Monitor Regional Inclusivity of Federal Health Policies

USING CHRONIC DISEASE INDICATORS DATA

Created in 2023 by Adriana J. LaGier

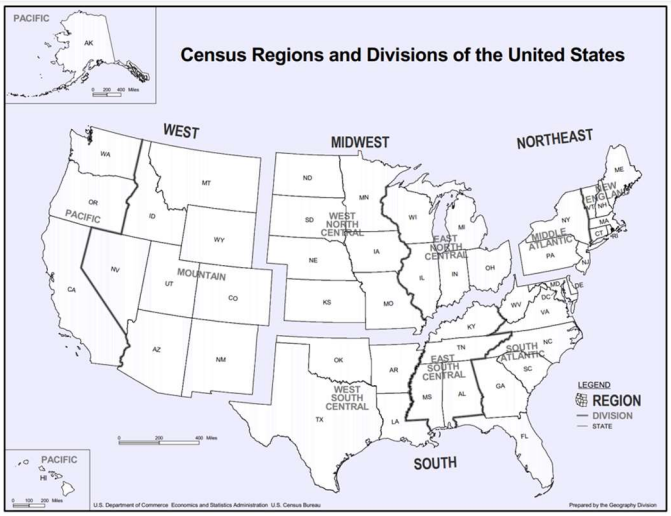
Contents

Problem:

Overarching Federal Health Policies may neglect regional health differences*

* Assumption made that regional health differences exist

U.S. census divides states into 4 geographic regions



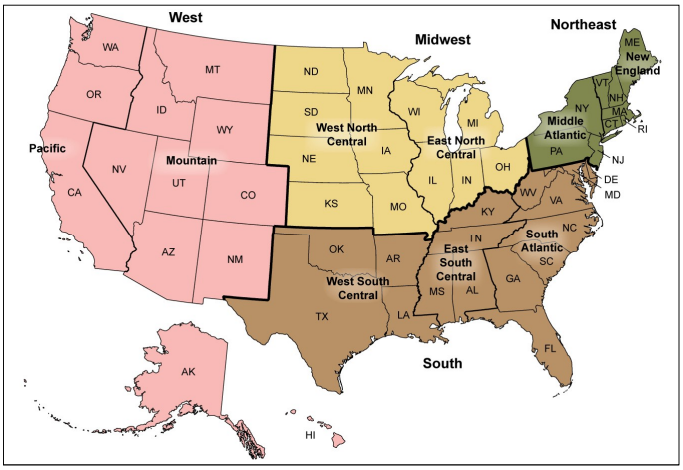
https://www2.census.gov/geo/pdfs/maps-data/maps/reference/us_regdiv.pdf

Objective

Determine whether regional health differences exist

Centers for Disease Control (CDC) collect health data from each US state

CDC utilizes 4 geographic regions same as census



https://www.cdc.gov/nchs/hus/sources-definitions/geographic-region.htm

Centers for Disease Control and Prevention (CDC) utilize US Census Bureau Model to divide the United States (US) into 4 distinct geographic regions: Northeast, South, Midwest, West.

Project Goal

Devise data structure for analysis

①

prove principle using ONE state from each region

Northeast:	Connecticut
West:	Utah
Midwest:	Iowa
South:	Mississippi

Data Structure tested using data from one state per region

Rank		State or territory	Census population[8][a]		
2022	2020		July 1, 2022 (est.)	April 1, 2020	April 1, 2010
29	29	Connecticut	3,626,205	3,605,944	3,574,097
30	31	Utah	3,380,800	3,271,616	2,763,885
32	32	Iowa	3,200,517	3,190,369	3,046,355
35	35	Mississippi	2,940,057	2,961,279	2,967,297

* States chosen for being within region of interest and having populations of 3.3 ± 0.3 million people

**8a: *"US Census Quickfacts, Population Estimates, July 1 2022". Census.gov. United States Census Bureau.*

Each Region had anywhere from 3 states to 9 states and the populations for each region was widely variable. As an example, the West region has California, the most populous state. In this regard, we chose 4 states, one from each region, whose populations were ± 0.3 million people from each other.

Project Goal

Devise data structure for analysis

②

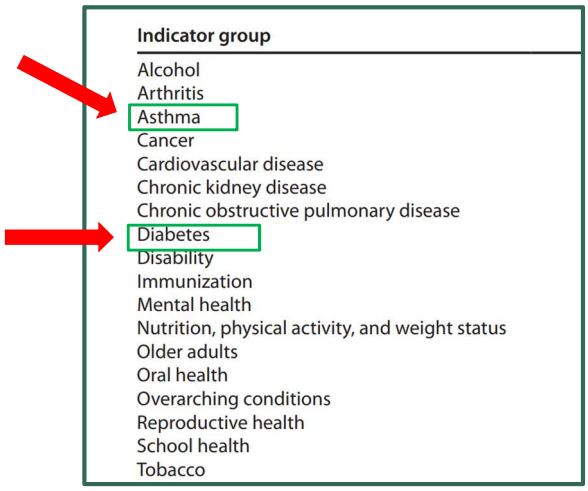
prove principle using ONE CDC collected health marker

Chronic Disease Indicators (CDI)

Chose two topic indicator groups

1) Asthma
2) Diabetes

Data Structure tested using Chronic Disease Indicators*



* CDC tracks 18 indicator groups encompassing 124 individual CDI

https://www.cdc.gov/mmwr/pdf/rr/rr6401.pdf

<https://www.cdc.gov/cdi/index.html> Link to CDC Chronic Disease Indicator home page
Chronic Diseases are listed as 7 of the top 10 leading causes of death in the US.
The topics chosen, asthma and diabetes lead this list.

Data

Chronic Disease Indicators (CDI) for **4 chosen states** were filtered in Excel and uploaded into SQL (BigQuery) from base CDC data tables

** Original database had 1.1M rows and 34 columns

CDI Data for 4 states uploaded into SQL

four_states

four_states QUERY SHARE COPY SNAPSHOT DELETE EXPORT

SCHEMA DETAILS PREVIEW LINEAGE DATA PROFILE DATA QUALITY

Row	YearStart	YearEnd	LocationAbbr	LocationDesc	DataSource
1	2019	2019	CT	Connecticut	YRBSS
2	2015	2015	CT	Connecticut	YRBSS
3	2017	2017	CT	Connecticut	YRBSS
4	2013	2013	CT	Connecticut	YRBSS
5	2013	2013	IA	Iowa	YRBSS
6	2017	2017	IA	Iowa	YRBSS
7	2015	2015	IA	Iowa	YRBSS
8	2019	2019	IA	Iowa	YRBSS
9	2013	2013	MS	Mississippi	YRBSS
10	2015	2015	MS	Mississippi	YRBSS
11	2019	2019	MS	Mississippi	YRBSS
12	2017	2017	MS	Mississippi	YRBSS
13	2017	2017	UT	Utah	YRBSS

DataSource

<https://catalog.data.gov/dataset/u-s-chronic-disease-indicators-cdi>
Database downloaded from data.gov on Oct. 2023 by Adriana LaGier
<https://data.cdc.gov/api/views/g4ie-h725/rows.csv?accessType=DOWNLOAD>
Data was created in 2020

Data Cleaning

In SQL:

1) Data type

2) null values

CDI Data for 4 states cleaned in SQL

-- Query converting string values into numbers

```
SELECT
  SAFE_CAST (DataValue AS FLOAT64) AS Value
FROM
  us-chronic-
disease.Chronic_Disease_Indicators.four_states
```

-- Query filling blanks with “null”

```
SELECT
  COALESCE (DataValue, DataValue) AS Value
FROM
  us-chronic-
disease.Chronic_Disease_Indicators.four_states
```

Data Analysis of Cleaned data

In SQL:

Filter by indicators, and order by state

CDI Data for 4 states analyzed in SQL

-- Query to filter indicators chosen from other indicators

```
SELECT
  *
FROM
  us-chronic-disease.Chronic_Disease_Indicators.four_states

WHERE
  Topic= “Asthma" OR
  Topic= “Diabetes"

ORDER BY
  LocationDesc;
```

Data Analysis of Cleaned data

In Sheets:

Pivot Table of Chronics Disease Indicators showing Mortality Rate per million people

Pivot Table of Mortality Rates

Mortality Rate (per 10^6)	Asthma	Diabetes
Connecticut	37	94
Iowa	299	941
Mississippi	69	657
Utah	354	546

* Data for 4 states and 2 indicator groups analyzed in Sheets

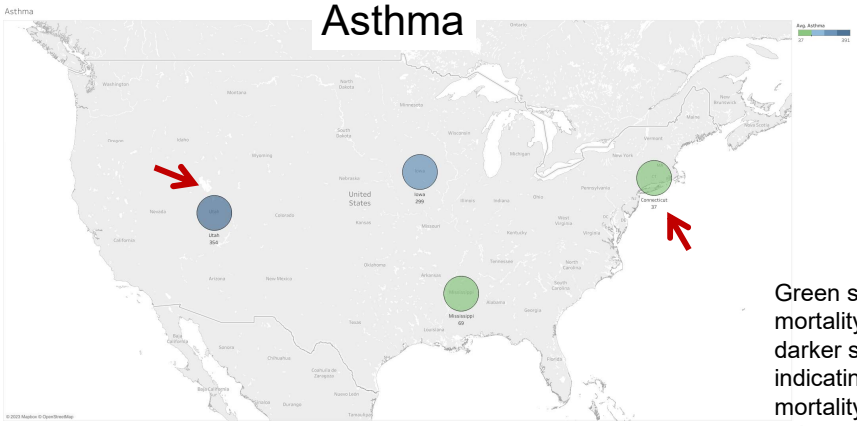
Received divide by zero error while creating pivot table. Used filter by condition to delete rows with no values to allow pivot table to calculate averages

Moratlity rate shown per million people

Each regions chronic health indicators

shown as mortality rate in millions of people

Asthma

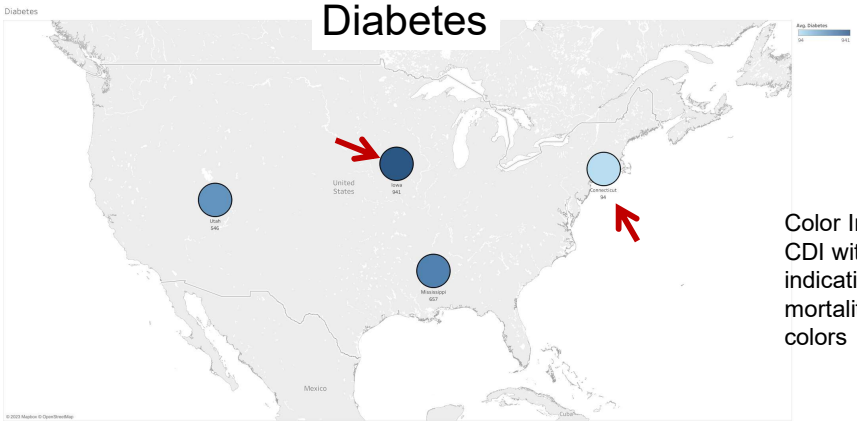


Green shows less mortality than blue with darker shades indicating more mortality than lighter colors

Each regions chronic health indicators

shown as mortality rate in millions of people

Diabetes



Color Intensity shows CDI with darker colors indicating more mortality than lighter colors

Conclusion about Data Structure

Chronic Disease Indicator Data is useful data when analyzing the inclusivity of Federal health regulatory efforts

Efforts to expand analysis are expected to produce data that would inform federal policy making strategies

Conclusion from pilot analysis

The inclusivity of Federal health regulatory efforts relies on focusing on country regions rather then the country as a whole

- Example, Mississippi, which represents the South, would benefit from diabetes prevention policies, but would not need as much support with asthma

Next Steps

Expand analysis to include all states in the region

Expand analysis to include all chronic disease health indicators relevant to federal policies

Appendix

The 4 geographical regions are further divided into nine geographical divisions that encompass anywhere from 3 states (Middle Atlantic) to 8 states plus DC (South Atlantic)

The average population of all US states is ~5.5 million.

An additional set of states were discussed. However, they were not nearly as far apart from each other as the one presented here.

14	14	Arizona	7,359,197	7,151,502	6,392,017
15	16	Tennessee	7,051,339	6,910,840	6,346,105
16	15	Massachusetts	6,981,974	7,029,917	6,547,629
17	17	Indiana	6,833,037	6,785,528	6,483,802