

An Experience in Home Injury Prevention

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AN EXPERIENCE in accident prevention in Richland County, Ohio, known as the home safety notebook project, sought to motivate families to keep a record of injuries in the home. It appears to have demonstrated that such families soon establish safety patterns that perceptibly reduce the rate of injuries.

The project was undertaken by the health committee of the Mansfield Parent-Teacher Association Council in cooperation with the home safety program of the Mansfield-Richland County Health Department. Two major purposes were (a) to test acceptability to homemakers of the methods used and (b) to measure change in frequency of injuries during a 16-week period. In addition, data on type of injury, location and activity of persons at the time of injury, parts of the body injured, and other injury characteristics were to be obtained.

The Mansfield-Richland County Health Department is 1 of 3 local health departments in the Nation carrying on a 5-year home safety program through a grant from the W. K. Kellogg Foundation. The home safety notebook project is one of many projects developed

during the course of this program, which was begun in the fall of 1951.

The Basic Plan

The recording by family members of all home injuries, regardless of severity, constituted the basic plan of action. The record was kept in a calendar-notebook, a booklet designed to facilitate the recording of selected information about each injury. The chairman and co-chairman of the PTA council health committee directed the project, and the chairman of each individual PTA health committee supervised the work of the participants.

The methods used in the project were modifications of those used in the home injury prevention experience conducted by the Washtenaw County Health Department of Michigan (1). In the Washtenaw County experience, public health nurses provided supervision and 95 families participated.

A total of 119 families agreed to keep safety records in the Richland County project. Ten or eleven families were selected from each of the PTA groups or mothers clubs in 10 elementary schools, and 14 families were from the health department staff. Participants were selected on the basis of agreement to cooperate and did not represent a random selection of families in the PTA or in the city.

Before the recording began, all PTA workers were given 1 hour of instruction in objectives and procedures by the health department home safety director. Following this orientation, each chairman visited the families in his group

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and explained to a responsible member, usually the housewife, the objectives of the project, terms used, and procedures for keeping the record. Drills in filling in the notebook were held. The time for starting the records varied within different PTA groups, but all were begun within a 4-week period, in October and November 1953.

On cards furnished by the health department, the health committee chairman recorded the names, ages, and injury data for the families in their group. Approximately every 2 weeks, they contacted the families, by visits to the home, by telephone, or at PTA meetings, to secure or to give information about the project.

During the 16-week period, the health department's home safety director visited each family at least twice. These visits were intended to sustain interest and to secure con-

tinued participation, as well as to answer questions on procedures. The health department maintained close communication with the PTA workers and at various stages of the project sent mimeographed newsletters to the families.

The fact that no families withdrew from the experience indicates that there was substantial interest on the part of those participating. However, the records of 5 families were unsuitable for use in the tabulation of data. One family moved from the area; 1 family's record was destroyed during an intercity household move; 1 record was not usable because of a misunderstanding regarding the completion date; and 2 records were lost or misplaced.

The possibility exists that the family member who recorded the injuries was less conscientious in performing the task toward the end of the study period. However, for several reasons,

Table 1. Injury frequency data, according to sex and age groups

Age and sex groups	Number of persons in study	Number of persons injured, by number of injuries					Total number of persons injured	Percent of persons injured	Number of injuries	Number of injuries per 100 persons	Average number of injuries per injured person
		1	2	3	4	5					
<i>Males</i>											
0-4	21	5	3	1	1	2	12	57	28	133	2.3
5-9	54	20	5	2	0	0	27	50	36	67	1.3
10-14	39	7	4	2	0	0	13	33	21	54	1.6
15-19	13	4	0	0	0	0	4	31	4	31	1.0
20-24	2	0	0	0	0	0	0	0	0	0	0
25-29	9	5	0	0	0	0	5	56	5	56	1.0
30-34	13	1	0	0	0	0	1	8	1	8	1.0
35-39	34	10	1	0	0	0	11	32	12	35	1.1
40-44	26	5	0	0	0	0	5	19	5	19	1.0
45-49	16	3	0	0	0	0	3	19	3	19	1.0
50-54	11	1	0	0	0	0	1	9	1	9	1.0
55 and over	6	0	0	0	0	0	0	0	0	0	0
Total	244	61	13	5	1	2	82	34	116	48	1.4
<i>Females</i>											
0-4	14	4	1	3	0	2	10	71	25	179	2.5
5-9	55	16	6	5	0	0	27	49	43	78	1.6
10-14	44	10	1	1	0	0	12	30	15	34	1.2
15-19	12	3	2	0	0	0	5	42	7	58	1.4
20-24	1	0	0	0	0	0	0	0	0	0	0
25-29	17	7	0	5	0	0	12	71	22	129	1.8
30-34	19	5	3	2	0	1	11	58	22	116	2.0
35-39	31	9	9	0	0	0	19	61	35	113	1.8
40-44	29	8	1	2	4	1	16	55	37	128	2.3
45-49	8	4	2	1	0	0	7	88	11	138	1.6
50-54	5	2	2	0	0	0	4	80	6	120	1.5
55 and over	15	5	0	1	0	0	6	40	8	53	1.3
Total	250	73	27	20	4	4	129	52	231	92	1.9

¹ One person had 8 injuries.

it is believed that the recording of injuries was faithful and continuous during the entire 16 weeks. As noted above, careful observation and close supervision were accorded the project throughout the period. Moreover, many families recorded injuries occurring outside the home as well as those occurring inside the home, and some families continued to record injuries during the several days between the end of the project and the collection of the records.

Conditions and Definitions

Certain conditions were inherent in the plan of this project, and selected definitions had to be imposed on the data in order to tabulate and summarize them.

Selection of the families to participate in the experience was without any known probability basis. Consequently, those selected do not constitute a statistical sample of known design, and there is no basis on which to assume that they were representative of the population of Richland County. In fact, certain characteristics of the participating families—age distribution, for example—would be expected to be at great variance from those of the county's population.

As shown in table 1, there were 244 males and 250 females in the 114 families whose records were analyzed, a male/female ratio of 0.976. This ratio is similar to that found in large population groups. The age distribution of the 494 persons, however, is notably unlike that of the general population in that there are far too few persons aged 0-4 years and 15-34 years. The person-per-family ratio was 4.3, which is well above the national average of 3.5.

Previous research studies of some 2,500 families in Washtenaw County, Mich., had indicated that rates of accidental injuries incurred within homes were relatively homogeneous by rural-urban and family income groups (1). These findings led to the expectation that rates for the Richland County families would simulate those for the Washtenaw County families if the following assumptions were made: (a) family constituency, living conditions, and other socioeconomic factors for the groups were similar; (b) the season of year in which the experiences were accumulated did not influence

the rate; (c) the groups were large enough to reflect the injury rate with relative accuracy; (d) conditions of instruction, motivation, and recording of events were essentially equal; (e) other pertinent factors were similar. Insofar as rates from this experience are found to parallel those from the Washtenaw County experiences, bases may be formed for acceptance or rejection of these assumptions.

Instructions on recording injuries included the following:

1. Record all injuries in the notebook provided by the health department.
2. Record all injuries occurring in your home or in other homes to members of your household, including relatives and others living with you.
3. Record the injury as soon as practicable after it occurs.
4. Give the best answer you can for each item of information requested and be as specific as necessary to be clear.
5. Refer all questions concerning the project to the PTA chairman of your group.

For this project, the term "home" was defined as the dwelling and yard area used for usual home activities. Not included within this definition are public and community playgrounds, parks, and buildings and areas used primarily for agricultural and vocational purposes. Several families recorded all injuries regardless of the place of occurrence, but because they gave the location clearly selection of the home injuries was an easy task.

Each injury was classified by the analysts as major or minor. A major injury was an injury having one or more of the following characteristics: (a) preventing usual activity for 1 hour or more; (b) costing \$1 or more for treatment; (c) receiving professional treatment. Any other injury was classified as minor.

Injury Frequency Patterns

Analysis of the recorded injuries by age and sex shows that males under 20 years of age exhibited approximately the same injury frequency pattern as did females in this age group (table 1). However, the male/female ratio of injuries for persons 20 years of age or over was

approximately 1:5. For all ages, females suffered about twice as many injuries as did the males.

The frequency of recorded injuries among both sexes was substantially reduced during the time of this project, as shown in table 2. The reductions after the first 2 weeks tended toward plateaus rather than regular decrements by time intervals. Graphically, these reductions resemble an inverted learning curve, suggesting that persons in this experience gradually adopted or learned safer ways of home life.

Table 2. Injury frequency data, according to week of participation

Week	Number of injuries, major and minor			Injury rate per person-year	Number of major injuries		
	Males	Females	Total		Males	Females	Total
1st	17	42	59	6.2	0	3	3
2d	10	24	34	3.6	0	1	1
3d	8	15	23	2.4	0	2	2
4th	9	15	24	2.5	1	1	2
5th	8	18	26	2.7	0	0	0
6th	5	18	23	2.4	0	2	2
7th	10	15	25	2.6	0	1	1
8th	9	12	21	2.2	1	0	1
9th	5	12	17	1.8	0	2	2
10th	8	10	18	1.9	1	0	1
11th	5	10	15	1.6	0	1	1
12th	3	11	14	1.5	0	2	2
13th	4	6	10	1.1	1	0	1
14th	2	11	13	1.4	0	1	1
15th	5	8	13	1.4	0	1	1
16th	8	4	12	1.3	2	0	2
Total	116	231	347	2.3	6	17	23

During the first week of the project, injuries were recorded at the rate of 6.2 per person-year. This rate is comparable to the estimated rate of 6.0 in the Washtenaw County research studies and to the rate of 5.5 reported for the week before the recording of injuries began in the county's 95-family experience. Furthermore, the reduction in rate of reported injuries among the Richland County families from 6.2 during the first week to 1.3 during the sixteenth week parallels the change from 6.1 in the first month to 1.2 in the fourth month among Washtenaw County's 95 families.

Table 3. Number of injuries in males and females, according to location and activity when injury occurred

Location or activity	Males	Females	Total
Location:			
Inside dwelling unit (exclusive of basement)	60	177	237
Basement	21	21	42
Outside dwelling unit	26	21	47
Other places	9	12	21
Total	116	231	347
Sublocation:			
Bedroom, nursery	9	14	23
Living room	19	24	43
Kitchen	19	114	133
Dining room		10	10
Recreation room	5	3	8
Steps	5	9	14
Yard	14	13	27
Other places	25	27	52
Not ascertained	20	17	37
Total	116	231	347
Activity:			
Playing inside	39	36	75
Playing outside	13	8	21
Preparing meals	3	62	63
Household tasks	15	59	74
Walking	7	12	19
Walking on stairs	3	7	10
Running on stairs	3	4	7
Mechanical "do-it-yourself" activities	21	9	30
Others	11	32	43
Not ascertained	1	2	3
Total	116	231	347

These similarities in rates are very impressive. The experience in Richland County indicates that interested leaders of club groups with a relatively short period of training and with little expert supervision can make noteworthy contributions in the field of home accident prevention. It also indicates that the home-recording technique might be used profitably on a broad scale within a health jurisdiction by enlisting the cooperation of community organizations.

If injuries had continued at the rate of 59 per week, as during the first week, a total of 944 injuries would have accumulated. The 347 recorded are approximately 600 fewer than might have been expected. Of the 347 recorded injuries, 23 were classified as major injuries. If these had continued at the rate of 3 per week,

Injury occurrences during specified hours of the day, by sex and age groups.

Time of day	Age group																											
	Males														Females													
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74		
A. M. 4-5																											1	
5-6																												
6-7																											1	
7-8																											1	
8-9																											1	
9-10																											1	
10-11																											1	
11-12																											1	
P. M. 12-1																											1	
1-2																											1	
2-3																											1	
3-4																											1	
4-5																											1	
5-6																											1	
6-7																											1	
7-8																											1	
8-9																											1	
9-10																											1	
10-11																											1	
11-12																											1	
A. M. 12-1																											1	
unknown																											1	

as during the first week, 48 would have been recorded, or at the rate of 8 recorded for the first 4 weeks, 32 would have been reported.

The infrequency of major injuries among the families in this experience argues against drawing any conclusions from the data on these injuries. There appears, however, to have been a trend for reduction in major injuries during the same time that minor injuries were being reduced, at least among the females. Since descriptions of accidental injury occurrences rarely allow accurate prediction of the severity of the injury, programs of prevention may well be aimed at the often recurring events which terminate in minor injuries with the expectation that the number of severe injuries will be reduced concurrently.

Injury Characteristics

Table 3 shows the location and type of activity when injuries were incurred. Predominance of injury to females was accounted for almost exclusively by "preparing meals" and "household tasks" and by location in the kitchen and dining room and on steps. At another season of the year, the yard might be expected to present a higher relative frequency of location, as was the case in the Washtenaw County research studies, and the entire pattern for males might be changed.

Males suffered injury most frequently during the hours of 11:00 a. m. and 1:00, 4:00, and 5:00 p. m. The frequency among females was greatest from 10:00 to 12:00 a. m. and from 4:00 to 8:00 p. m. (see chart). The variations in injury occurrences by hour of the day and by

age and sex groups suggest concentration of preventive effort at specific hours for the different groups. Children under 10 years appear to be injured during the afternoon and evening far more often than during the morning, and the times of highest frequency for adult females appear to be associated with the usual hours of meal preparation or other routine household tasks.

Cuts were the predominant type of injury, and bruises were next in importance (table 4). Burns from hot surfaces occurred approximately six times as frequently among females as among males. Cuts occurred most frequently among adult females; among males, children suffered cuts more frequently than adults. Children of both sexes suffered many more bruises than did their parents. These data provide suggestive bases for specific approaches to prevention, as well as indications for advice regarding first-aid practices.

The upper extremities, especially the fingers and the hand, suffered injury most often (table 5). Tabulations not presented in this paper showed that the injuries to these parts were largely cuts, with bruises and burns next in order. The majority of the difference between the number of injuries to females and the number to males was accounted for by injuries to the fingers and hands.

Table 5. Number of injuries in males and females, according to part of the body injured

Part of body	Males	Females	Total
Head, skull, hair, temple	10	11	21
Face, cheek, lip, forehead, eyelids, eyelashes	9	14	23
Eye	3	2	5
Nose	3	0	3
Mouth, teeth, tongue, gums	2	0	2
Jaw, chin, neck	0	2	2
Chest, ribs	1	2	3
Arm	3	11	14
Elbow	1	2	3
Hand, wrist	14	24	38
Finger, thumb, knuckle	50	127	177
Hip, abdomen, groin, buttocks	1	3	4
Knee	9	7	16
Leg, shin, thigh	4	8	12
Ankle	1	3	4
Foot	2	7	9
Toes	0	1	1
Back, spine	0	2	2
Multiple parts	3	5	8
Total	116	231	347

Responsibility for the injury was attributed to the injured person for 77 percent of the injuries to females and for 67 percent of those to males (table 6). Assignment of responsibility for an accidental injury is, of course, a difficult task. Adults and older children were usually considered responsible for their own injuries. For 24 injuries to children, the mother was

Table 4. Number of injuries in males and females by type of injury, according to age group

Age group	Cut, laceration, scratch		Pierce, puncture		Cut and bruise		Bruise		Burn from hot surface		Burn from fire		Other accidents		Total	
	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females
	0-4	12	8	1	0	3	4	11	11	1	2	0	0	0	0	28
5-9	20	25	1	2	2	2	9	12	0	1	1	0	3	1	36	43
10-14	9	7	2	0	2	2	4	5	2	0	1	0	1	1	21	15
15-19	3	3	0	0	0	0	0	2	0	1	1	0	0	1	4	7
20-24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25-29	4	14	0	1	1	2	0	3	0	1	0	1	0	0	5	22
30-34	0	12	0	1	0	1	1	2	0	4	0	0	0	2	1	22
35-39	5	16	1	2	1	2	0	0	2	11	1	0	2	4	12	35
40-44	3	25	0	0	0	0	2	2	0	3	0	1	0	1	5	37
45-49	3	3	0	0	0	0	0	1	0	3	0	0	0	4	3	11
50-54	0	2	0	0	0	0	0	2	1	1	0	0	0	1	1	6
55 and over	0	3	0	0	0	0	0	3	0	2	0	0	0	0	0	8
Total	59	118	5	6	9	13	27	43	6	34	4	2	6	15	116	231

Table 6. Number of injuries in males and females, according to responsibility for injury

Responsibility for injury	Males	Females	Total
Same person as injured.....	78	177	255
Child or sibling under 5 years.....	1	2	3
Child or sibling over 5 years.....	11	9	20
Mother.....	9	15	24
Father.....	0	1	1
Both parents.....	4	2	6
Spouse.....	1	1	2
Neighbor or visitor.....	2	1	3
Other persons, including manufacturers.....	1	0	1
Objects.....	1	0	1
More than one classification or responsibility.....	2	8	10
Nothing or not ascertained.....	5	13	18
Not recorded.....	1	2	3
Total.....	116	231	347

listed as the person responsible, but only one father was thus implicated. Both parents were responsible for 6 injuries to children.

The most common action taken when females were injured was "change in performance of household task"; for males the most frequent action was "safety instructions to person injured" (table 7). A nonspecific category composed of such terms as "being more careful" and "being more thoughtful" was recorded for 19 injuries to males and 50 to females. "Correction of environment" was recorded for 43 of the 347 injuries. These data suggest that about 90

Table 7. Number of injuries in males and females, according to action taken to prevent similar injuries

Action	Males	Females	Total
Safety instructions to person injured.....	34	36	70
Safety instructions to self (when injured).....	1	8	9
Safety instructions to others than persons injured (as well as to person injured)....	6	3	9
Correction of environment.....	12	31	43
Change in performance of household task.....	21	68	89
Improvement in supervision of children.....	4	3	7
General resolve to be more careful.....	19	50	69
More than one action.....	0	1	1
Nothing.....	13	22	35
Not ascertained.....	6	9	15
Total.....	116	231	347

percent of the injuries could be attributed to practices and personal action, since for only 12 percent was the environment changed. However, the data may indicate that few persons in the home are capable of interpreting the role of environment in accident causation and of making environmental changes for prevention of injuries. The records showed that most participants seriously attempted to provide information concerning action taken to prevent similar injuries, and perhaps the recording of such information helped in developing safe practices and improving the safety of surroundings in the home.

Summary

In a home accident prevention project in Richland County, Ohio, the rate of injuries per person-year for 114 families was reduced from 6.2 during the first week to 1.3 during the 16th week. This finding, which parallels the reduction reported in a similar project in Washtenaw County, Mich., suggests that the recording of injuries by families may be a method useful in establishing safety patterns in the home, as well as in collecting epidemiological data.

Co-sponsored by the Mansfield-Richland County Health Department and the Mansfield Parent-Teacher Association Council, the project demonstrated a cooperative approach between an official health agency and a civic organization. The fact that no families withdrew indicates that interest in the project was sustained throughout its course.

The procedures used were both economical and practicable and could be applied in any community. They might be used profitably on a broad scale within a community or health jurisdiction.

The data obtained concerning several characteristics of accidental home injuries add to the steadily accumulating information on this problem. Such data are essential for sound planning and operation of home accident prevention programs.

REFERENCE

- (1) Investigation and application of home injury survey data in development of prevention procedures. Ann Arbor, Mich., University of Michigan School of Public Health, 1953.