Population Health Assessment Engine

Population Health Assessment Engine Curriculum

BACKGROUND

01

Introduction to Population Health

02

Introduction to Geospatial Concepts

BEGINNER

03

Introduction to the Population Health Assessment Engine

04

How to use My Community

05

How to use Community HotSpots

ADVANCED

06

Getting the Most out of My Community

07

Getting the Most out of Community Hotspots

Overall goal for the PHATE Curriculum

To integrate community data, clinical data, and community resources in order to address social determinants of health and improve the health of patients and populations.

Target audience

- Anyone interested in learning about improving the health of populations
  - Providers
  - Staff
  - Learners
    - Residents
    - Medical students

GEOGRAPHIC AND DATA CONCEPTS IMPORTANT FOR POPULATION HEALTH

BACKGROUND 02

Background 02: Introduction to Geospatial Concepts
Learning Objectives

- Describe how geography interacts with population health
- Explain geographic terms like thematic mapping and geocoding
- Demonstrate how to use online population health tools

Relevant family medicine milestones

Family Medicine Milestone
Integrates practice and community data to improve population health.
Identifies specific community characteristics that impact specific patients' health.
Identifies health inequities and social determinants of health and their impact on individual and family health.
Recognizes social context and environment, and how a community's public policy decisions affect individual and community health.

Relevant nurse practitioner competencies

Competency
Demonstrate the conceptual ability and technical skills to develop and execute an evaluation plan involving data extraction from practice information systems and databases.
Analyze epidemiological, biostatistical, environmental, and other appropriate scientific data related to individual, aggregate, and population health.
Use information technology and research methods appropriately to collect appropriate and accurate data to generate evidence for nursing practice, inform and guide the design of databases that generate meaningful evidence for nursing practice, analyze data from practice, design evidence-based interventions, predict and analyze outcomes, examine patterns of behavior and outcomes, and identify gaps in evidence for practice.
Integrates appropriate technologies for knowledge management to improve health care.
Uses technology systems that capture data on variables for the evaluation of nursing care.

Population Health

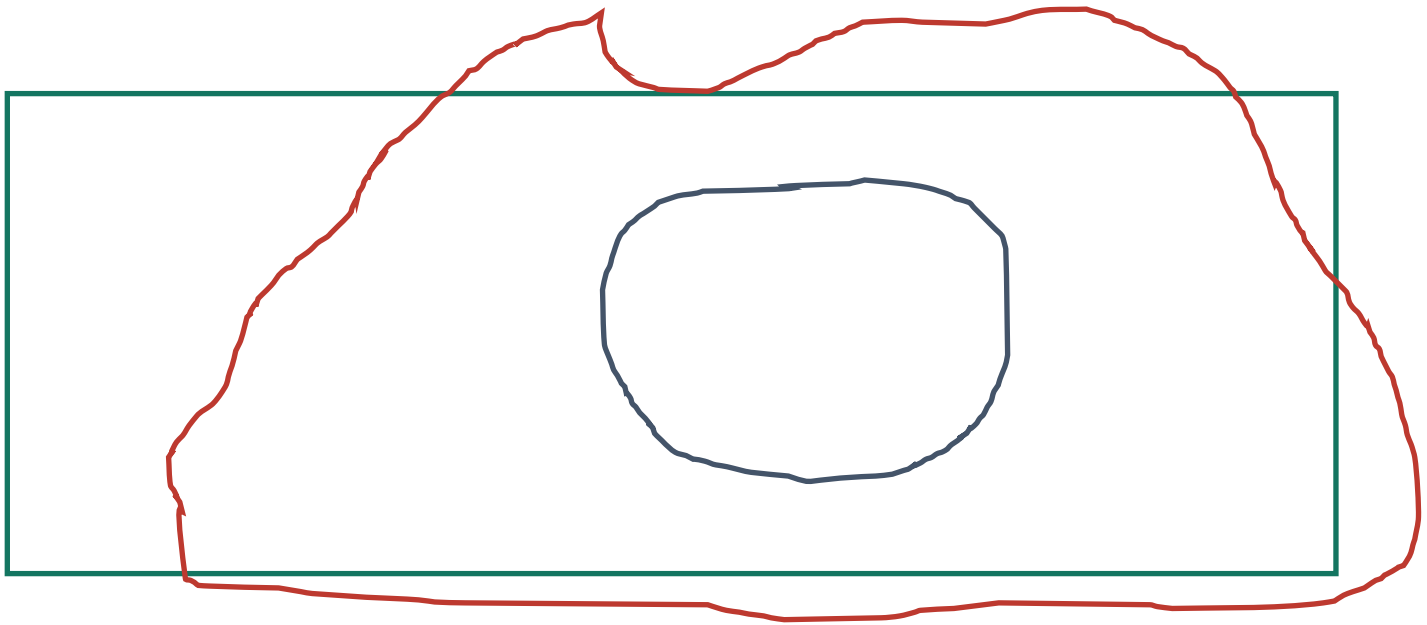
In order to practice population health:

- **Define** who your population is
  - Examples: All people in X state or county; all women
- **Measure** health outcomes of individuals within that population
  - Examples: Mortality, morbidity
- **Examine** the distribution of health and **identify** disparities
- **Address** the disparities to improve population health

Defining Population in a Clinical Context

Service area = Where patients who come to see me live

- Generic = neighborhood, city, county or state name
- Examples:



Capturing Social and Behavioral Domains and Measures in Electronic Health Records

Domains include:

- Sexual Orientation
- Race/ Ethnicity
- Country of Origin
- Education
- Employment
- Financial Resource Strain (Food and Housing Insecurity)
- Health Literacy
- Stress
- Negative Mood and Affect (Depression and Anxiety)
- Psychological Assets
- Dietary Patterns
- Physical Activity
- Tobacco Use and Exposure
- Alcohol Use
- Social Connections and Social Isolation
- Exposure to Violence
- Neighborhoods/ Community Compositional Characteristics

Census Geography

ZIP Codes

- "Easy" to get from EHR

- Can change at any time
- No attempts to contain homogenous population
- Huge size variation (in land mass and population size)
- Not truly an "area" so data are not always comparable

Use

Don't Use

ZIP Code vs ZCTA

- ZIP Code Tabulation Areas (ZCTAs) are generalized areal representations of United States Postal Service (USPS) ZIP Code service areas
- ZCTA (ZIP Code Tabulation Area) are more stable than ZIP Codes because they only change every 10 years
- ZCTA is built from Census Blocks so one can report demographic/ SDoH data at the ZCTA level

Deriving Service Area from Patient Data (Geographic Retrofitting)

- There are two ways to use patient data to define service area
  - Option 1: Use the address to get census tracts (or other geography)
  - Option 2: Use ZIP Codes and convert to ZCTAs
- No matter which one you pick, you will then aggregate your data so that you have a compiled list of areas to create your service area

Option 1: Geocoding Patient Addresses

- Geocoding is the process of comparing address information to a standard database to assign longitude and latitude for that location
- Once geocoded, you can verify the different geographies that location is in, including Census Tract

1100 S Ocean Blvd
Palm Beach, FL 33480 → x = -80.036066
y = 26.677778 → ct: 12099003504
ZCTA: 33480
Cong. Dist.: FL-21
etc.

Geocoding Caveats

- HIPAA- Address is PHI
- Patients with PO Boxes will not be placed in correct location
- In rural locations where streets/ mapping not fully developed, patients may be placed incorrectly
- HIPAA- Address is PHI

Option 2: Using Existing Patient Address Data

- Since ZIP Code is in the EHR, you can extract the data
- Then convert it to ZCTA (most ZCTA numbers are the same as the five-digit ZIP Code) but if you don't convert before using, you will lose data from ZIP Codes that do not have a direct ZCTA match
- You can use the ZIP Code to ZCTA Crosswalk (https://www.udsmapper.org/zcta-crosswalk.cfm) to convert your data with no loss of data

Compile and (maybe) Aggregate!

- After either option 1 or option 2 you will end up with a list of ZIP Codes, ZCTAs, Census Tracts- whatever geography you chose- that you can aggregate into a service area

OR

- You can consolidate the data into counts of patients in each area

Converting Patient Data to Service Area

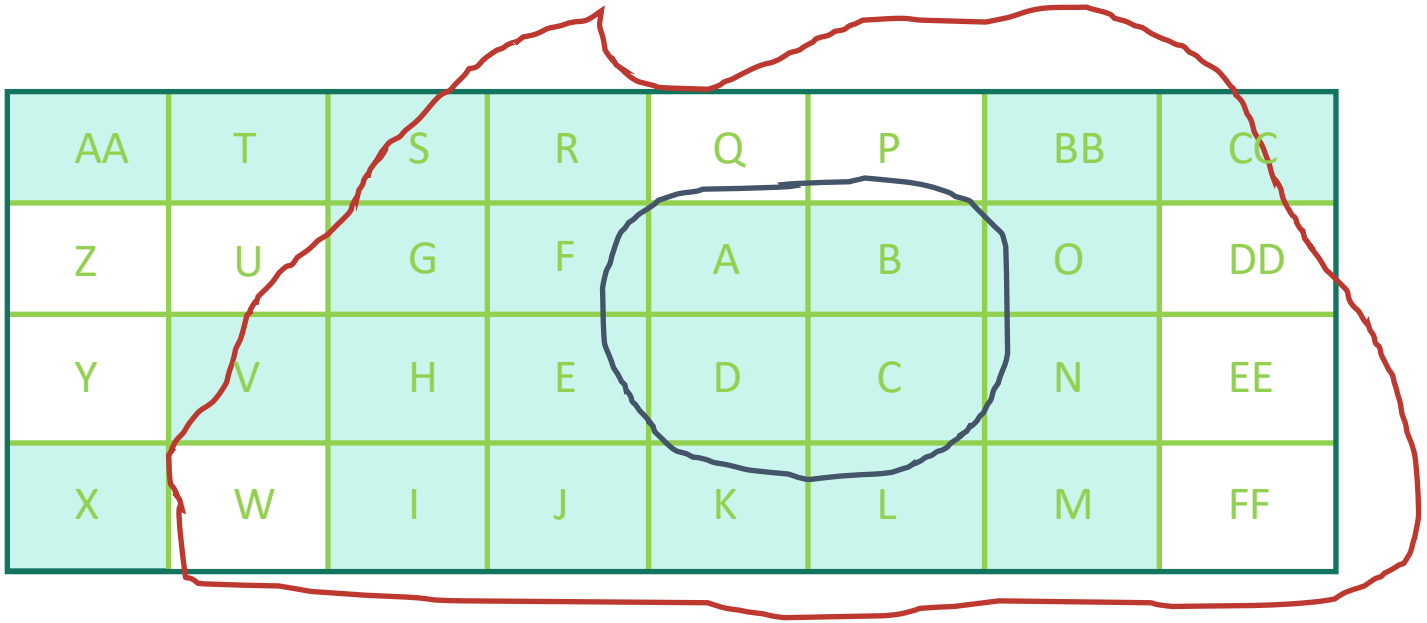
Area	# pts
A	432
B	380
C	349
D	312
E	301
F	263
G	251
H	233

Area	# pts
I	208
J	199
K	181
L	167
M	146
N	135
O	120
R	99

Area	# pts
S	96
T	90
V	89
X	60
AA	27
BB	21
CC	15

Thinking about Patient Panels in a Non-Clinical Context

- Service area = just based on the areas where my patients live



Converting Patient Data to Service Area

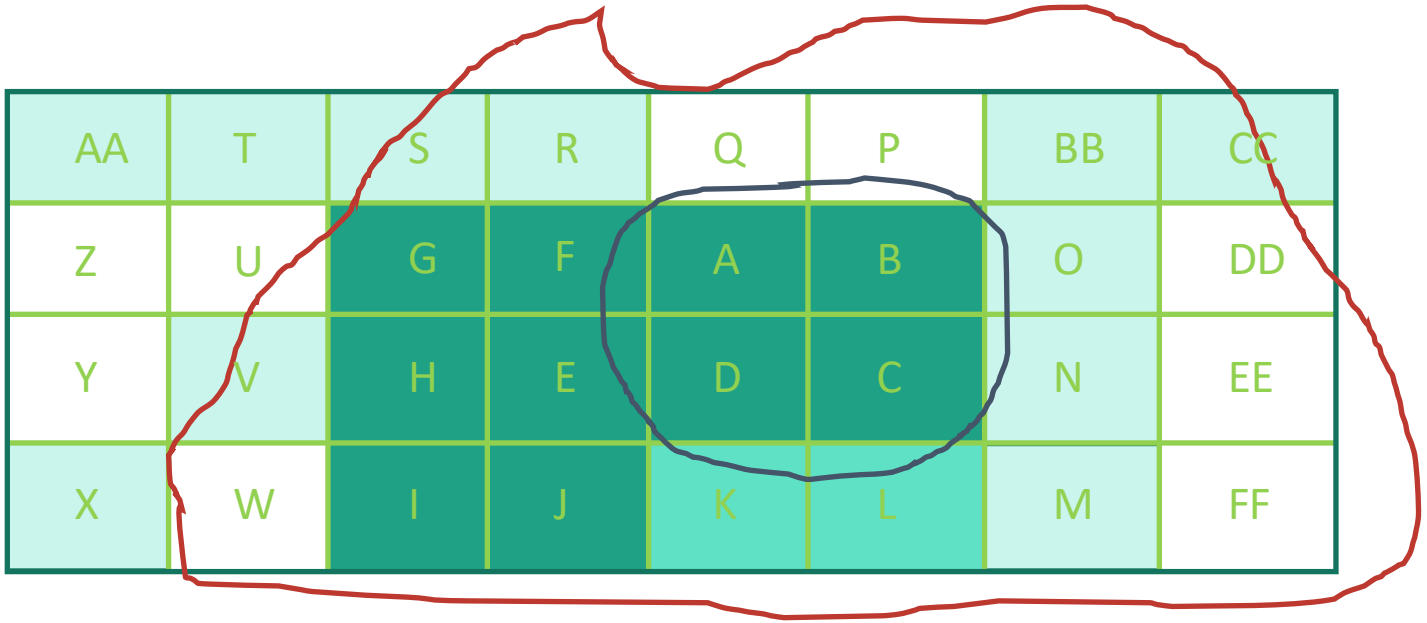
Area	# pts	Cum. %
A	432	10.3%
B	380	19.5%
C	349	27.8%
D	312	35.3%
E	301	42.5%
F	263	48.8%
G	251	54.8%
H	233	60.4%
I	208	65.4%
J	199	70.1%
K	181	74.5%

Area	# pts	Cum. %
L	167	78.5%
M	146	82.0%
N	135	85.2%
O	120	88.1%
P	0	--
Q	0	--
R	99	90.5%
S	96	92.8%
T	90	94.9%
U	0	--
V	89	97.1%

Area	# pts	Cum. %
W	0	--
X	60	98.5%
Y	0	--
Z	0	--
AA	27	99.1%
BB	21	99.6%
CC	15	100%
DD	0	--
EE	0	--
FF	0	--
TOTAL	4,174	100%

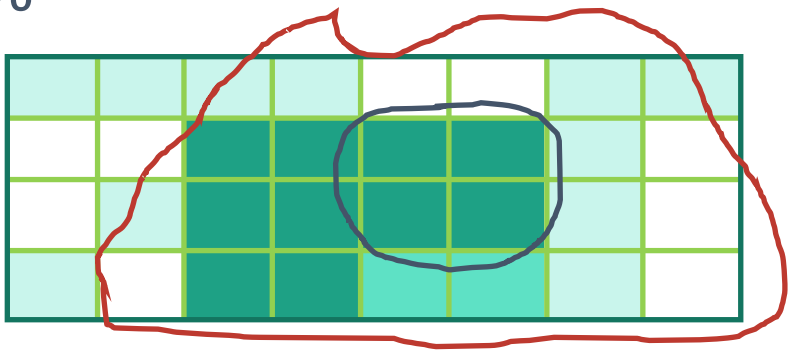
Thinking about Patient Panels in a Non-Clinical Context

- Service area = based on the number of patients per area; include the ones with the most patients first/ in core area



Why is This Level of Detail Important?

- Focusing on a statistic with a state average of 24% and a national average of 21%



- County average = 12.3%
- City average = 13.2%
- Neighborhood average = 28%

- Core service area average = 22.8%
- Total service area average = 16.0%

Find SDOH Data to Better Understand Contextual Information about Patients

- What is the income level in this neighborhood?
- Do most of the adults in this neighborhood have a high school diploma? College education?
- What is the walkability of this area? Are there sidewalks? Are the parks, if any, usable?
- What is the prevalence of diabetes in the area?
- Etc.

Tools with Geospatial SDOH

- UDS Mapper- www.udsmapper.org
- Population Health Mapper by County- www.healthlandscape.org/map_PopulationHealth.cfm
- Social Determinants of Health Mapper by Census Tract- www.healthlandscape.org/map_SDOH.cfm
- 500 Cities Project Mapping Tool by Census Tract- www.healthlandscape.org/map_Project500Cities.cfm
- Community Health View by State/ County- www.healthlandscape.org

Background 02: Introduction to Geospatial Concepts
Learning Objectives

- Describe how geography interacts with population health
- Explain geographic terms like thematic mapping and geocoding
- Demonstrate how to use online population health tools

Relevant family medicine milestones

Family Medicine Milestone
Integrates practice and community data to improve population health.
Identifies specific community characteristics that impact specific patients' health.
Identifies health inequities and social determinants of health and their impact on individual and family health.
Recognizes social context and environment, and how a community's public policy decisions affect individual and community health.

Relevant nurse practitioner competencies

Competency
Demonstrate the conceptual ability and technical skills to develop and execute an evaluation plan involving data extraction from practice information systems and databases.
Analyze epidemiological, biostatistical, environmental, and other appropriate scientific data related to individual, aggregate, and population health.
Use information technology and research methods appropriately to collect appropriate and accurate data to generate evidence for nursing practice, inform and guide the design of databases that generate meaningful evidence for nursing practice, analyze data from practice, design evidence-based interventions, predict and analyze outcomes, examine patterns of behavior and outcomes, and identify gaps in evidence for practice.
Integrates appropriate technologies for knowledge management to improve health care.
Uses technology systems that capture data on variables for the evaluation of nursing care.