USING DATABASES IN TOBACCO RESEARCH

Robert McMillen
Mississippi State University & AAP Richmond Center
Welcome to Data Camp

So what?
- Surveillance
- Evaluation
- Inform Policy Decisions

Data Sources
- Surveys
- Administrative Records
- Social Media
SURVEY DATA

- Social Climate Survey of Tobacco Control
- Tobacco Use Supplement to the Current Population Survey
- Behavioral Risk Factor Surveillance System
- National Health Interview Survey
- National Health and Nutrition Examination Survey
- Adult Tobacco Survey
- The Population Assessment of Tobacco and Health (PATH)
- Youth Tobacco Survey
- Youth Risk Behavior Survey
ADMINISTRATIVE RECORDS

- Per Capita Sales
- Sales Tax Revenue
- Hospital Admission Data
- Medicaid Expenditures
- Gaming Revenue and Employment Data
- State Funding for Tobacco Control
- Legislation Tracking
SOCIAL MEDIA

- Publicly Visible Platforms
  - Twitter
  - YouTube
Supported by the AAP, FAMRI, & The Truth Initiative

Dual Frame Survey
- Annual, cross-sectional survey, 2000-2015
- U.S. Adults, 18+
- RDD – Mobile and Landline Telephones

Social Climate
- Tobacco Use
- Rules and Practices
- Knowledge
- Attitudes
- Tobacco Counseling

SOCIAL CLIMATE SURVEY OF TOBACCO CONTROL
SOCIALCLIMATE.ORG

[91x352]
[0x0]Supported by the AAP, FAMRI, & The Truth Initiative

[113x295]
[0x0]Dual Frame Survey

[113x269]
[0x0]Annual, cross-sectional survey, 2000-2015
[113x244]
[0x0]U.S. Adults, 18+
[113x222]
[0x0]RDD – Mobile and Landline Telephones

[113x185]
[0x0]Social Climate

[113x160]
[0x0]Tobacco Use
[113x134]
[0x0]Rules and Practices
[113x109]
[0x0]Knowledge
[113x83]
[0x0]Attitudes
[113x57]
[0x0]Tobacco Counseling
Association between clean indoor air laws and voluntary smokefree rules in homes and cars

Kai-Wen Cheng,1 Cassandra A Okechukwu,2 Robert McMillen,3 Stanton A Glantz4

Public support for raising the age of sale for tobacco to 21 in the United States

Jonathan G Winickoff1,2 Robert McMillen1,3 Susanne Tanski4 Karen Wilson5

Mark Gottlieb6 Robert Crane7

Trends in Electronic Cigarette Use Among U.S. Adults: Use is Increasing in Both Smokers and Nonsmokers

Robert C. McMillen PhD1, Mark A. Gottlieb JD2, Regina M. Whitmore Shaefer MPH3, Jonathan P. Winickoff MD, MPH4, Jonathan D. Klein, MD, MPH3
75% of Mississippi Adults support this policy

This policy decreases teen smoking by making it harder to get tobacco products for minors.

Raising the age of purchase is effective because it puts legal purchasers outside high school students’ social networks.

2017 • mississippi tobacco data
Supported by the NCI
- cancercontrol.cancer.gov/brp/tcrb/tus-cps

National & State-Level Estimates

Household Survey

Core Questions +

Years
# 2010-11 TUS-CPS Data, Table 2: Home & Work Environments in Which Smoking is Not Allowed

Table 2. 2010-11 Tobacco Use Supplement to the Current Population Survey (TUS-CPS):

<table>
<thead>
<tr>
<th></th>
<th>Smoking not allowed at home %* (CI)</th>
<th>Population size (denominator)</th>
<th>Sample size (denominator)</th>
<th>Smoking not allowed at work %† (CI)</th>
<th>Population size (denominator)</th>
<th>Sample size (denominator)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total</strong></td>
<td>83.9 (83.6-84.3)</td>
<td>224,518,619</td>
<td>167,281</td>
<td>82.2 (81.8-82.6)</td>
<td>100,218,641</td>
<td>74,139</td>
</tr>
<tr>
<td><strong>Sex:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Male</strong></td>
<td>82.8 (82.4-83.3)</td>
<td>108,098,930</td>
<td>73,715</td>
<td>79.3 (78.7-79.9)</td>
<td>47,369,715</td>
<td>31,654</td>
</tr>
<tr>
<td><strong>Female</strong></td>
<td>85 (84.7-85.3)</td>
<td>116,419,690</td>
<td>93,566</td>
<td>84.8 (84.3-85.2)</td>
<td>52,848,925</td>
<td>42,485</td>
</tr>
<tr>
<td><strong>Region:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Northeast</strong></td>
<td>82.9 (82.1-83.6)</td>
<td>41,341,659</td>
<td>33,781</td>
<td>84.8 (83.9-85.7)</td>
<td>19,123,412</td>
<td>15,375</td>
</tr>
<tr>
<td><strong>Midwest</strong></td>
<td>79.1 (78.5-79.8)</td>
<td>48,749,962</td>
<td>40,601</td>
<td>85.4 (84.7-86.1)</td>
<td>23,514,928</td>
<td>19,542</td>
</tr>
<tr>
<td><strong>South</strong></td>
<td>82.9 (82.3-83.5)</td>
<td>82,386,926</td>
<td>53,050</td>
<td>79.1 (78.3-79.8)</td>
<td>35,613,754</td>
<td>22,533</td>
</tr>
<tr>
<td><strong>West</strong></td>
<td>91 (90.5-91.4)</td>
<td>52,040,072</td>
<td>39,849</td>
<td>81.5 (80.6-82.3)</td>
<td>21,966,547</td>
<td>16,689</td>
</tr>
</tbody>
</table>
Smokefree Rules/Policies - Survey Data - Smokefree Policies in Homes

Mississippi

Percent of Households Protected by Smokefree Rules

Note: The above estimate is a percentage of households with smokefree rules. This estimate is based on agreement of self-respondents aged 15 years and older within each household.

Source: Tobacco Use Supplement to the Current Population Survey (TUS-CPS)
Established in 1984 with 15 states, BRFSS now collects data in all 50 states as well as the District of Columbia and three U.S. territories.

- BRFSS completes more than 400,000 adult interviews each year.
- Sample obtained using RDD methods.
  - Mobile Phone surveys were included beginning in 2011.
TUS & BRFSS
ESTIMATES FOR
TRENDS IN
CURRENT
CIGARETTE
SMOKING
NATIONAL HEALTH INTERVIEW SURVEY
WWW.CDC.GOV/NCHS/NHIS

- Initiated in July 1957
- Administered by the CDC’s National Center for Health Statistics (NCHS)
- Cross-sectional household interview survey
  - Multistage area probability design
  - From each family in the NHIS, one sample adult and one sample child (if any children are present)
FIGURE. Percentage of adults aged ≥18 years who were current smokers,* by sex and race/ethnicity --- National Health Interview Survey (NHIS), United States, 1965--2008†

* For NHIS survey years 1965--1991, current smokers included adults who reported that they had smoked ≥100 cigarettes in their lifetime and current smoking. Since 1992, current smokers included adults who reported smoking ≥100 cigarettes during their lifetime and specified that they currently smoked every day or on some days.
Current smoking

Figure 8.1. Prevalence of current cigarette smoking among adults aged 18 and over: United States, 1997–September 2016
NHANES
WWW.CDC.GOV/NCHS/NHANES

- Most recent NHANES began in 1999
- Annually, 7,000 individuals, of all ages, are interviewed in their homes
  - 5,000 complete the health examination component of the survey
Cigarette Smoking and Lung Obstruction Among Adults Aged 40–79: United States, 2007–2012

Ryne Paulose-Ram, Ph.D., M.A.; Timothy Tiler, B.S.; Charles F. Dillon, M.D., Ph.D.;
and Debra J. Brody, M.P.H.

Figure 1. Cigarette smoking among adults aged 40–79 with and without lung obstruction:
United States, 2007–2012

<table>
<thead>
<tr>
<th>Lung obstruction</th>
<th>None</th>
<th>Any</th>
<th>Mild</th>
<th>Moderate or worse</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>154.1</td>
<td>23.8</td>
<td>31.1</td>
<td>10.8</td>
</tr>
<tr>
<td>Any</td>
<td>19.6</td>
<td>46.2</td>
<td>41.2</td>
<td>55.0</td>
</tr>
</tbody>
</table>

'Significantly different from adults with any lung obstruction for same smoking status group.

NOTES: Significance testing only conducted between adults with any lung obstruction and those without lung obstruction.

Access data table for Figure 1 at: [http://www.cdc.gov/nchs/data/databriefs/db181_table.pdf#1](http://www.cdc.gov/nchs/data/databriefs/db181_table.pdf#1).

Tobacco-Smoke Exposure in Children Who Live in Multiunit Housing

**Authors:** Karen M. Wilson, MD, MPH, MD, Jonathan D. Klein, MD, MPH, MD, Aaron K. Blumkin, MS, Mark Gottlieb, JD, and Jonathan P. Winickoff, MD, MPH

**Department of Pediatrics, University of Rochester, Rochester, New York; Julius B. Richmond Center of Excellence, American Academy of Pediatrics, Elk Grove Village, Illinois; Public Health Advocacy Institute, Northeastern University School of Law, Boston, Massachusetts; and Department of Pediatrics, Massachusetts General Hospital for Children, Harvard Medical School, Boston, Massachusetts

**Keywords:** secondhand smoke, passive smoking, environmental tobacco smoke, multiunit housing, apartment

**What's Known on This Subject:** Exposure to secondhand tobacco smoke is an important cause of morbidity and mortality among children, even at low levels of exposure. In a recent national sample, 54% of children who did not live with a smoker showed measurable amounts of cotinine.

**What This Study Adds:** Children who live in homes in which no one smokes inside have a 45% increase in cotinine levels if they live in apartments compared with detached homes. Multiunit housing may be a significant source of secondhand tobacco-smoke exposure for children, at levels associated with morbidity.

**Figure 1**
Percentage of children who are unexposed by housing type and cotinine cutoff. The y-axis shows the proportion of children who are unexposed at 3 different cotinine cutoff levels. These levels, displayed on the x-axis, are <0.015, <0.05, <1, and <2 ng/mL cotinine. The types of bars for each of the different housing types: detached house, attached house, and apartment.
NATIONAL ADULT TOBACCO SURVEY

WWW.CDC.GOV/TOBACCO/DATA_STATISTICS/SURVEYS/NATS

- NATS establishes a comprehensive framework for evaluating both the national and state-specific tobacco control programs.
- Administered 2009/10, 2012/13, 2013/14
- Stratified, national, landline, and cell phone survey of non-institutionalized adults aged 18 years and older residing in the 50 states or D.C.
### TABLE 1. Percentage of persons aged ≥18 years who reported tobacco product use "every day" or "some days" and met established thresholds, by tobacco product and selected characteristics — National Adult Tobacco Survey, United States, 2013–2014

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Tobacco product % (95% CI)</th>
<th>Any combustible tobacco product</th>
<th>Cigarettes</th>
<th>Cigars/Cigarillos/Filtered little cigars</th>
<th>Regular pipe</th>
<th>Water pipe/Hookah</th>
<th>E-cigarettes</th>
<th>Smokeless tobacco</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td></td>
<td>21.3 (20.8–21.7)</td>
<td>18.4 (18.0–18.8)</td>
<td>17.0 (16.6–17.4)</td>
<td>1.8 (1.6–1.9)</td>
<td>0.3 (0.2–0.4)</td>
<td>0.6 (0.5–0.7)</td>
<td>3.3 (3.1–3.5)</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td></td>
<td>26.3 (25.6–27.0)</td>
<td>21.5 (20.8–22.1)</td>
<td>19.3 (18.6–19.9)</td>
<td>2.8 (2.5–3.1)</td>
<td>0.6 (0.5–0.7)</td>
<td>0.8 (0.6–0.9)</td>
<td>4.0 (3.6–4.3)</td>
</tr>
<tr>
<td>Female</td>
<td></td>
<td>16.7 (16.2–17.3)</td>
<td>15.7 (15.1–16.2)</td>
<td>15.1 (14.5–15.6)</td>
<td>0.8 (0.6–0.9)</td>
<td><strong>-</strong></td>
<td>0.4 (0.3–0.5)</td>
<td>2.8 (2.6–3.0)</td>
</tr>
</tbody>
</table>
THE POPULATION ASSESSMENT OF TOBACCO AND HEALTH (PATH)

PATHSTUDYINFO.NIH.GOV

- Nationally representative, longitudinal cohort study
- Tracks approximately 59,000 tobacco product users, never users, and former users including 16,100 youth aged 12-17 and 42,700 adults aged 18 and older
- Computer-assisted interviews to collect information from adults, youth, and parents of youth;
  - Biospecimens (i.e., buccal cell, urine, blood) are collected from consenting adults.
- Participants are assessed annually for at least three years
SPECIAL ARTICLE

Tobacco-Product Use by Adults and Youths in the United States in 2013 and 2014


Product preferences among light and regular adolescent e-cigarette users: Results from the first wave of the PATH Study

Robert C. McMillen, PhD, Mississippi State University, Starkville, MS, Susanne Tanski, MD, MPH, The Geisel School of Medicine at Dartmouth, Lebanon, NH, Karen Wilson, MD, MPH, Icahn School of Medicine at Mount Sinai, New York, NY, Jonathan D. Klein, MD, MPH, University of Rochester, Chicago, IL and Jonathan P. Winickoff, MD, MPH, Harvard Medical School, Boston, MA
The PATH Study Wave 1 – Youth Reporting

Percent of Youth Reporting Ever, Past 30-Day, Frequent,* and Daily Use, by Product

- Ever use
- Past 30-day use
- Frequent use
- Daily use

* Frequent use is defined as: use of a product on 20 or more of the past 30 days; for hookah, frequent use is defined as: use at least 20 times per month on average; frequent use of “any tobacco” product reflects only those who used a particular product on 20 or more of the past 30 days; daily use of “any tobacco” product reflects only those who used a particular product daily.

# Estimate suppressed because it is statistically unreliable; it is based on a sample size of less than 50, or the coefficient of variation of the estimate is larger than 30 percent.
Stratified, three-stage cluster sample design to produce a nationally representative sample of middle school and high school students in the United States

- Assesses
  - Tobacco-related beliefs
  - Attitudes
  - Behaviors
  - Exposure to pro- and anti-tobacco influences

- School-based self-administered survey
- Some states also administer the YTS
FIGURE 1. Estimated percentage of high school students who currently use any tobacco products,* ≥2 tobacco products,† and select tobacco products§ — National Youth Tobacco Survey 2011–2015
MISSISSIPPI YOUTH TOBACCO SURVEY

CURRENT CIGARETTE SMOKING

- 1998: 30.3%
- 1999: 32.5%
- 2000: 29.2%
- 2002: 23.1%
- 2003: 23.4%
- 2004: 22.1%
- 2006: 18.7%
- 2008: 20.2%
- 2009: 18.8%
- 2010: 19.7%
- 2011: 19.0%
- 2012: 18.1%
- 2013: 13.3%
- 2014: 12.2%
- 2015: 9.9%
- 2016: 9.4%
YOUTH RISK BEHAVIOR SURVEY

WWW.CDC.GOV/HEALTHYYOUTH/DATA/YRBS

- Developed in 1990 to monitor priority health risk behaviors
- Administered in odd years, 1991 through 2015
- School-based, self administered survey
- Nationally, administered to middle and high school students
- Most states administer the YRBS to high school students
  - Fewer, to middle school students
YOUTH RISK BEHAVIOR SURVEY

2015 High School YRBS Participation Map
YOUTH RISK BEHAVIOR SURVEY

Percentage of High School Students Who Currently Smoked Cigarettes*

*On at least 1 day during the 30 days before the survey

State Youth Risk Behavior Surveys, 2015
ADMINISTRATIVE RECORDS
The Mississippi (Tax) Experience

- The Mississippi legislature increased the state cigarette tax from 18 cents to 68 cents on May 15, 2009.
- The average state cigarette tax is currently $1.63 and Mississippi’s tax ranks 39th.

Packs Sold | 2008-2015

Revenues Collected | 2008-2015

Per Capita Consumption & Tax Revenue
HOSPITAL ADMISSIONS

Smoke-free legislation reduces hospital admissions for childhood lower respiratory tract infection

So Lun Lee,¹ Wilfred Hing Sang Wong,¹ Yu Lung Lau¹,²

Hospital Admissions for Childhood Asthma After Smoke-Free Legislation in England
### Medicaid Costs & Secondhand Smoke

<table>
<thead>
<tr>
<th>Condition</th>
<th>Attributable Population Risk</th>
<th>Total Costs</th>
<th>Costs Attributable to Exposure to Secondhand Smoke</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Population - Birth to Age 17</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low Birth Weight Codes - ICD Codes that begin with 765</td>
<td>18.0%</td>
<td>$85,240,444</td>
<td>$15,343,280</td>
</tr>
<tr>
<td>Acute Lower Respiratory Illness (birth to age 5 only) - ICD Codes that begin with 480-488, 466</td>
<td>25.0%</td>
<td>$28,551,853</td>
<td>$7,137,963</td>
</tr>
<tr>
<td>Otitis Media and Middle Ear Effusion - ICD Codes that begin with 382</td>
<td>14.0%</td>
<td>$16,501,901</td>
<td>$2,310,266</td>
</tr>
<tr>
<td>Asthma - ICD Codes that begin with 493</td>
<td>35.0%</td>
<td>$28,344,206</td>
<td>$9,920,472</td>
</tr>
<tr>
<td><strong>Population - Ages 18+</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heart Attacks and Other Heart Diseases - ICD Codes that begin with 410</td>
<td>6.9%</td>
<td>$12,149,244</td>
<td>$838,298</td>
</tr>
<tr>
<td>Lung Cancer - ICD Codes that begin with 162</td>
<td>4.9%</td>
<td>$12,204,636</td>
<td>$598,027</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>$182,992,283</strong></td>
<td><strong>$36,148,306</strong></td>
</tr>
</tbody>
</table>

Dates of Service: 07/01/2012 - 06/30/2013

Specified diagnosis present in either the principle diagnosis field or other diagnosis codes 1-4 positions.
GAMING REVENUE AND EMPLOYMENT DATA

NUMBER OF SLOTS AT THE PALACE CASINO

- 2007/8: 814 slots
- 2008/9: 811 slots
- 2009/10: 801 slots
- 2010/11: 804 slots
- 2011/12: 1,059 slots (smoke-free)
- 2012/13: 1,001 slots
- 2013/14: 930 slots
- 2014/15: 885 slots
- 2015/16: 887 slots

Number of slots at the Palace Casino increased by 18% after going smoke-free.

NUMBER OF EMPLOYEES AT THE PALACE CASINO

- 2007/8: 538 employees
- 2008/9: 525 employees
- 2009/10: 519 employees
- 2010/11: 566 employees
- 2011/12: 642 employees (smoke-free)
- 2012/13: 620 employees
- 2013/14: 610 employees
- 2014/15: 624 employees
- 2015/16: 635 employees

Number of employees at the Palace Casino increased by 17% after going smoke-free.
Map of Smokefree Indoor Air - Private Worksites, Restaurants, and Bars (CDC STATE System Tobacco Legislation - Smokefree Indoor Air Summary) (In effect as of March 31, 2017)

About This Map
- No Law - designated areas - or separate ventilation law
- 100% smokefree in one location
- 100% smokefree in two locations
- 100% smokefree in three locations

Territories
- Guam
- Puerto Rico
- Virgin Islands

[Map of the United States showing states with smokefree laws in designated areas, including states with 100% smokefree in one, two, or three locations]
SMOKE FREE POLICIES

There are 135 Smoke-Free Communities in Mississippi, of which 93 have ordinances that include restrictions on electronic cigarettes.

Partial Smoke-free Communities in Mississippi:
- August 6, 1996 | West
- October 2007 | Greenville
- November 15, 2007 | McComb
- May 1, 2008 | Gulfport
- July 31, 2008 | Walls
- January 6, 2010 | Columbus
- June 3, 2010 | Goodman
- October 5, 2010 | Rienzi
- June 2011 | Olive Branch
- June 6, 2012 | Vaiden
- July 3, 2014 | Gautier
- March 18, 2017 | Fulton
U.S. Tobacco Control Laws Database: Research Applications

- Collection started in early 1980’s
- Database created in 1985
- Database includes records back to 1914
  - the earliest smoking control ordinance is a 1936 Milwaukee, WI law prohibiting smoking on buses, and
  - the earliest Youth Access ordinance is a 1914 Houston, MO law prohibiting sales to minors
SOCIAL MEDIA
Social Media

A cross-sectional examination of marketing of electronic cigarettes on Twitter

Jidong Huang, Rachel Kornfield, Glen Szczypka, and Sherry L Emery

Using Twitter Data to Gain Insights into E-cigarette Marketing and Locations of Use: An Infoveillance Study

Monitoring Editor: Gunther Eysenbach
Reviewed by Gabbi Promoff, Yi Wang, and Sanmitra Bhattacharya

Annice E Kim, PhD, Timothy Hopper, MS, Sean Simpson, MA, James Nonnemaker, PhD, Alicea J Lieberman, MPH, Heather Hansen, MPP, Jamie Guillory, PhD, and Lauren Porter, MPH, PhD

Vaporous Marketing: Uncovering Pervasive Electronic Cigarette Advertisements on Twitter

Eric M. Clark, Chris A. Jones, Jake Ryland Williams, Allison N. Kurti, Mitchell Craig Norotsky, Christopher M. Danforth, Peter Sheridan Dodds

Published: July 13, 2016 • https://doi.org/10.1371/journal.pone.0157304
ARE THERE ANY QUESTIONS? FEEL FREE TO ASK ANYTHING AT ALL.

WHY DO GHOSTS HAVE CLOTHES?

IF SOMEONE GIVES YOU A WEDGIE AT THE MOMENT YOU DIE, WILL YOU HAVE IT FOR ETERNITY?