

HEALTH

Office of the Director

OD PUBLIC HEALTH GRAND ROUNDS

September 17, 2009

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



HELPING PEOPLE LIVE to their FULL POTENTIAL

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*



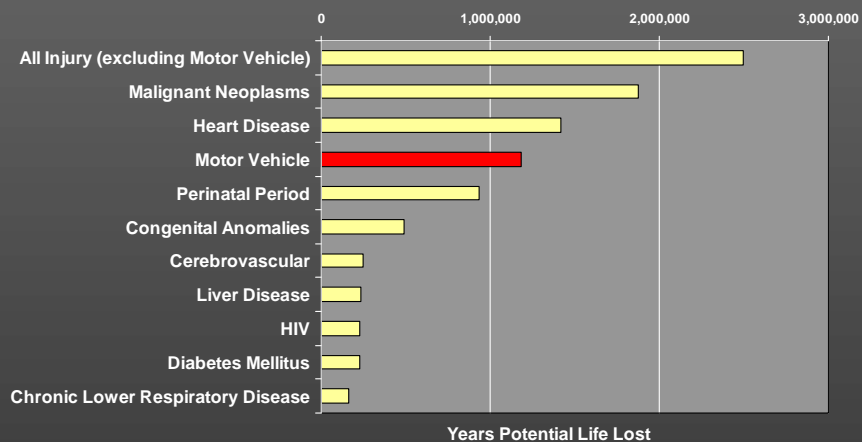
10 Leading Causes of Death by Age Group, United States, 2006

Rank	Age Groups										All Ages
	<1	1-4	5-9	10-14	15-24	25-34	35-44	45-54	55-64	65+	
1	Congenital Anomalies 5,919	Motor Vehicle 592	Motor Vehicle 578	Motor Vehicle 762	Motor Vehicle 11,098	Motor Vehicle 7,395	Malignant Neoplasms 19,917	Malignant Neoplasms 50,334	Malignant Neoplasms 101,454	Heart Disease 510,542	Heart Disease 631,936
2	Short Gestation 4,841	Congenital Anomalies 515	Malignant Neoplasms 459	Malignant Neoplasms 448	Homicide 5,717	Unintentional Poisoning 5,267	Heart Disease 12,339	Heart Disease 36,095	Heart Disease 86,477	Malignant Neoplasms 387,515	Malignant Neoplasms 559,888
3	SIDS 2,323	Unintentional Drowning 458	Congenital Anomalies 162	Homicide 241	Suicide 4,189	Suicide 4,985	Unintentional Poisoning 7,542	Unintentional Poisoning 8,234	Chronic Low Resp. Disease 12,375	Cerebrovascular 117,010	Cerebrovascular 137,119
4	Pregnancy Complications 1,688	Malignant Neoplasms 377	Homicide 149	Suicide 216	Unintentional Poisoning 2,906	Homicide 4,725	Motor Vehicle 6,706	Liver Disease 7,712	Diabetes Mellitus 11,432	Chronic Low Resp. Disease 108,845	Chronic Low Resp. Disease 124,583
5	Placenta Cord Membranes 1,140	Homicide 366	Unintentional Drowning 142	Heart Disease 163	Malignant Neoplasms 1,644	Malignant Neoplasms 3,856	Suicide 6,591	Suicide 7,426	Cerebrovascular 10,516	Alzheimer's Disease 71,860	Diabetes Mellitus 72,449
6	Unintentional Suffocation 843	Unintentional Fire/Burn 262	Unintentional Fire/Burn 118	Congenital Anomalies 162	Heart Disease 1,076	Heart Disease 3,387	HIV 4,010	Motor Vehicle 6,954	Liver Disease 7,217	Diabetes Mellitus 52,361	Alzheimer's Disease 72,452
7	Respiratory Disease 825	Heart Disease 161	Heart Disease 90	Unintentional Drowning 114	Unintentional Drowning 616	HIV 1,182	Homocida 3,020	Cerebrovascular 6,341	Suicide 4,983	Influenza & Pneumonia 49,345	Influenza & Pneumonia 56,326
8	Bacterial Septis 807	Unintentional Suffocation 137	Chronic Low Resp. Disease 52	Unintentional Fire/Burn 64	Congenital Anomalies 490	Diabetes Mellitus 673	Liver Disease 2,551	Diabetes Mellitus 5,692	Motor Vehicle 4,532	Nephritis 37,307	Motor Vehicle 45,495
9	Neonatal Hemorrhage 618	Influenza & Pneumonia 125	Unintentional Suffocation 90	Chronic Low Resp. Disease 83	Unintentional Poisoning 399	Unintentional Poisoning 625	Cerebrovascular 2,221	HIV 4,377	Nephritis 4,368	Septicemia 25,201	Nephritis 45,344
10	Circulatory System Disease 543	Septicemia 80	Cerebrovascular 45	Unintentional Suffocation 58	Cerebrovascular 210	Cerebrovascular 527	Diabetes Mellitus 2,084	Chronic Low Resp. Disease 3,924	Septicemia 4,032	Hypertension 19,858	Septicemia 34,234

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



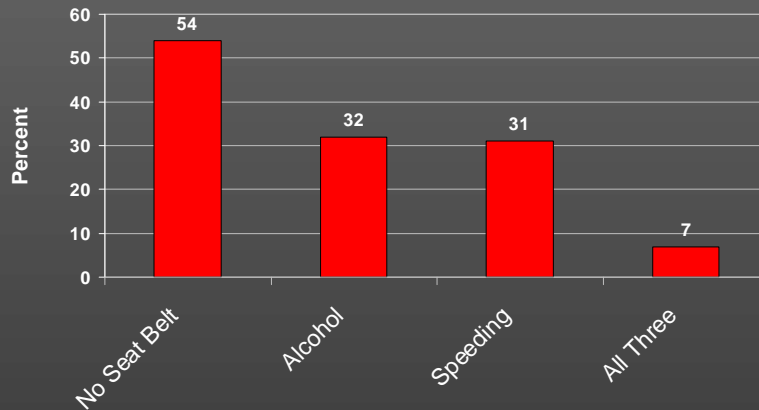
Source: CDC, NCIPC, Office of Statistics and Programming, WISQARS. Data Source: CDC, NCHS, National Vital Statistics System.

Economic Costs of Motor Vehicle Death and Injuries

	Deaths	Percentage of Deaths	Injuries	Percentage of Injuries	Costs (in millions)	Percentage of Costs
ROAD USER TYPE						
MV Occupant	33,230	73.8%	2,790,567	75.8%	70,083	70.6%
Motorcyclist	4,550	10.1%	237,689	6.5%	11,945	12.0%
Pedalcyclist	1,006	2.2%	474,355	12.9%	5,488	5.5%
Pedestrian	6,056	13.4%	167,029	4.5%	10,310	10.4%
MV Unspecified	187	0.4%	13,104	0.4%	1,493	1.5%
Total	45,029		3,682,744		99,318	
AGE						
Kids (0-14)	2,147	4.8%	512,975	13.9%	7,352	7.4%
Teens (15-19)	4,904	10.9%	530,008	14.4%	13,628	13.7%
Adults (20-64)	30,670	68.1%	2,441,527	66.3%	75,087	75.6%
Older Adults (65+)	7,308	16.2%	198,234	5.4%	3,251	3.3%
Total	45,029		3,682,744		99,318	

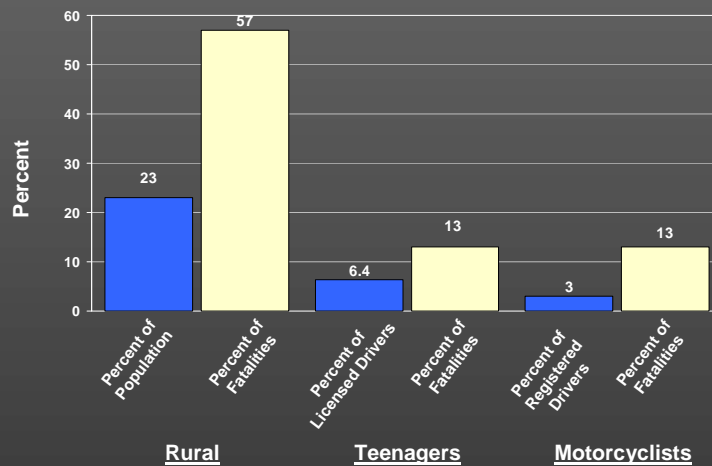
Source: Naumann et al., 2009 Unpublished

Percentage of Motor Vehicle Fatalities Involving Key Risk Factors, 2007



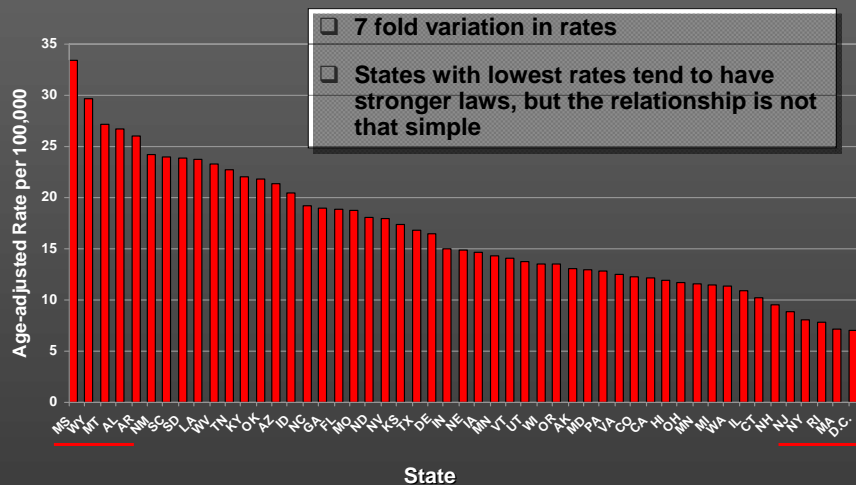
Source: NHTSA Traffic Safety Facts - 2007

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



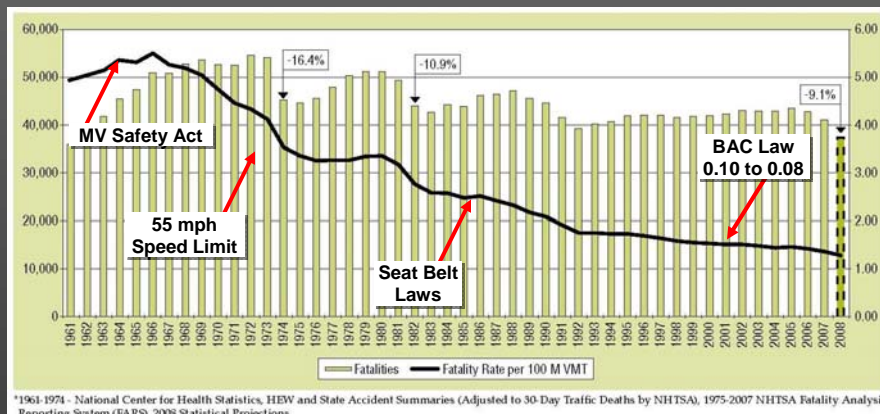
Source: NHTSA Traffic Safety Facts - 2007

Motor Vehicle Death Rates by State, 2006

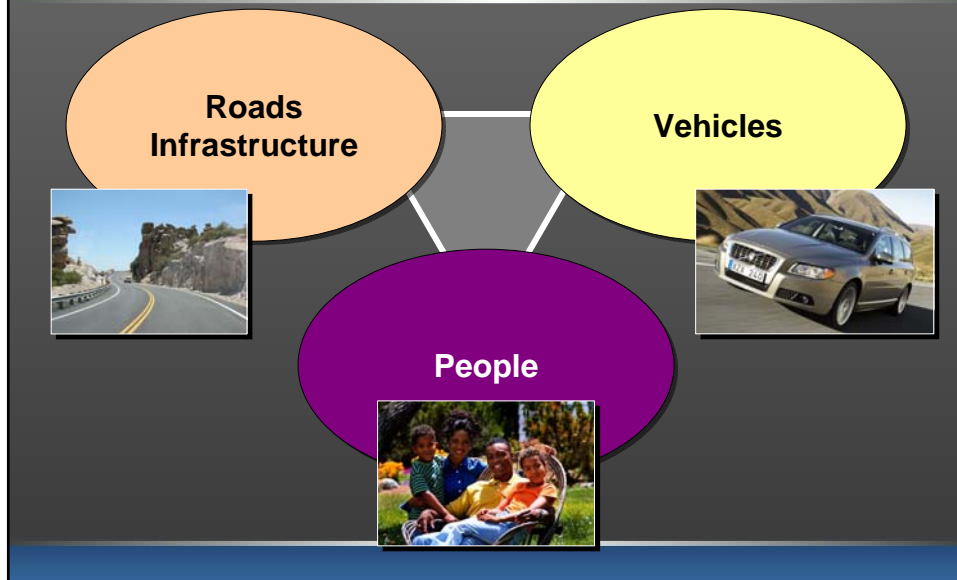


Source: CDC, NCIPC, Office of Statistics and Programming, WISQARS. Data Source: CDC, NCHS, National Vital Statistics System.

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



Domains Important for Motor Vehicle Safety



Focus on People

- High risk groups
- Safety device use
- Risk factors
- Policy



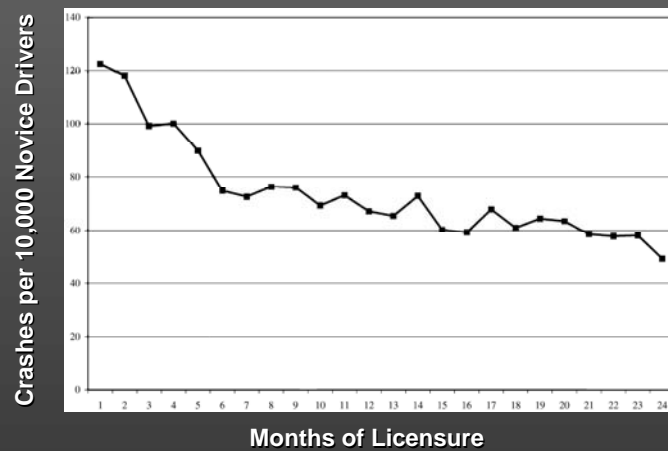
Teenage Drivers: Risk Factors

- ❑ Inexperience
- ❑ Immaturity
- ❑ Teenage passengers



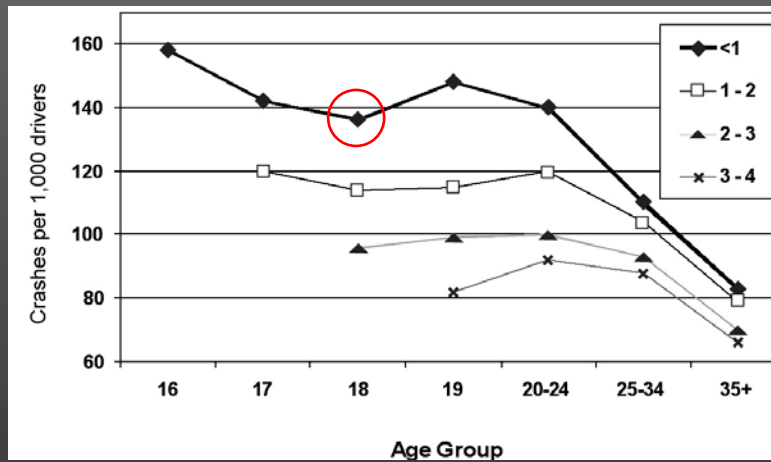
Benefits of Driving Experience

Crash Rates by Months of Licensure



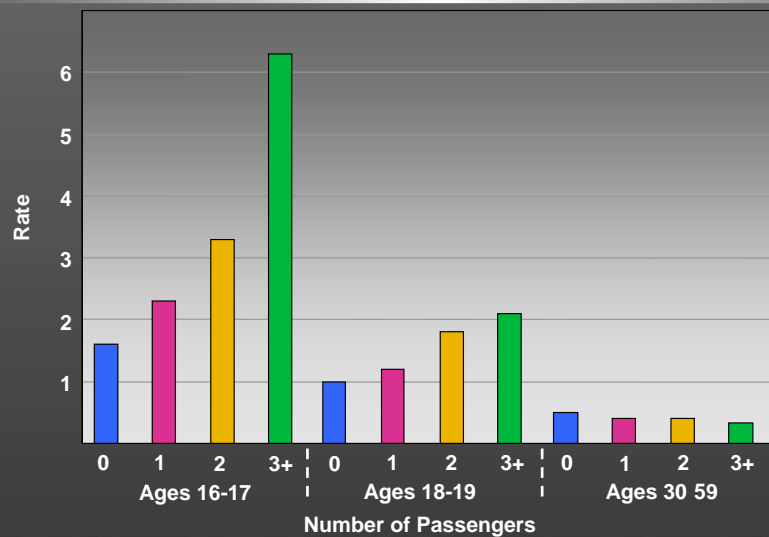
Source: Mayhew, 2003

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



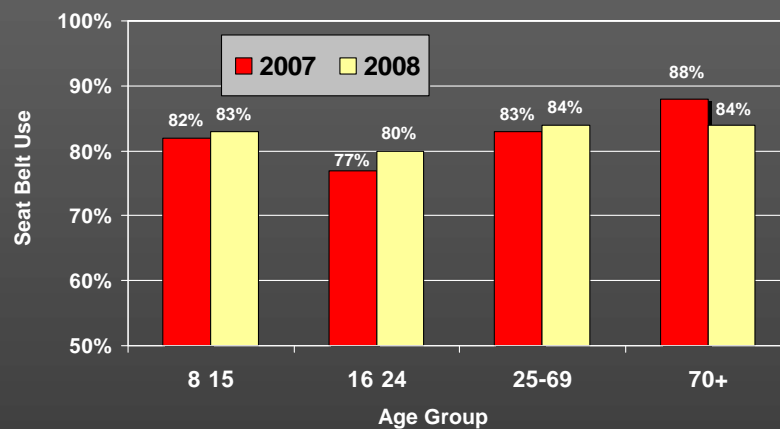
Source: Insurance Institute for Highway Safety

Risks for Everyone, but Greater for Teens

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

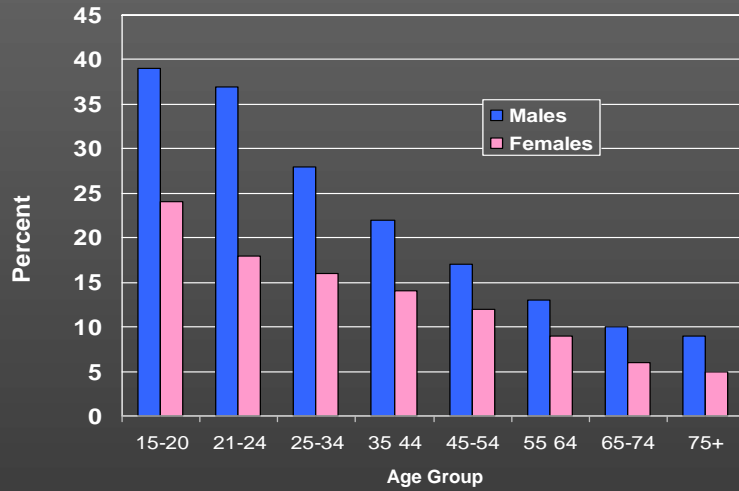


Seat Belt Use by Age



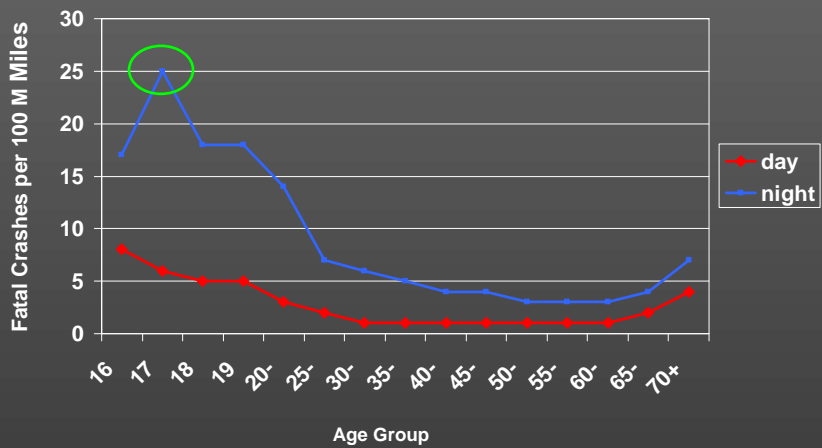
Source: NHTSA (2009)

Speeding Drivers in Fatal Crashes



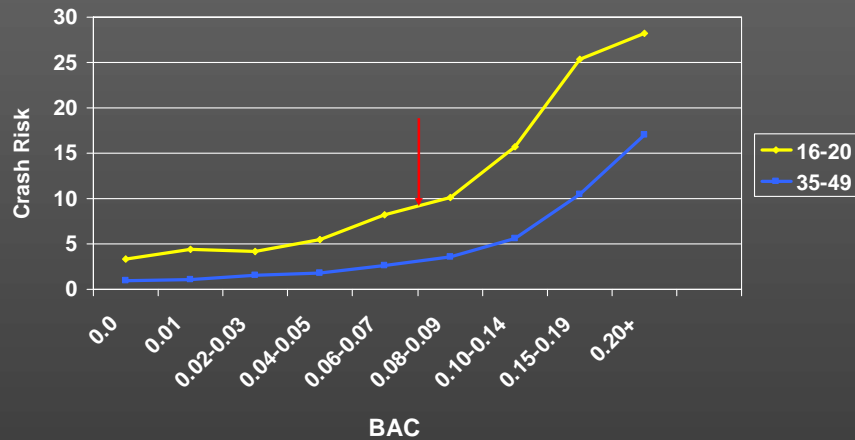
Source: NHTSA (2008)

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)



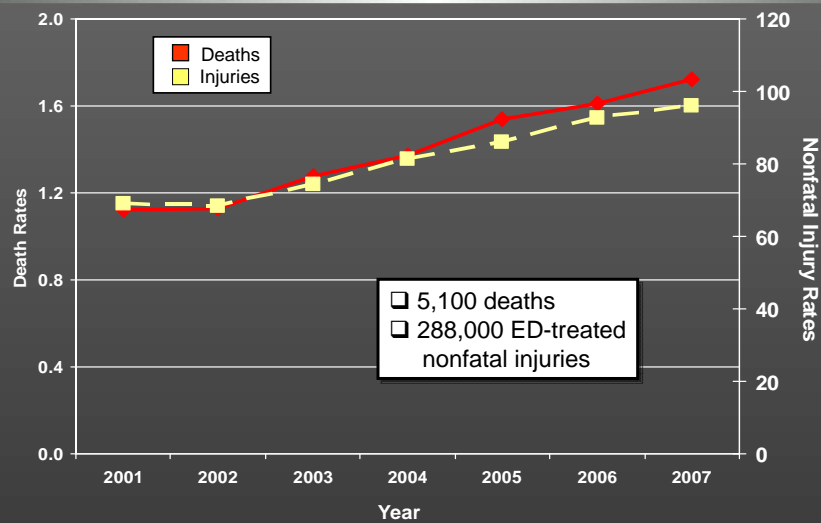
Source: Preusser, 2002

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



Source: FARS, NHTSA, 2009 & WISQARS, CDC, 2009

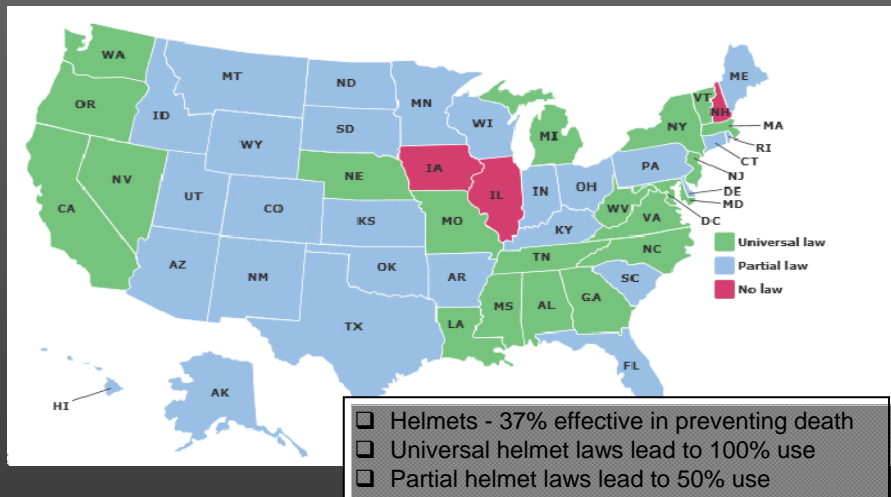
Motorcyclists: Risk Factors

- 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



Source: Insurance Institute for Highway Safety (2009)

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: 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): \pm 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: \pm 50% effective preventing death
- ❑ 2008 use 83% in US
 - State use differs, 64%-98%

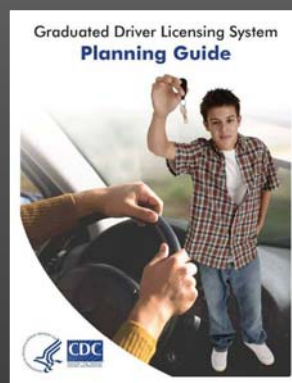
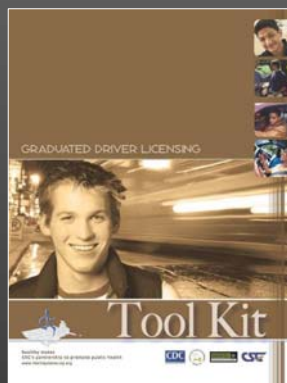


Seat Belts: Potential Impact & Challenges

- ❑ 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?

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What Should CDC Be Doing?

- ❑ **Assess effectiveness of interventions**
 - ❑ **Community Guide systematic reviews**
 - **Ignition interlock programs**
 - **Multi-component programs with community mobilization**



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Global Burden of Road Traffic Injuries

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



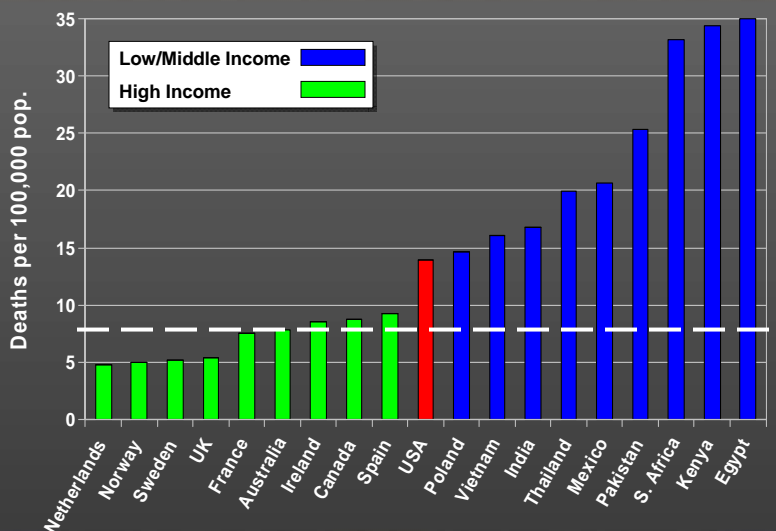
\$518 billion dollars annually

Leading Causes of Death 2004 and 2030 Compared

TOTAL 2004			TOTAL 2030		
	LEADING CAUSE	%		LEADING CAUSE	%
1	Ischaemic heart disease	12.2	1	Ischaemic heart disease	12.2
2	Cerebrovascular disease	9.7	2	Cerebrovascular disease	9.7
3	Lower resp. infectious	7.0	3	Chronic obstr. pulmonary disease	7.0
4	Chronic obstr. pulmonary disease	5.1	4	Lower resp. infectious	5.1
5	Diarrhoeal diseases	3.6	5	Road traffic injuries	3.6
6	HIV/AIDS	3.5	6	Trachea, bronchus, lung cancers	3.5
7	Tuberculosis	2.5	7	Diabetes mellitus	2.5
8	Trachea, bronchus, lung cancers	2.3	8	Hypertensive heart disease	2.3
9	Road traffic injuries	2.2	9	Stomach cancer	2.2
10	Prematurity & low birth weight	2.0	10	HIV/AIDS	2.0

Source: WHO, 2009

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

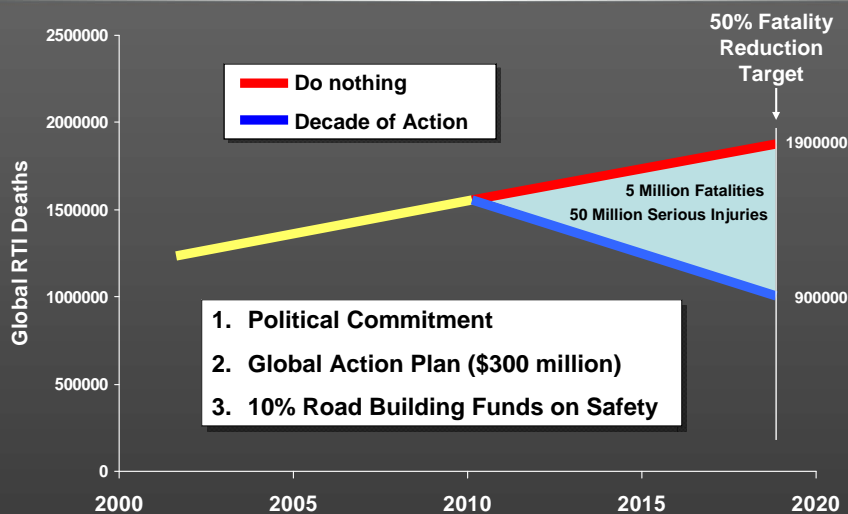


Contributing Factors Global Status Report – 2009

- ❑ 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



A Decade of Action... Saving 5 Million Lives



Success Story - Vietnam



Before



After

- ❑ 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.