



## DATA DETECTIVES: PROMISING STRATEGIES TO IDENTIFY SUSPECT CLIENT RECORDS IN OREGON'S IMMUNIZATION INFORMATION SYSTEM (ALERT IIS)

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# Background



- ALERT Immunization Information System (IIS)
  - ▣ Started in 1996 as statewide childhood registry
  - ▣ Lifespan in 2008
  - ▣ ~6 million client records
  - ▣ ~350k new in 2014

Oregon  
Health  
Authority

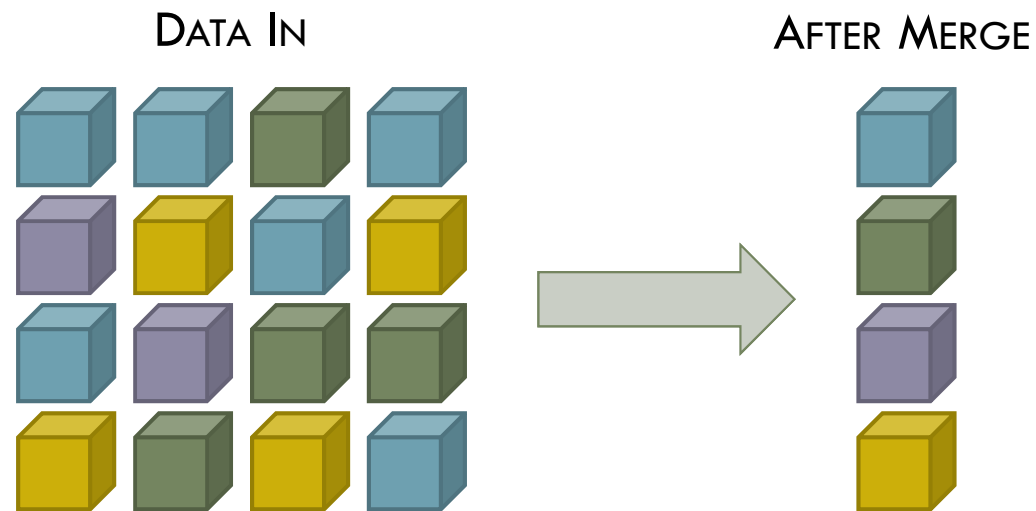
OREGON IMMUNIZATION PROGRAM  
Oregon Public Health Division

# It's Raining Data



# Record Merging

- Goal: Minimize duplicate records in system by proactively merging records



DEDUPLICATION

# Record Merging

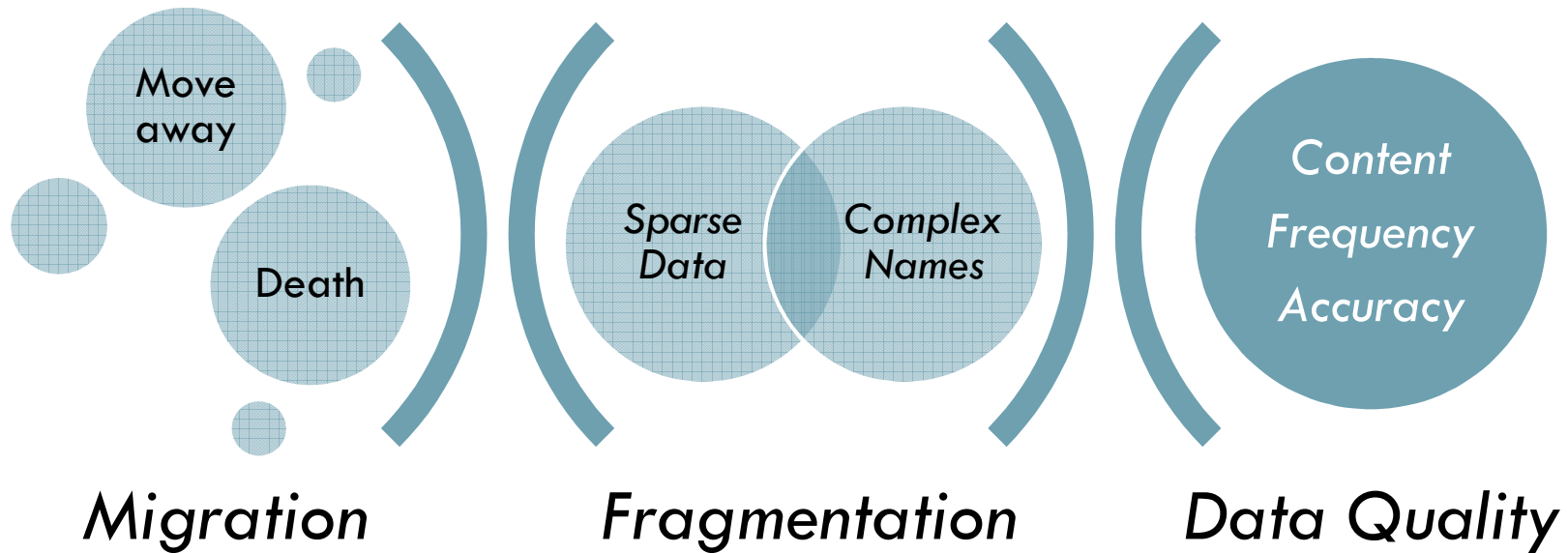


- Automatic client and immunization record merging
- Targeted Manual Merging
- Future Enhancements of match algorithms and processes

# Data Scene Investigation



- ~8% more clients over population estimates



# CDC NCIRD\* Sentinel Program

- Project supported by Center for Disease Control and Prevention
  - ▣ Six contiguous counties
  - ▣ Monitor vaccine trends
  - ▣ Conduct evaluations



\* National Center for Immunization and Respiratory Diseases

# CDC Sentinel Program

- Oregon one of six CDC Sentinel sites across US
- Leading national data quality improvement effort



THE NEW YORK CITY  
DEPARTMENT of HEALTH  
and MENTAL HYGIENE



WISCONSIN DEPARTMENT  
of HEALTH SERVICES





# There's a Method for that...

- Statistical methods exist...  
...but are they enough?
- The purpose of investigating records:
  - ▣ To enhance existing statistical methods
  - ▣ To enhance overall ALERT IIS data quality
  - ▣ To make record resolution more efficient and effective



# And more help is on the way...

- Major improvements in demographic field population:
  - ▣ More fields are populated
  - ▣ Populated more frequently
  - ▣ Populated more accurately

- Of interest today:
  - ▣ Numeric fields
  - ▣ Address field



# Leverage Numeric Data Fields

Names are good... numbers are better

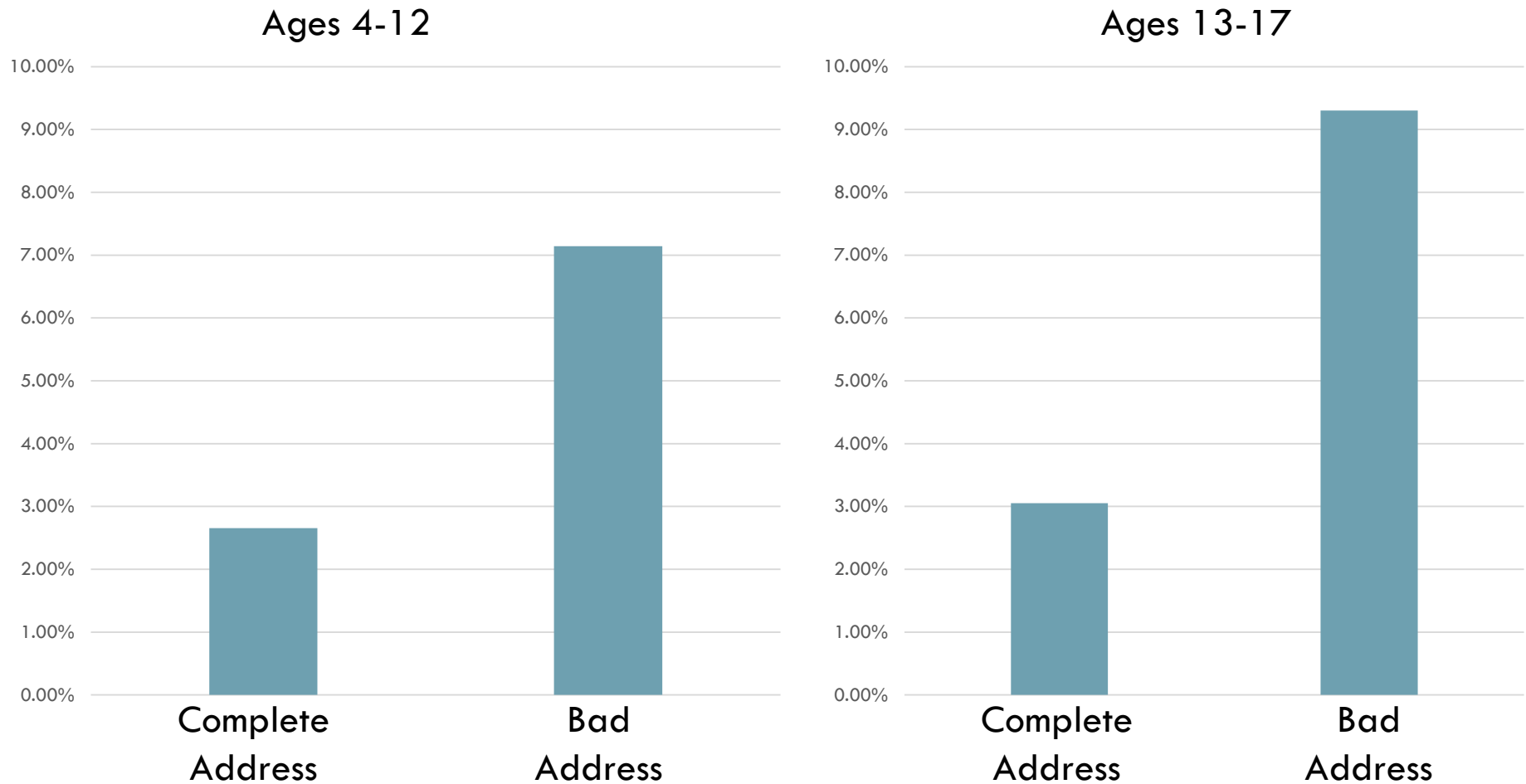
Table 1: Likelihood that selected fields were populated among client records that were successfully merged (Oregon Sentinel data, n=2,876)

	Odds Ratio
Traditional Merging Fields	
Mother's First Name	1.23
Mother's Maiden Name	1.20
Client's Middle Name	1.01
	Odds Ratio
Numerical fields	
Medicaid ID	3.78
Encrypted Social Security Number	2.99
Phone Number	2.15

# Leverage Address Field

Kids with bad addresses: it starts out bad... and gets worse

Percent of clients with only one vaccination recorded in ALERT IIS



# What else?

## Leverage Migration Patterns

Every year, some kids move out of Oregon...

... and every year, some kids' shots stop showing up in ALERT IIS...

**...coincidence???**



# Leverage Migration Patterns

Match pattern of moving to vaccination pattern:

## Discount Rate

Calculate discount rate by comparing last update figures with known state migration patterns

## Years since update

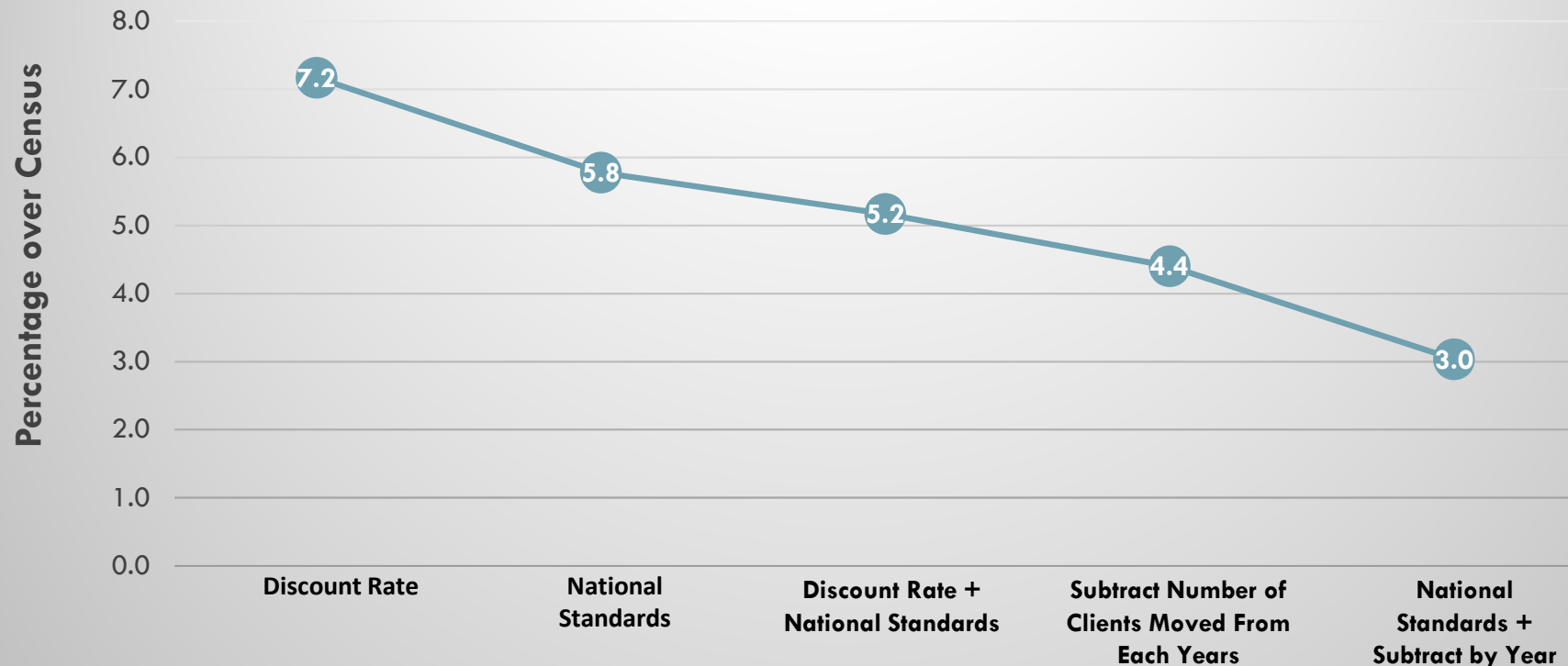
Determine years since last update for each record  
Difference between date record entered system vs. since last update date

## National Standards

Utilize National DQ Standards  
Recommendations on record inactivation following period of inactivity, other factors

# Leverage Migration Patterns

How close can we get to Census population estimates? It depends on which method(s) we use.



# Sentinel Next Steps



- All methods presented promise to improve accuracy of rates calculations using ALERT IIS data, and can help target suspect records for resolution
- Project in its infancy but momentum is building
- National white paper on IIS data quality will result



# Thank you

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