

# Health Trends Across Communities: A Novel Health System-Public Health Data Partnership

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**MN EHR**  
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# Public Health Data Infrastructure in the US

POPULATION AND PUBLIC HEALTH

***Public Health Infrastructure Needs \$36.7 Billion Investment Over Next 10 Years, HIMSS Report Finds***

Published on May 3, 2022

**Viewpoint**

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Karen B. DeSalvo, MD, MPH, MSc; Kushal T. Kadakia, MSc; Dave A. Chokshi, MD, MSc

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Trends, Risks, and Recommendations, 2020**

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Bridging a Gap Between Public Health and Health Care**

Isaac Kohane, M.D., Ph.D., and Gilbert S. Omenn, M.D., Ph.D.



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# Criminal Legal and Housing Data

Invited Commentary | Public Health

## Challenges Encountered in the Public Health Data Collection of COVID-19 Cases Among People Experiencing Homelessness

Sarah Axelrath, MD

HEALTH AFFAIRS FOREFRONT

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## Incarceration Is A Health Threat. Why Isn't It Monitored Like One?

[Meghan Peterson](#), [Lauren Brinkley-Rubinstein](#)

OCTOBER 19, 2021

10.1377/forefront.20211014.242754

## Principles to Guide National Data Collection on the Health of Persons in the Criminal Justice System

Ingrid A. Binswanger, MD, MPH<sup>1,2,3</sup>; Laura M. Maruschak, MA<sup>4</sup>;  
Shane R. Mueller, MSW<sup>1</sup>; Marc F. Stern, MD, MPH<sup>5</sup>;  
and Stuart A. Kinner, PhD<sup>6,7,8,9,10</sup>



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# Healthcare and Public Health Siloes

## COLLABORATION BETWEEN HEALTH CARE and PUBLIC HEALTH

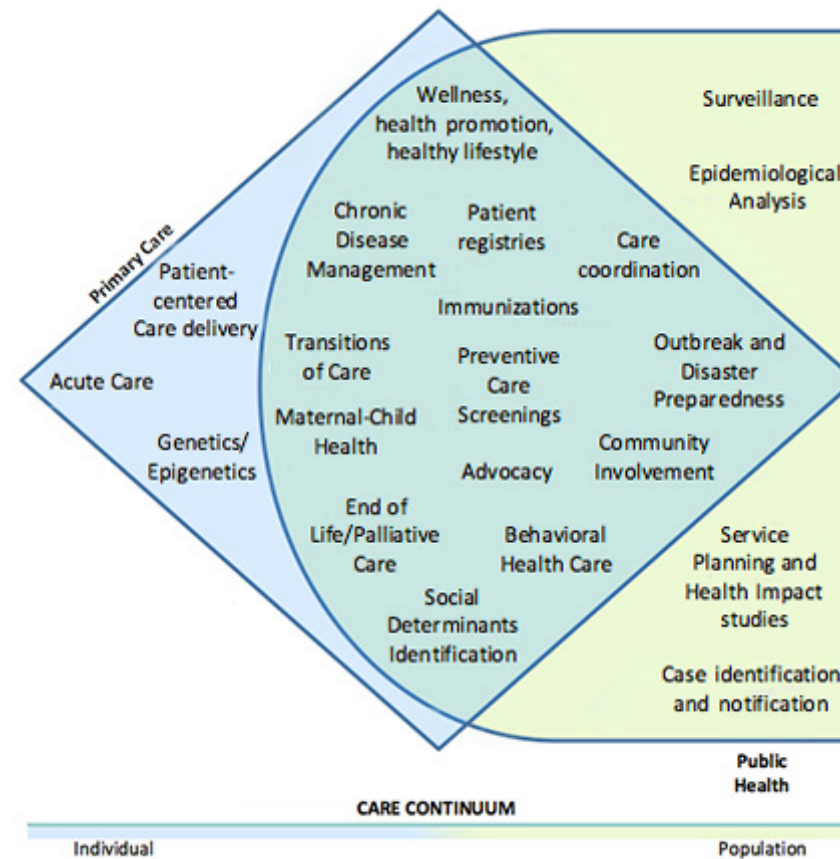
WORKSHOP SUMMARY

### PUBLIC HEALTH

By Margaret Bourdeaux, Annmarie Sasdi, Shefali Oza, and Vanessa B. Kerry

### OVERVIEW

## Integrating The US Public Health And Medical Care Systems To Improve Health Crisis Response



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# Using EHRs to Fill Gaps in Public Health Data and Foster Collaboration

- EHR Data offers several advantages:
  - Timely
  - Granular geographies and demographics
  - Established collection methods with opportunities for linkages
- Centralized approaches have often failed or been slow in the United States. EHR data can be aggregated without centralization.
- Potential for public health and health system collaboration to meet the data and analytic needs of multiple pressing crises



# Minnesota EHR Consortium



Our mission is to improve health by informing policy and practice through data-driven collaboration among members of Minnesota's health care community.



# Key Principles of the Consortium

- Prioritize privacy through a distributed data model
- Voluntary Collaboration
- Good governance through our Governance Board
- Adaptable and nimble
- Scientific Review Committee for proposal and manuscript submissions
- Master DUA across all participating sites (Second revision)

# Consortium Data Sources

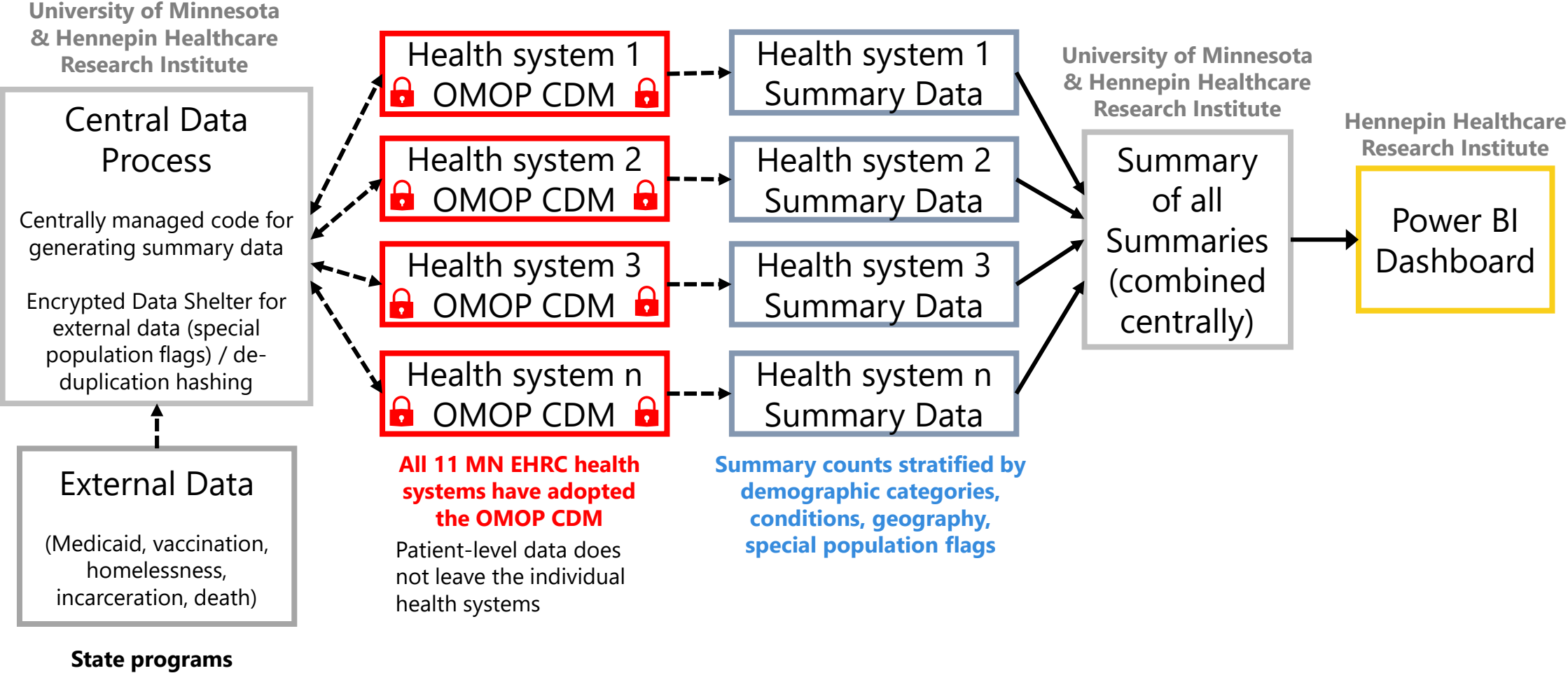


- Primarily relies on EHR data
- Census data
  - Area-level income, rurality
- Minnesota Immunization Information Connection (MIIC)
  - Statewide vaccine data
- Population data
  - Social vulnerability index (SVI)
  - State homeless shelter, incarceration data (prison and jail)
  - State mortality data
  - Medicaid enrollment data
- Climate data

# Data Aggregation Process



# MNEHRC Data Infrastructure



## Department of Corrections

f_name	l_name	dob	sex	race	phone
Bill	Clinton	8/19/1946	M	White	501-683-5228
Good	Match	5/21/1975	M	Black	612-624-5555
Joan	Smith	8/20/1965			612 781-5544

f_l_dob_sex	f_l_dob_race	f_l_dob	f_phone
billclinton08191946m	billclinton08191946w	billclinton08191946	bill5016835228
goodmatch05211975m	goodmatch05211975b	goodmatch05211975	good5126245555
joansmith08201965	joansmith08201965	Joansmith08201965	joan6127815544

hash function

Hashes simplified for display purposes

hash1	hash2	hash3	hash4
a8d9	a9f9	a0n7	a4z5
<b>g3k8</b>	<b>g9u4</b>	<b>g1x8</b>	<b>b3e9</b>
j3r8	j2w4	j9s3	<b>j4x8</b>

## Health System

mrn	f_name	l_name	dob	sex	race	phone
00042	William	Clinton	8/19/1946	M	White	501-683-5228
00345	Good	Match	5/21/1975	M	Black	612-624-5555
00256	Joan	Smit	8/20/1956			612 781-5544
01454	Anti	Vac	12/1/1985	M	White	651-766-9876

mrn	f_l_dob_sex	f_l_dob_race	f_l_dob	f_phone
00042	williamclinton08191946m	williamclinton08191946w	williamclinton08191946	william5016835228
00345	goodmatch05211975m	goodmatch05211975b	goodmatch05211975	good5126245555
00256	joansmit08201965	joansmit08201965	joansmit08201965	joan6127815544
01454	antivac12011985m	antivac12011985w	antivac12011985	anti6517669876

hash function

mrn	hash1	hash2	hash3	hash4
00042	x9b6	x6q3	x6i3	x2r5
<b>00345</b>	<b>g3k8</b>	<b>g9u4</b>	<b>g1x8</b>	<b>b3e9</b>
<b>00256</b>	x5f4	x9g2	x2k4	<b>j4x8</b>
01454	v8c3	v3g5	v2p9	v4n5

**00345** – Consortium includes Mr. Match in summary reports as having been recently incarcerated

# MN population size

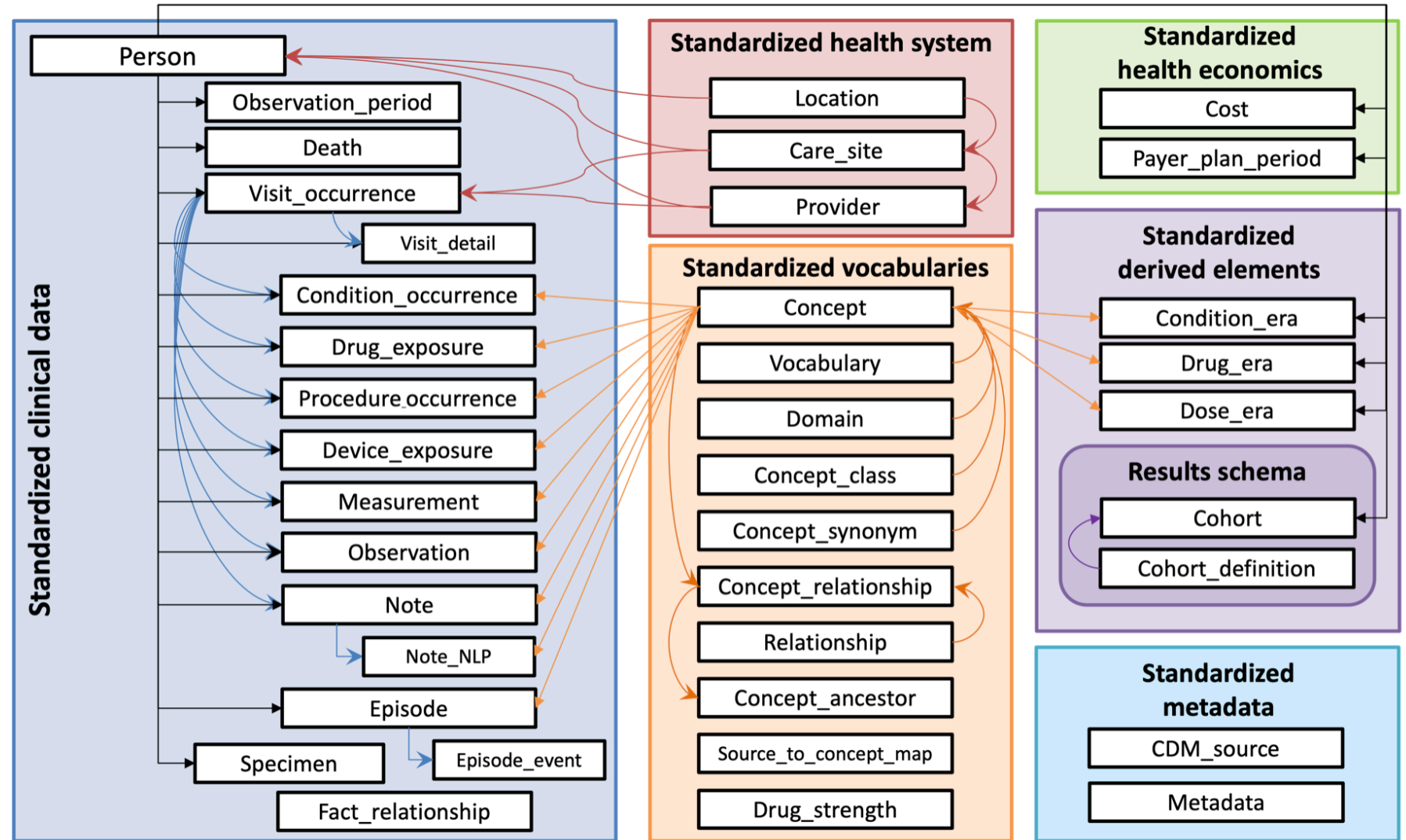
Years of encounters	HTAC, 2023	Census, 2023
3 year	5,627,400	5,737,915



# Observational Medical Outcomes Partnership (OMOP) Common Data Model



# OMOP



# OMOP



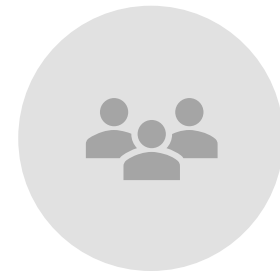
OPEN SOURCE



INTERNATIONAL



EXPERIENCE



CAPACITY  
BUILDING



# Converting Minnesota Administrative Data to OMOP



# Minnesota Administrative Data

- Minnesota Department of Corrections
  - County jail and state prison records
  - Encounter level file with limited demographic information, admission dates, discharge dates
  - Jail and prison data must be combined to create episodes
- Homelessness Management Information System (HMIS)
  - Homelessness service use – encounter level file
  - Individual encounters must be combined to create episodes



# Admin Data to OMOP

- Created a copy of the OMOP Observation table (“observation2”)
- OMOP not well setup to handle external SDOH data
- Match rate is ~75%
- HHRI is content/data expert
- UMN serves as the clearinghouse



## 1. Incarceration

Example observation2 table

<u>person_id</u>	<u>episode_id</u>	<u>observation_date</u>	<u>observation_end_date</u>	<u>observation_concept_id</u>	<u>qualifier_concept_id</u>	<u>observation_source_value</u>
12345	7856	1/22/23	1/23/23	4238923	4223683	Hennepin County ADC
12345	3764	2/01/23		4238923	4223683	Ramsey County ACF
45678	9425	8/01/2021	10/31/2022	4238923	4022670	MCF St. Cloud

## 2. Homelessness

Example observation2 table

<u>person_id</u>	<u>observation_date</u>	<u>observation_end_date</u>	<u>observation_concept_id</u>	<u>qualifier_concept_id</u>	<u>observation_source_value</u>
12345	1/22/23	1/23/23	4139934	3656375	MN-500
12345	2/01/23		4139934	3656379	MN-503
45678	8/01/2022	10/31/2022	4139934	3656380	MN-501

# Health Trends Across Communities



# Project background

Health Trends Across Communities in Minnesota (HTAC-MN) is a unique data collaboration of health systems and public health agencies

Led in partnership by MNEHRC, Local Public Health, MDH, and Hennepin County

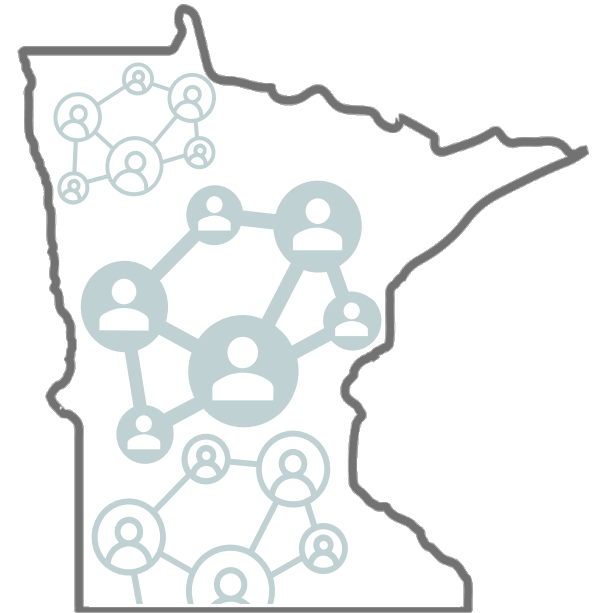
**Together, we build a community** of practitioners interested in reducing siloes and improving health and provide a dashboard of accessible, timely, and detailed community health info



# Project opportunities and goals

## Develop comprehensive community health data infrastructure in MN using EHR data

- Create impactful community health needs assessments (CH(N)As), monitor trends, inform policy, evaluate interventions, and more
- Strengthen community capacity to build healthy communities with actionable, disaggregated, open-access data
- Promote health equity and improve the health of communities across Minnesota



# Community health indicators

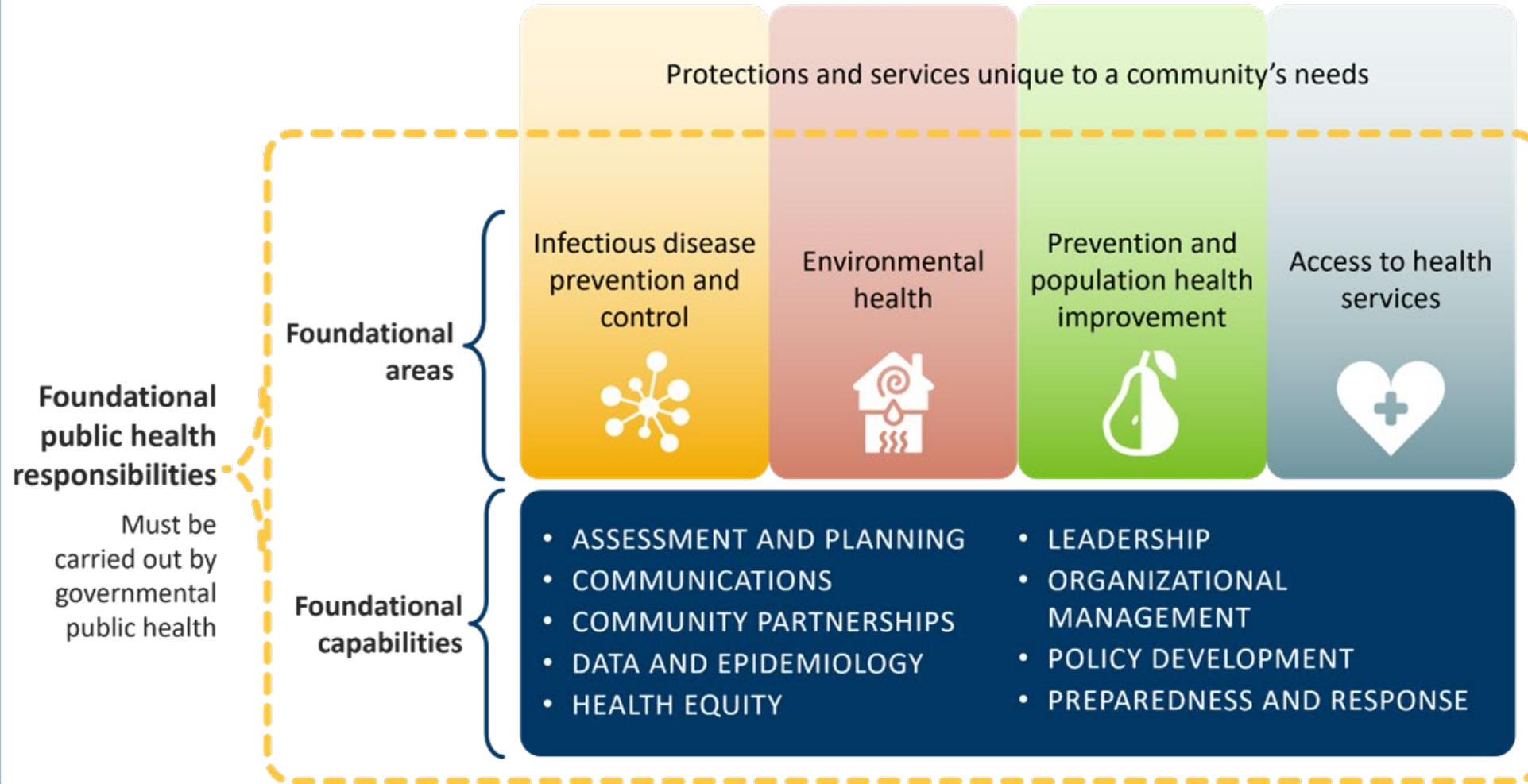
Substance Use	Mental Health	Chronic Conditions	Maternal & Child Health	Other
Opioid use Alcohol use Methamphetamine use Cocaine use THC use Other substance use	Depression Anxiety PTSD Bipolar disorder Psychotic disorders Suicide	Hypertension Hyperlipidemia Diabetes CAD / IHD Heart failure Chronic kidney disease Asthma COPD	Maternal morbidity Maternal opioid use	Gun violence Climate change



# Hennepin County

- Largest county in MN
- 45 cities, including Minneapolis
- 1.28 million residents
- Part of the 7-county metro area
- HCPH: 400+ employees

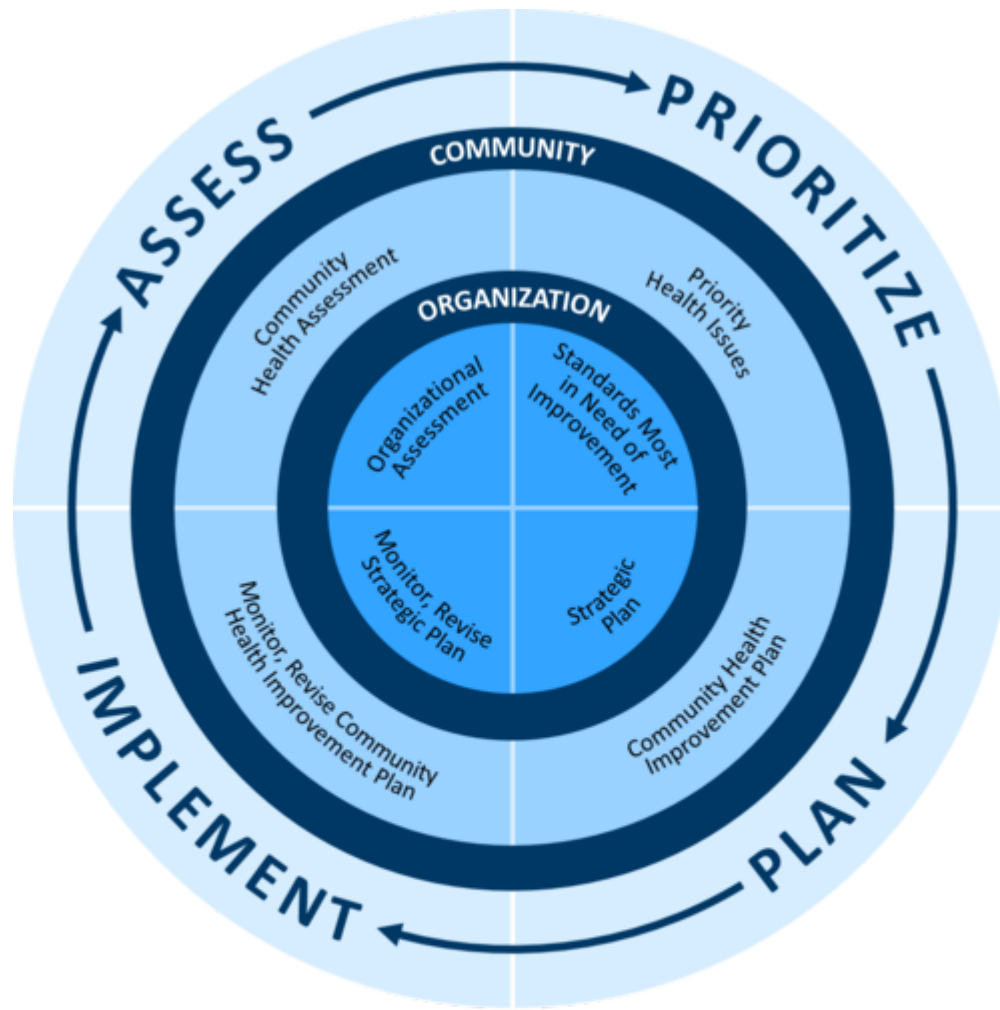
# A framework for governmental public health in Minnesota: Creating healthy communities



# Statewide public health cost and capacity assessment

- Statewide assessment performed by state health department and University of Minnesota
- Specific gaps identified in the capabilities of data and epidemiology, policy development, and health equity
- Smaller departments had less capacity to carry out responsibilities





Local Public Health  
Assessment and Planning Cycle



# Center for Community Health



- **Collaborative** between public health agencies, health plans and hospital/health systems in Twin Cities metro
- **Mission:** share data and processes to identify health needs and implement innovative approaches to advance community health, well-being, and equity
- **Assessment Alignment Committee** connects & coordinates on alignment for Community Health (Needs) Assessments



# How we got here

2015

**Private/Public Health Informatics Collaborative** (PPHIC) project: Partnership among local public health and health systems in Hennepin County that explored use of EHR data for population health using indicators from CCH

2020

**MNEHRC**: Formed in March 2020, led rapid collaboration of health systems to address gaps in COVID-19 data sharing and communication. Developed model for aggregating EHR data for real-time public health needs

2022

**MDH Infrastructure Fund** proposal for novel partnership between MNEHRC and CCH



# How could you use HTAC?

- Community health (needs) assessments & community health improvement plans
- Grant applications
- Program evaluation
- Strategic planning
- Demonstrate health disparities
- Get buy-in from decision makers
- Deep dives into priority health issues
- Disease-specific program development
- Collective project design
- Understanding substance use for coalition work
- Guide local prevention and response work
- Share with community partners

I see this helping us reshape our CHA process. Instead of 30 questions asking, “Have you been diagnosed with XYZ”, we can focus on asking questions aligned with SDOH.

There has not been timely reliable data for many of these indicators. It will be very helpful to understand the health of our communities on more of a real time basis.

We can share the data with community partners for implementation of projects or better direction for grant opportunities.

This data will be a hugely valuable source for use in CHAs and CHNAs! It is really a game-changer. The process will become more ongoing and kinetic rather than every 3-5 years.

Comments from CCH AAC members and MDH Regional Data Practice Group members

# Utilization of HTAC Dashboard

To pull demographics of children with depression, anxiety, and/or suicidal ideation/attempt by select counties for a pediatric mental health training grant

As an additional source of identifying substance use in Hennepin County. Along with the Hennepin SUD hospital use report and opioid death report to develop talking points to be used with internal and external stakeholders.

Looking for rates of asthma, COPD, and cancer around the Northern Iron Foundry that has been found to have elevated levels of lead and particulate matter.

As a resource for an RFP focused on residents of the Rondo and Capital Heights neighborhoods, designed to increase community-clinical linkages in support of improved heart health and hypertension outcomes by addressing social needs.

Shorten CHA/CHIP and ask more questions about poverty, ACE's, belonging etc

Using information in the dashboard to shorten CHA/CHIP survey

Asthma prevalence

Benchmarking and Population Health

Community Health Board Input



# Next steps in developing partnerships

- **Expand collaborative partnerships to broaden input statewide, with a focus on local public health professionals. Strategies include:**
  - HTAC Advisory Committee: Invited 2-3 local public health departments in greater Minnesota to join the current group of clinical research leads and data analysts to discuss data priorities, data specifications, and analyses.
  - Local Public Health Council:
    - Establish a group of local public health professionals from across the state to continue collaboration on a variety of HTAC activities over time.
    - Prioritization of new health data, evaluation of HTAC use and value, upgrades and new technical assistance tools, and communications are a few examples of topics this group can address.



# HTAC Next Steps

- **Develop and implement process to identify and prioritize new conditions**
  - Solidify initial list of health conditions and other data (e.g., ethnicity, language) of interest to add to HTAC
  - Administer survey of healthcare systems, local public health, community organizations, researchers, and others to identify priorities  
Status: survey completed (n = 159)
  - Discussions with MNEHRC members, HTAC Advisory Committee, and local public health in fall 2024 to finalize list of priorities and discuss timeline and order, challenges, and additional information needed to address each



# HTAC Next Steps

- **Evaluate HTAC:**
  - Use: Who is using HTAC? How are they using it?
  - Impact: How is HTAC impacting users' work? What is the unique contribution of EHR data on larger public health surveillance data landscape?
- **Develop plan for long-term sustainability**



# Key takeaways

- Collaboration across public health and healthcare has been essential to developing actionable data for both sectors
- MNEHRC is building of the most robust, real-time, cross-sector data sources in the United States
- Dashboards are publicly available at [www.mnehrconsortium.org](http://www.mnehrconsortium.org)
- MNEHRC wants to partner with you to advance projects that can improve community health in Minnesota



# Contact Information

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<https://mnehrconsortium.org>



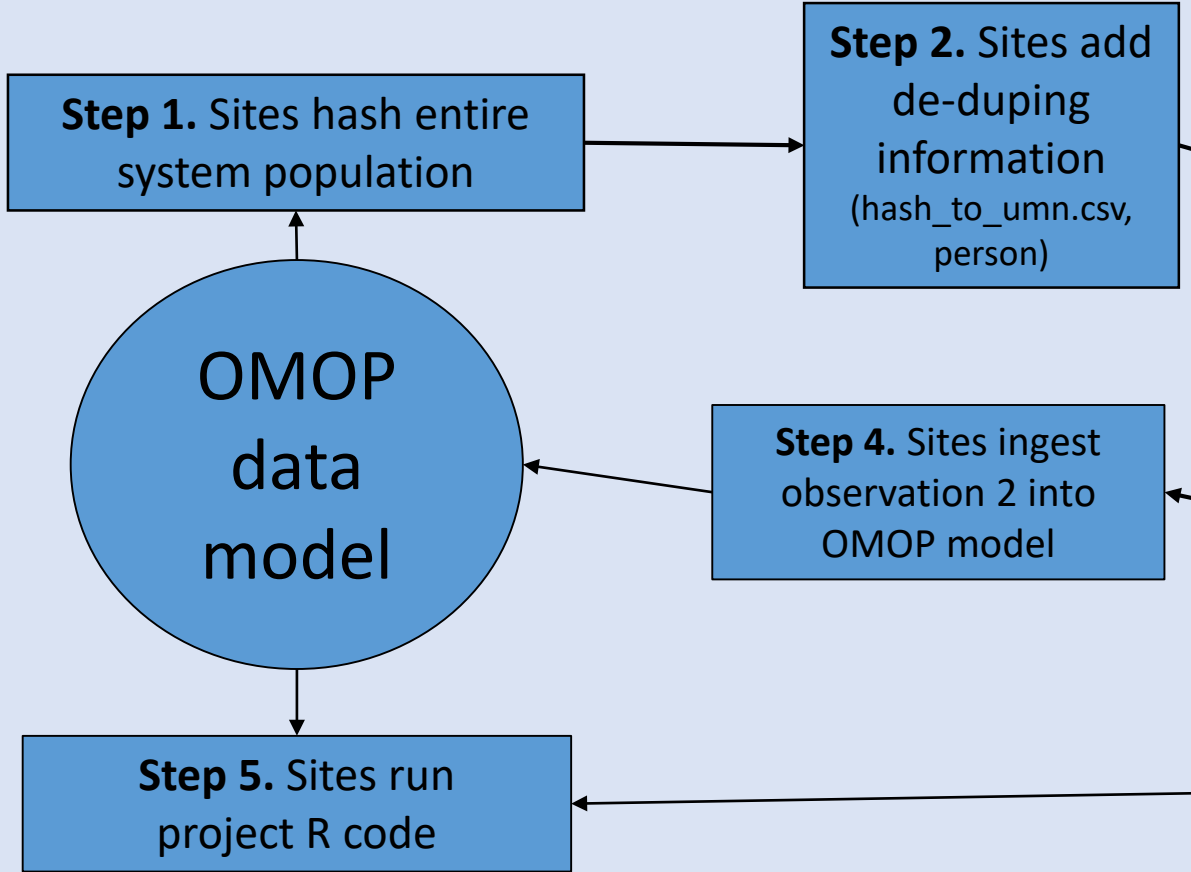
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# HTAC Dashboard

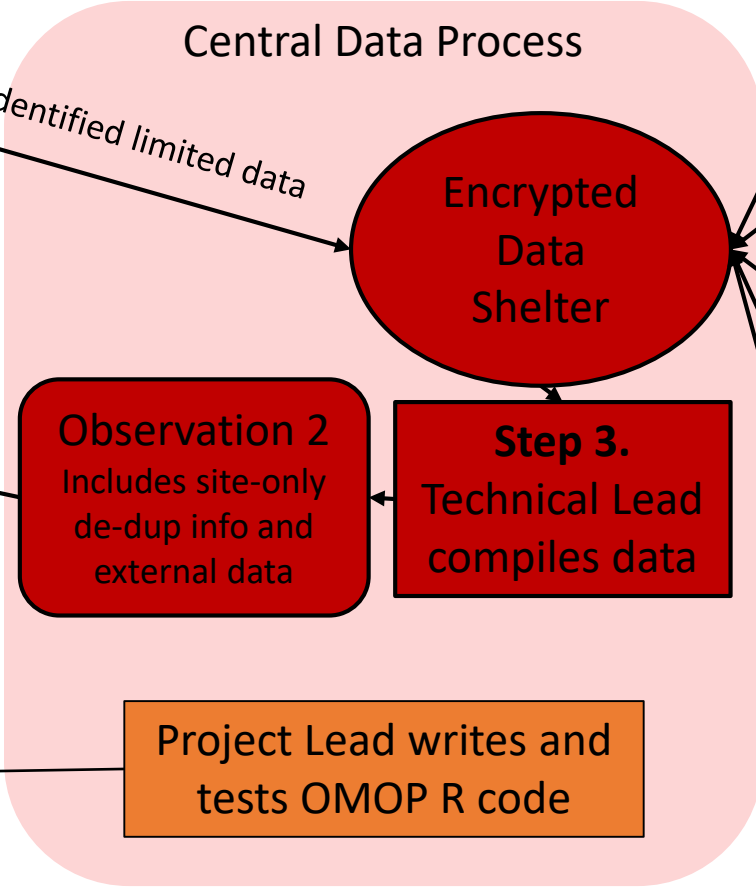


# MN EHR Consortium Data Integration Process

## Health System Process



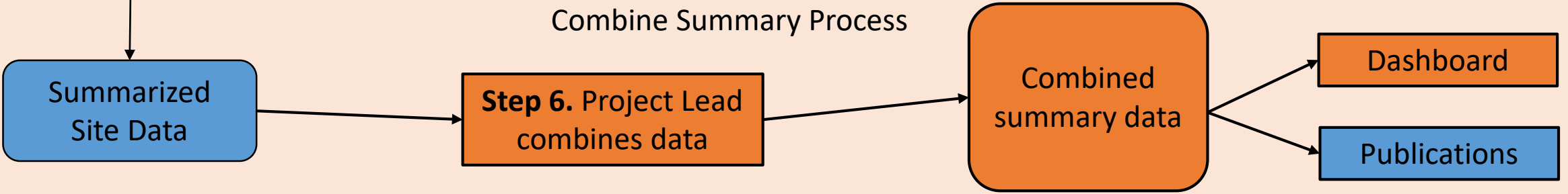
## Central Data Process



## External data

- Death
- Homelessness
- Medicaid
- Incarceration
- Vaccination

## Combine Summary Process



SEARCH BY KEYWORD

jail ×

**DOWNLOAD RESULTS**

Show by  items Total 8,072 items

**1** 2 3 4 5 ... 539 >

	ID	CODE	NAME	CLASS	CONCEPT	VALIDITY	DOMAIN	VOCAB
<b>DOMAIN</b> ▼	4223683	8434001	Jail	Physical Object	Standard	Valid	Device	SNOMED
<b>CONCEPT</b> ▼	45884861	LA18693-4	Police/jail	Answer	Standard	Valid	Meas Value	LOINC
<b>CLASS</b> ▼	3468687	8434001	Jail, device	Physical Object	Non-standard	Valid	Device	Nebraska Lexicon
<b>VOCAB</b> ▼	4315097	216426001	Place of occurrence of accident or poisoning, jail	Location	Non-standard	Invalid	Observation	SNOMED
<b>VALIDITY</b> ▼	40770308	67697-3	One of the parents went to jail [PhenX]	Clinical Observation	Standard	Valid	Observation	LOINC
	32601	103	Discharged to Court / Law Enforcement / Jail	UB04 Pt dis status	Non-standard	Valid	Visit	UB04 Pt dis status
	1009382	LP133638-9	One of the parents went to jail	LOINC Component	Non-standard	Valid	Observation	LOINC
	45467767	T773.00	Place of occurrence of accident or poisoning, jail	Read	Non-standard	Valid	Observation	Read

