

1999 SENATE HUMAN SERVICES

SB 2279

1999 SENATE STANDING COMMITTEE MINUTES

BILL/RESOLUTION NO. SB2279

Senate Human Services Committee

Conference Committee

Hearing Date FEBRUARY 1, 1999

Tape Number	Side A	Side B	Meter #
1	X		
Committee Clerk Signature <i>Baral Kalodjchuk</i>			

Minutes:

The committee was called to order. All senators were present.

The hearing was opened on SB2279.

SENATOR DEMERS introduced the bill. She supports the bill with written testimony.

ANNE VIESTENZ, med student, supports bill with written testimony. SENATOR LEE asked what the statistics are. Ms. VIESTENZ replied helmets reduce risk by 69%, brain injury by 65%, and severe brain injury by 74%.

RYAN CLIFFORD, med student, supports bill with written testimony. Talked about cost of helmet and explained the amendment by SENATOR DEMERS .

WADE SWENSON, med student, supports bill. Three major points. 1. helmets work - save lives and reduce injuries. 2. Need for increased bike safety; presently 600,000 emergency room visits in nation; 8,000 hospitalizations, and 900 deaths. Children most at risk are ages 10-14 and

especially boys. 3. Legislation is effective after researching various methods. Three methods have been used across the states - subsidies, education and legislation. Legislation is by all the most effective. 15 states mandate helmet use; little information about compliance with these laws; however, in 1990 Howard County Maryland became the first US locality to mandate helmet use and were able to increase from 4% helmet use to 47% a year later. In 1994 Oregon passed a law; they are able to achieve a 49% compliance rate. Georgia has achieved a 52% compliance rate. SENATOR LEE: Do other states limit to age? Mr. SWENSON replied that it varies.

ELEANOR WILKING 12 year old student in Fargo, was hit by a van and supports this bill. I currently owe my life to two inches of Styrofoam with a plastic cap. Description of accident on a rainy day. I wore a helmet for two reasons: 1. I'm a creature of habit; Mom put it on at age 5 and I thought it was pretty cool and I kept wearing it. 2. I'm very accident prone; typical kid. Most of my classmates don't wear a helmet; they are very intelligent, but it probably won't happen -- but it might!

MARTHA LECLERE, Eleanor's mother, supports bill. We know first hand. When Eleanor was hit by the car, we felt that we had taught our children all the right things, had rules for them to follow. The picture of the dented helmet was a realistic picture; it could have been her head. Eleanor's friends have stopped wearing helmets. They have no sense of their own mortality at that age. It is very hard for parents to fight that battle without some assistance from both the legislature and the law enforcement communities. The best prevention and wellness programs for children is aimed at accidents. The leading cause of death and highest contributor to health costs in that age group. A visual demonstration for kids used in one of these programs is a melon

will be dropped from 5-6 feet off the ground and it splatters and there are pieces everywhere.

Then a helmet is put on the melon, drops it again and it comes out perfectly fine. Please support this bill.

Bill Parker introduced the pages of the day, Amy Halvorson from Wahpeton and Sarah Friez from Mandan.

CAROL HOLZER, Dept of Health, written testimony supporting bill. Training in neighborhoods, free helmets and education. After 3 months we survey the parents and asked if the child has worn the helmet. Peer pressure was a big part of not wearing a helmet.

MARGARET RIECKE, ND Nurses Assoc. supports bill (written testimony). Introduced the racer that was injured in Medora.

BRUCE JOHNSON, racer in Medora that fell down a 106 foot cliff in a bike race. Racers required to wear helmet. I broke my wrist, back, ribs, collarbone, shattered my kidney, received a closed head injury. The worst of all the injuries was the closed head injury. The cost to my family was great. It completely changed me. I read what my kids wrote about what they had to go through in being around a person in the accident. This bill is for the victim and the family. Please support it.

HUNTER THANE was introduced to the committee; a grandson of SENATOR THANE .

BOB GRAVELINE, ND Safety Council, supports bill. We also recognize the peer pressure problem. A law will help the parents enforce the helmet wearing.

SHELLIE RUSSELL, pediatrician and a mother, supports bill. She explained the swelling and bleeding of closed head injuries and the damages that happen. Texas law includes all children under age of 15.

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Senate Human Services Committee

Bill/Resolution Number SB2279

Hearing Date FEBRUARY 1, 1999

BRUCE LEVI, NDMA, supports bill. He supports the bicycle helmet use. Encourages states to legally support bill.

LINDA ISAKSON, ND Children's Caucus, supports bill.

Hearing closed on SB2279.

Committee reconvened in the afternoon.

SENATOR DEMERS moved her amendments and Carol Holzer's, which would recognize another helmet requirement and children belong the age of 15. SENATOR FISCHER seconded it. Roll call vote carried 6-0. SENATOR DEMERS moved a DO PASS AS AMENDED; SENATOR MUTZENBERGER seconded it. No discussion. Roll call vote passed 6-0. SENATOR THANE will carry it.

PROPOSED AMENDMENTS TO SENATE BILL NO. 2279

Page 2, line 14, replace "A minor" with "An individual under fifteen years of age"

Page 2, line 15, replace "minor" with "individual"

Page 2, line 24, replace "a minor" with "an individual under fifteen years of age"

Page 2, line 25, replace "minor" with "individual"

Page 2, line 27, replace "minor" with "individual"

Renumber accordingly

PROPOSED AMENDMENTS TO SENATE BILL NO. 2279

Page 2, line 5, after "the" insert "US Consumer Product Safety Commission, the Snell Memorial Foundation," and replace "national" with "National"

Page 2, line 6, replace "standards institute" with "Standards Institute (ANSI)," and replace "Snell memorial foundation" with "American Society for Testing and Materials (ASTM)"

Page 2, line 14, replace "A minor" with "An individual under fifteen years of age"

Page 2, line 15, replace "minor" with "individual"

Page 2, line 24, replace "a minor" with "an individual under fifteen years of age"

Page 2, line 25, replace "minor" with "individual"

Page 2, line 27, replace "minor" with "individual"

Renumber accordingly

Date: 2/1/99
Roll Call Vote #: 1

1999 SENATE STANDING COMMITTEE ROLL CALL VOTES
BILL/RESOLUTION NO. 2279

Senate HUMAN SERVICES COMMITTEE Committee

Subcommittee on _____
or
 Conference Committee

Legislative Council Amendment Number _____

Action Taken Amendments

Motion Made By Sen DeMers Seconded By Sen Fischer

Senators	Yes	No	Senators	Yes	No
Senator Thane	✓				
Senator Kilzer	✓				
Senator Fischer	✓				
Senator Lee	✓				
Senator DeMers	✓				
Senator Mutzenberger	✓				

Total 10 (yes) 0 (no)
Absent 0
Floor Assignment _____

If the vote is on an amendment, briefly indicate intent:
Carol Salzman & Sen DeMers

Date: 2/1/99
Roll Call Vote #: 2

1999 SENATE STANDING COMMITTEE ROLL CALL VOTES
BILL/RESOLUTION NO. 2279

Senate HUMAN SERVICES COMMITTEE Committee

Subcommittee on _____
or
 Conference Committee

Legislative Council Amendment Number _____

Action Taken Do Pass As Amended

Motion Made By Sen DeMers Seconded By Sen Mutzenberger

Senators	Yes	No	Senators	Yes	No
Senator Thane	✓				
Senator Kilzer	✓				
Senator Fischer	✓				
Senator Lee	✓				
Senator DeMers	✓				
Senator Mutzenberger	✓				

Total 6 (yes) 0 (no)

Absent 0

Floor Assignment Sen Mutzenberger for Thane

If the vote is on an amendment, briefly indicate intent:
Carol Holzer's + Sen DeMers amendment

REPORT OF STANDING COMMITTEE

SB 2279: Human Services Committee (Sen. Thane, Chairman) recommends **AMENDMENTS AS FOLLOWS** and when so amended, recommends **DO PASS** (6 YEAS, 0 NAYS, 0 ABSENT AND NOT VOTING). SB 2279 was placed on the Sixth order on the calendar.

Page 2, line 5, after "the" insert "United States consumer product safety commission, the Snell memorial foundation, the"

Page 2, line 6, after "institute" insert an underscored comma and replace "Snell memorial foundation" with "American society for testing and materials"

Page 2, line 14, replace "A minor" with "An individual under fifteen years of age"

Page 2, line 15, replace "minor" with "individual"

Page 2, line 24, replace "a minor" with "an individual under fifteen years of age"

Page 2, line 25, replace "minor" with "individual"

Page 2, line 27, replace "minor" with "individual"

Renumber accordingly

1999 HOUSE TRANSPORTATION

SB 2279

1999 HOUSE STANDING COMMITTEE MINUTES

BILL/RESOLUTION NO. 2279

House Transportation Committee

Conference Committee

Hearing Date March 5, 1999

Tape Number	Side A	Side B	Meter #
1	x		0-55
1		x	0-9.4
1(3/18/99)	x		12.0-25.0
Committee Clerk Signature <i>Jaurah</i>			

Minutes:

CHAIRMAN KEISER OPENED THE HEARING ON SB 2279; A BILL RELATING TO BICYCLE HELMETS AND RESTRAINING SEATS; AND RELATING TO BICYCLES AND TO PROVIDE A PENALTY.

SENATOR JUDY DEMERS, District 18, introduced SB 2279. (See attached testimony).

REPRESENTATIVE WANDA ROSE, District 32, testified in support of SB 2279. She said that she supported the bill and believed in the concept of protecting children. This bill will increase the awareness and make a good deal for kids and parents.

REP. KEMPENICH asked if a fiscal note would be required for this bill.

CHAIRMAN KEISER said they would have to look into that.

CHAIRMAN KEISER asked Rep. Rose if this would apply in a home rule charter. Could the city enforce it?

REP. ROSE said she assumed that it would apply. She was not positive on that question.

REP. SVEEN asked if children would be educated on which side of the street to ride their bikes with the passage of this law.

REP. ROSE said yes.

REP. MICKELSON questioned the cost of helmets. Is it possible to wear the helmet as the head grows?

REP. ROSE said that the foam placement in the helmet can be removed as the child's head grows.

REP. MAHONEY noted that many children ride two on a bike. Is that going to be a crime now?

REP. ROSE said that it is not supposed to be done now as it is dangerous.

REP. MAHONEY asked if there aren't the same hazards with rollerblading and skateboarding. Did the bill drafters consider that in writing this bill?

REP. ROSE deferred that question to the students.

REP. MICKELSON asked if this bill is passed, would it start a trend to make all people wear helmets eventually?

REP. ROSE said that hopefully it would encourage it.

REPRESENTATIVE ROXANNE JENSEN, District 17, testified in support of SB 2279. (See written testimony).

REP. KEMPENICH asked what North Dakota's statistics are.

REP. JENSEN deferred the question to the students.

REP. SCHMIDT questioned if the law would apply only on bike paths as it is worded.

REP. JENSEN said yes.

ANNE VIESTENZ, UND School of Medicine, testified in support of SB 2279. (See written testimony). Anne gave an example of a child being hit by a vehicle while riding their bicycle.

REP. MICKELSON asked who was found to be at fault.

ANNE said the child was. Since so many children don't know better, they are commonly at fault in accidents. This legislation would help in those cases.

REP. KEMPENICH questioned the money issue. If the state is going to save so much money in cases of accidents when kids wear these helmets, should the state supply the helmets to those under 15 years of age?

ANNE said that there are several programs in place that already provide helmets.

REP. THORPE asked if the helmets always do their intended job.

ANNE said that yes, they tend to protect the front part of the brain where impact most often occurs in bicycle accidents.

REP. MICKELSON asked what the chances of a child living would be if they were hit while wearing a helmet by a car traveling at 65 miles per hour.

ANNE said that they have a 75% better chance of living with a helmet on.

REP. MAHONEY asked if there are different levels of standards that the helmets have to meet.

ANNE referred to her testimony for that question. She said that a new law has recently been passed about the standards so both standards fit under one. All of the helmets sold in stores must follow the standards.

CHAIRMAN KEISER asked if the youth have to be wearing the helmets, will the court waive or charge them if they aren't? What happens to the parents?

ANNE said that the parents are responsible to buy the helmets as they are to pay the ticket.

CHAIRMAN KEISER asked if there should be a penalty for those who violate this legislation?

ANNE said that it is in place only as a deterrent. They hope that it would keep people from violating the law.

CAROL HOLZER, North Dakota Department of Health, testified in support of SB 2279. (See attached testimony). Carol also brought in two different styles of helmets for the committee to see.

REP. MAHONEY asked what the cost of the helmets shown are.

CAROL said that they cost around \$10.00 in stores such as Target, Walmart, and Kmart.

Specialty sports stores are going to cost more.

REP. KELSCH asked whose job it is to enforce the proper fittings of the helmets.

CAROL said that it is an education issue. Public Health would play a part in that with the law enforcement.

REP. KELSCH expressed concerns about getting children to wear helmets.

CAROL said that since it would be law, a certain percent would comply and hopefully it will encourage others.

REP. KEMPENICH asked how many children live in North Dakota under the age of 15.

CAROL said she would find out.

REP. MEYER asked how many children have been hurt from an improperly sized helmet falling over their eyes.

CAROL said that the Department of Health does not receive those kind of statistics.

REP. MICKELSON asked if pads can be bought to fit in those helmets.

CAROL said she did not think that they sell them. However, to purchase a \$10.00 helmet for each child is not a bad deal.

REP. MAHONEY asked from the law enforcement aspect, is it right to issue an eight year old child a ticket?

CAROL said that it more up to each person's own discretion.

REP. WEISZ noted the extensive education program involved in this. Why aren't parents requiring their children to wear helmets.

CAROL said that question is on everyone's minds. But for whatever reason, legislation would help.

ELEANOR WILKING, Fargo, testified in support of SB 2279. (See attached testimony).

REP. KEMPENICH asked Eleanor why she wears her helmet.

ELEANOR said because her parents have taught her to.

BOB GRAVELINE, North Dakota Safety Council, testified in support of SB 2279. He said that it is a good program that the Safety Council supports. They urge the passage of this bill.

KAY LECLERC, Fargo, testified in support of SB 2279. (See written testimony). She noted what a terrifying experience it was to hear about her granddaughter Eleanor.

WADE SWENSON, UND Medical Student, testified in support of SB 2279. (See written testimony).

REP. MEYER asked if a child would more likely suffer a traumatic brain injury with no helmet on.

WADE said Rep. Meyer was correct.

REP. MEYER asked if the helmet would eliminate all brain injuries.

WADE said it would eliminate a majority of them, but nothing can safeguard against all injuries.

CHAIRMAN KEISER questioned the implementation of the bill.

WADE referred to the last page of his handout for that information.

REP. MAHONEY asked how the statistics are reached.

WADE said through the American Medical Association, the Journal of Medicine, and various case studies.

MICHAEL WOLL, Bismarck, testified in support of SB 2279. He told about his bicycle accident where his bike tire was low. Michael hit a car and had to get four stitches in his forehead. He now wears a helmet and commented that you can buy some "cool looking" helmets in stores. His parents remind him that it is a helmet on his head or he could possibly lose his life.

BRUCE JOHNSON, Bismarck, testified in support of SB 2279. He said that he was bicycle racing in the Badlands and went off of a cliff, a 106 foot fall. Bruce suffered broken bones, a broken back, punctured organs, and a closed head injury. He said that if he had not been wearing a helmet, he would have died. It has taken Bruce 10 years to recover from the closed head injury, and the potential to lose people from these injuries is the cost of not passing this bill.

BRUCE LEVI, North Dakota Medical Association, testified in support of SB 2279. He supervised the medical students that did the research for this bill. He urged a Do Pass of SB 2279.

JERRY SAUDE, Bismarck, testified in opposition to SB 2279. (See attached testimony).

SHIVANI SETH, testified in support of SB 2279. She noted a personal experience of a bicycle accident when she wasn't wearing her helmet. She is now in favor of wearing helmets.

CHAIRMAN KEISER CLOSED THE HEARING ON SB 2279.

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House Transportation Committee

Bill/Resolution Number sb 2279

Hearing Date March 5, 1999

March 18, 1999

COMMITTEE ACTION

REP. KEMPENICH moved a DO NOT PASS on SB 2279. REP. MEYER seconded the motion.

The motion carried.

General Discussion took place. REPS. KEMPENICH, MEYER, JENSEN, KEISER,

MAHONEY, AND WEISZ participated.

ROLL CALL - 10 YEA, 4 NAE, 1 ABSENT AND NOT VOTING.

FLOOR ASSIGNMENT - REP. THORPE

Date: 3/10
 Roll Call Vote #: (

1999 HOUSE STANDING COMMITTEE ROLL CALL VOTES
BILL/RESOLUTION NO. 2279

House Transportation Committee

Subcommittee on _____
 or
 Conference Committee

Legislative Council Amendment Number _____

Action Taken DNP

Motion Made By Rep Kempenich Seconded By Rep Meyer

Representatives	Yes	No	Representatives	Yes	No
Representative Keiser, Chair	✓		Representative Thorpe	✓	
Representative Mickelson, V. Ch.	✓				
Representative Belter	✓				
Representative Jensen		✓			
Representative Kelsch	✓				
Representative Kempenich	✓				
Representative Price		✓			
Representative Sveen		✓			
Representative Weisz	✓				
Representative Grumbo		✓			
Representative Lemieux	✓				
Representative Mahoney	✓				
Representative Meyer	✓				
Representative Schmidt					

Total (Yes) 10 No 4

Absent 1

Floor Assignment Rep. Thorpe

If the vote is on an amendment, briefly indicate intent:

REPORT OF STANDING COMMITTEE (410)
March 18, 1999 1:54 p.m.

Module No: HR-49-5107
Carrier: Thorpe
Insert LC: . Title: .

REPORT OF STANDING COMMITTEE

SB 2279, as engrossed: Transportation Committee (Rep. Keiser, Chairman) recommends **DO NOT PASS** (10 YEAS, 4 NAYS, 1 ABSENT AND NOT VOTING). Engrossed SB 2279 was placed on the Fourteenth order on the calendar.

1999 TESTIMONY

SB 2279

January 29, 1999

SCHOOL OF MEDICINE & HEALTH SCIENCES
 DEPARTMENT OF PEDIATRICS
 1919 NORTH ELM STREET
 FARGO, NORTH DAKOTA 58102
 (701) 293-4121
 FAX: (701) 293-4145

RE: Senate Bill #2279 - Bicycle Helmet Safety Law

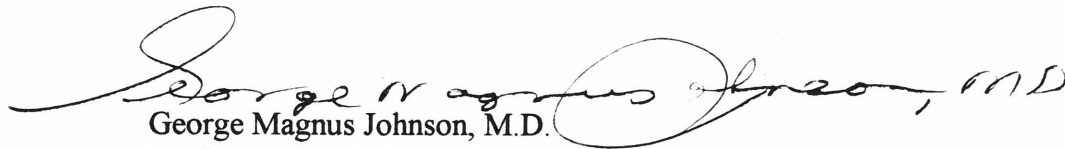
Members of the Human Services Committee:

Three senior medical students, Wade Swenson, Anne Viestenz, and Ryan Clifford at the University of North Dakota School of Medicine & Health Sciences are presenting a well considered bill in favor of bicycle helmet use by North Dakota children and adolescents. The genesis of this request relates to severity of closed head injuries secondary to bicycle accidents, particularly bicycle-vehicular accidents. These medical students all served on the same rotation in hospital Pediatrics at Fargo during the early part of their third year of medical school. It was a devastating circumstance for them and all the rest of us to see at that time a school-age boy suffer severe brain damage secondary to such a bike accident without a helmet. This boy will never achieve any degree of his former potential and his long-term continuing rehabilitation will be a source of great difficulty, anxiety, and expense to his family and obviously have a marked negative impact on society as a whole.

Bicycle helmet usage in North Dakota is about the same as it is around the rest of the nation - 10 to 15%. These three outstanding medical students have precise statistics to present to your committee about the import of this bill. Suffice it to say, in the city of Seattle and in King County Washington, a concerted effort has resulted in bicycle helmet usage for well over half the young people under the age of 18 with a consequent marked drop in closed head injury and its sequelae.

The kind of advocacy these three students are presenting to you represents the quality and earnestness of our outstanding medical students at the University of North Dakota School of Medicine & Health Sciences. The performance of our students and their quest for better lives for children is a stimulus to us all. I know you as legislators are as proud of these medical students for their earnest desire to help children and adolescents as we are within the Department of Pediatrics at the University of North Dakota School of Medicine & Health Sciences.

Sincerely,



George Magnus Johnson, M.D.
 Professor and Chairman, Department of Pediatrics
 UND School of Medicine & Health Sciences

cc: Judy DeMers
 H. David Wilson, M.D., Dean, UND School of Medicine & Health Sciences
 Anne Viestenz
 Wade Swenson
 Ryan Clifford

TESTIMONY IN SUPPORT OF SB 2279
CAROL HOLZER
ND DEPARTMENT OF HEALTH
SENATE HUMAN SERVICES COMMITTEE
FEBRUARY 1, 1999

Mr. Chairman, Senators, my name is Carol Holzer. I am the Injury Prevention Program Director with the North Dakota Department of Health. Our agency supports SB 2279.

Head injuries are the leading cause of death in bicycle crashes. Helmets have been shown to reduce the risk of head injury by as much as 85 percent and the risk of brain injury by as much as 88 percent.

Currently, 15 states and numerous localities have enacted some form of bicycle helmet legislation, most of which cover only young riders.

Our injury prevention program has been promoting the use of bike helmets since 1992. Over 6000 helmets have been provided to public health nurses, traffic safety programs, and other community programs to give to children in their community, and we are aware that other agencies have distributed as many helmets. The helmets have been distributed through neighborhood block parties that must be attended by parents and children. Unfortunately, local programs report they are not seeing the large increases in the number of helmets being worn in their communities. Approximately three months after the party, our office sends a survey to parents asking how often their child wore the helmet and reasons if they did not wear it. Many parents responded their child wore the helmet immediately following the party, but usage declined after the novelty wore off. Many reported "peer pressure" as the reason for non-use of the helmets. A law requiring all children to use a helmet would reduce the peer pressure for children.

We would like to suggest an amendment to the bill. Effective March 10, 1999, all bicycle helmets manufactured must meet the new US Consumer Product Safety Commission standard. On page 2, line 4, the definition of a "protective bicycle helmet" should be "standards... set by the US Consumer Product Safety Commission, the Snell Memorial Foundation, American National Standards Institute (ANSI), or the American Society for Testing and Materials (ASTM)."

TESTIMONY - SB 2279

Presented by: Senator Judy L. DeMers, District 18

February 1, 1999

Chairman Thane and Members of the Senate Human Services Committee. For the record, I am Judy L. DeMers. I represent District 18, consisting of part of Grand Forks and part of the Grand Forks Air Force Base, in the North Dakota Senate. I appear this morning as the prime sponsor of SB 2279.

Mr. Chairman and Committee Members, I am submitting SB 2279 at the request of three University of North Dakota School of Medicine senior medical students: Ryan Clifford, Wade Swenson, and Anne Viestenz. They became interested in child bicycle safety well over a year ago as a result of third year medical school studies. They contacted me at that time about the possibility of introducing a bicycle helmet law. Together, we reviewed the model act of the American Academy of Pediatrics (AAP) and studied the laws of fifteen other states who had passed bicycle helmet legislation between 1992 and 1996. The result is SB 2279.

I could provide all kinds of reasons for you to support this bill, but I plan to leave that for those who are here this morning to testify. I do want you to know, however, that I have prepared amendments to SB 2279 to limit application of this proposed law to children who are under fifteen (15) years of age. This targets the age group at highest risk of injury. Nationally, cyclists ages 14 and under are at five times greater risk for injury than older cyclists.

Mr. Chairman and Committee Members, SB 2279 is aimed at keeping our kids healthy and safe. It is prevention, pure and simple. I ask your favorable consideration of SB 2279. Thank you.

Simone Anne Ujestenz^①

- 8yo - rural highway - struck at highway speed
- head took 1° blow during impact
- originally not expected to live
- prolonged hosp course both PICU + Peds
- very gradual, ~~un~~complete return of functions
- continues to receive extensive rehabilitative services
 - speech
 - school
 - home health
 - child life specialists
 - OT
 - PT
 - Psych counseling

~~Bills ? astronomical -
uninsured~~

- Harborview Helmet Studies in
Western Wash. State have ②
undertaken most comprehensive
research onto bicycle helmet
injuries

- Most recent project lasted from
Mar. '92 - Aug. '94

- Revealed:

1) Bare helmets ↓ risk

head injury 69%

brain injury 65%

severe brain injury 74%

2) Helmets equally effective

- all age groups

- all types crashes including
motor vehicles

- of 14 fatal injuries - 10

~~unhelmeted~~ cyclist struck by
motor vehicle - only one
crushed truck helmeted

Currently suffers from

- (L) spastic hemiparesis
- (R) sluggish pupillary response
- (R) visual field deficit
- Significant behavioral problems:
 - short attention span
 - cooperative behavior
 - unrestrained display of affection
 - distractibility

- Lifetime diagnosis -

Head injury is ~~not~~ an isolated event but an ongoing process

- Bills astronomical
- Uninsured

- Harborview Helmet Studies -
Snell Memorial Foundation

Circumstances and Severity of
Bicycle Injuries

- Helmets ↓ risk of head injury by 69%, brain injury by 65%, and severe brain injury by 74%
- Helmets work equally well in all age groups
- Helmets equally effective in all types of crashes including those involving motor vehicles

Overall Conclusions

"Our research clearly indicates that bicycle helmets should be worn by all riders, regardless of their age, experience as cyclists, the distance they plan to ride, or any other factor."

Mr.
~~Madam~~ Chairman and Cmte Members,
my name is ...

In the next few minutes, I hope to express to you why we believe so strongly in bike helmet legislation. I'd like to do this by summarizing our views into 3 pts.

① (Simply) Helmets work! Save lives reduce injury. We've found there are many misconceptions about the effectiveness of helmets and many people underestimate the value of bike helmets. As Anne mentioned $3/4$ of HI can be eliminated by bike helmets. In a couple minutes, I'll introduce you to 2 people who can share first-hand the value of bike helmets.

② There is a need for increased bike safety. There are no state statistics, but each year in the U.S. bicycle-related injuries are responsible for almost 600,000 emergency room visits, 7700 hospital admissions, and 900 deaths. It is also important to note that the children most at risk for these injuries and fatalities are children aged ~~10-14~~ ¹⁰⁻¹⁴, and esp boys.

③ Legislation is effective. We came to this conclusion after researching various methods to increase helmet use. We concentrated on the three most popular methods: subsidies, legislation, education. We provided summaries of our findings as well as many other interesting things in our handout. ~~But I will very briefly summarize our findings.~~ And I encourage you to look at that.

Overall Legislation is the most effective method to increase and maintain helmet use

Subsidies - can be effective, but to maintain helmet use there must also be education or legislation

Education - generally ineffective without simultaneous legislation, but there are exceptions

The large scale Seattle Bicycle Helmet Campaign was very successful, but these successes are hard to find.

Legislation - Currently 15 states have laws mandating helmet use. There is ~~very~~ little information about compliance with these laws, but we do have some information.

1990 Howard County MD 4 → 47%

1994 Oregon - 49% Georgia - 52%

one state that has had marginal success with legislation is NY State, one study found that bicycle helmet use in NYC is 13.9%

~~Overall Legislation is the most effective method to increase helmet use.~~

Many bicycle riders and parents do not know how important helmets are. These laws serve to educate as much as they force compliance.

I'd like to conclude with a 1991 study that appeared in the JAMA. 1984-1988

2500 deaths 757000 HI

in other words 1 death/day 1 HI/4 min

We believe that bicycle helmets is a children's issue it is also a health issue. I would draw comparisons to ~~immigration~~ or car seats. or highschool football children wearing



Circumstances and Severity of Bicycle Injuries

Summary Report of Harborview Helmet Studies Sponsored by the Snell Memorial Foundation

TABLE OF CONTENTS

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- Risk Factors for Serious Injury
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 - *Other Potential Safety Measures*
- Overall Conclusions
- Acknowledgments

Executive Summary

This is the largest study conducted to date on the circumstances of bicycle injuries and the protective effect of helmets. The purpose of this study was to address a number of previously unanswered questions about the effectiveness of bicycle helmets. Injured cyclists were recruited between March 1992 and August 1994 from seven Western Washington hospitals (Harborview Medical Center, Group Health Cooperative Central and Eastside hospitals, Children's Hospital and Medical Center, Mary Bridge Hospital, Overlake Hospital and Medical Center, University of Washington Medical Center), as were cases from two Medical Examiners offices (King County and Pierce County).

Of 3,854 bicyclists who were injured or died during this time period, 3,390 (88 percent) were recruited for this study. This project was based on a case-control design in which individuals with head or brain injuries (cases) were identified and compared to those who were involved in crashes but did not suffer head or brain injuries (controls). Data were collected by self-report questionnaires, abstraction of medical records, and, in some cases, examination of bicycle helmets and measurements of cyclists' heads.

Questionnaires completed by subjects included demographic inquiries, as well as questions on cycling experience, circumstances of the crash, severity of damage to the bicycle, ownership and use of helmets, and self-reported helmet fit. Slightly more than half (50.6 percent) of subjects wore helmets at the time of their crashes.

The study found significant evidence that bicycle helmets prevent head and brain injury. Corollary research questions were also successfully answered.

Major findings include:

- *Helmets decreased the risk of head injury by 69 percent, brain injury by 65 percent, and severe brain injury by 74 percent. These results, using emergency room controls, are the same as the results obtained in our 1989 study. Had it been possible to use population controls in the current study, the overall protectiveness rate of 85 percent for head injury and 88 percent for brain injury reported in our prior work would in all likelihood have been obtained.*
- *Helmets work equally well in all age groups examined. There is no evidence supporting the need for a separate standard for young children.*
- *Helmets were equally effective in protecting cyclists in crashes involving motor vehicles and those not involving motor vehicles.*
- *Helmets provide substantial protection against lacerations and fractures to the upper- and mid-face, but appear to offer little protection to the lower face.*
- *Involvement in a motor-vehicle crash was the most important risk factor for serious injury.*
- *Hard-shell, thin-shell and no-shell helmets had similar protective qualities. Hard-shell helmets, however, may offer greater protection against severe brain injury.*
- *The major site of helmet damage was to the rim in the frontal region.*

Despite the overwhelming protectiveness of helmets, a few helmeted cyclists did suffer head injuries. This may be due to inadequate coverage by the helmet, improper wearing of the helmet because of poor fit or incorrect wearing behavior, movement of the helmet at the time of the crash, or crash forces that exceed the helmet's ultimate protective capacity.

Aims

As bicycling grows in popularity as a recreational activity and a means of transportation for adults and children, injuries continue to take a toll on cyclists. Each year crashes involving cyclists cause approximately 900 deaths, 23,000 hospital admissions, 580,000 emergency room visits, and 1.2 million visits to physician offices and clinics in the U.S. These statistics have challenged epidemiologists to gather information on cycling injuries and the effectiveness of methods for preventing them.

Bicycle helmets have been considered the single best means of protecting cyclists from the leading cause of injury and death: head injuries during crashes. Educational and legislative efforts have been successful in increasing the use of bicycle helmets.

Despite previous studies demonstrating that bicycle helmets are effective in preventing head and brain injuries, there remained significant questions about helmet efficacy. This study was designed to answer these questions by addressing the following aims:

- *Evaluate helmet effectiveness in four separate age groups: under 6 years, 6-12 years, 13-19 years, and 20 years and older.*
- *Evaluate the effectiveness of three helmet types: hard-shell, thin-shell and no-shell.*

- *Study the relationship between helmet fit and the risk of head or brain injury.*
- *Examine helmet damage and correlate with head and brain injury.*
- *Describe the severity of bicycle crashes and correlate with injury severity.*
- *Describe facial injuries suffered in bicycle crashes and determine the protective effects of helmets.*
- *Determine the risk factors for serious injuries.*

Methods

This project was based on a case-control design, in which individuals (cases) with the outcome of interest (head injury from bicycling crashes) are compared to a control group (cyclists without head injuries from crashes). Unlike our prior study, no population-based control group was used.

Information was collected on possible differences between cases and controls (e.g., crash severity) that could obscure the central relationship between helmet use and head or brain injury, thus permitting needed adjustments between comparison groups through multivariate analysis. Analyses were also conducted on sub-groups (e.g., different age groups), different circumstances of the crash, and different helmet types.

Subjects were recruited from seven hospitals in Western Washington and from records of the King and Pierce County Medical Examiner's offices. The characteristics of the hospitals are as follows:

- *Harborview Medical Center: a level-one trauma center in Seattle*
- *Group Health Cooperative of Puget Sound (Central) and Group Health Cooperative of Puget Sound (Eastside): hospitals serving the patients of a large, staff-model HMO in the Seattle area*
- *Children's Hospital and Medical Center: a tertiary-care children's hospital in Seattle*
- *Mary Bridge Children's Hospital: a community and secondary-level children's hospital in Tacoma*
- *Overlake Medical Center: a community hospital east of Seattle*
- *University of Washington Medical Center: a tertiary-care university hospital*

To identify injured cyclists, emergency room logs and treatment forms were examined once or twice a week between March 1, 1992 and August 31, 1994. All injured cyclists were eligible for the study. Information was entered into a computer database to track subjects throughout the study. Detailed questionnaires were sent to all subjects, and those who did not respond to the mailed questionnaire were telephoned about two weeks after the initial mailing.

The questionnaire included inquiries regarding demographic characteristics of subjects, cycling experience, severity of damage to the bicycle, ownership and use of helmets, and self-reported helmet fit. Information on injuries was gathered from emergency room, hospital and medical examiner's records.

Injuries were assessed using the Abbreviated Injury Scale (AIS) for injuries in individual body regions, and the Injury Severity Score (ISS) for overall measure of severity. A commercial computer program, TRI-CODE, was used to ensure consistent and accurate coding and injury severity scoring for data gathered from seven hospitals.

For the purposes of this study, head injury, brain injury and severe brain injury are defined as follows:

- *Head injury: All injuries to the forehead, scalp, ears, skull and brain, including superficial lacerations, abrasions and bruises on the scalp, forehead and ears, as well as skull fractures, concussion, cerebral contusions and lacerations and all intracranial hemorrhages (subarachnoid, subdural, epidural and intra-cerebral).*
- *Brain injury: A diagnosis of concussion or more serious intracranial injury, excluding skull*

fractures without accompanying brain injury.

- *Severe brain injury: An intracranial injury or hemorrhage, including all cerebral lacerations/contusions, and subarachnoid, subdural and extradural hemorrhages.*

Study Population

During the 30-month study period, 3,854 eligible subjects were treated in the emergency rooms of the seven hospitals. This includes five subjects identified in medical examiner's records who died from bicycle-related injuries before arriving at an emergency room. Completed questionnaires and injury data were obtained for 3,390 subjects, an 88 percent study response rate. Of the 3,390 subjects, 1,718 (50.6 percent) were helmeted at the time of the crash. The authors believe this is the largest group of injured bicyclists ever to be the subject of a study of this nature.

The figures on these pages describe essential information on the subjects of this study. Subjects were most likely to be male, well educated, relatively affluent, and helmet owners.

More than two-thirds of the study population (72 percent) were male, and 43 percent were under 13 years of age (*see Figure 1*). The subjects (or their parents, in the case of children) were an educated population, with nearly one-half (49 percent) having college degrees and nearly a quarter (24 percent) having post-graduate degrees (*see Figure 2*). Almost half (48 percent) had incomes of more than \$35,000 annually (*see Figure 3*).

Nearly two-thirds (62 percent) of the cyclists reported that they bicycle daily. More than half of the adults (53 percent) rode more than five hours per week, and 37 percent rode more than 50 miles weekly.

Three-fourths of subjects (76 percent) reported they own bicycle helmets, with the rate of ownership lowest for teenagers (67 percent) and highest for cyclists older than 20 (79 percent) (*see Figure 4*). Slightly more than half (51 percent) were wearing helmets at the time of the crash, with helmet use lowest (32 percent) among teens (*see Figure 4*).

Among helmeted cyclists, hard-shell helmets were most common (49 percent), followed by thin-shell helmets (29 percent) and helmets without shells (19 percent) (*see Figure 5*). When examined by testing standard, helmets were most commonly Snell-approved (54 percent) (*see Figure 6*).

The most common cause of crashes was loss of control by cyclists causing the cyclist to fall to the ground or hit an obstacle. Motor vehicles were involved in only 15 percent of crashes (*see Figure 7*). Crashes occurred most often (77 percent) while cyclists reported riding at speeds 15 mph or less (*see Figure 8*).

The majority of crashes occurred on paved streets (78 percent), followed by dirt, gravel and sand surfaces (*see Figure 9*). Almost half of the bicycles involved in crashes (43 percent) sustained some damage (*see Figure 10*).

The vast majority of injuries sustained by cyclists (92 percent) were in the Injury Severity Score (ISS) range of 0-8. An ISS of 9 or greater indicates moderate to severe injury. Only 6 percent of the injured cyclists with scores of 8 or less were hospitalized compared to 73 percent with scores of 9 or greater.

Facial injuries were most common, found in 34.8 percent of subjects. Head injuries were suffered by 22.3 percent of cyclists, and 6.0 percent received brain injuries (*see Figure 11*). About a tenth (9.7 percent) required hospital admission, nine subjects died in hospitals, and five died before transport to a hospital.

Overall Effectiveness of Helmets

Although prior studies have found that bicycle helmets are effective in reducing head and brain injuries, there have remained several significant questions about helmet efficacy. The authors of this study sought to remedy these deficiencies in understanding the overall effectiveness of bicycle helmets in injury prevention. This study was designed to provide information on helmet effectiveness in four age groups (less than 6 years old, 6-12, 13-19, 20 and older), to evaluate the different helmet types and engineering standards, and to determine helmet effectiveness for crashes involving motor vehicles.

Age

Because of small sample sizes, no previous study has evaluated the effectiveness of helmets in different age groups, particularly children under six years old.

Benefits In this study, analysis of the protective effect of helmet use for risk of head injury and brain injury show substantial efficacy in all age groups. Overall, helmets were found to prevent 69 percent of head injuries, 65 percent of brain injuries, and 74 percent of severe brain injuries (*see Figure 12*), with no significant difference in the protective effect for any age group (*see Figure 13*). While the protective effect appeared to be somewhat lower in teenagers, this was not significant. These results are the same as those obtained in that portion of our 1989 study with emergency room controls. As previously mentioned, had it been possible to employ population controls in the present work (e.g., crashing cyclists regardless of medical attention), comparably higher levels of protection would have been obtained.

Benefits Of 62 bicyclists with severe brain injuries, only 24 percent were helmeted (15 riders out of the 1,718 who were helmeted), compared to the 57 percent rate of helmet use by the control group (riders with injuries other than head trauma). No helmeted bicyclists who sustained crashes in the youngest group (under 6 years old) and the 13-19 group suffered a severe brain injury. This again demonstrates the excellent protective effect of bicycle helmets.

Helmet Types and Standards

Previous studies have evaluated hard-shell helmets, the only type in wide use at that time. The growing popularity of no-shell and thin-shell helmets suggested the need to examine the effectiveness of these models, as well. There are three helmet standards in the U.S.: Snell Memorial Foundation (Snell), American National Standards Institute (ANSI), and American Society for Testing and Materials (ASTM). No real-world field data have compared the relative effectiveness of the three standards in protecting against head and brain injury.

Of the helmet types used by cyclists in this study, 49 percent were hard-shell, 29 percent were thin-shell, and 19 percent were no-shell (*see Figure 5*). Over half the helmets (54 percent) were Snell-certified, 28 percent had ANSI certification and 0.4 percent had ASTM certification (*see Figure 6*). Since Snell certification is most stringent, helmets meeting this standard would also meet ANSI and ASTM standards.

The protective effect of different helmet types is shown in *Figure 14*. The protective effect of hard-shell helmets for brain injuries was 73 percent compared to the 58-59 percent for other types. The protective effect against severe brain injuries was 83 percent compared to 70 percent for thin-shell and 64 percent for no-shell. There were only 62 helmeted individuals with brain injuries and 15 with severe brain injuries in our study. In order for these differences to be statistically significant, the number of people in the study would have had to be 11 times greater.

Snell and ANSI approved helmets provided similar protection against head and brain injuries. However, Snell helmets decreased the risk of severe brain injuries by 81 percent and ANSI helmets by 72 percent. In order for this difference to be statistically significant the number of people in the study would have had to be 53 times greater.

Motor Vehicle Involvement

Some observers have questioned the effectiveness of helmets in protecting the head against collisions between bicycles and motor vehicles. No previous study has systematically examined this issue.

Of the 518 bicyclists who were involved in motor vehicles crashes, 42 percent were helmeted. A similar level of protection against head injury was found after comparing for the protective effects of helmets in crashes with and without motor vehicle involvement (*see Figure 15*).

Summary

Results of this study indicate that helmets are effective for all bicyclists, regardless of age. The levels of protection are the same as were delineated using emergency department controls in our 1989 study. There is no evidence that the youngest children need a different type of helmet since the level of protection in this age group is similar to other ages. Current energy-management capabilities of helmets are effective for all ages.

Helmets are effective in preventing head and brain injuries in all types of crashes, including those involving motor vehicles. The three types of helmets (hard-, thin- and no-shell) offer approximately the same degree of protection. Hard-shell and Snell-certified helmets may provide more protection against severe head injuries. However, since only 15 helmeted riders had severe brain injuries, we were unable to show a statistical difference between the helmet types and certification standards in this study.

Bicycle Helmet Effectiveness in Preventing Serious Facial Injuries

While helmets have been widely recommended as protection against head injuries, questions have remained about the effectiveness of these helmets in the prevention of facial injuries. Unlike motorcycle helmets, which usually have face pieces, bicycle helmets lack this protective feature. As part of the overall study of bicycle helmet effectiveness, we also collected data on facial injuries.

Facial injury was defined as any injury of the jaw, lips, cheeks, nose, ears, eyes, forehead and mouth. Only serious facial injuries--fractures and lacerations--were considered for this study. Minor facial injuries that were found when cyclists were treated for other injuries (e.g., head injuries or broken legs) were not counted. Facial injuries were categorized as occurring in three regions: the lower face (lips, mouth and lower jaw), the middle face (nose and cheeks) and upper face (forehead, orbit, eyes and ears).

Of the 3,388 injured bicyclists analyzed in this study, 34.8 percent had facial injuries, 700 (20.7 percent) of which had serious facial injuries. Lacerations were nine times more frequent than fractures, occurring most often to the chin, lip and forehead (*see Figure 16*). The most common fractures were to the nose and mandible, each occurring in about 4 percent of facial-injury patients. Children aged 5 to 12 were most likely to suffer facial injuries, as 51 percent of all facial injuries occurred to cyclists in this age group, compared to 38 percent of other injuries.

By comparing the injuries suffered by helmeted cyclists with the injuries to those who were unprotected, it was found that helmets reduce the overall risk of serious facial injuries by 50 percent. Helmets were most effective in preventing injuries to the upper and middle facial regions, reducing lacerations and fractures in these areas by approximately 65 percent. There was no evidence, however, that bicycle helmets protect cyclists against injuries to the lower facial region (*see Figure 17*).

This is the first study to demonstrate clearly that bicycle helmets provide protection to the midface region as well as the upper face.

Given the vulnerability of the lower face to serious injury in a bicycle crash, consideration should be given to adding a face bar or chin covering to the present design of bicycle helmets. Injuries in this area can be particularly disfiguring, lending an urgency to the need to develop such a protective modification.

Helmet Fit and the Risk of Head Injury

Studies of the effectiveness of bicycle helmets, including this one, have reported that a number of helmeted cyclists have sustained head injuries. This study found that 29 percent of cyclists who sustain head injuries and 30.5 percent of those who suffer brain injuries were wearing helmets at the time of the crash. In seeking a better understanding of why helmeted riders suffer these injuries, the relationship between helmet fit and the risk of injury was also examined.

Helmet fit was assessed by asking cyclists (or their parents for children younger than 14 years old) to report on helmet snugness, positioning on the head, custom fitting using adjustable foam pads, comfort, adjustability of straps, whether the helmet covered the forehead, and whether the helmet could be removed while the strap was fastened.

Factors in poor helmet fit included helmets worn too far to the back of the head instead of fitting on the center of the head. Cyclists whose helmets came off during a crash were three times more likely to have a head injury compared to those cyclists whose helmets were snugly fastened at the time of the crash.

Helmet fit proved to correlate closely with the degree of protection afforded by helmets during a crash. Overall, a clear dose-response relationship between self-reported fit and head injury emerged. Cyclists who reported that their helmets fit poorly were nearly twice as likely to suffer head injury than cyclists whose helmets fit the best. Cyclists reporting good and fair helmet fits received relatively less protection (*see Figure 18*).

Self-reported fit appears to be a valid measure of helmet fit and one that has easy applicability for assessing community programs to promote helmet use. There is a strong suggestion that fit, or lack thereof, may contribute to increased risk of head injury by a factor of two. However, since riders or parents were asked about fit after the injury that brought them to the emergency room, it is possible that those with head injuries may have had different recall of fit than those without such injuries. This phenomenon, known as recall bias, may partially explain these results.

In another portion of our study assessments of helmet fit were made by expert study personnel following a standard protocol. Their observations were compared to parent- and self-report of helmet fit. In general, the results indicated that many parents did not have an adequate understanding of "good fit." Based on this empiric experience, we have developed information describing how to test a helmet for proper fit.

Damage to Bicycle Helmets Involved in Crashes

Helmet design, in addition to improper fit, may play a role in head and brain injuries sustained by cyclists who are wearing helmets at the time of the crash. Energy exceeding the threshold of protection and impact occurring outside the covered area of the head are potential reasons for a lack of complete protection.

In this study, helmets were purchased from cyclists who met any of the following criteria: helmeted cyclists who sustained head injury; helmeted cyclists who reported that they hit their head at the time of the crash; and cyclists who reported that their helmets were visibly damaged in the crash.

A total of 527 helmets were forwarded to the Snell Memorial Foundation for laboratory testing. Examiners were blinded to all information on circumstances of the crash and injuries to cyclists. Damage was scored according to the site (i.e., within an inch of the edge, middle or top of helmet) and severity.

The degree of damage was scored as follows:

Score = 0: No visible damage related to crash (40 percent of helmets);

Score = 1: Minimal damage, but none to liner (20 percent);

Score = 2: Moderate damage, with evidence of energy attenuation to liner (18 percent);

Score = 3: Major damage, with more than minimal compression of liner (14 percent);

Score = 4: Catastrophic damage, in which integrity of shell is lost (7 percent).

Damage occurred most frequently to the helmet front (47.1 percent of damaged helmets) and sides (30.4 percent). There was no difference between frequency of damage to the right and left sides of the helmets, and little damage occurred on the top or in the back of helmets. Damage to the *edge* of the liner accounted for nearly half of all impacts to the helmets (see [Figure 19](#)).

Damage score of helmets was found to be associated with the risk of head and brain injury to cyclists. Cyclists with catastrophic helmet damage were five times more likely to have suffered injury to the head (including the scalp, forehead, skull or brain) and nearly eleven more times as likely to have sustained a brain injury (i.e., concussion or worse) (see [Figure 20](#) and [Figure 21](#)).

A relatively large proportion of helmets examined (39 percent) had damage to the liner. Damaged liners may not offer the same protection as new helmets, and many cyclists may be unaware that damage to the liner has occurred. For these reasons, the offer by many manufacturers of free replacement for helmets that have been involved in crashes appears to be appropriate.

Despite the association between the degree of helmet damage and the risk of head and brain injury, it should not be assumed that a causal relationship exists. Cyclists who have been in high- energy crashes generally have both head injuries and helmet damage. It's quite possible that injury to the head or brain would have been far worse for unhelmeted cyclists involved in the identical crashes. The association does suggest, however, that for certain types of crashes the helmet's energy-absorbing threshold has been exceeded.

Location of helmet damage (primarily to the front and at the edge) suggests that manufacturers should consider building an extra energy-absorbing capacity in the front, designing the helmet to fit as close as possible to the top of the eyes, and improve the retention system to prevent the helmet from rotating back.

The large number of injuries to the forehead suggest that either helmet design provides inadequate coverage or that the helmet is being worn improperly (*see "Helmet Fit and the Risk of Head Injury"*). The frequency of these injuries indicates the need for further investigation of these issues.

Risk Factors for Serious Injury

Helmet use is not the only factor involved in whether a cyclist is vulnerable to serious injuries. By analyzing the types and severity of all injuries suffered by bicycle riders in the study group, researchers were able to make suggestions on safety measures that may decrease the number of the more serious injuries.

Epidemiology

Of the injured cyclists, 52.1 percent sustained one or two injuries, 37.1 percent had three to five injuries, and 10.8 percent had more than five. Injuries to the upper extremities were most common (suffered by 59.6 percent of injured cyclists) followed by injuries to the lower extremities (46.9 percent). Slightly more than one-fifth of the injured cyclists sustained head injuries, and one-third had facial injuries (*see Figure 22*). Neck injuries were quite infrequent.

Injured cyclists most commonly had abrasions, lacerations and contusions, while one-fourth of the study group suffered fractures. Brain injuries (defined as concussion or more severe brain injury) occurred to 6.0 percent of riders. Injuries to internal organs and to blood vessels and nerves were un-common.

Risk Factors

Motor vehicles were involved in 15.3 percent of all crashes. Riders crashed most often after losing control of the bicycle, then hitting the ground or an obstacle (*see Figure 7*).

Researchers correlated circumstances of crashes with injury severity (ISS) to determine the importance of various risk factors. Collisions with motor vehicles increased the risk of severe injury (ISS>8) by 360 percent and markedly increased the risk of fatal injury. Riding at speeds greater than 15 mph increased the risk of severe injury by 40 percent. Children under the age of 10 were most likely to sustain injuries to the head and face, while teenagers and young adults were more apt to suffer injuries to the extremities.

Cyclists who sustained neck injuries (2.7 percent of the study group) tended to be more severely injured, with 22.3 percent having ISS>8, compared to 6.4 percent of cyclists without neck injuries. Neck injuries included sprains, cervical spine fractures, and nerve-cord injuries. There was no correlation between neck injury and helmet use or helmet type.

Of 14 fatal injuries, 10 were suffered by cyclists hit by motor vehicles, and only one, a 6-year-old child crushed by a truck, was helmeted.

Other Potential Safety Measures

The risk of crash involvement with motor vehicles may argue for more bicycle paths, but risk remains at points of intersection between bicycle paths and roads. Injuries suffered by younger cyclists suggest that some children may be riding before they are developmentally ready, that their bicycles may not fit their size, or that the sites they ride may be unsafe or poorly supervised.

Injuries occurring to cyclists riding at greater speeds may argue for separate facilities for these riders or for a version of the leather clothing worn by motorcyclists or the neoprene suits worn by ski racers. The number of facial injuries suffered by such high-risk groups as children and young adults suggests the need for additional facial protection on helmets for these cyclists. Fractures and dislocations to the extremities dictates study of the effectiveness of elbow and knee pads and wrist guards.

The number and severity of injuries to the face and body indicate that bicycle helmets alone are not sufficient to prevent injury to cyclists. Multiple approaches to intervention, including educational programs, product modification and regulation, are clearly warranted as strategies in the overall cycling-safety effort.

Overall Conclusions

This study provides powerful statistical evidence that bicycle helmets, regardless of type, provide protection to cyclists in all circumstances, including crashes involving motor vehicles. *Our research clearly indicates that bicycle helmets should be worn by all riders, regardless of their age, experience as cyclists, the distance they plan to ride, or any other factor.*

Educational programs can increase the rate of helmet use dramatically, yet there is national and international evidence that the rate of compliance plateaus when helmet use remains voluntary. A legislative approach, similar to the mandate that motor vehicle drivers wear seat belts, would appear to be the most promising next step.

Bicycle helmets cannot protect riders against all trauma, as the findings on neck injuries and extremity fractures, abrasions and contusions indicate. Environmental changes, such as safer roads and separate bike lanes, should be explored as an additional means of reducing injuries to cyclists.

This study of 3,390 injured cyclists, the largest undertaken to date, produced a wealth of data and the inevitable conclusion that bicycle helmets are the single most important protection against head injury and brain injury. Other issues that arose during the course of the study may inspire others to proceed with further investigations. The design of this study can be readily adapted to the evaluation of other questions regarding bicycle injuries.

Acknowledgments

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I AM MARGARET RIECKE FROM THE NORTH DAKOTA NURSES ASSOCIATION AND I APPEAR HERE IN SUPPORT OF SB 2279.

MY PRIMARY RESPONSIBILITY AT THE NURSES ASSOCIATION IS CLASSROOM EDUCATION.

WE PRESENT PROGRAMS ON HEAD AND SPINAL CORD INJURY AND DRINKING AND DRIVING IN NORTH DAKOTA SCHOOLS.

PART OF THE PRESENTATIONS, CONSIST OF TALKS BY REAL LIFE VICTIMS. WHEN WE GO INTO CLASSROOMS, WE ARE PLEASED TO SEE AN INCREASE IN SEATBELT USAGE BUT, WE ARE VERY DISCOURAGED BY HELMET USE AMONG YOUNGSTERS.

HELMETS ARE NOT VIEWED AS 'COOL' BY NORTH DAKOTA STUDENTS. WE ARE LUCKY TO FIND A HANDFUL OF STUDENTS THAT SAY THEY WEAR HELMETS 'SOMETIMES.'

ONE OF THE SPEAKERS THIS SCHOOL YEAR HAS SHARED HIS STORY ON HOW HE FELL 106 FEET DOWN A CLIFF IN MEDORA AND SURVIVED THANKS TO A BICYCLE HELMET. HE SUFFERED A TRAUMATIC BRAIN INJURY, A RUPTURED KIDNEY, BROKEN BACK, BROKEN RIBS ,HERNIA ETC. THANKFULLY HIS HEAD INJURY IS MILD. HE IS THE REAL LIFE EXAMPLE OF WHAT A HELMET CAN DO TO SAVE A LIFE!

HE HAS BEEN VERY HONEST IN SHARING WITH STUDENTS
WHAT A FRUSTRATION EVEN A RELATIVELY MILD HEAD INJURY
CAN BE BOTH FOR THE VICTIM AND THEIR FAMILIES.

HE STILL HAS SOME DOUBLE VISION AND SAYS HE IS NOT THE
PERSON HE USED TO BE. HE STATES THAT AT TIMES HE STILL
ACTS IN WAYS THAT HE WOULD NEVER HAVE DONE PRIOR
TO THE ACCIDENT.

THE STATISTICS FURNISHED BY THE 'THINK FIRST FOUNDATION'
STATE THAT NON-HELMET WEARING BICYCLISTS HOSPITALIZED
WITH A HEAD INJURY ARE 20 TIMES MORE LIKELY TO DIE THAN
THOSE WHO DID WEAR A HELMET. THOSE ARE STARTLING
STATISTICS! THEY STATE THAT IF 85% OF OUR CHILDREN WORE
HELMETS FOR JUST ONE YEAR, WE COULD CUT LIFETIME
MEDICAL COST BY \$109-\$145 MILLION DOLLARS.

THE WORK THAT I DO BRINGS ME IN CONTACT WITH MANY
SEVERELY HEAD INJURED VICTIMS. THIS IS SOMETHING I
WOULD NOT WISH ON MY WORST ENEMY. THE IMPACT ON
THE VICTIMS AS WELL AS THE FAMILIES ARE INCREDIBLE.

Testimony on SB 2279
March 5, 1999

Chairman Keiser and distinguished members of the house transportation committee. My name is Jerry Saude and I am a resident of Bismarck. I am appearing before your committee in opposition to this legislation. To me, this goes against the family and family responsibility. I would like to share just a little family history with you this morning. In 1883 a young Norwegian named John Bjornson Saude came to this country and homesteaded in Pierce County near the town of Barton. He met a lovely Norwegian girl named Olivia Simenson and they soon married and 9 children were born on that farm. Those children married and 44 Grandchildren were born. Those 44 Grandchildren married and 117 GreatGrandchildren were born. I'm proud to be counted among them. My children and the other 160 some GreatGreatGrandchildren of John & Olivia Saude are living testimony to the family values these pioneers have passed on to the present 5th and 6th generations of Norwegian Americans. Common sense and strong parental involvement in each generation, has been the guiding force to this testament of "family".

It bothers me a great deal when the government steps in to take over the responsibility of parents who are not reckless and endangering their children. I view this legislation as striking at one of the very most important rights and responsibilities I and my wife accepted when we chose to be parents. One of those responsibilities is the protection of my family from harm. I am opposed to this legislation that will make me a criminal, if I allow my children to ride a bike on the street in front of my home. I think back on my youth and the fun my brothers and I enjoyed from jumping on our bikes and racing around our neighborhood with our friends. I think of all the things we did as kids growing up 25-30 years ago and wonder, wow, what would it have been like if we were required to have helmets and safety guards and padding for every action we did? Granted, accidents can and will happen. And wearing helmets may very well be a choice we will make in certain circumstances. But it should be OUR choice. Is anyone looking at requiring safety gear for the elderly? Gosh, they certainly are prone to falling down and breaking a hip. And we all know about the medical costs of the elderly on our state. There are some things best left alone.

Previous legislation, now in affect, has made more than half of the citizens of North Dakota criminals in the eyes of the law. According to the latest poll, more than 50% of North Dakotans are not wearing their seatbelts. Are they now no better than common criminals. Please don't place another law on the books that will cause the numbers of criminals to grow. These are not criminal acts that you are considering to stop today. They are about family choices that are best left up to those who involved. Will the enforcement of this legislation cause the city police in Leonard, Lidgerwood, Maddock and Rolette patrol the streets for the 6 year olds without helmets?

(Over)

I would urge this committee to recommend a DO NOT PASS on SB 2279, and vote for the recognition of family rights and all of us who out there each day doing our very best to provide for our families. We should not be consulting the Century Code in order to dress our children to go out and play.

I would hope that the bill sponsors might spend some time researching the laws of this state and instead, remove the restrictions that are slowly working their ways into the daily lives of North Dakotas citizens. It makes me think of the Washington buzz phase, "It Takes A Village to Raise A Child". Well, maybe in Washington it does, but in North Dakota we still rely on Family.

Please vote no and urge your colleagues on the floor to vote no as well.

Jerry Saude
112 Hill Street
Bismarck ND 58504
255-0684

TESTIMONY IN SUPPORT OF SB 2279
CAROL HOLZER
ND DEPARTMENT OF HEALTH
HOUSE TRANSPORTATION COMMITTEE
MARCH 5, 1999

Mr. Chairman, Representatives, my name is Carol Holzer. I am the Injury Prevention Program Director with the North Dakota Department of Health. Our agency supports SB 2279.

As you may be aware, injuries are the leading cause of death for North Dakota children, after their first year of life. Our program strives to reduce the number, severity, and cost of injuries to children. Many of our activities encourage the use of protective safety devices, such as car safety seats, seat belts, bike helmets, smoke detectors, and personal flotation devices.

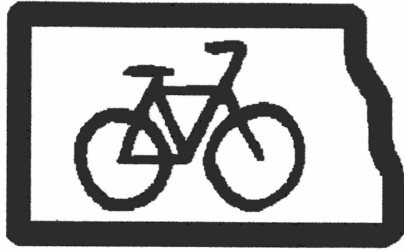
Since head injuries are the leading cause of death in bicycle crashes, our bike safety projects have involved promoting the use of helmets. Helmets have been shown to reduce the risk of head injury by as much as 85 percent and the risk of brain injury by as much as 88 percent.

Through our program and with funding from the Department of Transportation, we have provided over 6000 helmets, since 1992, to public health nurses, traffic safety programs, and other groups to give to children in their community. Other community groups have purchased thousands more helmets with private funds. The helmets have been distributed through neighborhood block parties that must be attended by parents and children. As an incentive to encourage children to wear the helmet, we work with law enforcement to reward children with a food coupon, bike water bottle, or some other prize when they are seen wearing a helmet.

Approximately three months after the party, our office sends a survey to parents asking how often their child wore the helmet and reasons if they did not wear it. Many parents responded their child wore the helmet immediately following the party, but usage declined after the novelty wore off. Many reported "peer pressure" as the reason for non-use of the helmets. Local groups who are distributing helmets have reported increases in use, but not in proportion to the number of helmets that they have given out. A law requiring all children to use a helmet would reduce the peer pressure for children and would help parents enforce a family rule.

North Dakota has already proven they are concerned about the safety of children. We have a law requiring children to buckle up in motor vehicles and a law requiring children to use personal flotation devices in boats. A law requiring bicycle helmet use would be another step in protecting our children.

If this legislation is enacted, our program will increase its efforts to provide low-cost helmets and to educate parents and children on how to properly fit and wear a helmet.

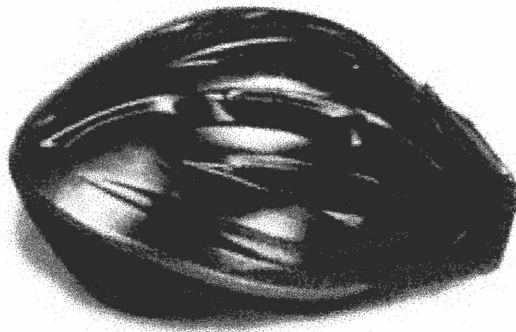


North Dakota Bicycle Helmet Safety Project

A Medical Student Senior Project: UND School of Medicine
Wade Swenson – Anne Viestenz – Ryan Clifford

www.med.und.nodak.edu/users/helmet/index.htm

An Overview of Our Findings



Bicycle Helmet Safety

Fact Sheet

National Head Injury Statistics

- Each year in the United States, bicycle-related injuries result in approximately ¹
580,000 emergency room visits (376,000 under age 14)
7,700 hospital admissions
900 deaths (600 children)
- Highest injury rates are among children 5-15 years of age ¹
- Death rates are highest among 10-14 year olds ²
- Males are at a higher risk of bicycle-related injury and death among all age groups ²

Helmet Efficacy

- Helmet use decreases the chance of head injury by 69-85% ^{3 4}
- Universal use of bike helmets from 1984 through 1988 could have prevented 2,500 deaths and 757,000 head injuries, or, in other words, 1 death per day and 1 head injury every 4 minutes in the U.S. ¹

Cost of Helmets in North Dakota

- Average cost of a bicycle helmet is \$20 (range of \$10-\$100)
- Several programs are available to help reduce cost (eg. SAFE KIDS)

Cost-effectiveness of Bicycle Helmets

- For children ages 4 to 15, every bike helmet saves the U.S. \$30 in direct health care costs, \$95 in other tangible costs, and \$270 in quality of life ⁵
- Every bicycle helmet purchased saves health insurers \$29 and automobile insurers \$12 ⁵

Cost of Treating Head Injuries

- An average severe head injury results in 5-10 years of intense rehabilitation costing \$1-2 million dollars over the first couple years and \$4-9 million dollars over the injured persons' lifetime

Current Helmet Use Among Bicyclists

- Currently about 5%-15% of the population wears a bike helmet while riding ^{6 7}

Bicycle Helmet Legislation

- Currently, 15 states have a law mandating the use of bicycle helmets
- In Oregon, helmet use rates of 47% were achieved after the passage of legislation ⁸
- In Georgia, legislation has increased helmet use rates to 52% ⁹

Bicycle Helmet Community Education Programs

- Seattle utilized a successful multifaceted campaign, involving mass media, local retailers, healthcare providers, and tradeshows
- Helmet use increased from 5.5% to over 40%, ¹⁰ a 65% decrease in bicycle-related head injuries over that same time period

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- ¹ Sacks JJ, et al. *JAMA*. 1991;266:3016-3018.
 - ² Friede. AM, et al. *Pediatric Clinics of North America* 1985 Feb;32(1):141-151.
 - ³ Thompson RS, et al. *New England Journal of Medicine* 1989;320(21):1362-1367.
 - ⁴ Thomson RS, et al. *JAMA* 276;24:1968-1973.
 - ⁵ Children's Safety Network Economics and Insurance Resource Center and National Public Services Research Institute 3/96
 - ⁶ Rodgers GB. Bicycle and bicycle helmet use patterns in the United States: a description and analysis of national survey data. Washington, DC: US Consumer Product Safety Commission, 1993.
 - ⁷ Weiss BD. *JAMA* 1991;266:3032-3033.
 - ⁸ Ni H, et al. *Archive of Pediatric and Adolescent Medicine* 15(1):59-65.
 - ⁹ Schieber RA, et al. *Archives of Pediatric and Adolescent Medicine* 1996;150:707-712.
 - ¹⁰ "Bicycle helmet promotion programs—Canada, Australia, and United States." *MMWR* 1993 Mar 26;42 (11):203

Bicycle Helmets/ General Information

In the past bicycle helmets were considered by most people to be expensive, ugly or "plain" in appearance and uncomfortable to wear. While the previous description of helmets may have been true in the past, this is certainly no longer the case. Today's helmets are constructed from a light weight material and designed not only for protection but also for a comfortable fit as well as desirable appearance. Helmets are now available in a variety of styles and colors and are often further enhanced with an endless variety of decals. Many of these changes have been made to encourage helmet use especially among children and adolescents. Along with changes made in appearance, today's helmets also meet better safety standards. Starting March 10, 1999, all helmets sold in the USA will be required to meet the standards drafted by the Consumer Product Safety Commission (CPSC). The CPSC standards meet or exceed current standards recommended by the American Society for Testing and Materials (ASTM) and by the Snell Foundation. The new standard replaces the old legal standard which was drafted by the American National Standards Institute in 1984 and which is considered by many to be inadequate. Today's helmets not only look nice, but they also offer increased protection from injury.

Cost of Bicycle Helmets

The cost of bicycle helmets has decreased substantially in the last five years. Currently anyone can buy a helmet that meets safety standards for a price of \$10 to \$100. The average cost of a "nice" helmet is \$20 to \$30. While these prices are low in comparison to what prices have been in the past, the cost of helmets may still represent a barrier to purchasing them for some families. For these individuals there are many options available for buying helmets at reduced prices. For example, Safe Kids of North Dakota (and Nation wide) has sponsored several bicycle helmet rodeos where kids learn about bicycle safety and can purchase Bell helmets for under \$10. Insurance companies have also been involved in programs that provide helmets at reduced cost. Other cost reducing strategies have included coupons offered by local businesses or drawings for free helmets donated by manufacturers. The bottom line is that today's helmets are universally affordable.

Head Injuries: The Long-Term Cost

Persons suffering from severe head injuries endure unimaginable personal suffering as well as dramatic changes in quality of life. In addition, treatment of such injuries often involves huge medical costs which continue over the injured persons lifetime. Persons suffering a severe head injury often require 5 to 10 years of intensive rehabilitation. The cost of such care often exceeds 1-2 million dollars over the first couple of years and often 4-9 million dollars over an entire lifetime. One study done in Washington found that an average of \$113 million was spent annually for the treatment of non-fatal bicycle related hospital admissions involving children < 14 years old (an average of \$218,000/child). Prevention of such injuries through bicycle helmet use would not only be cost effective, but it would also improve the quality of life of those involved in potentially life-threatening accidents.

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Methods of Increasing Helmet Use:

A Review of the Medical and Public Health Literature

Three methods of increasing bicycle helmet use were seen repeatedly in the literature. These methods were:

- **Subsidies**
- **Education**
- **Legislation**

The following excerpt summarizes our findings of our literature review.

“Legislation that mandates the use of bicycle helmets effectively increases helmet use, particularly when combined with an educational campaign. Education often facilitates behavioral change; however, education alone is rarely effective. Laws mandating helmet use supplement and reinforce the message of an educational campaign, requiring people to act on their knowledge.”

-Morbidity and Mortality Weekly Report 1995;44(RR-1)
(Center for Disease Control and Prevention)

Do Subsidies Work?

A few representative studies

\$5.00 helmets vs. free helmets

Kim AN, et al. *Injury Prevention* 1997 Mar; 3(1):38-42.

This study examined the use of helmets among children who received free bicycle helmets and children whose parents' bought inexpensive helmets. There was no significant difference in the use of the helmets.

Bicycle helmet giveaway program

Logan P, et al. *Pediatrics* 1998 Apr;101(4):578-582.

This study examined the effect of a bicycle helmet giveaway program in Texas. Although there was an immediate increase in helmet use in the community, the effect was short-lived, as helmet usage declined to levels similar to before the helmet distribution.

Subsidies to low-income families

Parkin PC, et al. *Pediatrics* 1995 Aug;96(2):283-287.

This study concluded, by observational studies, that subsidies alone do not increase bicycle helmet use in low-income neighborhoods.

Community-based education program with subsidies

Rouzier P, et al. *Journal of the American Board of Family Practice* 1995;8(4):283-287.

A community-based bicycle helmet campaign in Grand Junction, Colorado was successful in increasing helmet use from 9.9% to 37.1% two years later. The authors suggest that "A major key to a successful program is a local retailer willing to sacrifice profits to promote helmet sales and use." The program utilized community donations to provide helmets to low-income families.

Bicycle Helmet Safety Education

How effective is Education?

Seattle Community Bike Helmet Campaign

“Bicycle helmet promotion programs...” *MMWR* 1993 Mar 26;42(11):203-4.

Seattle underwent a successful multifaceted bicycle helmet campaign in the early 1990's. The campaign utilized mass media, local sports celebrities, local retailers, healthcare providers, and tradeshow for parents. Helmet use was increased from 5% before the campaign to 39%.

Rivara FP, et al. *Ann Rev Pub Health* 19:293-318.

Another study demonstrated that the Seattle bicycle helmet campaign was effective in reducing hospital head-injury admissions by 40% from levels prior to the campaign.

Helmet Promotion in the Emergency Room

Cushman R, et al. *Pediatrics* 1991 81(8):1044-1046

This study examined children presenting to an Emergency Department following a bicycle-related accident. The children were counseled about the importance of bicycle helmets. A follow-up telephone survey found that only 9.3% of the patients purchased a helmet, compared to 8.0% who were not counseled.

Association Between Bicycle Helmet Legislation and Community-based Education

Macknin ML, et al. *Archive of Pediatric and Adolescent Medicine* 1994;148:255-259

This study examined four Ohio communities, one with helmet legislation and a bicycle safety education program, one with legislation only, and two had neither. There was a dramatic association between increased helmet use and legislation plus education (67.6% helmet use rate), more so than the community with legislation only (37.2%) and the two communities with neither legislation nor education programs (17.9 and 21.5%).

A School-based Bicycle Helmet Promotion in Ontario

Morris BA, et al. *Canadian Journal of Public Health* 1991;81:92-94.

This study utilized a relatively small sampling of three elementary schools in Ontario. All of the students were exposed to a bicycle helmet awareness program. Some of the students were offered subsidized bicycle helmets. The authors concluded that the education program alone had no effect on helmet use (0 of 73, no children were observed wearing their helmets). Those children who were offered subsidized helmets and were exposed to the educational program had a better compliance rate (22.2%).

Community-based Education Program in Ontario

Morris BA, et al. *Canadian Family Physician* 1994;40:1126-1131.

This study evaluated the effectiveness of a wide-scale, long-term community bicycle helmet promotion. The promotion included print, radio, and television advertising, posters, pamphlets, and bicycle rodeos. The authors demonstrated an increase in helmet use from 5.4% to 15.4% during the community program.

School-based Promotional Strategy in High- and Low-income Communities

Parkin PC, et al. *Pediatrics* 1993;91(4):772-777.

This study compared a school-based program in high- and low-income urban communities in Canada. The study found that this type of intervention was very effective in a high-income community, increasing helmet use from 4% to 36%. In the low-income community the helmet use rate increased from 1% to 7%.

Is Legislation Effective?

Efficacy of Bicycle Helmet Legislation

Victoria, Australia

Cameron MH, et al. *Accid Anal Prev* 1994 26(3):325-337.

Victoria, Australia became the first state to require mandatory bicycle helmet use. Accompanying the legislation was a large mass media campaign. Within four years helmet use increased from a pre-legislation rate of 36% to 83%

Howard County, Maryland

Cote TR, et al. *Pediatrics* 89:1216-20.

Public sentiment was behind the bicycle helmet legislation following the bicycle-related deaths of two children. Howard County utilized an education campaign in addition to the legislation to increase bicycle helmet use. Observational studies demonstrated a increase from 4% pre-law to 47% after the passage of the law. A neighboring county, Montgomery County, served as a control, and utilized only an educational campaign. There the helmet use increased from 8% to 19%.

Oregon

Ni H, et al. *Arch Ped Adol Med* 15(1):59-65.

Oregon passed a law in 1994, requiring children under the age of 16 wear a bicycle helmet while riding a bicycle on public property, or be subject to a \$25 fine. The study found that helmet use in Oregon increased from 24.5% before the law, to 49.3% immediately afterwards.

New York State

Abularrage JJ, et al. *Arch Ped Adol Med* 151(1):41-44.

New York State passed legislation which mandated that all children ages 1 to 14 years wear helmets when riding. Parents are subject to a \$50 citation which is waived if a helmet is purchased. The study found that in New York City, the legislation alone was not effective. However, helmet use increased when accompanied by education campaigns (from 4.7 to 13.9%).

Georgia

Schieber RA, et al. *Archives of Pediatric and Adolescent Medicine* 1996;150:707-712.

Georgia passed legislation in 1995. Following the legislation, helmet ownership increased from 39% to 57% after the law took effect. Bicycle helmet use increased from 33% before the law to 52% afterward.

Barriers to Helmet Use

Why are children not wearing helmets?

The Ohio Bicycle Injury Study

This study questioned children involved in a bicycle-related trauma following admission to the hospital. Ashbaugh SJ, et al. "The Ohio Bicycle Injury Study". *Clinical Pediatrics (Philadelphia)* 1995 May;34(5):256-260.

<u>Reason why child was not wearing helmet</u>	<u>Helmet non-owners</u>	
	<u>n = 47</u>	<u>% (n/47)</u>
Never thought of it	13	28 %
Not necessary	9	19 %
Does not like it	5	11 %
Discussed, not purchased	4	9 %
Do not know	4	9 %
Could not afford one	3	6 %
Does not ride often	3	6 %
Does not own bike	2	4 %
Only going next door	1	2 %
Rides on sidewalk	1	2 %
Not popular	1	2 %
Ugly or embarrassing	1	2 %

Results from the North Dakota Health Department Survey

From 1992-1996, the North Dakota Health Department distributed 5200 bicycle helmets through an injury prevention program. The helmets were funded through the Department of Transportation, and distributed through public agencies in 104 North Dakota communities. As part of the program, a survey was distributed to parents before and several weeks after the helmets were distributed. The program was targeted for children ages 6 to 10. Eighty percent of children who received helmets were in this age group.

The results of the survey demonstrated that 66% of children did not own a helmet prior to the distribution. Parents indicated, in the survey, why their child did not own a helmet. The most popular responses were as follows:

Didn't think of buying one	37%
Helmets are too expensive	24%
Didn't think their child would wear one	24%
Their child doesn't ride on the street	8%
Their child is a safe bike rider	3%
Helmets are uncomfortable	3%
Don't believe in helmets	1%

The survey also asked parents of children who own helmets, why their child did not wear a helmet. The most popular responses were as follows:

Peer pressure	16%
Helmets are uncomfortable	13%
Didn't think it was important	11%
Helmets are ugly	9%
Helmet doesn't fit properly	6%
Parents felt it wasn't important	1%

Who should be targeted?

Identifying those at risk

1994 Minnesota study

Gerberich SG, et al. *Minnesota Medicine* 1994 Apr;77:27-31.

Bicycle-Motor Vehicle Collision Rates

Ages 12-14 164 per 100,000

Ages 15-19 71 per 100,000

“Males had consistently higher collision rates among all age groups.”

1985 Study of U.S. Bicycling Deaths

Friede, AM, et al. *Pediatric Clinics of North America* 1985 Feb;32(1):141-151.

Rate (per 100,000) of Bicyclist Deaths in Children, United States, 1980

<u>Age</u>	<u>Males</u>	<u>Females</u>	<u>Total</u>
0-4	2.4	0.6	1.3
5-9	14.3	5.3	9.9
10-14	20.9	5.8	13.5
15-19	13.4	2.6	8.1

Cost-effectiveness of Methods to Increase Helmet Use

Evaluation of Three Programs to Increase Helmet Use

Hatziandreu EJ, et al. Public Health Report 1995;110(3):251-259.

This study evaluated the cost-effectiveness of three programs, a community-based, legislative, and school-based approach. The legislative approach was based on the Howard County, Maryland experience. The Community approach utilized the Seattle bicycle helmet campaign. The school-based approach examined a program in Oakland County, Michigan. The program targeted children aged 6 to 10. It included brochures for parents and students, posters, public service announcements, discount coupons for helmets, and classroom activities. The cost effectiveness ratios per head injury avoided was as follows.

Legislative approach	\$ 36,643	(most cost-effective)
Community approach	\$ 37,732	
School-based approach	\$ 144,498	

Cost-Benefit Analysis of Legislation in Israel

Ginsberg GM, et al. American Journal of Public Health 1994;84(40):653-656.

A cost-benefit analysis of bicycle helmet legislation in Israel demonstrated a benefit-cost ratio of 3.01:1. The study examined a 5-year period, and assumed an 85% compliancy rate (based on a 90% seatbelt compliance). The total benefits from reductions in health care services use, work absences, and mortality would exceed program cost of the program.

Direct and Indirect Savings from Bicycle Helmets

Children's Safety Network Economics and Insurance Resource Center and National Public Services Research Institute, March 1996

For children ages 4 to 15, every bike helmet saves the U.S. \$30 in direct health care costs, \$95 in other tangible costs, and \$270 in quality of life. Every bicycle helmet saves health insurers \$29 and automobile insurers \$12.

Bicycle safety overview

The facts

Current statistics related to deaths and injuries:

- Bicycles are the #2 cause of pediatric injuries from a consumer product following the automobile.
- 250 children under the age of 14 died in bicycle related accidents in 1995 (cars were involved in 230 of these deaths)
- 5-14 year old age group accounts for 1/3 of all bicycle related deaths and greater than 2/3 of all bicycle related injuries.
- 60% of bicycle-associated deaths are due to head injuries
- Greater than 350,000 children under the age of 14 were treated in a hospital emergency room for bicycle associated injuries in 1996 (1/3 of these were due to a head injury)
- Most bicycle crashes occur between the months of May-August, between the hours of 3:00-6:00 pm, 60% occur on minor roads, and most within one mile of the riders home.
- 80% of fatal crashes in the pediatric age group are due to the child's behavior (not stopping at crossings, swerving into traffic, etc)
- Current national bicycle helmet usage is reported at between 15-25%, one study found that approximately 26% of children owned a helmet, of these 15% reported that they actually used the helmet (Rodgers, 1996).

Demographics of those at the maximum risk of injury:

- Non-helmeted riders are involved in fatal crashes at a rate 14 times greater than those wearing helmets
- Males make up approximately 85% of all bicycle-related deaths and 70% of non-fatal bicycle-related injuries
- The 10-14 year age group has the highest death and injury rate
- Bicycle-associated head injuries admitted to the hospital are 20 times more likely to die as other bicycle-related injuries

Head injuries: long term trauma

- A head injury is not an isolated event...it is an ongoing process
- Bicycle crashes are the #2 cause of head injury in pediatric patients
- Wearing a helmet reduces the risk of head injury by > 63% and of loss of consciousness by 86%

For each individual who survives a head injury:

- An average of 5-10 years of intensive rehabilitation services will be needed with an overall lifetime medical cost of between \$4.1-\$9 million dollars
- Each year head injuries lead to 2,000 cases of persistent vegetative state in the US
- A study done at Johns Hopkins University in June of 1995 found that of the 2333 patients studied between the ages of 0-14, 54% sustained a head injury, these primarily consisted of concussions and skull fractures. The head injury patients were more likely to be admitted to an ICU and were two times as likely to develop complications. In addition they had a high rate of in hospital fatality and showed long term problems with communication and behavior after discharge (Li, Baker, Fowler & DiScala).
- An second article titled, "Head injuries in helmeted child bicyclists" (Grimard, Nolan, & Carlin, 1995) found that of the 189 children studied with head injuries suffered from a bicycle crash, 34 children wore helmets. The children were between the ages of 5 and 14, 79% suffered only mild injuries. No injuries were reported secondary to the use of the helmet.
- Shafi, et al reported in the Journal of Pediatric Surgery in February of 1998 that in comparing helmeted children with nonhelmeted children (NHC):
 - only 15% wore helmets at the time of injury
 - helmeted children were most likely to incur a concussion alone (65%)
 - helmeted children were less probable to suffer a skull fracture (0% compared to 13% NHC) and had fewer intracranial hemorrhages (0% compared to 9% NHC)
 - none of the 3 children who died wore a helmet and of these three, all died from multiple head injuries.
- Research has shown that the younger the child the higher the proportion of head injuries. A study published in the Australian New Zealand Journal of Health in June of 1998 found that 50% of bicycle-associated injuries in children under 10 occurred to their head and face, compared to 20% in older children.
- It is important to keep in mind that the long-term trauma and rehabilitation of even a minor head injury is not like mending a broken arm. They have specific needs related to their rehabilitation related to their social, cognitive and academic development.

Current estimates of costs and savings to US health care are:

- For each \$15 bicycle helmet purchased a savings of \$30 in direct health care costs as well as an additional \$365 savings in other costs to society
- A lifetime medical cost savings could total between \$109 to \$142 million if 85% of all children wore helmets.
- A study in Washington found that an average cost of greater than \$113 million each year (average of \$218,000/child) was spent on treatment for nonfatal bicycle injury admissions after discharge involving children less than 14 years of age.

The benefits of wearing a bike helmet both to the individual and to society overall:

The largest and most comprehensive study of the effectiveness of bicycle helmets was completed by the Harborview Helmet Studies between the dates of March 1992 and August of 1994 in seven Western Washington hospitals. The results of their study revealed:

- Bicycle helmets decreased risk of head injury by 69%, brain injury by 65%, and severe brain injury by 74%
- Helmets are equally effective in all age groups as well as in all crashes including those that involve motor vehicles
- Increased protection to both the forehead and mid face, however added very little protection to the lower face
- No helmeted cyclists in the 0-6 and 13-19 year age group suffered a severe brain injury
- Of the 14 fatal injuries, 10 occurred in cyclists struck by a motor vehicle and only one, crushed by a truck, was helmeted.

Other studies have shown:

- An estimated 75% reduction in bicycle related fatalities among children could be seen with a widespread use of helmets
- An estimated decrease of 135-155 deaths, 39,000-45,000 head injuries and 18,000-55,000 scalp and face injuries in kids between the ages of 4-15 could be seen yearly with widespread helmet usage

A study in the May 1, 1993 issue of Pediatrics (Thompson, et al, 1993) looked at the hypothetical cost-effectiveness of bicycle helmet at their current costs, and with a scenario of increased usage and discounted prices:

- A 40% increase in bicycle helmet usage could lead to the prevention of 564 head injuries in 5-9 year old age group.
- 50% increase in bicycle helmet usage by the same 5-9 year old group could lead to the prevention of as many as 840 head injuries over a 5-year period.
- A price decrease in helmets of as little as 2% (\$5-\$10) could lead to a cost savings of between \$189,207 - \$427,808 in health care costs

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Mandatory Bicycle Helmet Laws in the United States

From the Bicycle Helmet Safety Institute (www.bhsi.org)

Alabama			
State Law	State-wide	Under 16	1995
Montevallo	City-wide	All ages	1993
Homewood	City-wide	All ages	1994
Arizona			
Tucson	City-wide	Under 18	1993
Yuma	City-wide	Under 18	1997
California			
State Law	State-wide	Passengers under 5	1987
State Law	State-wide	Riders under 18	1994
Bidwell Park, Chico, CA	Regional park	All ages	1991
Connecticut			
State Law	State-wide	Under 15	1993/1997
Seymour	Town-wide	All ages	1998
Delaware			
State Law	State-wide	Under 16	1996
Florida			
State Law	State-wide, public property only.	Under 16	1997 (fines 1-1-98)
Georgia			
State Law	State-wide	Under 16	1993
Illinois			
Barrington	Village-wide	Under 17	1997
Maryland			
State Law	State-wide	Under 16	1995
Allegheny Co	County-wide	Under 16	1992
Howard County	County-wide	Under 17	1990
Montgomery Co	County roads	Under 18	1991
Sykesville	City-wide	All ages	1995
Massachusetts			
State Law	State-wide	Passengers under 5	1990
State Law	State-wide	Riders under 13	1994
Michigan			
E. Grand Rapids	City-wide	Under 18	1995
Adrian	City-wide	Under 15	1998
New Jersey			
State Law	State-wide	Under 14	1992

New York			
State Law	State-wide	Passengers under 5	1989
State Law	State-wide	Riders under 14	1994
Chemung Co.	County-wide	Under 15	1995
Erie County Parks	County parks	All ages	1993
Greenburgh	City-wide	All ages	1994
Guilderland	Town-wide	Under 14	1992
Rockland County	County-wide	All ages	1992
North Carolina			
Black Mountain	City-wide	All ages	1996
Boone	City-wide	All ages	1995
Carolina Beach	City-wide	Under 16	1994
Carrboro	City-wide	Under 16	1997
Chapel Hill	City-wide	Under 16	1992
Ohio			
Beachwood	City-wide	Under 16	1990
Brecksville			
Dublin			
Orange Village	City-wide	Ages 6 to 15	1992
Strongsville	City-wide	Under 12	1993
West Carrollton			
Oregon			
State Law	State-wide	Under 16	1993
Pennsylvania			
State Law	State-wide	Passengers under 5	1991
State Law	State-wide	Riders under 12	1995
Rhode Island			
State Law	State-wide	Under 9	1996
State Law	State-wide	Under 16	1998
Texas			
Arlington	City-wide	Under 18	1997
Austin	City-wide	Under 18	1996/1997
Bedford	City-wide	Under 18	1996
Benbrook	City-wide	Under 17	1996
Coppell	City-wide	All ages	1997
Dallas	City-wide	All ages	1996
Fort Worth	City-wide	Under 18	1996
Houston	City-wide	Under 18	1995
Tennessee			
State Law	State-wide	Under 12	1994
Clarksville	City-wide	All ages	1993

Virginia

Alexandria	City-wide	Under 15	1994
Arlington County	County-wide	Under 15	1993
Blacksburg	City-wide	Under 15	1994
Fairfax County	County-wide	Under 15	1993
Falls Church	City-wide	Under 15	1993
Front Royal	City-wide	Under 15	1996
Manassas	City-wide	Under 15	1995
Manassas Park	City-wide	Under 15	1997
Newport News	City-wide	Under 15	1997
Prince William Co.	County-wide	Under 15	1995
Virginia Beach	City-wide	Under 15	1995

Washington State

Eatonville	City-wide	Under 16	1996
Fircrest	City-wide	All ages	1995
Gig Harbor	City-wide	All ages	1996
King County	(excludes Seattle)	All ages	1993
Lakewood	City-wide	All ages	1996
Milton	City-wide	All ages	1997
Orting	City-wide	Under 17	1997
Pierce County	County-wide	All ages	1994
Port Angeles	City-wide	All ages	1993
Poulsbo	City-wide	Under 18	1995
Puyallup	City-wide	All ages	1994
Steilacoom	City-wide	All ages	1995
Tacoma	City-wide	All ages	1994
University Place	City-wide	All ages	1996

West Virginia

State Law	State-wide	Under 15	1996
Clarksburg	City-wide	Under 18	1993
Morgantown	City-wide	All ages	1993
South Charleston	City-wide	Under 18	1994
St. Albans	City-wide	Under 18	1995

Wisconsin

Port Washington	City-wide	Under 17	1997
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U.S. State Bicycle Helmet Legislation

August, 1997

STATE	EFFECTIVE DATE	AGE GROUP	PENALTIES	CONTRIBUTORY NEGLIGENCE ?
New Jersey	July, 1992	Under 14	1st offense: Max. \$25.00 fine Other offenses: Max. \$100.00 fine	No
Georgia	July, 1993	Under 16	No Provision	Yes
Connecticut	October, 1993 modified July, 1997	Under 16	Verbal Warning Only	No
Tennessee	January, 1994	Under 12	Max. \$2.00 plus Court Costs	Yes
California	January, 1994	Under 18	Max. \$25.00 fine	No
Massachussetts	March, 1994	Under 13	No Provision	Yes
New York	June, 1994	Under 14	Max. \$50.00 fine	Yes
Oregon	July, 1994	Under 16	Max. \$25.00 fine	Yes
Pennsylvania	February, 1995	Under 12	Max. \$25.00 fine	Yes

Alabama	September, 1995	Under 16	1st offense: Counselling on bike safety 2nd offense: Citation to Parent/Guardian 3rd offense: Temporary confiscation of bicycle Other offenses: \$50.00 fine	No
Maryland	October, 1995	Under 16	Verbal Warning Only	No
Delaware	April, 1996	Under 12	Verbal Warning Only	Yes
Rhode Island	July, 1996	Under 8	No Provision	No
West Virginia	July, 1996	Under 15	\$10.00 fine or 2 hours community service related to child injury prevention	Yes
Florida	January, 1997	Under 16	\$17.00 fine	Yes

[International Legislation] [U.S. City/County and Local Jurisdiction]

[Back To WHO Helmet Resource Center]

Last updated: Friday, February 06 1998

Testimony submitted to the ND House of Representatives Transportation Committee
by Martha K. Leclerc, 1115 South 8th Street, Fargo, ND (District 11)
In support of legislation requiring bicycle helmets to be worn by children 15 and under
March 5, 1999

Although I am not able to attend the hearing this morning, I would like to have the opportunity to share my story with you, in the hope that it will help you to understand the importance of passing this legislation.

Our family has experienced first hand the importance of wearing helmets when riding bicycles. Last June, my daughter Eleanor was involved in a serious bicycle/car accident while riding home from softball practice.

We have tried to do all the right things as parents, especially establishing rules to protect our children from harm. Eleanor is a very responsible child, a straight A student, and is generally very respectful of the rules and boundaries we establish. At the beginning of last summer, we sat down and agreed to a few of these rules and posted them on the refrigerator. Things like how far she could go on her bike that summer, that she had to let the babysitter know where she was going and what time she would be home, and most importantly, that she wear her helmet at all times.

But accidents happen, no matter how careful or responsible you are. It is a terrifying experience for any parent to get a call saying that your child has just been in an accident and has been rushed to the emergency room. I hope that none of you have had this experience personally, but I can tell you that throughout the summer, every day there are some parents in this state receiving phone calls like this.

In our case, it could have been much worse. If she had not been wearing a helmet, she probably would not be here today. She was cut up, scraped up, black and blue, and really sore, but she was alive and she had all her faculties intact.

All three local news programs that night carried the story. One station showed a picture of her helmet lying on the street, emphasizing the importance of wearing helmets. I will never forget that image and neither will most of the parents I know. Kids, however, forget. They have no sense of their own mortality. Many of Eleanor's friends and classmates stopped wearing helmets in the past year. It's just not cool. That's a hard thing for parents to fight without some assistance from the state and the law enforcement community, just as we work together to fight drugs, smoking, alcohol, gangs, and other social problems that threaten the health and safety of our children. You can help us by passing this legislation

Thank you.

Testimony by Eleanor R. Wilking in Support of Mandatory Bike Helmets

Mr. Chairman and members of the Committee, Good Morning.

My name is Eleanor Wilking. I am 12 years old and I attend Agassiz Middle School in Fargo. I am here to speak in support of the proposed law to require kids to wear helmets.

This past summer, in June, I was riding my bike home from softball practice and I was hit by a white van. I owe my life to a piece of styrofoam with a plastic capping. I'm here to tell you why I think helmets are important.

That morning in June I was riding my bike home from softball practice. It was raining a little bit, and my glasses were a little wet. There was not much visibility. The last thing I remember was my head hitting the windshield of a white van. An amazing 2 inches of styrofoam that cost around \$8 saved my life. If I hadn't been wearing my helmet, I could have died.

Why did I wear my helmet that day? I wore it for two reasons. First, because I am a creature of habit. Since I was a little kid, my mother has made me wear a helmet when I ride bike. Second, because I am extremely accident-prone. Ask my mom. I have gone through 3 pairs of glasses in the past year and ½.

Most of my classmates don't wear their bike helmets. They don't think that anything like that will happen to them. And for most of them, it won't. But for some of them it will happen. A few of them will have an accident – it is a statistical probability.

Why risk a life needlessly? There are so many things to do and see, so many things to experience. If I had not had that helmet on, I might not have learned to play the cello. I would have missed out on high school and college, going to Paris, and all the other wonderful things I want to do this year, and next year, and the next.

In conclusion, the minds of the children and young people of this state are the future of the state, and I think it is a good idea to protect those minds in any way possible to protect the future of this state.

Thank you.

TESTIMONY - SB 2279

Presented by: Senator Judy L. DeMers, District 18

Presented to: House Transportation Committee

Representative George Keiser, Chairman

March 5, 1999

Chairman Keiser and Members of the House Transportation Committee. For the record, I am Senator Judy L. DeMers. I represent District 18, consisting of part of Grand Forks and part of the Grand Forks Air Force Base. I appear this morning as the prime sponsor of SB 2279.

Mr. Chairman and Committee Members, I have submitted SB 2279 at the request of three University of North Dakota School of Medicine senior medical students: Ryan Clifford, Wade Swenson, and Anne Viestenz. They became interested in child bicycle safety well over a year ago as a result of third year medical school studies. They contacted me at that time about the possibility of introducing a bicycle helmet law. Together, we reviewed the model act of the American Academy of Pediatrics (AAP) and studied the laws of fifteen other states who had passed bicycle helmet legislation between 1992 and 1996. The result is SB 2279.

I could provide all kinds of statistics and many reasons for you to support this bill, but I plan to leave that for those who are here this morning to testify. I do want you to know, however, that SB 2279 was amended at my request to limit application of this proposed law to children who are under fifteen (15) years of age. This change targets the age group at highest risk of injury. Nationally, cyclists ages 14 and under are at five times greater risk for injury than older cyclists. The bill also was amended in the Senate to reflect the new U.S. Consumer Product Safety Commission standard for bicycle helmets which is effective March 10, 1999.

Mr. Chairman and Committee Members, SB 2279 is aimed at keeping our kids healthy and safe. It is prevention, pure and simple. The goal is not punishment; it is educating children and their parents about the effectiveness of bicycle helmet use. SB 2279 is a positive, proactive step that we can take to protect our children from serious injury or even death. I ask your favorable consideration of SB 2279. Thank you.

Rep. Roxanne Jensen

FACTS SUPPORTING SB 2279 BICYCLE HELMETS

- SB 2279 would require the use of approved bike helmets for children under age 15.
- Bicycles are associated with more childhood injuries than any other consumer product except the automobile.
- Head injury is the leading cause of death and permanent disability in bike crashes.
- Helmet use is lowest for children ages 11 to 14. Children under age 10 are at greatest risk for serious injury.
- In 1996, 213 children 14 and under died in bicycle-related crashes. In 1997, more than 350,000 children 14 and under were treated in hospital emergency rooms.
- Bike helmets can reduce the risk of head injury by as much as 85 percent and the risk of brain injury by as much as 88 percent.
- The cost of a bike helmet is as low as \$10, and many health and safety organizations provide free or low-cost helmets.

Why we need legislation

- 3 points
- ① helmets work
 - ② there is a need for increased bicycle safety
 - ③ legislation is effective

Talking to groups

1. Helmets work—they save lives and reduce injuries
 We've found that there are misconceptions about the effectiveness of helmets... across the state,

many people including health care providers underestimate the effectiveness of the helmets and educators

2. There is a need for increased bicycle safety
 Each year in the United States:

600,000 580,000 emergency room visits (376,000 under age 14)
 8,000 7,700 hospital admissions
 900 deaths (600 children)

due to bicycle related accidents

Studies show that those most at risk are children age 10-14. Boys are consistently involved in more bicycling-related injuries and fatalities in all age groups.

5/2

3. Legislation is effective

We researched different methods to see what has worked: Subsidies, Education, and Legislation

Subsidies: ^{alone} are ineffective

Education: school-based, community-based, health care-based

Generally ineffective without simultaneous legislation

I believe the ND Health Dept will share a statistic with you about helmet use in the state.

The programs that have been successful typically large scale expensive endeavors

there are exceptions

Exception: Seattle Bicycle Helmet Campaign (multi-faceted community-based campaign: mass media, tradeshows for parents, health care providers) local celebrities

~~North Dakota: Fargo-Mhd-WF Elementary Curriculum, Bicycle Rodeos throughout state~~
~~Doctor's offices and classrooms every spring and summer~~

Legislation: Currently 15 States have laws mandating helmet use. Very little is published about the success of these laws...

1990, Victoria, Australia	83%
1990, Howard County, Maryland	4% to 47%
1994, Oregon	49%
1995, Georgia	52%
New York State, NYC	13.9%



Many bicycle riders and parents do not know they need a helmet. The laws educate as much as they force compliance. Well as

~~For children ages 4 to 15, every bike helmet saves the U.S. \$30 in direct health care costs, \$95 in other tangible costs. Every bicycle helmet saves health insurers \$29 and automobile insurers \$12.~~

JAMA 1991 Sacks

Universal use of bike helmets from 1984-1988:

Could have prevented 2500 deaths, 757,000 head injuries

In other words: 1 death per day, 1 head injury every 4 minutes

The author found that

~~slipping slope~~

Rollerblade

~~taken this to a car seat~~

cost

cost

Design cover for legislator

look for group that named ND the best state for children

I believe that this demonstrates our commitment to children