

Current Comments®

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Child Safety. Part 2. What Governments Are Doing about Injury Prevention

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Injuries are the greatest single cause of death and disability among children in the US.¹ They are responsible for about 40 percent of deaths of children 1 to 4 years old, and 50 percent among children 5 to 14.² This means that injuries cause more fatalities than the five other leading causes of childhood fatality—pneumonia, cancer, congenital malformation, heart disease, and homicide—combined. In addition, many thousands more children are injured severely enough each year to require medical attention. It should be obvious that injury prevention should have one of the highest priorities in the “practice” of preventive medicine. And yet, as a public health issue, it is given less attention than most life-threatening diseases.

Theoretically, many of these injuries could be avoided by paying careful attention to your child's activities. But it is difficult to watch a child every minute of the day. Many accidental injuries occur when a parent's attention is diverted momentarily, or when one underestimates a child's capabilities. Moreover, parents aren't always aware of potential dangers. In a survey, P.S. Simons, Department of Pediatrics, Washington University School of Medicine, St. Louis, Missouri, found that only 8 percent of parents remembered being advised about automobile safety by their physicians.³

In this second portion of the study, I will review some of the steps taken by various organizations and governments

to prevent those injuries that occur most frequently. These include motor vehicle crashes, poisonings, house fires, and firearms. I will also discuss prevention of injuries from children's toys and furniture.

Automobile Safety

According to the *Morbidity and Mortality Weekly Report*, published weekly by the Centers for Disease Control (CDC), automobile injuries constitute the greatest risk to infants and children, accounting for 20 percent of all fatalities among children ages 1 to 14.⁴ Auto safety has been the focus of much legislative activity. But not until 1971 did the US National Highway Traffic Safety Administration (NHTSA) issue regulations governing the design of special car seats, or restraints, for children.⁵ These standards were revised in 1981 to include dynamic tests of restraint performance in automobile crashes. Every state in the US has passed legislation requiring that *young* children be restrained in these seats. Child-restraint laws also have been passed in the Canadian province of Saskatchewan and in Victoria, Australia. Many European countries have laws mandating seat-belt use. However, according to James L. Nichols, Traffic Safety Programs, NHTSA, children are usually exempted.⁶ For example, many European countries requiring seat-belt usage do not require that these belts be

installed in the rear seat, where children usually sit. In the Federal Republic of Germany (FRG), all adults and children must wear seat belts, and youngsters may ride only in the back seat. But, according to Franz Willeke, vice consul, Legal Department, Consulate General of the FRG, New York, the law merely *recommends* that parents put their youngsters in child restraints.⁷ In the UK, although children under 1 year of age must be in a restraint, children 1 to 14 need wear a seat belt only while riding in the front seat.⁸ And, according to Faka Kobayashi, director, Automobile Division, Japan Trade Center, New York, Japan currently has no laws governing child safety in automobiles.⁹ It seems odd that many of our overseas counterparts are also less concerned about the survival of children, especially since they are less strict about speed-enforcement laws. However, the per capita number of automobiles in most other countries is much lower than in the US.

It is estimated that as many as 80 percent of all traffic fatalities to children could have been avoided through the proper use of child restraints.¹⁰ Nevertheless, according to Christy Hughes, a safety specialist with the National Safety Council (NSC), many parents are either failing to use the restraints or are not using them properly.¹⁰ Stephanie Tombrello, executive director, Los Angeles Child Passenger Safety Association, California, notes that some studies of child-restraint usage have shown that about two-thirds of the restraints are being used improperly.¹¹ And despite the passage of mandatory child-restraint laws, usage of restraints has increased to only 40 percent in the US.¹⁰ Similar findings were reported by M.D. Decker, CDC, Atlanta, and colleagues, in an article in the *Journal of the American Medical Association*.¹² In Victoria, Australia, where child-restraint legislation has

been in effect since 1976, child-restraint usage reached 70 percent for children riding in the front seat. The majority of those riding in the rear seat, however, were unrestrained.⁶ Thus, we have a human behavioral compliance problem, not unlike that reviewed in our essay on patient compliance and medication.¹³

Why are these child-restraint laws proving to be ineffective in so many cases? A report by the National Transportation Safety Board concludes that many of the laws contain loopholes that limit their applicability. Some only require that car restraints be used in the parent's or guardian's car, or cars registered in the state. Others permit children to be unrestrained when they are being nursed or diapered.¹⁴

Enforcement also tends to be lax. Several states prohibit police officers from stopping vehicles solely for enforcement of this law. And, in those states where officers can stop vehicles, it can be difficult to determine whether drivers are actually violating the law. The police must determine, for example, whether the child is under four years of age, whether the car belongs to the parent, and whether the car is registered in the state. Fines are generally small, or nonexistent, and are usually waived when the parent proves a child restraint has since been obtained.¹⁴

Tombrello notes that for child-restraint laws to be effective, support for their enforcement must be encouraged by the highest levels of police and by community leaders. Parents, as well as police officers, must be educated about the dangers of transporting unrestrained children.¹¹

Several groups, most notably the American Academy of Pediatrics (AAP) and Physicians for Automotive Safety (PAS), have launched educational programs encouraging physicians to counsel patients about child safety. But accord-

ing to John S. O'Shea, Division of Ambulatory Pediatrics, Pediatric Primary Care Unit, Rhode Island Hospital, Providence, and colleagues, most pediatricians still do not stress injury prevention for their patients.¹⁵ And those pediatricians who try to educate parents about auto safety are not always successful. K.S. Reisinger, Departments of Pediatrics and Community Medicine, University of Pittsburgh, Pennsylvania, and A.F. Williams, Insurance Institute for Highway Safety (IIHS), Washington, DC, found that only about one-fourth of the mothers who had been given educational literature and a free car seat for their children were using the seats. This was only slightly higher than the number of parents who had received neither literature nor a seat.¹⁶

In light of these and similar findings by other researchers, the US government passed legislation in 1984 that required states to use at least 8 percent of their highway-safety appropriation for programs to promote child-restraint usage.¹⁷ The Child Restraint Systems Act calls for media campaigns to educate parents, education of the police community about the importance of enforcing child-restraint laws, and programs to either loan or subsidize restraints for low-income families.

Passive vs. Active Protection

Although legislation and educational programs encouraging parents to use child restraints are the most common approaches to child auto safety, many researchers believe they are the least effective. This is because such approaches are what the late William Haddon, former president, IIHS, referred to as *active strategies*.¹⁸ These are measures that require individuals to make a conscious effort to protect themselves and their children. For example, before a car seat

can offer any protection, the parent must, first, be willing to use it, and second, be taught how to use it. Apparently, many parents are not willing to spend the time and money to buy and use child restraints.

According to Haddon, the most effective measures for compliance in preventing childhood injuries are automatic, or *passive*, strategies.¹⁸ These are measures that require no action by the persons being protected. Passive strategies that protect children in motor-vehicle accidents include vehicle interiors with no hard surfaces or sharp edges, doors that children cannot open while the vehicle is moving, and air bags that inflate automatically in frontal crashes. Unfortunately, although the US government has enacted safety standards¹⁹⁻²⁵ for vehicle interiors, these standards provide little protection for infants and children.

Williams and colleagues, IIHS, reviewed safety standards for certain interior components.²⁶ Since children are of lower height, their faces or heads are more likely to contact the hard and protruding areas of the instrument panel or the back of the front seat during accidents. Williams believes, "...this may in part explain the finding that child occupants are more likely than adults to sustain head injuries in crashes."²⁶ (p. 367)

According to Williams, standards for car interiors initially included protection for unrestrained children. However, automobile manufacturers objected to these protective design requirements, claiming that if they include them, parents might be lulled into failing to use child restraints. Consequently, Williams concludes that the standard "...in its present form is a standard for 'occupant protection in interior impact' in name only."²⁶ (p. 372)

An NHTSA rule that required air bags or automatic seat belts in all cars manufactured after September 1, 1983,

also has suffered a series of setbacks since it was ordered in 1977 after 10 years of study.²⁵ The NSC estimates that 6,000 to 9,000 lives could be saved annually if air bags were installed in the front seats of all passenger cars.²⁷ Despite this, the Department of Transportation (DOT) suspended the air-bag ruling in 1981. It was reinstated only after the suspension was declared "arbitrary and capricious."²⁸ As the legislation now stands, manufacturers must install automatic restraints in 10 percent of their cars sold in the US in 1987, in 25 percent in 1988, in 40 percent of the 1989 models, and in all cars thereafter. These requirements, however, will be rescinded if states representing two-thirds of the nation's population enact mandatory safety-belt use laws by April 1, 1989.²⁵

School-Bus Safety

Federal standards governing school buses²⁹⁻³² have also come under fire from child-safety advocates. School buses have the safety advantage of weight. But according to the NHTSA *Fatal Accident Reporting System*, 17 school-bus occupants lost their lives in school-bus accidents in 1982.³³ In addition to the danger of riding without seat belts, parents are concerned that their efforts to habituate children to seat-belt use will be undermined if their children become accustomed to riding on buses without seat belts.

Carol Fast, president, National Coalition for Seat Belts on School Buses, notes that federal regulations governing school-bus construction and safety were considerably "watered down" prior to their passage in 1977.³⁴ Emergency exits on the sides and roofs of the buses, which were required in the original regulation, were eliminated. Rather than requiring seat belts on buses, the DOT opted for padded seats that would cushion children during accidents. Fast

believes these seats are inadequate because the 24-inch seat backs required by the DOT will not protect children 12 years old and over from whiplash injury.³⁴ Two bills requiring seat belts in school buses will be reintroduced into Congress this year. However, these bills have failed to pass during previous legislative sessions.^{35,36}

Driver error is a factor in many school-bus accidents, according to a PAS newsletter.³⁷ But DOT standards for driver training are strictly voluntary.³⁸ These voluntary standards addressing pupil transportation safety recommend a 40-hour training program. But many school districts only require that drivers pass a driving test. Two-thirds of school-bus fatalities occur when children are hit by their own bus or by passing motorists. Nevertheless, the federal government presently has only voluntary standards governing blind areas that prevent drivers from seeing children.³⁸

Toys and Furniture

The safety of children's toys and furniture is another matter that has experienced considerable governmental intervention. Although a number of federal statutes and regulations had been on the books prior to 1973, the US government's decision that year to establish the Consumer Product Safety Commission (CPSC) provided the first independent regulatory agency devoted to product safety. Under the provisions of the Consumer Product Safety Act (CPSA),³⁹ the commission has the authority to enforce mandatory safety standards or encourage industry associations to implement them voluntarily. It also has the authority to ban and recall unsafe products, and is responsible for educating the public about potentially dangerous items. The National Electronic Injury Surveillance System (NEISS), which collects injury

information from 66 hospital emergency rooms, is one of the CPSC's primary means of identifying hazardous products. It also collects information on hazardous items through its toll-free consumer hotline (800-638-2772), reviews of product liability cases, medical literature, and newspaper articles, and death certificates collected from health departments and coroners.

The CPSC currently mandates testing procedures to insure the safety of such children's items as full-sized and portable cribs, baby rattles, pacifiers, bicycles, electrically operated toys and articles for children, and fireworks. Also regulated by CPSC are lawn darts, clacker balls, aluminized polyester film kites, and the noise levels of toy caps and guns.⁴⁰ The Flammable Fabrics Act, over which the CPSC has jurisdiction, specifies that sleepwear for children, up to size 14, must be flame resistant.⁴¹ The CPSC also has jurisdiction over the Refrigerator Safety Act, which specifies that refrigerator doors must be capable of being opened from the inside.⁴² This act was passed in 1956 after several children were trapped inside abandoned refrigerators.

In 1980, the CPSC implemented a small-parts regulation. It specifies that products for children under three years of age may not contain loose parts smaller than one and a quarter inches (3.5 cm) in diameter, a size that can cause suffocation by lodging in a child's throat.⁴⁰ The CPSC also requires manufacturers to test toys and other articles for children under eight years of age to insure they do not have sharp points or edges.⁴⁰ Other regulations over which the CPSC has jurisdiction prohibit the use of poisonous and otherwise harmful chemicals in children's items⁴⁰ and limit the level of lead in paint used on children's toys and articles.³⁹

Although the CPSC regulations have probably saved many lives and prevent-

ed many accidental injuries, critics believe budget cuts and inadequate legislation have prevented the CPSC from acting as quickly as it should to protect children from hazardous products. Until 1984, children's toys and articles were regulated under the Federal Hazardous Substances Act,⁴⁰ which specified that products could only be banned or recalled after commissioners had published their intentions in the *Federal Register*, held hearings, and responded to manufacturers' challenges. Molly Sinclair, staff writer, *Washington Post*, notes that this procedure often took up to three years, during which dangerous items could continue to be sold.⁴³ Under the CPSA,³⁹ in contrast, other kinds of consumer products could be recalled almost immediately. In 1984, the US Congress passed the Toy Safety Act,⁴⁴ which permits more immediate recall of dangerous children's items. Doug Noble, program manager for emerging hazards, CPSC, says that under this act, as in the past, the CPSC tries to convince manufacturers to recall hazardous products voluntarily before the CPSC seeks a recall through an administrative law judge.⁴⁵

Several authors question the effectiveness of the NEISS. Joseph Greensher, chairman, AAP, Committee on Accident and Poison Prevention, says that the number of hospitals reporting injury data—down from 119 to 66—is insufficient for estimating the risks from children's items.⁴⁶ And Kenneth W. Feldman and Roy J. Simms, Department of Pediatrics, University of Washington School of Medicine, Seattle, believe the format NEISS uses to present injury statistics "tends to obscure the specific design defects" that lead to injury.⁴⁷ Greensher believes this problem will eventually be remedied when the International Classification of Diseases (ICD) code⁴⁸ is revised in the mid-1990s. This is an international nomenclature system

for classifying diseases and injuries. The CDC are currently working with scientists and physicians worldwide to revise the ICD to include detailed information about the causes of an injury. Greensher believes that by collecting this improved ICD information from emergency rooms, the CPSC will be able to create a more useful database on the causes of specific injuries.⁴⁶

Another criticism of the CPSC stems from a 1981 amendment to the CPSA that requires commissioners to rely on voluntary standards where these standards will eliminate or reduce risks, and where it is likely manufacturers will comply.³⁹ Noble notes that the CPSC's policy is to mandate standards only after a manufacturer, or its trade association, has been notified that a product is dangerous and fails to develop voluntary standards. Noble emphasizes that the CPSC tends to prefer voluntary standards since they can generally be drawn up faster.⁴⁵

But Edward M. Swartz, a personal injury attorney in Boston, claims that "asking the toy industry to indulge in self-regulation has proven as effective as asking the fox to guard the henhouse."⁴⁹ Greensher, in contrast, believes voluntary standards enacted by industry associations have been largely effective. However, he adds that manufacturers who do not belong to such associations are not governed by the voluntary standards and, in many cases, do not abide by them.⁴⁶

Greensher says that the AAP is very supportive of the CPSC, frequently testifying on its behalf during budget hearings. But members are alarmed at reductions in the CPSC budget, which has declined from \$42.1 million in 1981 to \$36 million in 1985. Greensher adds that the AAP is also concerned about the CPSC's failure to set standards for a number of products. These include

water-heater thermostats, which the AAP believes should be set at 120° F (49° C) to prevent scalds; mini-motorbikes, which cause many severe injuries; and playground equipment, which should not be installed over a concrete base. He is also critical of the CPSC's failure to consult physicians and to encourage public input when establishing priorities on which products should be regulated. He notes that priorities tend to be established on the basis of the number, rather than the severity, of injuries reported.⁴⁶

Poisoning

One of the CPSC's most successful regulations has been in the area of poison prevention. Under the provisions of the Poison Prevention Packaging Act,⁵⁰ all prescription drugs, unless the customer requests otherwise, and most over-the-counter drugs must have child-resistant caps. The child-resistant closures are also required on several household substances such as anti-freeze, drain and oven cleaners, and paint thinners and solvents. The introduction of these childproof caps has been credited with a 66 percent reduction in child poisonings since 1972.⁵¹ As I mentioned earlier, the CPSC also has jurisdiction over the Federal Hazardous Substances Act,⁴⁰ which requires precautionary labeling on all household substances that pose a danger to children.

Other governmental agencies concerned with poison prevention include the US Environmental Protection Agency, which requires warnings on all containers of pesticides, except those in packages not available for home use.⁵² The Food and Drug Administration has a Poisoning Surveillance and Epidemiology Branch (PSEB), which administers some of the functions of the now-de-

funct National Clearinghouse for Poison Control Centers. The PSEB compiles statistics about incidents of poisoning. These statistics, along with other sources, serve as a database for the CPSC in determining which products should be equipped with safety closures. The PSEB also does research on the epidemiology, treatment, and basic mechanisms of poisoning. Most of the poison-control centers in the US are medical centers that provide treatment and other information to doctors and first-aid personnel on a 24-hour basis. Their national organization, American Association of Poison Control Centers (AAPCC), maintains a database on incidents of poisoning, and sets standards for treating people who have been poisoned and for operating the centers.

Regina Aronow, president, AAPCC, feels that poison-control efforts in the US are inadequate. She cites the closing of the National Clearinghouse on Poison Control Centers, which formerly served as a coordinating agency for the poison-control centers, and notes that very few agencies are funding research on child-related poisonings. Aronow is also critical of the CPSC's failure to require child-resistant closures on pesticide containers, since these frequently resemble food and are therefore attractive to children.⁵³

As is evident from this essay, a great deal is being done to prevent injuries from accidents involving automobiles, children's toys and articles, and poisonous substances. But it should also be apparent that there is much room for improvement. In addition to the problems already mentioned, the US is sorely lacking in legislation to prevent accidental injuries from gunshot wounds and fires. For example, although guns are the fifth leading cause of accidental death among youngsters, no legislation has been passed to make it more difficult

to fire guns or to prevent children from having access to these weapons in their homes. Instead, Frederick P. Rivara and F. Bruder Stapleton, University of Tennessee Center for the Health Sciences, Memphis, explain that in the US, "state and local firearm regulations are a quagmire of 20,000 laws, many of them obsolete, unenforced, or unenforceable."⁵⁴

Similarly, the US government has failed to pass legislation to minimize the capacity of cigarettes for igniting upholstered furniture and mattresses. According to Elizabeth McLoughlin and colleagues, Shriners Burn Institute, Boston, between 35 and 45 percent of fatal fires are ignited by cigarettes.⁵⁵ Moreover, Frederic B. Clarke and Merrit M. Birky, Center for Fire Research, National Bureau of Standards, Washington, DC, report that most fire deaths result from the inhalation of smoke and toxic combustion products. But only a few states have laws that require the testing of building materials for toxicity.⁵⁶

As promised in the first part of this essay, I have listed organizations and governmental agencies concerned with childhood accident prevention in Table 1. Several of these groups are primarily composed of pediatricians. The AAP, in particular, has played a leading role in accident prevention in the US. In 1952 the AAP established its Accident and Poison Prevention Committee, and conducted a member survey on the most common factors associated with childhood accidents. This committee has worked closely with the CPSC in identifying hazardous products, and was instrumental in reducing the level of lead in paint used on children's articles. Its 1952 survey also led to the establishment of the first Poison Control Center in Chicago in 1953. The AAP members have fought at the local level for zoning regulations to require fencing around pools and smoke detectors in homes, and

have, along with members of the Ambulatory Pediatric Association, been active in promoting state laws requiring car restraints.

Research Front Data

There are seven 1983 research fronts related to child safety. I've included, in

Table 1: A selected list of organizations involved in child safety.

Ambulatory Pediatric Association
Degnon Associates
1311 A Dolley Madison Blvd.
McLean, VA 22101

American Academy of Orthopaedic Surgeons
444 North Michigan Avenue
Suite 1500
Chicago, IL 60611-3981

American Academy of Pediatrics
141 Northwest Point Road
Elk Grove Village, IL 60007

American Association for Automotive
Medicine
40 Second Avenue
Arlington Heights, IL 60005

American Association of Poison Control
Centers
Regional Poison Center
225 Dickinson Street
University of California
San Diego, CA 92103

American Automobile Association
8111 Gatehouse Road
Falls Church, VA 22047

American College of Preventive Medicine
1015 Fifteenth Street, NW
Suite 403
Washington, DC 20005

Canadian Paediatric Society
401 Smyth Road
Ottawa, Ontario K1H 821
Canada

Center for Auto Safety
2001 S Street, NW
Suite 410
Washington, DC 20009

Centers for Disease Control
Center for Environmental Health
1600 Clifton Road, NE
Atlanta, GA 30303

Center for Occupational Hazards
5 Beekman Street
New York, NY 10038

Consumer Product Safety Commission
1111 Eighteenth Street, NW
Washington, DC 20207

Council on Family Health
633 Third Avenue
New York, NY 10017

Health Education Council
78 New Oxford Street
London WC1A 1AH
England

Insurance Institute for Highway Safety
600 New Hampshire Avenue
Suite 300
Washington, DC 20037

National Automobile Safety Belt Association
69 Aldwych
London WC2B 4DY
England

National Child Passenger Safety Association
P.O. Box 841
Ardmore, PA 19003

National Coalition for Seatbelts on
School Buses
11 Orlando Avenue
Ardsley, NY 10502

National Fire Protection Association
Batterymarch Park
Quincy, MA 02269

National Highway Traffic Safety
Administration
400 Seventh Street, SW
Washington, DC 20590

National Safety Council
444 N. Michigan Avenue
Chicago, IL 60611

National Swedish Road and Traffic Research
Institute
S-581 01 Linkoping
Sweden

National Transportation Safety Board
800 Independence Avenue, SW
Washington, DC 20594

Physicians for Automotive Safety
P.O. Box 430
Armonk, NY 10504

Royal Society for the Prevention of Accidents
Cannon House
Priory Queensway
Birmingham B4 6BS
England

Transportation Research Institute
University of Michigan
Huron Parkway and Baxter Road
Ann Arbor, MI 48109

US Environmental Protection Agency
Public Information Center
401 M Street, SW
Washington, DC 20460

Figure 1: Historiograph of the 1983 and 1984 research fronts on child safety. The numbers of core/citing documents are in parentheses.

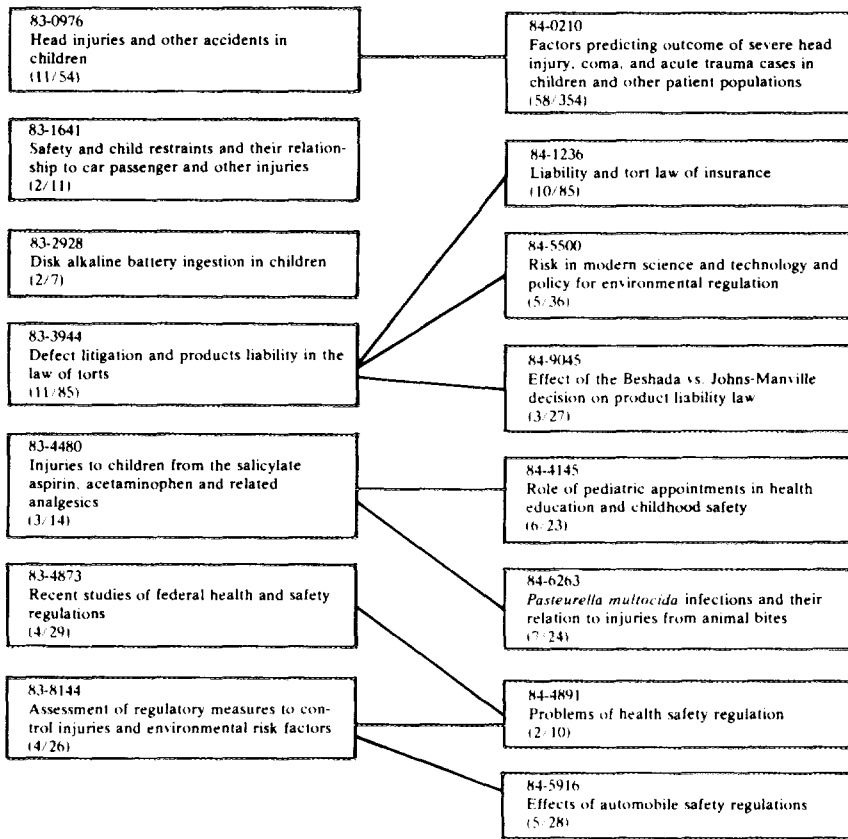


Figure 1, a historiograph, or cluster string, of 1983 and 1984 *Science Citation Index*[®] (*SCI*[®]) and *Social Sciences Citation Index*[®] (*SSCI*[®]) research fronts that deal with child safety and governmental regulations. These range in subject matter from automobile accidents to treatment for poisoning. Two of these (#83-1641 and #83-2928) did not carry through to any 1984 research fronts. The core papers in these fronts were not heavily co-cited in 1984. The core papers^{57,58} for one of these topics (#83-1641), "Safety and child restraints and their relationship to car passenger

and other injuries," provided important background material for the first part of this essay. In 1984, there were only four articles that cited these core papers. The core papers^{59,60} on "Disk alkaline battery ingestion in children" (#83-2928), discuss the relatively recently discovered dangers of mercury toxicity from ingestion of the ubiquitous small, dime-sized alkaline batteries used in calculators, watches, and a variety of other items. Again, only four 1984 articles cite either of these core papers. The amount of research on these topics seems to have declined significantly.

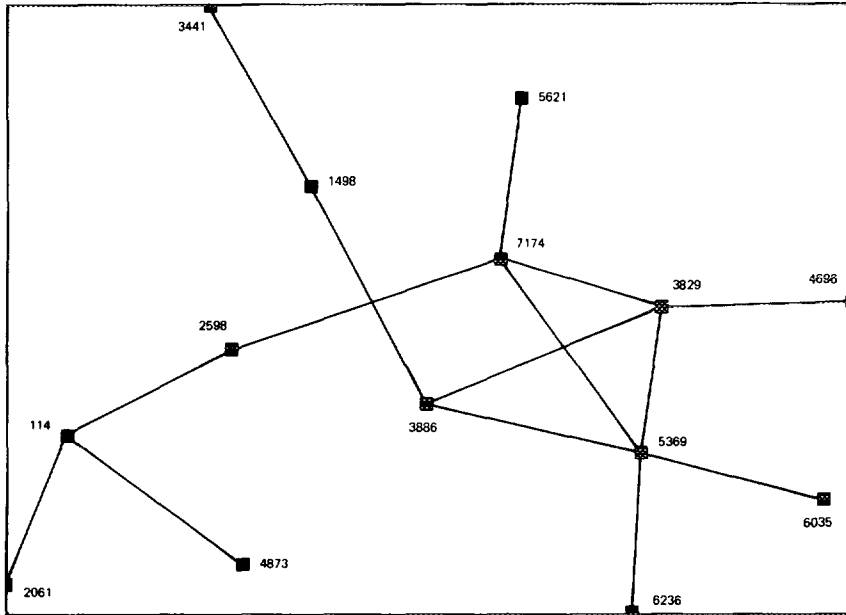
Other research topics listed cover "Recent studies of federal health and safety regulations" (#83-4873) and "Assessment of regulatory measures to control injuries and environmental risk factors" (#83-8144). These concern cost-benefit analyses of consumer protection regulations and discuss the US government's movement toward the deregulation of business. ISI® has already completed its tabulation of 1984 research fronts. Eight of these fronts are related to child safety. The connections between the 1983 and 1984 fronts are shown in Figure 1. As we continue to identify research fronts from year to year, we will be able to follow long-term trends and make informed forecasts about future developments. The problem of federal safety and health regulation is, of course, inseparable from other political and social phenomena. To demonstrate these connections, and how they are handled in our classification system, Figure 2 provides a higher-level map covering the broad area that subsumes #83-4873. This map was created by clustering the more specific research fronts lower down in the hierarchy. It illustrates the connections between diverse subspecialty research areas. For example, the study of health and safety regulations in the US is linked to research that focuses on workplace health and safety regulations in Sweden.

According to Gordon Smith, medical epidemiologist, CDC, unintentional injuries are the third leading cause of death in the US.⁶¹ And, among the leading causes of death, injuries are the leading cause of year of life lost before the age of 65. They kill more people aged 5 to 44 than all other causes combined. The leading adult killers in the US—cancer and cardiovascular disease—are considered serious enough to warrant separate institutes of health devoted to research on their causes, treatment, and

prevention. However, the amount of money currently being spent on research into the causes and prevention of injuries is minimal compared to the impact and cost to society. Even the budget of the CPSC has been reduced since its inception. This may reflect the attitude that the word "accident" implies, for many people, the notion of randomness—that, by definition, accidents are not preventable. For this reason, many people in the field prefer to use the term "injury" prevention.

Research on injury prevention has been funded, to some extent, by the CDC, DOT, the National Institute for Child Health and Human Development, and by such private organizations as the Insurance Institute for Highway Safety and the Robert Wood Johnson Foundation. And the DOT is funding a National Academy of Sciences study to review the status of injury research, and make recommendations for governmental coordination of this research. William Foege, CDC, is chairman of this study, entitled *Federal Research on Trauma*. The study is tentatively scheduled to be published around the end of May 1985. But the US government has done less than it could in terms of research and legislation to counteract one of the most preventable "diseases" of all. While I deplore the twigging or proliferation of institutions, better methods for focusing the public's attention on child safety and injury prevention must be found. It may be fashionable to focus on the economic consequences of all this avoidable tragedy, but it is perhaps more to the point to mention the unquantifiable pain, misery, and sorrow involved in each of these events. People can more readily accept the death of aged adults, but the loss of a child is never acceptable, especially when such a loss is preventable. In a technological world, the public must decide how much it is willing to pay to

Figure 2: Higher-level map for cluster #83-0071, "Analysis of political and social change, and health and safety regulations" showing links between research fronts. A=1983 research front number. B=title.



- | A | B |
|---------|--|
| 83-0114 | Swedish economic democracy and social policy determinants in regulating workplace health and safety |
| 83-1498 | Spatial network equilibrium models in geography, transportation, politics and other fields |
| 83-2061 | Effects of the welfare state on industrial relations in the workplace in the United States and Europe |
| 83-2598 | Analysis of regulatory practices |
| 83-3441 | Price and spatial equilibrium in a dynamic marketing network |
| 83-3829 | Analyses of political realignment, changes in public policy and voter turnout in the United States |
| 83-3886 | Political, electoral and social change in Britain |
| 83-4696 | Public opinion and the attitudes of the people towards governmental policy; foreign and domestic policy in America and elsewhere |
| 83-4873 | Recent studies of federal health and safety regulations |
| 83-5369 | Role of party politics in United States public policy; patterns of influence on congressional committees, bureaucratic agencies, budgets and economic policy |
| 83-5621 | Social, cultural and political perspectives and symbolic interpretations of government policy and public administration |
| 83-6035 | Voting in American congressional and presidential elections |
| 83-6236 | Influence of presidential elections and the political business cycle in the United States economy |
| 83-7174 | Theory and analysis of policy-making, organizational problems, and interest groups in the United States and Europe |

reduce the risks. So far as preventive medicine is concerned, there is a long way to go.

While there is always room for improvement in the science and technol-

ogy of injury prevention, the mapping exercise in this essay indicates that we are dealing with a political problem of worldwide dimensions. Whether it is more or less urgent than issues such as

preventing starvation in Africa might be a relevant issue for us to ponder as we review other international priorities. But as our sensitivity to the prevention of injury to children in this country increases, so will our sensitivity to this problem abroad. In particular, we need to counteract the widespread fallacy that, somehow, large developing nations are culturally or otherwise less susceptible to such sensitization. The death of

children in Bhopal is no less abhorrent than it is anywhere else. The safety belt around your child symbolizes the worldwide impact of technology on Spaceship Earth.

* * * * *

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REFERENCES

1. Garfield E. Child safety. Part 1. So your children will not be victims. *Essays of an information scientist*. Philadelphia: ISI Press, 1984. Vol. 6. p. 396-403.
2. US Department of Health and Human Services. *Better health for our children: a national strategy*. Washington, DC: GPO, 1981. Vol. 1. DHHS (PHS) Publ. No. 79-55071.
3. Simons P S. Failure of pediatricians to provide automobile restraint information to parents. *Pediatrics* 60:646-8, 1977.
4. State action to prevent motor vehicle deaths and injuries among children and adolescents. *MMWR—Morbidity and Mortality Weekly Report* 31:488-90, 1982.
5. Standard No. 213: Child restraint systems. *Code of Federal Regulations. Transportation*. Title 49, Pt. 571. 1 January 1984 ed. p. 378.
6. Nichols J L. *Effectiveness and efficiency of safety belt and child restraint usage programs*. Washington, DC: US Department of Transportation, National Highway Traffic Safety Administration, January 1982. DOT-HS-806-142.
7. Willeke F. Telephone communication. 15 April 1985.
8. Department of Transport and the Central Office of Information. *Child safety in cars*. (Brochure.) Middlesex, UK: Department of Transport, 1983. 6 p.
9. Kobayashi F. Telephone communication. 2 April 1985.
10. National Safety Council. *Child safety seats and safety belts are easy ways to save children's lives*. (Press release.) Chicago, IL: Public Relations Department, 9 May 1983. 3 p.
11. Tombrello S. Telephone communication. 22 April 1985.
12. Decker M D, Dewey M L, Hutcheson R H & Schaffner W. The use and efficacy of child restraint devices. *JAMA—J. Am. Med. Assn.* 252:2571-5, 1984.
13. Garfield E. Patient compliance: a multifaceted problem with no easy solution. *Essays of an information scientist*. Philadelphia: ISI Press, 1983. Vol 5. p. 676-85.
14. National Transportation Safety Board, Bureau of Safety Programs. *Safety study—child passenger protection against death, disability, and disfigurement in motor vehicle accidents*. Washington, DC: NTSB, September 1983. NTSB/SS-83/01 or PB83-917005.
15. O'Shea J S, Collins E W & Butler C B. Pediatric accident prevention. *Clin. Pediat.* 21:290-7, 1982.
16. Reisinger K S & Williams A F. Evaluation of programs designed to increase the protection of infants in cars. *Pediatrics* 62:280-7, 1978.
17. Child Restraint Systems. An act to amend the Surface Transportation Assistance Act of 1982. (PL 98-363, 17 July 1984).
18. Haddon W. Strategy in preventive medicine: passive vs. active approaches to reducing human wastage. *J. Trauma* 14:353-4, 1974.
19. Standard No. 201: Occupant protection in interior impact. *Code of Federal Regulations. Transportation*. Title 49, Pt. 571. 1 October 1984 ed. p. 326-7.
20. Standard No. 202: Head restraints. *Code of Federal Regulations. Transportation*. Title 49, Pt. 571. 1 October 1984 ed. p. 327-9.
21. Standard No. 203: Impact protection for the driver from the steering control system. *Code of Federal Regulations. Transportation*. Title 49, Pt. 571. 1 October 1984 ed. p. 329.
22. Standard No. 204: Steering control rearward displacement. *Code of Federal Regulations. Transportation*. Title 49, Pt. 571. 1 October 1984 ed. p. 329-30.
23. Standard No. 205: Glazing materials. *Code of Federal Regulations. Transportation*. Title 49, Pt. 571. 1 October 1984 ed. p. 330-3.
24. Standard No. 207: Seating systems. *Code of Federal Regulations. Transportation*. Title 49, Pt. 571. 1 October 1984 ed. p. 335-8.
25. Standard No. 208: Occupant crash protection. *Code of Federal Regulations. Transportation*. Title 49, Pt. 571. 1 October 1984 ed. p. 338-55.

26. **Williams A F, Wong J & O'Neill B.** Occupant protection in interior impacts. An analysis of Federal Motor Vehicle Safety Standard No. 201. *Proceedings of the Twenty-Third Conference of the American Association for Automotive Medicine*. Morton Grove, IL: AAAM, 1979. p. 361-81.
27. **National Safety Council.** *Accident facts*. Chicago, IL: NSC, 1983. 97 p.
28. US Court of Appeals for the District of Columbia Circuit, No. 82-354, 82-355 and 82-398. *United States Law Week*, 21 June 1983. Vol. 51, p. 4953-61.
29. Standard No. 220: School bus rollover protection. *Code of Federal Regulations. Transportation*. Title 49, Pt. 571. 1 October 1984 ed. p. 420-1.
30. Standard No. 221: School bus body joint strength. *Code of Federal Regulations. Transportation*. Title 49, Pt. 571. 1 October 1984 ed. p. 421-2.
31. Standard No. 222: School bus passenger seating and crash protection. *Code of Federal Regulations. Transportation*. Title 49, Pt. 571. 1 October 1984 ed. p. 422-9.
32. Standard No. 217: Bus window retention and release. *Code of Federal Regulations. Transportation*. Title 49, Pt. 571. 1 October 1984 ed. p. 397-406.
33. **US Department of Transportation, National Highway Transportation Safety Administration.** *Fatal accident reporting system 1983*. Washington, DC: GPO, March 1984. DOT-HS-806-705.
34. **Fast C.** Telephone communication. 22 January 1985.
35. **US House. 98th Congress, 2nd Session. H.R. 5511, a bill to amend Title 23, United States Code, to provide incentive grants in order to encourage States to adopt and enforce laws requiring the use of safety belts by schoolchildren in new schoolbuses, and for other purposes.** Washington, DC: GPO, 1984.
36. **US House. 98th Congress, 2nd Session. H.R. 6307, a bill to provide for the use of safety belts by children in schoolbuses and for other purposes.** Washington, DC: GPO, 1984.
37. **Physicians for Automotive Safety.** *School transportation—a summary of needed safety improvements*. (Newsletter.) Irvington, NJ: PAS, 1981. 2 p.
38. **US Department of Transportation, National Highway Transportation Safety Administration.** *Highway Safety Program Manual. Pupil transportation safety*. Vol. 17. Washington, DC: GPO, 1974.
39. Consumer Product Safety Act Regulations. *Code of Federal Regulations. Commercial Practices*. Title 16, Pts. 1105-1404. 1 January 1983 ed. p. 134-312.
40. Federal Hazardous Substances Act Regulations. *Code of Federal Regulations. Commercial Practices*. Title 16, Pt. 1500. 1 January 1983 ed. p. 313-435.
41. Flammable Fabrics Act Regulations. *Code of Federal Regulations. Commercial Practices*. Title 16, Pt. 1602, 1 January 1983 ed. p. 436-598.
42. Refrigerator Safety Act Regulations. *Code of Federal Regulations. Commercial Practices*. Title 16, Pt. 1750. 1 January 1983 ed. p. 620-3.
43. **Shinclair M.** Faster response to child perils being proposed; lawmakers would use product safety act. *Wash. Post* 10 May 1984. p. A17.
44. Toy Safety Act of 1984. (PL 98-491, 17 October 1984), *United States Statutes at Large* 98, p. 6257-8.
45. **Noble D.** Telephone communication. 30 January 1985.
46. **Greensher J.** Telephone communication. 28 January 1985.
47. **Feldman K W & Simms R J.** Strangulation in childhood: epidemiology and clinical course. *Pediatrics* 65:1079-85, 1980.
48. **World Health Organization.** *International Classification of Diseases*. (Manual.) Geneva, Switzerland: WHO, 1977-78. 2 vols.
49. **Swartz E M.** Toys-r-dangerous: protecting children from hazardous playthings. *Trial* 18(2):28-31; 75, 1982.
50. Poison Prevention Packaging Act of 1970. (PL 91-601, 30 December 1970), *United States Statutes at Large* 84, p. 1670-1.
51. Hazardous substances. Child-resistant closures doing their job, CPSC Chairman says. *Consumer product safety guide* (554, Pt. 1):4, 29 March 1984.
52. Federal Pesticide Act of 1978. Amending the Federal Insecticide, Fungicide, and Rodenticide Act of 1972. (FIFRA). (PL 95-396, 30 September 1978.)
53. **Aronow R.** Telephone communication. 5 February 1985.
54. **Rivara F P & Stapleton F B.** Handguns and children: a dangerous mix. *Develop. Behav. Pediat.* 3:35-8, 1982.
55. **McLoughlin E, Vince C J, Lee A M & Crawford J D.** Project burn prevention: outcome and implications. *Amer. J. Public Health* 72:241-7, 1982.
56. **Clarke F B & Birky M M.** Fire safety in dwellings and public buildings. *Bull. NY Acad. Med.* 57:1047-60, 1981.
57. **Baker S P.** Motor vehicle occupant deaths in young children. *Pediatrics* 64:860-1, 1979.
58. **Scherz R G.** Fatal motor vehicle accidents of child passengers from birth through 4 years of age in Washington State. *Pediatrics* 68:572-5, 1981.
59. **Blatnik D S, Toohill R J & Lehman R H.** Fatal complication from an alkaline battery foreign body in the esophagus. *Ann. Otol. Rhinol. Laryngol.* 86:611-5, 1977.
60. **Reilly D T.** Mercury battery ingestion. *Brit. Med. J.* 1:859, 1979.
61. **Smith G.** Telephone communication. 4 February 1985.