

Reducing the burden of asthma in RI: The role of data

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Acknowledgements

Rhode Island Department of Health

Asthma Control Program

Center for Health Data and Analysis

Funding agencies

Centers for Disease Control and Prevention,
Air Pollution and Respiratory Health Branch,
Asthma Control Program

Agency for Healthcare Research and Quality

Public Health Problem

Genetics and individual behaviors (diet, smoking) are not the best predictors of whether we stay healthy or become ill

Where you live matters

“Social determinants of health”

Social Determinants of Health

Broad consensus that people who live in socially and economically deprived neighborhoods are in worse health, on average, than those living in affluent communities

Social Determinants of Health

Main causes of ill health

- ✓ Neighborhood poverty
- ✓ Poor housing
- ✓ Residential racial segregation
- ✓ Environmental degradation

Table 15
Health Outcomes by Net Financial Wealth

Net financial wealth quintile/ range (\$'000's)	Diabetes	Hypertension	Heart Attack	Stroke	Heart Disease	Lung Disease	Cancer
<i>England</i>							
1: < 0.8	9.8	37.6	11.5	6.0	18.2	10.6	5.5
2: 0.8-14.4	7.7	36.8	6.9	3.0	16.4	6.3	2.7
3: 14.4-46.4	7.0	35.9	4.8	1.5	10.7	4.9	2.7
4: 46.4-112.7	5.6	32.9	5.0	2.8	9.4	5.1	2.5
5: >112.7	5.6	29.4	3.7	1.5	8.5	2.3	4.6
<i>United States</i>							
1: <0.5	21.0	54.2	15.4	5.3	25.9	13.1	4.5
2: 0.5-10.5	16.5	46.0	10.0	6.5	17.9	6.4	6.0
3: 10.5-42.3	10.6	46.5	5.6	3.2	14.5	5.9	9.7
4: 42.3-146.9	14.5	47.6	5.0	2.5	16.3	6.3	6.8
5: >146.9	10.2	40.5	4.8	2.7	15.8	3.0	9.2

Sources: English data is from first wave of ELSA. American data is from the 2002 wave of the HRS.

Poverty in RI

1990

Median HH income

White	\$33,103
Black	\$20,377
Hispanic	\$20,064

% Unemployed

White	6.0
Black	12.6
Hispanic	14.2

% in Poverty

White	7.6
Black	25.8
Hispanic	30.4

2000

Median HH income

White	\$44,610
Black	\$24,973
Hispanic	\$22,851

% Unemployed

White	4.8
Black	12.2
Hispanic	11.8

% in Poverty

White	8.8
Black	29.5
Hispanic	36.1

Social Determinants of Health

The field of the social determinants of health is one of the most complex and challenging areas in public health.

Why?

Challenges

Population data to monitor inequalities in health

- Inconsistent data on race/ethnicity and income
- Neighborhood socioeconomic characteristics rarely collected; need to link to US census
- Indoor and outdoor environmental data difficult to collect and link to population data

Examples: Behavioral Risk Factor Surveillance Survey, Rhode Island Health Interview Survey

Challenges

Linking health surveys and US census data
costly

1. What street do you live on?
2. What is the address of a building/house on your block?
3. What are the names of the streets at the nearest intersection to your home?

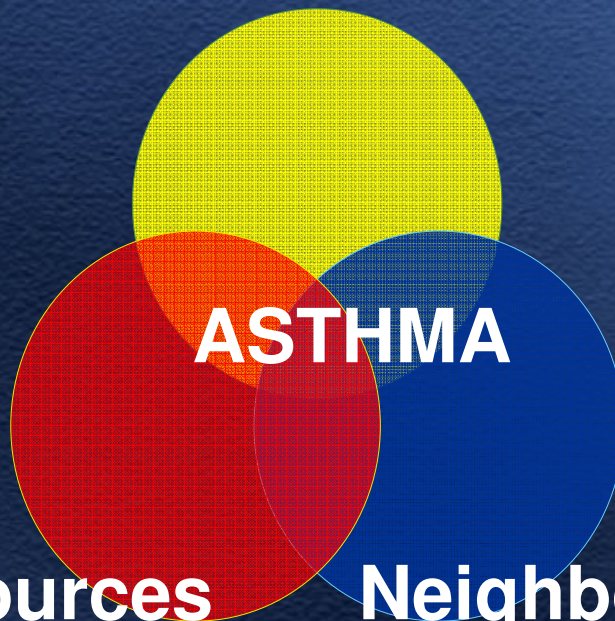
Challenges

- Neighborhood effects on health may be non-linear; difficult to measure and map
- Need to identify the threshold or tipping point at which the impact of a neighborhood factor affects health

Do neighborhoods with 40% residents in poverty have 2X impact on health as neighborhoods with 20% residents in poverty?

Conceptual Model

Race/ethnicity



Household Resources

Neighborhood Resources

Asthma in RI

Adults

National asthma prevalence = 8.0% (BRFSS 2005)

RI asthma prevalence = 10.4% (BRFSS 2005)

RI asthma prevalence = 8.7% (RI HIS 2004)

Children

National asthma prevalence = 9.1% (NSCH 2003)

RI asthma prevalence = 8.9% (RI HIS 2004)

Adult Asthma, 2004 RI BRFSS

Poverty vs. Non-poverty

Not Significant

Recent flu shot

Pneumonia
vaccination

Exposure bad air

Mold/mildew in home

Smoker in home

Significant

Poor health

Activity Limitations

Interrupted sleep

Missed work days

Use ER for asthma

Childhood Asthma, 2004 RI HIS

Poverty vs. Non-poverty

Significant

Exposure any
asthma trigger in
home

Significant

Moderate to severe
health problems due
to asthma

Asthma Prevalence Children

Model 1

- Race, neighborhood economic resources, and other factors
- Race not neighborhood poverty increased risk

Model 2

- Include demographics of poverty neighborhood
- Black children in a poverty neighborhood 3X risk of asthma than white children living in poverty neighborhoods, Hispanic children living in poverty neighborhoods, and children living in non-poverty neighborhoods

Asthma Hospital Readmissions Children

Model: Race, neighborhood resources, other factors

Not significant

- Race
- Neighborhood poverty

Significant

- ✓ Time of year (spring or summer admission)
- ✓ Having publicly funded health insurance
- ✓ Living in census tract > 5% of residents live in crowded housing

Asthma Risks

Genetic

Environmental



Viral infections, dust mites, cockroach feces, mold, volatile organic compounds, secondhand smoke, pollen, ozone, nitrogen oxides, particulate matter, diesel exhaust



Often more prevalent lower-income communities and communities of color

Asthma Environmental Risks

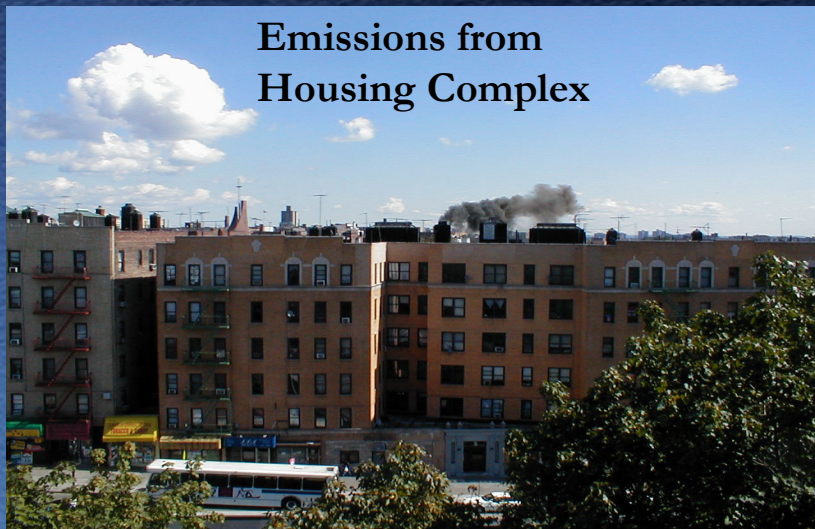
Toxic waste dumps



Smudge polluting plants



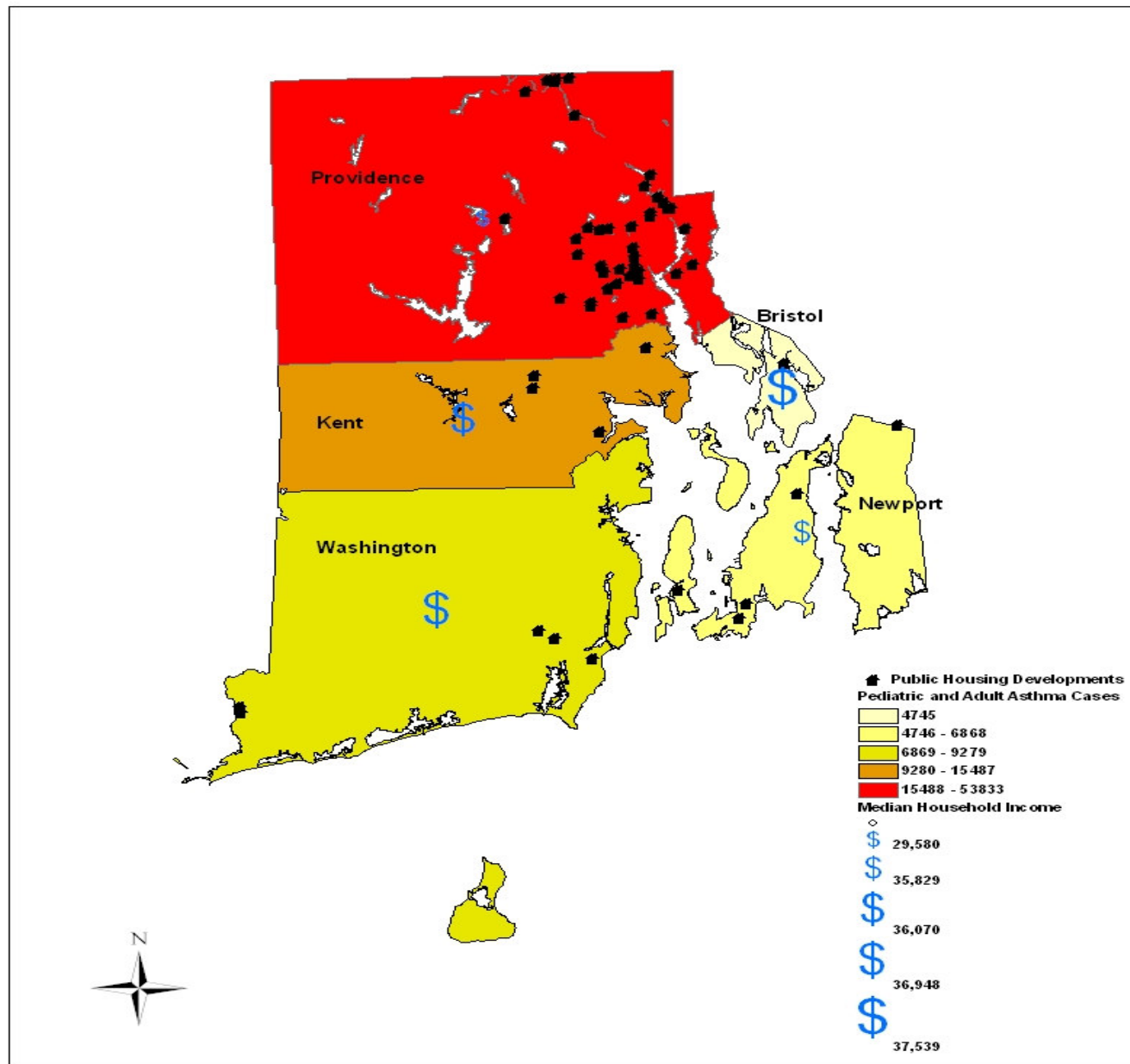
Emissions from
Housing Complex



Highway/
Truck Route



Figure 2. Asthma Cases by Rhode Island County, 2004



Eliminating racial and ethnic disparities in health will require enhanced efforts at preventing disease, promoting health and delivering appropriate care. This will necessitate improved collection and use of standardized data to correctly identify all high risk populations and monitor the effectiveness of health interventions targeting these groups.”

CDC Office of Minority Health 9/8/2005