Epidemiology of COPD in South Carolina: Use of the Behavioral Risk Factor Surveillance System (BRFSS)

Charlie Strange, MD
Professor of Pulmonary and Critical Care Medicine
Medical University of South Carolina

Dr. Strange is a grant recipient from the Alpha-1 Foundation, Grifols, the NIH, PneumRx, Pulmonx and Uptake Medical. He is a consultant for Astra Zeneca, CSL Behring, Grifols, PneumRx and Uptake Medical.
Underdiagnosis of COPD in the United States

Diagnosed with COPD
GOLD stage II or higher

Age in Years

Rate per 1000 of Population

5.2%
7.2%
14.0%
20.7%
22.9%

Mannino DM, MMWR 2002; 51:1-16
Behavioral Risk Factor Surveillance System

In 2011 > 506,000 interviews were conducted
70 core questions (10,000 in each state)
Optional modules
State add on questions

Representative epidemiology from patient perspective
Oversampling of hard to reach groups
Use of cellphone
Weakness of self reported data and telephone response rates

Prevalence data for every county in the US
National Application of COPD BRFSS Questions Beginning in 2011

Model-based COPD Prevalence by County, United States 2011


Adapted from Zhang X et al, Am J Epidemiol 2016;179(5):622-630
2012 BRFSS SC COPD Initiative

• NC COPD Taskforce supported by the Learn More Breath Better Campaign® worked with SC DHEC to add 4 “At Risk” Questions

• 12,000 Respondents

• Added Questions:
  • Years of tobacco use
  • Frequency of productive cough past 30 days
  • Frequency of shortness of breath past 30 days
  • Frequency of breathing problems limiting activities past year
American Lung Association Report Card

South Carolina 2014

Grades:

• Smokefree Air F
• Cessation Coverage F
• Tobacco Prevention and Control Spending F
• Cigarette Taxes F
Comparison between HTN and COPD

- Hypertension
  Surrogate Marker
  (140/90)

- COPD
  Surrogate Marker
  (FEV1/FVC <0.7)

Outcomes

- Angina
- MI
- Stroke
- CHF
- Dyspnea
- Exacerbations
- Resp Failure
Definitions of COPD and High-risk for COPD

- **COPD**  Self-reported, provider-diagnosed COPD
- **High-risk for COPD**  
  
  $\geq 10$ years of cigarette/tobacco use

  +

  SOB most days

  or

  Productive cough most days

  or

  Breathing problems increasingly affecting physical activities
COPD At-risk Module – 2012 SC BRFSS

- Overall prevalence
  - COPD 9.1%
  - High-risk for COPD 8.0%
- Females more likely to have COPD
- Males more likely to be at high-risk for COPD
- African-Americans more likely to be at high-risk
- Asthma 3 times more likely in COPD than high-risk group
- Frequent cough notably more common in high-risk group
- Dyspnea notably more common in COPD group than high-risk group
### Comparison of COPD and At Risk Populations 2012

<table>
<thead>
<tr>
<th>Smoking duration (years)</th>
<th>COPD</th>
<th>At Risk for COPD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>1-9</td>
<td>799</td>
<td>6.8</td>
</tr>
<tr>
<td>10-19</td>
<td>952</td>
<td>9.1</td>
</tr>
<tr>
<td>20-29</td>
<td>930</td>
<td>11.6</td>
</tr>
<tr>
<td>≥30</td>
<td>1,454</td>
<td>25.6</td>
</tr>
</tbody>
</table>

#### Prevalence of COPD Among South Carolina Adults By Region 2012

#### Prevalence of At High Risk of COPD Among South Carolina Adults By Region 2012
Conclusions

• COPD can be epidemiologically targeted with the BRFSS Questionnaire.
• South Carolina can do VERY much more on tobacco control initiatives.
• We now have a mechanism to track the outcomes associated with tobacco control initiatives.
• COPD is widely underdiagnosed. Diagnosis is by spirometry.
Partners

- Duke University- Roy Pleasants, Pharm D
  Monica Kraft, MD
- SC DHEC- Khosrow Heidari, MS
- CDC- Anne Wheaton, PhD
  Janet Croft, PhD
- Wake Forrest University- Jill Ohar, MD
- NC COPD Taskforce- Winston Liao, MPH
- University of Kentucky-David Mannino, MD
- MUSC- Tatsiana Beiko, MD
  Suchit Kumbhare, MBBS