Overweight and Obesity in Nevada

A Comparison of Behavioral Risk Factor Surveillance System and Department of Motor Vehicles Data

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Overview

- Problem statement
- Objective
- Background
- Analysis
- Results
- Conclusion
- Questions
Public Health Issue

- Obesity is a major public health issue affecting adults and children.
- Being overweight or obese increases the risk of various health conditions.
- In 2012, 62.5% Nevada adults were overweight or obese compared to 64.2% nationwide.¹
Objective

- To explore whether body mass index (BMI) computed from DMV data is comparable to BMI from BRFSS data.
Established in 1984 by CDC

Largest health survey system in the world

Cross-sectional, state-based survey

Used widely to monitor public health
Background BRFSS

- Core and optional modules and state-added questions
- Gathers information on:
  - Chronic diseases and conditions
  - Health-risk behaviors
  - Emerging health problem
  - Preventive services
Nevada’s DMV records release to third parties is governed by NRS 481.063.

Some entities that can access DMV data include:

- Government agencies
- Researchers
- Car insurance companies
- Dealers of motor vehicles
- Employers
- Private investigators
- Reporters
Background
DMV

- Information available on DMV data include:
  - Name
  - Date of Birth
  - Height
  - Weight
  - Mailing and physical address
  - Date of issuance
  - Sex
Inaccurate height and weight
- Under reporting for weight and BMI
- Over reporting of height
- Underestimating overweight and obesity
Body Mass Index (BMI)

Body mass index = \frac{\text{weight (kg)}}{[\text{height (m)}]^2}

Example:
Weight = 68 kg, Height = 165 cm (1.65m)

BMI calculation: \frac{68}{(1.65)^2} = 24.98
BMI Interpretation

- CDC’s standard weight status categories

<table>
<thead>
<tr>
<th>BMI</th>
<th>Weight Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below 18.5</td>
<td>Underweight</td>
</tr>
<tr>
<td>18.5 – 24.9</td>
<td>Healthy Weight</td>
</tr>
<tr>
<td>25.0 – 29.9</td>
<td>Overweight</td>
</tr>
<tr>
<td>30.0 and Above</td>
<td>Obese</td>
</tr>
</tbody>
</table>

In 2012, 2,154,289 total records
The following records were excluded:
• Issue years 1976-2007
• Duplicates
• No Nevada physical address
• Ages 10-19 years
• Biologically implausible values for height and BMI
Results

- Overall, BRFSS and DMV BMI estimates appear similar.
- BMI differences by sex
- DMV male estimates are within BRFSS confidence intervals (CIs)
- Only overweight DMV female estimate is within the BRFSS CIs
Nevada: BRFSS 2011 vs. DMV 2008-2012

- Underweight: BRFSS 2.2%, DMV 1.8%
- Healthy Weight: BRFSS 36.0%, DMV 39.0%
- Overweight: BRFSS 36.7%, DMV 36.9%
- Obese: BRFSS 25.1%, DMV 22.3%
Nevada: BRFSS 2011 vs. DMV 2008-2012 (by Sex)
Clark: BRFSS 2011 vs. DMV 2008-2012

<table>
<thead>
<tr>
<th>Condition</th>
<th>BRFSS</th>
<th>DMV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underweight</td>
<td>2.4%</td>
<td>1.9%</td>
</tr>
<tr>
<td>Healthy Weight</td>
<td>36.3%</td>
<td>39.2%</td>
</tr>
<tr>
<td>Overweight</td>
<td>36.6%</td>
<td>36.6%</td>
</tr>
<tr>
<td>Obese</td>
<td>24.7%</td>
<td>22.2%</td>
</tr>
</tbody>
</table>
Washoe: BRFSS 2011 vs. DMV 2008-2012

- Underweight: 1.6% (BRFSS) vs. 0% (DMV)
- Healthy Weight: 36.9% (BRFSS) vs. 41.2% (DMV)
- Overweight: 37.9% (BRFSS) vs. 37.2% (DMV)
- Obese: 23.5% (BRFSS) vs. 20.0% (DMV)
Strengths of BRFSS data

- Sampling is representative
- Data is collected in all 50 states DC, Guam, and U.S. Virgin Islands
- Data is collected annually
- Data is readily available
Strengths of DMV data

• Overall estimates similar to BRFSS, however, by sex estimates are different

• Provides adequate counts for analysis in all Nevada counties

• Height and weight data for individuals aged 10 + years

• Minimal cost for acquiring data

• Street address
Limitations

- **BRFSS**
  - Self-report
  - Small counts for counties
  - Persons without phones

- **DMV**
  - Self-report
  - Seasonal residents
  - Persons without a license or ID card
Conclusion

- BRFSS is a good source for health data.
- All self-reported data is subject to bias.
- Nevada DMV renewal form contains height and weight items.
Acknowledgement

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  ◦ Coordinated Chronic Disease Prevention and Health Promotion CDC grant
Thank you!
Questions?
References


2. Centers for Disease Control and Prevention. About BMI for Adults. Available at;  
http://www.cdc.gov/healthyweight/assessing/bmi/childrens_bmi/about_childrens_bmi.html


4. Morris DS, Schubert SS, Ngo DL, Rubado D, Main E, Douglas JP. (2013) DMV records are valuable for monitoring obesity in Oregon. Oregon Health Authority Environmental Public Health Tracking. Available at:  


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