Motor Vehicle Injuries: A Priority for the U.S.–Mexico Border Population Authors

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Introduction

The United States–México Border Health Commission (BHC) was established in 2000 to promote and protect the health of people in the border region.1,2 The BHC Healthy Border 2010 initiative has specific objectives of importance: 1) reduce diabetes mortality and 2) reduce motor vehicle crash mortality. The unusually high prevalence of diabetes in Mexico makes it a high priority disease to compare with motor vehicle injury to assess its influence on the population. Since diabetes has such a high influence on mortality and focus of intervention, it is chosen to compare with motor vehicle injury mortality which is not as prioritized with interventions.

The BHC Strategic Actions identified for 2010/2011 focuses on a number of issues included in the Healthy Border 2010 report, entitled Healthy Border 2010: An Agenda for Improving Health along the United States-Mexico Border, published in 2003, with the exception of injury prevention.3 This report emphasizes diabetes control, which is valid given the alarming projections by the World Health Organization (WHO) and the Centers for Disease Control and Prevention (CDC).4,5 The omission of motor vehicle injury mortality from the BHC’s Strategic Actions planned in 2010/2011 may be inadvertent, given its priority in Healthy Border 2010.1,2 In an earlier study assessing the leading causes of mortality along the U.S.–Mexico border by the Pan American Health Organization in 1999, accidents and adverse effects ranked among the top five causes of death on both sides of the border.6

The comparison between these two leading causes of mortality will be reviewed using years of potential life lost to understand how they contrast.

Methods

Border counties and municipios included in this study are listed by the BHC.2 In the United States, 44 border counties are in four states (California, Arizona, New Mexico, and Texas).2 The 80 Mexican border municipios [counties] are in six estados [states] (Baja California Norte, Chihuahua, Coahuila, Nuevo León, Sonora and Tamaulipas).2

Years of potential life lost (YPLL), a measure devised by the CDC in 1982 to quantify loss of years from premature death, were used to assess the burden of motor vehicle and diabetes mortality. For further details regarding YPLL see Gardner & Sanborn, 1990.7 Basically, it is the sum of years lost from age at death to age 65.
U.S. mortality data came from the CDC Wonder database for diabetes and motor vehicle-related deaths by county and age in 2005. Comparable detailed information for Mexican municipios was unavailable. Therefore alternate sources were used to estimate the age-specific mortality per municipio. Census data was retrieved from the Mexican Consejo Nacional de Población for the border municipios in 2005 to determine the population of people living in border counties. Since mortality data by cause is not available for the Mexican municipios, two assumptions were made. The first assumption was that deaths per capita are distributed evenly throughout the respective state. This assumption means the number of deaths in border municipios would depend on the percent of the population in the border municipios. Data from the Sistema Nacional de Informacion en Salud lists deaths by state. This allowed for determination of total deaths in border municipios due to diabetes and motor vehicles. The second assumption is that mortality profile by age group for the municipios can be estimated from national mortality data by age in 2005 for diabetes and motor vehicle deaths. This allowed calculation of deaths by age using the national death trends for the border region. Once the deaths per age group are estimated, YPLL were calculated.

Results

Total motor vehicle-related deaths in the U.S. greatly outnumber deaths due to diabetes in people under 65 years. More total deaths in Mexican municipios result from diabetes as compared to motor vehicle injury.

Motor vehicle injury YPLL in both the U.S. and Mexican border counties are higher than from diabetes. Table 1 shows the YPLL for the U.S. and Mexican border counties for both diabetes and motor vehicle injury. In the U.S. border counties’ motor vehicle injury YPLL is 5.5 fold higher than for diabetes. In Mexican border counties, however, YPLL is only 3.9 percent higher for motor vehicle deaths than for diabetes. Although motor vehicle-related death is important, it is also of note that diabetes is 4.7 fold higher for YPLL in Mexico as compared to the U.S.

Conclusion and Discussion

This study reveals that motor vehicle injury causes greater loss of productive years of life than diabetes in both the U.S. and Mexico. This finding is especially surprising for Mexico, with its alarming prevalence of diabetes.

The high rates of motor vehicle mortality, especially in younger populations, underscore the need for both countries to develop interventions to reduce motor vehicle injuries. What approaches should be considered to reduce motor vehicle injuries in the border region? Two important measures are enforcement of seatbelt laws and reduction of drunk driving. Further investigations should be carried out to identify other cause-specific factors leading to motor vehicle mortality.
Reduction of motor vehicle injury is essential. However, diabetes intervention in the border population of Mexico is also of major concern. Diabetes mortality reduction in the Mexican border population should remain a priority.

Since its inception, the U.S.–México Border Health Commission has made great strides in improving the health of the border population. Results of this study support the recommendations of the Commission to reduce the burdens of both diabetes and motor vehicle injuries.
### Table 1. Years of Potential Life Lost by Age Group in the U.S. and Mexico, 2005

#### Years of Potential Life Lost in U.S. Border Counties by Age

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Total Population</th>
<th>1-4 years</th>
<th>5-9 years</th>
<th>10-14 years</th>
<th>15-19 years</th>
<th>20-24 years</th>
<th>25-34 years</th>
<th>35-44 years</th>
<th>45-54 years</th>
<th>55-64 years</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>120,781</td>
<td>462,557</td>
<td>490,593</td>
<td>522,425</td>
<td>525,711</td>
<td>541,591</td>
<td>943,011</td>
<td>941,874</td>
<td>856,081</td>
<td>585,367</td>
<td>5,989,991</td>
</tr>
<tr>
<td>Motor Vehicle</td>
<td>258</td>
<td>375</td>
<td>986</td>
<td>954</td>
<td>4,464</td>
<td>6,794</td>
<td>5,325</td>
<td>3,009</td>
<td>1,876</td>
<td>391</td>
<td>24,432</td>
</tr>
<tr>
<td>Diabetes</td>
<td>0</td>
<td>0</td>
<td>53</td>
<td>144</td>
<td>0</td>
<td>391</td>
<td>740</td>
<td>1,798</td>
<td>1,309</td>
<td>4,435</td>
<td></td>
</tr>
</tbody>
</table>

**Source:** Centers for Disease Control and Prevention WONDER Database ([http://wonder.cdc.gov/](http://wonder.cdc.gov/))

#### Calculated Years of Potential Life Lost in Mexican Border Municipios by Age

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Total Population</th>
<th>1-4 years</th>
<th>5-14 years</th>
<th>15-24 years</th>
<th>25-34 years</th>
<th>35-44 years</th>
<th>45-54 years</th>
<th>55-64 years</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>135,102</td>
<td>575,879</td>
<td>1,503,073</td>
<td>1,355,536</td>
<td>1,166,942</td>
<td>943,095</td>
<td>636,232</td>
<td>388,903</td>
<td>6,704,762</td>
</tr>
<tr>
<td>Motor Vehicle</td>
<td>258</td>
<td>1,334</td>
<td>2,331</td>
<td>8,236</td>
<td>5,716</td>
<td>3,060</td>
<td>1,318</td>
<td>314</td>
<td>22,567</td>
</tr>
<tr>
<td>Diabetes</td>
<td>65</td>
<td>64</td>
<td>222</td>
<td>774</td>
<td>1,882</td>
<td>4,055</td>
<td>8,045</td>
<td>5,748</td>
<td>20,855</td>
</tr>
</tbody>
</table>

References:

4. World Health Organization. (2009). Table 2. Estimated total DALYs ('000), by cause and WHO Member State, 2004 (a,m), Table 6. Age-Standardized DALYs per 100,000 by cause, and Member State, 2004 (a,m,p). Accessed on 12/28/10 from http://www.who.int/healthinfo/global_burden_disease/estimates_country/en/index.html