

# Improving Population Health Outcomes Through Information Exchange

**Phillip D. Levy, MD, MPH, FACEP, FAHA, FACC**

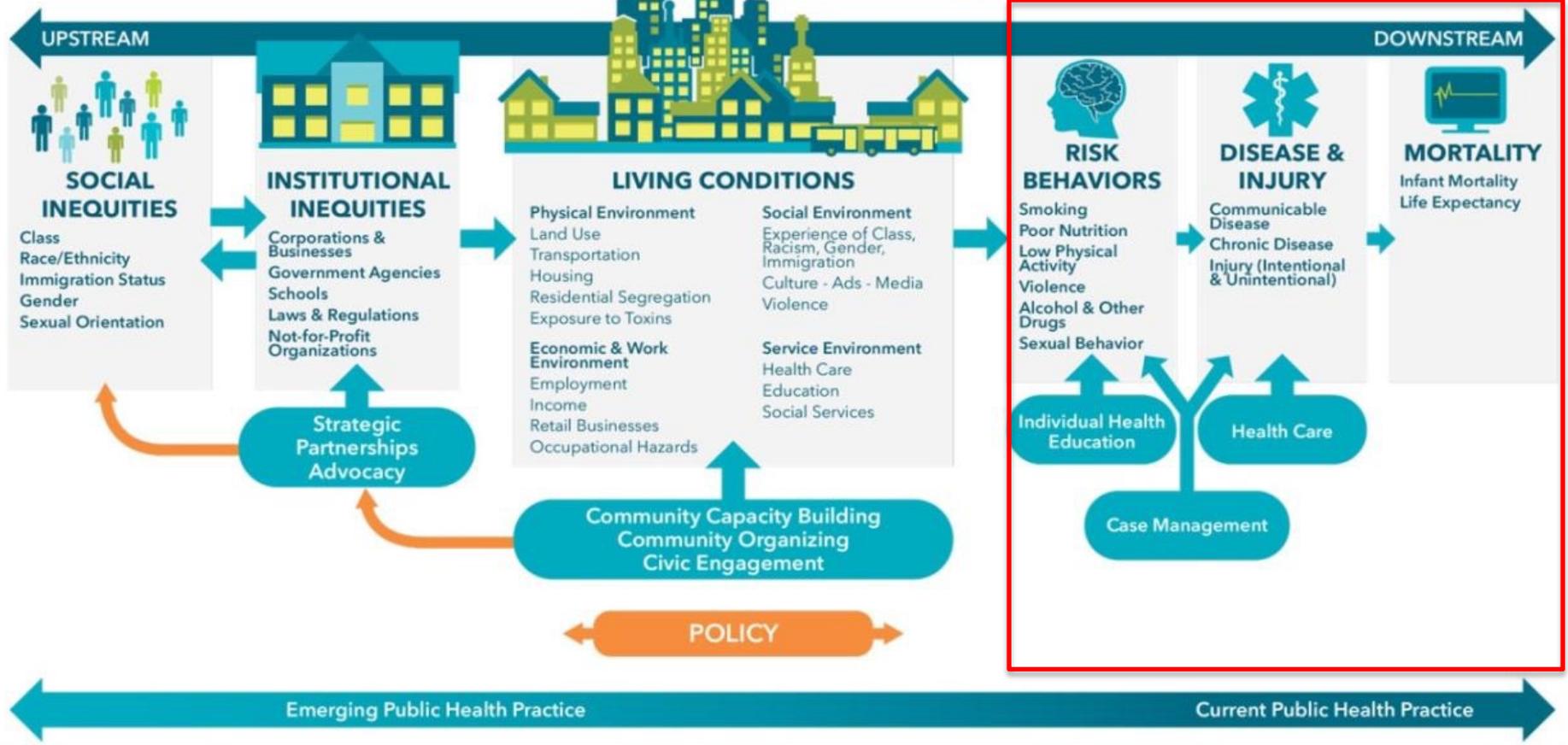
**Professor and Associate Chair for Research**

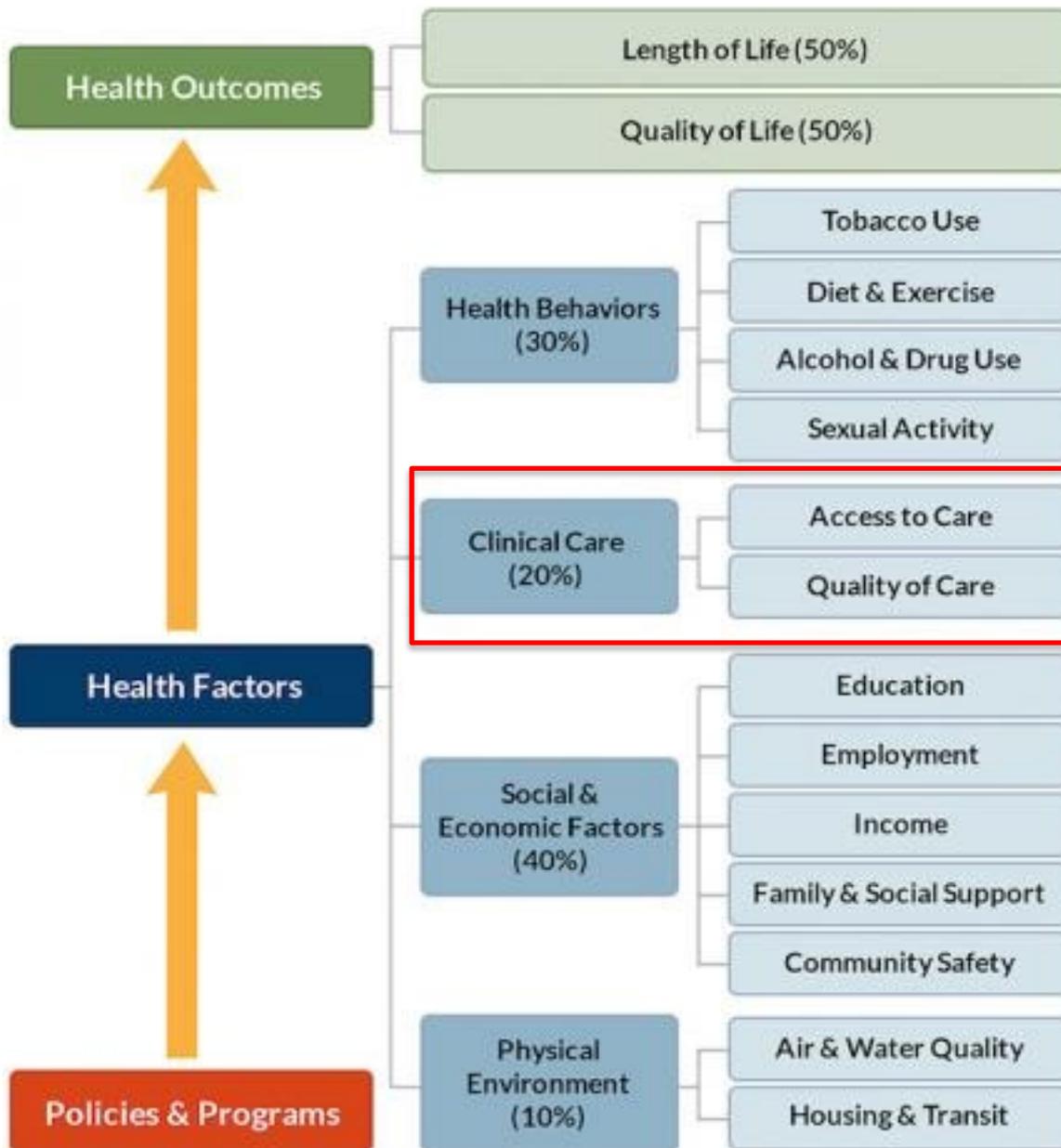
**Department of Emergency Medicine**

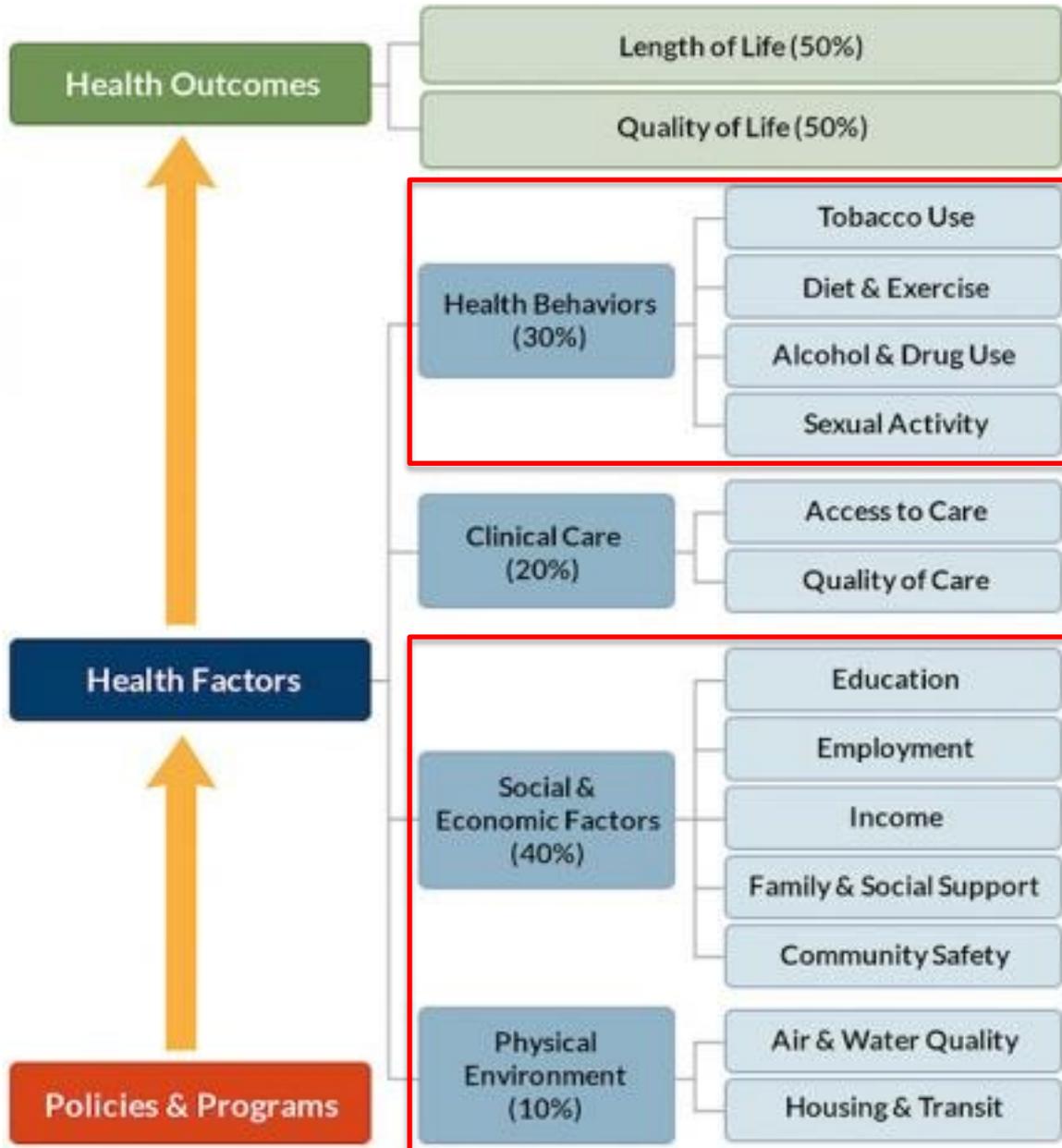
**Assistant Vice President for Translational Science and Clinical Research Innovation**

**Wayne State University**

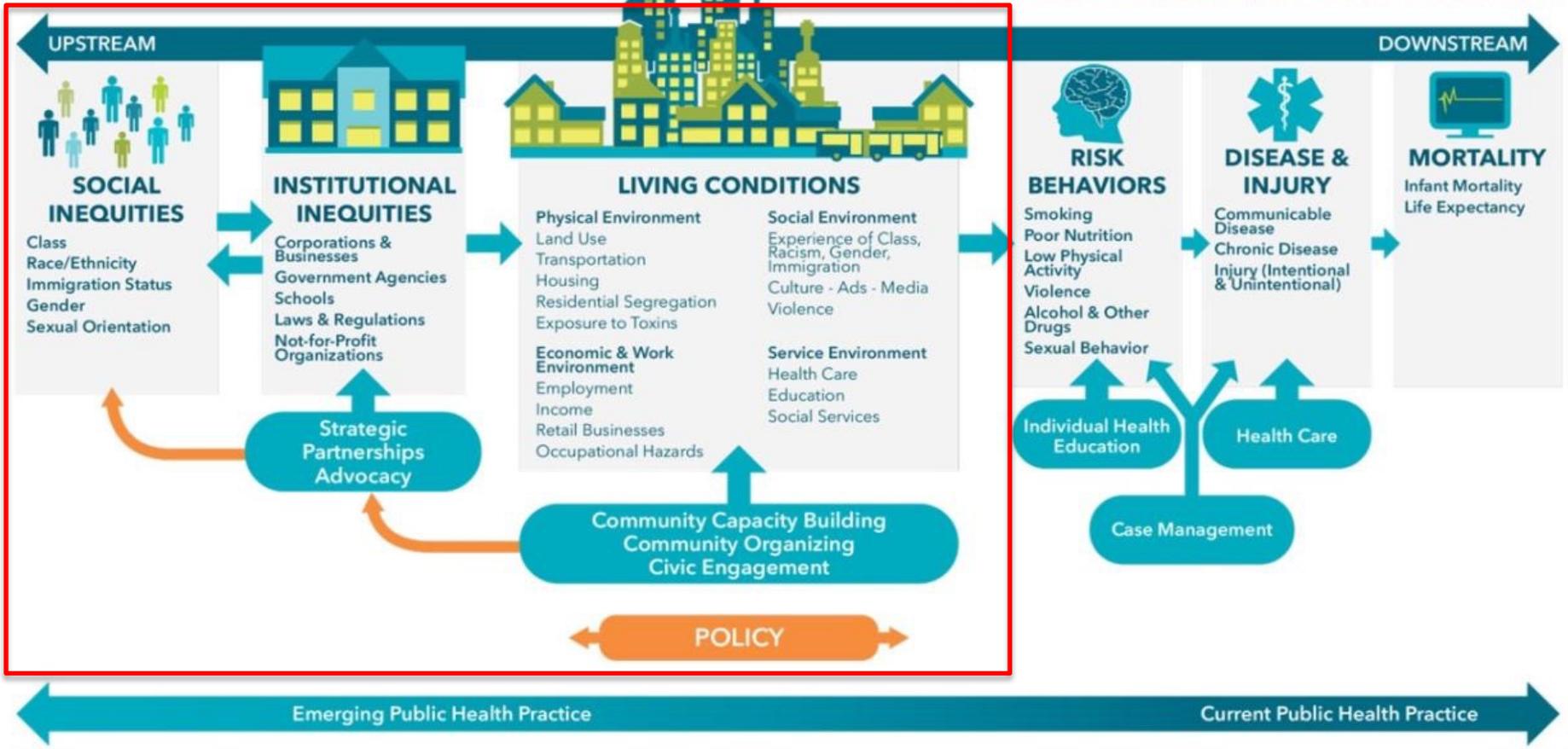
**A PUBLIC HEALTH FRAMEWORK FOR REDUCING HEALTH INEQUITIES**  
**BAY AREA REGIONAL HEALTH INEQUITIES INITIATIVE**







**A PUBLIC HEALTH FRAMEWORK FOR REDUCING HEALTH INEQUITIES**  
**BAY AREA REGIONAL HEALTH INEQUITIES INITIATIVE**



**Bottom Line**  
**Records**

**PHOENIX**

Suslik Publishing BMI /  
Nancy Goltsman ASCAP

**BLR-9052**  
**SIDE A**  
**STEREO**  
**33 1/3 RPM**

**"THE ANSWER"**

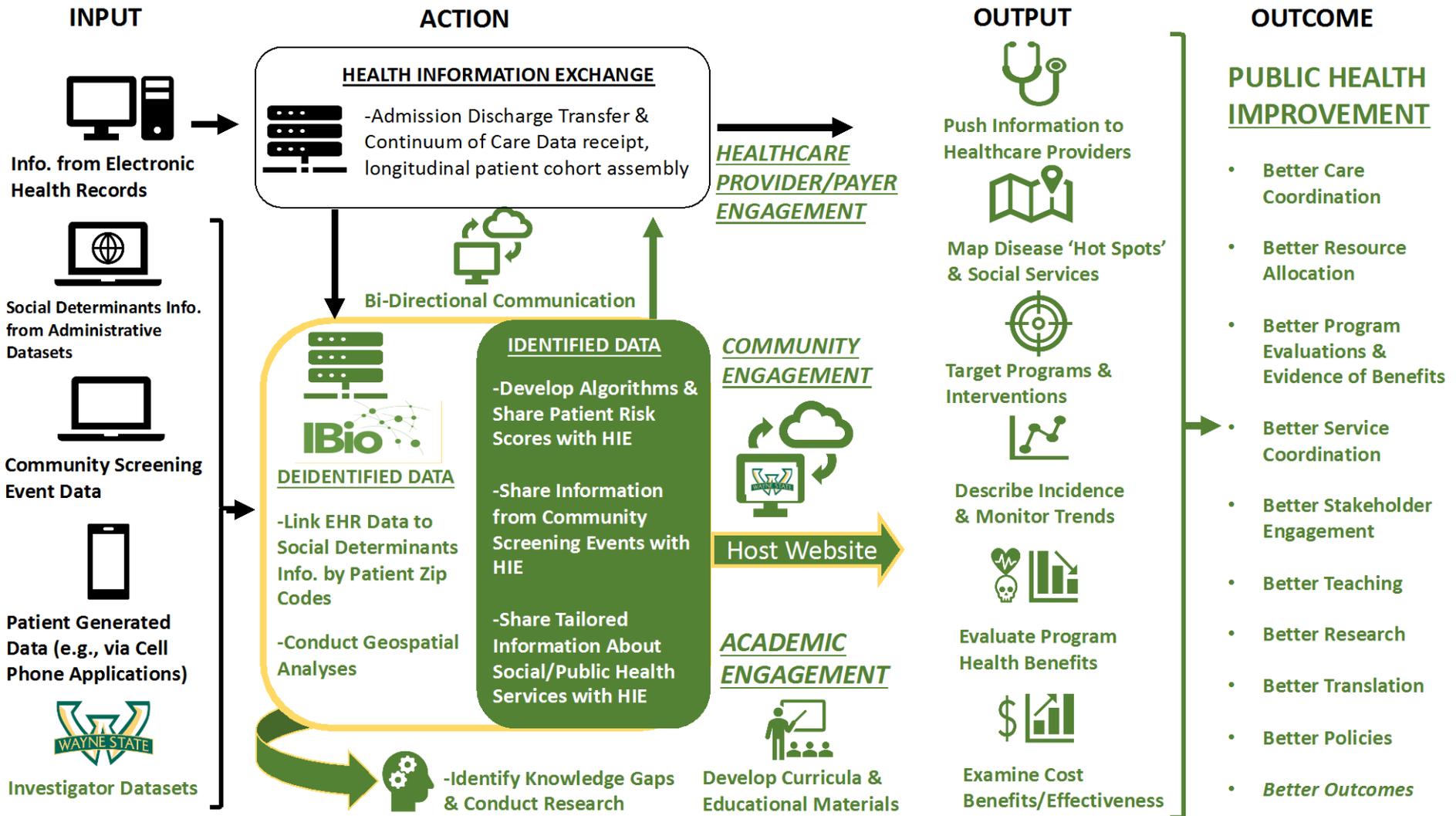
(DAVID A. TOBIN, EDWARD GOLTSMAN)

**1. MESSAGE MIX**

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"ED THE RED" GOLTSMAN & NELSON "PARADISE" ROMAN.  
Engineered by "NANCY KAY" GOLTSMAN & ED THE RED.  
Keyboards by ED THE RED.  
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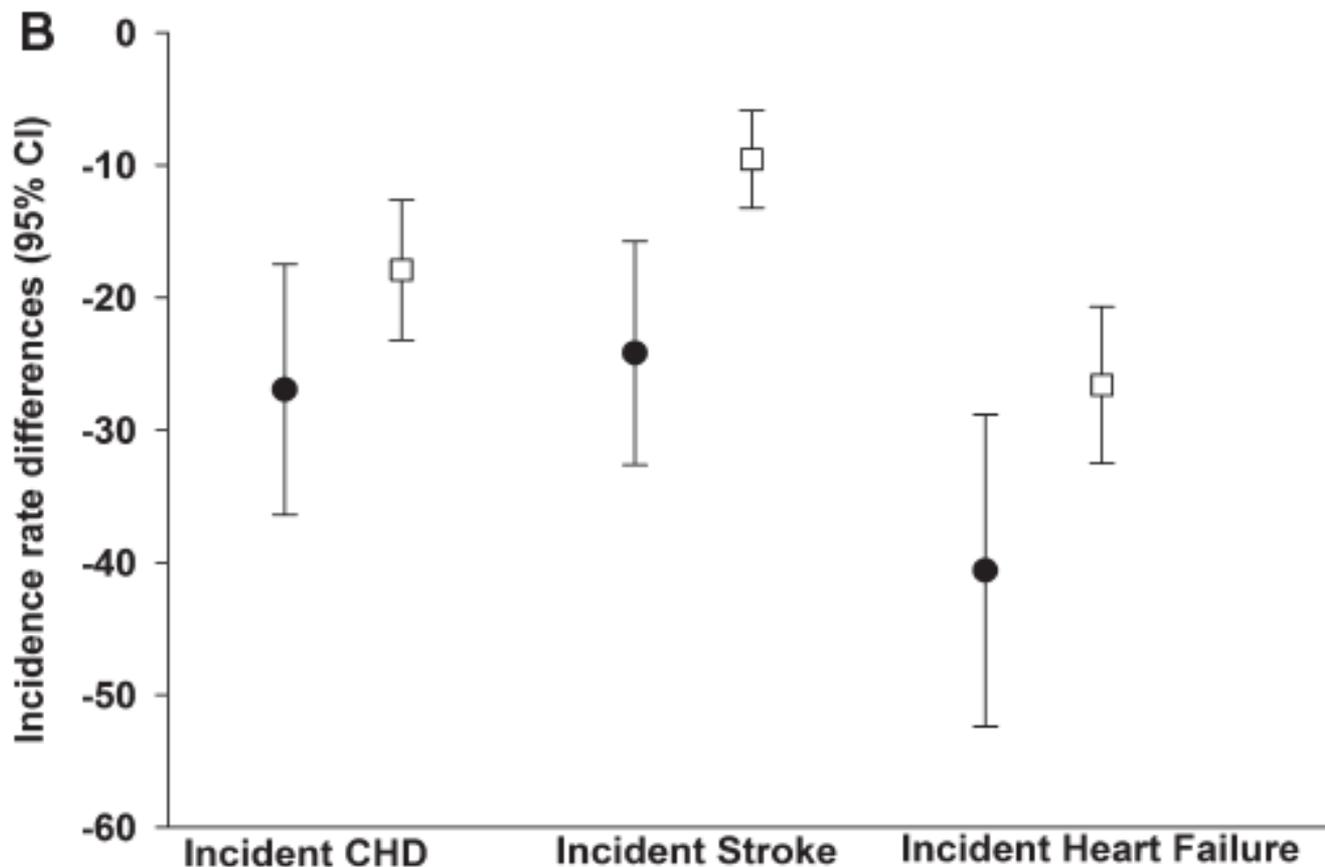
**Population Health Outcomes  
aNd  
Information EXchange**



# Reducing the Blood Pressure–Related Burden of Cardiovascular Disease: Impact of Achievable Improvements in Blood Pressure Prevention and Control

Shakia T. Hardy, MPH; Laura R. Loehr, MD, PhD; Kenneth R. Butler, PhD; Sujatro Chakladar, MS; Patricia P. Chang, MD, MHS; Aaron R. Folsom, MD, MPH; Gerardo Heiss, MD, PhD; Richard F. MacLehose, PhD; Kunihiro Matsushita, MD, PhD; Christy L. Avery, PhD

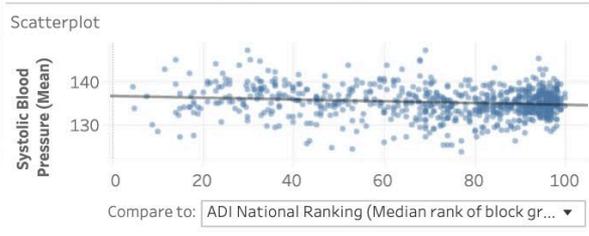
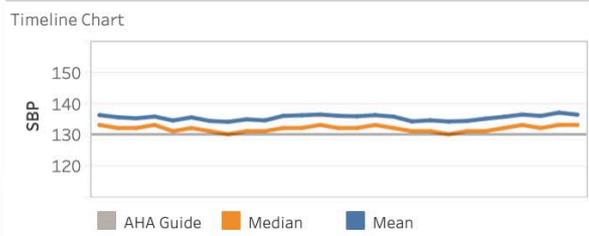
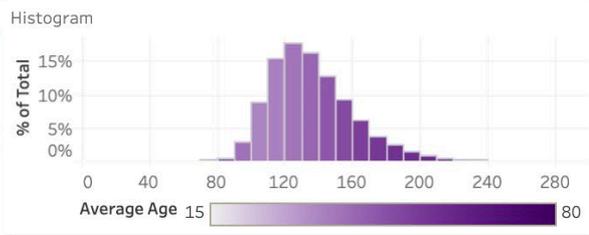
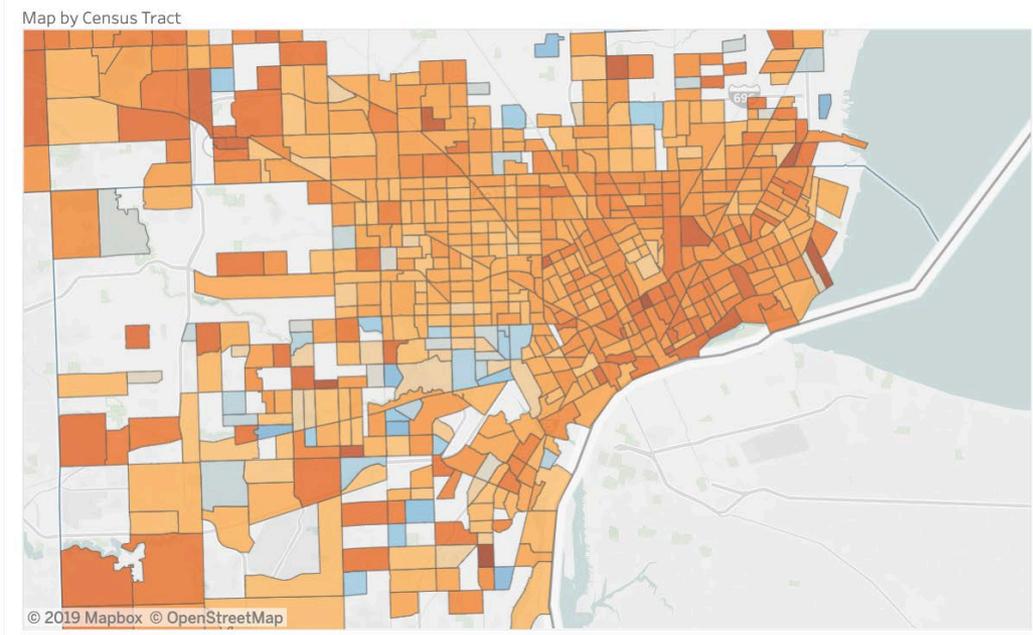
## Population Level BP Reduction of 2 mm Hg





# Hypertension Dashboard Metro-Detroit (Wayne, Oakland, Macomb, and Livingston Counties)

Select a Vital Category to Explore: Systolic Blood Pressure (Mean)



**Filter Data:**

Select County: ALL COUNTIES

Select City: ALL CITIES

Date of Arrival: Dec 2016-Feb 2019  
(All)

Gender: (All)

Age at Time of Visit: 0 118

Race/Ethnicity

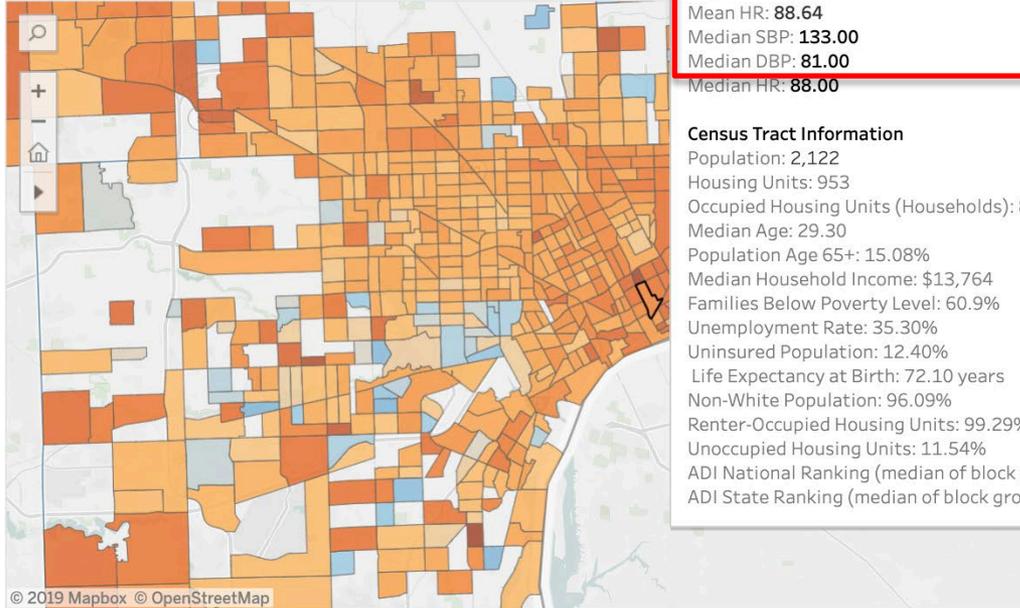
- (All)
- Black/African American
- Other Race or More tha...
- Spanish/Hispanic
- Unknown
- White

Race/Ethnicity	Number of Records	Mean SBP	Mean DBP	Mean HR	Mean Age	Mean Temp	% of Total
Black/African American	422,654	135.20	81.98	89.00	42	36.76	76.61%
White	82,775	135.72	80.33	90.02	46	36.72	15.00%
Other Race or More than On..	31,395	136.51	81.22	87.79	48	36.73	5.69%
Unknown	8,950	134.57	80.85	90.05	42	36.77	1.62%
Spanish/Hispanic	5,916	134.17	81.47	89.49	42	36.72	1.07%
<b>Grand Total</b>	<b>551,690</b>	<b>135.33</b>	<b>81.67</b>	<b>89.11</b>	<b>43</b>	<b>36.75</b>	<b>100.00%</b>

# Hypertension Dashboard Metro-Detroit (Way

Select a Vital Category to Explore: Systolic Blood Pressure (Mean)

Map by Census Tract



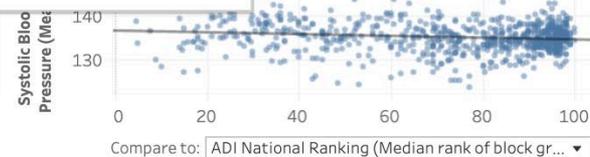
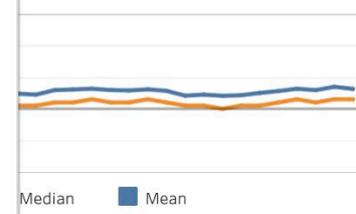
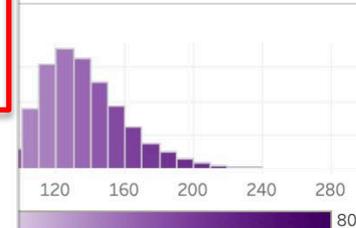
Tract ID: 26163518900

Number of Patient Records: 4,493

Mean SBP: **137.22**  
 Mean DBP: **83.01**  
 Mean HR: **88.64**  
 Median SBP: **133.00**  
 Median DBP: **81.00**  
 Median HR: **88.00**

**Census Tract Information**

Population: 2,122  
 Housing Units: 953  
 Occupied Housing Units (Households): 843  
 Median Age: 29.30  
 Population Age 65+: 15.08%  
 Median Household Income: \$13,764  
 Families Below Poverty Level: 60.9%  
 Unemployment Rate: 35.30%  
 Uninsured Population: 12.40%  
 Life Expectancy at Birth: 72.10 years  
 Non-White Population: 96.09%  
 Renter-Occupied Housing Units: 99.29%  
 Unoccupied Housing Units: 11.54%  
 ADI National Ranking (median of block groups within tract): 100.00  
 ADI State Ranking (median of block groups within tract): 10.000



Set map legend midpoint as: AHA Guideline (Midpoint: 130)



Race/Ethnicity	Number of Records	Mean SBP	Mean DBP	Mean HR	Mean Age	Mean Temp	% of Total
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Select City  
 ALL CITIES

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 Dec 2016-Feb 2019  
 (All)

Gender  
 (All)

Age at Time of Visit  
 0 118

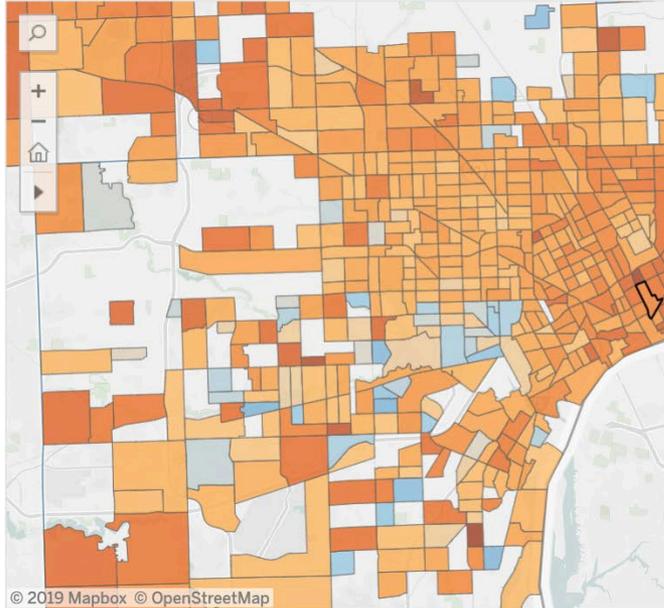
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# Hypertension Dashboard Metro-Detroit (Way

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© 2019 Mapbox © OpenStreetMap

Set map legend midpoint as: AHA Guideline (Midpoint: 130)



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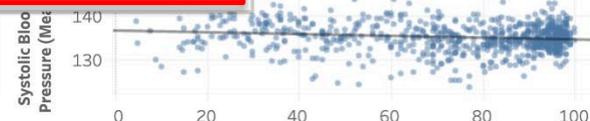
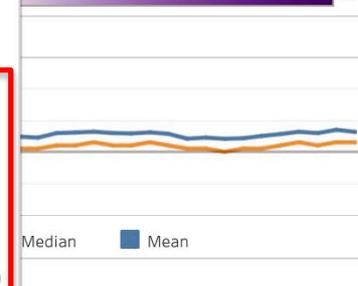
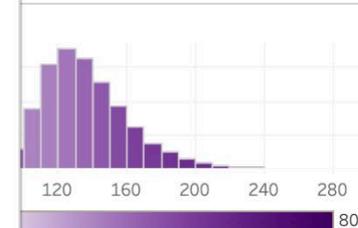
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Compare to: ADI National Ranking (Median rank of block gr...

### Filter Data:

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Select City

ALL CITIES

Date of Arrival

*Dec 2016-Feb 2019*

(All)

Gender

(All)

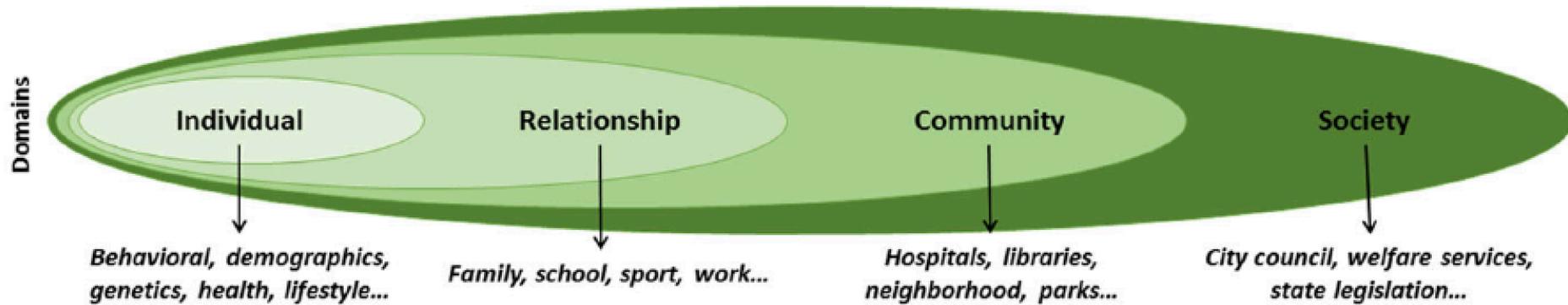
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<b>Data Types</b>	Electronic health records Mobile apps Shopping receipts Social media posts Questionnaires Wearable techs	School records Social media networks Employment records	Area deprivation index, Crime rates, Food deserts, Green areas, Income, Pollution levels, Walkability	Gun control, Social security, Unemployment wage, Universal healthcare
<b>Example Sources</b>	Agency for Healthcare Research and Quality, National Health and Nutrition Examination Survey	Facebook, Instagram, National Center for Education Statistics, Twitter	American Community Survey, Department of Housing and Urban Development, Esri Demographics, Food Access Atlas, National Center for Environmental Protection, Terra Modis	CDC, CNN, FOX, White House

Welcome to



Scroll Down To Learn More About MiHIN



1. Collect

2. Ingest

# Big Data Software



3. Blend



4. Transform

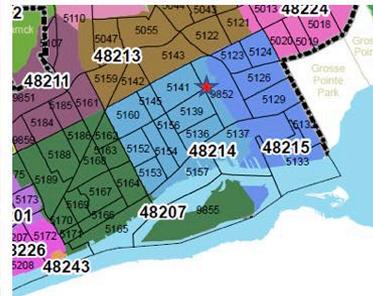
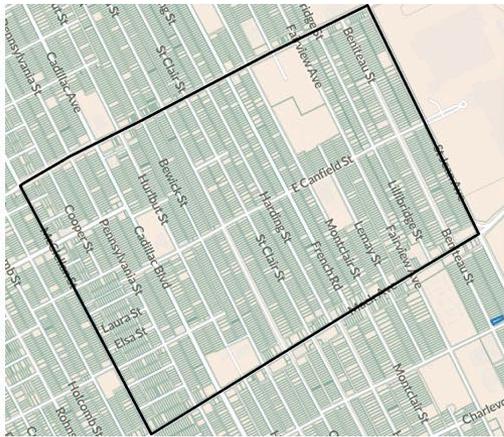


5. Publish

6. Distribute



Source	Description	Level	Open Access
MiHIN	Demographic, clinical information, insurance	Patient	No
OpenStreetMap	Point of Interests	City/Instance	Yes
Census Bureau	Socioeconomic data	Census Tract	Yes
Detroit Open Data Portal	Crime and violence data	Census Block	Yes
Michigan Department of Environmental Quality	Environmental conditions	Census Tract	Yes
USDA	Food access	Census Tract	Yes
Landgrid, Loveland Tech	Housing security	Census Block	Yes
Bureau of Labor Statistics	Monthly employment, unemployment	Census Tract	Yes
Data Driven Detroit	Transportation, education	Census Tract	Yes
Neighborhood Atlas	Area deprivation index	Census Block	Yes



**Detroit Zip Codes and 2010 Census Tracts**

Census Tract 5141, Detroit  
 Lat: 42.3798303, Lon:-82.9893988  
 Square miles: 0.62148509  
 With a radius around 715.8 meters

Extraction: `pois_from_point([lat,lon], radius)`  
 Return with different radius values

**radius = 500**

parking	6
place_of_worship	5
school	2
ice_cream	1
doctors	1

**radius = 715.8**

parking	18
place_of_worship	8
school	4
fuel	1
ice_cream	1
doctors	1
bus_station	1
marketplace	1

**radius = 1500**

parking	97
place_of_worship	34
school	22
fast_food	4
social_facility	3
restaurant	2
fire_station	2
marketplace	1
bench	1
fuel	1
ice_cream	1
doctors	1
bus_station	1
car_wash	1
college	1

MRN: 12345678    AGE: 54    EMPLOYER: General Motors    ROLE: Manufacturing - Welding    LOCATION: Detroit, Michigan

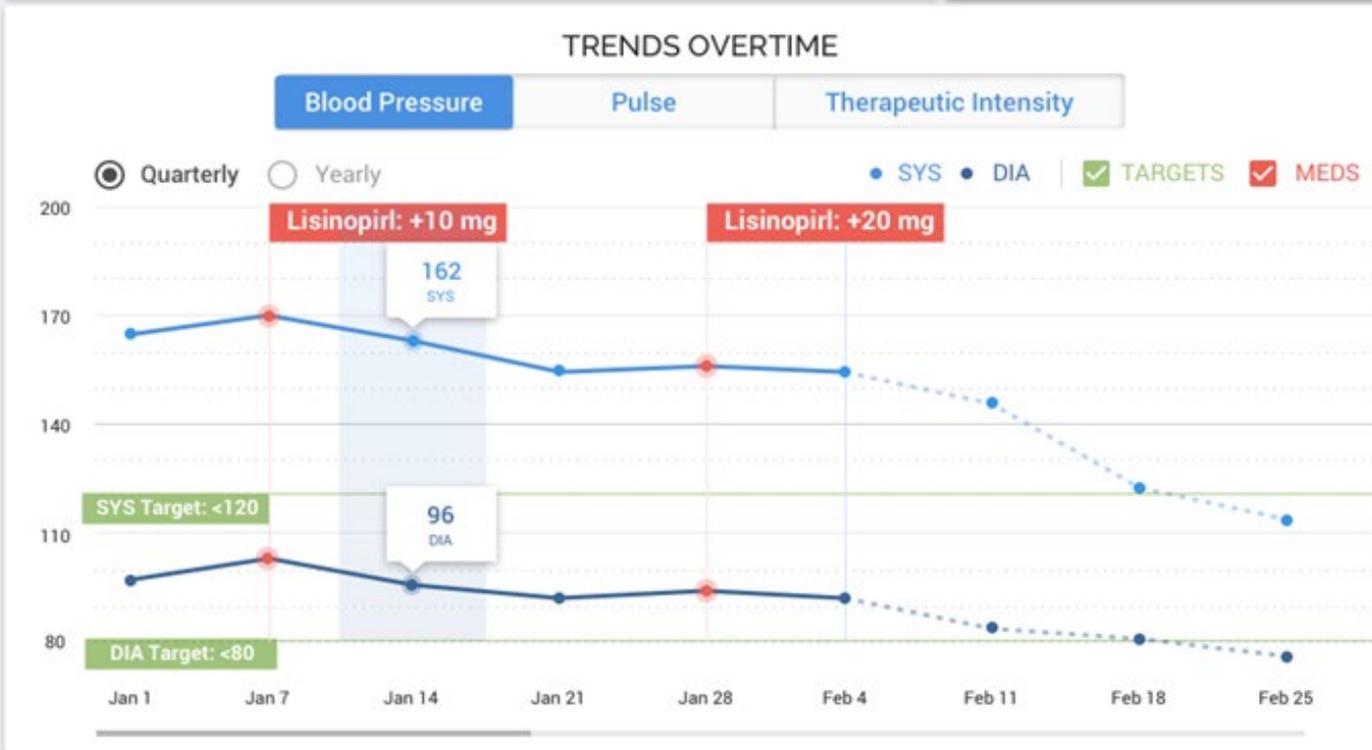
	Prior BP	Current BP	Next Visit BP	ASCVD Target BP
SYS	156	↑ 155	↓ 148	117
DIA	95	95	82	77
Pulse	80	74	70	22

### SOCIAL DETERMINANTS OF HEALTH

- Economic Stability: Fair
- Livability: Above Standard
- Education: Below Regional Standards
- Food Access: No 'healthy' options within 5 mi

### BEHAVIORAL RISKS

- Low Physical Activity
- Poor diet adherence
- Missed medical encounters
- Alcohol Risk



### ORDER HISTORY

All Orders

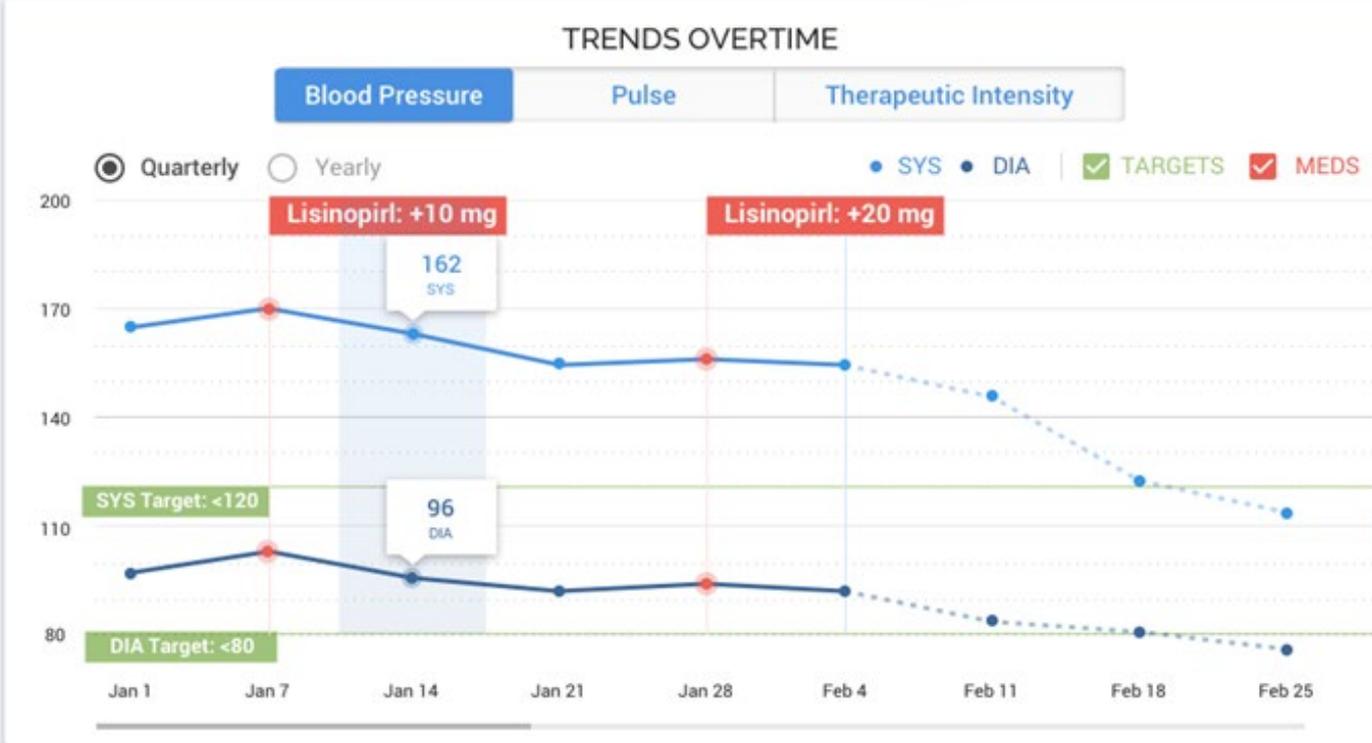
Orders	Date	BP
Lab Results	01/07/2019	165/99
<b>VALUE</b>		<b>RESULTS</b>
Blood Urea Nitrogen		20 mg/dL
Glucose		102 mg/dL
Creatinine		1.3 mg/dL
Urine Albumin/Creatinine		30 mg/L
Lisinopiril	01/07/2019	170/104
Nutritionist	01/14/2019 @ 11...	162/96
Excercise	01/21/2019	155/92
Lisinopiril	01/28/2019	156/95
Support Group	02/04/2019 @ 3...	155/95
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Lisinopiril	01/28/2019	156/95
Support Group	02/04/2019 @ 3...	155/95
Support Group	02/11/2019 @ 3...	--

Referrals

Classes

✓ **HFHS Smoking Cessation Program**  
Community Center · 9464 Main St  
Learn about the effect of cigarette smoking on you BP

Next Available Date

Mon. 3/4/2019

9:30 am

10:45 am

Thur. 3/7/2019

1:30 pm

4:45 pm

✓ **HFHS Diabetes Prevention Program**  
GW Hospital · 9464 Main St  
Better glucose managment; Better BP managment

Mon. 3/4/2019

9:30 am

10:45 am

Thur. 3/7/2019

1:30 pm

4:45 pm

✓ **Fitness Workshop @ FitnessWorks**  
Community Center · 9464 Main St  
Learn about the effect of cigarette smoking on you BP

Mon. 3/4/2019

9:30 am

10:45 am

Thur. 3/7/2019

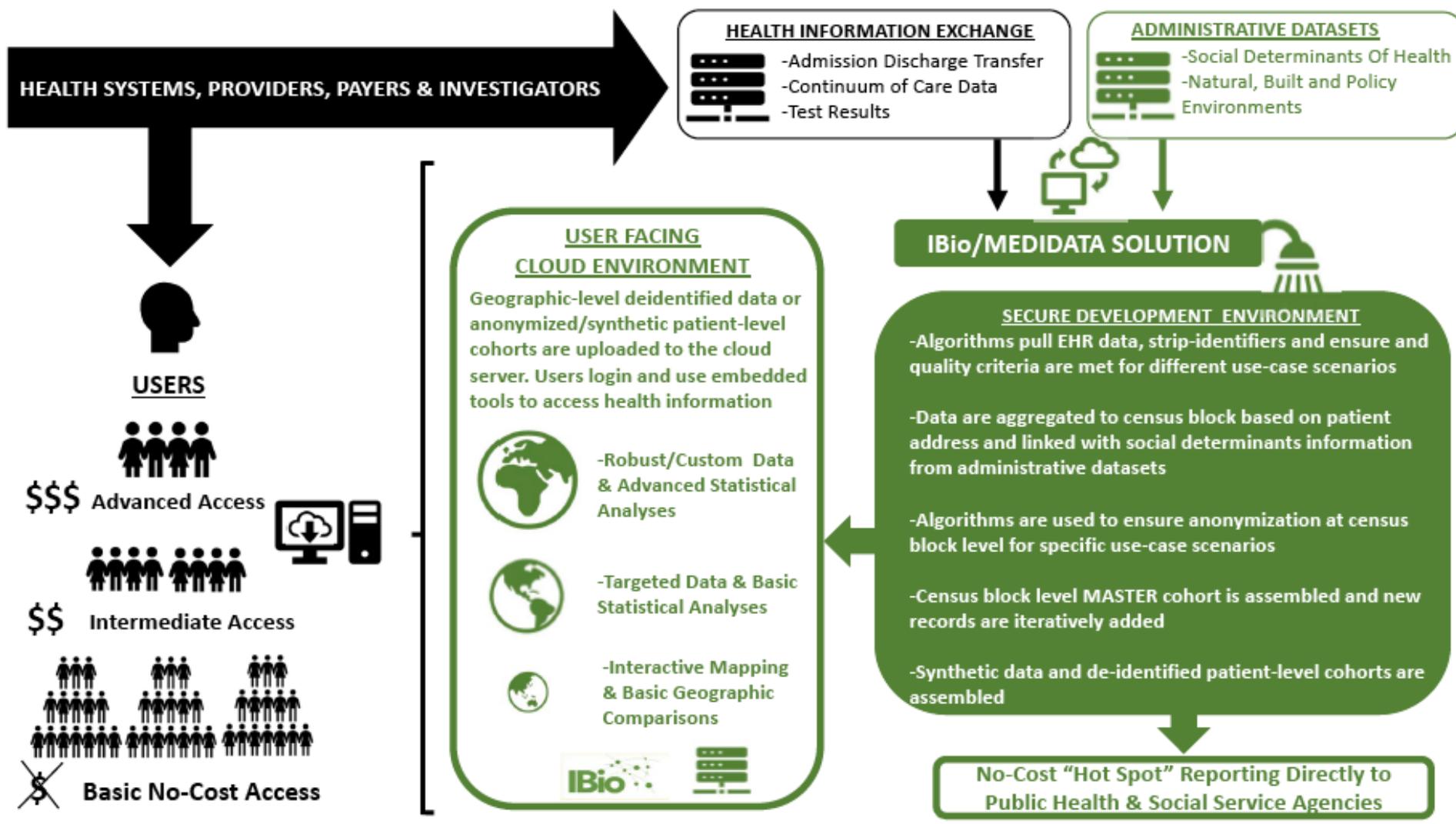
1:30 pm

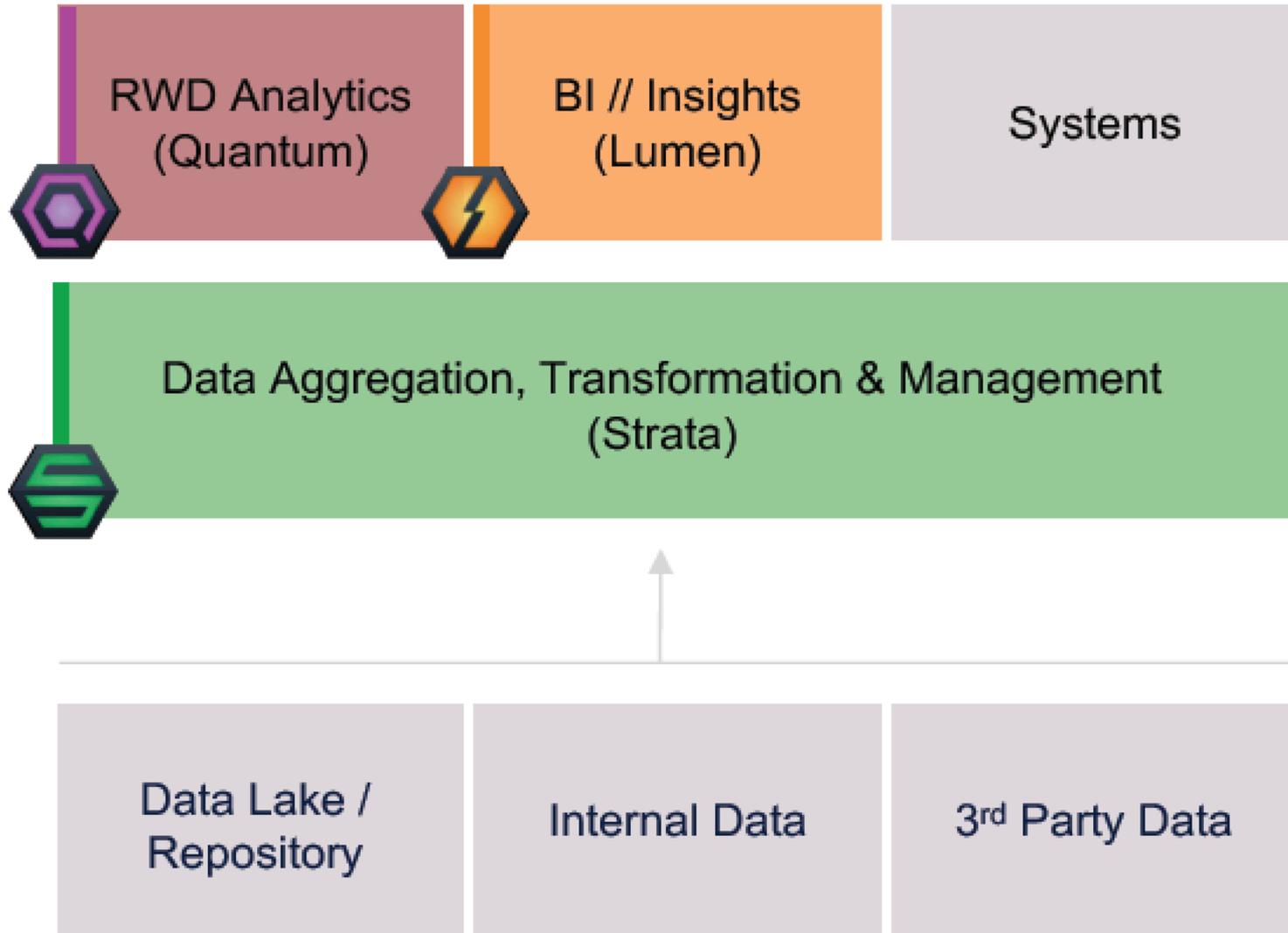
4:45 pm

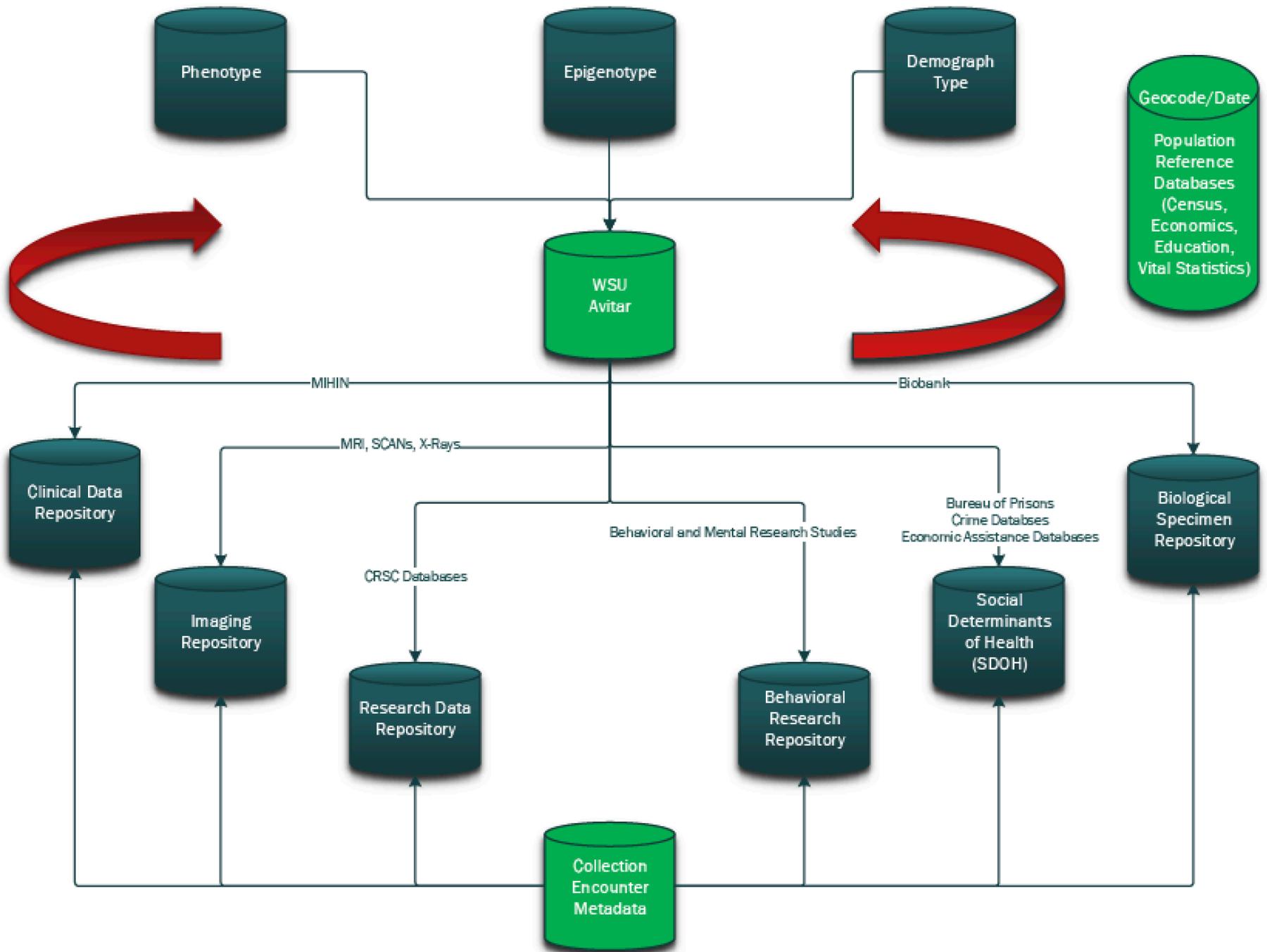
SEND REFERRALS



Zoom in







A photograph of a modern building at dusk. The building features a large glass facade that is illuminated from within, reflecting the sky. A prominent feature is a tower section with a facade of horizontal wooden slats, which is also lit from within. The sky is a deep blue with some clouds. In the foreground, there is a paved area and some landscaping with small trees and bushes. The overall scene is a nighttime architectural shot.

[plevy@med.wayne.edu](mailto:plevy@med.wayne.edu)