Commercial Driver Medical Exams
Multiple Medical Conditions and Trends Over Time

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Federal Motor Carrier Safety Administration
Analysis, Research, and Technology Forum
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Background and Introduction

- Matthew Thiese, Chief Executive Officer of SafeLane Health, Inc.

- SafeLane Health has an online tool to help carriers and examiners track and perform exams that follow the most current guidance for medical certification of commercial motor vehicle (CMV) drivers.

- Received multiple grants, and currently submitting additional grants to the National Institutes of Health (NIH) and the Centers for Disease Control and Prevention (CDC).

- Assistant Professor at the University of Utah.
Data Sources: Road Ready, Inc.

- Commercial driver medical exams (CDMEs) performed by numerous examiners in all 48 contiguous States.
- Study included drivers employed by private carriers and those who are independent owner-operators.
- Most were over-the-road or long-haul drivers.
- CDMEs performed between January 1, 2005, and October 31, 2012, were analyzed.
- Only the first CDME was analyzed when drivers had multiple, consecutive CDMEs in the database. The remaining CDMEs were excluded.
Body Mass Index (BMI)

- Data were stratified by BMI category:
  - Underweight (BMI <18.5kg/m²).
  - Normal weight (BMI ≥18.5 to <25.0 kg/m²).
  - Overweight (BMI ≥25.0 to <30.0 kg/m²).
  - Obese (BMI ≥30 to <35 kg/m²).
  - Morbidly Obese (BMI ≥35 kg/m²).

- A 5’10” driver would weigh:
  - Morbidly Obese: 244 pounds or more.
NIH National Heart, Lung, and Blood Institute: Obesity Criteria

Body Mass Index and Risk of Death

\[ \text{BMI} = \frac{\text{kg}}{\text{m}^2} \quad \text{or} \quad \frac{\text{lb}}{\text{in}^2} \times 703 \]

- **BMI 18.5 - 24.9**: Normal Weight
- **BMI 25.0 - 29.9**: Over Weight
- **BMI 30.0 - 34.9**: Obesity Class I
- **BMI 35.0 - 39.9**: Obesity Class II
- **BMI 40.0 - 49.9**: Obesity Class III

Sources:

Flow Chart of CDME Data

More than half of drivers were obese or morbidly obese (total 53.2 percent).
# Relationships between BMI Categories and Demographic Data

<table>
<thead>
<tr>
<th>Measure</th>
<th>Underweight BMI &lt;18.5 n = 424</th>
<th>Normal weight 25 &gt; BMI ≥ 18.5 n = 13,465</th>
<th>Overweight 30.0 &gt; BMI ≥ 25.0 n = 27,336</th>
<th>Obese 35 &gt; BMI ≥ 30 n = 23,511</th>
<th>Morbidly Obese BMI ≥ 35 n = 23,510</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (year)</td>
<td>42.3</td>
<td>44.6</td>
<td>46.9</td>
<td>46.9</td>
<td>45.1</td>
</tr>
<tr>
<td>Systolic blood pressure (BP)</td>
<td>116.8</td>
<td>121.1</td>
<td>125.7</td>
<td>128.1</td>
<td>130.3</td>
</tr>
<tr>
<td>Diastolic BP</td>
<td>74.6</td>
<td>77.4</td>
<td>80.5</td>
<td>82</td>
<td>83.1</td>
</tr>
<tr>
<td>Male (#, %)</td>
<td>390</td>
<td>12,878</td>
<td>26,450</td>
<td>22,584</td>
<td>22,057</td>
</tr>
<tr>
<td></td>
<td>92.0%</td>
<td>95.6%</td>
<td>96.8%</td>
<td>96.1%</td>
<td>93.8%</td>
</tr>
<tr>
<td>Female (#, %)</td>
<td>34</td>
<td>587</td>
<td>886</td>
<td>927</td>
<td>1,453</td>
</tr>
<tr>
<td></td>
<td>8.0%</td>
<td>4.4%</td>
<td>3.2%</td>
<td>3.9%</td>
<td>6.2%</td>
</tr>
<tr>
<td>Certification Time: 2-year</td>
<td>358</td>
<td>10,940</td>
<td>19,417</td>
<td>14,470</td>
<td>10,870</td>
</tr>
<tr>
<td>(#, %)</td>
<td>84.4%</td>
<td>81.2%</td>
<td>71.0%</td>
<td>61.5%</td>
<td>46.2%</td>
</tr>
<tr>
<td>Certification Time: Periodic</td>
<td>33</td>
<td>1,748</td>
<td>6,145</td>
<td>7,261</td>
<td>9,942</td>
</tr>
<tr>
<td>(#, %)</td>
<td>7.8%</td>
<td>13.0%</td>
<td>22.5%</td>
<td>30.9%</td>
<td>42.3%</td>
</tr>
<tr>
<td>Certification Time:</td>
<td>15</td>
<td>301</td>
<td>798</td>
<td>763</td>
<td>1,076</td>
</tr>
<tr>
<td>Temporarily Disqualified</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4.6%</td>
</tr>
<tr>
<td>(#, %)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not Certified (#, %)</td>
<td>18</td>
<td>476</td>
<td>976</td>
<td>1,017</td>
<td>1,622</td>
</tr>
<tr>
<td></td>
<td>4.2%</td>
<td>3.5%</td>
<td>3.6%</td>
<td>4.3%</td>
<td>6.9%</td>
</tr>
</tbody>
</table>
Comparing Driver Population with Other Studies

- Sieber et al., *Data from 2010 National Survey of Truck Drivers* (AJIM and JOEM, 2015).
- Thiese et al., *Cross-sectional Study of Truck Drivers*, conducted from 2008–10 (JOEM 2015).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Sieber et al. (n=1,265)</th>
<th>Thiese et al. (n=797)</th>
<th>Current Data (n=88,246) A = Total B = 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>~48</td>
<td>47.2</td>
<td>A=46.0 B=45.9</td>
</tr>
<tr>
<td>Percent Female</td>
<td>6.5%</td>
<td>14.1%</td>
<td>A=4.2% B=3.7%</td>
</tr>
<tr>
<td>BMI</td>
<td>32.60</td>
<td>32.90</td>
<td>A=31.70 B=32.50</td>
</tr>
<tr>
<td>BMI ≥ 35 (men)</td>
<td>31.3%</td>
<td>28.8%</td>
<td>A=26.6% B=30.1%</td>
</tr>
<tr>
<td>High blood pressure</td>
<td>26.3%</td>
<td>28.9%</td>
<td>A=23.9% B=31.8%</td>
</tr>
<tr>
<td>Cardiovascular disease</td>
<td>4.4%</td>
<td>6.0%</td>
<td>A=3.4% B=4.4%</td>
</tr>
</tbody>
</table>
Many CMV drivers (53.2 percent) in this study are obese and 26.6 percent have a BMI over 35.0 kg/m².

BMI is related to many medical conditions:
- Cardiovascular issues.
- Diabetes mellitus.
- Sleep disorders.
- Lung disease.
- Shortness of breath.
- Spinal injuries or disease.
- Digestive problems.
- Illness or injuries in the past 5 years.
- Requiring vision correction.

Influences of obesity are abundant and may be beyond those commonly recognized among CMV drivers.
Multiple Medical Conditions

- January 2010 recommendations from the Medical Review Board (MRB) of the U.S. Department of Transportation’s Federal Motor Carrier Safety Administration (FMCSA)
- List of 13 conditions; limited certification with increasing number of conditions.

<table>
<thead>
<tr>
<th>Number of Conditions</th>
<th>Certification Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 or 1</td>
<td>Maximum 2 years</td>
</tr>
<tr>
<td>2</td>
<td>Maximum 1 year</td>
</tr>
<tr>
<td>3</td>
<td>Maximum 6 months</td>
</tr>
<tr>
<td>4 or more</td>
<td>Not eligible until resolution of at least one condition</td>
</tr>
</tbody>
</table>

MRB recommendation, January 6, 2010, for fitness for duty with multiple medical conditions:

Data Used from the CDME Form for Each Condition

- Body mass index > 35 kg/m².
- Diabetes mellitus controlled by medication.
- Heart disease, heart surgery, or heart abnormalities.
- Elevated blood pressure above 140/90, hypertension medication, or self-reported history of hypertension.
- Corrected vision in both eyes worse than 20/40 or horizontal field of vision <70 degrees in either eye.
- Sleep problems.
Data Used from the CDME Form for Each Condition

- Kidney disease.
- Lung and chest abnormalities.
- Seizures or epilepsy.
- Spine or other musculoskeletal disorders.
- Stroke or paralysis.
- Nervous or psychiatric disorders.
- Opioid or benzodiazepine medication, including generic and trade names.
Change over Time for Select Conditions

- Meaningful increase in the prevalence of medical conditions.
- Standards for diagnoses not changed over time for these conditions.
Prevalence odds ratio and 95-percent confidence interval for number of multiple conditions per year compared to 2005, adjusted for age, gender, and body mass index.
Relationships between Obesity and Driver Health

- 8 of 13 conditions changed significantly over time.
- Significant increases over time for:
  1. Opioid or benzodiazepine use.
  2. BMI >35 kg/m².
  3. Sleep disorders.
  4. Hypertension.
  5. Diabetes mellitus.
  6. Cardiovascular disease.
  7. Psychiatric disorders.
Relationships between Obesity and Driver Health

- Vision problems were the only condition where the prevalence meaningfully decreased.
- Prevalence of multiple concomitant conditions also significantly increased.
- Data suggest drivers may be becoming more unhealthy over 8-year period.
Disclosures

- This study has been funded, in part, by grants from the National Institute for Occupational Safety and Health (NIOSH/CDC), 1K01OH009794, and NIOSH Education and Research Center training grant T42/CCT810426-10.
- The CDC/NIOSH is not involved in the study design, data analyses, or interpretation of the data.
Published Reports

  [http://journals.lww.com/joem/Citation/2015/06000/Commercial_Driver_Medical_Examinations__Prevalence.8.aspx](http://journals.lww.com/joem/Citation/2015/06000/Commercial_Driver_Medical_Examinations__Prevalence.8.aspx)

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