2023 PUBLIC HEALTH LAW CONFERENCE

People. Policy. Progress.

Using Data Hashing to De-identify Cross-Sector Data for Chicago's Crisis Assistance Response and Engagement (CARE) Program

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The Network for Public Health Law

Agenda

- **Chicago's Crisis Assistance Response and Engagement (CARE) Program Overview**
- **CARE Challenges**
  - Implementation Challenges
    - Federal Regulations
    - State of Illinois Regulations
    - City of Chicago Regulations
  - Data Challenges
    - Lack of cross-agency data access and insight
    - Communicating CARE performance indicators to external stakeholders
- **Evaluating CARE and Data Transparency: Scope & Challenges**
  - Evaluation overview
  - Twin challenges of de-identification and linking cross-agency PH data
  - Data from hashing
- **Key Takeaways**

CARE Program Overview

Chicago Launched CARE to Better Address BH-related 911 Calls

Launched in late 2021, Chicago's *Crisis Assistance Response and Engagement* (CARE) program: seeks to address underlying unmet health and social needs by ensuring that individuals in crisis are assisted by teams of trained professionals.

Partnership between:

- Chicago Mayor's Office
- Chicago Department of Public Health (CDPH)
- Chicago Fire Department (CFD)
- Chicago Police Department (CPD)
- Chicago Office of Emergency Management & Communications (OEMC)
- Illinois Emergency Medical Services (EMS) Region 11
- Community Outreach Intervention Projects (COIP), University of Illinois at Chicago

CARE is Designed to Comprehensively Address BH-related 911 Calls

1. Pre-Response

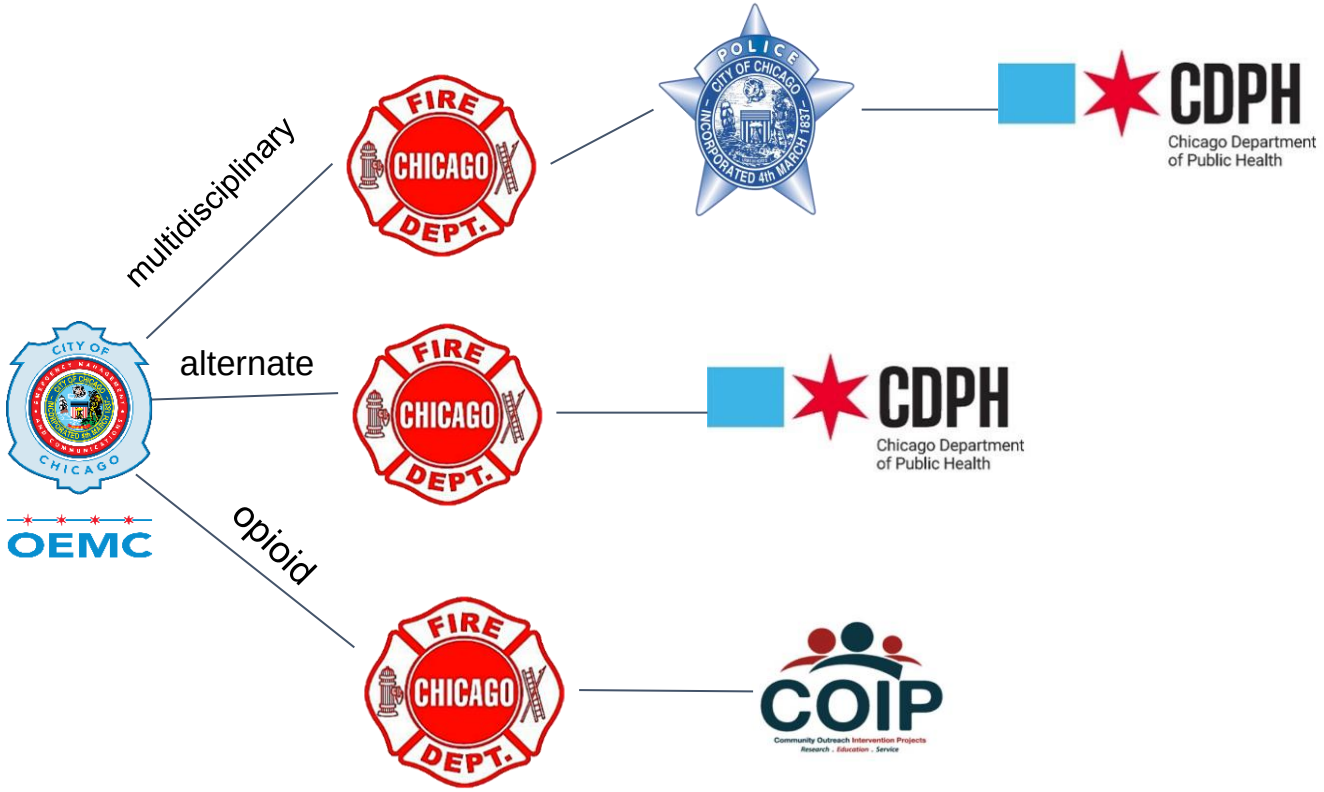
- Clinicians embedded in OEMC (Chicago's 911 call center)

2. Response

- **Multidisciplinary response:** CFD paramedic + CDPH crisis clinician + CPD officer
- **Alternate response:** CFD paramedic + CDPH crisis clinician
- **Opioid Response:** CFD paramedic + COIP peer recovery specialist

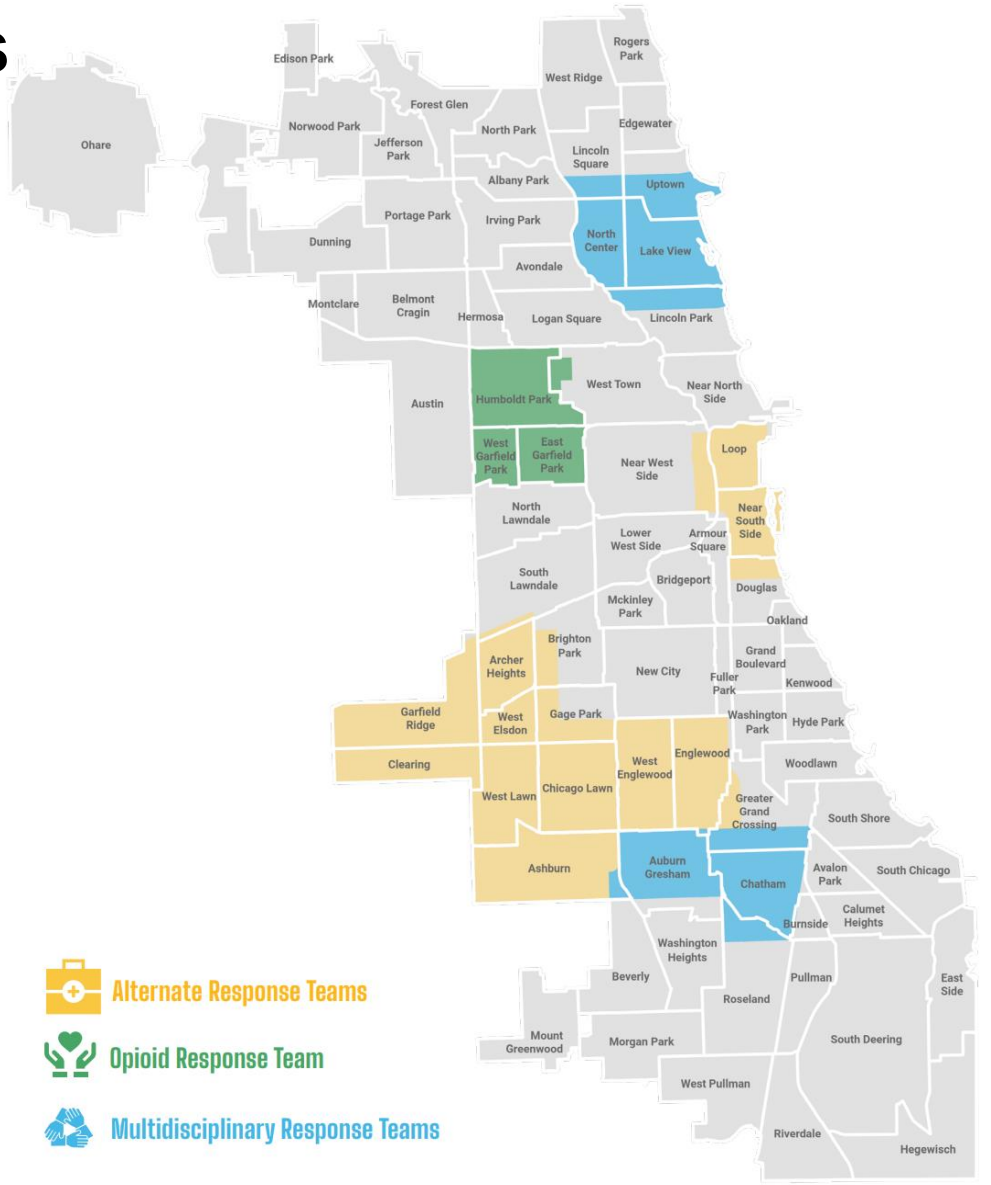
3. Post-Response

- Sobering centers
- Stabilization housing



CARE Operations

- CARE operates in 15 Chicago neighborhoods
- Monday-Friday 10:30am-4:00pm; individuals 12 – 65
- Call types: mental health disturbance, wellbeing checks, threatening suicide, psychiatric, trespass, suspicious person
- Risk level:
  - No violence (MDRT only: punching, kicking, swearing)
  - No weapons (MDRT only: unknown weapons)
- Pilot logistics based on analysis of five years of citywide call data (type, volume, time/day of week)
  - Labor union rules also impacted pilot operations



CARE Implementation Challenges : Regulatory and Operational

Implementation Challenges: Which Are True?

Color of the CARE vans

Ice cream truck song instead of sirens for the van

When CARE teams can take lunch

Bullet proof glass in the CARE van

What to do if person refuses treatment

Bullet proof vests for the clinicians

Strangle proof glass in the CARE van

Where to place to CARE logo on the uniforms

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Regulatory Framework: Federal

- The Health Insurance Portability and Accountability Act of 1996 (HIPAA)
  - Covered entities may not use or disclose PHI for purposes other than treatment, payment or health care operations without securing prior authorization
  - Certain disclosures permitted without authorization:
    - As required by law
    - **Public health activities**
    - Suspected abuse, neglect, DV
    - **Health oversight activities (audits, investigations)**
    - Judicial or administrative proceedings
    - **Law enforcement purposes**
    - Death notices to relevant authorities
    - **Research purposes**

Regulatory Framework: State

- IL Emergency Medical Services (EMS) Systems Act
  - All emergency medical dispatch agencies must operate “under the approval and supervision of the EMS medical director, the establishment of a continuous quality improvement program” (210 ILCS 50/30.70.b.(10).
  - The EMS Medical Directors “have the responsibility and authority for total management of the [EMS] System as delegated by the EMS Resource Hospital.”
  - EMS Medical Directors shall have the authority to require System participants to provide data to the System in addition to that required by [IDPH].”

Regulatory Framework: State

- IL Mental Health and Developmental Disabilities Confidentiality Act of 1979 (MHDDCA)
  - Prevents disclosure and protects confidentiality of mental health treatment records, premised on idea that confidentiality is necessary to promote patient-therapist relationship
  - Adopted in 1979, pre-dating alternative crisis response by several decades
  - In many respects, more restrictive than HIPAA
    - Additional information required for authorizations
    - All records protected from disclosure except as explicitly permitted
      - Similar disclosures without authorization permitted, with the exception of: public health activities; workers' compensation purposes; peer review or research purposes (must be deidentified)

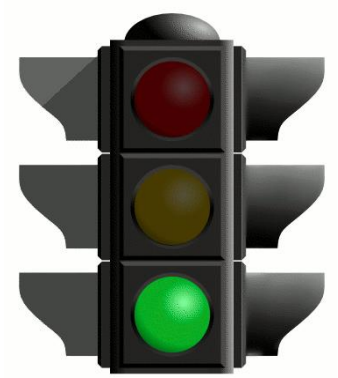
Regulatory Framework: City

- City of Chicago is a Hybrid Entity: It has 13 business-associate-like healthcare components and 9 covered-entity healthcare associates.
- HIPAA permits the EMS Division of the Chicago Fire Department and OEMC to disclose Protected Health Information to the Region 11 EMS Medical Directors for oversight in accordance with the EMS Systems Act. *See 45 CFR 164.512(d); 45 CFR 164.502(b).*
- Local level: agency procedures and labor contracts
  - Question protocols: Dispatching to non-violent events - what does nonviolent mean?
    - Physical vs verbal violence?
    - Knowing someone has a weapon vs knowing someone doesn't have a weapon?
  - Labor agreements about shifts, procedures, etc.
- Firewalls between City agencies

Regulatory Frameworks

HIPAA

Allows sharing data (under several circumstances)



IL EMS Act

Requires sharing data (for operation of all EMS providers)

IL MHDDCA

Prohibits sharing data (very few strict exceptions)

Operational Challenges: Nature of the Cross-agency Partnership

- Agencies previously had limited experience responding together. Needed to define:
  - Partner roles, responsibilities, and relationships
  - How should decisions be made (including Mayor's Office)
- Agencies had substantially different operational policies and practices
  - Staffing/schedules
  - Operational guidelines
- During pilot, agencies had to adopt new cross-agency operational capacity
  - Separate headquarters/base of operations, staffing decisions, field operations (working as a team), uniforms, vehicles
  - How to get buy-in from: staff, home agencies, the public
- All while rethinking relationship with communit(ies): complicated relationships between police and communities; 50 aldermen and 50 opinions

Data Challenges

How do we document CARE Activity in order to systematically communicate impact to interested parties in government and the community?

Data Challenge: Cross-agency Data Access

- **Challenge:** How to establish ground truth in existing data collection systems?
  - Multiple data sources that all report ‘the same’ information
    - Examples: Calls for Service data
  - Defining the systems by which we understand the activity of the team and translating them to data
    - Examples: Events, Arrests, Use of Force, Violent/Non-Violent Calls
  - Limitations in data sharing
    - Example: ‘Fire Wall’ between agencies’ data systems to prevent sharing of data

- **Adaptation:** QA and Data Review
  - Weekly cross-agency QA and data review sessions
  - But:
    - How do you perform QA when you cannot see anyone else’s data?
    - Process must be blinded (cross-agency) and done in real-time

Data Challenge: Cross-agency Data Insights

- **Challenge:** Existing data collection processes were not sufficient to measure CARE activity
  - Each agencies' data collection practices were designed with only their operations in mind
    - Example: CFD - NEMSIS

- **Adaptation 1:** Development of new or amended fields for standard activity forms.
  - Supplemental Questions (previously unrecorded)
  - Reduced need to pull from multiple data sources

- **Adaptation 2:** Aligning First Responders to new documentation processes
  - Survey/form design challenges: How do first responders interpret documentation process? Is it the same across the collaborating agencies?
  - Adoption by first-responders
    - Communication of changes
    - Mandatory Fields

Data Challenge: Communicating CARE Performance Indicators and Metrics

- **Challenge:** Several Core Tradeoffs
  - Trade-offs between transparency and privacy.
    - Who can see what and why?
  - Trade-offs between technical information and non-technical audiences
    - Ex: Use of Force, Involuntary Transport
  - Pilot realities versus stakeholder expectations
    - Project growth and methodology changes
      - Ex: Counting follow-ups

- **Adaptation:** CARE Data Dashboard(s)
  - Development of several internal and external CARE data dashboards
  - But: Hosting issues caused by CPD ownership of Tableau Server

Display Settings | Neighborho... All | Start Date 09/2021 | End Date 09/2023

Data Updated Weekly on Wednesdays through previous week. Data Current Through: 10/8/2023
All event counts are subject to an on-going data validation process and may fluctuate as a result.

CARE Team Activity Summary

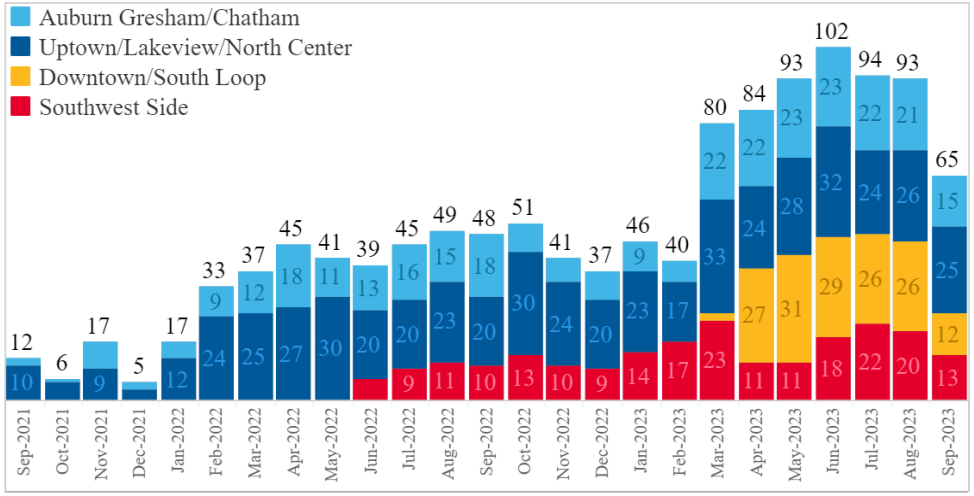
Sep 2021 to September 2023 for Neighborhoods: All

CARE 911 Responses	Follow-Up Encounters	Use of Force Events	Arrests*
1,220	898	0	0

*Events where the CARE CIT Officer makes an arrest

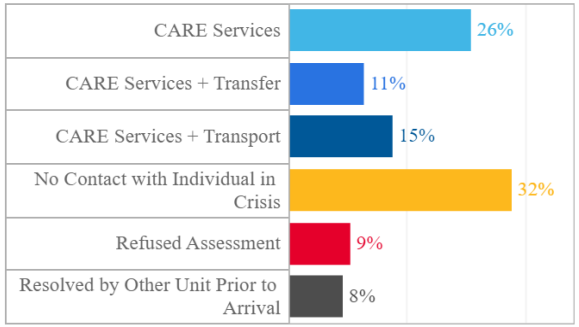
CARE 911 Responses

CARE 911 Responses Over Time by Neighborhood

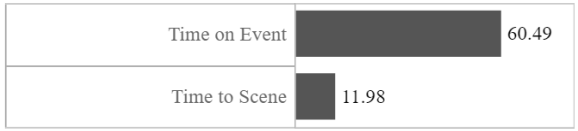


Most current month may appear to have lower event totals because data collection is still in progress.
Southwest Side includes Gage Park, West Elsdon, West Lawn, Chicago Lawn, and West Englewood.

All CARE 911 Responses by Outcome

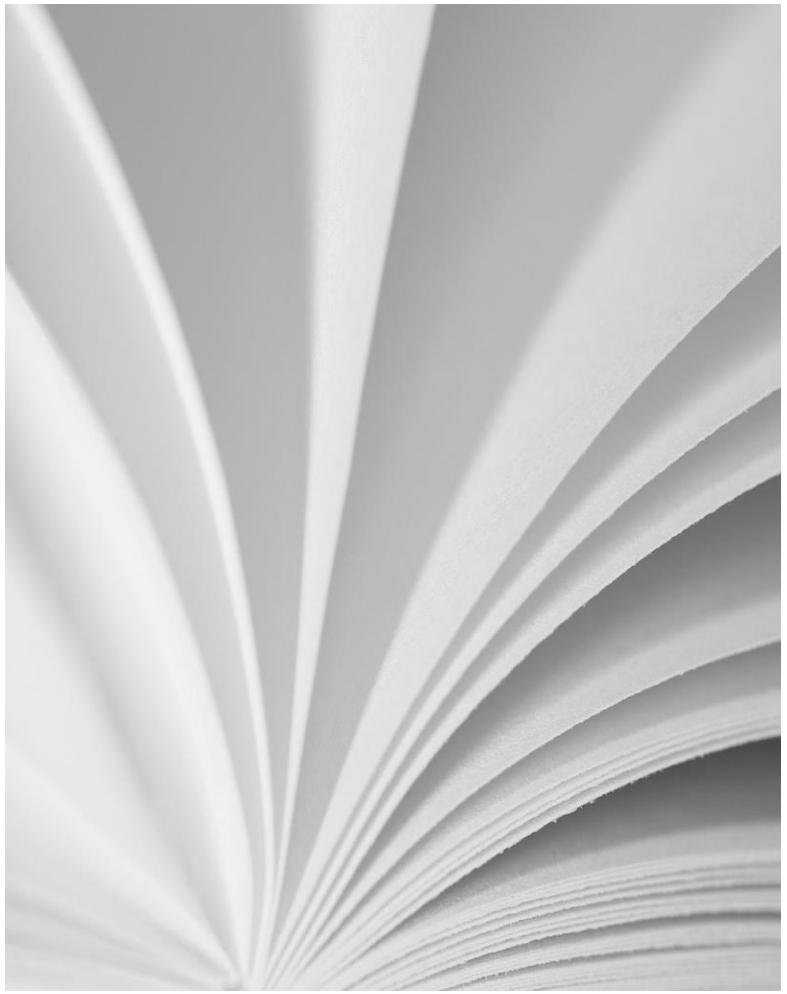


Average CARE Team Service Times in Minutes



*Average time to scene only calculated for calls dispatched directly by 911.

CARE Evaluation & Data Sharing



Health Lab's Implementation Evaluation

Goal: Deliver critical insight into pilot operations & logistical challenges

Descriptive approaches:

Pilot planning & implementation process

Qualitative approaches:

Interviews with program staff & key informants

Quantitative approaches:

Descriptive statistics, predictive analytics & outcomes

Evaluation Challenges

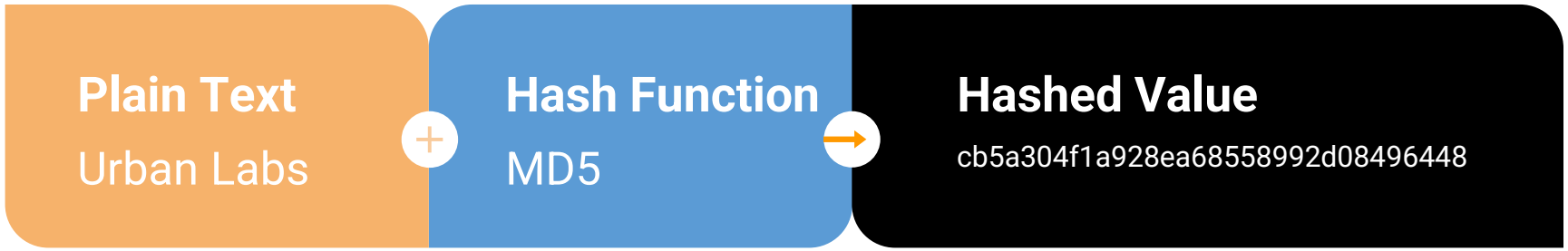
- Need to identify events and individuals and link across multiple agencies' datasets
- While de-identifying and protecting individuals' privacy
- Solution: Hashing

CARE Data De-identification: Hashing

How do we de-identify CARE data to comply with IL MHDDCA and preserve individual privacy while retaining ability link individuals across agency datasets?

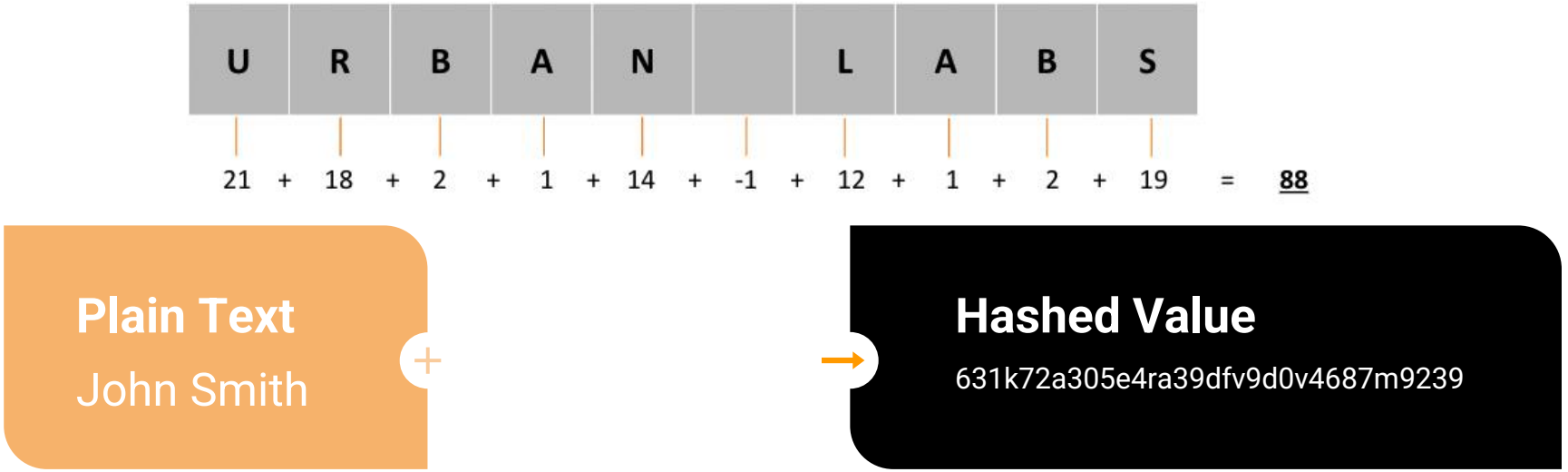
What is Hashing?

- A process of converting text into a fixed-size, cryptographic string of alphanumeric characters (hash value) based on the contents of the data.
- Transforms potential identifiers (name, address, birthdate) into de-identified alphanumeric “strings”



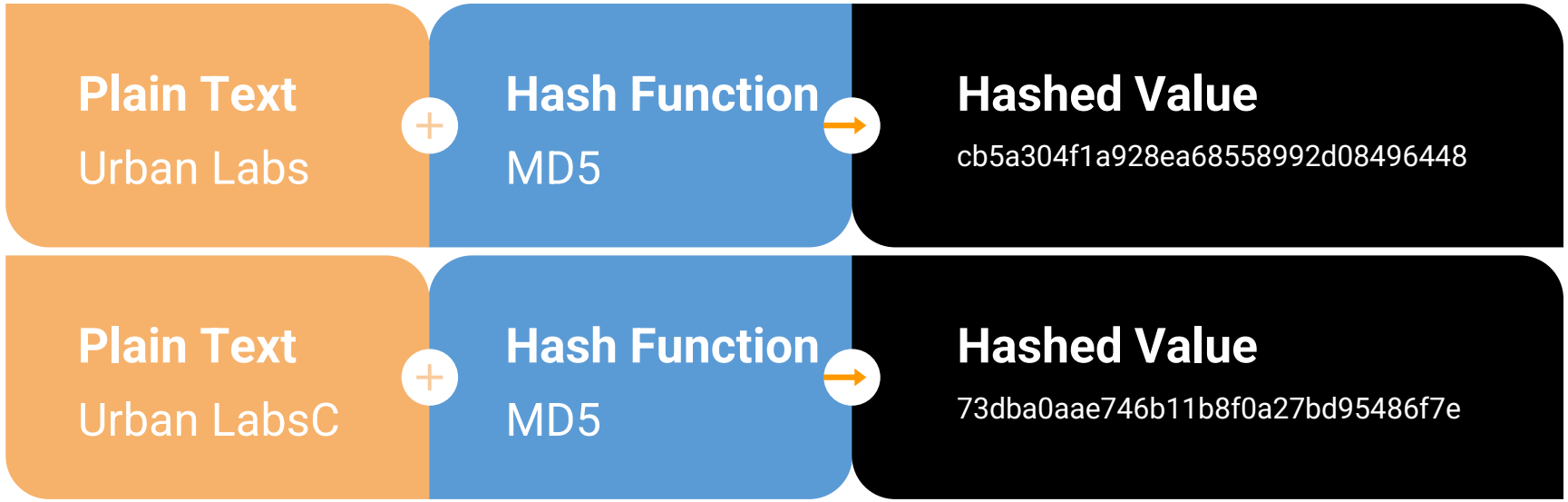
Hashing is Irreversible (mostly)

While technically possible to reverse a hash function using brute-force methods, this is typically impractical due to the enormous number of possible input values.

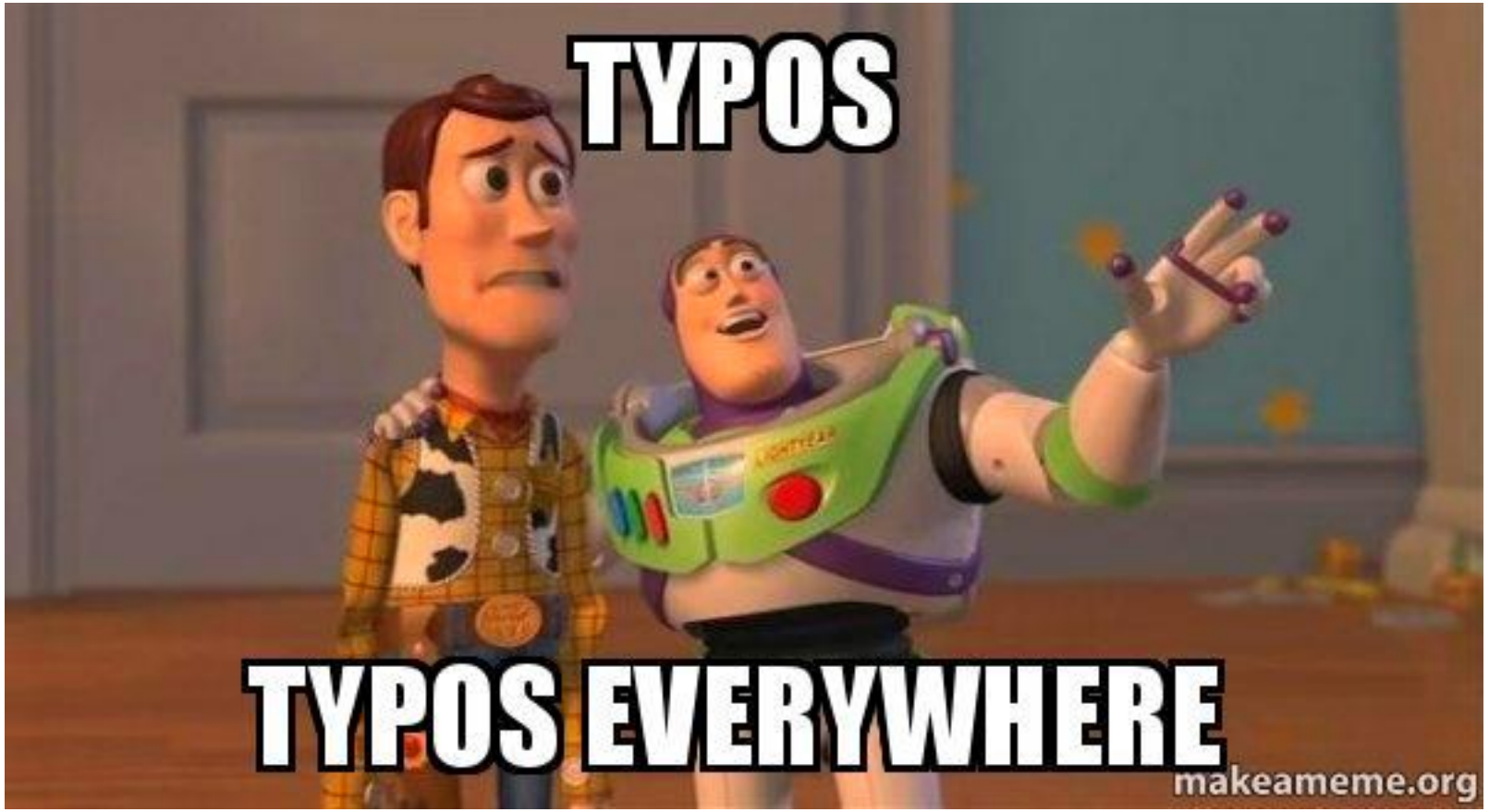


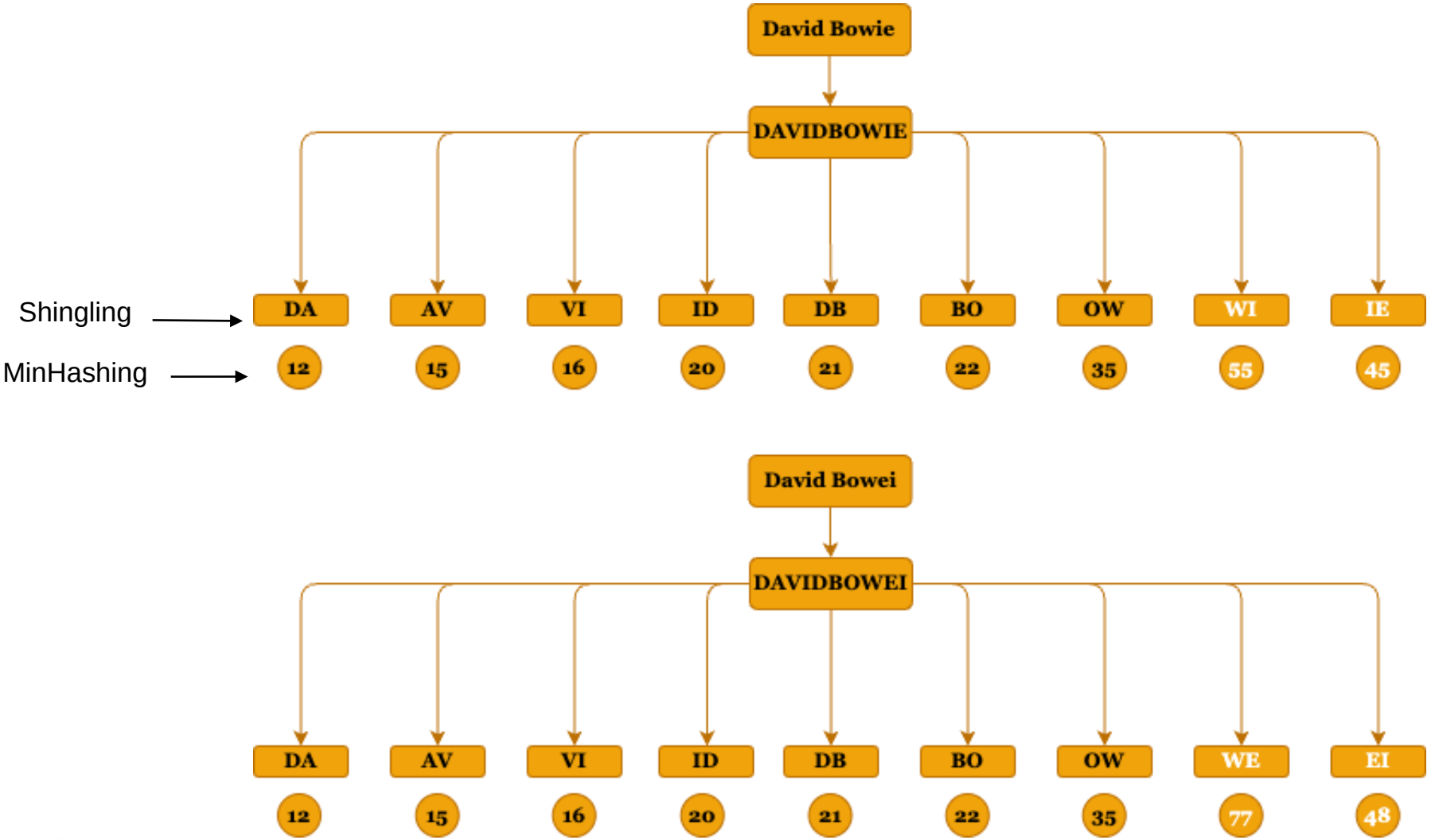
Adding “salt” increases safeguards

We introduce hidden/random values–similar to encryption–before hashing, making it even more difficult to reverse.



Handling misspellings and other data errors

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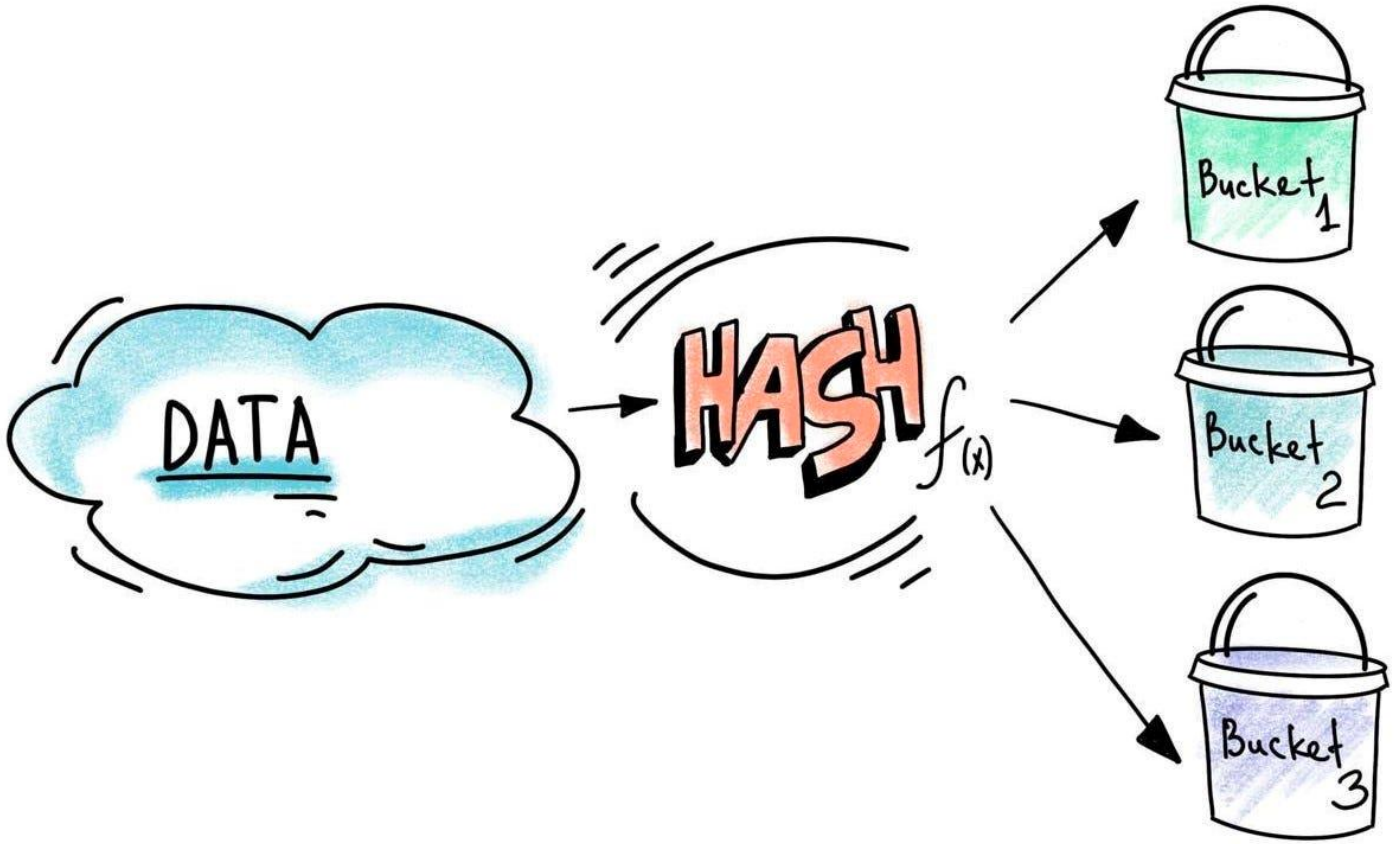
Locally Sensitive Hashing



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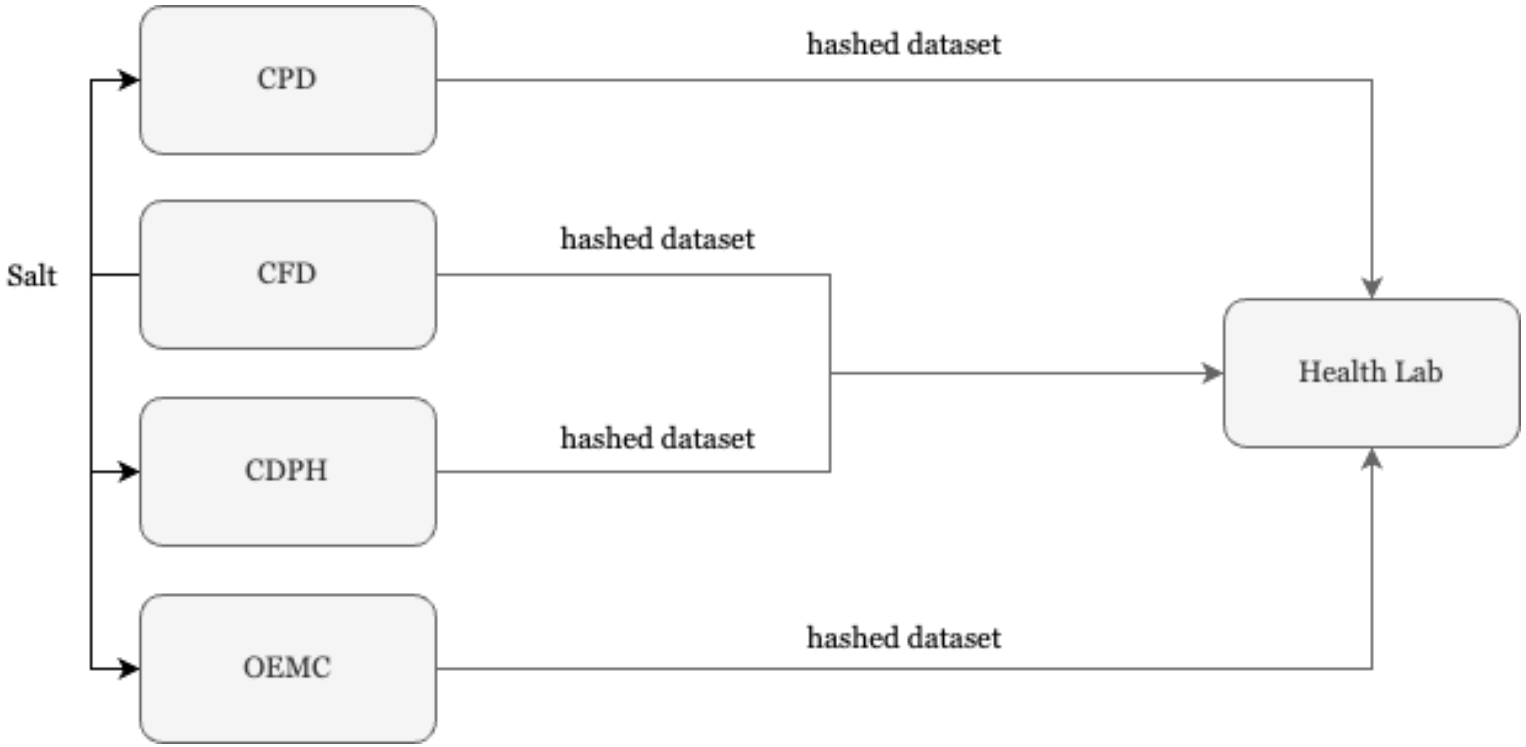
CARE Hashing Operations



HASH

Early Findings from CARE Hashing

- Preliminary evidence suggests that we are able to match 94-95% of available cross-agency data
- Unexpected benefit:
  - CFD software platform change in 2021, with no ability to link individuals pre- and post- using patient identifiers
  - Hashing allows us to reliably link these individuals

Key Takeaways

Key takeaways

- Cross-agency nature of CARE + IL state regulatory environment created numerous obstacles
- Pilot phase allowed partners capacity and time to:
  - Experiment with potential solutions
  - Build trust
- Implementation evaluation allows City of Chicago and others to learn from CARE pilot
- Data hashing may have broader public health benefits by offering an opportunity for agencies and evaluators to protect individual privacy while preserving ability to link across datasets

Questions?