from rigorous science ... 

... to impactful practice
Stay Tuned

- Toward elimination of healthcare associated infections (Oct 15)
- Public health impact of tobacco product and advertising regulation in the United States (Nov 22)
- Polio vaccine effectiveness in India – implications for polio eradication (Dec 17)
- Food safety (January 21)

Getting to Zero Traffic-Related Deaths

National Center for Injury Prevention and Control
Outline

- **Presentation:** Grant Baldwin, PhD, MPH and Ann Dellinger, PhD: *Applying What Works: Promoting Evidence-based Motor Vehicle Interventions*

- **Focused discussion:** David Sleet, PhD: *Global Road Traffic Safety: The United States in Context*

- **Partner perspective:** Justin McNaull, Director, State Relations, AAA: *The Roles and Experiences of Stakeholders in Influencing Motor Vehicle Policies*

- **Focused discussion:** Barron H. Lerner, MD, PhD: *Historical Barriers to Traffic Safety*

### 10 Leading Causes of Death by Age Group, United States, 2006

<table>
<thead>
<tr>
<th>Rank</th>
<th>Cause</th>
<th>0-4</th>
<th>5-14</th>
<th>15-24</th>
<th>25-34</th>
<th>35-44</th>
<th>45-54</th>
<th>55-64</th>
<th>65+</th>
<th>All Ages</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Heart Disease</td>
<td>11,250</td>
<td>9,260</td>
<td>5,170</td>
<td>3,280</td>
<td>2,340</td>
<td>1,980</td>
<td>1,860</td>
<td>1,550</td>
<td>1,170</td>
</tr>
<tr>
<td>2</td>
<td>Cancer</td>
<td>5,730</td>
<td>3,350</td>
<td>3,080</td>
<td>2,640</td>
<td>2,160</td>
<td>1,960</td>
<td>1,900</td>
<td>2,000</td>
<td>2,160</td>
</tr>
<tr>
<td>3</td>
<td>Suicide</td>
<td>2,100</td>
<td>1,760</td>
<td>1,660</td>
<td>1,570</td>
<td>1,600</td>
<td>1,660</td>
<td>1,760</td>
<td>2,100</td>
<td>2,600</td>
</tr>
<tr>
<td>4</td>
<td>意外伤害</td>
<td>1,380</td>
<td>1,590</td>
<td>920</td>
<td>440</td>
<td>310</td>
<td>270</td>
<td>260</td>
<td>300</td>
<td>340</td>
</tr>
<tr>
<td>5</td>
<td>Unintentional Injury</td>
<td>1,380</td>
<td>1,590</td>
<td>920</td>
<td>440</td>
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<td>6</td>
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<td>300</td>
<td>340</td>
</tr>
</tbody>
</table>

Source: National Vital Statistics System, National Center for Health Statistics, CDC.
Years of Potential Life Lost before Age 65: Top 10 Causes of Death and Motor Vehicle Deaths, United States, 2006


Economic Costs of Motor Vehicle Death and Injuries

Source: Naumann et al., 2009 Unpublished
Percentage of Motor Vehicle Fatalities Involving Key Risk Factors, 2007


Percentage of Population/Licensed Drivers/Registered Vehicles vs. Percentage of Motor Vehicle Fatalities by Risk Factor, 2007

7 fold variation in rates
- States with lowest rates tend to have stronger laws, but the relationship is not that simple

Motor Vehicle Death Rates by State, 2006


Fatalities and Fatality Rates per 100 Million Vehicle Miles Traveled from 1961-2008

Domains Important for Motor Vehicle Safety

- Roads Infrastructure
- Vehicles
- People

Focus on People

- High risk groups
- Safety device use
- Risk factors
- Policy
In the first 6 months, newly licensed drivers are 8 times more likely to be involved in fatal crashes than more experienced drivers.

**Teenage Drivers: Risk Factors**

- Inexperience
- Immaturity
- Teenage passengers

**Benefits of Driving Experience**

*Source: Mayhew, 2003*
Male Driver Crash Rates per Licensed Driver During 1 - 4 Years of Licensure by Driver Age, Ontario

Source: Mayhew and Simpson, unpublished

Crash Rates by Driver Age and Passenger Presence - per 10,000 Trips

Source: Insurance Institute for Highway Safety
Risks for Everyone, but Greater for Teens

- Non-use safety belts
- Speed
- Night-time driving
- Distraction
- Alcohol
- Fatigue

Seat Belt Use by Age

Source: NHTSA (2009)
Speeding Drivers in Fatal Crashes

Source: NHTSA (2008)

Fatal Crashes per 100 Million Miles
Day vs. Night, by Driver Age

Source: Insurance Institute for Highway Safety
Crash Risk by Age and Blood Alcohol Concentration (BAC)

Source: Preusser, 2002

Teen Driving: Effective Interventions, Potential Impact & Challenges

- **Seat Belts**: raise seat belt use to 100% (1,325 lives saved a year)
- **State-based Graduated Drivers Licensing Policy**: all states strong GDL (175 16-year old drivers saved a year)
- **Alcohol policies**: no alcohol-impaired driving by drivers under 21 (984 lives saved a year)
  - Challenge: compliance with existing policy
  - Challenge: state by state progress
  - Challenge: difficult to enforce

Source: Baker et al., 2007
Motorcyclist Fatal and Nonfatal Injury Rates, 2001-2007

- 5,100 deaths
- 288,000 ED-treated nonfatal injuries

Motorcyclists: Risk Factors

- No helmet use: 42% of riders
- Speeding: 36% of motorcyclist deaths
- Invalid license: 26% of motorcyclist deaths
- Alcohol: 28% of motorcyclist deaths BAC >.08

Source: NHTSA (2008)
Motorcycles: Effective Interventions

- Helmets - 37% effective in preventing death
- Universal helmet laws lead to 100% use
- Partial helmet laws lead to 50% use

Motorcycles: Potential Impact & Challenges

- Excess deaths: 100% helmet use would save 800 lives a year
  - Challenge: state by state policy
  - Challenge: strong opposition
  - Challenge: personal freedom argument against, not lack of science
  - Challenge: multi-causal nature of crashes for calculating lives saved
- 100% helmet use would save $250 million a year

Source: Insurance Institute for Highway Safety (2009)

Source: NHTSA (2008)
Alcohol-Impaired Driving: Burden

- Every day 36 people die and 700 more are injured in crashes that involve an alcohol-impaired driver
- One arrest for every 88 episodes of drinking and driving
- Societal cost is $1.00 per drink consumed
- 160 million annual self-reported episodes

Alcohol-Impaired Driving: Who is Most at Risk?

- Risk of impaired driver death
  - Males: 81% of impaired driver deaths, M/F RR=1.9
  - Young adults: 64% impaired driver deaths are aged 21-34 years
  - Nighttime drivers: vs. 6 am - 9:00 pm, RR= 4
  - Seat belt non-users: 74% impaired driver deaths are unbelted, PR = 1.7

- Risk of self-reported impaired driving episode
  - Persons who binge drink at least monthly: RR=13.6
Alcohol-Impaired Driving: Potential Impact of Two Interventions & Challenges

- .05 BAC (blood alcohol concentration): + 500 lives saved a year
  - Challenge: lack of political will and strong industry opposition
  - Challenge: measurement of BAC is inconsistent across states, imputation for between 16% - 87%

- Ignition Interlocks: Reduce DUI recidivism by 64%
  - Challenge: logistics of widespread use not determined

Seat Belts: Epidemiology

- Seat Belts: +50% effective preventing death
- 2008 use 83% in US
  - State use differs, 64%-98%
Seat Belts:
Potential Impact & Challenges

- 100% use saves 4,000-5,000 a year
- 90% use saves $5 billion a year
  - Challenge: 19 states have only secondary enforcement laws
  - Challenge: enforcement at night is more difficult, but belt use is lower at night

What Should CDC Be Doing?

- Strengthening effective policy
What Should CDC Be Doing?

- Strengthening effective policy

What Should CDC Be Doing?

- Assess effectiveness of interventions
  - Community Guide systematic reviews
    - Ignition interlock programs
    - Multi-component programs with community mobilization
Global Burden of Road Traffic Injuries

3,000 deaths each day
20-50 million injuries annually

$518 billion dollars annually

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### Leading Causes of Death 2004 and 2030 Compared

<table>
<thead>
<tr>
<th>LEADING CAUSE</th>
<th>%</th>
<th>LEADING CAUSE</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ischaemic heart disease</td>
<td>12.2</td>
<td>Ischaemic heart disease</td>
<td>12.2</td>
</tr>
<tr>
<td>Cerebrovascular disease</td>
<td>9.7</td>
<td>Cerebrovascular disease</td>
<td>9.7</td>
</tr>
<tr>
<td>Lower resp. infectious</td>
<td>7.0</td>
<td>Lower resp. infectious</td>
<td>7.0</td>
</tr>
<tr>
<td>Chronic obstr. pulmonary disease</td>
<td>5.1</td>
<td>Chronic obstr. pulmonary disease</td>
<td>5.1</td>
</tr>
<tr>
<td>Diarrhoeal diseases</td>
<td>3.6</td>
<td>Diarrhoeal diseases</td>
<td>3.6</td>
</tr>
<tr>
<td>HIV/AIDS</td>
<td>3.5</td>
<td>HIV/AIDS</td>
<td>3.5</td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>2.5</td>
<td>Tuberculosis</td>
<td>2.5</td>
</tr>
<tr>
<td>Trachea, bronchus, lung cancers</td>
<td>2.3</td>
<td>Trachea, bronchus, lung cancers</td>
<td>2.3</td>
</tr>
<tr>
<td>Road traffic injuries</td>
<td>2.2</td>
<td>Road traffic injuries</td>
<td>2.2</td>
</tr>
<tr>
<td>Prematurity &amp; low birth weight</td>
<td>2.0</td>
<td>Prematurity &amp; low birth weight</td>
<td>2.0</td>
</tr>
</tbody>
</table>

Source: WHO, 2009

### International Comparison: MV Deaths per 100,000 Population, 2007

- **Low/Middle Income**
- **High Income**
**Contributing Factors**
**Global Status Report – 2009**

- Less than half of countries have a BAC law at 0.05 g/dL or below
- 60% of countries lack a universal motorcycle helmet law
- 43% lack primary seat belt laws that cover the driver and all passengers
- 29% have urban speed limits below 30 mph

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**A Decade of Action… Saving 5 Million Lives**

1. Political Commitment
2. Global Action Plan ($300 million)
3. 10% Road Building Funds on Safety
Success Story - Vietnam

- 3% helmet use prior to the law
- 99% use after law (2007)
- Saved 1,000 lives to date, injuries down 25%
- Child helmet coverage began in 2009

What Should CDC Be Doing Globally?

- Create public-private partnerships
- Improve and expand global surveillance
- Translate the most effective interventions and policies
- Provide technical assistance & training
- Integrate road safety into CDC’s other global public health activities
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Traffic Safety Efforts in the U.S.

- Federal
- State
- Local
- Non-government
Legislative Climate for CDC Priorities

- Teen Driver Safety
- Seat Belts and Occupant Protection
- Alcohol Impaired Driving
- Motorcycle Helmet Laws

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Questions?

For any questions on this presentation, please contact Amy Harris at abharris@cdc.gov.