



Urban and Rural Disparities in Tobacco Use

Ming Shan, BS; Zach Jump, MA; Elizabeth Lancet, MPH
National Conference on Health Statistics
August 8, 2012

American Lung Association

- ***Our Mission:*** *To save lives by improving lung health and preventing lung disease.*
- ***Mission Goals:***
 - Eliminate tobacco use and tobacco-related lung disease.
 - Improve the air we breathe so it will not cause or worsen lung disease.
 - Reduce the burden of lung disease on patients and their families.
- ***Three-prong Approach:***
 - Education, Advocacy and Research.

Support

- Funding from Communities Putting Prevention to Work (CPPW) grant
- Part of 2009 American Recovery and Reinvestment Act
- Designed to address two leading causes of preventable death and disability: obesity and tobacco use

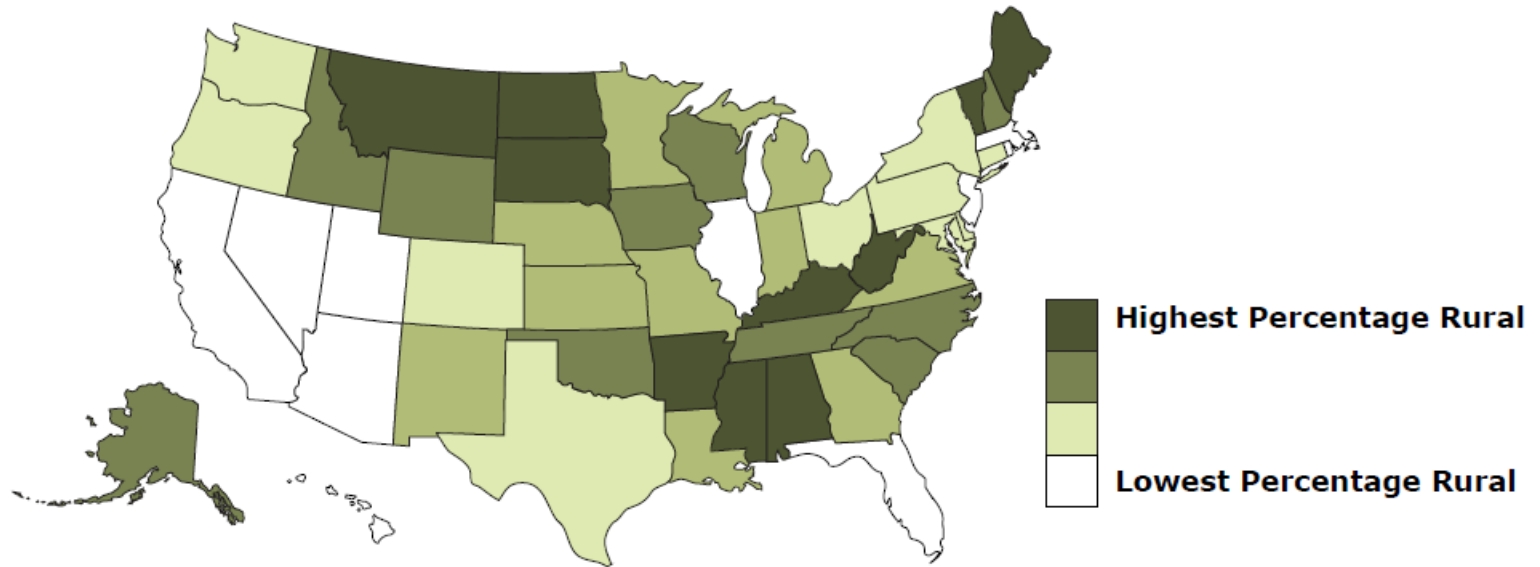
Tobacco

- Leading cause of preventable illness and death in the United States.
- Rural populations are heavily impacted
 - Socio-economic Factors
 - Cultural Roots
 - Legislation
 - Cash Crop
 - Lack of Access/Utilization of Health Care

Background

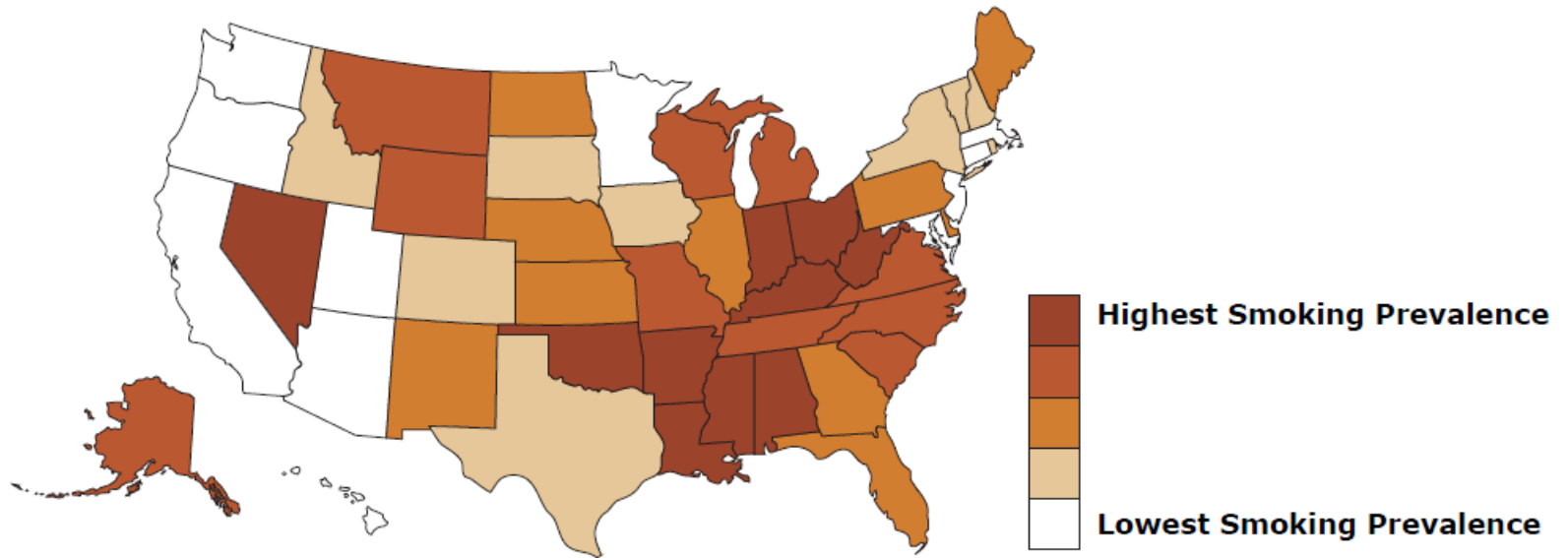
- Rural residency has long been associated with higher rates of smoking nationwide
- Adolescent age of onset of smoking is earlier in rural regions and use is higher
- Previous studies suggest lower levels of income and education, as well higher amounts of Caucasians, may be attributed to this difference

Rural Population



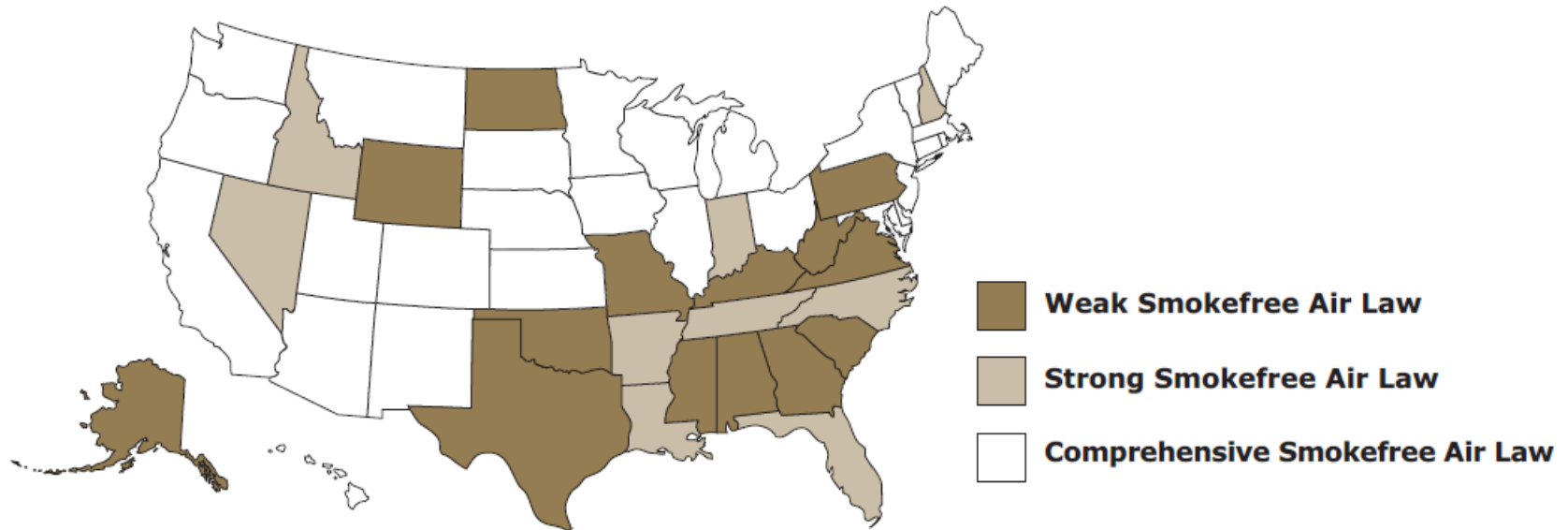
Source: Statistical Abstract of the United States 2012, U.S. Census Bureau

Adult Smoking Prevalence



Source: Behavioral Risk Factor Surveillance Survey 2010, U.S. Department of Health and Human Service:

Strength of Smokefree Air Laws



Source: State Legislated Actions on Tobacco Issues 2012, American Lung Association

Objectives

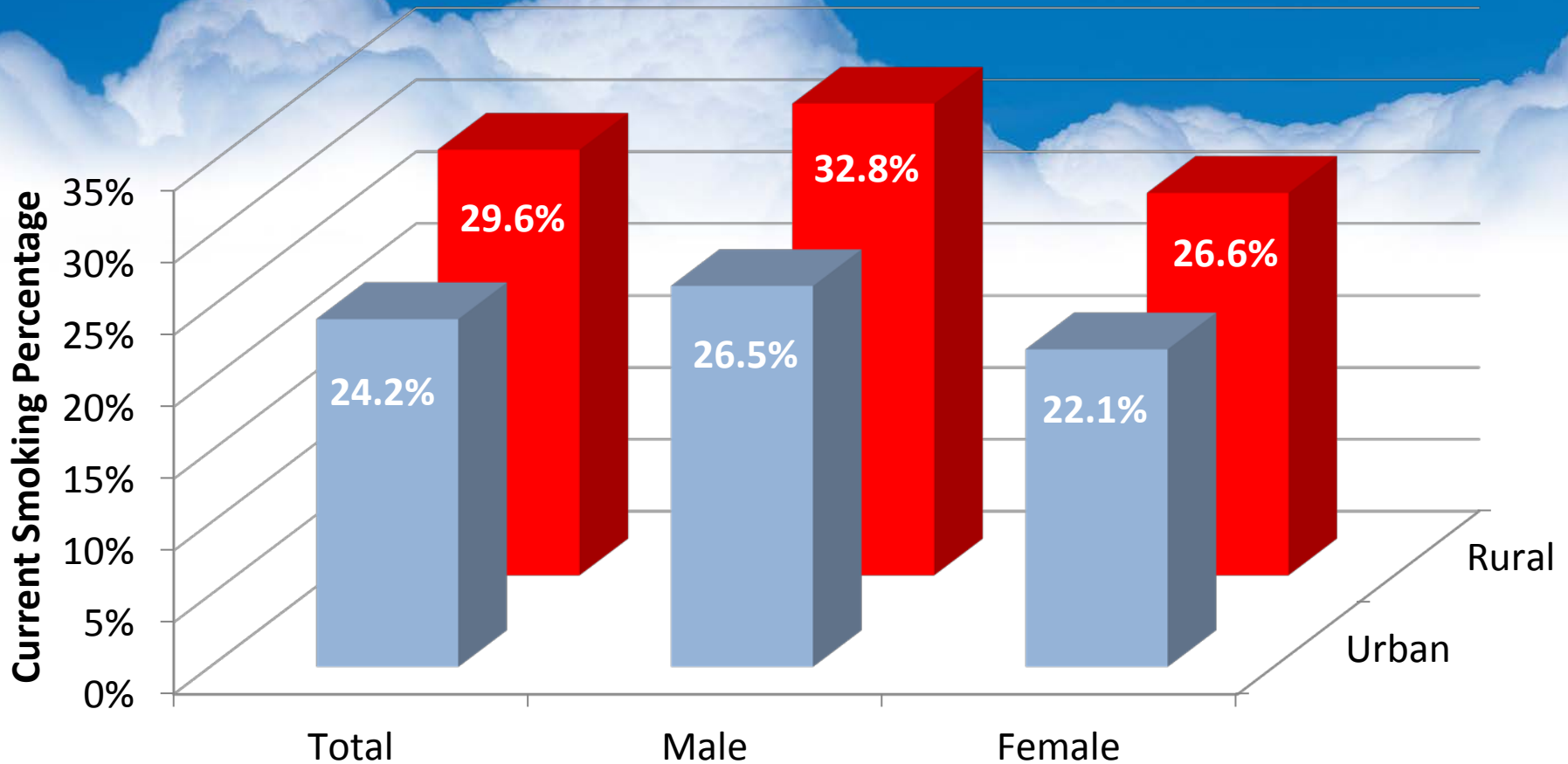
- Confirm pre-established notions regarding rural and urban differences in tobacco use
- Determine significant predictors of tobacco use among rural and urban areas
- Determine areas where programs and advocacy would be useful

Survey

- 2009 National Survey on Drug Use and Health (NSDUH; n=55,722)
- Noninstitutionalized U.S. civilian population aged 12 or older
- Nationally representative information on substance use and its correlates

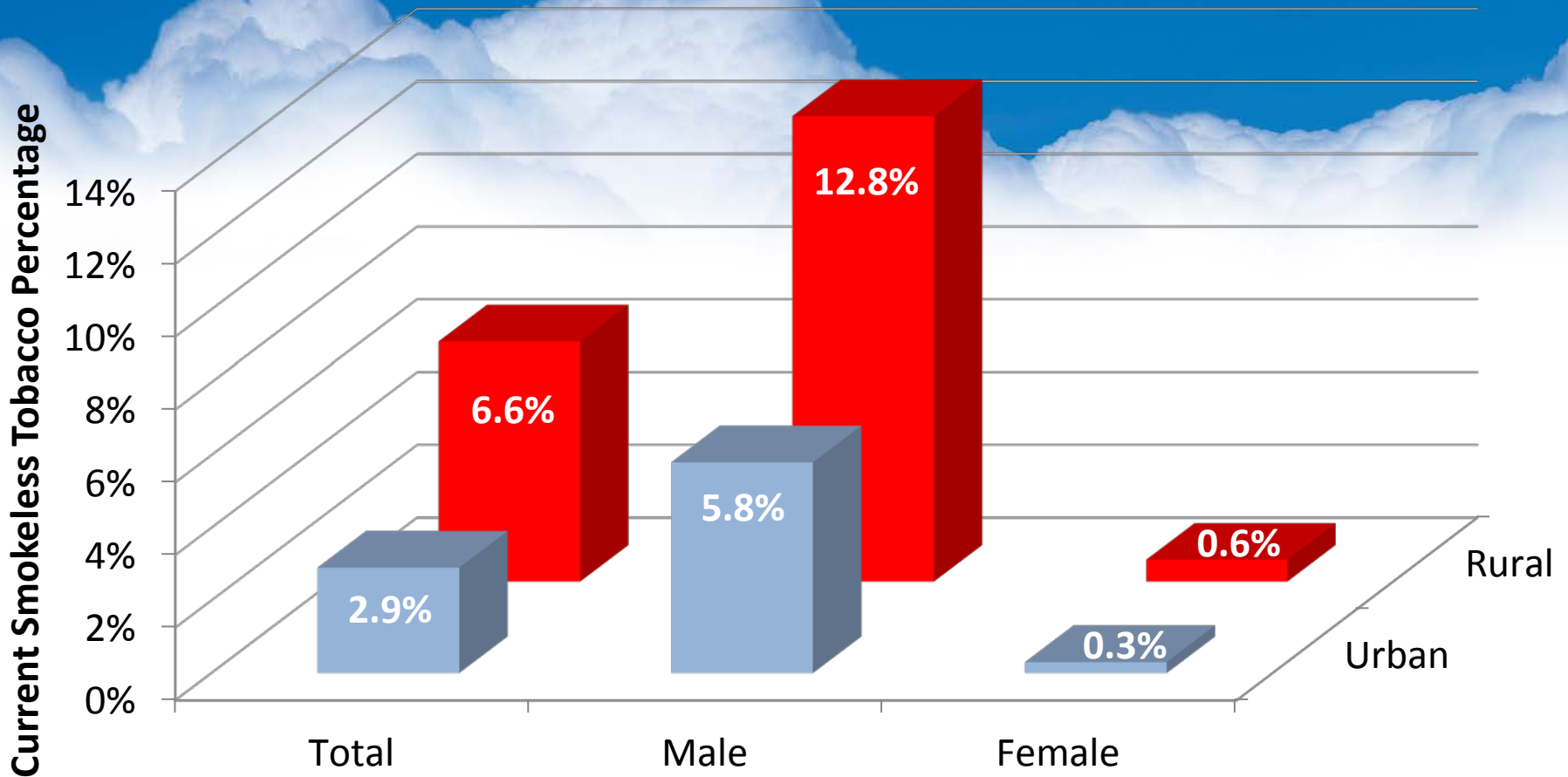
Methods

- Analyzed current (30-day) cigarette and smokeless tobacco use
- Smokeless tobacco use included chew, snuff and dip
- Rural = small MSA (<250k), Urban = medium MSA (250k-1000k) + large MSA (1000k+)
- Logistic regression using SPSS-SUDAAN
- Controlled for sex, age, race/ethnicity, education, and income



Crude Smoking Rates by Geography and Sex

- Rural > Urban
- Male > Female



Crude Smokeless Tobacco Rates by Geography and Sex

- Rural > Urban
- Male > Female

Current Cigarette Use

Variables --- Odds Ratio

Geography ---

Urban vs Rural **0.98**
95% confidence interval 0.89-1.07

Sex ---

Male vs Female **1.28 ***

Family Income ---

Less than \$20,000 **2.28 ***
\$20,000 - \$49,999 **1.81 ***
\$50,000 - \$74,999 **1.17 ***
\$75,000 or More **1**

Variables --- Odds Ratio

Age ---

18-34 **7.70 ***
35-49 **5.84 ***
50-64 **4.46 ***
65+ **1**

Education ---

Some High School **3.54 ***
High School Grad **2.67 ***
Some College **1.96 ***
College Grad **1**

Race/Ethnicity ---

White **1**
Black **0.63 ***
Other **0.60 ***
Hispanic **0.44 ***

* Significant p<.05
Does not include youth

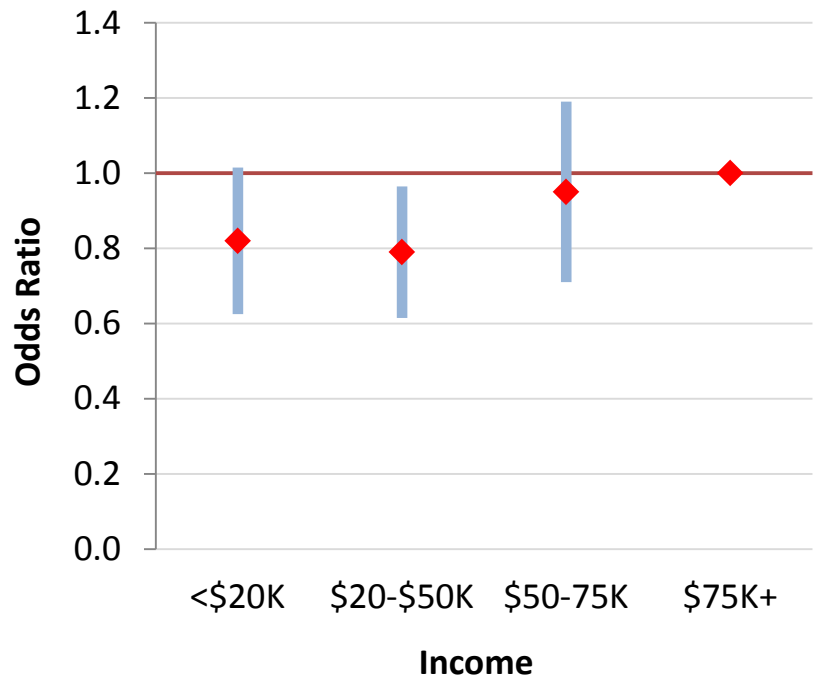
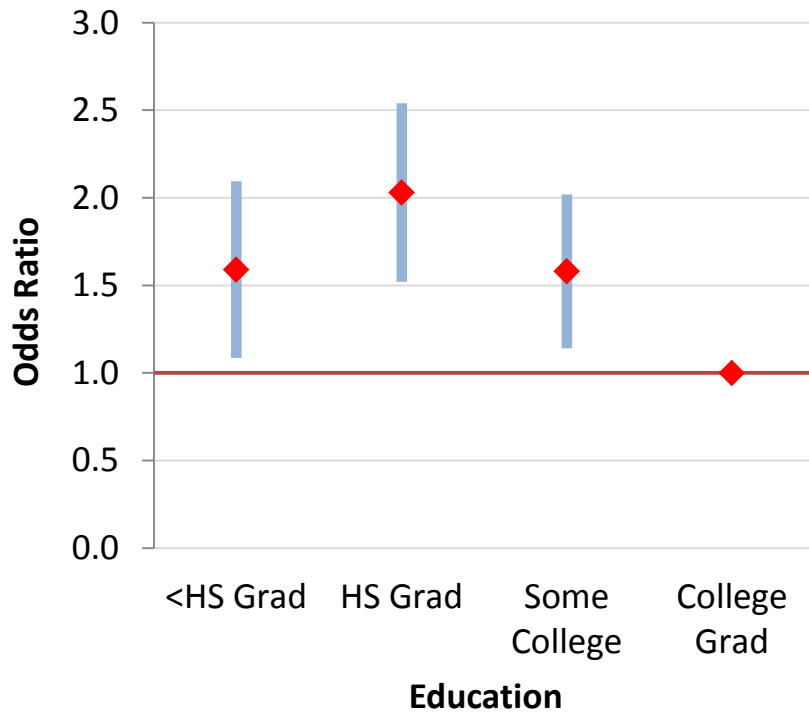
Current Smokeless Tobacco Use

<u>Variables</u>	<u>Odds Ratio</u>
Geography	
Urban vs Rural	2.03 *
<i>95% confidence interval 1.68-2.46</i>	
Sex	
Male vs Female	24.25 *
Age	
18-34	5.84 *
35-49	4.12 *
50-64	1.47
65+	1

<u>Variables</u>	<u>Odds Ratio</u>
Education	
Some High School	1.44 *
High School Grad	1.91 *
Some College	1.52 *
College Grad	1
Race/Ethnicity	
White	1
Black	0.23 *
Other	0.51 *
Hispanic	0.17 *

* Significant $p < .05$
Does not include youth

Odds Ratios and 95% Confidence Intervals for Education and Income in Smokeless Tobacco Model

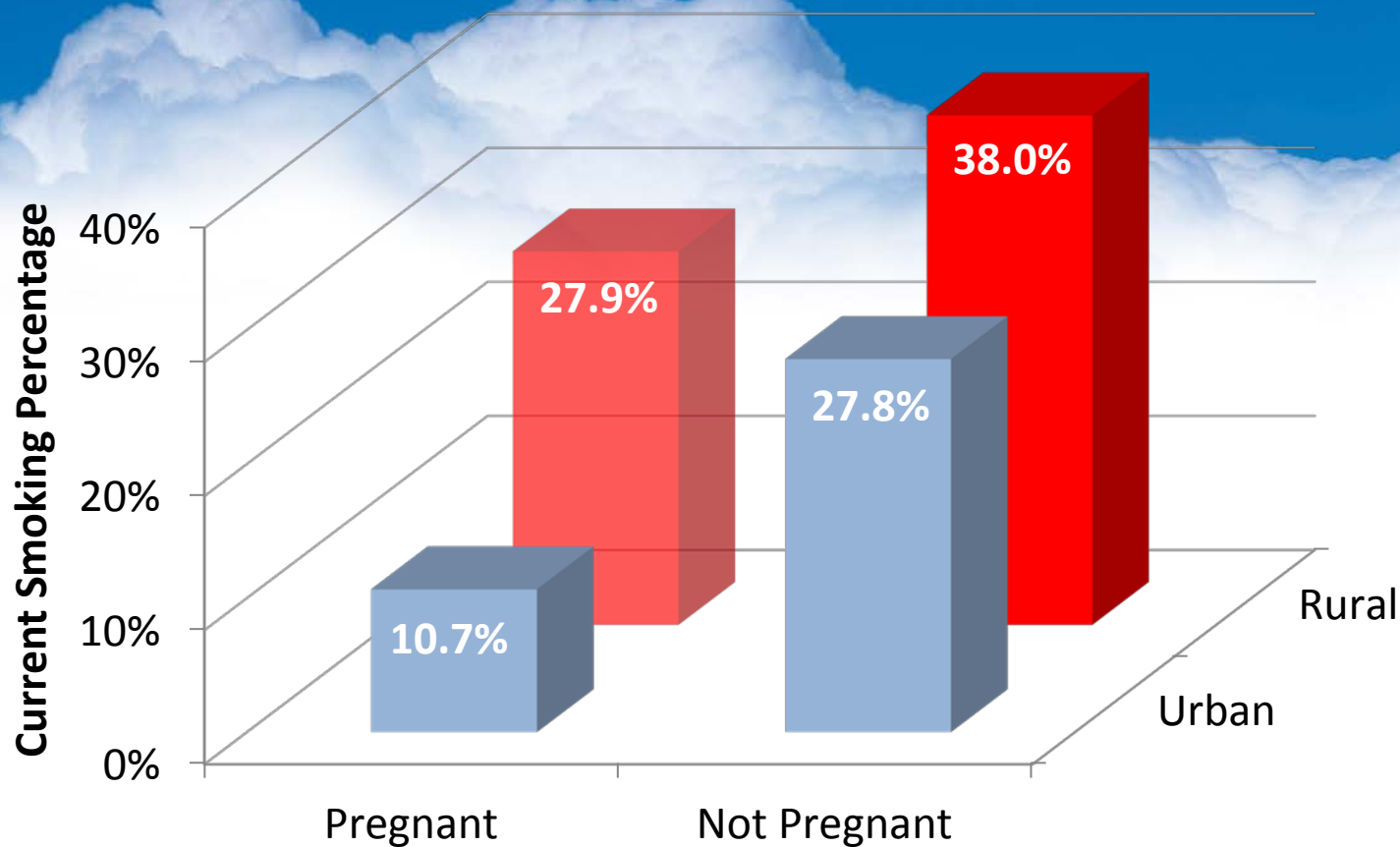


Relationships were not linear for both variables

-2 * Log Likelihoods for Cigarette and Smokeless Models

	Cigarette Use	Smokeless Tobacco Use
Model without Rural/Urban Variable	38,588.50	9,232.71
Model with Rural/Urban Variable	38,587.95	9,124.69
<i>Difference</i>	<i>0.55</i>	<i>108.02</i>

Adding geography variable improves the log likelihood of both models



Crude Smoking Rate Among Women by Geography and Pregnant Status

- Rural pregnant not different from urban or rural not-pregnant

Pregnancy and Smoking

Variables	Odds Ratio
Geography	
Urban vs Rural	2.06*
Family Income	
Less than \$20,000	2.23 *
\$20,000 - \$49,999	1.83 *
\$50,000 - \$74,999	1.23 *
\$75,000 or More	1
Education	
Some High School	4.02 *
High School Grad	2.82 *
Some College	1.23 *
College Grad	1

Variables	Odds Ratio
Race/Ethnicity	
White	1
Black	0.42 *
Other	0.47 *
Hispanic	0.32 *
Pregnant	
Not Pregnant vs Pregnant	3.48*
Geography × Pregnant	
Rural, Not Pregnant	0.52*
Rural, Pregnant	1
Urban, Not Pregnant	1
Urban, Pregnant	1

* Significant $p < .05$

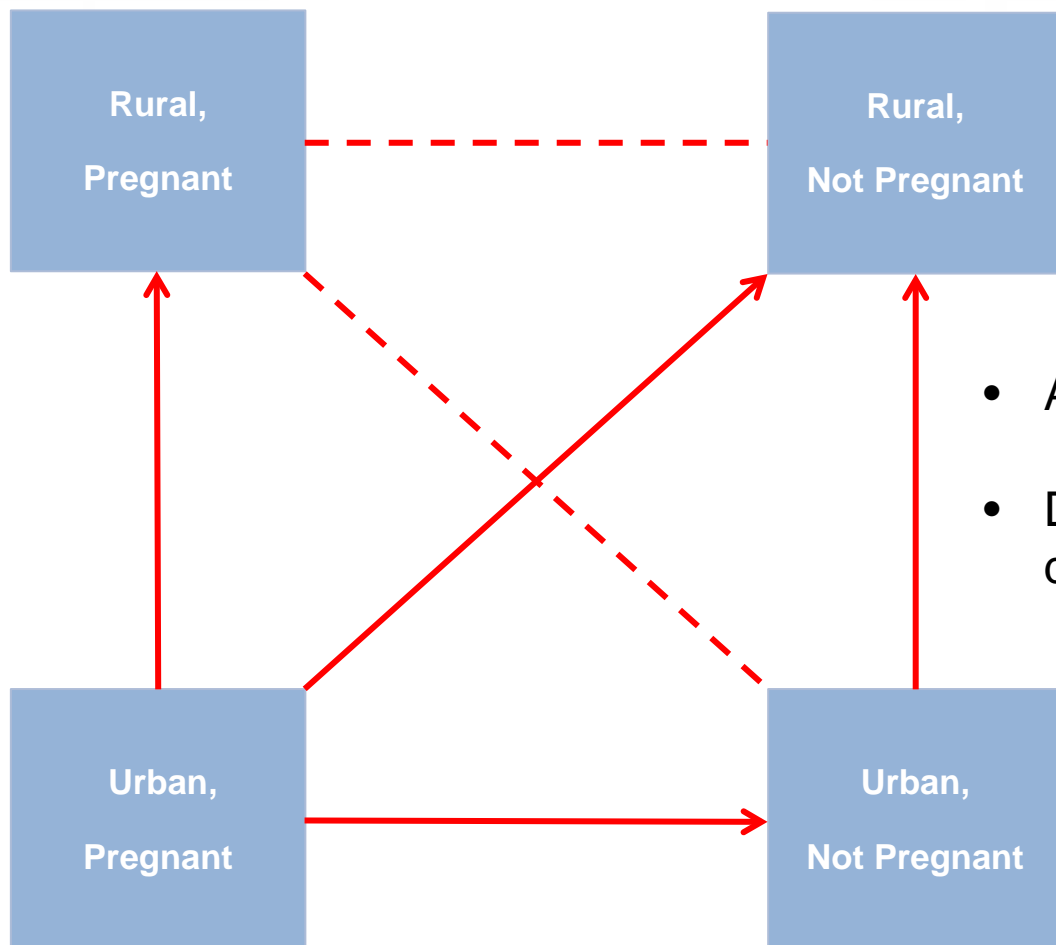
Only includes females aged 18-44

Pregnancy and Smoking Interaction

	OR	95% CI	p-value
Urban, Not Pregnant vs Urban, Pregnant	3.49	2.60; 4.68	<0.0001
Rural, Not Pregnant vs Rural, Pregnant	1.80	0.73; 4.44	0.1996
Urban, Not Pregnant vs Rural, Pregnant	1.70	0.59; 4.85	0.0848

Rural, pregnant smokers n=60

Significance of Relationships in Geography × Pregnant Interaction



- Arrow indicates group with higher OR
- Dashed lines indicate no significant difference

Discussion - Cigarettes

- For cigarette use, geography is less of a predictor than socioeconomic factors
- Preconceived notions for cigarette use regarding the relationship between different levels of education and income were confirmed
- Smoking among pregnant women in rural areas is disproportionately high

Discussion - Smokeless

- For smokeless tobacco, gender is the dominant factor, matching expectations
- Geography remains a significant predictor even when controlling for demographic factors
- Income was not a significant predictor, surprisingly

Limitations

- Unable to include group dynamics
- Cross-sectional design limits inference
- Definitions for rural/urban vary widely
- Potential for unmeasured confounders

Future Research

- Examine smokeless tobacco use further to determine why nonlinear trends in education and income were seen
- Reanalyze smoking in pregnant women in rural areas with a larger sample size
- Explore environmental and group level factors using community-based longitudinal methods

Questions?

American Lung Association

Research and Health Information Department

www.lung.org/finding-cures

Elizabeth.Lancet@lung.org

212-315-8788

Zach.Jump@lung.org

212-315-8749