Data Trends after the Repeal of Mandatory Motorcycle Helmet Laws in US and Estimated Socioeconomic Effects of Repealing Michigan's Universal Helmet Law

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Background

Forty-seven states, the District of Columbia, Guam, the Northern Mariana Islands, Puerto Rico and the U.S. Virgin Islands have some form of helmet law for motorcyclists**.** Twenty states, the District of Columbia, the Northern Mariana Islands, Puerto Rico and the U.S. Virgin Islands have a universal helmet law, requiring helmets for all riders**.** The remaining twenty-seven states and Guam require helmets for specific riders and three states do not have a motorcycle helmet law (Illinois, Iowa, and New Hampshire).[1]

Michigan's universal helmet law was enacted in 1969: Michigan Vehicle Code Public Act 300 of 1949, Section 257.658 requires all motorcycle riders wear a helmet. This report will explore the data trends in other states after the repeal of respective helmet laws and estimated effects in Michigan if such a law were enacted**.**

People involved in crashes involving a motorcycle in Michigan between 2005 and 2009 were reported to the police as 30,819.[2] This number does not include individuals who did not file a police report. Out of the 30,819 citizens involved in a motorcycle crash, 3,863 people were either killed or suffered from an incapacitating injury.[3]

Statistical Data Findings

Currently, twenty-nine states have repealed a universal helmet law.[4]
Several states have conducted studies to statistically illustrate the impact of helmet use rates as a result of the repealed law. Each state studied showed an *extraordinary decrease* in the use of helmets when riding a motorcycle after the law was repealed.[5]

This table illustrates *decrease* in helmet use after each state repealed the mandatory helmet law:

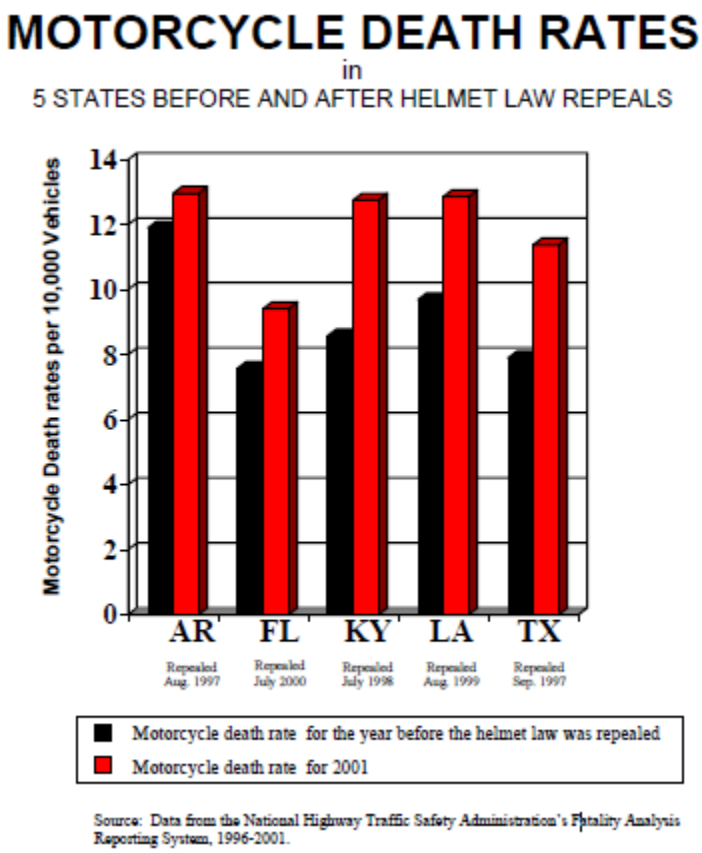
	With Helmet Law	After Repeal of Helmet Law	Amount of Change
Arkansas	97%	52%	-45%
Kentucky	96%	56%	-40%
Louisiana	100%	52%	-48%
Texas	97%	66%	-31%
Florida	99%	53%	-46%
Average	**98%**	**56%**	**-42%**

Following the repeal, it was noted there was an *increase* of eighty fatalities in Texas and sixty fatalities in Louisiana, and un-helmeted riders were *four times more* likely to suffer traumatic brain injuries as found in Kentucky.[6] It should be noted Louisiana re-enacted its universal helmet law in 2004 due to a *statistically significant increase* in fatalities and incapacitating injuries.[7]

When Florida repealed its universal rider motorcycle helmet law in 2002, there were *forty percent more* motorcyclists admitted to hospitals for treatment in the thirty months immediately following the helmet law change compared to the thirty months just before the law change (4,986 versus 3,567).[8] Deaths *increased* by twenty-four percent *above* what was expected from the increased registrations after the repeal of the mandated motorcycle helmet law.[9]

Fatalities in Florida per 10,000 registered motorcycles *increased* twenty-one percent compared to thirteen percent nationally for the two years before and after the law change—*seventy-five percent higher* than the national fatality rate.[10] Un-helmeted fatalities under the age twenty-one *increased 188 percent*, even though the law still applied to them. [11] Costs to treat motorcycle injures with head injury as the primary diagnosis more than *doubled* to forty-four million (adjusted for inflation).[12] Nebraska reinstated a helmet law on January 1, 1989, after repealing an earlier law in 1977. The state saw a twenty-two percent *reduction* in motorcyclist serious head injuries.[13]

The following graph shows the statistical evidence for the effect of motorcycle fatality rates before and after five states repealed the mandatory helmet law.[14]



According to studies conducted at UMTRI (University of Michigan Transportation Research Institute) in 2009, Michigan has a ninety-nine percent helmet use rate. The nation-wide trend suggests if Michigan repeals its universal helmet law, helmet use would *decrease* to approximately fifty-eight percent.

Predicted Effects if Michigan had repealed its Law 2005-2010

For this report's standard, it shall use fifty-eight percent as a "realistic estimate", but will also provide estimates on an "optimistic" sixty-eight percent use rate and a "pessimistic" fifty-three percent use rate. This methodology produces a conservative estimate, employing *helmet use estimate* as the *actual helmet use* in police-reported crashes.

Due to the fact motorcyclists who engage in risk-seeking behavior are more likely to crash and less likely to wear helmets; the actual helmet use in crashes is always lower than the statewide use rate.[15]

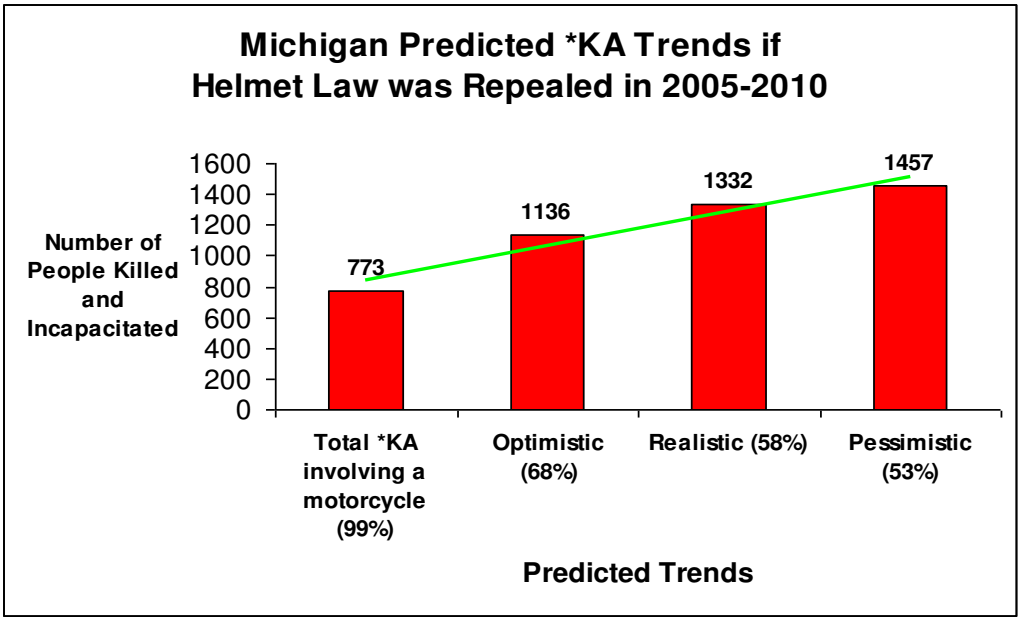
The following table shows the predicted fatalities and incapacitating injuries to the **3,863 citizens if the helmet use had been lower. These figures are based on the actual injury experience of crash-involved citizens during the period 2005-2009 in Michigan:

	Actual total *KA Involving a motorcycle (99% helmet use)	Predicted Pessimistic (53% helmet use)	Predicted Realistic (58% helmet use)	Predicted Optimistic (68% helmet use)
2005	743	1401	1281	1092
2006	658	1241	1134	967
2007	826	1558	1424	1214
2008	890	1679	1534	1308
2009	746	1407	1286	1097
Five Year Average	773	1457	1331	1136

***KA**: Fatalities and Incapacitating Injuries based on the Injury Severity Scale

Does not include non-incapacitating injuries, possible injuries or uninjured citizens of the **30,819 total people involved in motorcycle crashes 2005-2009.

The graph below illustrates the *predicted increase* of fatalities and incapacitated injuries as postulated by the data in the table above if helmet use had been estimated on the nationwide average trend rate based on states whose mandatory helmet law was repealed based on realistic, optimistic, and pessimistic predicted user rates:



Socioeconomic Impact

Although these are predicted trends only based on nationwide variables, it is noted un-helmeted riders have *higher* health care costs as a result of their crash injuries, and many lack health insurance. In November 2002, NHTSA reported that twenty-five studies of the costs of injuries from motorcycle crashes "consistently found that helmet use *reduced* the fatality rate, probability and severity of head injuries, cost of medical treatment, length of hospital stay, necessity for special medical treatments, and probability of long-term disability.

A number of studies examined the question of **who pays** for medical costs. Only slightly more than half of motorcycle crash victims have private health insurance coverage**. For patients without private insurance, a majority of medical costs are paid by the government.** [16]As a result, helmet effectiveness was documented nationwide to *lower* fatality rates, *prevent* serious head injuries, and *reduce* the need for ambulance service, hospitalization, neurosurgical intervention, intensive care, rehabilitation, and long term care.[17] The vast majority of economic costs are borne by the individuals in the crash and families, but a recent University of Michigan trauma center study showed motorcyclists not wearing helmets incurred twenty percent higher in-patient costs due to crashes. This averaged out to approximately $6,000.00 per individual.

The Michigan Catastrophic Claims Association (MCCA) is a fund financed by a surcharge on "every auto insurance policy in the state." While Michigan motorcyclists represent only 1.7 percent of those contributing to this fund, they account for *6.7 percent* of claims. [18] There will be an increase in all Michigan policyholders' insurance rates because Michigan's no-fault law pays for 'reasonable and necessary' injuries over a lifetime. As more motorcyclists who do not wear a helmet are seriously injured, reimbursement for those claims, which have already exceeded $4.4 billion, will increase as such that the "$20,000 first-party medical benefit coverage" that is proposed by repealing the universal helmet law will not be enough coverage for citizens. As of June 2005, the MCCA paid claims on 503 motorcycle accidents, totaling more than $210 million. The average motorcycle claim paid by the MCCA was over $418,000 last year (up seventy-one percent from the $297,000 paid in 1994).[19]

A NHTSA evaluation of the weakening of Florida's universal helmet law in 2000 to exclude riders twenty-one and older who have at least $10,000 of medical insurance coverage

found a huge *increase* in hospital admissions of cyclists with injuries to the head, brain, and skull. Such injuries *increased* eight-two percent during the thirty months immediately following the law change. The average inflation-adjusted cost of treating these injuries *increased* from about $34,500 before the helmet law was weakened to nearly $40,000 after. Less than one-quarter of the injured motorcyclists would have been covered by the $10,000 medical insurance requirement for riders who chose not to use helmets.[20]

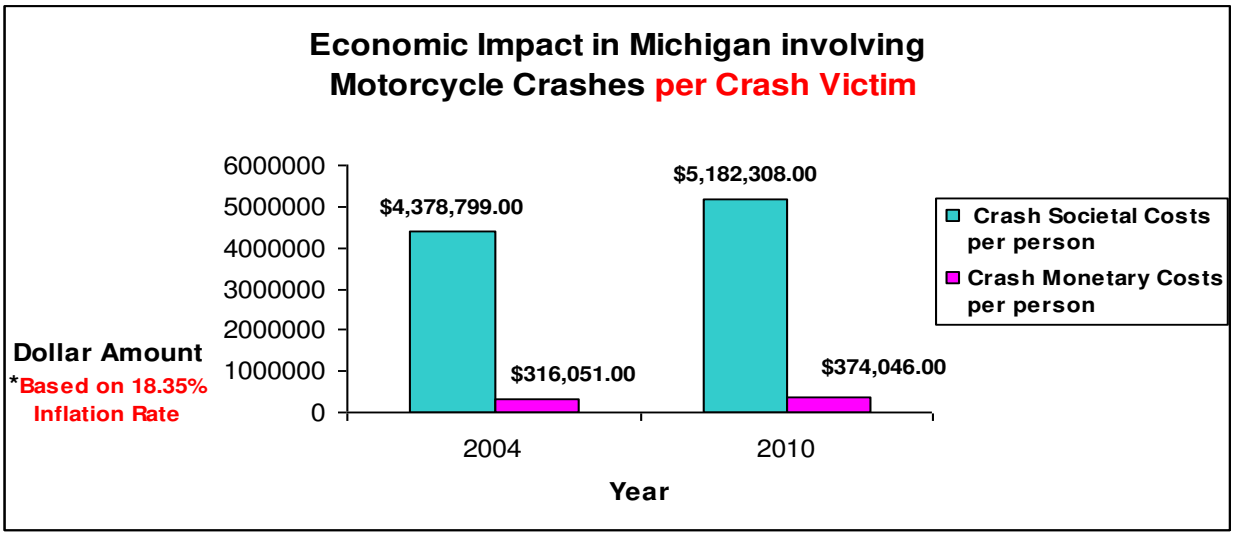
Studies conducted in Nebraska, Washington, California, and Massachusetts indicates how injured motorcyclists burden taxpayers: Forty-one percent of motorcyclists injured in Nebraska from January 1988 to January 1990 lacked health insurance or received Medicaid or Medicare.[21] In Seattle, sixty-three percent of trauma care for injured motorcyclists in 1985 was paid by public funds.[22] In Sacramento, public funds paid 82% of the costs to treat orthopedic injuries sustained by motorcyclists during 1980-83.[23] Forty-six percent of motorcyclists treated at Massachusetts General Hospital during 1982-83 were uninsured. [24]

As represented by a study conducted by NHTSA in 2008, helmeted motorcyclists were less likely to experience facial and head injuries compared to un-helmeted motorcyclists. Helmeted motorcyclists were significantly less likely to experience a traumatic brain injury. [25]

Head Injury Severity	Helmet Not Used	Helmet Used
No Head Injury	14,511 (80.2%)	22,266 (87.9%)
Minor	824 (4.6%)	262 (1.0%)
Moderate	1,220 (6.7%)	1,526 (6.0%)
Serious	517 (2.9%)	412 (1.6%)
Severe	693 (3.8%)	606 (2.4%)
Critical	322 (1.8%)	262 (1.0%)

According to the U.S. General Accounting Office, a surviving patient with a critical head injury incurs an average of $171,000 in medical and convalescence costs in just the first year following the injury.

The graph below displays the societal costs for **un-helmeted** victims involved in a motorcycle crash:



It is clear the repeal of universal helmet laws have a lasting effect on the community: riders and non-riders, short term and long term. Statistical evidence confirms the use of helmets by motorcyclists and passengers save lives.

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[1] State Highway Safety Offices and Insurance Institute for Highway Safety (IIHS)
[2] University of Michigan Transportation Research Institute
[3] University of Michigan Transportation Research Institute
[4] State Highway Safety Offices and Insurance Institute for Highway Safety (IIHS)
[5] Ulmer, R.G. and Preusser, D.F. 2003. Evaluation of the repeal of motorcycle helmet laws in Kentucky and Louisiana. Report no. DOT HS-809-530. Washington, DC: National Highway Traffic Safety Administration
[6] Houston, D.J. and Richardson, Jr., L.E. 2008. Motorcycle fatality rates and mandatory helmet-use laws. *Accident Analysis and Prevention* 40:200-08.
[7] National Highway Traffic Safety Administration. 2009. Traffic safety facts, 2008. Report no. DOT HS-811-159. Washington, DC: US Department of Transportation.
[8] National Highway Traffic Safety Administration. 2009. Traffic safety facts, 2008. Report no. DOT HS-811-159. Washington, DC: US Department of Transportation.
[9] National Highway Traffic Safety Administration. 2009. Traffic safety facts, 2008. Report no. DOT HS-811-159. Washington, DC: US Department of Transportation.
[10] National Highway Traffic Safety Administration. 2009. Traffic safety facts, 2008. Report no. DOT HS-811-159. Washington, DC: US Department of Transportation.
[11] National Highway Traffic Safety Administration. 2009. Traffic safety facts, 2008. Report no. DOT HS- 811-159. Washington, DC: US Department of Transportation.
[12] National Highway Traffic Safety Administration. 2009. Traffic safety facts, 2008. Report no. DOT HS-811-159. Washington, DC: US Department of Transportation.
[13] Muelleman, R.L.; Mlinek, E.J.; and Collicott, P.E. 1992. Motorcycle crash injuries and costs: effect of a re-enacted comprehensive helmet use law. *American Journal of Emergency Medicine* 21:266-72.
[14] Fatality Analysis Reporting System (FARS)
[15] Michigan Office of Highway Safety Planning: Estimated Effects of Repealing Michigan's Mandatory Helmet Law.

[16] Lawrence, B.A.; Max, W.; and Miller, T.R. 2002. Cost of injuries resulting from motorcycle crashes: a literature review. Report no. DOT HS-809-242. Washington, DC: National Highway Traffic Safety Administration

[17] Houston, D.J. and Richardson, Jr., L.E. 2008. Motorcycle fatality rates and mandatory helmet-use laws. *Accident Analysis and Prevention* 40:200-08.

[18] Michigan AAA

[19] Michigan AAA

[20] Ulmer, R.G. and Northrup, V.S. 2005. Evaluation of the repeal of the all-rider motorcycle helmet law in Florida. Report no. DOT HS-809-849. Washington, DC: National Highway Traffic Safety Administration

[21] Max, W.; Stark, B.; and Root, S. 1998. Putting a lid on injury costs: the economic impact of the California motorcycle helmet law. *Journal of Trauma* 45:550-56.

[22] Rivara, F.P.; Dicker, B.G.; Bergman, A.B.; Dacey, R.; and Herman, C. 1988. The public cost of motorcycle trauma. *Journal of the American Medical Association* 260:221-23.

[23] Bray, T.; Szabo, R.; Timmerman, L.; Yen, L.; and Madison, M. 1985. Cost of orthopedic injuries sustained in motorcycle accidents. *Journal of the American Medical Association* 254:2452-53.

[24] Bach, B.R. and Wyman, E.T. 1986. Financial charges of hospitalized motorcyclists at the Massachusetts General Hospital. *Journal of Trauma* 26:343-47.

[25] Lawrence J. Cook, Ph.D.; Tim Kerns, M.S.; Cindy Burch, M.P.H.; Andrea Thomas, M.S.; Emily Bell, M.S., 2008. Motorcycle Helmet Use and Head and Facial Injuries: Crash Outcomes in CODES-Linked Data. Report no. DOT HS-811-208. Washington, DC: National Highway Traffic Safety Administration