S. HRG. 102-1061

IMPACT OF BULLET-RELATED VIOLENCE ON FAMILY AND FEDERAL ENTITLEMENTS

HEARING

BEFORE THE

SUBCOMMITTEE ON
SOCIAL SECURITY AND FAMILY POLICY

OF THE

COMMITTEE ON FINANCE
UNITED STATES SENATE

ONE HUNDRED SECOND CONGRESS

SECOND SESSION

ON

S. 3373

OCTOBER 23, 1992

Printed for the use of the Committee on Finance

U.S. GOVERNMENT PRINTING OFFICE

63-672—CC WASHINGTON : 1993

For sale by the U.S. Government Printing Office
Superintendent of Documents, Congressional Sales Office, Washington, DC 20402
ISBN 0-16-040298-0

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FRIDAY, OCTOBER 23, 1992

U.S. SENATE,
SUBCOMMITTEE ON SOCIAL SECURITY
AND FAMILY POLICY,
COMMITTEE ON FINANCE,
Washington, DC.

The hearing was convened, pursuant to notice, at 10:00 a.m., in room SD–215, Dirksen Senate Office Building, Hon. Daniel Patrick Moynihan (chairman of the subcommittee) presiding.

Also present: Senator Chafee.

[The press release announcing the hearing follows:]

[Press Release No. H–52, October 16, 1992]

MOYNIHAN PLANS HEARING ON BULLET-RELATED VIOLENCE BILL, SENATOR TO EXAMINE IMPACT ON FAMILY AND FEDERAL ENTITLEMENTS

WASHINGTON, DC.—Senator Daniel Patrick Moynihan, Chairman of the Senate Finance Subcommittee on Social Security and Family Policy, Friday announced a hearing on a new model for controlling the epidemic of gun-related deaths and injuries.

The hearing will be at *10 a.m. Friday, October 23, 1992* in Room SD–215 of the Dirksen Senate Office Building.

Moynihan (D., New York) said the model focuses on bullets as agents of disease rather than on handgun bans.

"In the middle of this century it was recognized that epidemiology could be applied to automobile death and injury. Experience shows the approach worked. Sure it could have worked better, but it worked and we can apply our experience to the epidemic of murder and injury from bullets," Moynihan said.

The Senator recently introduced S. 3373, the Bullet Death, Injury and Family Dissolution Control Act, that recognizes the epidemic nature of bullet-related death and injury. It requires the collection of systematic information about the nature and magnitude of bullet-related death and injury. And it seeks to control the agent of disease, the bullet, through taxation of the ammunition used disproportionately in crime—.25-caliber, .32-caliber and 9mm bullets.

OPENING STATEMENT OF HON. DANIEL PATRICK MOYNIHAN, A U.S. SENATOR FROM NEW YORK, CHAIRMAN OF THE SUBCOMMITTEE

Senator MOYNIHAN. A very good morning to our distinguished guests and our most distinguished panelists.

This is a regular hearing of the Subcommittee on Social Security and Family Policy of the Committee on Finance to which there has been referred a bill which this Senator introduced for the end of 102nd Congress. I have a copy of the bill here. It is S. 3373.

It is a bill to provide for the collection of and the dissemination on the information of injuries, death, and family dissolution due to

bullet-related violence. It establishes a national center for that purpose in the NIH.

It has as its general conception the proposal which most recently was advanced with great vigor in an article in the Journal of the American Medical Association. We are dealing with an epidemic here. We ought to think in epidemiological terms.

The numbers are in my statement here which I will place in the record at this point.

[The prepared statement of Senator Moynihan appears in the appendix.]

Senator MOYNIHAN. The numbers are graphic and they go beyond our perception. I think that our perception begins to get dulled at these things.

In 1989, about 35,000 persons lost their lives to bullets. Another 175,000 were injured. The rate of death and injury is about 84 per 100,000.

That is an epidemic at many levels. The homicide rate has doubled since 1963. If you go to high-incidence groups, for black males 15 to 19 years of age in Washington, DC, the rate is 227 per 100,000.

Now, that is an epidemic rate you would expect to find for typhoid fever in our cities during the 1880's. It is a pattern that we have seen before.

The subject is, how can we cross the barrier and begin to think about bullet death as an epidemic?

I am not going to go on forever here, Senator Chafee, but if I can just take a moment. You were a Governor so you can understand.

Back in the 1950's, there was a general level of concern about automobile injuries, trauma, morbidity, and mortality.

The post-war prosperity led to an enormous rise in automobile sales and with that, an enormous increase in automobile crashes and the attendant concerns.

The only mode we had of control was the mode of law enforcement. We had begun to develop laws for automobiles in the 1920's mostly. You had to invent rules about staying on one side of the road. Horses did it.

It generally took on the pattern of horse traffic, but you made changes, speed limits, for example.

The notion was that there were laws. They were understood. They could be obeyed. Obedience and compliance would be increased by enforcement. And yet, that was not happening. It was seen to happen and also seen not to happen.

There was for me a great moment in my life. Governor Harriman was running for reelection in 1958. I was minding the capital store as his acting secretary.

We were having a meeting of the Governor's Traffic Safety Policy Coordination Committee. You probably had one of those in Rhode Island, Senator Chafee.

We were sitting down very business-like, going down the agenda of things that we would do with the new regulations, the new laws, and the new penalties, and so forth.

In the back of the room, there was a young man I had never seen before who kept asking if he could see the papers on this.

Well, the commissioner of Motor Vehicles was not impressed. The superintendent of Traffic and Safety was visibly annoyed at this young man saying, "Can I see the papers on this?"

I was not an experienced political operative at this point in 1958, but I could recognize a Republican spy when I saw one. And this man stayed behind us. [Laughter.]

I found that as much as I was worried, he was a lot more worried. His name is, as Dr. Graham would recognize right away, William Haddon, Jr.

He had just graduated from the Harvard School of Public Health, having received his degree from MIT and, then, Harvard Medical. He had been sent to this meeting to represent the Commissioner of Health, but no one had given him the papers.

When he went back, he knew that the secretary to the Commissioner would want to know what he did and why. He would be able to tell him what, but not the why.

It is one of those little epiphanies. I said, "What papers?" He said, "The research papers."

I realized in a moment that there were no research papers. There never had been. There never was going to be. We had just done what common sense told us to do.

After another hour of conversation with Haddon, you began to see the epidemiological mind at work. It was an interesting thing.

It was 8 years and 1 month from that day to the day that President Johnson appointed William Haddon as head of the National Highway Safety Bureau.

It moved rather quickly. As Dr. Graham has noted, I wrote an article for a magazine called "Epidemic on the Highways" in 1960.

I was at the Democratic Convention and was asked later to write a statement for Senator Kennedy on the Interstate Highway Program.

I said that this gives us a chance to address what is probably the Nation's most important public health problem which is that of automobile safety.

From a Senator saying it to a President having accepted it, an idea got moving. The idea of treating auto deaths as an epidemic required a lot of impetus, and met a lot of resistance.

I wrote a letter to the New York Times. I have just found my old papers on this subject. The local Syracuse Post Standard went—actually what you would say—ballistic at the epidemiological suggestions about traffic safety.

The Times had written an editorial proving Governor Ribicoff's proposal in Connecticut to crack down on people who had three moving violations.

I wrote to say that everything that we have on the subject tells us that being arrested for a moving violation is a random event.

According to the Poisson distribution, random events are unevenly distributed. Here we are, proposals to have a bunch of helpless creatures persecuted by a statistically illiterate bureaucracy.

Well, the Syracuse Post editor did not think that was funny at all. Pseudo-scientific hogwash was their proclamation on the subject, but we did move forward.

General Motors could not comprehend that document. They could not cope with the idea then, although they now have research lab-

oratories devoted to reducing the agent of death and injury in auto crashes, energy transfer.

Automobile companies regularly advertise their safety features. They do not fear them at all. They show dummies clattering around inside of cars or air bags going off. That is part of the appeal they now offer the public. Something which they dreaded at first because they did not understand.

We are thinking of the same phenomenon with handgun violence. We do not know whether it will accomplish anything or not, but we have a simple proposition.

Six years ago, the Congress passed a bill outlawing a certain kind of a round of ammunition. The first one was the so-called cop-killer bullet.

We have a little dictum here that is, guns do not kill people, bullets do. We say we have a 2-century supply of handguns, more than you will ever use. If we do not leave them out in the rain, they last forever. Those 45s that are still being carried by deck officers today we used when I was in the Navy, many were made in 1911.

We only have a 4-year supply of ammunition. If you think in the epidemic mode, it is the ammunition you want to control anyway because that is what kills people. We have drafted some legislation on this approach.

In the meantime, we have had a very powerful recent issue of the Journal of the American Medical Association saying, "Why don't we try to think about gun control in the way we tried to think about the earlier question of highway safety?"

We have asked Dr. Lundberg—Dr. Lundberg is the editor of the Journal—and Dr. McAfee vice chairman of the Board of Trustees for the American Medical Association, and four other distinguished research scientists in this field to come visit us to explore what can be done.

If it seems improbable, I will point out that it took only 8 years from my first meeting with Bill Haddon in the executive chambers in Albany to Lyndon Johnson's bill signing ceremony in Washington. You never know.

Sir, thank you for coming and thank you for listening. I know that those war stories do get to be lengthy. [Laughter.]

STATEMENT OF HON. JOHN H. CHAFEE, A U.S. SENATOR FROM RHODE ISLAND

Senator CHAFEE. Well, thank you, Mr. Chairman. Your war stories always intrigue me. It is my pleasure to sit with you on a couple of committees now. I enjoy the experience tremendously.

I am particularly pleased that you are holding this hearing. I am all for what you are doing. As you know, I have introduced my own legislation that would ban the sale, possession, manufacture, transfer, and everything else dealing with handguns.

We should eliminate handguns totally in our society except for the use of the military, law enforcement officers, and licensed security personnel and licensed handgun shooting clubs. And that is all.

However, I support what you are doing. If we can accomplish the steps that you are advocating here, I am all for it.

That does not mean that I would not continue to press for our handgun ban. But nonetheless, I think you are right.

Senator MOYNIHAN. Yes.

Senator CHAFEE. I came down from Rhode Island this morning at 6:45 solely because of this hearing because I feel so strongly about what you are doing. I commend you for it.

I would just like to speak a little bit on the automobile accident business because I dealt with that, as you mentioned, as Governor.

There were several dramatic changes in automobile safety that came along. Probably the biggest single change was the introduction of safety glass to reduce horrible accidents.

Then, it was the elimination of the 3-lane road. Do you remember the 3-lane road?

Someone conceived the idea that we should have one lane going in one direction, the other lane going in the other direction, and the third lane for passing.

They did not figure out what happens if people going north and people going south both decided to pass at the same time. So the third lane became a slaughter lane.

We embarked, as did every State, vigorously on what were known as the threc Es: education, engineering, and enforcement.

We were able to pull down the number of highway deaths. We certainly pulled them down vis-a-vis the number of passenger miles traveled.

So the automobile deaths in this Nation versus the passenger miles traveled are dramatically lower than it was 20 years ago.

Now, we have a situation, Mr. Chairman, that is an epidemic. The slaughter by handguns is truly an epidemic. It relates right back to your highway illustration.

In Louisiana and in Texas in 1990—the latest year for which we have figures—more people were killed by firearms than were killed by automobile accidents.

Now, if we embark with the same tremendous effort that we had to reduce the number of automobile accidents and deaths, we might get similar results with handgun deaths. Don't forget that you have to also address the commensurate number of horrible injuries that accompany actual deaths, whether they are from automobile accidents or from handguns.

Senator MOYNIHAN. Right.

Senator CHAFEE. We should be willing to put all our efforts into this. After all, the interstate highway system which you are so familiar with, one of the selling points of it is the safety of it.

Senator MOYNIHAN. Right.

Senator CHAFEE. They have the double-barrels that are divided by substantial margins. If they are not wide enough, then, you have the New Jersey barriers which are wide enough to encourage highway safety.

Why can't we make the same effort to reduce this firearm slaughter?

Just a couple of statistics, if I may, Mr. Chairman, on what is taking place with handguns. The National Safety Council reports that in 1991, with the exception of firearm accidental deaths, the rate for all accidental deaths dropped by 5 percent: Burns, falls, drownings, and suffocations. But not firearm accidental death: That went up by 8 percent.

As you yourself mentioned, the biggest single killer of black males aged 14 to 19 is handguns. We are killing off a whole generation of potential leaders and necessary potential adults for our society. That is what is happening in our inner cities to black young men.

And so it goes in all the statistical indices that we have. On suicides, listen to this statistic: If there is a handgun in the house, the odds are that there is a 75-fold—what is that?

Senator MOYNIHAN. 7,500.

Senator CHAFEE. A 7,500 increased chance of suicide by a teen if there is an available gun in the house.

And what is happening in our society all reflects back into public health costs. When these individuals go out and shoot each other, the poor victim does not have Blue Cross or Aetna coverage. The average cost of a gunshot wound is $16,700. And that cost goes right back into the public health costs and taxpayers pay for it. It adds to our already staggering health care costs.

Everybody talks about these health care costs. Well, here is a health care cost that adds $4 billion a year to the cost in the United States for health care, just due to these guns.

So any steps that we can take, Mr. Chairman, to reduce this slaughter, I am for. And the toll in suffering that comes with it is just indescribable suffering for the individuals and the suffering of those in society that have to pay for it.

Senator MOYNIHAN. The first condition of civil government is that the State will have a monopoly on violence. That monopoly is being frittered away. It is not just the individuals, but society starts paying this price.

Senator CHAFEE. Mr. Chairman, I have not even mentioned what it is doing to our educational system when scarce dollars that should be going for teachers, facilities, books, coaches, and guidance counselors for students is going instead for metal detectors. And for every metal detector, you have to have someone to run the metal detector. It is another tremendous expense.

[The prepared statement of Senator Chafee appears in the appendix.]

Senator MOYNIHAN. Before we go to our witnesses, can I just make a point for the record? If anyone thinks that Senator Chafee might have wimpish tendencies, he was a Marine infantry officer in the World War II. He has heard guns go off and has seen what they can do.

Now, let us begin with Dr. McAfee who is a member of the Board of Trustees of the American Medical Association. His colleague, Dr. Lundberg, is the editor of the Journal of the American Medical Association.

Doctors, we thank you for being here. Your testimony is sequential.

It begins with you, Dr. McAfee.

STATEMENT OF ROBERT E. MCAFEE, M.D., MEMBER, BOARD OF TRUSTEES, AMERICAN MEDICAL ASSOCIATION, PORTLAND, ME

Dr. MCAFEE. Thank you, Mr. Chairman and Senator Chafee.

My name is Bob McAfee. I am a practicing general surgeon in Portland, ME.

I will digress a moment to point out that I did have the honor of being the first Chairman of the Advisory Committee to implement the National Highway Safety Act in 1967 in my State of Maine.

You may forget that this was really the impetus for the beginning of the entire emergency medical system organization in this country. I think that was a major spinoff of that legislation that we enjoy to this day.

I am pleased to have this opportunity to testify regarding the very serious and all too unfortunate escalating, national health problem posed by gun violence in this country today.

We commend you for the introduction of S. 3373, the Bullet Death, Injury, and Family Dissolution Act of 1992.

This, indeed, is a matter that the 103rd Congress needs to consider. We urge you to reintroduce this measure next year.

We share your interest in the subject of bullet-related violence and your heartfelt desire to limit such violence.

In a perfect world, this would not be a concern, but reality dictates that we recognize the major problem and act accordingly.

As physicians and witnesses to violence and too much bullet-related injuries, we agree with your remarks offered in introducing the bill that, quote, We must view the public health impact of bullets, death, and injury, much as we view an epidemic. End of quote.

The epidemic proportions and the need to treat this pervasive violence through public health measures is indeed obvious. The following sobering statistics are telling. Violent fatal injuries are the leading cause of premature death in the United States.

Violence is the leading cause of injuries in women. Homicide accounts for 42 percent of deaths among young men aged 15 to 24 years. It is estimated that as many as 100,000 school-aged children carry guns with them to school each day.

As physicians, it is clear to us that violence is a major medical and public health problem.

After the immediate impact of a violent act, this violence has an after-shock effect that ripples through our health care system.

Care for the victims of violence strains the health care system and adds significantly to the U.S. health care bill.

It has been reported that over 500,000 emergency department visits annually are due to violent injury and that two-thirds of crime victims treated in hospitals are uninsured.

Secondly, it has been estimated that the direct medical cost of all violent injuries may annually add as much as $5.3 billion to U.S. health expenditures. Violence involving firearms certainly adds to this problem and must be addressed.

Frankly, Mr. Chairman, as a surgeon who treats the victims of too much violence, I and my colleagues are sick and tired of being sent the bill for violence in our society, a problem that should have been prevented in the first place, and then being criticized for the high cost of medical care in this country.

Just the hospital costs related to firearm injuries add an estimated $429 million to health care costs each year. And when costs for ambulance services, physicians services, rehabilitation, and

long-term are included, total medical expenditures for just firearm injuries reach an estimated $1 billion per year.

There is absolutely no doubt that this money could be better spent.

There is a starting point. Treating violence and firearm violence in particular as a public health matter is an important step to limiting its scope.

In public health terms, this is an epidemic that must be turned around. While the population of the United States increased by 26 percent from 1960 to 1980, the gun-related homicide rate, as you have mentioned, during this same time period increased 160 percent.

Senator MOYNIHAN. Yes.

Dr. MCAFEE. The leading cause of death in black teenage boys in this country today is gunshot wounds. Suicide stands as our third leading cause of death among children and adolescents, an increase almost solely related to the use of firearms.

Family and so-called intimate assaults involving firearms are at least 12 times more likely to result in death than family assaults involving all other kinds of weapons.

It is indisputable that the availability and wrongful use of firearms is a major and still-growing factor in our epidemic of violence.

The American Medical Association recognizes that uncontrolled ownership and the use of firearms, especially handguns, is a serious threat to the public health.

We, therefore, support the enactment of the Brady bill to mandate a national waiting period that allows for a police background and positive identification check for anyone who wants to purchase a handgun from a gun dealer anywhere in the United States.

The AMA also supports banning armor-piercing bullets, restricting the sale and private ownership of assault weapons, strict enforcement of existing laws related to the use of firearms, and the development and presentation of safety education programs for more responsible use and storage of firearms.

We are eager to see quick action in this regard early in the 103rd Congress.

In conclusion, it is obvious that violence is an enormous public health problem in this country today, both in terms of the number of lives touched and lives lost, and in terms of the impact on the health care system.

Thank you for affording me, Senator, the opportunity to appear here before you today. I would be pleased to respond to any questions that you may have.

[The prepared statement of Dr. McAfee appears in the appendix.]

Senator MOYNIHAN. Thank you, Dr. McAfee.

I think we will be collegial about this. We will hear from each of our panelists. Then, we will have questions and discussion.

Dr. Lundberg, you are the second half of the AMA. Good morning, sir. We all want to congratulate you and your editors for an extraordinary performance.

You only published a selection of the papers that you have. You sent down word, I gather, that if anyone had something to say on this subject to send in their papers. And you received a very consid-

erable number which is suggestive of a profession getting ready for this subject.

STATEMENT OF GEORGE D. LUNDBERG, M.D., EDITOR, JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, CHICAGO, IL

Dr. LUNDBERG. Yes. I agree, Senator. Thank you very much, Senator Moynihan and Senator Chafee.

My name is Dr. George D. Lundberg. I am the AMA's Editor in Chief of Scientific Publications. I am the Editor of the Journal of the American Medical Association.

I appear before you today in my role as editor of the Journal and as a physician/citizen who believes that action is needed now to address our National problem of firearms.

To this end, we published 437 pages in our 10 AMA medical journals on the subject of violence in June 1992.

This included an editorial in the June 10 issue of the Journal, written by former U.S. Surgeon General C. Everett Koop and me.

The editorial entitled, "Violence in America: A Public Health Emergency," advocates viewing the problem of violence associated with the use of firearms from a public health perspective.

Our position squares with the highly laudable intent of your bill, S. 3373.

In fact, to digress, your focus on the bullet, goes back to Dr. Lester Adelson, a famous French pathologist.

Senator MOYNIHAN. Exactly.

Dr. LUNDBERG. Dr. Adelson in 1980 wrote an article called, The Bullet as Pathogen.

Senator MOYNIHAN. If I could just interrupt to make the point that there are constants in this mode of analysis.

It is not in the least bit surprising to me that a number of people, quite independently, think about this subject.

This mode will come up with more responses. It suggests that there is a discipline here. Yes. The bullet as pathogen.

I had no idea that he had done that until we had read it in your Journal.

Dr. LUNDBERG. We are in agreement that a medical public health orientation is a viable direction to reduce injuries and deaths stemming from firearm violence.

The editorial states in part, "Regarding violence in our society as purely a sociologic matter or one of law enforcement has led to unmitigated failure. It is time to test further whether violence can be amenable to medical/public health interventions."

By analogy, automobiles, intended to be a means of transportation when used inappropriately, frequently become lethal weapons and kill human beings.

Firearms are intended to be lethal weapons. When used inappropriately in peace time, they, too, frequently kill human beings.

In the State of Texas, as already noted, in 1990, deaths from firearms, for the first time in many decades, surpassed deaths from motor vehicles as the leading cause of injury mortality.

In the 1960's, 1970's, and 1980's, defining motor vehicle casualties as a public health issue and initiating intervention activity

succeeded in reversing the upward trend of such fatalities without banning or confiscating automobiles.

We believe that comparable results can be anticipated by similarly treating gunshot wound casualties. But the decline in fatalities will not occur overnight and will require a major coordinated effort.

The right to own or operate a motor vehicle carries with it certain responsibilities. Among them are that the operator meet certain criteria: to be of a certain age or physical/mental condition; to be identifiable as the owner or operator; to be able to demonstrate knowledge and skill in operating the motor vehicle safely; to be subject to performance monitoring; and to be willing to forfeit the right to operate or own a vehicle if these responsibilities are abrogated.

We regard the right to own or operate a firearm carry with it the same prior conditions, namely, that the owner and operator of a firearm also meet specific criteria: be of a certain age and physical/mental condition; be required to demonstrate knowledge and skill in the proper use of the firearm; be monitored in the firearm's use; and forfeit the right to own or operate the firearm if these conditions are abrogated.

These restrictions should apply uniformly to all firearms, not just handguns, and to all U.S. inhabitants across all States through a system of gun registration and licensing for owners and users. No grandfather clauses should be allowed.

As the editorial states, defining motor vehicle casualties as a public health issue and initiating intervention activity succeeded in reversing the upward trend of such fatalities.

In this regard, the National Safety Council states that the 1990 national mileage death rate was the lowest rate ever since 1912.

More progress was made in reducing motor vehicle deaths by using these interventions by the 1980's than in any other decade because it takes awhile to get things started and to get them rolling along obviously.

Motor vehicle deaths declined in absolute terms by 13 percent from 1980 to 1990. This decrease was achieved in spite of significant increases during the decade in numbers of drivers, vehicles, and miles driven.

Contributing significantly to the reduction in motor vehicle deaths for the decade was an increased legislative emphasis on occupant protection, alcohol programs, mandatory safety seat belt laws, minimum drinking age laws, etcetera.

This success can and, I think, must be repeated to start making significant inroads against firearm-related violence.

Dr. Koop and I believe that the enactment of the proposed legislation set forth in our editorial would very likely result in a similar ameliorative effect and impact with respect to reductions in injuries and deaths stemming from firearm violence.

It is time to take action. As we say, it is time to bite the bullet back.

I appreciate having this opportunity to testify. And I will look forward to any questions and discussion later.

[The prepared statement of Dr. Lundberg appears in the appendix.]

Senator MOYNIHAN. In the spirit of the traffic safety analogy, may I just point out that there was no greater obstacle to introducing an epidemiologic mode in that field than the annual reports of the National Safety Council.

As the youths say, they just did not get it. They were constantly awarding Rhode Island or Connecticut with the best traffic safety performance award of the year to whichever lucky Governor was there for the number of the vehicle death rates. And poor Wyoming would always be last.

I remember discovering 1 day that I noticed Rhode Island was good, but the District of Columbia was better. It occurred to me that, could the death rate have something to do with the distance to the nearest hospital? Of course, it plainly does.

If the death rate is lower in 1991 than it was in 1912, maybe it is because those emergency rooms are better, along with the introduction of blood transfusior hniques, etcetera.

Thank you very much, Dr. Lundberg.

We will now have, in a semi-logical sequence, Dr. John Graham who is the director of the Center for Risk Analysis at the Harvard School of Public Health where so much of this work was originally done.

Dr. Graham is an historian of the automobile question and has a paper that tries to relate to that.

We welcome you, Dr. Graham, and good morning.

STATEMENT OF JOHN D. GRAHAM, PH.D., DIRECTOR, CENTER FOR RISK ANALYSIS, HARVARD SCHOOL OF PUBLIC HEALTH, BOSTON, MA

Dr. GRAHAM. Thank you, Senator Moynihan.

The theme of my testimony today is that America's historical record of success in traffic safety provides some insights into how we could make progress against bullet-related injury, how that progress might be made in the future.

Few people realize that as recently as 1960, we knew very little about the frequency and causes of traffic injuries in the United States, or of scientifically sound strategies for reducing this highway trauma.

The conventional wisdom at the time was that motor vehicle accidents are unavoidable acts of human nature that must be accepted as the fate of God.

In the last three decades, this myth has been destroyed by a stream of scientific-based interventions ranging from automobile safety belts and air bags to changing national norms toward drinking and driving.

In my 1989 book, Auto Safety: Assessing America's Performance, I trace the history of the Federal Government's achievements in this area.

The book argues that our success reflects a very simple yet profound step: a commitment by the Federal Government to develop a new science in support of public policy toward automobile safety.

A critical, historical event was the publication in 1959 of a highly provocative article entitled, "Epidemic on the Highway."

In this article, the author pointed out that the science of traffic safety was so immature that no one even knew how many people were killed and injured in traffic crashes each year.

There were no reliable data systems that could document the frequency of crashes, their severity, and associated risk factors.

The author of this article predicted that without the development of such rudimentary data systems, the science of traffic safety would be overwhelmed by political power plays of the grossest kind.

This 1959 article received widespread attention among opinion leaders and laid the groundwork for the subsequent accomplishments of Ralph Nader, the late Dr. William Haddon, Jr., and many others.

For those of who do not know, this path-breaking article was written by the chairman of this subcommittee, the then Professor Daniel Patrick Moynihan.

When the Federal Government moved into the traffic safety field, some very basic steps were created. A national census was launched of every motor vehicle fatality that occurs in the United States, the so-called Fatal Accident Reporting System, FARS.

On each fatality, the FARS system reports information on 90 variables about the driver, the vehicle, and the roadway environment.

More recently, a National Accident Sampling System, NASS, provides critical information about nonfatal injuries in a large sample of crashes nationwide.

Now, the FARS and NASS systems are much more than a researcher's fantasy. They are the data systems that provide policymakers with timely and accurate information about the success and failure of safety programs.

For example, recent reports using FARS data have examined the following issues: the effectiveness of modern air bag technology in high-speed crashes, the public health impacts of relaxing speed limits from 55 to 65 miles per hour on rural interstate highways, and the consequences of raising the minimum legal drinking age from age 18 to age 21.

It is now well documented that the Federal Government's leadership role in the science of traffic safety has led to the saving of tens of thousands of lives each year.

By analogy, let us now consider the field of bullet-related injury in 1992. This field is not unlike the field of traffic injury in the 1950's.

Bullet-related injury is barely a field of respectable scientific endeavor. There is no national data system that reports information on incidents of bullet-related injury and death.

Basic information, such as the circumstances of the injury, the exact type of weapon used, and the role of alcohol and drugs, is not collected and reported on a routine basis.

In a recent article in Scientific America, Professor Franklin Zimring states that, "Much more money is spent on newspaper advertisements about gun control than on research about firearms and violence."

Since scientific data are lacking, we should not be surprised about the quality of the scientific literature about bullet-related injury. It is very poor.

Many of the so-called experts in this field are ideologues who are committed either to dramatizing the evils of guns or extolling the virtues of guns.

Very few talented and objective scientists have entered this field because there is little data, there are few resources, and there is a surplus of political adversaries.

Over 10 years ago, a report on guns and violence for the U.S. Department of Justice concluded, "The published literature is more noteworthy for what it does not show than for what it does. There is, it appears, scarcely a single finding in the literature that could be said to be indisputably established. In part, this reflects the highly politicized nature of research in this area, but perhaps more importantly, it results from a near-total absence of sound and generalizable data from which reliable information about weapons, crime, and violence might be extracted."

It is now 10 years later and roughly 300,000 bullet-deaths later, but it is certainly the case that the conclusions of this 1981 report remain basically valid.

Looking to the specifics of title I, Senator Moynihan, I do have several specific comments about the future of this proposed National Center for Bullet Death and Injury Control.

First, and perhaps most importantly, this center's chances of long-term success, measured in decades, will be enhanced if it develops a reputation for objective science, which means that its reported findings about bullet-related injury are based on what the data say, regardless of the public policy implications.

The interpretations of data should be published in peer-reviewed journals before they are distributed to the public.

It would be tragic if this center were to become captured by either the pro- or anti-gun lobbies.

As the legislative founder of such a center, I urge you to protect and nurture its scientific objectivity.

A second and related point concerns the center's advisory committee. While many of my colleagues appreciated the confidence you have placed in the field of epidemiology, they believe the membership of the center's advisory committee should be expanded and diversified to include criminologists, behavioral scientists, physicians, statisticians, engineers, and other disciplines that have insights to contribute to the problem of gun-related injury.

While this is a minor suggestion, it will enhance the credibility and scientific creativity of such a young center.

Third, and finally, I urge the subcommittee to consider the organizational relationship between the proposed center and the existing National Center for Injury Prevention and Control which is located at the Centers for Disease Control in Atlanta, GA.

As you may know, this week's issue of Science magazine discusses some of the recent scientific studies of bullet-related injury that have been supported by the CDC.

While, I think, it is too early to tell whether the findings of these limited studies will be replicated and widely accepted, my point is that CDC has some institutional momentum in this area and that your bill could easily build on that momentum.

Before concluding my testimony, I would like to thank and acknowledge my colleague, Dr. David Hemenway, who assisted me in preparing this testimony.

Thank you again very much for the opportunity to be here today. I would be happy to answer questions later on.

[The prepared statement of Dr. Graham appears in the appendix.]

Senator MOYNIHAN. Thank you very much, Dr. Graham. Is Dr. Hemenway here?

Dr. GRAHAM. He was not able to make it to today's hearing.

Senator MOYNIHAN. All right. I would like to say that we are all very scientific and like to be and ought to be. Haddon wrote about 10 strategies to prevent and treat injuries in an article, called, "On the Escape of Tigers: An Ecologic Note."

One strategy is, if you do not want to be eaten by tigers, make sure you lock up the cages before you go home at night.

He came up with this out of Deuteronomy 22.8, "When thou build a new house, then thou shalt make a battlement for thy roof, that thou shalt not bring blood upon thine house if any one falls from it."

It is there in the bible, intervening barriers. That is the barrier between the two different directions on a highway. You have a parapet to keep the kids from falling off of it.

Now, we are going to hear from Dr. Christopher C. Green who implemented some of the ideas that developed in this field in the medical profession in the 1950's and 1960's.

I think it is a point of historical record that the notions of automobile safety design began with aviation medicine.

I think there was a professor at the Harvard School of Public Health, Ross McFarland, who saw the transfer.

Dr. GREEN. Correct.

Senator MOYNIHAN. Somehow aviation design with respect to safety was always a province of the Federal Government from the beginning because it was connected with the military and also, flight seemed dangerous and automobiles seemed familiar.

Things like seat belts were in airplanes very early. The transfer to automobiles took a couple of generations. Now, General Motors is very active in this field.

Dr. Green, we welcome you, sir. We look forward to your testimony on what you are doing and what you think based on what you have learned in the automobile field about the area that Senator Chafee and I are interested in.

STATEMENT OF CHRISTOPHER C. GREEN, M.D., PH.D., RESEARCH AND ENVIRONMENTAL STAFF, GENERAL MOTORS CORP., WARREN, MI

Dr. GREEN. Thank you, Mr. Chairman and Senator Chafee. I am honored that you asked me to be here with my distinguished colleagues.

Indeed, the remarks that I would like to make will largely echo what has been said so far and, I am certain, will be said in the remainder of your hearing.

I am Christopher Green. My medical background is in neurophysiology and forensic science.

Over the last 10 years or so, I have been privileged to direct the biomedical laboratory at General Motors, which conducts basic research and has done so for the last 25 years on the cause and control of automotive injury, environmental health effects, and new manufacturing materials medicine, and bio-remediation.

Let me first start with what I believe to be some similarities between what we have heard discussed so far and what we would like to hear a good deal of in the next years concerning your initiative, Senator.

First, the epidemiological triad has been referred to here several times. It is, of course, the host, the agent, and the environment—indeed, present for both motor vehicle trauma and for gunshot injuries.

Data analysis should focus first on the host because a study of the incidence and the prevalence of the disease, as it were, will identify the first clues to patterns that one sees in the agent.

The host is the person who becomes sick from an infection or the crash or the gunshot victim. The agent is the bacteria or virus, the vehicle, or the bullet "pathogen."

Analysis of the interactions among the host, the environment, and the agent often leads to new insights in identifications as to the mechanisms and the causes of the injury itself.

Many believe that the environment is the most important element of the epidemiological triad. Gunshot injury like automotive injury occurs in a highly-structured setting.

In motor vehicle research, we learned often that very careful analysis demonstrated unknown organizational elements of interactions among the road, the vehicle, and the driver. But medical, social, and environmental settings in which violence occur are at least as complicated and as amenable, in my view, to analysis.

Analysis may provide unexpected results. For example, environmental factors are causally related to vehicle crashes in about 10 percent of the cases and yet human factors are implicated as a definite causal factor in about 70 percent of the crashes.

It is through an analysis of the interactions among the host, the agent, and the environment that strategies for protection in injury mitigation can be found in that setting.

Analysis of the triad, then, leads to the second similarity, human behavior. Traffic-related behavior modification is, as has been pointed out today already, very difficult to achieve.

As a Nation though, we are finally recognizing that the use of readily available safety belts, air bags, and other interventions can achieve a 30 to 40 percent life-saving benefit in many crashes and could reduce the billions of dollars of societal cost resulting from injury.

Through the national program to increase safety belt use, the national usage rate is now an amazing 60 percent. We want it to go higher.

This is significant because it increased from 14 percent in 1984, just 8 years ago.

Senator MOYNIHAN. Can I interrupt there?

Dr. GREEN. Certainly.

Senator MOYNIHAN. Did you say from 14 percent in 1984 to 60 percent now?

Dr. GREEN. Yes.

Senator MOYNIHAN. That is a change in behavior that is almost precipitous, as if there was a learning pattern that was resisted and resisted and, then, bang!

Dr. GREEN. Indeed, one of my colleagues a moment ago referred to that change in behavioral awareness. It is encouraging.

Senator MOYNIHAN. I will go into this later, but there is in psychology and in science a certain notion of how people change their minds, which often is not an incremental pattern.

Dr. GREEN. Right.

Senator MOYNIHAN. Is there Dr. Lundberg?

Dr. LUNDBERG. I agree with you entirely. It flutters along like this and, then, it snowballs. Somehow it happens to become acceptable and normal behavior.

Senator CHAFEE. In all fairness and I am all for the education that is taking place on seat belts, it is not all a change in human patterns.

Some of it is the mechanical situation whereby you just shut the door of your vehicle and the seat belt automatically comes across. You do not take any voluntary steps at all to achieve the seat belt coming in front of you.

Dr. GREEN. Well, you are right. We are beginning to see some dramatic changes in attitude about all of these issues. It is encouraging.

Regardless of the law enforcement and education efforts, however, that you have just referred to, certain segments of the driving population still have not changed their driving behavior.

We presume that violent behavior and bullet-related injury is probably equally resistant to change.

Indeed, that leads to the third broad similarity that, I think, I see in the issue today and that is the linking of bullet and automobile injury epidemiology.

Senator Moynihan has stated in his writings, one of which is, "Epidemiological data are rarely employed to advantage."

And, as you, Mr. Chairman, have persuasively argued in many forums for many decades, science should be impartial and the analysis of this data should be used to seek, as I indicated earlier, the clues for intervention strategies.

Now, what about some of the differences? I think that there are two major differences in epidemiological research between motor vehicle and ballistic injury.

The first is that the likelihood of discovering intervention strategies, in my opinion, can occur much more quickly in ballistic trauma than occurred in automotive trauma.

Senator MOYNIHAN. Yes.

Dr. GREEN. Unlike the situation that we have been reviewing this morning, many years ago when automobile crash field investigation and impact trauma research had just begun to evolve and become invented, today research scientists do have the methodologies for collecting and analyzing and understanding how to do that analysis of the complicated, highly structured human environmental events.

Also, the field of forensic ballistic research and injury is mature. That is largely due, as has been mentioned earlier, to the significant base of military knowledge.

Second, we believe that unlike the automotive experience, interventions to fix the bullet "agent" may not require high-tech solutions.

The similarities and differences lead me to four lessons that may apply to bullet injury. The first lesson learned is that I believe it is necessary to work backwards through the four principles of injury control and to avoid assuming conclusions that appear early in analysis to define prevention or protection strategies.

Now, the four principles that are consummate with all forms of injury are: prevention of interaction between the human and the environmental injurious agent; protection when such interactions occur; as Senator Chafee indicated earlier, rapid treatment of the injury; and rehabilitation that is sophisticated and, if necessary, long-term.

In motor vehicle trauma research, initially one might have presumed that prevention or training occupants to, for example, brace themselves against the dashboard or the back seat for an impending crash or designing protection systems in the vehicle with very soft and cushy padding would reduce our motor vehicle injury, but research proved that such early presumptions were wrong.

We needed to do the science first. We needed to find out and discover what the mechanical and the other tissue properties are from actual injury observations, that third part of the program that regards rapid treatment of injury.

I believe we need to guard against similar early conclusions in ballistic injury research.

Second, the cost to society in dollars for rehabilitation for automotive and ballistic trauma are enormous. Therefore, very small expenditures in the first two segments—finally, when we discover what they need to be of the injury control process, prevention and protection—are incredibly important in leveraging enormous results.

Third, be aware of confounding, unexpected variables when analyzing the host agent interactions and beware of oversimplified answers.

In addition, as is the case in motor vehicle intervention, I would not be surprised if the control of one form of gun, bullet, or other condition could lead to increased pressures with somewhat negative results on other segments of the problem, as yet unknown.

This lesson was learned and it is relearned and relearned by all scientists in all forms of research.

Senator MOYNIHAN. Before you continue, could I just interrupt? You are being very thoughtful in the collapsing of your statement.

Dr. Green just mentioned a new idea. We talked about that first collision which is what we were all trying to avoid in the first stage in which the car hits the tree.

Unless you have a thing about trees, nobody gets hurt. It is not until the second collision that the occupant hits the car.

Now, along comes another generation that says that the third collision is when body organs hit the body structure.

Dr. GREEN. That is absolutely right. Indeed, in my longer statement, some of that is explicated. You are right on target, Mr. Chairman.

That is, indeed, the kind of analysis I was referring to that leads to surprises, observing those injury patterns, the fact that there were second and third collisions that actually related to what was seen in the emergency departments, and, then, finding that the tissue properties of what was injured could relate to strategies for protection were what this story is all about.

Senator MOYNIHAN. Nice work.

Dr. GREEN. That leads me to my final comment that I wish to make and that is: When one analyzes all of this data taken together, one should not minimize the data itself, that is, the data of epidemiology.

In injury control, we need to keep foremost before us the knowledge that seemingly very, very small changes in any aspect of the epidemiological triad across tens of thousands of victims every year will reap positive benefits to mitigate human suffering and death.

Finally, to conclude, as the understanding of the behaviors that lead to automotive trauma became more sophisticated, we expected that human factors research and driver/occupant education—mentioned just a moment ago—once again, would lead quickly to decreased injury.

As you have just pointed out, that did not happen until recently in almost a matter of a step function that we did not predict. How wonderful that has been.

Senator MOYNIHAN. A step function?

Dr. GREEN. As you indicated, almost suddenly, the changes have occurred within the last decade, even in the last 5 years in the behavioral appreciation of what this issue is.

Senator MOYNIHAN. That is what you would call a step function?

Dr. GREEN. I would call it a step function. I am not a statistician.

I believe, indeed, that we did not understand the importance of reducing the automotive trauma from recognition error, inattention, false assumptions, the strong correlation with alcohol and drug impairment, driver inexperience, emotional upsets, and more recently, an exploding data base in the research literature on the importance of age differences and the environment.

Detailed studies of all of these features, I believe, could lead to differences in the relative importance between automotive and ballistic trauma and some additional important similarities.

As a scientist and a physician, I believe that similar scales of importance exist in the worlds of domestic violence with the collisions of the bullet and the victim and automotive trauma.

We applaud what you are doing, Senators, and we hope that you will help us bring more scientific understanding to these problems.

[The prepared statement of Dr. Green appears in the appendix.]

Senator MOYNIHAN. We thank you, sir. Clearly, that is absorbing.

We are now going to hear from Dr. Marzuk who is at Payne Whitney, the teaching hospital of Cornell University.

Dr. Marzuk, we welcome you, sir.

STATEMENT OF PETER M. MARZUK, M.D., PAYNE WHITNEY PSYCHIATRIC CLINIC, CORNELL MEDICAL CENTER, NEW YORK, NY

Dr. MARZUK. Thank you, Senator Moynihan and Senator Chafee for inviting me to testify before you this morning.

As you mentioned, my name is Dr. Peter Marzuk. I am a psychiatrist and a researcher in the field of violence and suicide in your own home, the State of New York.

It is ironic, I believe, that the arms race is over among the super powers and yet there is clearly an arms race in America where individuals are accumulating a large arsenal of immense firepower and destructiveness in our streets and in our homes.

I support the establishment and funding of a National Center for Bullet Death and Injury Control because I believe that firearm injuries constitute a significant public health problem, that public health strategies could reduce, but not altogether eliminate the problem, that these strategies would work only if they are targeted to specific high-risk populations, that targeting requires detailed information and diverse expertise both to develop and to test preventive interventions, and that current mechanisms are inadequate to implement public health solutions fully.

The principle question, of course, is how can we reduce the rate of firearm injuries and deaths?

A second related question is, will the reduction in firearm injuries and deaths lead to a decrease in homicides and suicides?

Senator MOYNIHAN. Could you help me there? I thought the one would be equivalent to the other.

Dr. MARZUK. Well, what I would say is that many studies, for example, link the availability of guns with homicides and suicides. There are a number of other studies that show that there is no connection.

My guess with that is that we will never be able to prevent those people who are determined to die or determined to kill themselves from doing so.

However, a significant number of homicides and suicides probably occur when individuals are in an impulsive state, at the spur of the moment and, therefore, can be prevented.

So I do not think that we can completely eliminate the problem.

I will not belabor the costs, both in economic and human terms, which I think has been well covered by yourself and Senator Chafee and the other panelists here this morning.

I would say, of course, that the public generally fears street crime from strangers.

Senator MOYNIHAN. Sir, will you hold a minute there? You cite Cotton who says that, "Firearm injuries cost $16.2 billion in 1988."

That is the highest number that we have heard, isn't it?

Dr. MARZUK. Yes. That is a high number.

Senator MOYNIHAN. A higher number than Senator Chafee had.

Senator CHAFEE. Well, during the first testimony, Dr. McAfee used $5.3 billion I believe.

Dr. MCAFEE. I said $14 billion is the cost of firearm injuries.

Dr. MARZUK. The point is illustrated that we do not even know what these injuries cost. It is clearly a lot of money.

The center might be one step in the direction of determining how much these injuries cost.

Let me say, as I mentioned, that the public fears street crime from strangers, but, as you and Senator Chafee have pointed out, you are much more likely to die of a gun in your hand or in the hand of a relative or an acquaintance than that of a stranger.

Forty-two percent of firearm injuries are homicides, but 52 percent are suicides. Therefore, firearm injuries represent, in effect, the principle mortality of psychiatric illnesses in this country.

There are many mechanisms to control firearm injuries from a public health viewpoint that have been proposed, including: societal mechanisms to reduce the overall level of violence; legislative initiatives concerning the regulation of firearms; consumer strategies to promote safety devices, such as load-indicators or safety locks or the reduction of the muzzle velocity of firearms; educational strategies for firearm training and safety; and medical strategies to improve the quality of trauma centers that would treat those that are injured.

It is clear, however, in my opinion, that not one of these strategies will be affective in working completely. The public needs to understand that there are, I think, four basic reasons.

First, although firearm injuries and deaths are similar, there are many important differences between them, in the circumstances, the demographics of injuries, the type of bullets and weapons used.

So a safety lock may deter a 9-year-old from having an accident, for example, but would not necessarily stop a suicide or a homicide.

So targeting will require surveillance to identify high-risk groups and scientific expertise to assess the efficacy of various strategies.

Second, I believe that the public is misinformed about this problem, deriving most of its information from movies and TV shows where the image is glamorized and distorted, where attractive models are shown on television every night with the message that guns can solve problems, offer protection, are glamorous to use, widely possessed, and usually prevent or deter crimes.

There has been a decrease in advertising for cigarettes and alcohol, which may have led to some decrease in the consuming of these products.

But guns are shown every night on television, working and effective. And no other consumer product receives so much free-market saturation worth billions of dollars in advertising as firearms do.

A national center, charged to publish accurate and unbiased information, I hope, would begin to correct the public's distorted view of this situation.

Third, guns are consumer products that do not disintegrate. Half of all households have guns. They are estimated to be over 200 million firearms in the United States.

In effect, I propose that guns are more properly equated with nuclear waste. Both are dangerous, both accumulate, and both take decades to disintegrate.

The indestructibility of guns has important ramifications regarding any legislative initiative in a country that is already saturated with guns or any consumer strategy to replace the supply of weapons with safer ones.

It may actually be easier to limit bullets than to limit guns which simply do not disintegrate.

My fourth point is that the primary purpose for most Americans in owning weapons is self-protection. If guns are in good working order, it is expected that they will deter crimes or injury or kill other individuals.

Senator MOYNIHAN. Could I just ask a question, Dr. Marzuk?

Dr. MARZUK. Yes.

Senator MOYNIHAN. Do we have data that most Americans own guns for self-protection?

Now, you would not own a shotgun for self-protection. Is that data-survey based?

Dr. MARZUK. There are a number of surveys that suggest that to my knowledge.

Senator MOYNIHAN. Maybe you will supply them to us?

Dr. MARZUK. Yes.

Senator MOYNIHAN. I think we are told hunting.

Dr. MARZUK. Well, we are told that as well. Also, self-protection, I think, is the major reason.

As I was pointing out, the strategy of educating, for example, parents to lock up their guns and keep ammunition hidden may be unrealistic if guns are expected to be available, ready, and working to deter crimes. Similarly, safety devices may not be useful for those who are intent on harming others or harming themselves.

I support a National Center of Bullet Death. One, I believe that the state of crime surveillance of the problem is inadequate.

Firearm deaths are largely studied through death certificates accumulated at the National Center for Health Statistics and through FBI data, but death certificates only provide basic demographic data about the problem.

Much data is collected at the local level in medical examiner's offices and in police departments that would link toxicology, but it is not always readily available to researchers to systematize.

A center of this sort would go a long way in systematizing data collection, as well as deepening data collection.

Second, I believe that we need to expand the scope to non-lethal injuries. Very little is known about firearm injuries.

We need to establish their prevalence to better identify risk factors, the role of trauma centers in reducing the severity of injuries, and in assessing their economic costs.

It is not clear, for example, if trauma centers in violence-prone areas are worthwhile nor is the optimal combination of acute and rehabilitative care for those who are injured entirely clear.

Violent death is the culmination usually of repetitive acts of non-lethal violence so that those who are injured are at a higher risk of ultimately dying in violent incidents.

Senator MOYNIHAN. And that is survey data? There is a sequence?

Dr. MARZUK. Yes. That is clear, I think, from the scientific literature.

We also need to deepen data collection to be able to conduct sorely needed case control or cohort studies. We need more than just demographic data.

It may be clear that not all guns or bullets are equally as harmful. We need to be able to detect clusters or links between deaths.

For example, murder/suicides which account for over 1,500 deaths probably in the United States each year and have a significant amount of mortality that is on a par, for example, with hepatitis or meningitis, are not being studied because there is no way of linking these two deaths in the current surveillance system.

And the role of drugs and alcohol is clearly pivotal to any understanding of firearm injuries. We need data on that as well.

And finally, I would say that we need a critical mass of investigators to tackle such a large and complicated multifactorial problem as this.

Senator MOYNIHAN. Dr. Marzuk, would you read for my esteemed colleague, Senator Chafee, the passage after your critical mass where it says, "The field of violence research?"

I will read it. "The field of violence research has much catching up to do. As Kellerman notes: In 1983, NIH funded 19 grants to study five infectious diseases that in 1 year caused 17 illnesses and nine fatalities. There were no funded studies of firearm injuries that resulted in 33,000 deaths and 198,000 injuries."

Dr. MARZUK. It is quite a problem. Yes.

As I was saying, a critical mass is clearly needed of investigators from a wide variety of fields, epidemiology, public health, psychiatry, law enforcement, and sociology, among others, to spawn new hypotheses and pilot interventions and to recommend targeted policies.

A national center would go a long way in providing that critical mass.

Finally, I will conclude in closing that the problem will not be solved by any single strategy. There is, in effect, no magic bullet for this problem.

Given the gun supply and cultural investment that Americans have in guns, it will take a long time to solve the problem. We will have to chip away from many angles at the problem.

I think it is somewhat ironic that we require licenses to drive or to fish or even to own dogs, but it is a struggle to license firearms.

Millions of dollars are spent every year testing consumer products and experimental drugs and, then, banning them if they are unsafe.

It takes but a cent of intuition to know that guns are dangerous and they are not better restricted.

I thank you, Senator. I would be happy to answer any questions.

[The prepared statement of Dr. Marzuk appears in the appendix.]

Senator MOYNIHAN. We thank you, sir. Is Dr. Tardiff or Dr. Leon here by any chance?

Dr. MARZUK. No. They are not.

Senator MOYNIHAN. I was going to acknowledge, as you do, their help.

There is a lot to answer for obviously.

Dr. Rosenberg of the National Center for Injury Prevention and Control at the Centers for Disease Control.

I was just joking when I said how much you have to answer for. You do not have to answer for anything.

Dr. ROSENBERG. I wish. [Laughter.]

STATEMENT OF MARK L. ROSENBERG, M.D., NATIONAL CENTER FOR INJURY PREVENTION AND CONTROL, CENTERS FOR DISEASE CONTROL, ATLANTA, GA

Dr. ROSENBERG. Good morning, Mr. Chairman.

I am Dr. Mark Rosenberg, the associate director for Public Health Practice in the new National Center for Injury Prevention and Control of the Centers for Disease Control, CDC.

And so ends the remarks that I will read. I would like to defer from my written comments to talk to you about several issues.

I think that it is rare that a former student has a chance to come back and talk to an old professor from awhile back and see that they have traveled down paths that may be leading towards very common ground. That is really a delight. I am honored to be here.

Senator MOYNIHAN. Sir, we are very honored to have you.

Dr. ROSENBERG. I would like to talk about three things and really try to answer three questions that I think a lot of us have been addressing.

The first really is, what do we mean that violence is a public health problem? And what do we mean when we say that?

Second, I would like to say, what is the public health approach to violence? What does it bring? What does it offer?

And finally, I would like to say that we do have a center. We have this center that all of us have been talking about in some way. I would like to tell you what we are doing there right now.

The first question concerns what we mean when we say violence is a public health problem? When we use the word violence, we mean the use of force with the intent to harm another or oneself.

I think it is very important that we do continue to include suicide in this equation because most of the firearm injuries are suicides.

There are 30,000 suicides every year and 20,000 homicides. It is a very good point and important that we discuss both suicide and homicide.

Again, as we talk about these 50,000 deaths from violence that occur every year, they are really only the tip of the iceberg. It is a very small tip.

We are starting to look at numbers of nonfatal firearm injuries. Of those that come to the hospital, there are at least five to seven times as many non-fatal injuries as fatal injuries.

Probably, if you look at firearm injuries, including those that do not come to the hospital, you are talking about hundreds of thousands, perhaps millions of injuries that have occurred over the recent past.

When we talk about violence as a public health problem, we refer to the fact that the toll is enormous. We have heard about that. We have heard that violence is the leading cause of death for young black men in this country.

What is less well appreciated is that it is also the leading cause of death for young black women in this country. The number 1 cause of death for young black women aged 19 to 24 is homicide. Young black men and women in this country are both dying from violence.

Let me add that violence is not just a minority problem. Though they suffer disproportionately, they share this problem with non-minorities. Half of all firearm deaths, half of all violent deaths occur to whites in this country. So, it is not just a minority problem.

First, violence is a public health problem because of the enormous toll on life and morbidity. Second, we consider violence a public health problem to suggest that the criminal justice system by itself is not enough.

Our jails are full. A quarter of some populations are in prisons or on parole and yet the number of homicides in 1990, the last year for which we have data, is the highest ever before in our recorded history. And it is going up.

Senator MOYNIHAN. Do you want to say that once again? You said, "a quarter of some populations are in prisons." by which you mean an age group and an ethnic group?

Dr. ROSENBERG. Yes. The rates are very high. It is reported that one in four black men is in jail, prison, or on parole or probation in the United States.

I think, also, that criminal justice is not enough because a lot of homicides are not felony-related.

Every year in the national crime statistics, the FBI tells us that a lot of these homicides do not have any relationship to a crime.

They do not occur when you go out and get caught in the crossfire at the convenience store late at night.

They occur among people who know each other, those who get into an argument. The argument escalates. You know the pattern: there is drinking and there is a gun and there is a fatality.

These are homicides among what we used to call friends. People told us that it was not the best word to use and maybe we should use the word acquaintances instead.

Homicides among acquaintances, to a large degree, occur free from other criminal activity in people's homes.

Every year, the FBI tells us that this is not a criminal justice problem; this is a social problem. So we think that criminal justice is very important, but it is not enough.

Senator CHAFEE. Can I just ask you about the word homicide?

Homicide means a human being killing another human being. As a practical matter, does it mean a human being killing another human being with a firearm?

Dr. ROSENBERG. No. It is not necessarily with a firearm.

Senator CHAFEE. It could be strangulation.

Dr. ROSENBERG. Poisoning.

Senator CHAFEE. Or hit over the head or poisoning. But as a practical matter, 95 percent of the cases involves the use of a firearm?

Dr. ROSENBERG. It is not that many of all the ones that occur. If you look at the area where the epidemic is most severe and increasing most rapidly among young people in this country, 95 percent of that increase is all associated with firearms.

Senator CHAFEE. On page 5 you say, "Homicide has been the leading cause of death among both 15 to 24-year-old male and female African Americans for over a decade."

That is with guns, isn't it, handguns?

Dr. ROSENBERG. The largest proportion of those homicides, yes, are with firearms. The largest proportion of those firearms are handguns.

Senator CHAFEE. Well, if it is not with a handgun, what is it? I do not think it is with a knife, is it? In 1988, 61 percent of all homicides involved the use of a firearm, and 75 percent of these were committed with a handgun. The proportion of homicide victims killed with a gun was highest for black males 70 percent, with 55 percent of all black male victims killed with a handgun.[1]

Dr. ROSENBERG. Knives are used fairly often, all too often. It is a smaller proportion. It is not a majority of the cases in which knives are used. Other methods are used, but, again, firearms account for the large majority of these homicides.

Senator CHAFEE. By large majority, what percentage are you talking about?

Here is a note that was handed to me, "Firearms are 60 percent of all murders." I think it must be way more than that.

Dr. ROSENBERG. For all homicides——

Dr. LUNDBERG. It depends on the jurisdiction, Senator. In some areas, such as Detroit or St. Louis, your notion of 90 percent of homicides secondary to the use of firearms, usually handguns, is true.

There are other jurisdictions, such as New York, where the percentages are not nearly that high. People have studied this in relation to gun control.

Senator CHAFEE. What is the alternative?

Dr. LUNDBERG. The alternative is a knife, a fist, a baseball bat, strangulation, pushing somebody off a cliff, stabbings. There are a lot of ways you can kill someone else. Guns just happen to be the most effective.

Senator MOYNIHAN. I think we have an example here of the case we have all heard, Senator Chafee, about, the need for more systematic data. You ask a very direct question in which there is no direct answer.

Dr. ROSENBERG. It actually seems to vary among populations, too. If you look at young black men, it is approximatley 90 percent of those homicides that occur with a firearm.

If you look at young white men, it is slightly smaller. It is in the range of 80 percent. And then, if you look at older population groups, again, it changes.

Senator MOYNIHAN. And if you want to kill somebody very effectively, do it with an automobile. You will be charged with drunk driving or something like that.

We have not until very recently associated homicide as criminal in the context of the automobile.

Dr. ROSENBERG. You are right. The actual charge is vehicular homicide, but we do not think of that often enough.

Again, what we mean when we say that it is a public health problem is it takes an enormous toll. Secondly, criminal justice by itself is not enough.

And I should add that public health by itself is not enough. Here is an area where you probably know it better than I.

[1] Source: *Homicide Surveillance Summary.*

I think if we are going to make a significant impact on violence in our society, we need to address some of the underlying, structural causes, like poverty, discrimination, lack of education, and lack of employment as well.

The third reason we call it a public health problem is that violence is something we can do something about. That is what we have been talking about this morning.

It is not a fact of life. It is not what you have called it here, an accident.

At CDC, we have what we call a fine solution to getting rid of this notion of accident. We call it the A-word because it does imply, as Dr. Graham said, that people view it as something that just had to happen. It was fate. You could not understand it. If you cannot understand it, you cannot prevent it. So why even try? Just call it an accident.

So we fine people $.25 every time they use that A-word, accident. As I was keeping track, for Senator Moynihan, it was $1.25. For Senator Chafee, it was $8.50. [Laughter.]

We try to change the use of that word because, again, I think we can understand these problems. They are injuries which occur, not accidents.

Senator MOYNIHAN. I have learned a very emphatic lesson here. William Haddon, Jr. taught me that 40 years ago almost.

And here I am 40 years later. I still have not learned that accident is a pre-scientific term. You would hear, "Act of God" and things like that.

They are not accidents. They are more or less predictable events in a predictable environment.

Dr. ROSENBERG. And I think, as you have shown, people viewed motor vehicle injuries as just a fact of life, something we had to live with.

When I was in India, a country you know, people viewed smallpox as a fact of life. I was there in the early 1980's. There were tens of thousands of people walking around with pock-marked faces. Smallpox was a fact of life.

Through a public health approach, smallpox was eradicated. It was wiped off the face of the earth. What was once a fact of life, does not exist today.

So we do not accept the A-word here. And we consider finally, that violence is a public health problem because we can change it. It is a problem to be addressed.

What is the public health approach? What are we all talking about in common? It begins, as you so well said, that we need to collect data. We need better data.

Traditionally, this has been a real source of strength at CDC. We call it public health surveillance, a systematic collection of data to use for scientific analysis.

Again, the second step after you collect the data is to do an epidemiologic analysis and look for patterns in large numbers and see what comes out.

For example, we find that most homicides do not occur in a holdup. They do not occur as part of a robbery.

It is this pattern of young people getting in an argument. It escalates. A gun is available and you have a homicide that results. So we look for patterns that happen here.

The next part of our approach is to develop interventions and test them and apply them to see what works. Public health also brings a primary prevention focus. We focus on preventing violence before it occurs.

We try to change behaviors so that people, for example, will wear seat belts or do not get into arguments or walk away from arguments so that they do not escalate. The focus, again, is on primary prevention.

Public health uses a scientific approach. We base it on objective data that we can effectively collect. We have started to collect this kind of information.

We are supporting research now on firearm injuries that we hope and we think will be scientifically valid information upon which we can base and design interventions.

Again, the focus is not solely on understanding why. The focus is on what works and what we can do to prevent it.

An example that occurred at my children's school is that there was a young boy who was depressed.

Now, I am a psychiatrist. We do not always understand what causes depression. We do not always know all the factors.

He was depressed. He was bent on committing suicide. He got into his parents' car and drove it at 60 miles an hour into a huge concrete abutment. It crashed. He got out and walked away because the car had an air bag.

We did not understand the cause of his depression. We could not prevent his depression, but the suicide was prevented.

We want to look at the whole range of things, as you have so clearly laid out, the three Es, how you can change the environment as well as behavior.

Finally, what is CDC doing? We are supporting data collection and research. We are looking at the role of firearms as well as looking at how you change primary behaviors.

How do you get young kids to use non-violent conflict resolution methods? How do you change the behaviors as well as the environment?

We are collecting data on the risk of firearms, not only in the hands of criminals, but in the homes of ordinary citizens.

We have finally developed a community-based approach where we are working with communities to ask them what is going on. What do they think will work?

By identifying interventions that include programs like mentoring or non-violent conflict resolution or even early home visits to prevent child abuse, we think that we have assembled a number of possible interventions that may work.

We put these together and distribute them to communities to encourage communities to look at their options, to see what they can do by coming together.

I think, finally, one of the problems in this whole area is that there is so much violence, the total is so big that people look around and get discouraged. They look around and they give up hope. They look around and they close their eyes.

We cannot let that happen. We can make a difference with these methods that we have been talking about. We think we need to give them that hope.

It is very much with that in mind that Secretary Sullivan with Dr. Mason, and Dr. Roper, the director of CDC, recently established this new center at CDC, the National Center for Injury Prevention and Control to acknowledge the magnitude of this problem, and more than just the magnitude, to say that we can make a difference, that we can change things. It is a real commitment.

This center brings together for the first time lessons learned from motor vehicle injury. It includes motor vehicle injury. It includes firearm injury. It draws the lesson from one to apply to prevention of the other.

It looks at prevention. It looks at acute care. It looks at rehabilitation. All these have come together under the same roof. We have great hopes that we can make a difference.

Thanks for your interest and thanks for this chance.

[The prepared statement of Dr. Rosenberg appears in the appendix.]

Senator MOYNIHAN. We thank you, Dr. Rosenberg.

It is certainly the first time for this committee that we have heard from the National Center for Injury Prevention and Control.

This has been and continues to be a fascinating morning.

Senator Chafee, do you want to pick up here and discuss some matters?

Senator CHAFEE. Thank you very much, Mr. Chairman. I was very interested in what all the witnesses had to say.

Dr. Rosenberg, it seems to me that what you are saying is that your injury center at CDC will be doing what Senator Moynihan has suggested in title I of his legislation which establishes a National Center for Bullet Death and Injury Control.

In other words, do you have the capacity to do that now?

Dr. ROSENBERG. Yes, sir. I think this center is looking at firearm injuries. It is looking at other sorts of violence.

It looks at the three types of injuries that occur. One type is violence, where we look both at self-directed injury or suicide and suicide attempts. We look at homicide and interpersonal assaults.

So we look at violent injury. We look at motor vehicle injury. We look at other, unintentional injuries, such as falls, drownings, poisonings, or burns.

Senator CHAFEE. Well, of course, his specific title is the National Center for Bullet Death and Injury Control, which I presume you statistically separate out from your other material?

Dr. ROSENBERG. Yes. One of the focal points is to look at firearm injury. For example, we are working with the Consumer Product Safety Commission right now to look at the number of non-fatal firearm injuries that do occur.

We are using the system that they have developed for looking at other consumer product injuries to see if we can apply that to firearm injuries.

So far, the results are very promising. We certainly do address that.

Senator CHAFEE. I thought the panel might be interested to know the power of the gun control opponents and how reluctant

they are to have any statistics on gun injury or safety—the very statistics that will I hope emerge from this effort.

In the legislation that established the Consumer Product Safety Commission, the legislative language specifically excludes "firearms" and "ammunition" from the definition of a "consumer product." So you cannot subject the sale of a handgun to the safety regulations that you might have with other types of equipment.

It is interesting that last year in a giant step forward, the Consumer Product Safety Commission banned infant pillows which resulted in 30 infant deaths a year, and left untouched guns which kill more than 500 children a year.

Senator MOYNIHAN. That is our research grant from NIH.

Senator CHAFEE. I am very enthusiastic about this need to get statistics because I think it is important. As you can see, just in the area of the cost, we are all over the lot.

Senator MOYNIHAN. We were going to hear from Dr. Rosenberg.

Senator CHAFEE. Yes. And also, I could not understand Dr. McAfee's testimony in which he says at the top of page 3 in his testimony that it costs $5.3 billion a year.

And at the bottom of the same page, I guess, the difference is he talks about hospital costs relating to firearm injuries as being $429 million a year.

Is the difference, Dr. McAfee, that hospital costs only are calculated in the case of the $429 million, but then in the second case, ambulance services, physicians, and rehabilitation are added in to total $1 billion? I am a little confused.

And what is your difference between $1 billion and $5.3 billion?

Dr. MCAFEE. That is the total cost of violence as we see it from our perspective.

Now, granted, there are costs of violence, social costs, that are not factored into our medical assessment. From a medical point of view——

Senator MOYNIHAN. You are talking about a hospital bill?

Dr. MCAFEE. We are talking about hospitals, and a whole host of other areas.

Understand that the AMA right now is in the midst of a major public health effort against violence in general in our society, which includes child abuse, child sexual abuse, elderly abuse, domestic abuse, a good portion of which involves the inappropriate use of firearms. There are other costs of violence.

Senator CHAFEE. Dr. Rosenberg says on the top of page 8 of his testimony that in 1985—which was a long time ago when hospital costs or medical costs, I suppose, were maybe a third or a half of what they are now—firearm injuries cost $14.4 billion.

Now, this is a statistic that I would be delighted to use, since I have been stumbling along with $4 billion a year. Are you pretty sure of your facts?

Dr. ROSENBERG. I think we are very sure of the facts. I do think that economists use different approaches to calculate cost. I think you should feel very confident about this $14.4 billion estimate.

It includes both direct and indirect cost. It includes such things as estimates for loss of wages and loss of potential life.

Senator CHAFEE. I see.

Senator MOYNIHAN. Senator, I wonder if we should ask Dr. Rosenberg, in a sense that they work for us and we are very happy that they do, to give us this number in detail.

Senator CHAFEE. I will tell you the statistic that I would be interested in. What you have in that $14.4 billion is lifetime cost, loss of earnings, and so forth.

In this battle that we are engaged in now to bring down health care costs, we are in the process of determining what the costs are to our society of various activities, whether it is drugs or firearms or AIDS or whatever it is. Do you think that you could come up with a current annual direct medical cost of health care cost from guns? In other words, not loss of earnings, but direct medical costs such as those associated with rehabilitation, ambulance, hospital, doctors. That type of statistic would be helpful to me.

Dr. ROSENBERG. Yes, sir. We can. There is a book that was recently published called The Cost of Injury, that looked at all of these sorts of injuries and found that the average annual cost is $258 billion a year for injury.

It breaks it down into firearm injuries and other types, motor vehicle injury and, then, breaks that down into direct and indirect costs. We would be happy to supply that to you.

[The information submitted by Dr. Rosenberg follows:]

The lifetime cost of firearm injuries is estimated to be $14.4 billion. Firearms rank third in economic toll, after motor vehicles and falls.

Fatalities from firearm injuries are high for people of young ages, resulting in high lifetime costs.

- Fatalities from firearms cost $12.2 billion
- The lifetime cost per fatality from firearms is $373,520
- The cost per hospitalized injured person is $33,159

Lifetime direct medical and nonmedical costs of care associated with firearm injuries are estimated to be $911 million. Direct costs include all medical care costs and selected nonmedical costs.

Lifetime medical costs for firearm injuries are $863 million, and nonmedical costs associated with firearm injuries cost $48 million. Medical care costs include amounts spent for personal health care of persons injured in 1985. Included are hospital and nursing home care, physician visits, prescription drugs, physical therapy, ambulance and helicopter services, attendant care, and other expenses such as wheel chairs and appliances for injured persons. Included under hospital services are initial hospitalization, rehospitalization, emergency room visits and inpatient rehabilitation.

Nonmedical direct costs related to injuries include amounts spent for home modification, vocational rehabilitation, and overhead and administrative costs for automobile and health insurance.

These are the most current estimates we have for the cost of firearm injury, including medical care costs.

Source: *Cost of Injury.*

Senator CHAFEE. All right.

Let me also just say to you, gentlemen, that in the approach here, many of you have used an analogy to automobiles. The theory seems to be that automobiles were terribly damaging in our society in many respects.

But I am not sure I agree with the hypothesis that cars and guns are the same. It has been determined in our society that an automobile is a necessity. Indeed, many courts have said so. In a bankruptcy, an automobile is not taken from the working man because he has to get to work with his automobile.

To treat guns and handguns as if in that same "necessity" category, I think, is barking up the wrong tree. It is like saying if we had a plethora of rattlesnakes as pets in our society and they were biting lots of people and particularly escaping and biting children, we would say, "Now the thing that we have to have is a better educational process." I think what we would say is, "You are not allowed to keep rattlesnakes. They are banned."

I think we have to look beyond this analogy of saying, "Well, the handguns are with us. So what we are going to do is have this educational program. We are going to have to improve the environment as far as the handling of these guns."

I am not sure I agree with that thesis. First, I do not think they are a necessity. I believe it was you, Dr. Marzuk, that said that most handguns are for self-protection. And yet you, then, went on to say that, I think, the ratio of household members of the family being killed as opposed to the intruder being killed by handguns is 16 to 1.

Was it 16 to 1? Am I correct?

Dr. MARZUK. I think it is 18 to 1.

Senator CHAFEE. All right. I will take that figure, 18 to 1.

When you have a ratio like that, I think, the conclusion is you do not have them for protection to repel the invader when 18 of your own are being killed to every 1 of the invader. So that statistic alone would remove it from the necessity category.

Another point: With an automobile, if it is not licensed and registered, you can tell. It is a very visible object, where as a handgun is a concealed item that cannot be controlled.

So the analogies that we are applying to automobiles, I am not sure I agree with.

Mr. Chairman, you have been very generous with your time. You undoubtedly have some comments.

I think the whole testimony here has been excellent.

I do not know who brought up the research award issue, but let me read these statistics. They still grant four NIH awards every year for cholera when there have been zero cases and zero deaths: diphtheria, two cases, two deaths, two NIH awards; polio, eight cases, no deaths, seven NIH awards; congenital rubella syndrome, seven cases, seven deaths, two NIH awards; rabies, zero cases, zero deaths, four NIH awards.

Now look at gun injury and death. Firearm injuries 198,000, firearm deaths 33,000, and zero NIH research awards.

Senator MOYNIHAN. I can help you with that, Senator. There are four NIH research awards on rabies. Of course, there will be because there is scientific prestige in rabies. Pasteur did research in rabies.

The question is, how do you allocate resources intellectually? There is not much literature on it. Dr. Lundberg, is there? I know why there is rabies research. Pasteur did research on rabies, right?

Dr. LUNDBERG. I think we have opened a very difficult question. I am sympathetic with your concerns.

Senator MOYNIHAN. You would do the same if you found the same for the Centers for Disease Control. There is always a two-generation lag. It is my impression, but I live off of impressions.

That is what I do. I am on the social science side of things, as Dr. Graham is, although he is a mathematician.

In 1983, crack cocaine appeared in the Bahamas. It was a mutant drug, the most powerful ever produced.

A couple of fellows tried to warn us. Dr. Allen, who runs the clinic staff down there and received his M.D. from Harvard and received his divinity degree from Yale, was one of them.

He said, "We have an epidemic here." Nobody would hear a word of it. If he had said smallpox, that would have been different.

They know about smallpox and so forth. "My God, it has broken out. We had that last spot in Ethiopia. We are about to finish it up, my God."

But they could not hear crack. That is normal. That is the pattern of the prestige in science.

So you get prestige. Look at Dr. Green there. I mean, he would not have been working with automobiles. Your grandfather would not have done it in automobiles. There you are working on third collisions and things like that. There is no prestige in it, but there is reward in the field.

Dr. GREEN. I would like to comment also on the analogy that Senator Chafee just made. I think I can speak for all of my colleagues on this panel.

Senator, we agree with you that to take any analogy in general and specifically the one that we have been speaking to today and over correspond point to point on all elements is not a good idea.

We certainly did not mean to do that. I think that, again, speaking for the panel, what we are trying to draw attention to is the fact that this is very complex, structured issue and that appropriate collection of information, such as has been posited by the legislation that you are considering would avoid a long time in finding answers that for 40 years we did not know about.

I will go you one better. We up here are part of the problem, too. We need to change some of the ways that we do the analysis and the collection of the data for this problem.

The most important example is that of the taxonomy of what we say are the manners of death. Physicians have five manners of death that are used for all of the documentation and the data collection in a medical/legal sense which drives almost everything that we are talking about: homicide, suicide, natural causes, undetermined, and the A-word, accidental death.

And as we have heard very eloquently, I agree 100 percent with Mark. We need to do two things. We need to understand that homicide, for example, includes interpersonal assaults at least on some level in terms of analysis of what it is that is causing the injury and what leads up to it.

That means we cannot include interpersonal assaults, again, under accidents. He had other reasons for that.

So we are part of the problem. We need to develop new taxonomy. I think that is part of the learning process.

But we agree with you, the analogies are not exact.

Senator MOYNIHAN. Could I ask a question? I am rattling a box of 32-caliber rounds up here. Somebody needs this box of 32-caliber rounds to attempt to shoot someone with.

Just as a technique, wouldn't control of ammunition bring results that would be desirable, Dr. Graham?

Dr. GRAHAM. Yes.

I wanted to joust a little bit with Senator Chafee on his critique of the analogy between guns and automobiles.

Senator MOYNIHAN. Yes.

Dr. GRAHAM. I just returned from a conference about 2 weeks ago on environmental protection. There is a deep split within the environmental community on how to deal with the environmental consequences of the automobile.

One camp says that we should civilize the automobile through better tailpipe standards, through new fuels, etcetera.

The other part of the environmental community does not accept the proposition that the automobile is a necessity. They would like to see both a reduction in vehicle miles of travel and in the sales of vehicles.

So I think if you look closely at the automobile in our culture, there are people who do not necessarily regard it as a necessity.

The reason that I draw that analogy is, I think that in the field of gun violence, if the science of it were to develop, I think you would find a lot of people who would identify measures short of getting rid of handguns that can have a very substantial public health improvement, whether they be non-penetrating bullets or safety locks on guns or the particular kinds of gun control laws.

Now, maybe in the long run, your solution is correct that somehow we will emerge as a society that has no handguns. There is going to be a long time between now and then, I would argue.

There may be a lot of things that we can do like what we have done to the automobile that can make incremental progress before we reach the ultimate destination that you seem to be desiring.

Senator MOYNIHAN. Dr. Lundberg wants to comment.

Dr. LUNDBERG. Yes. I would like to agree with that. While agreeing philosophically with Senator Chafee about how nice it would be if one could control who has guns, there are 100 million of them out there or who knows, 100 million, 150 million, or something.

Pragmatically, how are you going to collect them even if you have such a law?

So I think we need to study all kinds of ways to interdict the problem by interventions, short of the absolute solutions.

Senator MOYNIHAN. That is why I go around waving the box.

Dr. LUNDBERG. Well, obviously that is consumable in terms of supplies. You say a 4-year supply. I think it depends on how many times people shoot.

Senator MOYNIHAN. We do not know.

And remember something that Senator Chafee and I probably very much agree on is that the only department in the U.S. Government that knows anything about this subject is something called the Bureau of Alcohol, Tobacco and Firearms.

You get a 3-year license to manufacture. It costs about $100. There is no reporting. You can do as little or as much as you would like.

It is obviously a kind of a department in the Treasury Department that is a tax collecting sort of thing. It has an awful name, BATF, Bureau of Alcohol, Tobacco and Firearms.

Whatever it is, it does not deal in public health. No data comes out of it. They are decent people. They try to do it as law enforcement. It does not work.

The Secretary of the Treasury never asks, "What does this bureau do? What do we get out of it?"

Does anybody have any comment on that? Am I wrong?

Dr. LUNDBERG. I think you are right.

Senator MOYNIHAN. $30 will get you a 3-year license period. There are about 245,000 licenses to produce handguns.

There is no serious effort to constrain the amounts of activity.

Dr. LUNDBERG. I think you are right. I credit you with having creative thought in coming up with this epidemiological approach.

Senator MOYNIHAN. Doctor, you can do that at any time.

Dr. Rosenberg and Dr. McAfee?

Dr. MCAFEE. I would only, again, applaud you, sir, for the efforts in this regard. The impact of firearms on the violence in our society is readily apparent to us.

To eliminate those large caliber bullets would make our jobs so much easier in terms of trying to repair the results of this, but more importantly, the elimination, as suggested by Senator Chafee, indeed, would be our ultimate goal.

We stand ready to help wherever we possibly can.

Senator MOYNIHAN. We live in an imperfect world. I have discovered that over the years. The only flawless creature that has come along is Michael Patrick Avedon who is our 22 month-old grandson. He is beginning to show some flaws. [Laughter.]

John Chafee, a man of enormous and proven courage in the Marines and in public life, he will take on the NRA and the Senate.

People think that the Bill of Rights says that they have the right to keep and bear arms. We know that it meant to refer to militia, but do not try to tell that to them. They do not think so. They think otherwise.

Dr. Rosenberg?

Dr. ROSENBERG. If I could go back, Senator, to one of the questions you asked. You asked if it would be better and faster to ban the bullets than to try and ban the guns.

I do not know. I think one of the things that has happened in our society is that these thought experiments have become so complicated and so complex that we cannot start to answer them off the top of our heads.

I think that it is a very legitimate question and a very important question as to which would be better, but, I think, they take research and——

Senator MOYNIHAN. Now, let me make a point. And I want McAfee and Lundberg to note this.

I put this bill, it was called S. 25, in 6 years ago to ban the production of 25-caliber and 32-caliber rounds.

A quarter of the rounds fired in New York City by police officers are of this caliber. It is a Saturday night special.

In 6 years, I have never had a postcard from anyone in this administration saying, "That is interesting. Tell us more." or "We urgently suggest that you drop the idea. It is dumb. It will not work." There was no response that that was a good idea or bad idea.

Have you had much in the way of correspondence? [Laughter.]

Senator CHAFEE. Yes. [Laughter.]

The answer is yes.

Mr. Chairman, I just want to say this. I am all for what you are doing. Put me down as a co-sponsor to your legislation.

I agree with Dr. Lundberg that this is a step forward. Whether we can ever get to the other step, I do not know. In the long journey, let's take the first step.

Senator MOYNIHAN. Why don't we just leave it there with the request that maybe the AMA could help us with the cost question of Dr. Rosenberg's model.

We will impanel you, as a judge might say. Do you mind?

You have been very generous with your time. You have noble professions.

I want to learn more about seat belt use. I want to know what a step function is.

I remember Arthur Kirsler used to say, "People change their minds." That is pretty obvious. My wife changes her mind twice at breakfast about one thing or another.

He was making a different point. He was saying that we have an image of public opinion sort of moving by increments along some sort of S curve maybe or just some normal distribution. You can spot the change as you make your way from one point to another.

He and some scientists were of the view that, "No. There is something different. There is a pattern of build-up. You go for long periods with behavior. Belief does not change. And then, bang, it is changed." And they would go through a sequence of things like that.

It makes me think that we went through a pattern in this matter of seat belts. Let's find out about that.

Jack Fowle is our very able associate here, a geneticist and scientist.

We may find that people change their minds about violence. We also may find out that we cannot do anything about this subject, that we are dealing with a dependent variable flowing from the change in family structure. More about that.

You have socialized enough young males, the way we are doing it. You can expect all kinds of trouble 15 years later.

Dr. Lundberg?

Dr. LUNDBERG. As one teacher to another, may I also introduce into the record another little concept. We grew up with reading, writing, and arithmetic, the three Rs.

I am proposing four Rs as basic education in all of our schools: reading, writing, arithmetic, and resolution (conflict non-violent). Reading, writing, arithmetic, and non-violent resolution of conflict.

Senator MOYNIHAN. All right. Things can be learned. Things change.

The Chafee bill to ban television is also a very good bill. [Laughter.]

Senator CHAFEE. Let me just say this, Mr. Chairman, I think that it is absolutely essential that we get the statistics.

I also think that all of these efforts are helped by extremely well-written article delineating the problems in a more colorful way than solely statistical.

In other words—and I am going back a little bit—one of the things that, I think, propelled an increase in consciousness about automobile safety was an article that was written in Reader's Digest years ago. Nobody remembers it. It was called "And Sudden Death." It was written in Reader's Digest I would say about 1934 or 1935.

Another example: "What led the fight against pesticides?" It was in a 1960's book entitled Silent Spring which was not just a series of statistics, but an extremely well-written book delineating what the results of these statistics are with regard to pesticides and wildlife.

One final question, Dr. Rosenberg. Senator Moynihan has set forth a need for these statistics. I asked you this question before, but I just want to get it clear in my head. You believe that in CDC with the powers that you currently have—are you the head of the Center for Injury Prevention and Control?

Dr. ROSENBERG. They are currently searching for the first full-time head. I am not the head. We have an acting director.

Senator CHAFEE. But in any event, do you think that his goal can be accomplished under your organization?

Dr. ROSENBERG. His goal being Senator Moynihan's?

Senator CHAFEE. Yes.

Senator MOYNIHAN. The legislative goals.

Dr. ROSENBERG. I think a lot of it can. Yes. I certainly do. I think we need to know what the goals are.

I think if the goals are understanding the problem better, collecting the scientific data to let us advance on scientific grounds, not just political grounds, to get better comprehension of the scope of the problem, to understand the contribution of behavior, to understand how we will change their minds and apply those lessons from seat belts to fighting violence, yes, I certainly think we can. And we are advancing that.

Let me suggest in terms of colorful materials, we have been looking at this area for awhile. We have a colorful book. You might think that it is an appropriate red color. It is called, Violence in America: A Public Health Approach.

We have been trying to define the problem to apply science to it. What we do understand is that it depends on the type of violence that you are talking about.

If you want to know the role of firearms in child abuse and homicides of children by the parents, that is going to be very different from the role of firearms in domestic violence or elder abuse or youth violence.

So we are trying to break it down into categories and understand it. I think we have made advances there. I think we can do a lot of this work in that area.

Senator MOYNIHAN. I think that is a nice note on which to end. That is our official view of the prospect of some dramatic shift here. It is real. JAMA does not do things like that every day.

You see the way in which the automobile industry, in this case General Motors, which is so ably represented here today, approaches this subject today as to what it might have done 40 years ago.

You see change in Dr. Graham's work on risk analysis.

I want to work through this thing. It would be nice to have an article on the JAMA on those subjects with respect to this subset which the U.S. Government cannot investigate for the moment and, in fact, will not do.

If you tell me what your goals are, I will tell you what we can do. I think an awful lot of science says, "If you tell me what your analytical capacity is, I will tell you what goals I can have."

And that is about all I have to say except thank you, each of you. I know that is what Senator Chafee wants to do as well.

Senator Simon would like to put a statement in the record which I have here.

[The prepared statement of Senator Paul Simon appears in the appendix.]

Senator MOYNIHAN. We thank our very able reporter. We thank all of our staff and especially Dr. Fowle who brought you together.

Gentlemen, you understand that you are impaneled. We will seek your views and even impose ourselves on you as we try to think our way through. We hope you will free to impose yourselves on us.

Senator CHAFEE. I want to join in thanking each of you for coming down. I know that it is a personal sacrifice in time and expense for you to be here. It has been very, very helpful to us.

And the mere fact that you find 2 Senators here with the election 12 days away is an indication that we are interested.

You can shoot bullets down the hall of this place and you would not hit another Senator. [Laughter.]

Senator MOYNIHAN. Again, many thanks.

The hour of noon having arrived, the hearing is concluded.

[Whereupon, the hearing was concluded at 12:00 p.m.]

APPENDIX

ADDITIONAL MATERIAL SUBMITTED

PREPARED STATEMENT OF SENATOR JOHN H. CHAFEE

We in the United States today are the owners of more than 200 million firearms. Of these, 67 million are handguns, more than double the "mere" 31 million of just twenty years ago. And the number of these handguns is increasing at the staggering rate of 2 million per year.

There is a price tag—a hefty one—associated with the vast numbers of handguns in circulation. Too often, however, the price is calculated solely in terms of the burden placed on our criminal justice system. This must change. **We must begin to recognize gun-related violence not simply as a criminal justice matter, but as a deep threat to public health and also to public education and one that has reached crisis proportions.**

Handguns, so easily available and so easily concealed, are pushing our violent death and injury rate to levels unheard of in this nation, let alone overseas. The statistics are shocking, and shameful.

HOMICIDE: While *handguns* make up only one-third of all guns in circulation, *they are responsible for a stunning 75 percent (or about 10,000) of all firearm murders per year.* And as the number of handguns increase, so do the number of murders: handgun murders have set new records every year in the United States.

Although we too often do not think of it in public health terms, murder is now one of the most serious public health threats in the United States. *Homicide is the fourth leading cause of early death,* just behind the far better-known public health threats of accidents, cancer, and heart disease. And among these leading causes of early death, homicide is the fastest-growing threat.

SUICIDE: Just behind homicide and before AIDS is as the fifth leading cause of early death is suicide. More than 30,000 Americans successfully and intentionally kill themselves each year. *Sixty percent (or 18,000) use a gun*—and not surprisingly, again the gun of choice is a handgun.

Let me talk specifically about the saddest data of all: the unprecedented rate of *teen suicide.* For those *teenagers* between *age 15 and 19,* suicide is the *second leading cause of death,* with more than *2,000* boys and girls killing themselves each year. This is nothing short of a tragedy.

Study after study shows that a clear risk factor in teen suicide is the availability of a gun. Teen suicide attempts often occur on impulse—an impulse that in time may fade. But a firearm's efficiency means the first impulse can result in death or permanent damage. No wonder the odds that suicidal teens will successfully kill themselves go up a whopping 75-fold if a gun is available in the home.

INJURY DEATH: I believe one need only cite a single statistic to underscore the deplorable impact of guns on injury death: *In 1990, in both Louisiana and Texas, more people died from firearm-related injury than from automobile accidents.* Think about that.

ACCIDENTAL DEATH: Again, I will leave you with a telling statistic. The National Safety Council reports that in 1991, the rate for all accidental deaths dropped by five percent. In virtually every category of accident—falls, *drowning, burns, suffocation*—a marked decline was noted. But not gun-related fatal accidents: in stark contrast, *firearm accidental death increased by eight percent.*

One note: it is appalling that accidental gun deaths are taking a far higher toll on children and adolescents than on any other segment of our population. It shouldn't be surprising: more than 1.2 million children have access *at home* to guns—usually loaded and easily accessible. A family gun meant for self-protection is murderous for children: the Centers for Disease Control reports that more than

500 children die every year as a result of unintentional firearms injury; thousands more children are accidentally wounded, but manage to pull through.

I have given a brief outline only of the *deaths* associated with guns. I have not outlined the countless *injuries* that guns cause; but such injuries number in the thousands. A best guesstimate put forth by experts is that *for every gun-related death, another seven are injured but not killed.*

This is nothing short of carnage; and it is wreaking havoc with our best policy efforts. Our common goal is to improve the public health and safety of our citizens. But it is well-nigh impossible to make progress when we are faced with an alarming and increasing number of bone-shattering, nerve-cutting gunshot wounds.

These place incredible stress on our health care system and are major contributors to its escalating costs. Urban emergency rooms now are flooded with gunshot injuries. And despite emergency teams' hard work, weapons technology is outstripping advances in therapeutic skills.

The financial drain caused by gunshot wounds is staggering: the cost of a gun injury averages *$16,700 per patient.* And costs don't stop upon discharge from the hospital; there are bills for follow-up care, medication, and rehabilitation treatment. Initial rehabilitation costs for spinal cord trauma alone range up to $270,000 per patient. When added up, the overall health care cost of firearms is colossal: *more than $4 billion annually.*

These costs have a direct negative impact on our health care system: for example, *since 1985 nearly 100 trauma centers have closed,* in great part due to the staggering costs of treating thousands of *(ually uninsured) gunshot victims.* And these costs also impact the taxpayer—abou 86 percent of the $4 billion bill is paid by government.

I believe that allowing the status quo to continue is pure insanity. Hence, I have introduced legislation (the "Public Health and Safety Act") banning the sale, manufacture, or possession of handguns and handgun ammunition. The Chairman of this Subcommittee, long concerned about gun violence, has been a leader in this area and has introduced important legislation focussing on bullets. I applaud his efforts, and hope that he and I can continue to work together.

So I look forward to the testimony to be presented by this distinguished panel of experts. No matter what one's views on how best to reduce violence, or on how best to enhance public health, the testimony presented today will contribute significantly to our understanding of the problem.

We must act; or else sooner or later, handgun violence will touch every American family.

PREPARED STATEMENT OF JOHN D. GRAHAM

My name is John D. Graham. I am Professor of Policy and Decision Sciences at the Harvard School of Public Health and Director of the Injury Control Center and the Center for Risk Analysis at Harvard University. My principal areas of expertise are motor vehicle safety and environmental health. I appreciate the opportunity to testify today on bullet-related injury, which is a critical yet neglected public health problem.

I would like to focus my remarks on Title I of S. 3373, which calls for the establishment of a National Center for Bullet Death and Injury Control. The primary purpose of this Title is to stimulate the development of scientific knowledge about bullet-related injury, including the development of strategies to reduce the human toll of bullet-related injury. Senator Moynihan, I am extremely sympathetic with the aim of Title I and am encouraged that you have taken the leadership role to make a difference on this pressing social issue.

The theme of my testimony today is that Americals historical record of success in traffic safety research and public policy offers instructive insights into how progress against bullet-related injury might be made in the future.

Few people realize that as recently as 1960, we knew very little about the frequency and causes of traffic injuries in the United States, or of scientifically sound strategies for reducing highway trauma. The conventional wisdom at the time was that motor vehicle accidents are unavoidable acts of human nature that must be accepted as the fate of God. In the last three decades, this myth has been destroyed by a stream of science-based interventions ranging from automobile safety belts and air bags to changing national norms toward drinking and driving.

In my 1989 book, *Auto Safety: Assessing America's Performance,* I trace the history of the federal government's achievements in traffic safety. The book argues that our success reflects a very simple yet profound step: a commitment by the federal

government to develop a new science in support of public policy toward automobile safety.

In chapter two, I document a critical historical event, which was the publication in 1959 of a provocative article entitled "Epidemic on the Highway." In this article, the author pointed out that the science of traffic safety was so immature that no-one even knew how many people were killed and injured in traffic crashes each year. There were no reliable data systems that could document the frequency of crashes, their severity, and associated risk factors. The author of this article predicted that without the development of such rudimentary data systems, the science of traffic safety would by overwhelmed by political powerplays of the grossest kind.

This 1959 article received widespread attention among opinion leaders and laid the groundwork for the subsequent accomplishments of Ralph Nader, the late William Haddon, Jr., and many others. For those of you who do not know it, this path-breaking article was written by the chairman of this subcommittee, then professor Daniel Patrick Moynihan.

When the federal government moved into the traffic safety field, some very basic steps were created. A national census was launched of every motor vehicle fatality that occurs in the United States—the so-called Fatal Accident Reporting System. On each fatality, the FARS system reports information on ninety variables about the driver, the vehicle and the roadway environment. More recently, a National Accident Sampling System (NASS) provides critical information about nonfatal injuries in a large sample of crashes nationwide.

The FARS and NASS systems are much more than a researcher's fantasy. They are the data systems that have provided policy makers with timely and accurate information about the success and failure of safety programs. For example, recent reports using EARS data have examined the following questions: the effectiveness of modern air bag technology in high-speed crashes, the public health impacts of relaxing speed limits from 55 to 65 mph on rural Interstate highways, and the consequences of raising the minimum legal drinking age from age 18 to age 21. It is now well documented that the federal government's leadership role in the science of traffic safety has led to the saving of tens of thousands of lives each year.

By analogy, let us now consider the field of bullet-related injury in 1992. This field is not unlike the field of traffic injury in the 1950s. Bullet-related injury is barely a field of respectable scientific endeavor. There is no national data system that reports reliable information on the incidence of bullet-related injury and death. Basic information such as the circumstances of the injury, the type of weapon used, and the role of alcohol and drugs is not collected and reported on a regular basis. In a recent article in *Scientific American,* Professor Franklin Zimring states that "much more money is spent on newspaper advertisements about gun control than on research about firearms and violence."

Since scientific data are lacking, we should not be surprised that the quality of the scientific literature about bullet-related injury is poor. Many of the so-called experts in this field are ideologues who are committed either to dramatizing the evils of guns or extolling the virtues of guns. Very few talented and objective scientists have entered this field because there is little data, few resources, and a surplus of political adversaries.

Over ten years ago, a report on guns and violence for the U.S. Department of Justice concluded:

The published literature is more noteworthy for what it does not show than for what it does. There is, it appears, scarcely a single finding in the literature that could be said to be indisputably established. In part, this reflects the highly politicized nature of research in this area, but perhaps more importantly, it results from a near-total absence of sound and generalizable data from which reliable information about weapons, crime and violence might be extracted." It is now ten years and over 300,000 bullet-deaths later but it is certainly the case that the conclusions of this 1981 report remain valid.

Looking to the specifics of Title I, Senator Moynihan, I do have several comments about the future of the proposed National Center for Bullet Death and Injury Control.

First, and perhaps most importantly, this Center's chances of long-term success will be enhanced if it develops a reputation for objective science, which means that its reported findings about bullet-related injury are based on what the data say, regardless of the public policy implications. The interpretations of data should be published in peer-reviewed journals before they are distributed to the public. It would be tragic if this Center were to become captured by either the pro- or anti-gun lobbies. As the legislative founder of this Center, I urge you to protect and nurture the scientific objectivity of this Center.

A second, and related point, concerns the Center's advisory committee. While many of my colleagues appreciated the confidence you have placed in the field of epidemiology, they believe the membership of the Center's advisory committee should be expanded and diversified to include criminologists, behavioral scientists, physicians, statisticians, engineers and other disciplines that have insights to contribute to the problem of gun-related injury. While this is a minor suggestion, it will enhance the credibility and scientific creativity of the young Center.

Third, and finally, I urge the subcommittee to consider the organizational relationship between the proposed Center and the existing National Center for Injury Control which is located at the Centers for Disease Control in Atlanta, Georgia. As you may know, this week's issue of "Science" magazine discusses some of the scientific studies of bullet-related injury that have recently been supported by the CDC. While it is too early to tell whether the findings of these limited studies will be replicated and widely accepted, my point is that CDC has some institutional momentum in this area that your bill could readily promote.

Before concluding my testimony, I would like to acknowledge the advice of my colleague, Dr. David Hemenway, who assisted me in preparing this testimony. Thank you again very much for the opportunity to testify today and I would be happy to answer any questions.

PREPARED STATEMENT OF CHRISTOPHER C. GREEN

I am Christopher C. Green, M.D., Ph.D., department head of General Motors' Biomedical Science Department, of GM's Research and Environmental Staff. My medical background is in neurophysiology and forensic sciences. Over the past ten years, I have directed GM's Biomedical laboratory, where GM conducts basic research on the cause and control of automotive injury, environmental health effects, and manufacturing medicine and bio-remediation.

GM is honored that you have asked for our observations on comparison between GM's research to reduce automotive trauma and the potential application of epidemiological science in bullet injury. I will provide you with what I believe are the similarities and differences between automotive trauma and that of bullet injury, and will conclude with several recommendations based on GM's experiences.

SIMILARITIES

Let me start with a review of the similarities.

First, the epidemiologic triad—the host, the agent, and the environment—are present for both motor vehicle trauma and for gun shot injuries.

Data analysis should focus first on the "host," because study of the incidence and the prevalence of the "disease" will identify the first clues to patterns in the "agent." The "host" is the person who becomes sick from an infection, or the crash or gun shot victim. The characterization of the "agent"—the bacteria or virus, the vehicle, or the bullet—must be analyzed to observe the exact number of interactions and reasons for the surprising variation in injury patterns that occur as a result of the "second collision" of the agent with the host. The number of interactions, the rate of interactions per exposure contact, and the changes in the rates of interaction Over time are the "stuff" of epidemiological analysis. When analyzed together, the factors lead most frequently to identification of the true cause of an illness, or the causes of injury from a complicated vehicle interior, and later definition of specific protection methods. It is worth noting the similarities among (1) the world of microbiology, with antisepsis and vaccination; (2) the area of motor vehicle safety, with safety belts, energy-absorbing steering columns, self-aligning steering wheels, or air bags; and (3) ballistic injury. The use of smart materials to differentially absorb energy from bullets depending upon the angle ad rate of impact is now being evaluated in several laboratories for application in future fabrics and clothing. This work is the result of GM research in the science of the occurrence and mitigation of soft tissue and viscous injury. I believe that the physics and biomechanics of motor vehicle and ballistic injury are highly related.

Many believe that the "environment" is the most important element of the epidemiological triad. Post infection contact causes disease; the post-collision (second or third collision) causes trauma. Like automotive injury, ballistic penetration also occurs in a highly structured setting. Very careful analysis demonstrated the organization of interactions among the road, the vehicle, and the driver. In some instances, the importance of the relationships was previously unknown. For example, the environmental factors of road conditions, weather, and transient hazards are the setting in which vehicle inefficiencies, such as warn brake linings, inadequate tire tread depth, and inoperable lights, conspire against the human operators. The social

and environmental setting in which violence occurs is at least as complicated and amenable to analogy.

Analyses of the host, agent, and environment in ballistic injury may provide unexpected results, as has been the case with automotive trauma. For example, environmental factors are causally associated with vehicle crashes in about 10% of the cases and the vehicle factors in slightly less than 60%.However, human factors are implicated as a definite causal factor in 70% of crashes and are judged to be the sole cause in slightly less than 60%. About 30% of car crashes are the result of a combination of human and environmental factors, and in about 6% of the incidents a combination of human and vehicle factors result in crashes with injury. It is through analysis of the interactions among host, agent, and environment that strategies for protection in injury mitigation can be found. I presume that the same situation exists in the complex world of violence and bullet injury, but I am unaware of similar careful analysis of the factors.

Analysis of the triad leads to the "second" similarity—human behavior. Traffic safety-related behavior modification is difficult to achieve. As a nation, we are finally recognizing that the use of readily available safety belts can achieve 30–40% life saving benefits in many crashes and could reduce billions of dollars of societal cost resulting from injury. Through the national program to increase safety belt use, the national usage rate is now approximately 60%, which is a significant increase from 14% in 1984, just eight years ago. The combination of safety belts with air bags provides an additional safety improvement, and we expect that advances in smart materials may offer additional crash protection benefits in the decades to come. Through widespread education efforts and changes in laws, we are beginning to see changes in attitudes about driving while impaired. However, we still observe through crash analysis that, regardless of law enforcement and education efforts, certain segments of the population do not change behavior and continue to drive in a risky manner. Based on anecdotal observation, I presume that violent behavior is equally resistant to change.

The *third* important similarity linking bullet and auto injury epidemiology is Senator Moynihan's statement that "epidemiologic data are rarely employed to advantage." As he has persuasively argued, science should be impartial, and the analysis of epidemiological data should be used to seek clues for intervention. Science should not be applied "a priori," as reasons for regulation absent very clear understandings about the scientific interactions among elements of the epidemiologic triad.

DIFFERENCES

Now, let me list what I believe are two major differences in epidemiological research between motor vehicle and ballistic injury.

First, unlike the situation many years ago when auto crash field investigation and impact trauma research began to evolve, today, research scientists have methodologies for collecting and analyzing complicated but highly structured human environmental injury events. The field of forensic ballistic research ad injury from projectiles is mature, in large measure from a significant base of military knowledge. As a result, I believe that the likelihood of discovering intervention strategies will occur much more quickly in ballistic trauma than occurred in automotive trauma.

The *second* difference is found in examining closely what I believe is a mis-perception that advances in motor vehicle safety are self-actualizing and, therefore, that the same must be true for potential advances in gun shot violence. It seems self-evident, if people learn that wearing safety belts will reduce injuries and save lives, that vehicle occupants will wear safety belts. As I have previously noted, many still fail to do so. It also seems logical that insert ions between the "agent" and "host" in automotive trauma—such as crash protection padding, safety belts, or air bags—are simple, low technology and low cost fixes to trauma. This also is not true. Inappropriate, poorly-designed insertions or misused insertions between "host" and "agent" can have enormous and negative consequences and often are not appreciated for their complexity. For example, interior padding can be too soft or too stiff; steering wheels and columns may not be biomechanically tuned to a very narrow force-definition requirement to match human soft tissue injury that is segmented by body regions; or air bags could inflate too fast or too slowly or against occupants who are unbelted and out-of-position. I believe that interventions to "fix" the bullet victim may not require a high tech Solution. The science behind the invention of non-lethal weapons and bullets is already mature and, I believe, could have instantaneous application of intervention strategies.

Therefore, my sense is that the differences in automotive versus ballistic trauma are actually likely to result in positive intervention strategies much earlier than was

the case in motor vehicle trauma research. The similarities and differences lead me to four lessons that may apply to bullet injury.

LESSONS LEARNED

First, I believe that it is necessary to work backwards through the four principles of injury control and to avoid assuming conclusions that appear early in analysis to define prevention or protection strategies. The four principles of injury control that apply to all forms of injury, including automotive and ballistic trauma, are:

(1) prevention of interaction between the human and the environmental injurious agent,
(2) protection when such interactions nonetheless occur,
(3) rapid treatment of the injury by people qualified in the required sub-specialty, and
(4) rehabilitation that is sophisticated and, if necessary, long-term.

In motor vehicle trauma research, initially one may have presumed that training occupants to brace against the dashboard or back seat for an impending impact, or designing vehicles with very soft interiors—i.e., applying an intervention between the "host," "agent," ad the environment—would reduce motor vehicle injury. Research, however, proved such early presumptions wrong. I believe that we need to guard against similar early conclusions in ballistic injury research.

Second, the costs to society in dollars for rehabilitation and treatment for auto and ballistic trauma are very great. Therefore, small expenditures in the first two segments of the injury control process—prevention and protection—are important in achieving results. For example, I believe that research could show that the cause of bullet death is related to actions of the host that need intervention with social strategies. Perhaps more complicated host-agent interactions can be mitigated with high technology protection systems. Bullets with decreased lethality or vests with high tech energy absorbing capabilities may be parts of a multi-stage intervention program. I believe that it is likely that in all cases, a disproportionately small investment in data collection and analysis, prevention, and protection will lead to the same scale of enormous benefits as occurred in the understanding of the processes related to motor vehicle injury.

Third, as I have already mentioned, be aware of confounding unexpected variables when analyzing the host-agent interactions, and beware of over-simplified answers. In automotive research, even after the "second collision" was identified, years of research were necessary to understand (1) the nature of the biomechanics for protection and (2) the "third collision" between body organs and body structures of head, chest, and pelvis. Research on the host-gent "second" and "third collisions" leads to accepting new scientific discoveries and identifying trade-offs between strategies to protect people under one condition—for example, low speed crashes—and under other conditions—such as high speed crashes. Simply put, one needs to select specific conditions to protect against, which may actually increase the injury of smaller numbers of interactions at different conditions, or speed of crashes. To draw comparisons with ballistic injury, I would not be surprised if the control of one form of gun, bullet, or other condition could lead to increased pressures with somewhat negative results in other segments of the problem. This lesson is learned and relearned in all forms of research.

Fourth, do not minimize the data of epidemiology. We in injury control need to keep foremost the knowledge that even seemingly small changes in any part of the epidemiologic triad across tens of thousands of victims each year will reap positive benefits to mitigate human suffering and death. Numerous scholarly studies, including Senator Moynihan's, have post-audited these lessons learned in the field of automotive trauma.

To conclude, as the understanding of the behaviors leading to automotive trauma became more sophisticated, we expected that human factors research and driver/occupant education would to lead quickly to decreased injury. However, I believe that we did not understand the importance in reducing auto trauma of recognition error, inattention and false assumptions; the strong correlation with alcohol and drug impairment, driver inexperience and emotional upsets; and, more recently, age differences and the environment. Detailed studies of these and other factors, I believe, could lead to differences in the relative importance between automotive and ballistic trauma. The discovery of those differences will certainly lead to the areas requiring attention for intervention to achieve the greatest and most cost-effective results.

As a scientist and physician, I believe that similar scales of importance exist in the worlds of domestic violence—with the collisions of a bullet and victim—and automotive trauma. I applaud your effort to bring more scientific understanding to

both of these problems and conclude by encouraging you to collect much data, analyze it patiently, and expect wonderful and unexpected rewards.

PREPARED STATEMENT OF GEORGE D. LUNDBERG

Mr. Chairman and Members of the Subcommittee: My name is George D. Lundberg, MD. I am the AMA's Editor-in-Chief of Scientific Publications and Editor of the *Journal of the American Medical Association (Journal).* I appear before you today in my role as editor of the Journal and as a physician/citizen who believes that action is needed now to address our national fascination with firearms. To this end, we published 437 pages in our ten AMA Medical Journals on the subject of violence in June, 1992. This included an editorial in the June 10, 1992 issue of the *Journal,* written jointly by former United States Surgeon General C. Everett Koop, MD and me. The editorial, entitled "Violence in America: A Public Health Emergency," advocates viewing the problem of violence associated with the use of firearms from a public health perspective. It shares with S. 3373, the "Bullet Death, Injury, and Family Dissolution Control Act of 1992," the intent to reduce injuries and deaths stemming from firearm violence by means of an approach centered upon a medical/public health orientation. The editorial states, in part, as follows:

> Regarding violence in our society as purely a sociologic matter, or one of law enforcement, has led to unmitigated failure. It is time to test further whether violence can be amenable to medical/public health interventions.
>
> We believe violence in America to be a public health emergency, largely unresponsive to methods thus far used in its control. The solutions are very complex, but possible. We urge all persons in authority to take the following actions:
>
> 1. Support additional major research on the causes, prevention, and cures of violence.
> 2. Stimulate the education of all Americans about what is now known and what can now be done to address this emergency.
> 3. Demand legislation intended to reverse the upward trend of firearm injuries and deaths, the end result that is most out of control.
>
> **Proposed New Legislation**
>
> Automobiles, intended to be a means of transportation, when used inappropriately frequently become lethal weapons and kill human beings. Firearms are intended to be lethal weapons. When used inappropriately in peace time, they, too, frequently kill human beings.
>
> In the state of Texas in 1990, deaths from firearms, for the first time in many decades, surpassed deaths from motor vehicles, 3443 to 3309, respectively, as the leading cause of injury mortality. In the 1970s and 1980s, defining motor vehicle casualties as a public health issue and initiating intervention activity succeeded in reversing the upward trend of such fatalities, without banning or confiscating automobiles. We believe that comparable results can be anticipated by similarly treating gunshot wound casualties. But the decline in fatalities will not occur overnight and will require a major coordinated effort.

The right to own or operate a motor vehicle carries with it certain responsibilities. Among them are that the operator meet certain criteria:

- be a certain age and physical/mental condition;
- be identifiable as owner or operator;
- be able to demonstrate knowledge and skill in operating the motor vehicle safely;
- be subject to performance monitoring; and
- be willing to forfeit the right to operate or own a vehicle if these responsibilities are abrogated.

We propose that the right to own or operate a firearm carries with it the same prior conditions, namely, that the owner and operator of a firearm also meet specific criteria:

- be of a certain age and physical/mental condition;
- be required to demonstrate knowledge and skill in proper use of that firearm;
- be monitored in the firearm's use; and
- forfeit the right to own or operate the firearm if these conditions are abrogated.

These restrictions should apply uniformly to all firearms and to all U.S. inhabitants across all states through a system of gun registration and licensing for gun owners and users.. No grandfather clauses should be allowed.

As the editorial states, defining motor vehicle casualties as a public health issue and initiating intervention activity succeeded in reversing the upward trend of such fatalities. In this regard, the 1991 edition of the National Safety Council's *Accident Facts* states that the 1990 national mileage death rate was the lowest rate ever on record (since 1912). More progress was made in reducing motor vehicle deaths by using various public health interventions during the 1980s than in any other decade. Motor vehicle deaths declined by 13 percent from 53,172 in 1980 to 46,300 in 1990. This decrease in deaths was achieved in spite of increases during the decade in drivers (+15 percent), vehicles (+20 percent), and miles driven (+41 percent). The death rate per 10,000 registered motor vehicles fell 28 percent from 3.29 to 2.38, and the death rate per 100,000 vehicle miles fell 39 percent from 3.50 to 2.15, both the lowest rates on record. The death rate per 100,000 population declined by 21 percent from 23.4 to 18.6, and is now lower than any time since the infancy of mass motor vehicle travel in the early 1920's.

Contributing significantly to the reduction in motor vehicle deaths for the decade was an increased legislative emphasis on occupant protection and alcohol programs, manifested by the passage of mandatory safety belt use laws and tougher "drunk driving" laws and minimum drinking age laws. Dr. Koop and I believe that the enactment of the proposed new legislation set forth in our *Journal* editorial would very likely result in a similar ameliorative impact with respect to reduction in injuries and deaths stemming from firearm violence as was evidenced in the area of motor vehicle casualty reductions. Certainly, we believe it is time to at least take these steps.

I appreciate having this opportunity to testify before you, and I am happy to respond to any questions you may have.

PREPARED STATEMENT OF PETER M. MARZUK

OVERVIEW

As the American government disarms itself and reduces the number of nuclear weapons and the size of its armed forces, American citizens have themselves begun a massive arms build-up creating an arsenal of immense firepower and destructiveness. At a time when Americans have never been as safe from the threat of nuclear war from foreign powers, they have never been at greatest risk of shooting themselves and each other. I support the establishment and funding of a National Center for Bullet Death and Injury Control (NCBDIC) because I believe:

1. Firearm injuries and deaths constitute a significant public health problem.
2. Public health strategies could reduce, but not altogether eliminate the problem.
3. Such strategies would work only if they are targeted to specific high risk populations.
4. Targeting requires detailed information and diverse expertise both to develop and to test preventive interventions.
5. Current firearm surveillance mechanisms are inadequate to implement public health solutions fully.

BACKGROUND

I have been interested in firearm deaths and injuries for many years along with my colleague, collaborator, and mentor Dr. Kenneth Tardiff, who is the Director of the Section of Public Health Research in Psychiatry at Cornell University Medical College. In earlier work using 1985 data we showed that cocaine use appears to be a significant risk factor for suicide, particularly those involving firearms. (Marzuk et al., a) Using a medical examiner database in New York City, we are currently studying the risk of homicide, suicide, and accidents associated with alcohol, cocaine, and other illegal substances; how that risk is distributed among different age, sex, and racial groups; changes in cocaine-related mortality over time; and the pattern of fatalities at a neighborhood level assessing the role of marital disruption, household characteristics, economic inequality, unemployment, and poverty in contributing to these deaths. In addition, Dr. Tardiff and I are examining the role of drug use in mediating nonfatal violent and suicidal behaviors in psychiatric patients.

THE PRINCIPAL PUBLIC HEALTH ISSUE CONCERNING FIREARMS

There are two important questions that I believe should be kept foremost in mind. First, how can we reduce the number of firearm-related injuries and deaths in America? Second, will the reduction in firearm injuries result in a reduction in the number of homicides and suicides? These questions are not the same and need to be kept differentiated. For example, if we decrease the number of firearm suicides and homicides, but there is a compensatory rise in suicides due to hanging or homicides by knife wounds, we have merely substituted one problem for another. This second question forms the heart of the intense public debate concerning the restriction of firearm availability. It is based on the reasonable assumption that many suicides and homicides are impulsive acts that occur on the "spur of the moment" and that the ready availability of a lethal weapon when one is suicidally depressed or violently angered results in otherwise needless death or injury.

There is accumulating evidence to suggest that homicide rates and suicide rates are in large part related to the availability of lethal means, particularly firearms. For example, a well designed study that compared rates of firearm homicides in Seattle, which has permissive gun ownership laws with Vancouver, which has tight gun restrictions, found that the higher homicide rate in Seattle was accounted for almost exclusively by an increase in firearm homicides there. (Sloan et al.) Other studies, which are too numerous to mention also link firearm-related homicides and suicides with the availability of guns. (Boyd, Loftin) Yet these studies are not without controversy. (Centerwall) There are many other studies that suggest restricting firearms will have little effect on overall rates as individuals will simply substitute other means when deprived of access. How can such conflicting data be reconciled especially since they are used so freely by both the proponents and opponents of gun control to support their positions? (Marzuk et al., b)

Most likely, individuals who are determined to die by suicide or to commit a homicide will not be deterred by the unavailability of firearms. However, significant restrictive firearm policies may save the lives of many who would otherwise die as a result of impulsive acts. This number should not be minimized. I believe restriction of firearms, while not eliminating suicide and homicide altogether, can be expected to result in significant reduction in morbidity and mortality. It is therefore critical to obtain additional information about the subsegment of the population that is most likely to benefit from reduced firearm injuries (i.e. those who do not substitute other lethal methods) which is the major reason why I support national efforts both to increase surveillance of bullet-related injuries and to study options for injury control.

THE COST OF THE PROBLEM

The cost of firearm injuries and deaths in both human and economic terms is staggering. In 1986, firearms represented the seventh leading cause of death among Americans. Each year, there are more than 30,000 firearm-related deaths including 17,000 suicides, 12,000 homicides, and 2,000 fatal accidents or cause undetermined deaths. In 1987, firearms were involved in 61% of homicides, 59% of suicides and 2% of unintentional deaths. (Kellerman et al., a) These figures are national and belie an even greater problem in some segments of the population. Firearms now represent the second leading cause of death after motor vehicle accidents for 15–19 year old adolescents. (Committee on Adolescents) The firearm suicide rate among persons aged 15–24 years increased by 139% from 1933 to 1982, whereas the nonfirearm rate increased by only 32%. (AMA) From 1960 to 1980, the rate of homicide has doubled, but homicides involving firearms rose by 150%, whereas those involving knives or other weapons rose only by 60%. (Kellerman et al., a) Forty-eight percent of deaths of black male teens are due to firearms, usually homicide-related, and homicide is the leading cause of death among black males aged 15–24. (Fingerhut et al.) Although most statistics focus on deaths, it is estimated that there are 7 nonfatal injuries for every firearm-related death, which results in at least 70,000 hospitalizations annually. (Cotton) Firearm injuries cost $16.2 billion in 1988 and an estimated 86% of hospital costs are paid by taxes. (Cotton)

FIREARMS AS A PUBLIC HEALTH PROBLEM

In the past, firearm injuries and deaths were largely construed as a legal problem, best addressed by decreasing crime through legal deterrents and improved law enforcement. However, it has become increasingly clear that only a fraction of firearm deaths are incurred during commission of a crime. Although the public fears firearm-related street crime, firearm deaths are more likely to occur in one's home at one's own hand or the hand of a relative. For example, even after excluding suicides,

guns kept in homes largely for the perceived need of protection were involved in the death of family members 18 times more often than the death of an intruder. (Kellerman et al., b) In 1989, only 42% of all firearm deaths were due to homicides and of all homicides, only 20% occurred during another felony, usually robbery. (Kellerman, et al., a) In 50% of homicide cases, the victim knew his assailants and the homicide occurred in the course of an argument. (Kellerman et al., a) One-sixth of homicides involve members of the same family.

Approximately 52% of firearm deaths are suicides. Almost all suicides are committed by mentally ill persons, primarily the depressed. Suicide, in effect, represents the principal mortality of psychiatric illness.

Gun mishaps account for only 6% of all firearm deaths. They disproportionately affect young males, occur around the home and involve handguns. In addition, the tremendous role of drugs and alcohol in catalyzing all these types of deaths cannot be minimized. Thus, the narrow application of only legal deterrents, improved law enforcement, or enhanced consumer safety techniques will have little effect on reducing firearm morbidity and mortality. Clearly, a larger, more encompassing strategy from the public health vantage is warranted. The public health perspective, in essence, conceives of firearm injuries resulting from a "destructive energy" (tissue damage) caused by a "vehicle" (bullet) through a "vector" (assailant or shooter) striking or "infecting" a "host" (victim) all occurring in a social "environment." Public health approaches largely fall under one or more of Haddonls ten strategies for "breaking the chain of injury causation," i.e. they emphasize pre-injury factors (primary prevention) such as banning firearms, injury factors (secondary prevention) such as use of metal detectors, and post injury factors (tertiary prevention) such as improved trauma care. (Kellerman et al., a)

For simplicity, I have renamed and reduced these strategies to five: (1) reducing the overall level of violence in society (societal); (2) reducing the accessibility of certain segments of the population to firearms by legislating restrictions on the use, possession, transport or manufacture of guns (legislative); (3) improving the safety and design of guns to render them less dangerous (consumer); (4) educating the public about the dangers of guns (educative) and; (5) improving the care of those injured to reduce the severity of injury (medical).

Each of these five strategies has its own relative merits. However, *none of them if used alone* can provide a comprehensive solution to the problem because of four basic premises that I outline below. That is, a comprehensive solution will consist of small strategies applied to different target populations. Hopefully, the research and surveillance arm of the NCBDIC will allow assessment of the efficacy of different interventions in populations.

FOUR PREMISES

1. Although firearms injuries and deaths share many similarities, there are many important differences

Firearm injuries show many similarities; therefore, it is useful to establish a national surveillance and research agency to study these types of deaths. Nevertheless, it is important to keep in mind that there are marked differences in the circumstances and demographics of injury, and the type of weapon and bullet used in violent incidents. Firearm injuries represent, in effect, the final common pathway of many different "mechanisms" of violence. Thus it is virtually impossible for any one strategy to effectively reduce overall firearm mortality. For example, a safety lock may deter a 9 year old and prevent an accident, but is unlikely to stop a teenager from "playing" with a gun or block a suicide. Likewise, laws that require background checks of mental fitness may only stop those few individuals who have been judged by courts to be mentally ill. Yet more than half of firearm deaths are committed by suicidal individuals in the throes of alcoholism, depression, drug abuse, or schizophrenia who have never been "committed" by the courts. It is, therefore, crucial that different strategies be targeted to high risk groups. Targeting will require surveillance both to identify high risk groups and once identified, scientific expertise from different groups to assess the efficacy of various targeted interventions.

Thus it is important that NCBDIC utilize a wide range of experts from psychiatry, psychology, public health, injury prevention epidemiology, education, sociology, criminology, law enforcement, law, and demography to design experiments, test interventions, and recommend policy.

2. The public is misinformed, at best, and lacks a will, at worst, to control the problems of firearm deaths and injuries

In my view, the public is, at best, misinformed about firearm deaths and injuries. It receives most of its information from television shows, movies, and nightly news

programs. The perception of guns is both glamorized and distorted. Firearms are demonstrated by attractive or "macho" movie or television "models" either as an easy resolution to a conflict or as part of a criminal activity. Rarely is the aftermath of a gunshot wound depicted nor are firearms specifically linked to suicides, domestic quarrels, or minor disputes. Thus, the public receives the distorted message that guns can solve problems, offer protection, are glamorous to use, widely possessed by everyone, and usually involved in committing or preventing crimes.

The reduction and elimination of television advertising for cigarettes and alcohol has probably resulted in some decrease in consumer demand for these products. However, guns as "consumer products" are shown in use, working effectively, several times a night on all networks. The average American child grows up having watched thousands of firearm assaults and deaths on television over many years. No other consumer product receives such free market saturation of all age groups on every channel at every hour which is probably worth billions in advertising dollars. With the exception of advertising in gun magazines, the firearms industry has little need to promote its products and can devote many of its resources to fighting restrictive legislation.

Even the news media inadvertently distorts the public perception of the problem of firearm deaths. It fuels the public's greatest fear of being robbed, raped or murdered at gunpoint by strangers. Yet such crimes account for a fraction of all firearm injuries or deaths. Likewise, the public fears mass killings by "mental patients" using semiautomatic assault weapons. Yet, the number of deaths due to assault rifles is very small. Guns are also constantly paired with young black males on the evening news, resulting in an unfair "Pavlovian conditioning paradigm" that equates firearm violence with race. Yet, most homicides are committed by and against members of the same race and it is likely that socioeconomic status explains differences between black and white homicide rates, not race. Alternatively, the public may perceive little need to control firearms if it incorrectly perceives little personal involvement in the issue i.e. the incorrect notion that in most firearm deaths, there is little difference between the person pulling the trigger and the person being shot. NCBDIC's charge to publish accurate information would begin to correct both the public's distorted view of the problem and perhaps help the public "fall out of love" with guns.

Legislative options to control firearm injuries have traditionally included regulating or banning the manufacture, import, or interstate flow of firearms, insuring adequate background checks on high risk populations i.e. the mentally ill and criminals, requiring registration and licensure of guns, or increasing the liability of gun owners and manufacturers for damage incurred by misused firearms. (Christoffel) There are over 20,000 gun-control laws in the United States and taken as a whole, they have not reduced firearm mortality or morbidity. (AMA) Many laws have largely failed because they are theoretically unenforceable, unenforced or differentially enforced in various jurisdictions or irrelevant to preventing most firearm deaths.

Consider some of the problems. The effectiveness of laws that regulate the manufacture, sale or import of firearms is seriously compromised if neighboring jurisdictions do not enforce or do not have such laws. Mandatory sentencing for use of firearms in crimes is effective only if there are enough jail cells to ensure enforcement and compliance. They are useless in deterring suicidal deaths. Background checks are probably useful only if they are thorough, nationwide, computerized, and likely to identify criminals. Short of linking up to psychiatric hospital databases, they are unlikely to screen out the mentally ill. All legislative initiatives are usually lumped under the rubric "gun control laws." However, the public must be informed that no one law will be a magic solution to the problem of firearms. Rather, certain laws may help reduce some types of firearm injuries and deaths but will be relatively ineffective individually in reducing the overall problem. Well designed "enforceable and enforced" laws that tackle specific areas may chip away effectively at the problem. However, unless the public is informed of the specific goals and purposes of the law it will continue to view the passage of additional laws with appropriate cynicism and skepticism. Both lawmakers and the public may then unfortunately and inappropriately conclude that all further legal approaches to this problem are fruitless.

3. Guns are consumer products that do not disintegrate

Guns have been considered by some to be consumer products such as alcohol, tobacco, or automobiles which suggests product safety or regulative approaches to lessen their dangerousness or to control their use. However, consumer analogies, while useful, are limited. In some ways, guns more properly resemble nuclear waste. Both are dangerous, both keep accumulating, and both take decades, if not centuries, to disintegrate. It is estimated, for example, that there are 200,000,000 fire-

arms in the U.S. (AMA). At least half of all American households own at least one gun; many of them own more than one. Whereas television set owners usually discard older televisions that have out-of-date technology, weapons fanciers seem to have an insatiable appetite for accumulating more powerful, dangerous and technologically advanced guns. Older weapons are kept or sold to others rather than discarded.

This "indestructibility" of weapons has major ramifications for controlling gun availability through either legislative or consumer strategies. For example, the effect of legislative initiatives to restrict the possession, sale, or manufacture of firearms to reduce their availability in parts of the country that are already "gun saturated" is uncertain. It may be easier to restrict or control bullets which are a more "consumable" item. Likewise, it is uncertain if consumer safety initiatives to replace the gun supply with "safer" weapons will have much of an effect. Such questions deserve investigation by the NCBDIC.

4. The primary purpose of guns for most Americans is self-protection and the gun, if working properly, will deter a crime, or injure or kill another person

Most Americans own guns for self-protection. With the exception of hunting or target practice as sports, the primary purpose of firearms, if they are "in good working order," is to deter, injure or kill. This premise has significant ramifications for evaluating the effectiveness of consumer, educative, legislative, and medical strategies.

Consider several educational strategies. These might include physicians, schools, or community groups educating the public, particularly parents about the dangers of guns or the need for safe locked storage of weapons separate from ammunition. Yet, it may be unrealistic to expect people to unload their weapons and lock up their ammunition separately when the primary purpose of a gun is to be readily available and working. The effect of firearms safety training or education about the dangers of guns in school children or adolescents remains to be demonstrated and may even have paradoxical effects. Education may be best suited for teaching parents with small children about gun safety, but more surveillance and test data are needed before studies can be conclusive.

In general, injury control is better focussed on eliminating dangers of products rather than persuading or even legislating safer behaviors. Thus, installation of air bags in cars is probably more effective than legislating mandatory seat belt use which, in turn, is more effective than educating about seat belts. There has been much success in improving the safety of consumer goods such as the use of child tamper proof medication bottles, smoke detectors or lowered temperature settings on hot water tanks. These safety devices are most effective when injury is caused by poor judgment about use due to age (young children), intoxication, or mental or physical illnesses. Thus, it has been suggested that guns be equipped with loading indicators, safety locks, high pressure pull triggers, and limited muzzle velocity. Such safety devices may be expected to protect best those who would have died in a firearm mishap, especially young children or hunters. It is unlikely that safety devices would protect those committing suicide or those intending to harm others. Ironically, as Kellerman writes, L-tryptophan containing products were completely banned because they caused 19 deaths and 1,400 cases of eosinophilia-myalgia syndrome. Yet guns are not only one of the most dangerous consumer items, they are specifically touted as being dangerous and have not been banned.

Because of this premise, it is also uncertain whether trauma centers ostensibly designed to save firearm injury victims would be worth their cost or even effective if most injuries are intentionally inflicted to be lethal and therefore less likely to be salvageable.

Why I Support a National Center for Bullet Death and Injury Control

I believe that there are public health solutions to the problem of firearm-related injuries and deaths. If such solutions are to work however, they must be targeted differentially to various segments of the population. I support a National Center for Bullet Death and Injury Control because I believe current surveillance systems are neither broad enough in scope (i.e. they cover only deaths not injuries) or deep enough in detail (i.e. they provide only rudimentary demographic data) to allow adequate implementation of a successful public health strategy. There are precedents for such surveillance centers including the National Highway Traffic Safety Administration and the DAWN system to track traffic accidents and drug abuse emergencies and deaths respectively. In addition, such a center is needed to bring together a critical mass of researchers with expertise from different areas to begin to explore hypotheses about bullet-related death, to conduct field trials in high risk

populations, and to recommend comprehensive targeted policies to lawmakers that are rooted in sound data.

1. What is the state of current surveillance?

Data concerning firearm mortality is largely collected through death certificates compiled at the National Center for Health Statistics and through the use of Uniform Crime Reports and other FBI data. Although much information is collected by local police, it is collected in an unsystematic, nonuniform manner and is not readily accessible to public health experts. In addition, law enforcement data usually provides information only about homicides, which represent less than half of all firearm deaths. Similarly, although medical examiners can provide a wealth of information, data other than death codes and demographics may not be collected in a systematic, uniform or automated way across jurisdictions. The National Hospital Discharge Survey Data provides some information regarding firearm-related injuries, but does not include individuals treated and released from emergency rooms. Existing data collection is too slow to keep pace with the changing epidemic of violence or monitoring the use of new weapons or bullets. The NCBDIC, by design, should allow the gathering and synthesis of data that is already collected at the local level but currently inaccessible.

2. Why is it necessary to expand the "scope" of data collection to firearm-related injuries?

Data on firearm injuries are needed to establish their prevalence, identify risk factors, ascertain the role of trauma centers, assess economic cost and otherwise formulate health policy. The ability to use a medical model approach (i.e. improvements in emergency and rehabilitative care) to treating firearm injuries is feasible only if these data are collected. There have been many studies evaluating the role of rapid "in the field" treatment and rapid transport of persons with presumed myocardial infarcts to intensive care units. Analagous data are lacking for firearm injuries. It is unclear, for example, if regional trauma centers are worthwhile in certain violence prone neighborhoods or if their expense outweighs their benefits. In an era of rising medical care costs the optimal combination of acute and rehabilitative care for individuals with gunshot wounds is unknown.

It is also likely that those injured in firearm incidents and those killed represent two separate but overlapping populations. Violent death for many, though not all, represents the culmination of repetitive acts of earlier nonlethal violence. Thus, the group injured by firearms probably represents a high risk population that requires particular study if the overall rate of violent death is expected to decline.

3. Why is it necessary to "deepen" data collection?

Data collection provided through death certificates and crime reports provide little more than basic demographic information. Such reports do not provide the level of detail required to test interventions at the field level or to conduct sorely needed case control or cohort studies. Data are rarely available about the occupation of the victim, the type of firearm or bullet used, the exact location and time of the incident (which is often different from the time and location of death) or the circumstances surrounding the death. Death records provide virtually no data concerning the characteristics of the perpetrators of homicides. It is not possible to know if certain strategies are effective unless there are specific pre- and post-intervention measures of firearm injury rates in the targeted groups. For example, it is likely that both the "causes and cures" for domestically perpetrated homicides between spouses are markedly different from homicides resulting from arguments between two teenagers in a school.

Not all bullets or guns have the same propensity to harm. The amount of injury inflicted by firearms is determined, in part, by the biomechanics of ballistics. (Kellerman et al.) Thus, the severity of injury is largely a function of the accuracy, rate of fire, muzzle velocity and characteristics of the projectile. Long guns (i.e. shotguns and rifles) are intrinsically more dangerous than handguns because of higher muzzle velocity and/or larger projectiles. Similarly, semiautomatic weapons which fire a single round with a squeeze of the trigger and automatic weapons which fire a series of bullets with a single sustained squeeze of the trigger are intrinsically more dangerous than single shot manually loaded weapons. Handguns have lower muzzle velocities, are of lower caliber and are one-third as prevalent as long guns. Nevertheless, handguns kill twice as many people as shotguns and rifles combined probably because they are inexpensive, easily concealed, usually kept loaded, and have few automatic safety features. (Kellerman et al., a) The FBI data records class of firearm but does not track the caliber, manufacturer, or other useful "design" measures. Just as it may be more practical to ban certain floor space heaters that are more dangerous than all heaters, legislation might be more effective if it focused

on restricting or banning certain types of bullets or guns. The NCBDIC would allow exploration of this strategy.

Current surveillance systems also do not allow adequate detection of clusters of firearm injuries and deaths or links between deaths. Epidemiology advances through the recognition of cases of disease that cluster in time and space. Thus, Lord Snow was able to link the Broad Street pump with cases of cholera that developed in the vicinity of the pump at the same time. A more extensive surveillance system would provide data regarding the location and time of injury.

Some violent deaths are linked. For example, murder-suicides, events in which an individual commits homicide and shortly thereafter commit suicide, account for 1,500 deaths yearly in the U.S. (Marzuk et al., c.) Their mortality is on a par with tuberculosis, (1,467 deaths), viral hepatitis (1,290 deaths), influenza (1,943 deaths), and meningitis (1,156 deaths), yet there is no way of linking these deaths in the current surveillance system to study their causes or prevention.

Alcohol, cocaine, and other illegal drugs play a large role in contributing to firearm homicides, suicides and accidents both pharmacologically and as a result of drug sales. It is naive to believe firearm injuries and fatalities will be reduced without a greater understanding of the deadly interaction between guns and drugs. Current surveillance systems do not allow linking toxicology data obtained at medical examiner offices and hospital emergency rooms with injury reports or death certificates.

4. Why is a "critical mass" of investigators and data needed?

The field of violence research has much catching up to do. As Kellerman notes: In 1983 NIH funded 19 grants to study five infectious diseases that in one year caused 17 illnesses and 9 fatalities. There were no funded studies of firearm injuries that resulted in 33,000 deaths and 198,000 injuries. Since then, there has been gradual progress to increase funding in the area. In 1986, the Center for Environmental Health and Injury Control was established at the CDC and there were six injury prevention centers and 30 injury control/demonstration projects funded. Almost all successful scientific projects that have tackled large, complicated, multifactorial problems have required a "critical mass" of both data and researchers. The critical mass is needed both to spawn new hypothesis, pilot interventions, and bring together a wide array of experts from different disciplines. The NCBDIC is what is needed to create the critical mass.

TAXING BULLETS

I am not an expert on tax policy but had several thoughts regarding taxation as a public health strategy. The analogous model is the use of cigarette taxes. Both cigarettes and bullets are "consumable" items that could be repeatedly taxed. There is little doubt that heavy taxes on cigarettes probably contributed in part to reducing smoking. Thus, the tax may be expected to raise money from thousands of target shooters and hunters who consume bullets regularly, much like chain smokers. If the net effect discourages some persons from hunting or target practice, some firearm mishaps may be reduced but such accidents probably account for less than 1% of all firearm deaths. It is uncertain if those most likely to shoot themselves or others intentionally are frequent consumers of bullets. After all, it takes only bullet to maim or kill. Thus, there may be no immediate appreciable effect on firearm morbidity or mortality. It is conceivable that repeated taxation over many years on those bullets that are differentially more dangerous might result in a gradual shift toward a "less deadly" bullet supply. Presumably, the number of firearm incidents would be the same, but each incident would result in less serious injury and ultimately reduce both mortality and hospital costs for severe injuries. The effect of an excise tax on the "black market" supply of bullets deserves further investigation. Lastly, in these times of fiscal restraint, I would support the use of the bullet tax to pay, in part, for the National Center for Bullet Death and Injury Control.

CONCLUSIONS

First, the problem of firearm injuries will not be solved by any single strategy. Prevention can be targeted toward high risk groups using a variety of interventions that are designed specifically for those groups. Second, given the tremendous supply of guns and the marked cultural investment Americans have with them, it is unlikely firearm injuries will be substantially reduced in the near future. Thus, the problem is likely to be "chipped away from many angles" rather than "blown away with a single shot." I have always been amazed that we spend millions of dollars testing the safety of consumer products and experimental drugs and then ban them before marketing them if they are unsafe, yet we know with only a cent of intuition

that guns are dangerous and they are not better restricted. We require licenses and registration for driving, fishing and dog-owning, but it is a struggle to require the licensing and registration of firearms. I am heartened by a bill that assigns a national priority and devotes resources to reducing bullet related injuries and deaths.

ACKNOWLEDGEMENTS

I am indebted to Dr. Kenneth Tardiff, Professor of Psychiatry and Public Health and Director of the Public Health Research Section in Psychiatry and Dr. Andrew Leon, Assistant Professor Biostatistics in Psychiatry at Cornell University Medical College.

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PREPARED STATEMENT OF ROBERT E. MCAFEE

Mr. Chairman and Members of the Subcommittee: My name is Robert E. McAfee, MD. I am a practicing general surgeon in Portland, Maine and Member of the Board of Trustees of the American Medical Association (AMA). Accompanying me are George D. Lundberg, MD, AMA Editor-in-Chief of Scientific Publications and Editor of the *Journal of the American Medical Association,* and Jeffery M. Stokols, legislative counsel in the AMA's Division of Federal Legislation. On behalf of the AMA, we are pleased to have this opportunity to testify regarding the very serious, and all-too unfortunately escalating, national health problem posed by gun violence in this country today.

We commend Senator Moynihan for introducing S. 3373, the "Bullet Death, Injury, and Family Dissolution Control Act of 1992," for the interest in the subject of bullet-related violence, and for the expressed desire to control such violence. We applaud the purpose of the bill—to collect data about the nature and magnitude of bullet-related death and injury, and to develop options about how to reduce, and if possible, eliminate, bullet-related injury, death, and the associated negative impacts on the American family and society. We agree with Senator Moynihan's remarks offered in introducing the bill that "we must view the public health impact of bullets—death and injury—much as we view an epidemic."

It is undeniable that violence in the United States has reached epidemic proportions. The following statistics are telling:

- Violent fatal injuries are the leading cause of premature death in the United States;
- Violence is the leading cause of injuries in women;
- Homicide accounts for 42% of deaths among young men aged 15 to 24 years; and
- It is estimated that as many as 100,000 school-aged children carry guns with them to school each day.

These sobering statistics clearly demonstrate that violence in the United States is a major issue, but what also cannot be overlooked is that violence is a major medical and public health issue. In addition to having a severe, broad-reaching negative impact on the health of Americans, violence results in a huge number of encounters with the health care system. Care for the victims of violence strains the health care system and adds significantly to the U.S. health care bill. In this regard, it has been reported that over 500,000 emergency department visits annually are due to violent injury and that two-thirds of crime victims treated in hospitals are uninsured. It has been estimated that the direct medical costs of all violent injuries may annually add as much as $5.3 billion to U.S. health expenditures. Violence involving firearms certainly adds to this problem and must be addressed. Frankly, I must say that I'm a little sick and tired of being sent the bill for violence and then being criticized for the high cost of health care.

Violence in general is clearly an enormous and avoidable public health problem in this country today; particularly alarming is violence associated with the use of firearms. From 1960 to 1980, the population of the United States increased by 26%; during this same time period, the homicide rate due to guns increased 160%. The leading cause of death in both black and white teenage boys in this country today is gunshot wounds. Suicide stands as the third leading cause of death among children and adolescents in the United States today, a rate that has doubled in the last 30 years, with the increase almost solely related to the use of firearms. Family and so-called "intimate" assaults involving firearms are at least 12 times more likely to result in death than such family assaults involving all other types of weapons. Finally, hospital costs related to firearm injuries add an estimated $429 million to health care costs each year. When costs for ambulance services, physician services, rehabilitation, and long-term care are included, total medical expenditures for just firearm injuries reach an estimated $1 billion per year. Is there any doubt as to whether this money could be better spent?

It is indisputable that the availability and wrongful use of firearms is a major and still growing factor in our epidemic of violence. The AMA has in recent years taken a strong position on the subject of firearm control. The AMA recognizes that uncontrolled ownership and use of firearms, especially handguns, is a serious threat to the public health. In this regard, the AMA supports the enactment of legislation mandating a national waiting period that allows for a police background and positive identification check for anyone who wants to purchase a handgun from a gun dealer anywhere in the United States. Specifically, the AMA supports the "Brady bill" named for former White House press secretary James Brady, who was seriously wounded during the attempted assassination of then-President Ronald Reagan in 1981. The "Brady bill" would require a national 7-day waiting period before the purchase of a handgun. We hope to see quick action to enact this potentially life saving legislation early in the 103rd Congress.

The AMA is also on record as supporting legislation restricting the sale and private ownership of assault weapons. Furthermore, AMA policy encourages strict enforcement of existing laws relating to the use of firearms and endorses the development and presentation of safety education programs for more responsible use and storage of firearms. Also, AMA policy supports banning "armor-piercing" bullets.

In expressing support for the "Brady bill," the AMA believes that while a seven-day waiting period before a handgun purchase will not address all the difficult problems that have made violence so prevalent in our society, it is a beginning and will save lives. Physicians are first-hand witnesses to the horrendous cost in human life being exacted by firearm violence. A seven-day waiting period before the purchase of a handgun is a reasonable protection that the American people deserve.

In conclusion, it is obvious that violence is an enormous public health problem in this country today, both in terms of the number of lives touched, and lives lost, and in terms of the impact on the health care system. The widespread and easy availability and use of firearms is clearly a major factor in the increasing violence problem. It is for this reason that the AMA strongly supports requiring a national 7-day waiting period to allow a full background check before the purchase of a handgun and the removal of assault weapons and armor piercing ammunition from our communities.

Thank you for affording me the opportunity to appear here before you today.

PREPARED STATEMENT OF SENATOR DANIEL PATRICK MOYNIHAN

In the United States, more than 1 million people died from bullets between 1933 and 1987. In 1989, about 35,000 U.S. citizens lost their lives to bullets, and as many as 175,000 more were injured. This means that about 210,000 U.S. citizens were killed or maimed by bullets (a rate of bullet death and injury of 84 per 100,000 people per year).

This alarming epidemic is rising. In 1963, the year President Kennedy was assassinated, the national homicide rate was 4.6 per 100,000. By 1970 it had doubled to 8.1 per 100,000. The national rate is now about 10 per 100,000. For black males, 15 to 19 years of age, the bullet homicide rate in Washington, DC is 227 per 100,000 or 1 out of 440. The death rate for all our servicemen in Vietnam was about 1 in 184.

Attempts have been made to solve the problem, but it has been viewed largely as an issue for the criminal justice system. Efforts have focussed on gun control, but these have not proved effective. We need to shift the paradigm from law enforcement to epidemiology.

We have proven success controlling epidemics. Look at typhoid which caused about 100 deaths per 100,000 people in New York in the 1880's. The rate dropped to about 15 deaths/100, 000 after slow sand filtration began in 1889, and dropped again after chlorine disinfection began in 1915, reaching zero by 1950. Control of typhoid and other diseases was due to the work by pioneering epidemiologists who showed the world that epidemics require an interaction between three things: the host (the person who becomes sick); the agent (the cause of the sickness); and the environment (the setting in which the sickness occurs). Interrupt this "epidemiological triad" and you reduce or eliminate the disease and injury (e.g. if you trap typhoid bacilli in slow sand filters or kill them with chlorine they don't reach the host).

By the middle of this century my friend Dr. William Haddon showed us that epidemiology could be applied to the control of automobile death and injury. People aren't hurt when the car hits the tree, but rather during the second collision when the steering wheel or dashboard hits them. Seat belts, padded dashboards, and air bags are all specifically designed to reduce, if not eliminate, injury caused by the "agent" of automobile injuries, energy transfer to the human body. Experience showed the approach worked. Sure it could have worked better, but it worked. By focussing on simple, achievable remedies we reduced the traffic death and injury epidemic by 30%. Some 15,000 lives saved and 100,000 injuries avoided each year.

I introduced the Bullet Death, Injury1 and Family Dissolution Control Act, S. 3373 to begin to apply our experience with automobiles and other epidemics to the control of bullets. In a classic paper printed in Technology Review Volume 72, Number 7, May 1970 titled *On the Escape of Tigers: An Ecologic Note* Bill Haddon defined 10 injury control strategies, based on the continuum of events that occur from the invention and fabrication of a device to the treatment of wounds caused by energy transfer through use of the device.

S. 3373 seeks to help prevent the release of a hazard that already exists (i.e. strategy 3 in Haddon's scheme) by heavily taxing those calibers of bullets used disproportionately in crime (i.e. 9mm, 25- and 32-caliber bullets). It also seeks to gather the information that will be needed to develop even more effective strategies for controlling the epidemic of bullet-related death and injury in the future by creating a national center to conduct research and to collect data and compile statistics about the nature and magnitude of the problem. It builds on the June 10, 1992 issue of the Journal of the American Medical Association, especially the editorial by former Surgeon General C. Everett Koop and George D. Lundberg, M.D. in which they note the need to apply the lessons learned from improving auto safety to help control the bullet epidemic.

Attachments.

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October 29, 1992

Sen. Daniel P. Moynihan
Senate Office Building
Washington, DC 20515

Dear Sen. Moynihan,

Our group was formed in response to the deceptive research findings and the editorial bias of the medical literature. The medical literature on guns and violence is rife with fabrications and distortions.

Dr. Lundberg, who has testified before your Senate panel on Social Security, wants increased taxpayer funding of gun violence research Why not research on the root causes of violence ***regardless of instrumentality***? Is murder from stabbing or bludgeoning so "politically correct"... Is suicide from hanging or auto exhaust so much more "civilized" that research should not be directed at the root causes of ***all*** violence? Our group advocates competent and honest studies of these subjects.

Our group is also concerned that the 1990 Harvard Medical Practice Study - conducted in your state of New York - suggests that **Americans are three times as likely to die from a doctor as from a gun.** An estimated 93,000 Americans (not including outpatient or psychiatric care) die from "medical misadventure" - over three times as many deaths from doctors as from guns! It is no wonder that the AMA wants you to fund gun studies.

Dr. Lundberg encapsulated his remarks on the subject of gun violence in an editorial co-authored with the former Surgeon General Koop in the June 10, 1992 issue of the *Journal of the American Medical Association.*

I have enclosed a copy of my thoroughly referenced and completely accurate Letter to the Editor, namely, Dr. Lundberg, criticizing not only **his bald-faced 35-fold exaggeration of annual gun deaths**, but also his errors of logic and interpretation. At best and if we credit Dr. Lundberg with good intentions, such gross and compounded errors cast doubt upon Dr. Lundberg's competency in the field of guns and violence. Is it any wonder that my letter was rejected?

Dr. Lundberg's debate with me on Lifetime Medical Television revealed the embarrassing truth – except for his own publication, he is not familiar with the literature nor competent in the field of guns and violence. I have enclosed a video copy of that debate.

I am, of course, well aware of your gun prohibition sentiments, but I hope that, as a representative of the American people, you – unlike the medical literature – have a commitment to truth that exceeds your prejudices on gun issues.

I and other members of our group will be happy to testify on these matters before any congressional committee. We look forward to your invitation and to your considered response.

Please include this letter and the enclosed exhibits (the letter, the op-ed article, and the video) with the other testimony taken by your committee.

Thank you and best regards,

Edgar A. Suter, MD
Chair, DIRPP

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August 16, 1992 Letter to the Editor

George D. Lundberg, MD
Editor, JAMA
515 North State Street
Chicago, IL 60610

Re: Koop CE and Lundberg GD. "Violence in America: A Public Health Emergency." JAMA. 1992; 267: 3075-76.

Dear Dr. Lundberg,

The June 10, 1992 editorial by Drs. Koop and Lundberg[1] exemplifies three deceptions common amongst gun control advocates – the use of aberrant and sculpted data to reach illogical conclusions in the promotion of ineffectual and unconstitutional policy.

The aberrant, exaggerated, and sculpted data:

"One million US inhabitants die prematurely each year as the result of intentional homicide or suicide" is a 35-fold exaggeration[2] (carelessness or prevarication?).

In order to claim that Louisiana and Texas motor vehicle *accidents* exceed firearms deaths,[3] it was necessary to total firearm *accidents, homicides, and suicides* (an apples to apples *plus* oranges *plus* bananas comparison). Also, it is not that firearms deaths rose, but that, in just those two states, they fell less rapidly than accidental auto deaths.

In the forty-eight other states the converse is noted, firearms accidents (and most other accidents) fell 50% faster than motor vehicle accidents – between 1980 and 1990, a 33% rate drop nationally for guns compared to a 21% drop for motor vehicles.[4] Do we base public policy on data from the exceptions? or on falsehoods?

The illogical conclusion:

The referenced *Morbidity and Mortality Weekly Report* claims seven reasons for the fall in motor vehicle accidents – better cars, better roads, passive safety devices, children's car seats, aggressive drunk driving enforcement, lower speed limits, and motorcycle helmets – but does not claim licensing or registration of autos (measures undertaken in the 1920's and 1930's) are responsible for the fall. Apparently it is by a simple act of faith, rather than one of logic, that Drs. Koop and Lundberg propose their scheme.

The ineffectual and unconstitutional policy:

Crime and homicide rates are highest in jurisdictions, such as Washington, DC, New York City, and Chicago, where gun licensing, registration, and even prohibition schemes exist.[5] Precisely where victims are unarmed and defenseless is where assailants are most bold. Gun prohibitionists argue that this is evidence of need for national controls and prohibitions, yet similar national prohibitions have

been inadequate to stem the flow of heroin, cocaine, and bales of marijuana across our national borders. What mystical incantation will cause homicidal drug criminals to respect new gun laws when they flaunt current gun laws and ignore the most basic law of human morality, "thou shalt not kill"?

While certain state and federal gun controls may be constitutional, federal gun prohibitions are clearly unconstitutional; The US Supreme Court has explicitly protected an *individual* right to keep and bear arms.[6, 7, 8, 9, 10] The US Supreme Court has yet to use the Fourteenth Amendment to incorporate many Bill of Rights protections against the states, the Second Amendment protections among them.[11, 12] Using a states' rights prohibitionist argument that the Bill of Rights fails to protect the right to keep and bear arms from infringement by states,[13] however, uses logic that, if similarly applied, would fail to protect free speech, minority voting, and other rights from state infringement.

Otherwise law-abiding Americans have demonstrated their unwillingness to cooperate with licensing, registration, and prohibition schemes.[14] Intolerable police state tactics would be necessary to obtain even marginal compliance[15] – too high a price for too little benefit. The recent gun confiscations in New York City and Chicago were guided by registration lists[16, 17, 18] and underscore gun owners' fears that "it *can* happen here." Gun confiscation is now an American phenomenon, no longer a political tool restricted to Nazi Germany and the Soviet Union. The roots of gun control grow in the soil of political control and racism.[19, 20, 21, 22, 23]

At the press conference publicizing the JAMA violence issue, Dr. Lundberg described gun licensing, registration as a "first step", but would not answer a question regarding the next steps. Dr. Koop is on record as supporting prohibitionist measures.[24]

The medical literature has consistently chanted the mantra of prohibitionist fallacies and, unlike the criminological, sociological, and legal literature, has stifled dissenting views and research. "Freedom of the press belongs to those who own one."[25] To blatantly lie about the statistics – even to deceptively craft the statistics and contrive catchy ratios – is reprehensible. Failing to allow open discussion of this important public policy is a betrayal of a public trust. Public policy by deception in *any* matter injures the credibility of our profession in *all* matters.

There are solutions to the problem of violence in our society; gun licensing, registration, and prohibition are not among those solutions.

Sincerely,

Edgar A. Suter, MD

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21 Cottrol RJ and Diamond RT. "The Second Amendment: Toward an Afro-Americanist Reconsideration." The Georgetown Law Journal. December 1991: 80; 309-61.

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Deceptions in Medical Journals — Finding the Truth About Guns

An Op-Ed Submission by Edgar A. Suter, MD,
Chairman, Doctors for Integrity in Research and Public Policy

revised October 10, 1992

Our group, Doctors for Integrity in Research and Public Policy, has been quietly reviewing the research on guns and violence and has reached some surprising conclusions. Our revelations are much the same as those reached by gun control advocate, Prof. Gary Kleck, in his book, *Point Blank*.

We have uncovered major blunders, deceptions, and outright lies in the published medical research on guns. We have discovered it is quite common for gun control researchers to fabricate and sculpt their data to bolster their foregone conclusions. Contradictory data is ignored or dismissed as "not credible" without any discussion whatsoever. The deceptions are similar to the revelation that Sarah Brady has admitted the ineffectiveness of her Brady Bill proposal and that Rep. Feighan has acknowledged he had to "overstate" the benefits of his Brady Bill to obtain support.

The "peer review" process, the process whereby a panel of doctors is selected by the editor to review the work of other doctors before the work's publication, is supposed to prevent the publication of research that is flawed in method or conclusions. Editorial bias has caused a breakdown of that review process, allowing publication of much shoddy work simply because it supported the "politically correct" view. Unusual showmanship accompanies the announcement of gun research findings. Why?

Many physicians are wondering if the Journal of the American Medical Association (JAMA) has touted gun prohibition to divert attention from substantive medical concerns, such as the 36 million medically underserved Americans or the 1990 Harvard Medical Practice study of New York state that, if representative of national trends, suggests that over 93,000 people die every year from what is usually euphemistically called "medical misadventure." You are probably three times as likely to die from a doctor as from a gun.

We have speculated that the hype is a cynical effort in these times of budgetary deficits to obtain funding for pet medical projects and an article in the October 5, 1992 issue of *American Medical News* "Surtax to benefit nation's trauma centers proposed" gives us good evidence. Dr. Arthur Kellerman, an emergency physician at the University of Tennessee in Memphis, has repeatedly contrived and published catchy, but distorted and misleading, statistics on guns. *American Medical News* now tells us Dr. Kellerman supports a tax to "raise substantial trauma care funds..." So, the "squeaky wheel" wants lubrication from your tax dollars for his emergency room, and at the expense of your gun rights!

60% of physicians don't belong to the AMA because it doesn't represent our views on a host of issues – including gun bans.

Medical journals have virtually stifled the contradictory research and dissenting opinions. They have, however, ignored major blunders to publish the work of a handful of CDC "researchers." We hear Dr. Arthur Kellermann's catchy "43 times" as likely to kill the gun owner ratio – but we don't hear that even Kellermann admitted he calculated his ratio incorrectly – understating the protective benefits of guns by a factor of 100. Despite a preponderance of research showing that self defense with a gun is safer than using other means and certainly safer than not resisting an attack at all, in the July 1992 *Journal of Trauma* Kellerman has patronized women by suggesting that they "seriously question" what they are doing when they buy a gun for self-defense.

We hear Dr. Colin Loftin concluded that the Washington, DC gun freeze caused a drop in homicide – but the "peer review" of the New England Journal of Medicine (NEJM) overlooked seven major flaws in the "research," such as – the drop in DC homicide occurred in the 2 years *before* the gun ban, that Loftin conveniently ignored the data since DC homicide has skyrocketed, that Loftin didn't correct for the population changes in DC and his control group, and so on.

Taxpayers are funding the work of anti-gunner Dr. Daniel Webster to take polls that conclude silly tautologies such as, "Guns in the home have been linked to... firearms injuries..." Is it profound that cars have been linked to auto injuries? – or drive-by shootings? This is the kind of silliness that the journal *Pediatrics* has

published and used to justify their "remove guns from the home" policy, but Dr. Jerold Lucey, the editor in chief of *Pediatrics*, refused to publish criticism of Webster stating the criticism was "not of sufficient general interest."

Dr. George Lundberg, editor of JAMA, tells us that "One million US inhabitants die prematurely each year as the result of intentional homicide or suicide", but that is a *35-fold exaggeration!* Dr. Jerome Kassirer, editor of NEJM, tells us "Data on [assault weapon] risks are not needed..." The AMA's position paper on "assault weapons" quotes only the Cox newspaper gun trace study, none of the dozens of other contradictory studies. The Congressional Research Service of the Library of Congress, the FBI, and the Bureau of Alcohol, Tobacco and Firearms have all refuted the Cox study because gun trace data, for several reasons, is not representative of criminal gun use. Among the dozens of studies are the two studies suppressed by the California Attorney General's Office , the 1987 Helsley and the 1990 Johnson studies, funded by that office with taxpayer money, showing "assault weapons" account for only a minuscule fraction of crime.

Our doctor group found that, as elsewhere, fallacies and prevarication abound in the medical literature and, despite their exposure, the blunders and lies continue to be touted as "fact" by the well-funded gun prohibition lobby. Poor science is hardly the basis for sound public policy. It is a violation of a public trust – and an embarrassment for our profession – that medical journals continue to participate in the deceptions.

Just as the anti-gun lobby would like us to believe, on the basis of the support of a few highly politicized police administrators, that all police support gun bans, they would like us to believe, on the basis of support by a few "leaders" of organized medicine, that all doctors support gun bans. It just isn't so.

Though medical journals have been largely successful in stifling our findings and criticisms and prevented the prominent publication of our submitted articles, our group will continue to fight the battle. Since medical journals have been unwilling to allow a balanced – or even truthful, in some cases – discussion of these important public policy matters, we are mobilizing to go public and to inform Congress about the kinds of bias and deceptions financed by unwilling taxpayers.

Help us by writing your congressional representatives to complain about the Center for Disease Control's waste of tax money to fund biased and shoddy "research" on guns and violence. Mention the names of Kellermann, Loftin, and Webster. Get the truth to your representatives!

Help us by writing the editors of the guilty journals. Let them know how you feel. If you are disgusted by this kind of deceit and by biased and duplicitous efforts to infringe your rights, tell them! Tell them you expect honesty from doctors!

Spread the truth! If you would like additional information, send a self-addressed, stamped envelope with your request to:

Edgar A. Suter, MD, Chairman
Doctors for Integrity in Research & Public Policy
5201 Norris Canyon Road, Suite 140
San Ramon, CA 94583

We will send you a master copy of our brochure that you may copy and distribute at your clubs and organizations.

Word Count: 1235

Where to write your representatives:

Senate Office Bldg.
Washington, DC 20510

House Office Bldg.
Washington, DC 20515

An Op-Ed Submission by Edgar A. Suter, MD,
Chairman, Doctors for Integrity in Research and Public Policy
October 29, 1992

Where to write the journals:

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Editor-in-Chief, JAMA
515 North State Street
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Jerome P. Kassirer, MD
Editor-in-Chief, New England Journal of Medicine
1440 Main Street
Waltham, MA 02154-1649

Jerold F. Lucey, MD
Editor-in-Chief, Pediatrics
Pediatrics Editorial Office
Medical Center Hospital
Burlington, VT 05401

John H. Davis, MD
Editor-in-Chief, Journal of Trauma
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PREPARED STATEMENT OF MARK L. ROSENBERG

Good morning, Mr. Chairman. I am Dr. Mark Rosenberg, Associate Director for Public Health Practice in the new National Center for Injury Prevention and Control of the Centers for Disease Control (CDC). I am very pleased to be here today to discuss the public health approach to violence prevention. Our strategy provides us with hope for finding solutions to curb the epidemic of violence in this country. This approach has helped us make great strides in reducing motor vehicle-related injuries and we are optimistic that similar successes in reducing violence-related injuries can be realized.

Under the leadership of Secretary Louis Sullivan, Dr. James Mason, Assistant Secretary for Health, and CDC's Director, Dr. William Roper, a new center to address this problem has recently been established within CDC. This new center, the National Center for Injury Prevention and Control, has the lead within the Public Health Service (PHS) for violence prevention and injury control. The Center was formed in recognition of the impact of violence and unintentional injuries on public health and demonstrates the Department's commitment to preventing violence and other injuries.

My testimony today will focus on (1) the public health approach to violence prevention and the potential for reducing injuries, (2) the impact of violence on our families and our nation's health, and (3) the Centers for Disease Control's activities in violence prevention.

THE PUBLIC HEALTH APPROACH

Violence fills our news and produces fear and "dis-ease" in individual citizens and communities. When we speak of violence we are including both self-directed violence—suicides and suicide attempts—and interpersonal violence, such as assaults and homicides. While our jails are overflowing, the problem grows worse—there have never been as many homicides in a single year in this country as there were in 1990, the latest year for which such data are available. Suicides among young people have tripled since the mid-1950's. We need new solutions. The public health sector is uniquely suited to provide leadership and make important contributions to the prevention of deaths and injuries from youth violence. Our approach to violence prevention offers the country some hope and challenges us to rethink old strategies and create new ones.

We have a strategy which works—the best example of this is in the area of auto safety. For at least 30 years researchers and others have invested enormous amounts of time and money to make a safer automobile and implement interventions to prevent motor vehicle-related death and injury. The benefits of the systematic approach to reducing motor vehicle injuries has been impressive. As a result of these efforts, more than 75,000 lives are being saved every year. The reduction in the death rate from vehicle-related injuries has been brought about by a combination of interventions, including the construction of safer highways and vehicles, reductions in the levels of impaired driving due to alcohol, lower speed limits, and an increased use of safety belts, motorcycle helmets, and child restraint devices.

We are confident that we can make a significant impact in reducing violence-related injuries by using public health principles. Public health agencies are uniquely suited to provide leadership in preventing injuries and deaths from violence, for several reasons:

- **Public health introduces a primary prevention focus to the problem of violence.** Effective public health interventions would be designed to prevent behaviors and injury outcomes before youth behave violently towards themselves or others.
- **Public health brings a set of practical, goal-oriented, time-tested practices and principles for reaching violence prevention health goals.** The public health model of surveillance, epidemiologic analysis, intervention design, implementation, and evaluation has been applied to a wide range of non-infectious as well as infectious public health problems, with a remarkable record of success. Smallpox has been eradicated, smoking rates have been drastically reduced, tens of thousands of people don't die in car crashes, and countless cases of AIDS are prevented.
- **Public health can mobilize a broad array of existing resources in medicine, mental health, social services, education, and substance abuse prevention toward the prevention of injuries and death from youth violence.** Public health can pull together this multidisciplinary approach to violence prevention.

VIOLENCE AS A PUBLIC HEALTH PROBLEM

Violence is a public health problem that affects all segments of American society. Every year over 20,000 people die from homicide; 30,000 people die from suicide; more than 2.2 million suffer non-fatal injuries from assaultive violence; and there may be as many as 10 suicide attempts for every completed suicide. It is impossible to ignore the effects of violence on our nation's families. Every victim of violence is someone's child, brother, sister, father or mother. Each person is a part of a family and a community.

- **Violence occurs among family members and acquaintances**—In most cases, the murder victim knows the assailant and the homicide occurs in the course of an argument, often involving drug or alcohol consumption. Almost half of the murder victims in 1991 were either related to or acquainted with their assailants.
- **Violence takes a disproportionate toll on young people**—Homicide is the second leading cause of death among persons 15–24 years of age in the United States. Young people in this country are suffering the consequences of increasing violence. It is more likely today that a boy or girl between the ages of 12–14 will fall victim to violence than ever before. Suicide is also increasing among young persons. As previously stated, the rate of suicide among young people 15–24 years of age has tripled since 1950.
- **Violence affects individuals of all racial and ethnic groups**—Homicide has been the leading cause of death among both 15–24 year old male and female African Americans for over a decade. Young Hispanic males and Native Americans (e.g., American Indians and Alaskan Natives) are also at high risk of homicide victimization. In the Southwest, the homicide rate for 15 to 24 year old Hispanic males has been found to be over four times the rate of 15 to 24 year old non-Hispanic white males in the region. The homicide rate for Native Americans 15 to 24 years of age is 2.8 times that for white Americans in this age range. Although the health burden of violence is borne disproportionately by minority families, it should be remembered that violence is not just a problem for minority Americans—it affects all Americans.

Firearms play a major role in violence. Firearm related death rates for females, male teenagers and young adults are higher now than at any time previously. Last week, CDC released a survey which looked at weapon carrying among a representative sample of more than 12,000 high school students across the Nation. The survey showed that 26% of these students had carried a weapon for self-defense or to use in an altercation in the past 30 days. Among students who carried a weapon, 11% most often carried a handgun. This suggests that when kids fight, the outcome may be more deadly.

FIREARM-RELATED DEATHS

The cumulative impact of firearm-related deaths over time has been enormous. During 1989, the last year for which we have complete data, almost 35,000 people died from firearm-related injuries, based on data from CDC's National Center for Health Statistics (NCHS). Fifty-two percent of these firearm-related deaths were due to suicide, 42% were due to homicide, 4% were due to unintentional circumstances, and 2% were due to undetermined causes.

From 1980 to 1989, 330,000 people died from firearm-related injuries according to NCHS. Nearly five times as many Americans died from firearm-related injuries during the 1980's as died during the Vietnam Conflict. Indeed, from 1933–1989 more Americans died in this country from the non-military use of firearms (1,209,199) than died in all U.S. wars combined since and including the American Revolutionary War (1,177,956). The dead from our wars have inspired moving memorials and massive peace movements, but the mounting death toll from firearm-related injuries has continued without the same level of public attention.

FIREARM-RELATED NONFATAL INJURIES

Deaths related to firearms are only part of the overall firearm injury problem. Non-fatal firearm injuries are the other part. National estimates of the number of nonfatal firearm-related injuries are very imprecise. We do not have a data collection system that enables us to track nonfatal firearm-related injuries. National estimates have been developed, however, by combining information from state and national hospital discharge data. These estimates indicate that in 1985, the latest year for which estimates have been made, more than seven nonfatal firearm-related injuries occurred for every fatality due to such injuries. In 1985, an estimated 65,129

people were hospitalized because of firearm-related injuries, and another 171,000 were injured by firearms but not hospitalized.

ECONOMIC COSTS OF FIREARM INJURIES

Fireaarm-related injuries are estimated to account for 9% of the total lifetime cost of injury, making firearm-related injuries the third most costly type of injury. The lifetime cost of firearm-related injuries occurring in 1985 has been estimated to bee 14.4 billion dollars.

The average per person cost of a firearm-related fatality, ($375,520) is the highest of any cause of injury death. Most of the lifetime costs of firearm-related injuries are due to the loss of potential earnings. The disproportionate number of fatalities among young people accounts for the relatively high mortality costs for firearm-related injuries.

CDC ACTIVITIES TO PREVENT VIOLENCE

CDC has been focusing on violence as a public health problem since the early 1980's. Researchers study the problem with the same kinds of epidemiologic tools applied to suspected pathogens and toxins; and CDC sponsors the development, implementation and evaluation of interventions to prevent violence. In addition, the Department of Health and Human Services is committed to reducing violence-related death and injury as outlined in the Healthy People 2000 Objectives. For example, reducing homicide, suicide, and weapon-related violent deaths are part of the Healthy People 2000 Objectives on Violent and Abusive Behavior.

As part of a broader PHS effort, CDC is in various stages of implementing specific types of activities:

Data collection and analysis—Research and data collection activities document and monitor the magnitude and distribution of violence and violence-related injuries, as well as key risk factors for violence and violence-related injuries. The goals of these activities are to (1) help determine national, state, and local priorities in preventing injuries and deaths from violence; (2) guide research and prevention programs; (3) monitor progress in preventing injuries and deaths associated with violence, and in reducing the prevalence of key risk factors for violence (e.g., fighting, suicidal behavior, weapon-carrying by youth, alcohol and drug use).

Several specific projects related to data collection and analysis are currently underway:

- CDC has recently published a comprehensive analysis of homicide mortality data from 1978–1988 in the *Morbidity and Mortality Weekly Report* (MMWR). Data from this report show that the homicide mortality rate among young black males 15–24 years of age rose 54% from 1985 to 1988. Ninety-nine percent of the increase was accounted for by homicides in which the victim was killed with a firearm.
- CDC is working on a Firearm Injury Surveillance Study with the Consumer Product Safety Commission (CPSC) to get information on nonfatal firearm injuries. Data are available for violence-related deaths, but accurate records on those who have been shot or assaulted but not killed are not readily available. This study is designed to evaluate the feasibility and cost of using CPSC's National Electronic Injury Surveillance System to obtain data on nonfatal firearm injuries.
- A CDC grant was awarded to examine firearm injury rates and the impact of these injuries in three cities in the U.S. The study proposes to look at hospital, emergency department, and medical examiner records to identify firearm-related injuries and estimate the clinical costs of these injuries.
- CDC supports an ongoing effort to understand and examine behaviors that may cause people to act violently or make people more likely to become a victim of violence. Results of CDC's Youth Risk Behavior Survey show that physical fighting is a prominent cause of injury and homicide in adolescents.

Risk Factor Identification—Research activities identify the causes of violence and provide information to help us design and implement prevention programs. CDC has been studying these factors related to violence and has ongoing research in this area.

- A study by CDC researchers found that firearm attacks on family members and intimate acquaintances are at least 12 times more likely to result in death than are assaults using other weapons.

- A CDC funded project has examined the relationship between suicide and firearms. There is an almost five-fold increase in the risk of suicide for those living in homes where guns are kept.
- CDC is supporting a case-control study to determine whether a firearm in an urban household increases or decreases the probability that a resident will be the victim of a homicide in his or her home.
- A CDC study of gender and violence showed that when women killed with a gun, the victim was five times more likely to be their spouse, an intimate acquaintance, or a member of their family than to be a stranger or a person of undetermined relationship.

Develop test and implement interventions—Research activities evaluate the efficacy of specific violence interventions. The goals of these activities are to (1) determine the benefits, costs, and consequences of interventions designed to prevent injuries and deaths associated with violence; and (2) conduct the rigorous evaluation of discrete interventions that cannot typically be conducted in the context of community programs. CDC achieves this by supporting community demonstration programs in the area of violence prevention.

CDC is currently funding research to determine whether the absence of knowledge and skills about preventing violence are in fact associated with an increased incidence of violent behavior among adolescents.

CDC also promotes the use of community demonstration programs to (a) identify successful methods for delivering violence interventions at the community level; (b) determine if multi-faceted community programs can reduce rates of violent behavior, injury, and death associated with youth violence; and (c) build the capacity of state and local community agencies and organizations to successfully deliver youth violence interventions.

Several community demonstration projects have been recently funded by the CDC, one in North Carolina and the other in Houston. The North Carolina demonstration project will evaluate a community-based intervention designed to prevent and reduce violence among males aged 15–19. The intervention, called Supporting Adolescence with Guidance and Employment (SAGE), will use a two-tiered approach aimed at youth in Durham, North Carolina. The first component of the program utilizes job skills training and job placement to enhance self-esteem and assist in employment opportunities. An accompanying component focuses on mentoring to introduce the youth to a positive adult role model.

The Houston community demonstration program focuses on reducing violence among adolescents. The youth involved in the program will participate in training which emphasizes group support, social skills, leadership and violence prevention and trains them to become peer youth leaders. Parents of the peer group leaders will receive a program of parenting skills training. The project evaluation will examine whether adolescents who participate in positive peer group mentoring programs and whose parents participate in parenting training will be involved in less violence than those adolescents not exposed to this program.

In addition, CDC supports state and local health departments in their efforts to prevent violence by providing financial support and technical assistance. For example, CDC has funded over 20 states to build state capacity for injury prevention, including violence prevention activities. The programs define and track injuries in their jurisdictions, develop interventions focused on priority injuries, mobilize broad collaborations for intervention and public education and evaluate prevention effectiveness. Efforts related to violence prevention include conflict resolution curriculums, peer mediation programs, safe routes/safe havens for school students, positive parenting programs, and mentoring programs.

Together, these types of activities constitute the traditional public health approach to any health problem: determine how big the problem is, who suffers from it, and why; based on this information, design and implement programs to address those risk factors, and determine whether these programs work; and, in the meantime, begin to prepare and develop a broader infrastructure for delivering programs and services determined to be effective at the community level.

As part of this effort, we have developed, with broad input from experts in the field of violence prevention and representatives from community, health, and social service organizations, a draft document entitled the Prevention of Youth Violence: A framework for Community Action. This draft document has been distributed to state and large-county health officers and to a variety of community-based organizations. It identifies promising activities to prevent youth violence by drawing upon preliminary evidence from existing programs and from experience with other public health problems. The document should be useful to workers at various levels of

health, social service or criminal justice agencies, policy makers, and funding agencies, as well as community organizations and individuals.

OUTLOOK FOR THE FUTURE

Violence-related injuries clearly have an enormous public health impact, and there are no indications that this impact will lessen in the immediate future. The area of violence prevention is ripe for real progress. The progress requires first that we establish a firm scientific understanding of the risk factors, circumstances, and characteristics of these injuries and this requires a valid, comprehensive data base. CDC has the experience in public health data collection and analysis for conducting research in this area and has established a clear scientific approach.

The potential for real progress in this area, together with a real commitment to make change can result in considerable benefits for the country. We can save our children, we can make our communities the kind of places in which we are not afraid to live, and we can make tremendous contributions to reducing health care costs. It will take time, but like other advances in public health, from the reduction in motor vehicle fatalities to reductions in smoking and heart disease and the actual elimination of smallpox, the results will be well worth the effort.

PREPARED STATEMENT OF SENATOR PAUL SIMON

Thank you, Mr. Chairman, for including my brief statement in the record of this hearing. Like many of our colleagues, I have some very strong feelings about the subject that will be discussed a today.

Mr. Chairman, I am sure that by now most Americans have heard of the death of seven-year-old Dantrell Davis, who was walking from his home in a Chicago highrise to his neighborhood school last week. Dantrell Davis was killed by a sniper's bullet fired from the tenth floor of the building in which he lived. He is the third child from his elementary school to be shot to death since March.

Sadly, anecdotal evidence that firearm violence is a vast problem is not rare anymore. It is all too common, not just in our largest cities but also in smaller communities and suburbs.

The very respected journal *Science* reminded us of the enormity of the problem of homicide just this month: When President Kennedy was assassinated, the homicide rate in the country was 4.6 per 100,000. By 1970, it had increased to 8.1 per 100,000. Today, it is about 10 per 100,000. The overwhelming majority of these homicides were caused, of course, by firearms.

Mr. Chairman, I think that if there is a glimmer of hope here, it is that many policy makers and others are beginning to view firearm violence as an epidemic and to advocate studying it for what it is, a serious public health problem. Some scientists are very appropriately beginning to apply the science of epidemiology to the study of the problem.

So that I won't be misunderstood, I want to emphasize that I do a not believe we should relax our efforts to deal with violence through vigorous law enforcement, and I don't regard epidemiologic investigation as a substitute for criminal investigation.

But I think that the scientific study of violence, using the same tools scientists use to study other epidemics, can complement the other ways in which we try to understand and mitigate violence.

I want to commend you, Mr. Chairman, for taking a leadership role in proposing legislation in this area and for bringing a panel of distinguished experts here today to discuss the epidemiologic approach to violence.

As you know, Mr. Chairman, the epidemiologic study of firearm violence has already yielded some startling conclusions. A study that compared homicides in Seattle and Vancouver, for example, found that, from 1980 to 1986, the homicide rate was 60 percent higher in Seattle and that homicide caused by firearms was 500 percent higher in Seattle. The investigators chose these two cities for comparison, of course, because they are very similar in every important way except that firearms are much easier to obtain in Seattle than in Vancouver.

There is important evidence that the firearms that are increasingly available are also more lethal. Dr. John Barrett, Director of Cook County Hospital Trauma Unit in Chicago, was quoted recently in the *Journal of the American Medical Association* as saying, "In 1982, 95% of gunshot victims treated at Cook County [Hospital] had been shot only once, usually with a low-velocity bullet. In 1991, 25% of gunshot victims were treated for multiple wounds, many of which were made by high-velocity bullets."

A recent Centers for Disease Control nationwide survey of high school students found that 20 percent reported carrying a weapon to school at least once in the month preceding the survey. Of those who carried weapons, more than 20 percent reported carrying a firearm.

Mr. Chairman, I believe that even as these findings continue to frighten and shock us, it is crucial that we encourage expanded epidemiologic research and data collection in this area. I am convinced that nurturing this relatively fledgling application of epidemiology will someday produce the kind of information that can lead to effective interventions to prevent firearm injury and death. I don't expect this to happen overnight, but it will not happen at all if we dc. t begin in earnest.

As many have pointed out, one of the biggest killers of all, cigarette smoking, is on the decline because the weight of scientific evidence, the accretion of epidemiologic data collected over many years by scientists and public health experts, has changed the attitude of the public—notwithstanding the opposition of powerful special interests.

I am hopeful that the same thing will happen with firearm violence—that over a period of years, the scientific evidence will become so compelling that collectively we will change our views about firearms and we will put into place effective programs to interrupt the transmission of the epidemic of firearm violence.

Mr. Chairman, one final footnote to the killing of seven-year-old Dantrell Davis in Chicago last week: The Chicago newspapers reported last Tuesday that the students at Dantrell's elementary school have been writing letters to Mayor Daley about the incident. The letters are understandably poignant and saddening. One nine-year-old wrote, "My father allmost (sic) got shot going to the store. We can't have fun anymore without getting shot up." Another wrote the mayor, "We nid (sic) you to help us because we are getting shot."

Mr. Chairman, I believe we owe it to these children to do whatever we can to bring an end to firearm violence. I don't believe epidemiologic approaches will do that overnight, but I don't believe we will ever accomplish it until we fully appreciate that firearm violence is a public health epidemic and that the scientific study of it as an epidemic can help bring us the knowledge and understanding we need to tailor prevention efforts to this enormous problem.

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