Motor Vehicle Crashes in North Dakota: Measuring the Costs

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Each year, more than 16,000 motor vehicle crashes (MVCs) occur on North Dakota roadways, resulting in more than 2,900 injuries and 107 fatalities. These crashes are detrimental to the mobility and livelihood of residents, businesses, and tourists; and have an enormous impact on the economy. Economic costs range from vehicle repairs to long-term medical care, lost wages, and lost productivity.

An analysis of costs associated with crashes in North Dakota reveals two primary categories: medical costs and non-medical costs. Medical costs were analyzed in terms of initial, first-year, and long-term care, as well as diagnoses of traumatic brain injury, spinal cord injury, and other injuries. Non-medical costs were examined in terms of crash severity, including non-incapacitating injuries, incapacitating injuries, and fatalities. This brief summarizes our findings and analysis, and introduces a tool to address costs.

Medical Costs

Medical costs can be best understood in terms of injury type and time frame. Due to the high incidence rate in MVCs and the high costs associated with treatment, this analysis focused on two injuries: spinal cord injury (SCI) and traumatic brain injury (TBI). The National Spinal Cord Injury Statistical Center (NSCISC) reports variance among the four categories of SCI, ranging from $218,504 to $741,425 for the first-year costs, and from $15,313 to $132,807 for charges incurred after the first year (NSCISC 2006). The NSCISC also estimates that 43.3% of SCIs are caused by motor vehicle crashes (2006).

Cost estimates for TBIs were based on the charges from North Dakota provider claims data for the initial hospital costs and national estimates from the Craig Institute for the first-year post-discharge costs and subsequent years cost. First-year follow-up costs are $40,000, with costs for each subsequent year estimated at $26,781 (Chaudhary 2004). According to the National Center for Injury Prevention and Control, MVCs cause 25.2% of all TBI hospital admissions (Langlois 2006). Initial costs for the remaining admissions were based on charges from the claims data. However, estimates for the two other time frames are beyond the scope of this research.

As indicated in Table 1, initial hospital costs associated with MVCs approach $26 million, followed by first year follow-up costs of $7.3 million, and $7.2 million for every subsequent year of necessary medical treatment, which even at the low end is 8-10 years for both SCIs and TBIs.

Craig Institute research indicates that the percentage of TBI patients on Medicaid will double in the first year following injury, and that 25.4% of all SCI patients will eventually require Medicaid. The estimated costs borne by Medicaid, reflected in Table 2 below, exceed $1.9 million, with $520,000 in follow-up care during the first year following discharge. Annual costs after the first-year post discharge approach $1.4 million.

Table 1. Estimated Medical Costs for All Payers in North Dakota

Injury Type	Estimated Admissions	Initial Hospital Costs	First-Year Post Discharge Costs	Annual Costs after the First Year
TBI	182	$4,730,944	$7,280,000	$4,890,522
SCI	34	$16,284,360	Included w/ Initial Costs	$2,297,234
Other Admissions	559	$4,907,618	N/A	N/A
Total	775	$25,922,922	$7,280,000	$7,187,756

Table 2. Estimated Medical Costs for Medicaid in North Dakota

Injury Type	Estimated Admissions	Initial Hospital Costs	First-Year Post Discharge Costs	Annual Costs Incurred after the First Year
TBI	13	$392,776	$520,000	$698,646
SCI	3*	$1,041,168	Included w/ Initial Costs	$667,637
Other Admissions	56	$491,640	N/A	N/A
Total	72	$1,925,584	$520,000	$1,366,283

*Because the number of SCIs is small in the Medicaid population, fractional cases were used in estimating the costs and savings. This number has been rounded only for conformity.

Non-Medical Costs

Costs reported in Tables 1 and 2 are limited to direct medical costs to Medicaid and other insurers. Losses resulting from MVCs are not limited to medical insurers, however; they also include lost productivity and wages, loss of life, and property damage. These costs will be analyzed in terms of three categories of injuries: fatalities, incapacitating, and non-incapacitating.

In addition to the medical costs associated with serious injury crashes, substantial economic loss is associated with MVC death and injury. Costs for fatalities are based on the value of statistical life as reported by the U.S. Department of Transportation, (Duvall 2008) and does not include costs for medical expenses, property damages or other costs. Costs for both incapacitating and non-incapacitating injuries include wage and productivity losses, medical expenses, administrative expenses, motor vehicle damage, and employers' uninsured costs (National Safety Council 2010). Table 3 below contains all three estimates reported in 2008.

Table 3. Per Crash Cost Estimates by Crash Severity

Year	Fatal	Incapacitating Injury	Non-Incapacitating Injury
2008	$5,800,000	$214,200	$54,700

In 2008, 1,512 total MVCs yielded injuries, of which 87 were fatal, 258 were incapacitating, and 1,167 were non-incapacitating. Costs totaled more than $623 million, as shown in Table 4. These cost estimates can be used to better understand potential gains from investments and policy decisions related to traffic safety.

Looking Ahead

Strategies to minimize motor vehicle crashes will almost certainly require a consolidated effort to improve upon current trends. However, decreasing MVC-related deaths and injuries—and the immense costs related to those crashes—will certainly benefit North Dakota residents, tourists, and businesses.

A subsequent brief uses these cost estimates in a cost-benefit analysis of adopting a primary seatbelt law. Analysis indicates that such a law would save $90 million to $277 million over a seven-year period. The medical cost savings to Medicaid alone ranges from $1 million to $3 million, and the savings to all medical insurers ranges from $8.4 million to $25.3 million.

Table 4. Estimated Injury Costs for Motor Vehicle Crashes in North Dakota

	Crash Severity			
Year	**Fatal**	**Incapacitating Injury**	**Non-Incapacitating Injury**	**Totals**
2006	$534,296,000	$71,075,844	$63,809,738	$669,181,582
2007	$528,960,000	$66,007,872	$65,955,072	$660,922,944
2008	$504,600,000	$55,263,600	$63,834,900	$623,698,500
2009	$707,600,000	$55,049,400	$64,655,400	$827,304,800
2010*	$591,658,000	$60,359,418	$66,406,894	$718,424,312
2011*	$599,391,333	$56,952,210	$64,980,683	$721,324,226
2012*	$635,009,778	$57,445,584	$65,327,359	$757,782,721
Totals	$4,101,515,111	$422,153,928	$454,970,046	$4,978,639,085

*Estimated based on previous three years.

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