Motor Vehicle Crash Mortality among Northwest American Indians & Alaska Natives

Improving Data & Enhancing Access (IDEA-NW) Project, NW Tribal EpiCenter

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Background
Excess mortality among AI/ANs

- AI/AN life span 6 years below U.S. average
- After declining in 1900s, AI/AN death rates rose in mid-1980s
- Large racial disparities in injury deaths
  - Motor vehicle crashes account for majority of unintentional injury deaths
- Injury prevention has become a public health priority area for Indian Country
AI/AN race often misclassified on death certificates

- Race not often based on family’s own report
- AI/ANs misclassified more frequently than other races/ethnicities
- Misclassification errors may follow a patient between data systems
- Net result: morbidity and mortality measures are underestimated for AI/AN
IDEA-NW Project

- Improving Data & Enhancing Access (IDEA-NW)
  - Goal: Reduce misclassification of AI/AN race in surveillance systems; disseminate local-level health data to NW tribes.
  - Grant funding: AHRQ (2010 to 2013), OMH (2012-2017)

- Northwest Tribal Registry (“The Tribal Registry”)
  - All AI/AN registered at IHS or tribal clinic in the NW
  - Augmented with data from urban clinics

- Linkages conducted with public health datasets
Linkages in the Northwest

- Cancer registries
- Hospital discharge systems
- Death certificates
- STD/HIV and other communicable diseases
- Trauma registries
Methods
Data Sources

- Death certificates
  - Oregon: 2006-2010
  - Idaho: 2006-2010

- Linked with The Tribal Registry (known AI/AN)
  - Using LinkPlus software, compared data sets to find individuals who appear in both
  - Names, birthdates, SSN, etc. are compared
  - Probabilistic linkage - allow for errors, misspellings, missing data, nick names, etc.
  - Each pair given a score indicating likelihood of a match
  - “Grey area” matches reviewed by hand
Analysis

- Cause of Death defined using ICD-9/10 only underlying COD
- AI/AN in analysis = AI/AN (any mention) on death certificate and/or matched NTR
  - White race (alone) selected for comparison
  - AI/AN & White comprised 95% of the data
- Rates: 2006-2009
- Trends (Washington only): 1990-2009
- NCHS bridged-race population estimates used as population denominators
- Rates age-adjusted and presented per 100,000 population
Results
Racial misclassification

- Idaho: 8.3%
  - 95% coded as white
- Oregon: 12.9%
  - 98% coded as white
- Washington: 9.3%
  - 94% coded as white
Unintentional injury mortality, 2006-2009

Northwest Portland Area Indian Health Board

<table>
<thead>
<tr>
<th>State</th>
<th>AI/AN Rate</th>
<th>White Rate</th>
<th>RR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idaho</td>
<td>67.0</td>
<td>42.0</td>
<td>1.6</td>
</tr>
<tr>
<td>Oregon</td>
<td>63.7</td>
<td>37.7</td>
<td>1.7</td>
</tr>
<tr>
<td>Washington</td>
<td>95.9</td>
<td>40.3</td>
<td>2.4</td>
</tr>
</tbody>
</table>

RR = Relative Risk
Leading causes of unintentional injury deaths, NW region, 2006-2009

<table>
<thead>
<tr>
<th>Cause</th>
<th>Percent of UI deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor vehicle crashes</td>
<td>39.4%</td>
</tr>
<tr>
<td>Accidental poisoning</td>
<td>33.4%</td>
</tr>
<tr>
<td>Falls</td>
<td>27.6%</td>
</tr>
<tr>
<td>Accidental drowning</td>
<td>14.5%</td>
</tr>
<tr>
<td>Other</td>
<td>17.0%</td>
</tr>
</tbody>
</table>

AI/AN

White
Motor vehicle crash mortality, 2006-2009

<table>
<thead>
<tr>
<th>State</th>
<th>AI/AN</th>
<th>White</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idaho</td>
<td>34.5</td>
<td>16.1</td>
</tr>
<tr>
<td>Oregon</td>
<td>20.9</td>
<td>10.6</td>
</tr>
<tr>
<td>Washington</td>
<td>32.8</td>
<td>9.4</td>
</tr>
</tbody>
</table>

RR = 2.1

RR = 2.0

RR = 3.5
MVC mortality by sex, 2006-2009

Age-adjusted rate per 100,000

Idaho: 40.1 (AI/AN Male), 28.9 (AI/AN Female), 22.4 (White Male), 9.8 (White Female)
Oregon: 24.1 (AI/AN Male), 17.4 (AI/AN Female), 15.2 (White Male), 6.2 (White Female)
Washington: 40.6 (AI/AN Male), 25.0 (AI/AN Female), 13.9 (White Male), 4.9 (White Female)
AI/AN MVC mortality by age, 2006-2009

<table>
<thead>
<tr>
<th></th>
<th>Idaho</th>
<th>Oregon</th>
<th>Washington</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 8 yrs</td>
<td>5.4%</td>
<td>5.7%</td>
<td>2.4%</td>
</tr>
<tr>
<td>8-16 yrs</td>
<td>10.8%</td>
<td>8.1%</td>
<td>4.2%</td>
</tr>
<tr>
<td>17-25 yrs</td>
<td>29.7%</td>
<td>20.8%</td>
<td>39.8%</td>
</tr>
<tr>
<td>26-54 yrs</td>
<td>52.8%</td>
<td>15.1%</td>
<td>41.6%</td>
</tr>
<tr>
<td>55 yrs and older</td>
<td>12.0%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Percent of MVC deaths
AI/AN urban vs. rural MVC mortality, 2006-2009

RR = 1.2  
RR = 2.2  
RR = 1.1

Age-adjusted rate per 100,000

Idaho: Urban = 27.2, Rural = 32.2
Oregon: Urban = 15.3, Rural = 34.0
Washington: Urban = 29.5, Rural = 33.5

3-year rolling averages

Age-adjusted rate per 100,000

1990-1992
1991-1993
1992-1994
1993-1995
1994-1996
1995-1996
1996-1997
1997-1998
1998-2000
2000-2001
2001-2002
2002-2003
2003-2004
2004-2005
2005-2006
2006-2007
2007-2009

APC = -2.6%
Discussion
Correct racial classification is a critical factor in accurate surveillance of mortality
  - Linkage can help address misclassification

Unintentional injury & MVC mortality in particular remain disproportionately high for AI/ANs

Some improvements experienced by Whites (significant decrease in MVC rates) have not occurred for AI/ANs
Tribal uses of data

• Tribes use mortality data for:
  ▪ Health assessment
  ▪ Grant writing and reporting
  ▪ Program planning and evaluation
  ▪ Policy and advocacy

• Comprehensive 3-state mortality report to be published in November, 2012
Injury prevention projects at NPAIHB

- Injury Prevention Program
  - NW Tribal Injury Prevention Coalition → 5-year Tribal Injury Prevention Action Plan
  - Focus on motor vehicle safety & elder falls

- Native CARS (Children Always Ride Safe)
  - Randomized delayed-intervention CBPR study in 6 NW Tribes
  - Goal: to design, implement, and test the effectiveness of tribal interventions to improve the use of child safety seats among AI/AN children
Limitations & challenges

- Tribal Registry under-represents urban AI/AN and those with private insurance
  - Captures 75-80% of AI/AN population
- Even with combined data years, small numbers make AI/AN rates unstable
  - Local-level analysis/reporting even more difficult
- Death certificate data does not answer the “why” questions
Thank You!

- The Tribes of Idaho, Oregon, and Washington
- Victoria Warren-Mears, PhD (P.I.)
- Bridget Canniff & Luella Azule, Injury Prevention Program
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- Idaho, Oregon, and Washington vital statistics staff
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