Michigan Helmet Law Repeal: Early Clinical Impacts

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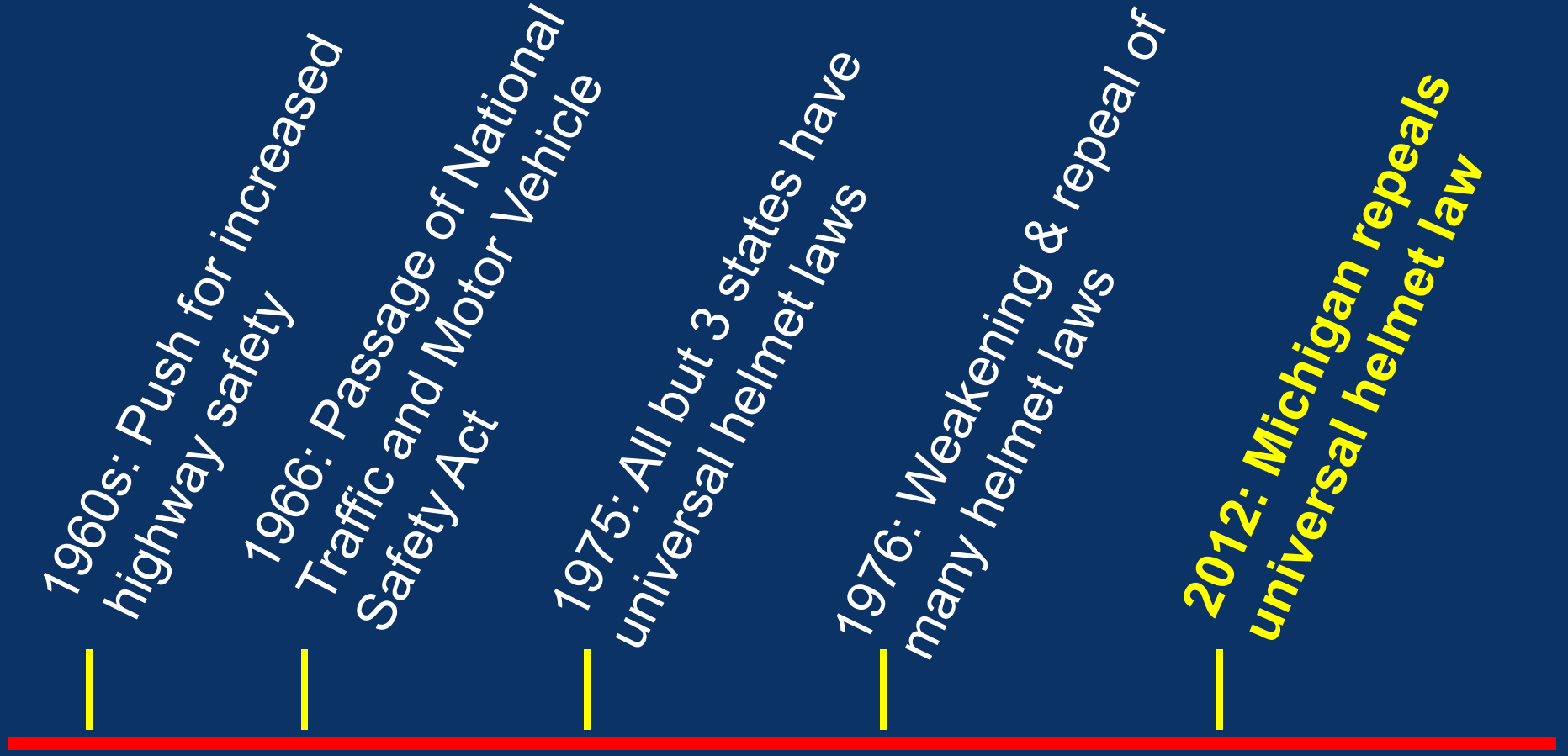
The authors have no financial disclosures or conflicts of interest

History of Helmet Laws in the United States



Effect of motorcycle helmet laws

Law	Helmet Use	Mortality
Universal Helmet Law	**90%**	**4.3%**
Partial Helmet Law	**61%**	**4.8%**
No helmet law	**53%**	**5.9%**

Unhelmeted motorcyclists: Mortality 6.7%, more severe brain injuries, longer ICU stay, consumption of resources, likely uninsured

76,944 patients - National Trauma Data Base (2002-2007)

Croce et al. *Ann Surg*. 2009; 250:390-4.

Effect of motorcycle helmet laws

Unhelmeted

- Higher mortality (1-4)
- Increased incidence of head injuries (5-7)
- More likely to be intoxicated (4,10)
- Less frequently insured (2,10)
- Longer ICU and overall hospital stay (5,8,9)

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Goal:

To study the early clinical and financial impacts of Michigan's motorcycle helmet law repeal on a Level 1 trauma center in West Michigan.

Methods

- Retrospective cohort study
- Motorcycle crash patients (192)
- Two motorcycle seasons included:
  - **April 13, 2011- November 13, 2011 (before)**
  - **April 13, 2012- November 13, 2012 (after)**
- Exclusion criteria:
  - Unknown helmet status
- Fatalities prior to hospital: Region 6

Methods

- Patient Demographics
- Helmet Status
- Mortality
- Toxicology
- Prior to Arrival Fatalities
- Injury Severity Score
- Abbreviated Injury Scale Head
- Glasgow Coma Scale
- ICU Length of Stay
- Hospital Length of Stay
- Ventilator Time
- Cost of Hospital Stay
- Disposition Location
- Insurance Status

Results

	2011	2012	p-value
Male (%)	68/79 (86.1%)	97/113 (85.8%)	0.963
Age (y)	41.7±15	43.7±15	0.324
Unhelmeted Riders	6/79 (7%)	33/113 (29%)	0.001
Mortality	2/79 (2.5%)	4/113 (3.5%)	0.156
Unhelmeted Crash Scene Fatalities	1/7 (14%)	10/13 (77%)	0.007

Results

	Helmeted	Unhelmeted	p-value
Male (%)	130/153 (85.0%)	35/39 (89.7%)	0.587
Age (y)	42.2	45.8	0.234
Hospital Mortality	5/153 (3.3%)	1/39 (2.6%)	0.162
Injury Severity Score (ISS)	15	16	0.617
AIS Head (AIS)	2	3	0.078
Glasgow Coma Scale (GCS)	14	13	0.118
Hospital Length of Stay (days)	4.8	6.6	0.083

Results

	Helmeted	Unhelmeted	p-value
EtOH (>0.08)	14.3%	47.8%	0.001
ICU Length of Stay (days)	1.5	2.9	0.020
Ventilator Time (days)	0.89	1.87	0.015
Cost of Stay	$21,300	$32,700	0.022

Disposition

	Helmeted	Unhelmeted	p-value
Deceased	5/153 (3.3%)	1/39 (2.6%)	0.821
Hospice	1/153 (0.7%)	0/39 (0%)	0.612
Rehabilitation Hospital	34/153 (22.2%)	13/39 (33.3%)	0.162
Home	113/153 (73.9%)	25/39 (64.1%)	0.227

Insurance

	Helmeted	Unhelmeted	p-value
Auto Insurance	55/153 (36.4%)	16/39 (39.0%)	0.558
Commercial Insurance	75/153 (49.7%)	20/39 (48.8%)	0.801
Medicare / Medicaid	15/153 (9.9%)	3/39 (7.2%)	0.686
Uninsured/Self Pay	6/153 (4.0%)	2/39 (4.9%)	0.780

Conclusions

- Motorcyclists riding without a helmet have increased from **7% to 29%**
- Prior to arrival fatalities among the unhelmeted have increased from **14% to 77%**
- Hospital mortality was **the same**
- **Clinical impacts** among unhelmeted:
  - Longer ICU length of stay
  - Longer ventilator times
  - Increased cost of stay
  - Increased EtOH use

Limitations

- Retrospective design
- Short time period represented (7 months)
- Small population size (n = 192)
- Local geographic analysis (Region 6)
- Cause of crash scene fatalities unknown
- Higher alcohol use among unhelmeted

Thank You