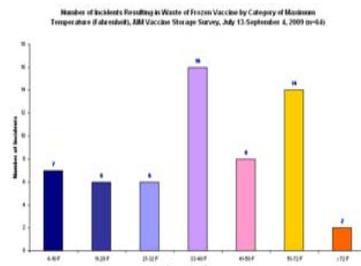
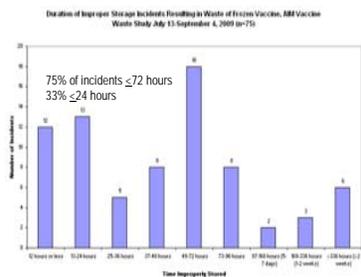
### Types of Refrigerators Involved:



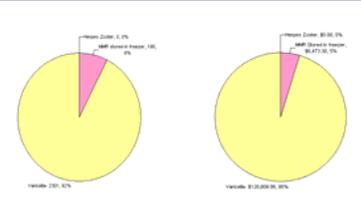
### Types of Freezers Involved:



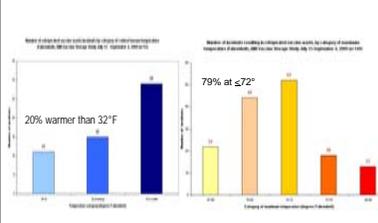
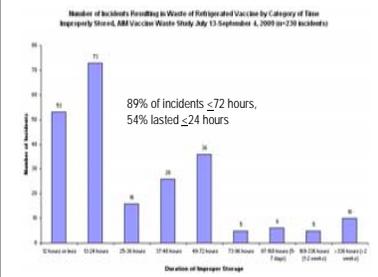
## Frozen Vaccine Incidents: Duration, Temperature



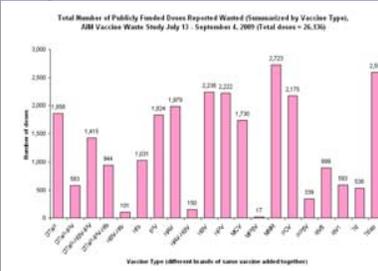
## Publicly Funded Frozen Vaccine Wasted in 8 Weeks: 2,491 Doses at a Cost of \$135,283



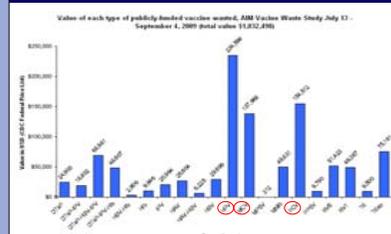
## Refrigerated Vaccine Incidents: Duration, Temperature



## Refrigerated Vaccine Doses Wasted in 8 weeks: 26,136



## Publicly Funded Refrigerated Doses Wasted in 8 weeks: \$1,032,498



## Limitations

- Study does not address whether vaccine was actually damaged by temperature excursions resulting in decision to waste it
- Results represent only publicly purchased waste identified by participating IP: a significant underestimate of actual \$ wasted
- IP policies may lead to different decisions about vaccine waste following identical incidents

## Conclusions

- Most vaccine waste occurs in combination (R/F) units
- Total value of publicly funded vaccines wasted in 8 weeks among 45 (of 64) IPs = \$1,167,781
- Results extrapolated to estimate waste over 1 year for the entire US population = \$11,500,000
- Science-based guidelines for responding to single incidents no warmer than room temperature and no longer than 72 hours would address most incidents that currently result in waste
- A new International Vaccine Thermostability Working Group was formed by CDC in March 2010 to begin exploring these issues

## Acknowledgements

- AIM Vaccine Storage and Handling Working Group members
- AIM Research Committee
- AIM Executive Committee
- All IP staff who reported incidents

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