

Tracking 1990 Objectives for Injury Prevention with 1985 NHIS findings

RICHARD E. HOFFMAN, MD, MPH

At the time of this study, Dr. Hoffman was a Medical Epidemiologist in the Division of Injury Epidemiology and Control, Center for Environmental Health, Centers for Disease Control. He is now Chief of Communicable Disease Control, Colorado Department of Health.

Requests for tearsheets should be addressed to the Division of Injury Epidemiology and Control, Center for Environmental Health, Centers for Disease Control, Atlanta, GA 30333.

Synopsis.....

The Health Promotion and Disease Prevention Survey, a component of the 1985 National Health Interview Survey (NHIS), contained a set of questions on injury control and child safety and health. The data collected from the responses were used to evaluate progress toward achieving three of

the 1990 objectives for the nation related to injury prevention. Those three objectives concerned the proportions of (a) households with a properly placed and functioning smoke detector (63.2 percent, as shown by the survey), (b) parents who can identify appropriate measures to address the risks to their children of motor vehicle injuries, burns, and poisonings (39.1 percent), and (c) primary health providers who advise their patients about the importance of using safety belts and child restraint devices in cars (47.0 percent). Further, information was gathered on the proportion of adults using seatbelts all or most of the time (35.5 percent) and the proportion of those who knew the range of hot water temperatures (120° to 130° F.) above which scald injuries can occur (21.3 percent).

In general, the data demonstrated a direct relationship of injury prevention awareness to education and income. In the future it will be important to demonstrate that increasing injury awareness has a measurable, beneficial impact on injury mortality and morbidity rates.

THE 1990 OBJECTIVES FOR THE NATION to promote health and prevent disease include 23 objectives specifically related to intentional and unintentional injury prevention (1). The Health Promotion and Disease Prevention component of the 1985 National Health Interview Survey (NHIS) included questions (see box) designed to track progress toward achieving three of the objectives (2a). In this report the survey findings related to injuries are presented, and strategies and approaches for meeting the objectives are suggested.

The three objectives that were tracked by the 1985 NHIS Health Promotion and Disease Prevention Survey and that relate to reducing the risk factors for burn injuries and increasing the awareness among professionals and the public of measures to prevent injuries are these: By 1990,

- at least 75 percent of residential units should have a properly placed and functioning smoke detector;
- the proportion of parents of children under age 10 years who can identify appropriate measures to address the three major risks for serious injury to

their children (motor vehicle injuries, burns, and poisonings) should be greater than 80 percent;

- virtually all primary health care providers should advise patients about the importance of safety belts and should include instruction about the use of child restraints to prevent motor vehicle-related injuries as part of their routine interaction with parents.

Baseline data are available only for the first objective. In 1980 and 1982, investigators found that 50 percent and 67 percent, respectively, of residential units had at least one smoke detector, but the extent to which the detectors were properly placed and functioning was not known (2b).

Since the 1990 objectives were first published in the fall of 1980, considerable national attention has focused on injury prevention: Many States have enacted mandatory child restraint and seatbelt use laws. Numerous local governments have passed ordinances requiring the installation of smoke detectors. The number of studies published on the epidemiology of injuries has increased. Injury surveillance systems and control programs

Injury Control Questions from the 1985 Health Promotion and Disease Prevention Survey

Questions for Tracking Progress in the Prevention of Injuries from Burns

How many smoke detectors are installed in this home?
How many of them are now working? (Is it now working?)
How do you know it is (they are) working?
Any other way?
Is it (are any) next to a sleeping area?
Do you know what the hot water temperature is in this home?
About what temperature is the hot water?
How did you estimate the hot water temperature?
In the past 12 months, have you (or has anyone in your household) used a thermometer to test the temperature of the hot water here?
Above what temperature will hot water cause scald injuries?

Questions for Tracking Progress in the Prevention of Injuries from Poisonings

Have you ever heard about poison control centers?
Do you have the telephone number for a poison control center in your area?
There is a medication called ipecac syrup which is sometimes taken to cause vomiting after something poisonous is swallowed. Do you now have any ipecac syrup in this household?

Questions for Tracking Progress in the Prevention of Injuries from Motor Vehicles

Have you heard about child safety seats, sometimes called car safety carriers, which are designed to carry children while they are riding in a car?
Did a doctor or other health professional ever tell you about the importance of using car safety seats for (your) children?
When driving or riding in a car, do you wear a seatbelt all or most of the time, some of the time, once in a while, or never?

have appeared in State and local health agencies across the country. New funding is available from the Federal Government to support injury prevention research and training.

The 1985 NHIS also provides information on seatbelt use by adults and awareness of the need to

prevent scald injuries from tapwater. Achieving the three objectives mentioned, as well as attaining universal seatbelt use and proper setting of hot water temperatures, necessarily involves changes in personal behavior by large segments of the population. The survey results may be useful, therefore, in identifying subpopulations to whom we should direct concentrated education efforts in the future, as well as in analyzing progress of the total population toward achievement of the objectives.

Data Source

Data used in this analysis are based on weighted respondent questionnaires from the 1985 NHIS conducted by the National Center for Health Statistics. Details of the survey's design and sampling techniques are discussed elsewhere in this issue (3). The survey instrument included questions about the physical environment of the respondent's residence and the respondent's knowledge and awareness of injury prevention. In the tables the data are grouped by the respondent's various personal characteristics including age, race, sex, education, family income, alcohol intake, and cigarette use. Questions about poison control centers and the use of syrup of ipecac were asked only if the respondent indicated there was a child under 10 years old in the household. Questions about car safety seats were asked if the household included at least one child under 5 years of age.

The second of the 1990 objectives listed earlier concerns the proportion of parents of children under age 10 years who can identify appropriate measures to address the risks to their children of motor vehicle injuries, burns, and poisonings. Based on responses to questions about child safety seats, smoke detector use, and poisoning prevention, an index was constructed for households that included children under age 5 years. The index was applied only to households with younger children because this age group is at highest risk of dying from an unintentional injury and because no specific question about measures to reduce the risk of motor vehicle injuries to children aged 5-9 years was included in the survey instrument. The objective did not specify the cause of the burn (conflagration or tapwater scald) or the intended measure to prevent poisonings (having the telephone number of a poison control center or having syrup of ipecac in the home). Our index is based on smoke detector use to prevent house fires and having available the telephone number of the poison control center.

Findings

Table 1 presents information on the household use of smoke detectors for the total population, delineated by demographic characteristics of the respondent. The table shows that 68.5 percent of residential units in the total population had one or more smoke detectors; 94.3 percent of these were said to be working and 92.2 percent were placed next to a sleeping area, which is considered to be the proper location for such a device (4). If the respondent stated the detector(s) was working, he or she was asked how that condition was known. Of the total population, 9.1 percent stated the detector "went off because of smoke," 14.5 percent said "it went off while cooking," and 76.4 percent gave other explanations, such as "tested it" (34.1 percent), "the light is on" (17.0 percent), and it "beeps when the battery is low" (16.2 percent). The recommended method of testing most smoke detectors is to hold a candle 6 inches under an ionization detector or to let visible smoke drift into a photoelectric unit (4). Some new detectors have a refined test system that simulates the presence of smoke in the detector chamber. On the basis of questions in the survey, it is not possible to determine precisely what proportion of the residential units in the population have at least one properly placed and functioning detector, but it appears to be no higher than 63.2 percent ($.685 \times .922$)—assuming all detectors in sleeping areas are functional but without considering the confidence intervals on the weighted percentages.

The percentage of households with one or more detectors varied inversely with the respondent's age and directly with education and income. The proportion in households with children under 10 years of age with one detector was 37.4 percent and with more than one detector, 33.1 percent. Analysis by race showed that blacks and other nonwhites had the lowest percentages of households with at least one detector, 58.5 percent for blacks and 58.7 percent for other nonwhites. Current cigarette smokers were less likely to have a smoke detector than nonsmokers (65.5 percent versus 69.9 percent).

As shown in table 2, awareness of certain measures to prevent poisoning in households with children under 10 years of age varied considerably among education, income, and race categories. For the total population the percentage that had the telephone number of a poison control center in the area was 69.9 percent, and the percentage that had syrup of ipecac in the home was 25.4 percent.

Table 1. U.S. households using smoke detectors, 1985 (percentages)

Characteristic of respondent	With 1 smoke detector	With more than 1 smoke detector	With detector next to sleeping area ¹	With detector that works ¹
Total	38.8	29.7	92.2	94.3
Age:				
18-29 years	41.2	26.1	92.4	93.7
30-44 years	38.6	34.6	93.0	94.1
45-64 years	34.2	32.9	91.4	94.8
65 years and older	42.7	21.8	91.2	95.0
Households with children under 10 years of age	37.4	33.1	93.7	94.0
Sex:				
Male	38.2	30.5	92.7	94.1
Female	39.4	29.1	92.2	95.5
Race:				
White	39.0	31.1	92.2	94.3
Black	36.6	21.9	92.4	94.6
Other	42.0	16.7	90.3	93.5
Education:				
Less than 12 years	37.0	20.0	90.5	92.6
12 years	38.4	30.3	92.6	95.0
13-15 years	41.7	32.4	92.9	94.7
16 or more years	39.4	39.4	92.3	94.3
Family income (annual):				
Under \$20,000 ...	41.4	18.0	91.1	92.4
\$20,000 and over	37.8	37.9	92.6	94.9
Current cigarette smoker:				
Yes	37.6	27.9	92.1	93.0
No	39.4	30.5	92.2	94.8

¹Percentages of respondents answering yes.

SOURCE: 1985 National Health Interview Survey, Health Promotion and Disease Prevention Survey.

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Table 2. Awareness of measures to prevent poisoning in U.S. households with children under 10 years of age, 1985 (percentages)

Characteristic of respondent	Have heard of poison control center ¹	Have telephone number of poison control center ¹	Have syrup of ipecac in house ¹
Total	88.1	69.9	25.4
Age:			
18-29 years	87.3	64.8	19.9
30-44 years	90.8	74.7	31.2
45-64 years	76.6	63.1	14.6
65 years and older	65.8	53.9	16.4
Sex:			
Male	86.1	70.9	24.5
Female	89.6	62.2	26.0
Race:			
White	91.0	72.5	28.6
Black	77.3	54.8	8.7
Other	61.8	54.6	13.5
Education:			
Less than 12 years	73.5	52.3	9.3
12 years	89.9	69.9	22.7
13-15 years	94.1	73.9	32.3
16 or more years	94.1	80.9	41.3
Family income (annual):			
Under \$20,000	82.3	60.6	16.2
\$20,000 and over	92.5	75.2	31.9

¹Percentages of respondents answering yes.

SOURCE: 1985 National Health Interview Survey, Health Promotion and Disease Prevention Survey.

dents were about three times more likely to have syrup of ipecac in the home than respondents from any other race group. Awareness of poison prevention measures rose with increasing education and income, the percentages in the highest education and highest income categories being 80.9 percent and 75.2 percent for having the poison control telephone number and 41.3 percent and 31.9 percent for having ipecac in the household. The difference between highest and lowest education categories was greater than the difference between highest and lowest income categories.

Table 3 shows that 39.1 percent of the population was aware of and using measures to prevent all three major childhood injury risks. As might be expected from tables 1 and 2, the index for white (42.6 percent) was higher than for any other race subgroup. The index for blacks was 23.3 percent and for all other races, 21.9 percent.

Data concerning the third objective listed—that virtually all primary health care providers should advise their patients about the importance of safety belts and child car restraints—are presented in table 4. The table also shows the percentage of the population who stated they wear seatbelts all

or most of the time and the percentage in households with children under 5 years of age who stated they had heard of child safety seats. Of the total population, 98.1 percent said they had heard of child safety seats, and 47.0 percent of that group indicated they were told about the importance of using child car restraints by a doctor or health professional. These percentages varied very little across age, race, education, and income categories.

Much greater variation occurred in responses to the question about seatbelt use. The percentages varied directly with education and income. Seatbelt use was highest in the "other" race subgroup (39.4 percent), which had a relatively low percentage of persons who had heard of child safety seats (95.6 percent). We examined the relation of alcohol consumption to seatbelt use and found the lowest percentage of seatbelt use (27.9 percent) among respondents who were characterized as "drinking drivers."

Table 5 presents survey findings concerning awareness of measures to prevent scald burns from tapwater. Of the total population, 36.2 percent indicated they knew the temperature of the hot water in their home. As a followup to that question, respondents were asked how they estimated the temperature: 62.9 percent stated "the setting on the hot water heater," 4.0 percent stated they "tested with a thermometer," and 25.7 percent said they "guessed." The table also shows that 4.0 percent of the respondents stated someone in the household had tested the hot water temperature with a thermometer in the preceding 12 months, and 19.6 percent correctly stated that hot water temperatures above those ranging from 120° to 130° F. will cause scald burns. The percentage of correct answers to all three questions in table 5 varied directly with education and income. (Note: Hot liquid burns are the most frequent cause of hospital admissions for burns among children and the elderly (5).) The percentages for all three questions in table 5 were higher for households with children, and lower for households with elderly persons, than percentages for the total population.

Discussion

The 1985 NHIS was a useful instrument for tracking the status of three of the 1990 objectives, although individual responses were not independently verified or validated. For example, we do not know if smoke detectors said to be working

Table 3. U.S. households with children under 5 years that had the telephone number of a poison control center in the area, had heard of child safety seats, and had at least 1 working smoke detector, 1985

Characteristic of respondent	Percent aware of all 3 measures
Total	39.1
Age:	
18-29 years	34.1
30-44 years	46.4
45-64 years	27.9
65 years and older	20.1
Sex:	
Male	39.0
Female	39.1
Race:	
White	42.6
Black	23.3
Other	21.9
Education:	
Less than 12 years	16.4
12 years	37.7
13-15 years	49.6
16 or more years	57.1
Family income (annual):	
Under \$20,000	26.2
\$20,000 and over	48.1

SOURCE: 1985 National Health Interview Survey, Health Promotion and Disease Prevention Survey.

actually were working, or if respondents who said their health providers had not advised them about seatbelt and child safety seat use actually had been advised but had forgotten. When we compared data for the question on seatbelt use with data collected as part of the 1981-83 Behavioral Risk Factor Surveys (6), somewhat dissimilar results were obtained: the percentage of the adult, civilian noninstitutionalized population stating they wore seatbelts all or most of the time was 35.5 percent in the NHIS and 24.1 percent in the Behavioral Risk Factor Surveys. The higher percentage in the NHIS Survey may be the result of increased public awareness because of mandatory seatbelt use laws passed in several States in the interval between the two surveys (7).

The survey indicates that a great percentage of the U.S. population is aware of measures to prevent injuries. However, other than response to the question of whether the respondent was told about car safety seats by a doctor or other health professional, the survey provides no data to indicate how the current level of awareness was attained.

The nation remains short of achieving the three objectives. As many as 63.2 percent of U.S. civilian households had at least one properly

Table 4. Awareness in U.S. households of measures to prevent motor vehicle injuries, 1985 (percentages)

Characteristic of respondent	Households with children under age 5 years		
	Uses seatbelts all or most of the time ¹	Have heard of child safety seats ¹	Were told by a physician or other health professional about using car safety seats for children ¹
Total	35.5	98.1	47.0
Age:			
18-29 years	33.4	98.5	50.1
30-44 years	38.7	98.1	45.5
45-64 years	35.6	95.8	34.5
65 years and older	33.0	96.8	26.9
Sex:			
Male	33.6	98.0	40.4
Female	37.2	98.3	52.2
Race:			
White	36.3	98.4	47.4
Black	28.3	97.0	44.7
Other	39.4	95.6	49.4
Education:			
Less than 12 years	24.4	96.7	40.5
12 years	30.7	98.5	45.3
13-15 years	39.8	98.6	50.1
16 or more years	56.8	98.4	55.0
Family income (annual):			
Under \$20,000	28.3	98.0	46.7
\$20,000 and over	41.3	98.5	49.1
Alcohol consumption:			
None in past year	30.5
Occasional heavy drinker ² ..	35.4
Chronic drinker ³	35.7
Drinking driver ⁴	27.9

¹Percentages of respondents answering yes.

²Consumed 5 or more drinks on a single occasion in the past year.

³Consumed 2 or more drinks per day at least once in previous 2 weeks, and this was typical behavior for previous 12 months.

⁴At least once in previous year, drove after drinking too much.

SOURCE: 1985 National Health Interview Survey, Health Promotion and Disease Prevention Survey.

placed and functioning smoke detector; the 1990 objective is 75 percent of residential units. Further, 39.1 percent of households with children under 5 years of age were aware of, or had taken measures to address, the three major risks of injury to children; that percentage does not meet the 1990 objective of 80 percent of parents of children under age 10 years. Last, 47.0 percent of the population with children under 5 years of age who had heard of child safety seats had been advised about the seats by a health provider; the 1990 objective is that virtually all (an exact measure is not defined) health providers will discuss the use of child restraints with parents.

Our analyses of various subgroups demonstrated little that was unexpected. Respondents who were less educated and had lower incomes were less

Table 5. Awareness in U.S. households of measures to prevent tapwater scald injuries, 1985 (percentages)

Characteristic of respondent	Knew temperature of hot water in home	Have tested hot water in home with thermometer in previous 12 months	Stated correctly temperatures at which water scalds ¹
Total	36.2	4.0	19.6
Age:			
18-29 years	23.6	3.5	23.5
30-44 years	41.0	4.9	22.1
45-64 years	45.3	3.7	16.1
65 years and older	34.8	3.1	11.1
Households with children under 10 years of age ..	36.8	4.8	23.1
Households with children under 5 years of age ...	35.8	4.6	23.3
Sex:			
Male	47.7	4.5	18.1
Female	26.0	3.2	22.3
Race:			
White	38.3	4.1	20.0
Black	21.7	2.8	16.9
Other	25.5	3.5	17.2
Education:			
Less than 12 years	30.5	2.1	16.1
12 years	35.9	3.8	19.0
13-15 years	37.8	4.8	21.8
16 or more years	43.0	5.5	20.9
Family income (annual):			
Under \$20,000	29.9	2.8	19.0
\$20,000 and over	42.0	4.8	20.1

¹Percentages of respondents who stated that water temperatures between 120° F. and 130° F. are those above which scald injuries occur.

SOURCE: 1985 National Health Interview Survey, Health Promotion and Disease Prevention Survey.

likely to use, or be aware of, measures to prevent injuries. Black and "other" race subgroups, in which less educated persons from low-income households constituted a greater proportion than those in any other subgroup, were less likely to be aware of or to use injury prevention measures. On questions that did not directly pertain to parents' knowledge or behavior, consistent trends were not observed within the four age categories. There were no consistent differences between sexes. Current cigarette smokers were less likely to have at least one smoke detector, and drinking drivers were less likely to wear a seatbelt.

The strategies for achieving the 1990 objectives remain to be determined, but one finding of the survey suggests action that should be considered. Burns and tapwater scalds are injuries that children suffer at high rates compared with other age groups. Logically, parents should be targeted for some kind of intervention. Tables 1 and 5 show that families with children under 10 years of age

had greater awareness of and use of preventive measures than the total population for these two kinds of injuries. This finding provides a hint that selected subgroups can be reached and injury prevention awareness increased. Exactly how specific subgroups can be reached is not yet clear.

Each of the three objectives tracked by the 1985 NHIS is linked to other injury prevention objectives, namely, those:

- to reduce the motor vehicle fatality rate for children,
- to reduce the number of deaths in residential fires,
- to reduce the home injury fatality rate for children, and
- to increase the percentage of the population living in an area with access to regionalized or metropolitan area poison control centers.

Awareness through safety education is a time-honored and widely used prevention measure for building skills and creating a climate for change. But it will be important to evaluate the effectiveness of increasing injury prevention awareness in reducing mortality and morbidity from injuries. With the 1985 NHIS we were unable to test the hypothesis that increased awareness, such as knowing the telephone number of the poison control center or testing the function of a smoke detector, is associated with decreased injuries, such as poisonings or deaths in fires.

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