




# Visual Analytics Final Project

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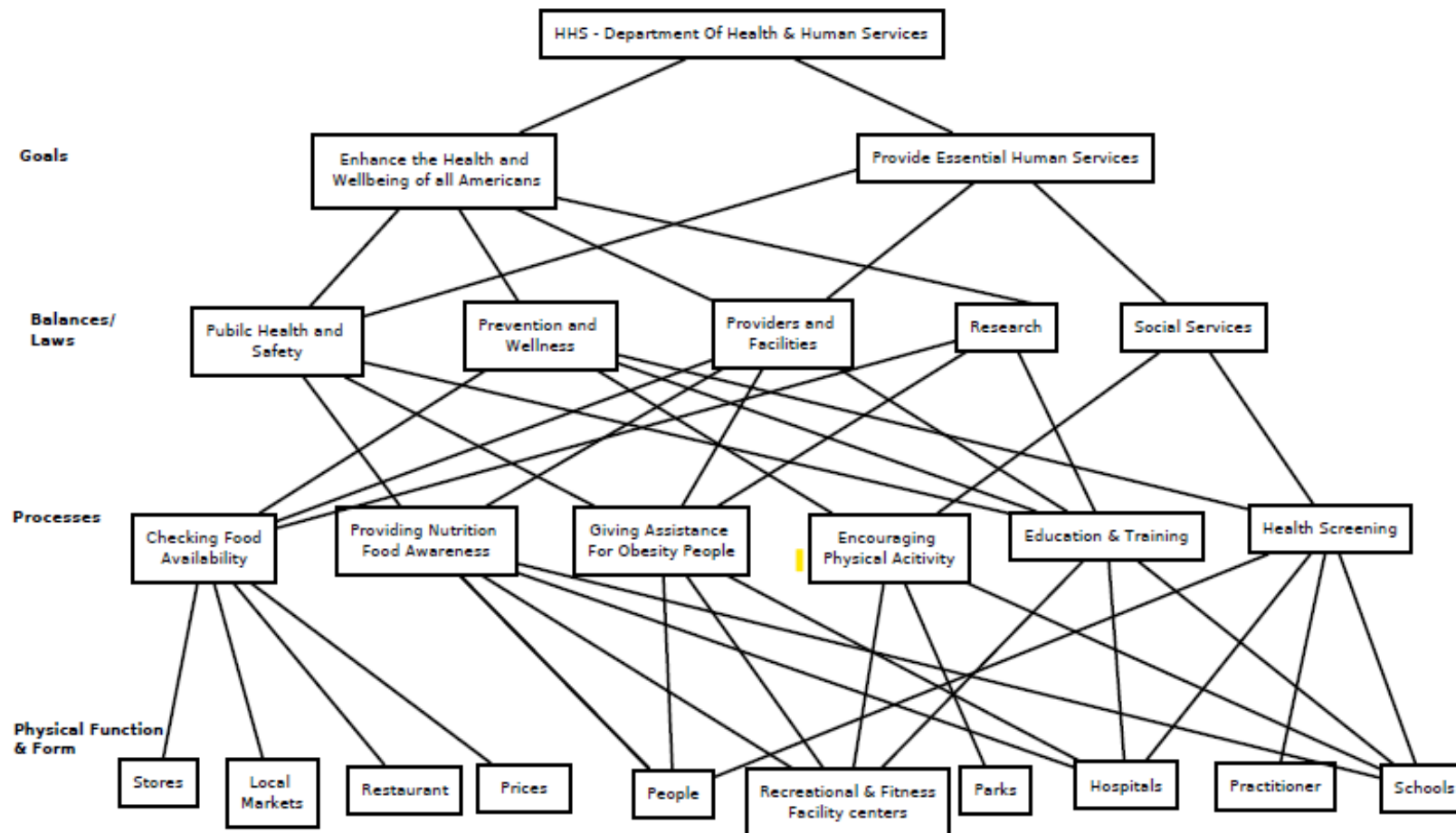
# Project Description

- ▶ The objective of this project is to present how certain food environment factors are contributing to increase in obesity and diabetes in America.
- ▶ The underlying report is meant for Human and Health services Department to evaluate impact of food environment indicators on health condition of Americans.



# Work Domain Analysis

# Abstraction Hierarchy



Abstract hierarchy depicting the Goals, Laws, Processes and Physical Forms of Department of Health and Human services.

# Part – Whole Decomposition

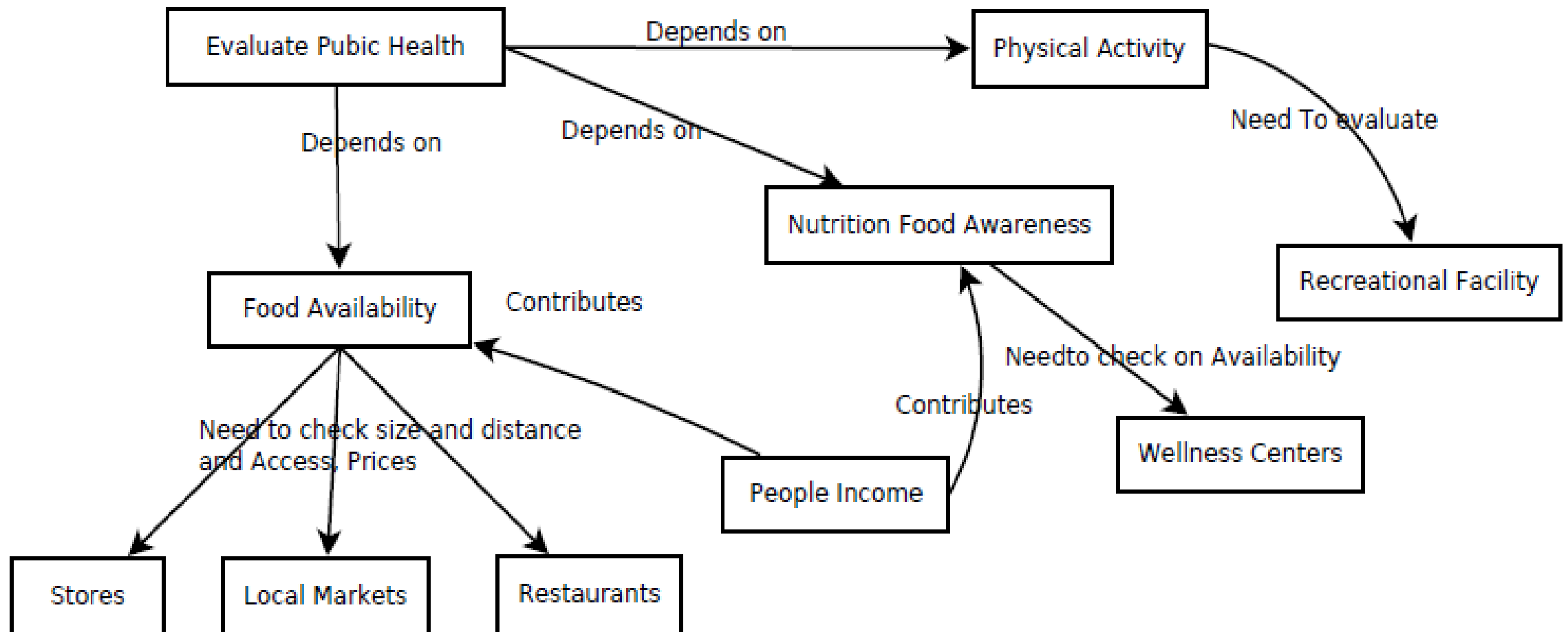
	Public Health	Disease Prevention and Wellness	Providers and Facilities	Social Services
Goals	Promoting Healthy lifestyle,	Disease Prevention	Accessibility to nutritious food	improve the well-being of individuals, families, and communities.
Balances/Laws	Health Awareness programs Vaccination, Health Checks	Providing Nutrition Food Awareness	Facilities availability for all	Assistance for people in need
Processes	Encouraging Physical Activity, Health Screening	Promoting, Educating	Availability, Proximity, Price	Supplemental Nutrition Assistance
Physical Function/Form	People, Hospitals	Training Centers, Schools, Hospitals, Parks, Health Screening centers	Stores, Local Markets, Restaurants, Price	food banks

Goals	Exhaustive List of Variables	Finalized List of Variables	Constraint	Constraint(s)	Means/End Between Variables	Between Goals
Enhance the health and well-being of all Americans	Number of Wellness Centers per community, Number of People coming, % of People getting benefit, improvement Percentage	Number of wellness Centers per community, Improvement Percentage	Univariate Multivariate	Wellness Centers Available, Improvement % should >0	People Should see improvement in their health	Affects health and well-being of People
Provide Essential Human Services	Number of Human Service centers per community, People working on it, Income for centers	Income Per Centers	Univariate	Income should >expenses	Service Centers should get good funding and support from Government	Affects Service Center Functioning
<b>Balance/Laws</b>	<b>Exhaustive List of Variables</b>	<b>Finalized List of Variables</b>	<b>Type of Constraint</b>	<b>Constraint(s)</b>	<b>Means/End Between Variables</b>	<b>Means/Ends Relationship between Balance/Laws</b>
Public Health & Safety	Number of Hospitals per state, type facilities provided by center, People working, % of people recovered	Number of Hospitals per state, people working	Univariate	People working should appropriate for Hospital size	Affected by Health Insurance	Limited by Income and Health Insurance
Prevention and wellness	Number of Wellness Centers per state, improvement Percentage, % of obesity people per community, Number of stores per community, Number of Local markets, Number of fitness centers per community	Number of Wellness Centers per state, % of obesity people per community, Number of stores per community, Number of Local markets,	Univariate Multivariate Univariate	Wellness Centers Available	Affected by Health Insurance	Limited by Income and Health Insurance
Providers and Facilities	% of people per ethnicity, income %, service centers per community	Service centers per community	Univariate Multivariate	Stores Available, Local Markets Available	Community Population, Income	Limited by Income
Social Services				Service Centers should be available based on population	Affected by Funding and Government Support	Affects Social Service
<b>Processes</b>	<b>Exhaustive List of Variables</b>	<b>Finalized List of Variables</b>	<b>Type of Constraint</b>	<b>Constraint(s)</b>	<b>Means/End Between Variables</b>	<b>Means/Ends Relationship between Processes</b>
Providing Nutritious Food Awareness	Number of Centers per community, Number of People working, Number of People Using the Service	Number of Centers per community	Univariate	Centers should be available	Affected by Social Services, Providers and Facilities	N/A
Checking Food Availability	Number of Local Markets per community, Number of Stores, Number of Restaurants	Number of Local Markets per community, Number of Stores, Number of Restaurants	Multivariate Univariate Univariate	Markets, Stores, Restaurants should available	Affected by Stores/Markets, Restaurants	N/A
Giving Assistance for Obesity People	Number of Training Centers, Hospitals with Facility centers, People, Number of parks	Number of Training Centers, Number of Fitness centers, Number of parks	Univariate Univariate Univariate	Centers should be available	Affected by Social Services, Providers and Facilities	N/A
Encouraging Physical Activity				Parks and Fitness Centers available	Affected by Social Services, Providers and Facilities, Prevention and Wellness Centers	N/A
Education & Training	Number of Trainers, Number of people, equipment	Number of Trainers	Univariate	Trainers available	Affected by Social Services, Providers and Facilities, Prevention and Wellness Centers	N/A
Health Screening	Number of Hospitals, People Working, Distance, Charges	People Working, Charges	Univariate Multivariate	Working People should available, charges >=0	Affected by Health Insurance, Social Services	N/A
<b>Physical Function &amp; Forms</b>	<b>Exhaustive List of Variables</b>	<b>Finalized List of Variables</b>	<b>Type of Constraint</b>	<b>Constraint(s)</b>	<b>Means/End Between Variables</b>	<b>Means/Ends Relationship between Physical Function/Forms</b>
Stores	Number of Convenient Store, Number of authorized Stores	Number of Convenient Store, Number of authorized Stores	Univariate	Stores Available	Affected by Providers and Facilities	N/A
Local Markets	Direct Farm Sales, no of Farm Markets with other products	no of Farm Markets with other products	Univariate	Farm Markets Available	Affected by Providers and Facilities	N/A
Restaurants	Distance, Food Prices, Grocery cost, Tax on Grocery, prices	Food Prices	Multivariate	>0	Affected by Providers and Facilities	N/A
People	Tax on fast food, ethnicity, Helpouts, Number of people have obesity in	Grocery cost, Number of people have obesity in community	Multivariate	>0	Affected by Providers and Facilities	N/A
	Recreation and Fitness centers	Recreation and Fitness			Affected by Prevention and	

# Variables, Constraints

Variables, Constraints are listed in a separate excel sheet for reference.

# Abstract Network



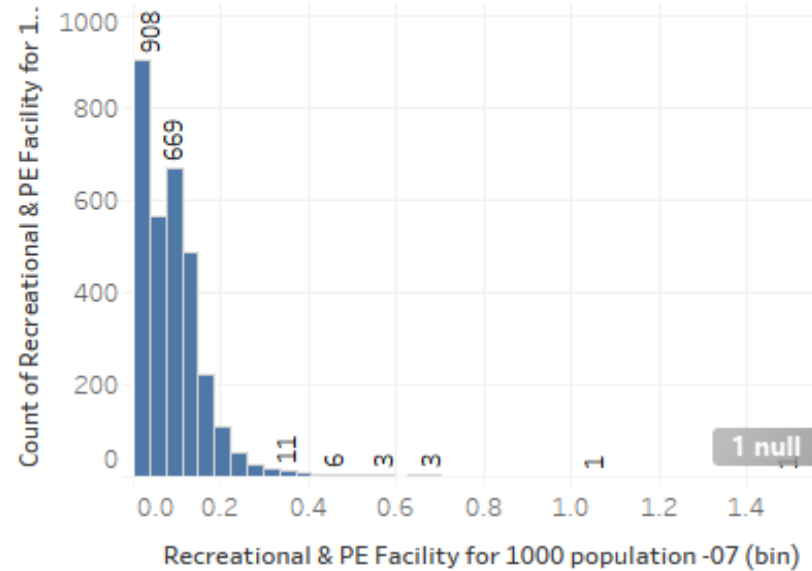


# Visualizations

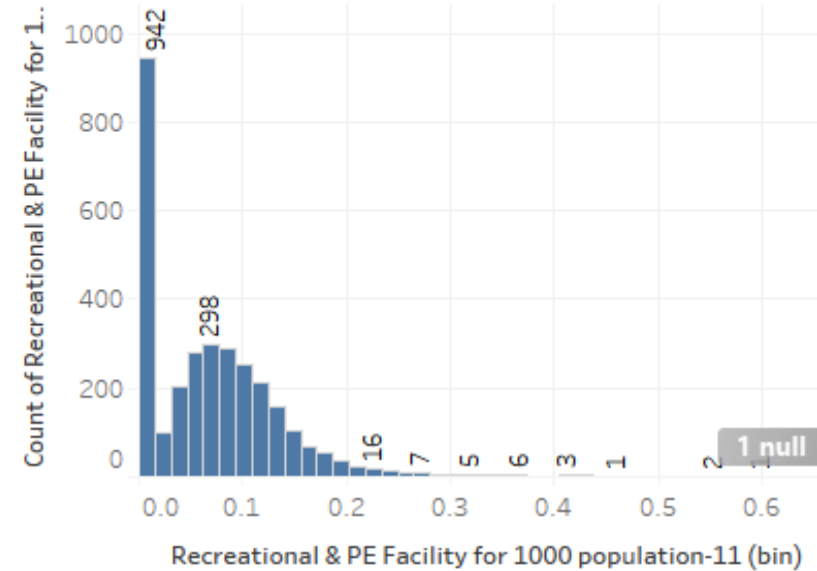


# Dashboard representing Recreational and PE facility across states: 2007 vs 2011

## Recreational and Facility 2007



## Recreational & Facility 2011



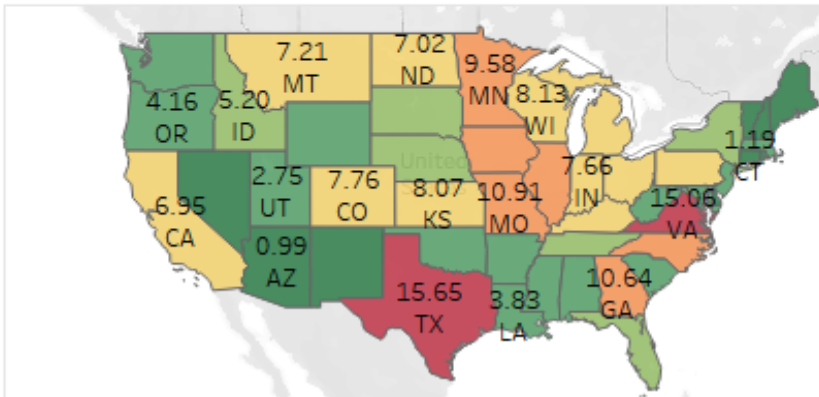
Recfacpth07

0.12 15.65

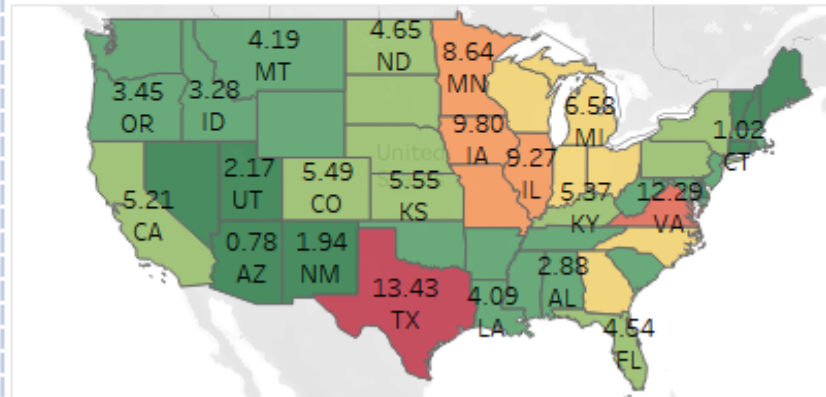
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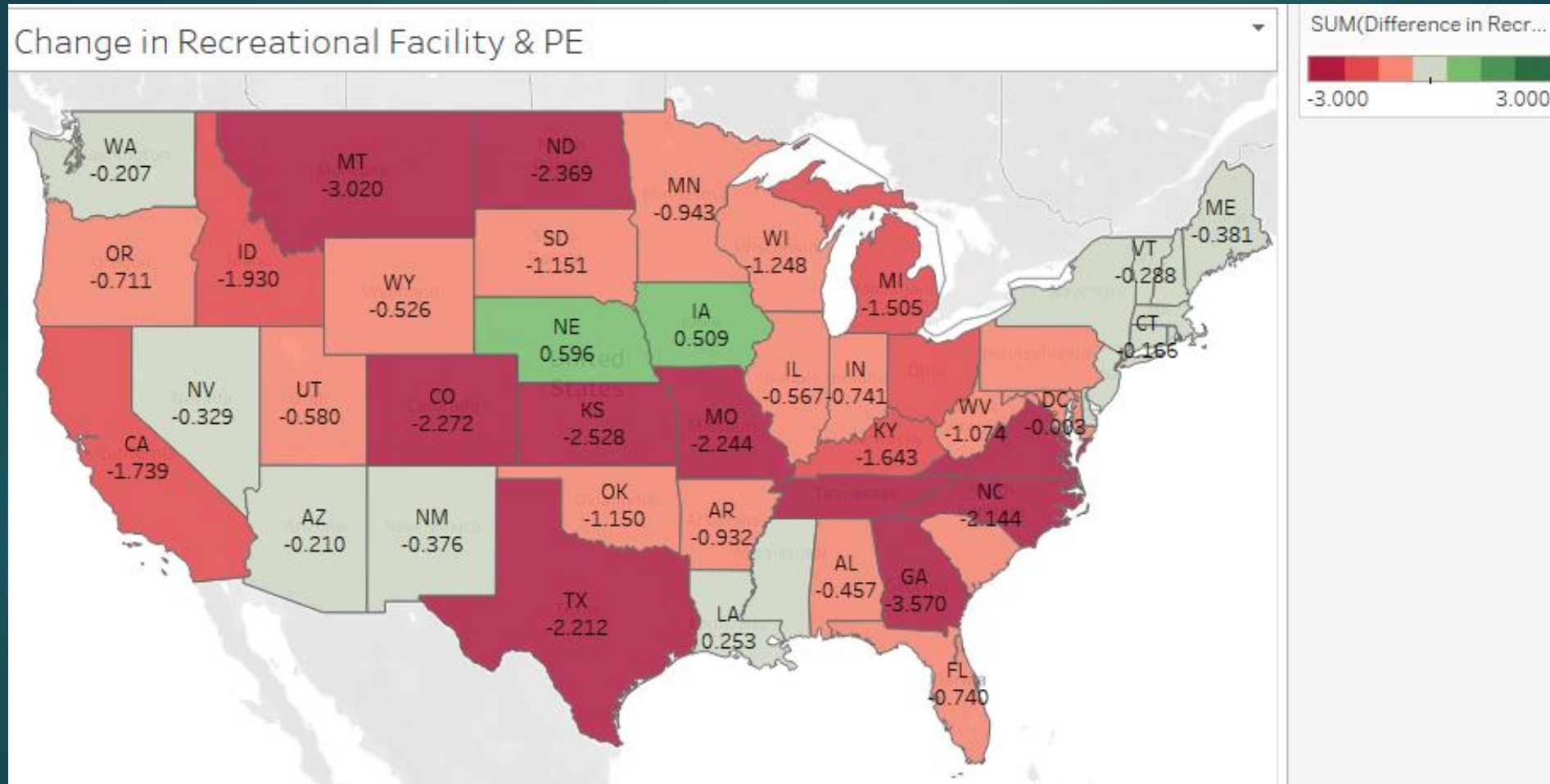
## Recreational & PE Facility for States 2007



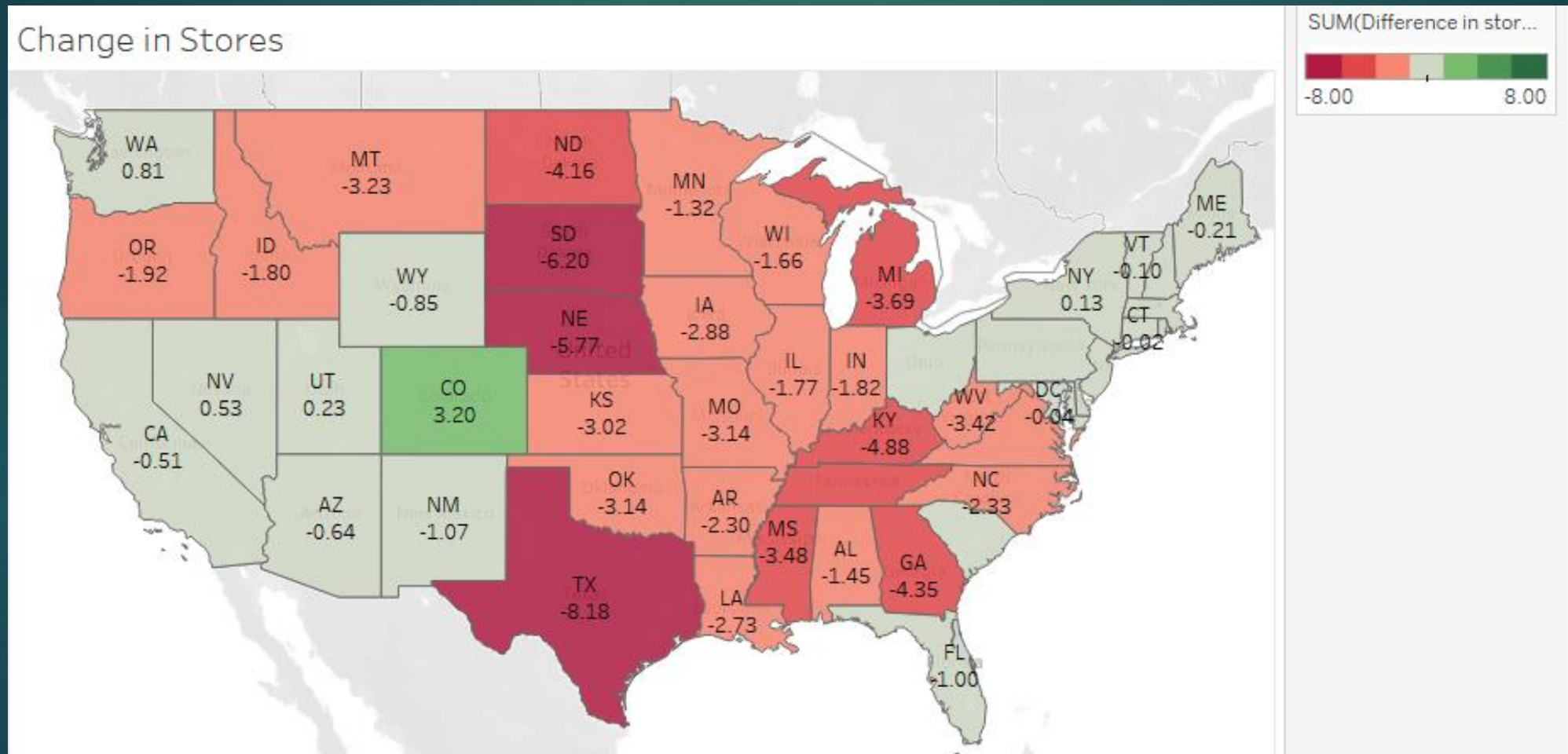
## Recreational & PE Facility for States 2011



# Change in Recreational & PE Facility



# Change in Stores

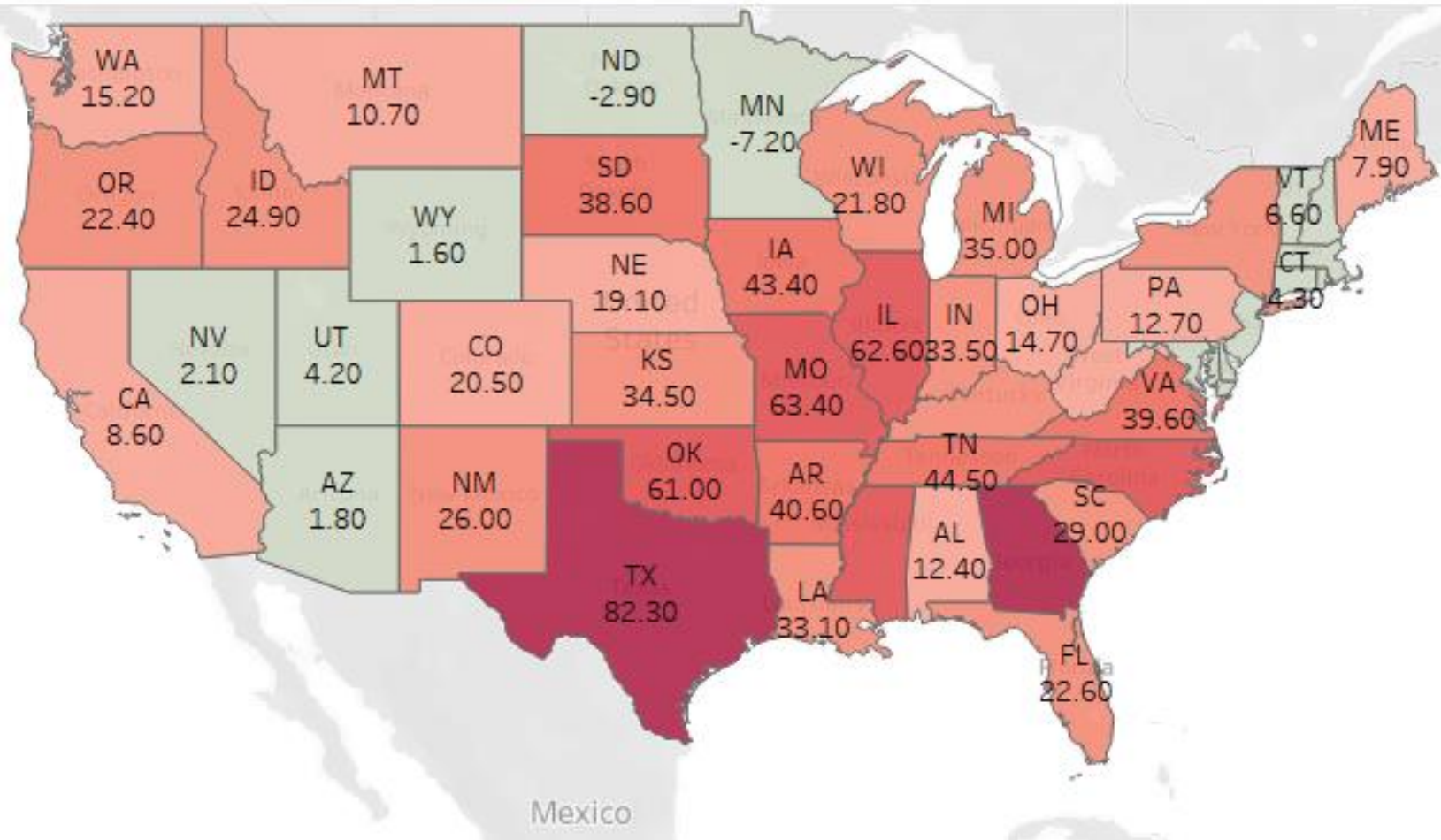


It can be observed from the above map Stores are decreased in few states such as TX.



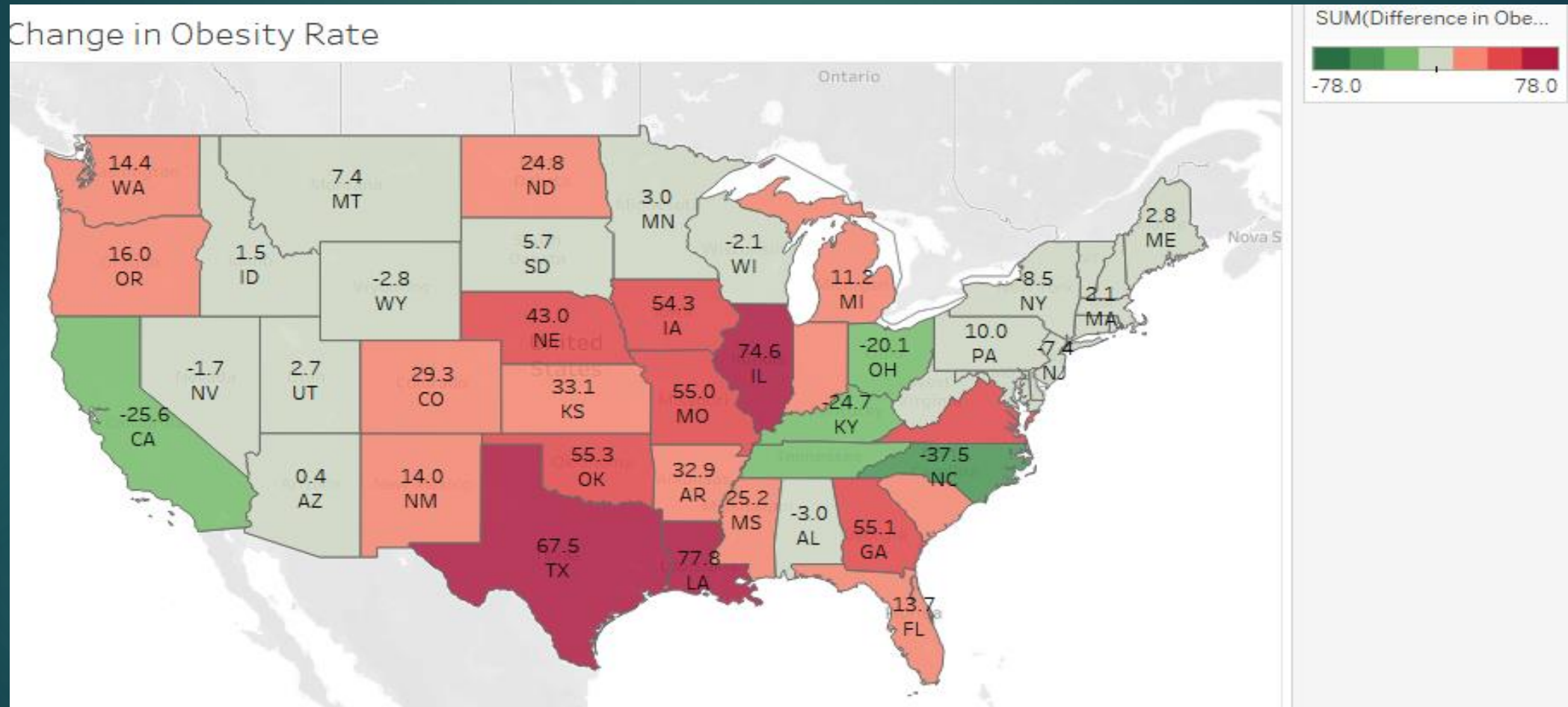
# Change in Diabetes Rate

Change in Diabetes Rate



From the above map it can be observed that Diabetes rate increased in few states which include TX

# Change in Obesity Rate



From the above map it can be observed that Obesity rate increased in few states which include TX



### ► Increase in Diabetes:

► From the above visualizations it is evident that decrease in stores and decrease in Recreational facilities has resulted in increase in Diabetes.

### ► Increase in Obesity:

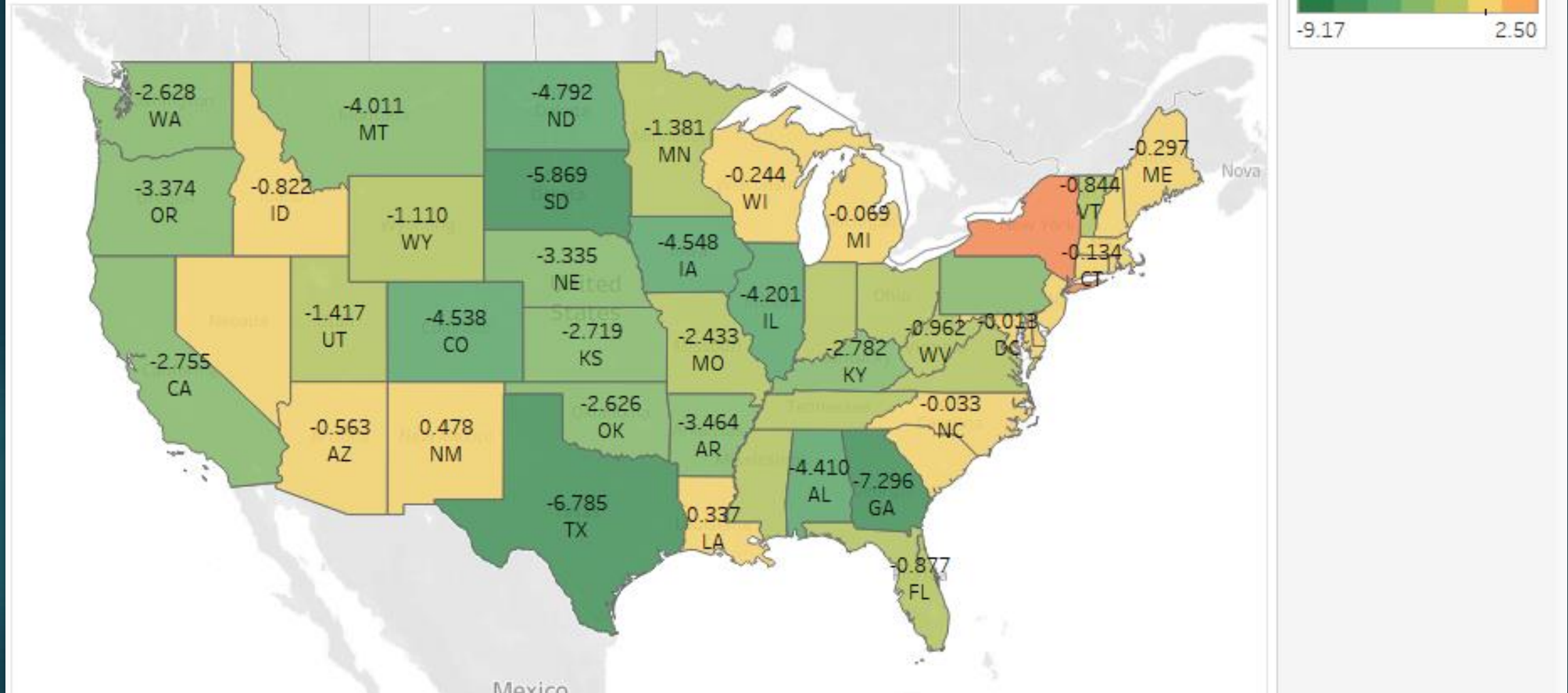
► From the above visualizations it is evident that decrease in stores and decrease in Recreational facilities has resulted in increase in Obesity.

### ► Factors NOT effecting Diabetes & Obesity

► From the provided dataset it is observed that certain food environment indicators are not contributing to Diabetes or Obesity, for example decrease in fast food restaurants typically mean people are opting for healthier food options on contrary decrease in fast food restaurants did not impacted the diabetic, obesity rate which in fact increased.

► \*Please find supportive visualizations below

## Change in Fast Food Restaurants



It can be observed from the above map Fast Food Restaurants were decreased in few states such as TX