



# The Health Equity Index

*Correlating TRI data with health outcomes in Connecticut*



Michael Knapp, PhD  
Managing Director

# Goal of HEI

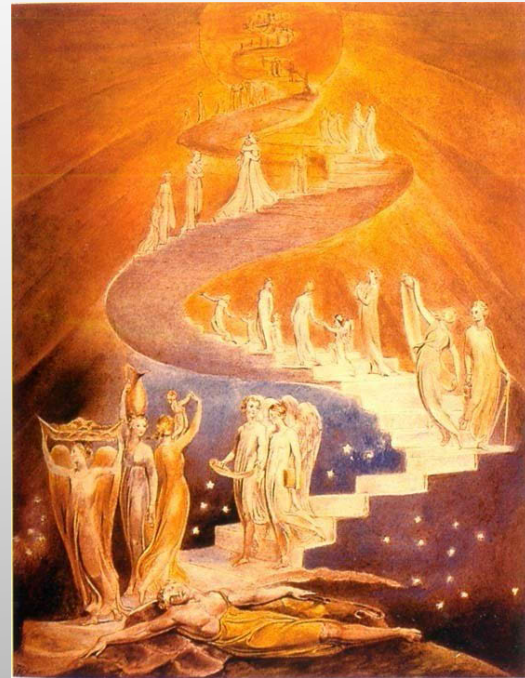
Identify social, political, economic, and environmental conditions correlated with health outcomes.

# A Public Health Ladder?

Promoting  
Equity

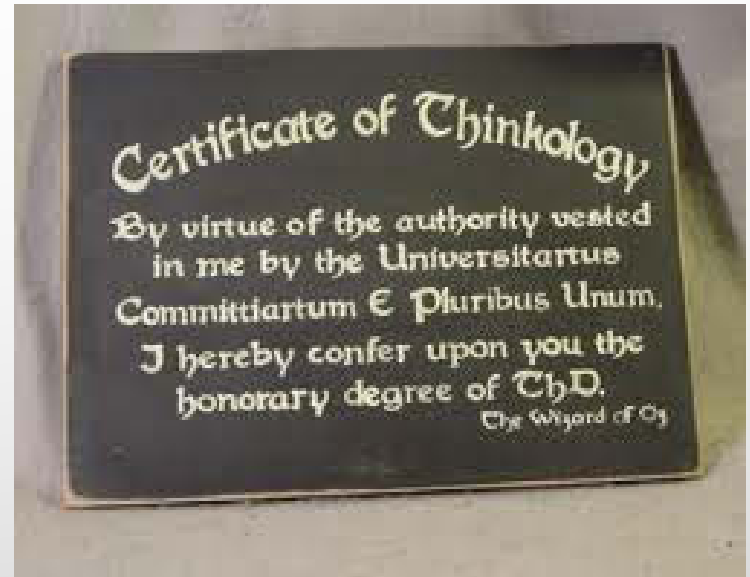
Focusing on  
Preventive Health

Evaluating Medical  
Treatment



Jacob's Ladder by William Blake

# Health and Social Determinant Scores



Walk Score  
**72**

## Very Walkable ?

Most errands can be accomplished on foot.

Arlington

Nearby Apartments

Favorite

[View your latest Credit Scores from All 3 Bureaus in 60 secs-\\$0](#)



This location has a Walk Score of 72 out of 100. This location is Very Walkable so most errands can be accomplished on foot.

This location is a four minute walk from the Blue Metrorail Blue Line and the Yellow Metrorail Yellow Line at the CRYSTAL CITY METRO STATION stop.

This location is in Arlington. Nearby parks include Nina Park, Virginia Highlands Park and Fort Scott Park.

[Read More](#) +

Transit Score  
**71**

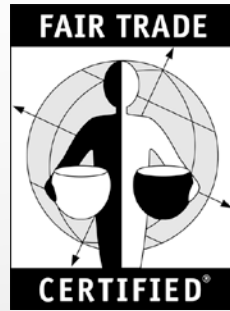
## Excellent Transit

transit is convenient for most trips.

Bike Score  
**79**

## Very Bikeable

Flat as a pancake, excellent bike lanes.



## Welcome to the Health Equity Index

The HEI can identify social, political, economic, and environmental conditions that are most strongly correlated with specific health outcomes.

[Connecticut Towns](#)



### What Does the HEI Do?

- › Highlights conditions in neighborhoods and communities **that lead to poorer health.**
- › Encourages collaboration between local public health, community leaders, municipal colleagues, neighborhood residents, and community organizations to **address health inequities.**
- › Provides focus for policymakers' efforts and investments in prevention, which helps to **improve conditions that promote good health.**

[Find out more](#)

### What Key Data is Involved?

The HEI looks at the correlation between social determinants and health outcomes.

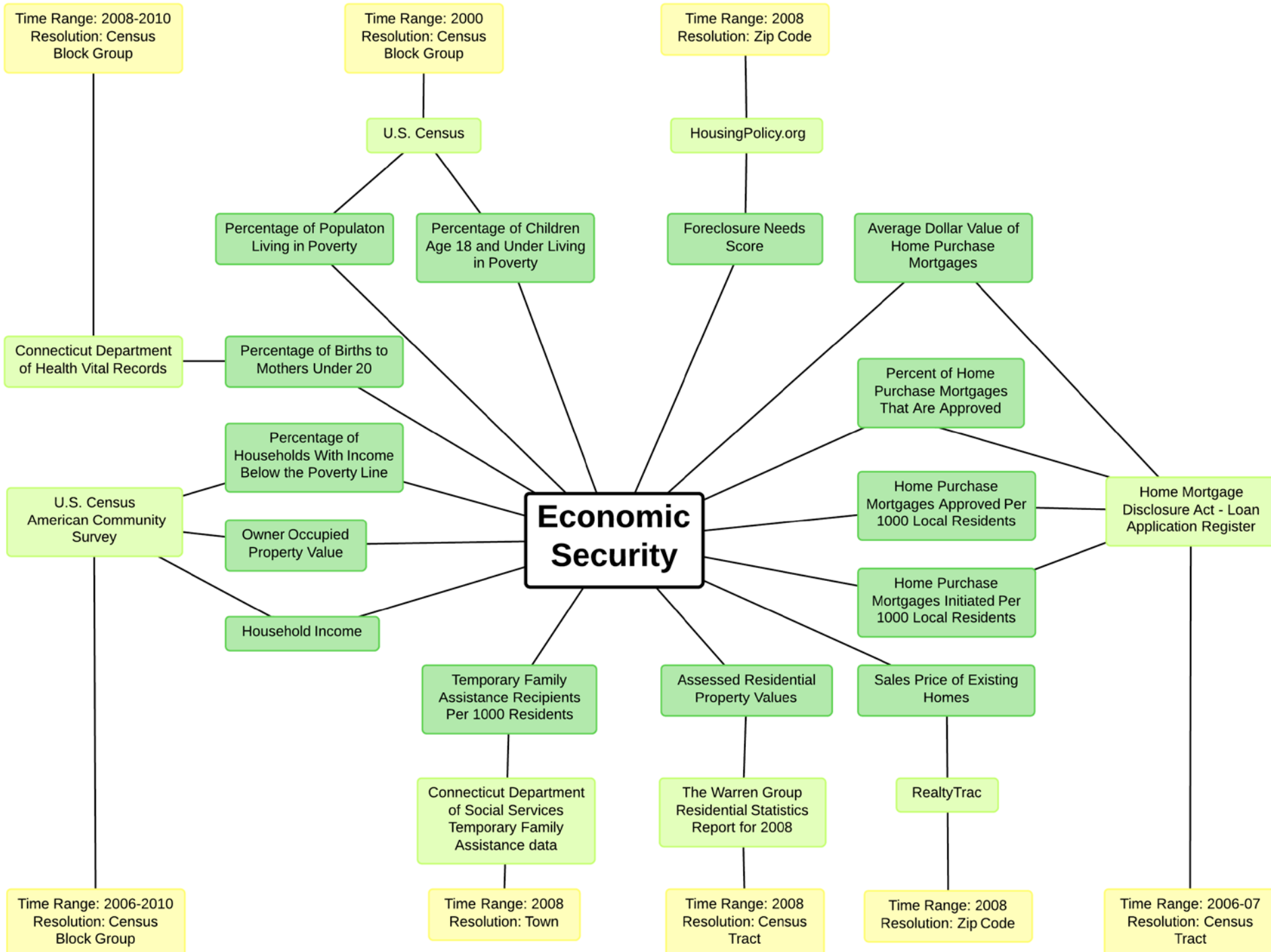
#### Social Determinants

[Civic Involvement](#)  
[Community Safety](#)  
[Economic Security](#)  
[Education](#)  
[Employment](#)  
[Environmental Quality](#)  
[Housing](#)

#### Health Categories

[Accidents/violence](#)  
[Cancer](#)  
[Cardiovascular](#)  
[Childhood Illness](#)  
[Diabetes](#)  
[Health Care Access](#)  
[Infectious Disease](#)  
[Life Expectancy](#)  
[Liver Disease](#)  
[Mental Health](#)  
[Perinatal Care](#)  
[Renal Disease](#)  
[Respiratory Illness](#)







# Bridgeport

Economic Security

**3** Low score

1 = LOW 10 = HIGH

Town Scores

About Indicator

About Town

## About Economic Security

This is an aggregate measure. Its score is the weighted average of the following contributing measures:

Contributing Measure	Score	Weight
Temporary Family Assistance Recipients Per 1000 Residents	1	0.295
Percentage of Populaton Living in Poverty	2	0.290
Percentage of Households With Income Below the Poverty Line	2	0.273
Percentage of Children Age 18 and Under Living in Poverty	2	0.256
Percentage of Births to Mothers Under 20	2	0.286
Percent of Home Purchase Mortgages That Are Approved	2	0.254
Home Purchase Mortgages Initiated Per 1000 Local Residents	9	0.000
Home Purchase Mortgages Approved Per 1000 Local Residents	7	0.085
Household Income	2	0.322
Owner Occupied Property Value	4	0.324
Assessed Residential Property Values	3	0.291
Sales Price of Existing Homes	3	0.292
Average Dollar Value of Home Purchase Mortgages	5	0.292
Foreclosure Needs Score	1	0.266

Correlations

Time-series

Race/Ethnicity

Other Towns

## Correlations within Connecticut

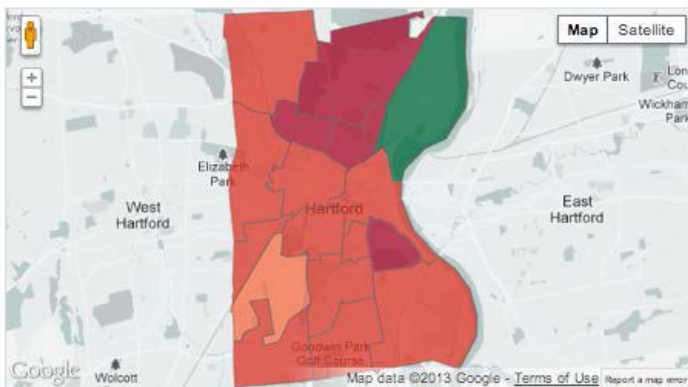
Economic Security

Correlated Measure	Correlation
Childhood Illness	High
Health Care Access	High
Life Expectancy	Medium
Mental Health	Medium
Cardiovascular	Medium
Accidents/violence	Medium
Infectious Disease	Medium
Respiratory Illness	Medium
Diabetes	Medium
Liver Disease	Medium
Renal Disease	Low
Cancer	Low
Perinatal Care	Low

# Hartford

Births Not Receiving Prenatal Care in the First Trimester: **20.44%**

2008-2010



Births Not Receiving Prenatal Care in the First Trimester for neighborhoods in Hartford (2008-2010)

[KML](#)

Neighborhood Scores

About Indicator

About Town

## Neighborhood scores in Hartford

Births Not Receiving Prenatal Care in the First Trimester (access08)

Neighborhoods	access08	Population
Asylum Hill	2	11,095
Barry Square	2	16,292
Behind-the-Rocks	3	8,408
Blue Hills	2	9,893
Clay Arsenal	1	6,429
Downtown	2	949
Frog Hollow	2	9,091
North Meadows	10	923
Northeast	1	10,156

Correlations

Time-series

Race/Ethnicity

Other Towns

## Correlations within Connecticut

Births Not Receiving Prenatal Care in the First Trimester

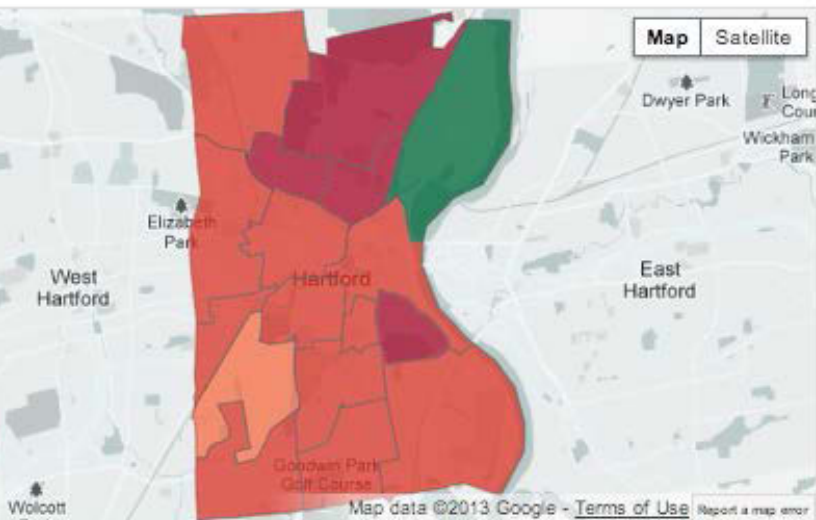
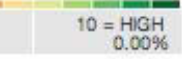
Correlated Measure	Correlation
Racial and Ethnic Diversity Index	High
Race: White	High
Percentage of Births to Mothers Under 20	High
Household Income	High
Owner Occupied Housing as a Percentage of Total Housing Units	High
Percentage of Populaton Living in Poverty	High
Race: Black or African American	High
Population Density	High
Percent of Adults With at Least a Bachelor's Degree	High
Percentage of Households With Income Below the Poverty Line	High
Ethnicity: Hispanic or Latino	High
Race: Other	High
Percentage of Children Age 18 and Under Living in Poverty	High
Owner Occupied Property Value	Medium
Percent of Adults With Less Than a 9th Grade Education	Medium
Show More...	

# Hartford

Births Not Receiving Prenatal Care in the First Trimester: **20.44%**

2008-2010

## Raw score



Births Not Receiving Prenatal Care in the First Trimester for neighborhoods in Hartford (2008-2010)

## Correlation Details

Direct correlation (High)  
 Spearmans's rank ( $R_s$ ) **0.48**

Higher values of **Births Not Receiving Prenatal Care in the First Trimester** are strongly correlated to higher values of **Percentage of Births to Mothers Under 20**

### Correlations within Connecticut

Births Not Receiving Prenatal Care in the First Trimester

Correlated Measure	Cut point	Spearmans's rank ( $R_s$ )
<a href="#">Racial and Ethnic Diversity Index</a>	Low	0.05
<a href="#">Race: White</a>	Medium	0.2
<a href="#">Percentage of Births to Mothers Under 20</a>	High	0.4

[Household Income](#) ⬇ High

[Owner Occupied Housing as a Percentage of Total Housing Units](#) ⬇ High

[Percentage of Population Living in Poverty](#) ⬇ High

[Race: Black or African American](#) ⬇ High

[Population Density](#) ⬇ High

[Percent of Adults With at Least a Bachelor's Degree](#) ⬇ High

[Percentage of Households With Income Below the Poverty Line](#) ⬇ High

[Ethnicity: Hispanic or Latino](#) ⬇ High

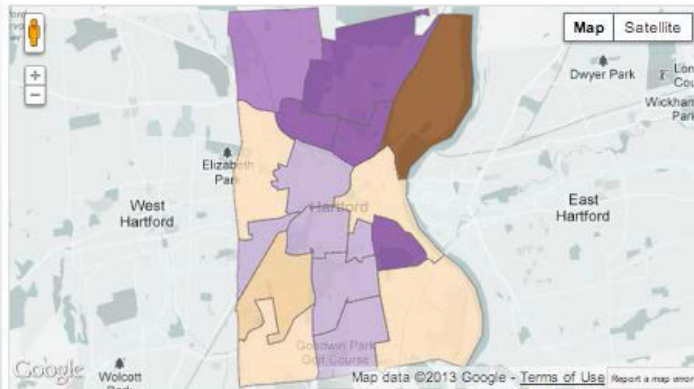
[Race: Other](#) ⬇ High



# Hartford

Births Not Receiving Prenatal Care in the First Trimester: **20.44%**

2008-2010



Births Not Receiving Prenatal Care in the First Trimester for neighborhoods in Hartford (2008-2010)

[KML](#)

Neighborhood Scores

About Indicator

About Town

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Northeast	2	10,156

Correlations

Time-series

Race/Ethnicity

Other Towns

## Towns with similar demographics to Hartford

Births Not Receiving Prenatal Care in the First Trimester (access08)

Town	access08	Population
Bridgeport	6	138,668
New Britain	3	71,203
New Haven	4	125,318
New London	8	25,782
Waterbury	8	107,847
Windham	7	23,920

# Probability Distribution Function



$$\text{Burden Score} = \sum_{i=1}^n a e^{(-1 * \frac{x_i^2}{2s^2})}$$

for all  $x_i$  from  $i=1$  to  $n$ , where:

$x_i$  is the distance between the block centroid and a proximate point source ' $i$ ' within a maximum radius (4.5 miles)

$a$  is a value of the point source

$s$  is spread constant (1.5 miles)

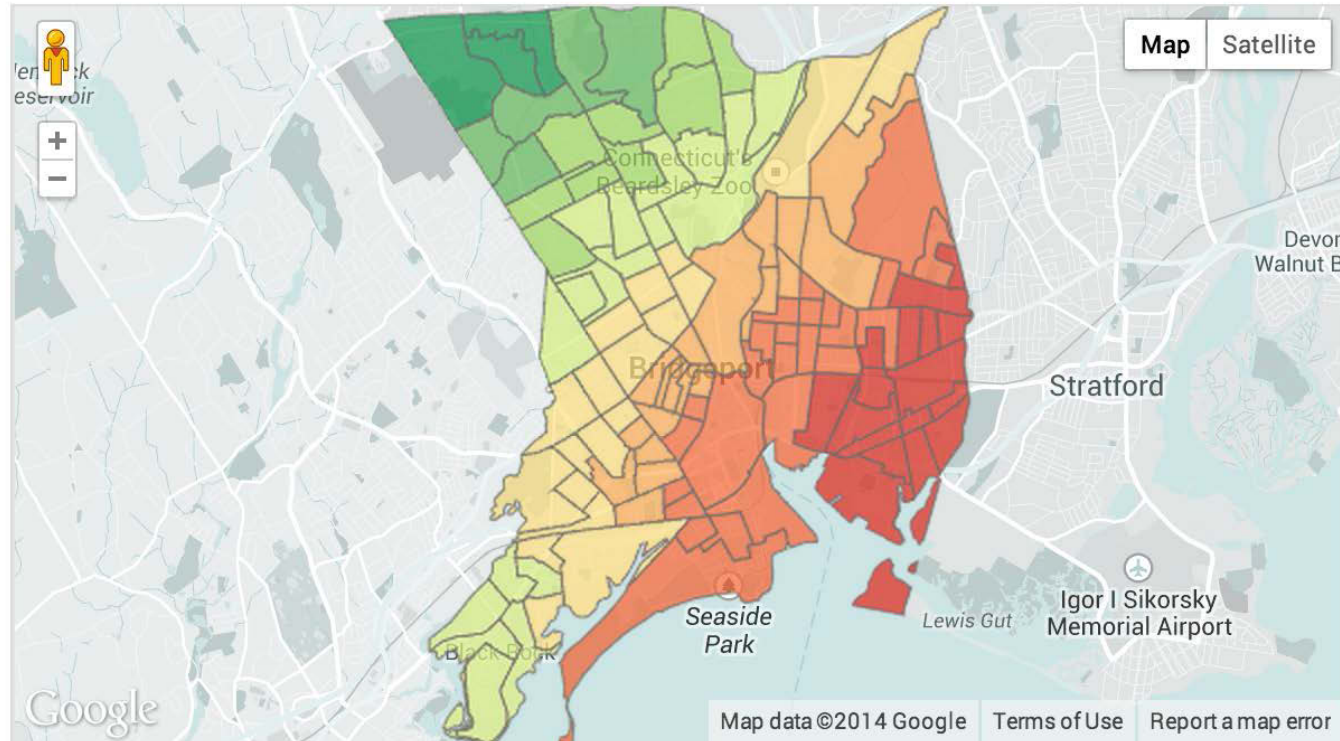
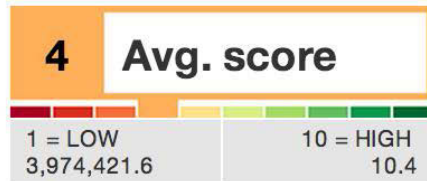
$n$  is the number of proximate point sources

# Bridgeport

Federal Toxic Release Inventory (Tri): Waste Stream in Pounds:

**138,253.9**

📅 2008



Federal Toxic Release Inventory (Tri): Waste Stream in Pounds for census block groups in Bridgeport (2008) [KML](#)

View Data

Town

Indicator

Stratification

State

Similar Towns

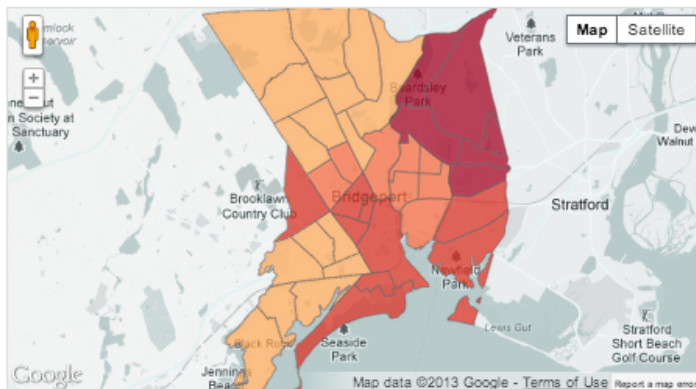
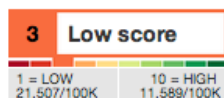
Jump to City or Zip Code



# Bridgeport

Ambulatory Care Sensitive Hospitalizations: **17,087 per 100,000**

2005-2010



Ambulatory Care Sensitive Hospitalizations for census tracts in Bridgeport (2005-2010) [KML](#)

Census Tract Scores

About Indicator

About Town

## Ambulatory Care Sensitive Hospitalizations

### About Indicator

The rate of ambulatory-care-sensitive (ACS) hospitalizations measures those in-patient hospitalizations that might have been avoided if timely and effective treatment had been received previously in an outpatient setting such as primary care. This algorithm is based on the work from the New York University Center for Health and Public Services Research. The list of "Ambulatory Care Sensitive" conditions by DRG code is available at [http://wagner.nyu.edu/chpsr/acs\\_codes.pdf](http://wagner.nyu.edu/chpsr/acs_codes.pdf) and the algorithm is described at <http://wagner.nyu.edu/chpsr/index.html?p=70>

### Rationale

ACS hospitalization is often used as a proxy measure to gauge the accessibility and adequacy of primary care services for population sub-groups and geographic areas. Although chronic conditions may not in

Grouping	Health Categories
Category	Health Care Access
Time Range	2005-2010
Resolution	Zip Code
Short Name	access05

Correlations

Time-series

Race/Ethnicity

Other Towns

### Correlations within Connecticut

Ambulatory Care Sensitive Hospitalizations

Correlated Measure	Correlation
Foreclosure Needs Score	High
Federal Toxic Release Inventory (Tri): Number of Facilities Reporting	High
Federal Toxic Release Inventory (Tri): Total Air Emissions in Pounds	High
Percent of Adults With Less Than a 9th Grade Education	High
Labor Force Participation as a Percentage of Males 16 and Older	High
Racial and Ethnic Diversity Index	High
Population Density	High
Federal Toxic Release Inventory (Tri): Waste Stream in Pounds	High
Percent of Home Purchase Mortgages That Are Approved	Medium
Unemployment Rate as a Percent of the Civilian Labor Force	Medium
Race: White	Medium
Percentage of Households With Income Below the Poverty Line	Medium
Race: Black or African American	Medium
Race: Other	Medium
Management Workers as a Percent of Total Employment	Medium

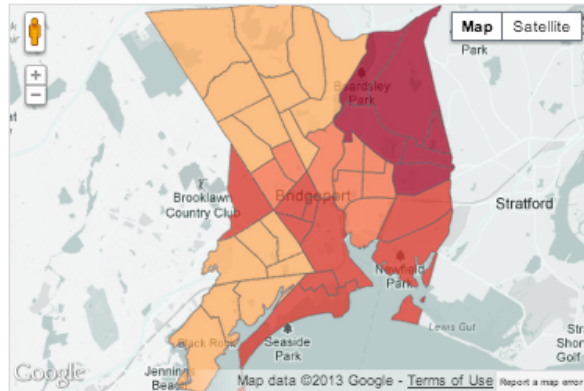
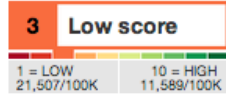
Show More...



# Bridgeport Ambulatory Care Sensitive Hospitalizations compared to Federal Toxic Release Inventory (Tri): Number of Facilities Reporting

Ambulatory Care Sensitive Hospitalizations: **17,087 per 100,000**

2005-2010

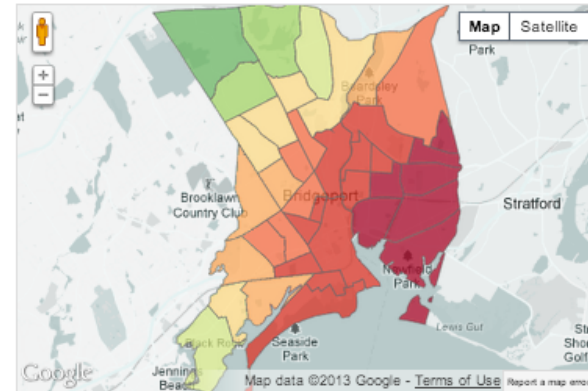
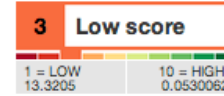


Ambulatory Care Sensitive Hospitalizations for census tracts in Bridgeport (2005-2010) [KML](#)

Federal Toxic Release Inventory (Tri): Number of Facilities Reporting:

**3.92184**

2008



Federal Toxic Release Inventory (Tri): Number of Facilities Reporting for census tracts in Bridgeport (2008) [KML](#)

## Correlation & Scores

Time

Race/Ethnicity

About Ambulatory C...

About Federal Toxi...

About Bridgeport

### High Positive Correlation

Spearman's rank correlation coefficient ( $R_s$ ) of **0.56**

The correlation implies that higher values of **Ambulatory Care Sensitive Hospitalizations** are strongly correlated to higher values of **Federal Toxic Release Inventory (Tri): Number of Facilities Reporting**

#### How is this calculated?

This correlation is performed at the zip code level, which is the highest common resolution between the data sets of these two measures.

### Census tract scores in Bridgeport

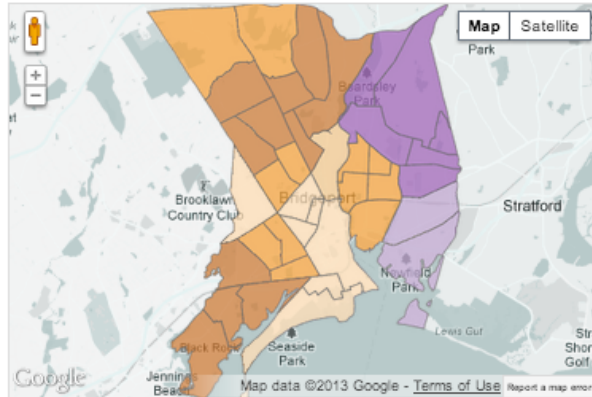
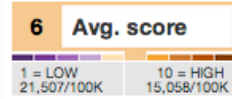
Ambulatory Care Sensitive Hospitalizations (access05) and

Federal Toxic Release Inventory (Tri): Number of Facilities Reporting (evq04)

Census Tracts	access05 scores	evq04 scores	Population
072900	4	5	4,583
072700	4	7	3,798
072100	2	4	5,989
071100	4	3	4,971
070600	2	2	2,188
072000	3	4	3,350
071700	3	2	840
070400	2	2	1,423
071200	4	3	5,020
071400	2	3	3,956

Ambulatory Care Sensitive Hospitalizations: **17,087 per 100,000**

2005-2010

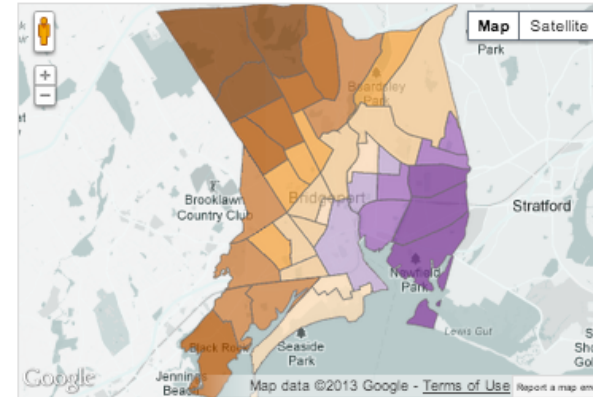
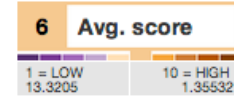


Ambulatory Care Sensitive Hospitalizations for census tracts in Bridgeport (2005-2010) [KML](#)

Federal Toxic Release Inventory (Tri): Number of Facilities Reporting:

**3.92184**

2008



Federal Toxic Release Inventory (Tri): Number of Facilities Reporting for census tracts in Bridgeport (2008) [KML](#)

**Correlation & Scores**

Time

Race/Ethnicity

About Ambulatory C...

About Federal Toxi...

About Bridgeport

No Significant Correlation

Spearman's rank correlation coefficient ( $R_s$ ) of **0.00**

**How is this calculated?**

This correlation is performed at the zip code level, which is the highest common resolution between the data sets of these two measures.

**Census tract scores in Bridgeport**

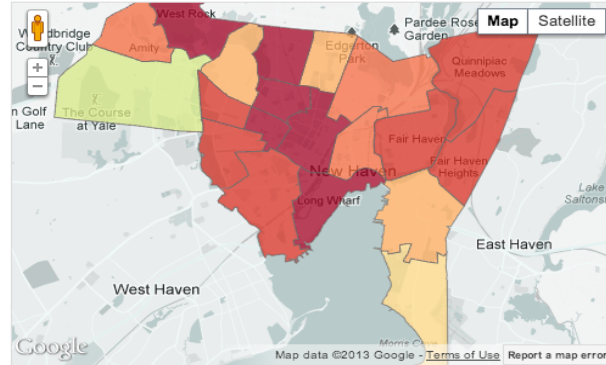
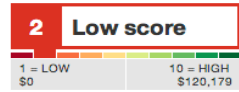
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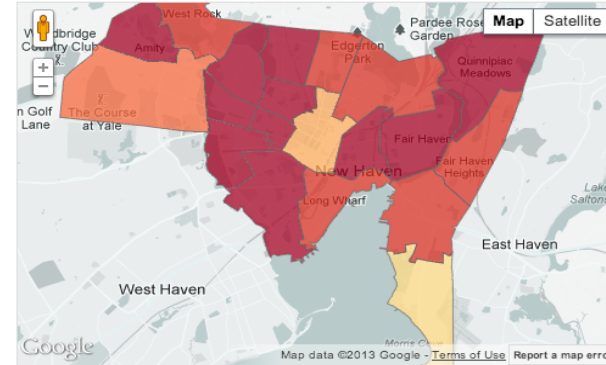
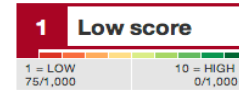
# New Haven Household Income compared to Chlamydia/gonorrhea Rate Per 1000 Residents

Household Income: **\$41,074**  
 2006-2010



Household Income for neighborhoods in New Haven (2006-2010) [KML](#)

Chlamydia/gonorrhea Rate Per 1000 Residents: **13 per 1,000**  
 2006-2009



Chlamydia/gonorrhea Rate Per 1000 Residents for neighborhoods in New Haven (2006-2009) [KML](#)

- Correlation & Scores**
- Time
- Race/Ethnicity
- About Household In...
- About Chlamydia/go...
- About New Haven

## High Negative Correlation

Spearman's rank correlation coefficient ( $R_s$ ) of **-0.69**

The correlation implies that higher values of **Household Income** are strongly correlated to lower values of **Chlamydia/gonorrhea Rate Per 1000 Residents**

### How is this calculated?

This correlation is performed at the census block group level, which is the highest common resolution between the data sets of these two measures.

## Neighborhood scores in New Haven

Household Income (estinc01) and Chlamydia/gonorrhea Rate Per 1000 Residents (diseas02)

Neighborhoods	estinc01 scores	diseas02 scores	Population
Amity	3	1	4,664
Annex	4	2	5,932
Beaver Hills	4	1	6,056
Dixwell	1	1	5,012
Downtown	1	4	10,926
Dwight	1	1	5,239
East Rock	3	2	9,006
East Shore	5	5	4,405
Edgewood	2	1	5,075
Fair Haven	2	1	12,640
Fair Haven Heights	2	2	6,829
Hill	2	1	13,601
Long Wharf	1	2	1,764

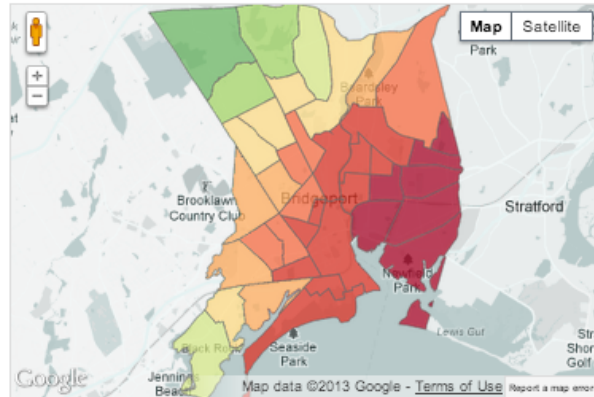
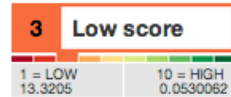
# Bridgeport Federal Toxic Release Inventory (Tri): Number of Facilities Reporting compared to Chlamydia/gonorrhea Rate Per 1000

## Residents

Federal Toxic Release Inventory (Tri): Number of Facilities Reporting:

**3.92184**

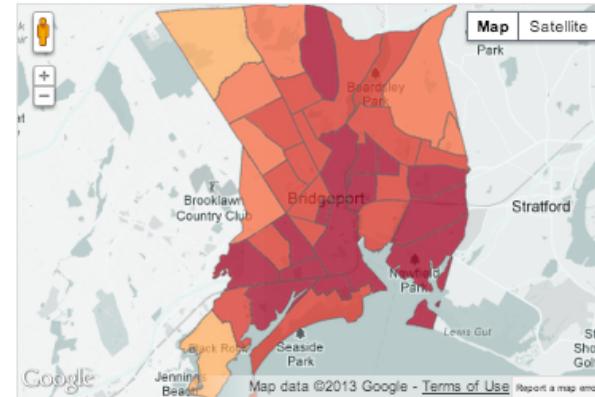
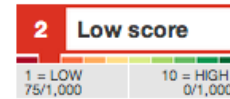
2008



Federal Toxic Release Inventory (Tri): Number of Facilities Reporting for census tracts in Bridgeport (2008) [KML](#)

Chlamydia/gonorrhea Rate Per 1000 Residents: **9 per 1,000**

2006-2009



Chlamydia/gonorrhea Rate Per 1000 Residents for census tracts in Bridgeport (2006-2009) [KML](#)

Correlation & Scores

Time

**Race/Ethnicity**

About Federal Toxi...

About Chlamydia/go...

About Bridgeport

### Correlations by Race/Ethnicity

between Federal Toxic Release Inventory (Tri): Number of Facilities Reporting and Chlamydia/gonorrhea Rate Per 1000 Residents

#### State-wide correlation by race/ethnicity

Race/ethnicity	Correlation	R <sub>s</sub>
Black or African American	Medium	0.28
Hispanic or Latino	Medium	0.39
White	High	0.48

#### Interpreting the correlation

Where sufficient population numbers permit, and if determinants contain racial and ethnic information, neighborhood scoring and correlations are stratified by race and ethnicity.

If one observes scores and correlations hold constant across race/ethnicity groupings, this suggests race and ethnicity is not a confounder or effect modifier.

Inconsistent correlations or scores may indicate that race/ethnicity is important in interpreting the observed patterns.

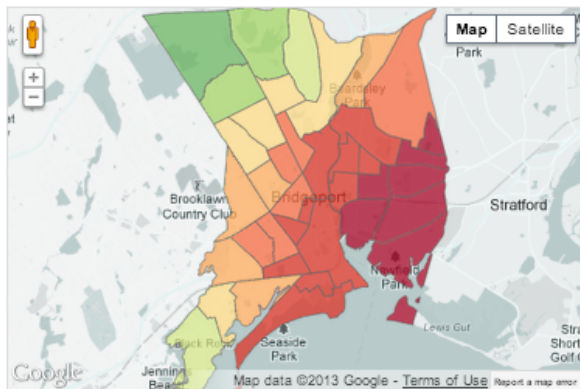
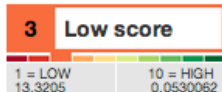
**▲ Only Chlamydia/gonorrhea Rate Per 1000 Residents (diseas02) is stratified over Race/Ethnicity.**

## Residents

Federal Toxic Release Inventory (Tri): Number of Facilities Reporting:

**3.92184**

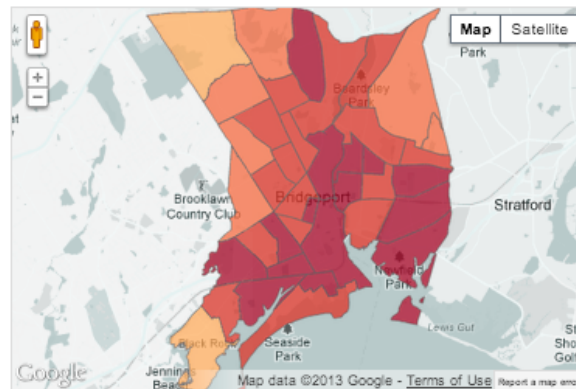
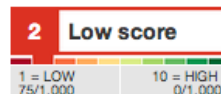
2008



Federal Toxic Release Inventory (Tri): Number of Facilities Reporting for census tracts in Bridgeport (2008) [KML](#)

Chlamydia/gonorrhea Rate Per 1000 Residents: **9 per 1,000**

2006-2009



Chlamydia/gonorrhea Rate Per 1000 Residents for census tracts in Bridgeport (2006-2009) [KML](#)

Correlation & Scores

**Time**

Race/Ethnicity

About Federal Toxi...

About Chlamydia/go...

About Bridgeport

### Correlations over time

between Federal Toxic Release Inventory (Tri): Number of Facilities Reporting and Chlamydia/gonorrhea Rate Per 1000 Residents

#### State-wide correlation by time

Time	Correlation	R <sub>s</sub>
2009-2010	High	0.48
2008-2009	High	0.48
2007-2008	High	0.47
2006-2007	High	0.47

#### Interpreting the correlation

While not a significance test per se, if you observe that correlations stay constant over time, this offers more confidence that the finding are not an anomaly that existed at only one period in time. A consistent increase or decrease over time in the magnitude of the correlations also provides some measure of certainty in the observations. These are findings worth investigating further.

On the other hand, inconsistent correlations over time suggest the findings could be due to random variation in small samples. This diminishes the certainty of the measured correlation at any particular moment in time.

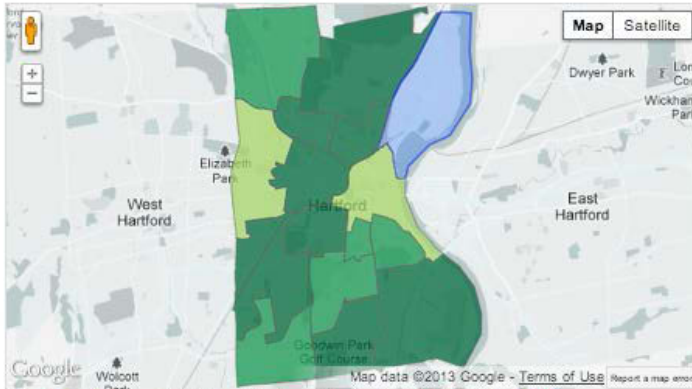
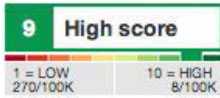
▲ Only Chlamydia/gonorrhea Rate Per 1000 Residents (diseas02) is stratified over Time.



# Hartford

Skin Cancer Incidence Rate: **9 per 100,000**

2006-2010



Skin Cancer Incidence Rate for neighborhoods in Hartford (2006-2010) [KML](#)

## Neighborhood Scores

About Indicator

About Town

### Neighborhood scores in Hartford

Skin Cancer Incidence Rate (diseas18)

Neighborhoods	diseas18	Population
Asylum Hill	10	11,095
Barry Square	9	16,292
Behind-the-Rocks	10	8,408
Blue Hills	9	9,893
Clay Arsenal	10	6,429
Downtown	7	949
Frog Hollow	10	9,091
North Meadows	N/A	923
Northeast	10	10,156
Parkville	10	5,237

Correlations

**Time-series**

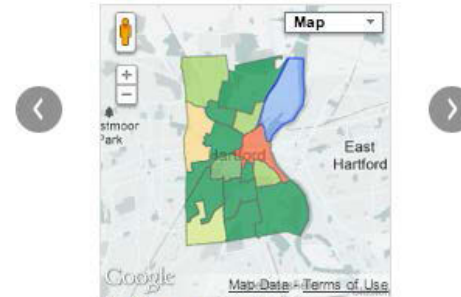
Race/Ethnicity

Other Towns

### Time-series

There are 5 time-series for Skin Cancer Incidence Rate: 2006-2007, 2007-2008, 2008-2009, 2009-2010, and 2010-2011

2006-2007 **8** 10 per 100,000



Skin Cancer Incidence Rate for neighborhoods in Hartford [KML](#)

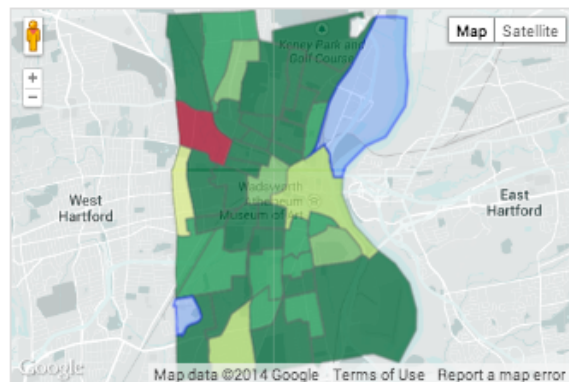
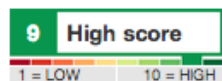
### Scores over time in Hartford

Skin Cancer Incidence Rate (diseas18)

Neighborhood	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	Pop 2007
Asylum Hill	9	9	9	8	8	11,095
Barry Square	9	5	9	9	8	16,292
Behind-the-Rocks	9	8	9	8	8	8,408
Blue Hills	7	8	7	8	8	9,893
Clay Arsenal	7	9	9	9	9	6,429
Downtown	3	9	9	9	3	949
Frog Hollow	8	9	9	9	9	9,091
North Meadows	N/A	N/A	N/A	N/A	N/A	923
Northeast	9	9	9	9	9	10,156
Parkville	9	9	6	9	9	5,237
Sheldon-	-	-	-	-	-	3,192

## Skin Cancer Incidence Rate

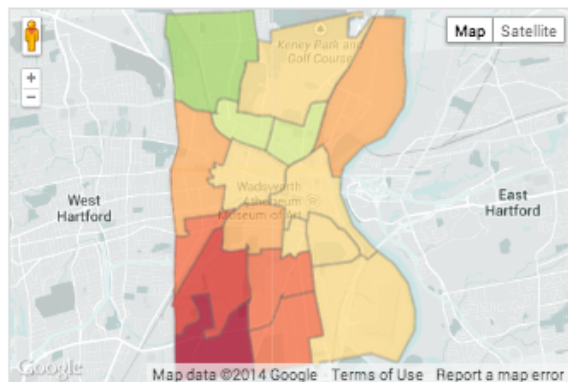
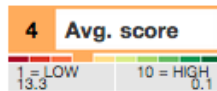
2006-2010



Skin Cancer Incidence Rate for census tracts in Hartford (2006-2010) [KML](#)

## Federal Toxic Release Inventory (Tri): Number of Facilities Reporting: 2.8

2008



Federal Toxic Release Inventory (Tri): Number of Facilities Reporting for neighborhoods in Hartford (2008) [KML](#)

### Correlation & Scores

Time

Race/Ethnicity

About Skin Cancer ...

About Federal Toxi...

About Hartford

### Medium Negative Correlation

Spearman's rank correlation coefficient ( $R_s$ ) of **-0.47**

The correlation implies that higher values of **Skin Cancer Incidence Rate** are correlated to lower values of **Federal Toxic Release Inventory (Tri): Number of Facilities Reporting**

### How is this calculated?

This correlation is performed at the census tract level, which is the highest common resolution between the data sets of these two measures.

### Census tract scores in Hartford

Skin Cancer Incidence Rate and

Federal Toxic Release Inventory (Tri): Number of Facilities Reporting

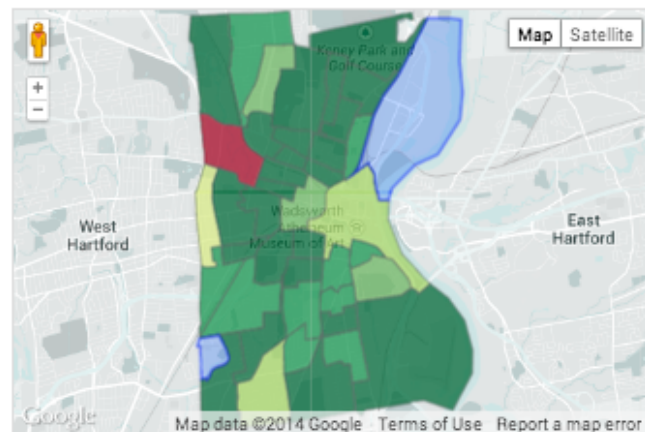
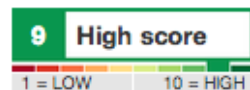
Census Tracts	Skin Cancer Incidence Rate	Federal Toxic Release Inventory (Tri): Number of Facilities Reporting	Population
502500	10	5	1,825
502100	7	5	949
503200	8	5	650
504200	10	4	4,740
503400	10	6	2,412
503100	10	5	5,136
503300	10	6	2,897
503800	10	8	1,263
501500	10	6	3,411
501400	10	6	2,463
501700	10	6	1,618



# Hartford Skin Cancer Incidence Rate compared to Federal Toxic Release Inventory (Tri): Number of Facilities Reporting

## Skin Cancer Incidence Rate

2006-2010

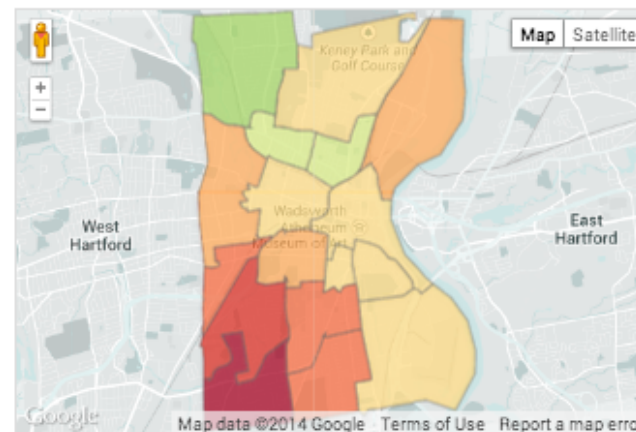
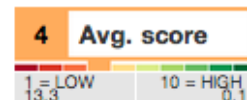


Skin Cancer Incidence Rate for census tracts in Hartford (2006-2010) [KML](#)

## Federal Toxic Release Inventory (Tri): Number of Facilities Reporting

Reporting: **2.8**

2008



Federal Toxic Release Inventory (Tri): Number of Facilities Reporting for neighborhoods in Hartford (2008) [KML](#)

Correlation & Scores

**Time**

Race/Ethnicity

About Skin Cancer ...

About Federal Toxi...

About Hartford

### Correlations Over Time

between Skin Cancer Incidence Rate and Federal Toxic Release Inventory (Tri): Number of Facilities Reporting

#### State-wide correlation by time

Time	Correlation	R <sub>s</sub>
2010-2011	● <b>Medium</b>	-0.41
2009-2010	● <b>Medium</b>	-0.33
2008-2009	● <b>Medium</b>	-0.36
2007-2008	● <b>Low</b>	-0.27
2006-2007	● <b>Medium</b>	-0.31

#### Interpreting the correlation

While not a significance test per se, if you observe that correlations stay constant over time, this offers more confidence that the finding are not an anomaly that existed at only one period in time. A consistent increase or decrease over time in the magnitude of the correlations also provides some measure of certainty in the observations. These are findings worth investigating further.

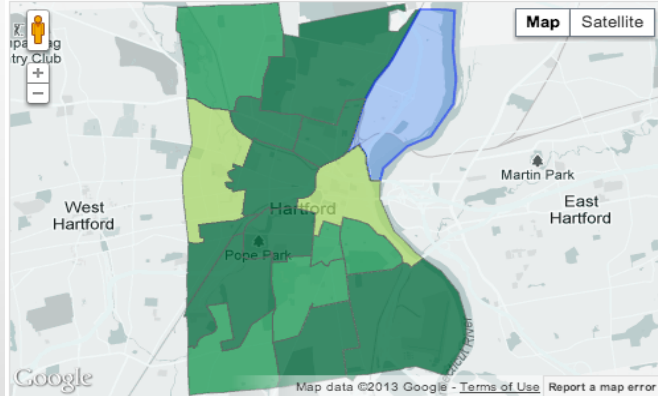
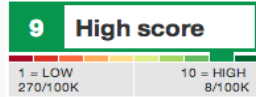
On the other hand, inconsistent correlations over time suggest the findings could be due to random variation in small samples. This diminishes the certainty of the measured correlation at any particular moment in time.

▲ Only Skin Cancer Incidence Rate is stratified over Time.

# Hartford Skin Cancer Incidence Rate compared to Household Income

Skin Cancer Incidence Rate: **9 per 100,000**

2006-2010

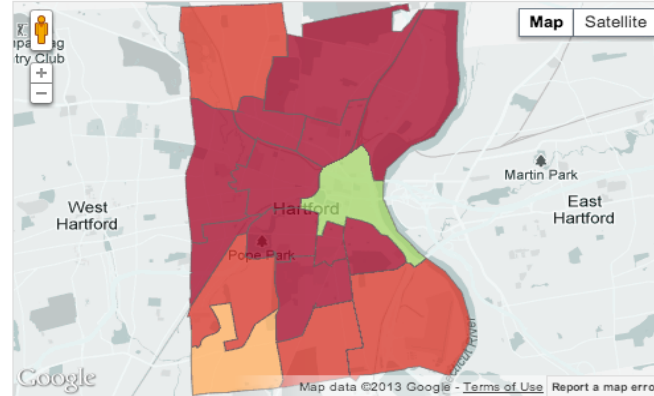
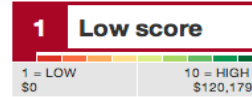


Skin Cancer Incidence Rate for neighborhoods in Hartford (2006-2010) [KML](#)

[KML](#)

Household Income: **\$30,730**

2006-2010



Household Income for neighborhoods in Hartford (2006-2010) [KML](#)

Correlation & Scores

**Time**

Race/Ethnicity

About Skin Cancer ...

About Household In...

About Hartford

## Correlations over time

between Skin Cancer Incidence Rate and Household Income

### State-wide correlation by time

Time	Correlation	R <sub>s</sub>
2010-2011	High	0.57
2009-2010	High	0.53
2008-2009	High	0.54
2007-2008	Medium	0.49
2006-2007	Medium	0.47

### Interpreting the correlation

While not a significance test per se, if you observe that correlations stay constant over time, this offers more confidence that the finding are not an anomaly that existed at only one period in time. A consistent increase or decrease over time in the magnitude of the correlations also provides some measure of certainty in the observations. These are findings worth investigating further.

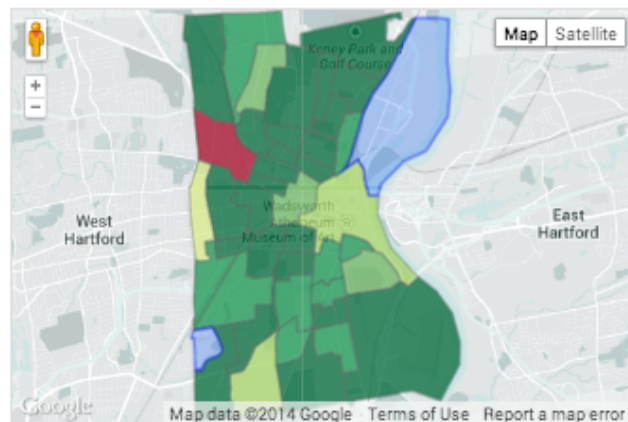
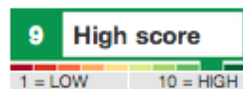
On the other hand, inconsistent correlations over time suggest the findings could be due to random variation in small samples. This diminishes the certainty of the measured correlation at any particular moment in time.

▲ Only Skin Cancer Incidence Rate (diseas18) is stratified over Time.

# Hartford Skin Cancer Incidence Rate compared to Federal Toxic Release Inventory (Tri): Number of Facilities Reporting

## Skin Cancer Incidence Rate

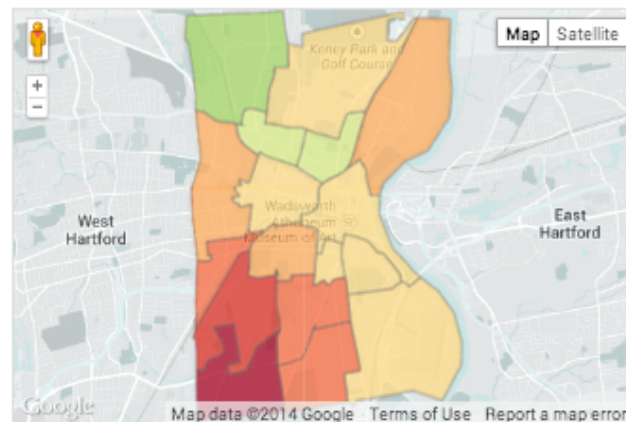
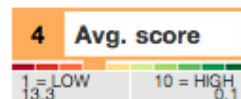
2006-2010



Skin Cancer Incidence Rate for census tracts in Hartford (2006-2010) [KML](#)

## Federal Toxic Release Inventory (Tri): Number of Facilities Reporting: 2.8

2008



Federal Toxic Release Inventory (Tri): Number of Facilities Reporting for neighborhoods in Hartford (2008) [KML](#)

Correlation & Scores

Time

**Race/Ethnicity**

About Skin Cancer ...

About Federal Toxi...

About Hartford

### Correlations by Race/Ethnicity

between Skin Cancer Incidence Rate and Federal Toxic Release Inventory (Tri): Number of Facilities Reporting

#### State-wide correlation by race/ethnicity

Race/ethnicity	Correlation	$R_s$
Black or African American	None	-0.02
Hispanic or Latino	None	0.00
White	Medium	-0.35

#### Interpreting the correlation

Where sufficient population numbers permit, and if determinants contain racial and ethnic information, neighborhood scoring and correlations are stratified by race and ethnicity.

If one observes scores and correlations hold constant across race/ethnicity groupings, this suggests race and ethnicity is not a confounder or effect modifier.

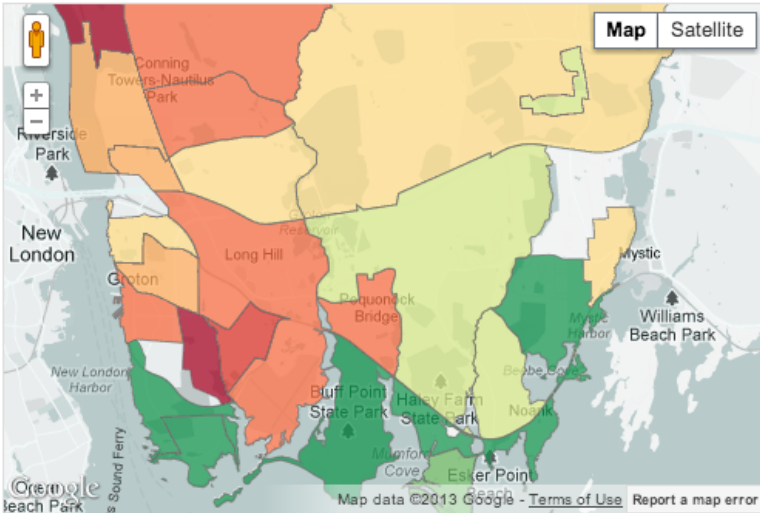
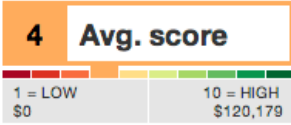
Inconsistent correlations or scores may indicate that race/ethnicity is important in interpreting the observed patterns.

▲ Only Skin Cancer Incidence Rate is stratified over Race/Ethnicity.

# Groton Household Income compared to Births Not Receiving Prenatal Care in the First Trimester

Household Income: **\$59,721**

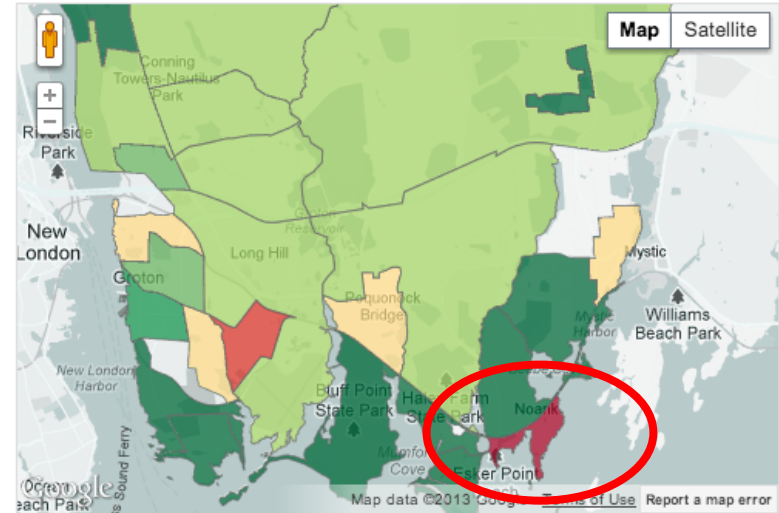
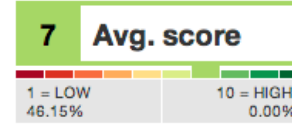
2006-2010



Household Income for neighborhoods in Groton (2006-2010) © KML

Births Not Receiving Prenatal Care in the First Trimester: **6.47%**

2008-2010



Births Not Receiving Prenatal Care in the First Trimester for neighborhoods in Groton (2008-2010) © KML

**Correlation & Scores**

Time

Race/Ethnicity

About Household In...

About Births Not R...

About Groton

## High Negative Correlation

Spearman's rank correlation coefficient ( $R_s$ ) of **-0.48**

The correlation implies that higher values of **Household Income** are strongly correlated to lower values of **Births Not Receiving**

## Neighborhood scores in Groton

Household Income (estinc01) and

Births Not Receiving Prenatal Care in the First Trimester (access08)

Neighborhoods	estinc01 scores	access08 scores	Population
Bailey Hill			1,421

# Next Steps

## *Enhancements*

- Other states
- Multivariate modeling to augment correlation analysis
- Add public narrative
- Improved documentation and interface
- Neighborhood boundaries (and names)
- Racial/ethnic and temporal stratification

# Next Steps

## *New Indicators*

- Update and refine existing indicators
- Add environmental indicators
- Add transportation indicators

# Next Steps

## *Scoring Algorithms*

- Improved scoring