

Toward Solving the Accident Problem

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ACCIDENTS as a cause of death and disability are of universal concern. Therefore, with the thought that in an aging city environment with much deteriorating property and overcrowded neighborhoods, the accident rate might be higher than would be expected by chance, I visited such a neighborhood, at the invitation of a sanitarian. Here I saw occupied dwellings in such bad condition that I immediately obtained the sanction of the Worcester Department of Public Health to condemn them as "unfit for human habitation" under a State law passed in 1954. This was the beginning of an intensive drive against substandard housing in Worcester.

Believing that the number of accidents under substandard housing conditions might be large, I decided to measure the size of the accident problem in the entire city. An accident survey committee was set up, and I sought financial assistance and backing from various outside agencies. Although I failed to obtain such assistance, I decided to proceed with the survey. This meant that the six general hospitals in the city would participate in the study without additional clerical assistance and that the health department would give time and labor as part of its normal routine. The Worcester

County Safety Council agreed to underwrite the relatively modest cost of materials.

The survey was carried out over the 12-month period July 1, 1957-June 30, 1958.

The Survey Plan

The plan of the survey was simple. It seemed most practical to collect and tabulate only accident reports from the six general hospitals in the city. Information requested on report cards was brief and to the point. Cards of a different color were used by each hospital. At the outset of the survey, two orientation meetings were held with the hospital clerks, and I kept in touch with them periodically thereafter.

Findings

Of the total of 20,077 accident reports received during the survey year, 19,752 were usable for tabulation purposes. A seasonal incidence of accidents was noted, with a marked peaking in the summer months (fig. 1). For most age groups, this rise was coincident with increased outdoor and vacation activities. For the group aged 15-19 years, however, the highest incidence of accidents was in October, when 165 youths were injured playing football.

The average daily number of accidental injuries reported was 53.8 (fig. 1). The highest daily average, 71.2, was in July; the lowest, 41.3, in March. February had the smallest number of accidents.

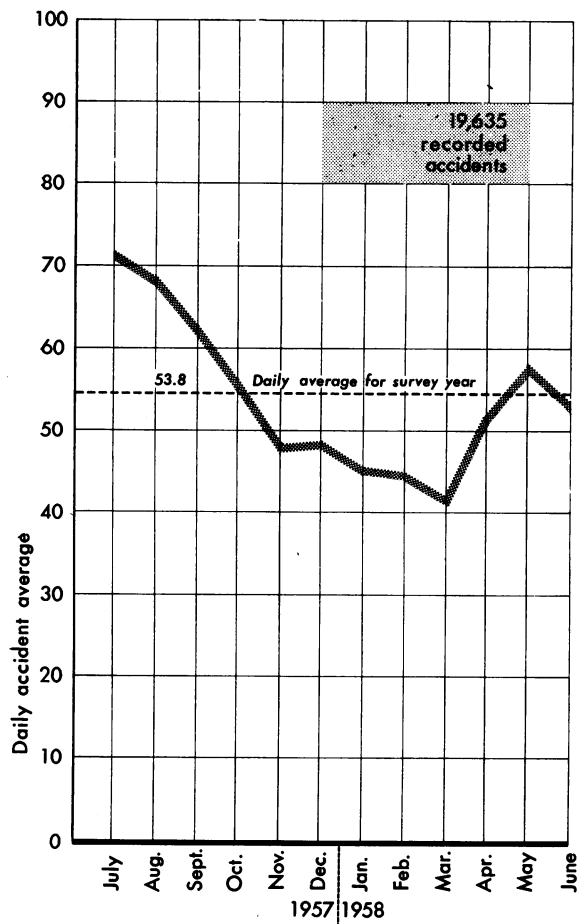
Types of Accidents

Traffic accidents reached a peak in December, closely followed by lower peaks in July

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This paper is an abridged report of the Worcester Accident Survey, carried out July 1, 1957-June 30, 1958. The Accident Prevention Branch of the Public Health Service assisted in setting up tabulations of the study data.

Figure 1. Incidence of accidents, by month, Worcester Accident Survey, Worcester, Mass., 1957-58



1957			1958		
Month	Total accidents	Daily average	Month	Total accidents	Daily average
July	2,207	71.2	January	1,395	45.0
August	2,110	68.1	February	1,248	44.6
September	1,863	62.1	March	1,281	41.3
October	1,702	54.9	April	1,523	50.8
November	1,435	47.8	May	1,778	57.4
December	1,480	48.1	June	1,603	53.4

and August. Injuries resulting from falls from one level to another were most frequent in July and August. On the other hand, the number of falls on the same level was highest in January. The highest accident rate for athletic activities and sports was in October, which had the largest number of football accidents of any month in the year.

The percentages for 17 types of accidents exceeded 1 percent of the total accidents reported, but 5 types led the list. These were:

	Percent
Falls on the same level.....	18.6
Falls from one level to another.....	10.8
Motor vehicle.....	10.4
Cutting or piercing instrument.....	9.8
Blow from falling or projecting object.....	7.7

Each age group had a distinctive accident pattern. Falls on the same level were the principal cause of injury at all ages except 15-19 years, when motor vehicle accidents and participation in sports were the leading causes. Motor vehicle accidents were the first cause of injury in the 20- to 24-year age group also. From age 70 onward, falls accounted for more than half of all accidental injuries. In early childhood, burns, poisonings, and animal bites were frequent causes of injury.

Injury Rates

The following accidental injury rates per 1,000 population, by age groups, were obtained from the 1958 State estimates of population:

	Injury rate
All ages.....	72.3
Under 5.....	121.0
5-19.....	118.1
20-64.....	54.7
65 and over.....	31.0

Table 1. Accidental injuries per 1,000 population,¹ by age and sex, Worcester Accident Survey, Worcester, Mass., July 1, 1957-June 30, 1958

Age (years)	Both sexes	Males	Females
All ages.....	72.3	99.4	48.0
Under 1.....	34.8	36.7	32.8
1-4.....	139.8	175.2	106.9
5-9.....	115.7	161.5	73.6
10-14.....	124.0	180.6	69.6
15-19.....	114.7	180.6	58.1
20-24.....	81.3	124.6	41.8
25-29.....	65.9	96.9	36.6
30-34.....	61.7	90.7	33.4
35-39.....	60.8	90.4	35.3
40-44.....	52.7	69.2	38.1
45-49.....	53.3	70.8	38.2
50-54.....	43.7	50.0	38.5
55-59.....	39.0	45.1	34.0
60-64.....	31.3	35.5	27.7
65-69.....	28.6	31.4	26.2
70 and over.....	32.7	27.3	37.2

¹ 1955 State estimate.

Preschool children had the highest percentage of injuries, 15.5 percent. Injury rates per 1,000 population, by age and sex, are shown in table 1.

More than half the accidental injuries reported were in persons under 20 years of age; over 40 percent, in persons under 15 years old. The 1- to 4-year age group had the highest accident frequency. In each age group over 1 and under 70 years, the frequency of accidents in males exceeded that in females, in some age groups by nearly three to one (table 1).

Activity at Time of Accident

The order of frequency of accidental injuries, by place of activity, was as follows:

Place of activity	Percent of accidents
Home	43.5
Street or highway	15.8
Industrial place or premises	9.6
Place of recreation or sport	4.9
Public building	3.4
Other specified place	1.4
Unknown or not stated	21.4

The three leading activities at the time of occurrence of the 8,604 known home accidents were: sports, recreation, or entertainment, 2,969; ascending or descending stairs, ladders, and so on, 808; and housekeeping, 506. In the complete report of the survey, the other categories have been similarly differentiated.

Activities at the time of the accident were listed in 10 broad categories, each containing many subcategories. Thus, the category "operating or riding in or on a vehicle" included a subcategory entitled "operating an automobile." In the category "participating in sports, recreation, and entertainment" there were 35 subcategories, from "playing baseball or softball" to "riding at an amusement park" and "spectator, (sports, TV, movie, fire, construction, and so on)." The numbers of injured in each major category excluding those in categories for which no activity was indicated are shown in table 2.

Through age 14 playing, manner unspecified, was the principal activity leading to injury; at all ages through 19 years, play activities, whether specified or not; and for ages 20-84 years, work activities were among the 10 leading causes of injury.

The 19,752 accidental injuries reported in the survey were distributed among 999 selected categories of activities. Thirty-five of these categories included 100 or more persons each. The 12,196 cases listed in these 35 categories were 61.8 percent of the total 19,752 accidents reported.

For the entire population of Worcester, 1 of 10 activities caused approximately 65 percent of all reported accidental injuries to children under 9 years of age, about 45 percent of injuries to persons 10-84 years old, and about 80 percent of those in persons aged over 85 years. These leading injury-producing activities, in descending order of frequency, were:

	Number
Playing, unspecified	2,199
Working, unspecified	1,296
Walking, unspecified	898
Playing in the house, unspecified	702
Passenger in automobile	664
Descending stairs	605
Operating automobile	455
Running	400
Walking in house	399
Riding bicycle	370

Home Accidents

A total of 8,604 home accidents were reported in the survey. The highest total for any month was 989, for August 1957, and the lowest 470, for February 1958.

The play activities of childhood were the most common cause of home accidents for both

Table 2. Number and percent of persons injured, by activity at time of accident, Worcester Accident Survey, July 1, 1957-June 30, 1958

Activity	Number	Percent
Operating or riding in or on a vehicle	2,198	11.1
Participating in sports, recreation, and entertainment	5,232	26.3
Maintaining, repairing, constructing, and so on	1,679	8.4
Ascending or descending (stairs, ladders, and so on)	1,118	5.6
Handling materials or objects	905	4.5
Housekeeping	669	3.4
Preparing, serving, or consuming food	535	2.7
Caring for or grooming self	208	1.0
Farming or gardening	69	.3
All other activities	5,563	28.1

sexes. The next three activities leading to accidents were "ascending or descending," "preparing or consuming food," and "caring for or grooming self." But surprisingly, "operating or riding in or on a vehicle" was reported as a home accident for certain age groups. These accidents presumably took place on the home premises.

Through 24 years of age males predominated as the victims of home accidents of all types. But from age 25 on to old age, females predominated, markedly so in old age, reflecting the high ratio of women to men who survive to old age. For women aged 25-74 years, housekeeping and related activities were the leading activities at the time of an accident.

By location, home accidents within or outside the home showed a seasonal variation, with the highest incidence in the summer months. The porch, for example, was the scene of many accidents in the summer months.

The most common accident locations, in order of frequency, were: yard, 2,582; kitchen, 1,402, and stairs, 608. In descending order of frequency, locations with an accident incidence in excess of 100 persons during the survey year were the stairs, bedroom, living room, basement, porch, other rooms in the house, and the steps.

Certain locations showed a sex differential for accidents. Outdoors and in the basement males predominated as the injured, whereas indoors, females were injured at approximately the same rate as males, or more often, depending on the location. Among children, males consistently predominated as the injured. Indoors, after 18 years of age, females were injured more frequently than males, in certain locations markedly so. This was particularly true of the kitchen and the stairs.

Falls accounted for nearly 40 percent of the injuries sustained at home, 1,844 occurring on the same level and 1,465 as a result of falling from one level to another. The 966 injuries from cutting or piercing instruments ranked second, and blows from falling or projecting objects, third. Among the other types of accidental injuries reported were 290 accidents due to poisoning by solid or liquid substances. The majority of these accidents affected preschool children. Two deaths from accidental poisoning were reported, one of an adult and one of a

child who died shortly after swallowing her mother's nitroglycerin heart pills.

Occupation

Among males whose occupation was recorded, operatives and kindred workers suffered the highest number of accidental injuries, with craftsmen, foremen, and so on, second, laborers third, and service workers fourth. For females, service workers led as the victims of accidental injuries followed by clerical workers, operatives, and professional workers, in that order. For professional workers, the accident rate per 1,000 population was 61.1 for females and 49.8 for males. The higher rate for females was noteworthy, since the accident rate for males is higher than the rate for females in each of the other occupational groups.

Because the most recent population data available were from the 1950 census, it was felt that injury rates for detailed occupations, including sex differentials, based on census figures would be unreliable. Therefore, accident rates were calculated for each major occupational group, as follows:

<i>Occupational group</i>	<i>Rate per 1,000</i>
Nonlabor force.....	79.8
Labor force.....	60.4
Professional, technical, and kindred workers	38.8
Managers, officials, and proprietors.....	28.9
Clerical and kindred workers.....	38.1
Sales workers.....	33.1
Craftsmen, foremen, and kindred workers..	76.8
Operatives and kindred workers.....	63.7
Private household and service workers.....	79.0
Laborers, except farm and mine.....	163.0

Severity of Injury

The severity of the injuries received was considered to be a measure of the risk to the accident victim's life, but on many reports the information on this point was insufficient for interpretation. The following data are based on reports of 7,789 nonfatal accidents for which the severity of injury was shown.

<i>Severity of injury</i>	<i>Number</i>	<i>Percent</i>
Minor	6,015	77.2
Moderate	1,475	18.9
Severe	299	3.8

For two specified types of accidents, the severity of injury was as follows:

	<i>Motor vehicle and traffic (percent)</i>	<i>Cutting and piercing instruments (percent)</i>
Minor -----	64.4	91.1
Moderate -----	25.7	8.0
Severe -----	9.9	.8

Admission of the victim to a hospital can safely be assumed to imply that an accident is severe. Some 1,777 of the total individuals in the accident survey were hospitalized. A study of severity of injury in both outpatients and inpatients indicates that the proportion of accidents that could be rated as severe, or very severe, was distinctly higher, 108 (6 percent) in the inpatient group. Incidentally, 10 of the 32 persons fatally injured were listed as outpatients, 18 as inpatients, and the hospitalization status of 4 was not stated. Motor vehicle accidents, falls, and blows generally accounted for the more serious injuries.

Part of Body Injured

The hand, including the fingers, was the part of the body most commonly injured. For ease of analysis, the parts of the body sustaining the primary injury have been grouped into broad categories, as follows:

	<i>Percent</i>
Upper extremity-----	35.5
Head -----	28.6
Lower extremity-----	22.3
Trunk -----	7.8
Shoulder -----	2.5
Hip -----	1.1
Generalized -----	1.8
Other -----	.4

In computing these percentages, 691 injuries for which the injured part was unknown or not stated were excluded.

Nature of Primary Injury

In the group under 1 year old, contusions, hematomas, lacerations, and avulsions were the most frequent types of injury. Lacerations led in frequency in every age group from 1 to 70 years. From age 70 on, fractures led, largely because of their high frequency in elderly females. From age 55 on, fractures were more

common among females than among males, and from age 60 on they were the most common cause of injury among females.

Poisoning was the third most frequent cause of accidental injury in the age group 1-4 years but was negligible in the group under 1 year. Burns and scalds were also a common cause of injury in preschool age groups. Fractures and puncture wounds were important primary injuries in school-age children. Until the later years of life, lacerations, sprains, and contusions were the most frequent causes in all age groups until fractures took first place among the elderly.

Fatalities

Not all of the residents of Worcester who died from accidents were treated at one of the six hospitals participating in the survey. Also, the deaths of some patients who died as a result of a complication, such as bronchopneumonia, may not have been reported as deaths due to accident. For example, the death of an elderly man or woman hospitalized because of a fracture of the hip due to a fall but who died as a result of a complication may not have been reported as a death due to an accident. Therefore, only 32 deaths were reported to the survey as being the result of an accident.

Two additional sources of reports of accidental death were searched, newspapers serving the Worcester area and returns from the city clerk's office. In Massachusetts vital statistics are the responsibility of the secretary of State and are recorded locally by municipal clerks. These statistics include all known accidental deaths of residents of Worcester, whether the accidents took place within or outside the city limits. They also include the deaths of nonresidents who were treated at one of the participating hospitals or who died as the result of accidents occurring within the city limits. Tables 3 and 4 categorize the 104 accidental deaths of residents and nonresidents reported during the survey period.

Of the 104 persons who died from accidents, 71, or 68.2 percent, were residents of Worcester and 33 were nonresidents. Of the 71 residents, 18 were injured outside the city limits. Of the 33 nonresidents, 11 were injured within the city

limits. A large number of deaths of elderly persons were consequent upon falls, with or without further complications. Most of the deaths occurred at home, 11 in Worcester area rest homes, nursing homes, or hospitals. One person died from a fall from a treatment table.

Forty Worcester residents died from accidents occurring in their homes. Fires accounted for six deaths. There were six drownings. One boy drowned in his bath at home, four were drowned at locations outside the city, and one victim was struck by a speed boat. Two "on the job" accidents resulting in death occurred within the city limits. Among the deaths from miscellaneous causes, two resulted from plane crashes, one of which took place within the city limits.

In three fatalities, lacerations and avulsions

Table 3. Fatalities reported by six participating hospitals and by other sources, according to accident category, age, sex, and place of residence, Worcester Accident Survey, Worcester, Mass., July 1, 1957-June 30, 1958

Accident category and age (years)	Total	Sex		Residence	
		Male	Female	Resident	Non-resident
All accidents.....	104	70	34	71	33
0-4.....	8	7	1	5	3
5-19.....	12	10	2	3	9
20-64.....	38	32	6	30	8
65 and over.....	46	21	25	33	13
Home.....	51	24	27	39	12
0-4.....	6	5	1	4	2
5-19.....	0	0	0	0	0
20-64.....	9	6	3	8	1
65 and over.....	36	13	23	27	9
Traffic and street.....	35	29	6	18	17
0-4.....	2	2	0	1	1
5-19.....	9	8	1	1	8
20-64.....	16	13	3	12	4
65 and over.....	8	6	2	4	4
Work ¹	3	3	0	1	2
0-4.....	0	0	0	0	0
5-19.....	0	0	0	0	0
20-64.....	2	2	0	0	2
65 and over.....	1	1	0	1	0
Miscellaneous.....	15	14	1	13	2
0-4.....	0	0	0	0	0
5-19.....	3	2	1	2	1
20-64.....	11	11	0	10	1
65 plus.....	1	1	0	1	0

¹ On the job.

Table 4. Fatalities reported by six participating hospitals and by other sources, according to accident category, place of death, and residence, Worcester Accident Survey, Worcester, Mass., July 1, 1957-June 30, 1958

Accident category and place of death	Total	Resident	Nonresident
All categories.....	104	71	33
In city.....	64	53	11
Outside city.....	40	18	22
Home.....	51	40	11
In city.....	42	39	3
Outside city.....	9	1	8
Traffic and street.....	36	18	18
In city.....	14	9	5
Outside city.....	22	9	13
Work ¹	3	1	2
In city.....	2	1	1
Outside city.....	1	0	1
Miscellaneous.....	14	12	2
In city.....	6	4	2
Outside city.....	8	8	0

¹ On the job.

were the dominant injuries; in three, concussion; in two, hemorrhage. But hip fracture and some other fracture or fractures in 38 elderly persons were the noteworthy leading primary injuries. Burns, various injuries, and asphyxia as the result of fires affected seven victims of home accidents.

In street and traffic accidents, two elderly pedestrians died after falls, one with a subdural hematoma, the other with a fractured left hip. Fractures of the skull with brain injuries or other head injuries were the primary injuries in 10 street and traffic deaths, but in many of them there were also other severe injuries, including other fractures and hemorrhage. But in some cases, reports of the injuries were not detailed; only phrases such as "multiple fracture or injuries" were given. Rib fractures, crushing injuries of the chest, leg fractures, broken neck, and skull fractures, and ruptured spleen, kidney, or liver with complicating hemorrhage were also listed as primary injuries. Fracture of the pelvis was listed in two instances but in 14 of 36 "traffic" cases no details were available of the injuries received that caused death.

The primary injuries in the three "work" accidental deaths included fracture of the spine after a 70-foot fall, epidural hematoma after being struck on the head by a lump of ice, and the long-term result of the inhalation of metal dust.

Among the miscellaneous deaths, chest injuries with hemorrhage, skull and head injuries, drownings, accidental shooting, and other such injuries occurred.

Others Involved in the Accident

The data in response to the question, "Were others involved?" were unreliable, due to various interpretations of the question. On the other hand, answers to the question, "Were others injured?" could be interpreted with some accuracy. But in view of the large number of nonresponses, 16,813 out of 19,752, any conclusions must be carefully stated. However, according to results of this survey, 3,243 persons other than the principal accident victims were involved in the accidents in some way, and 1,993 of them were reported as being injured in motor vehicle accidents.

Census Tracts

An attempt was made to study the accident rate and type of accident in Worcester, by census tract, using the 1955 estimated State census as the population base.

Table 6. Number¹ of accident victims in selected census tracts, by age group, Worcester Accident Survey, Worcester, Mass., July 1, 1957-June 30, 1958

Census tract No.	Age group (years)			
	0-4	5-19	20-64	65 and over
All Worcester	4, 668	4, 940	4, 627	836
1-----	68	119	59	24
4-----	45	145	136	18
9-----	120	125	108	33
13-----	91	232	252	33
17-----	29	73	267	57
20-----	215	259	198	15

¹ Less "not stated" in table 5.

Census tract 13, in the center of the city, and census tract 20, in the outskirts showed a strikingly high incidence of accidental injuries, 10.1 and 10.4 percent, respectively (table 5). About 50 percent of the accident victims in census tract 20 were preschool children (table 6).

The high accident rate in census tract 20 was at first difficult to explain, in view of the generally excellent supervision of large public housing projects by the municipal housing authority. However, since most of the project dwellers have low incomes, they are likely to use the outpatient facilities of a hospital for

Table 5. Number and percent of accident victims and of home accidents reported by six hospitals, according to selected census tracts, Worcester Accident Survey, Worcester, Mass., July 1, 1957-June 30, 1958

Census tract No.	Population	Accident victims								Home accidents	
		Total		Outpatients		Inpatients		Not stated		Number	Percent
		Number	Percent	Number	Percent	Number	Percent	Number	Percent		
All Worcester-----	202, 612	15, 332	7. 50	13, 822	6. 8	1, 249	0. 61	261	0. 12	6, 780	3. 31
1-----	4, 360	270	6. 19	251	5. 75	19	0. 43	0	0	140	3. 21
4-----	4, 571	347	7. 59	317	6. 93	30	. 65	5	. 10	181	3. 95
9-----	7, 199	386	5. 30	349	4. 84	33	. 45	4	. 05	190	2. 63
13-----	6, 095	617	10. 10	546	8. 95	61	1. 00	10	. 16	251	4. 11
17-----	5, 967	435	7. 29	350	5. 86	77	1. 29	8	. 13	132	2. 21
20-----	6, 722	699	10. 40	653	9. 71	39	. 58	7	. 10	410	6. 09
23-----	8, 107	580	7. 15	543	6. 69	32	. 39	5	. 06	262	3. 23

Census tract 13, Worcester, Mass.



Neighborhood with no sidewalks, poor roadway, crowded dwellings



Large industry, parking lot not in full use, parking on roadway excessive



Main street—apartments and business area

the treatment of their children rather than to call a physician or to visit his office.

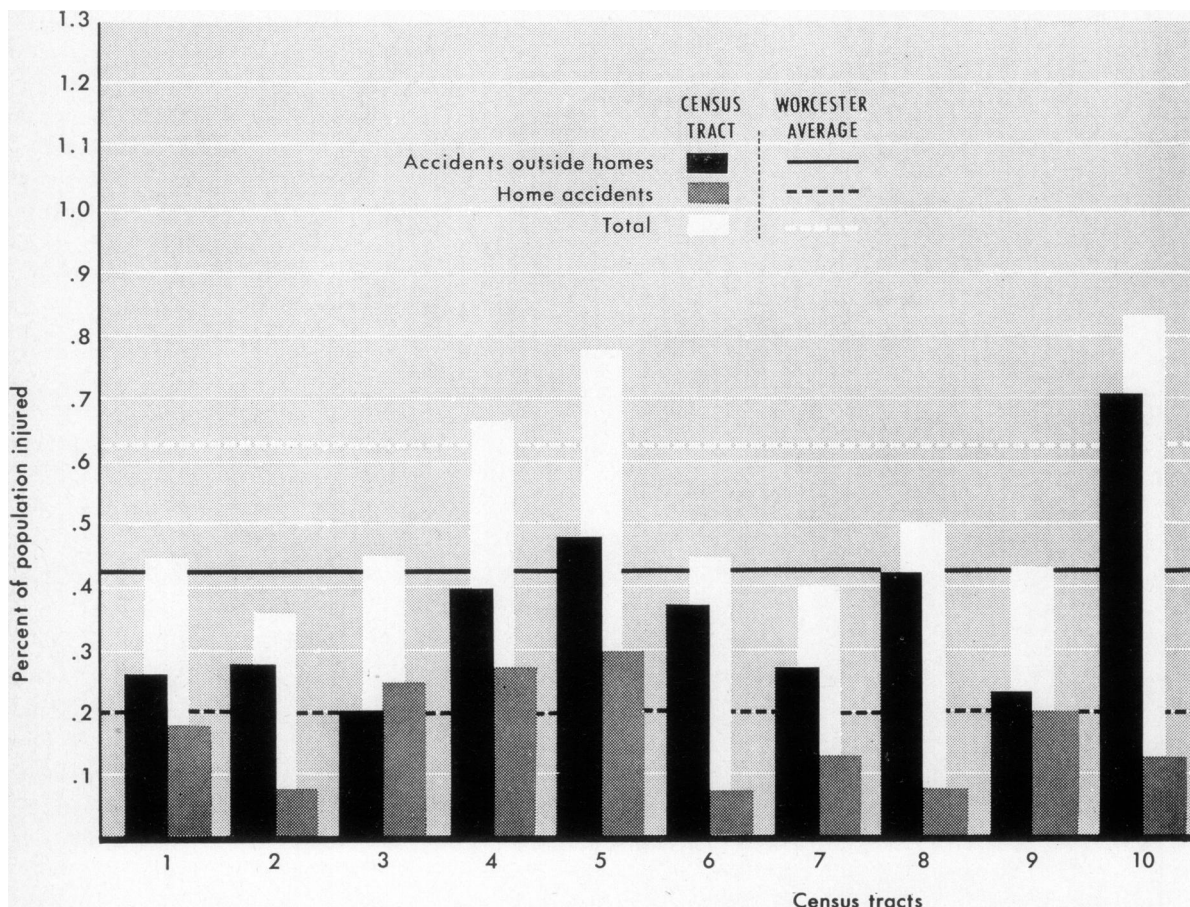
For this reason, the pattern of accident incidence for all census tracts was examined for inpatients only, on the theory that the more seriously injured, whether originally treated by a physician at his home or in his office or in the outpatient department of a hospital, would be admitted to the hospital for further treatment and care. When the charts of inpatients were examined, it was found that census tract 17, which is in the center of the city, adjacent to tract 13, had the greatest accident incidence. Of the inhabitants in this census tract, 1.29 percent were admitted to hospitals for injury during the study year, compared with 0.62 percent for Worcester as a whole. Figure 2 gives accident data for inpatients from census tracts 1-20 and an average for the city, broken down by total accidents, home accidents, and accidents outside the home. Census tract 21 is comprised of Worcester State hospital. In census tracts 22-31, the total accidents were fewer than the average for the entire city; in tracts 28-31, home accidents were slightly above the average.

Census tract 13, population 6,095, is made up of multifamily dwellings, large areas are occupied by industry, and business establishments front on the main street (see photographs). The only play area is University Park, at the extreme end of the tract. This tract had the second highest rate for all accidents and the second highest rate, 1.0 percent, for accidents to hospital inpatients. The rate for home accidents resulting in admission to the hospital was the highest observed.

Four students from a local college made a survey of census tract 13 as a study project, using a rough sampling method and a questionnaire. For comparison, census tract 4, a small tract with a relatively low accident rate, was also studied. This tract is an expanding residential area, with mainly single-family dwellings in the northern half and multifamily dwellings in the southern half, and with large areas used for business offices, parks, and schools. Its population is 4,571. In this tract, the inpatient accident rate was the lowest in the city, 0.27 percent.

This substudy of census tract 4 strongly sug-

Figure 2. Percentage of accidents in 1955 population, by census tracts,



gests that there is a real and possibly significant connection between the deteriorating, overcrowded conditions in census tract 13 and its high incidence of accidents, both in the home and in other places, when compared with census tract 4, with its relatively low accident incidence.

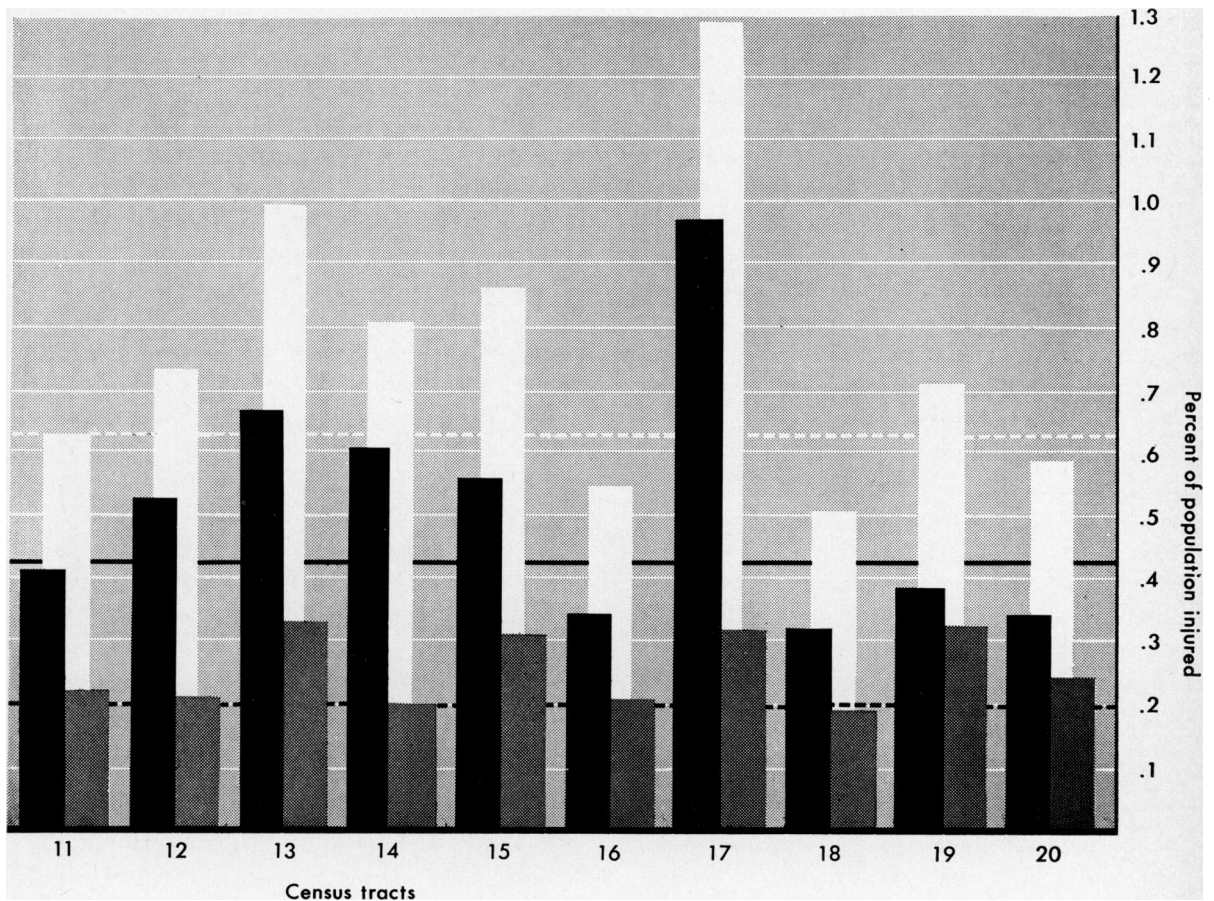
Discussion

Accidents, at least in the United States, "rank above disease as the chief cause of death and disability to many segments of the population and cause a major threat to the well-being and health of the people" (1). Public health, with its approach to problem solving, should have a most significant role to play in accident prevention. The same public health techniques can be applied to accident prevention as to other health problems. Much research in the field is going on in various centers and under

various sponsorships (2-9), but there are still many gaps in our knowledge. For example, how accurate is our information on the extensiveness of the overall accident problem?

The finding of over 20,000 hospital-treated accident cases in the Worcester area indicates that the problem is indeed an extensive one. This figure of course takes no account of the accident cases treated by a physician in his office or of those either treated at home by a physician or by a member of the victim's household without professional help. Although a great majority of accidents result in only minor injuries, every accident is potentially serious. Therefore, there is need for further research into the problem, both in toto and segmentally. The comparative severity of accidents and the number of fatalities from accidents have been discussed (10-18). The measure of the severity of injury was the degree of danger to the

inpatients of six hospitals, Worcester Accident Survey, Worcester, Mass., 1957-58



life of the victim, not the degree of severity of the injury per se. A badly crushed hand might be a severe injury, yet danger to life might be negligible.

Results of injuries sustained in accidents vary in relation to the age of the victim. There are many factors—physical, environmental, and psychological—to be taken into account (5-7, 17,18). For example, football, which results in the greatest number of accidental injuries, some of them serious, among youths, should always be played under strict supervision and control, and players should wear appropriate protective equipment. In Worcester, since the termination of the accident survey, backyard football has resulted in one death: a boy was injured on the head. He was not wearing any protective gear and he had no supervision.

Accidents affect proportionately more or fewer individuals at various age levels. In

childhood, accidents, are the leading cause of death in the Nation. But after 34 years of age, they rank second, third, fourth, or fifth in each 10-year age group (11).

Worcester had a fairly adequate traffic enforcement program, resulting in an improved accident experience. On-the-job accidents are numerous, according to the survey findings, but their incidence appears to be highest in small shops. Home accidents rank highest of all designated classes of accidents. There is a fertile field here for intensive and comprehensive accident prevention programs.

The distinctly higher accident rate found in deteriorating, overcrowded neighborhoods in Worcester has been observed elsewhere. In Baltimore, in a study on the effect of housing on health (19, 20), it was noted that “accidents were one-third lower in the housing project as compared with the slums.” In Worcester,

results of preliminary census tract studies suggested a similar correlation between slums and high accident rates. The need for parents and communities to provide more supervision of the young while playing is clear. At the community level, there is need for better provision of adequately supervised play areas available to residents as near their homes as possible. Playing on streets and busy thoroughfares should be discouraged.

Some unusual accidents were reported, such as accidents to operators of high-speed craft on water and to swimmers by propeller shafts. Accidents caused by implements such as power mowers are also noteworthy.

During the accident survey, the Worcester Department of Public Health provided frequent releases to the press and to radio stations, and these are being continued. The most significant result of the survey, however, has been the permanent system of reporting accidents set up by the Worcester hospitals. These reports cover accidents to inpatients only. They are sent to and are tabulated in the health department.

During the first year following completion of the survey, the participating hospitals sent to the health department reports of accidents to outpatients. However, because of the monumental amount of work involved, these were dropped at the end of the year. Study of these outpatient reports suggests that there has been a distinct and perhaps significant drop in poisoning cases since the end of the study year, but this trend will have to be observed further before definite conclusions can be drawn. The considerable publicity given to the accident survey may have contributed to this trend. Health education efforts obviously must continue indefinitely.

Accident prevention is a vital program, in which the physician, the hospital, and the health department each has a distinct role to play. However, they must first accept this responsibility. In Worcester, this responsibility is beginning to be shouldered, but there is still no reason for complacency.

Summary and Conclusions

Results of the Worcester Accident Survey conducted July 1, 1957–June 30, 1958, indicate

that the city's accident problem is a massive one. Although some details are not unexpected, the findings indicate that many factors must be considered before meaningful accident prevention programs can be carried out. The relationship of deteriorating properties and neighborhoods to the accident problem is clear and is probably significant.

The health department's role in accident prevention, like that of other public enforcement agencies, would appear to be at least twofold: (a) enforcement of pertinent codes, such as housing standards; and (b) education of the public, segmentally and at large.

In Worcester, the number of on-the-job accidents found by the survey was higher than expected. There is need for enforcement agencies to work with local industries, particularly with small shops employing 100 or fewer workers, to help them do a better job of accident prevention. The insurance industry also has a role to play here. The services of specially trained sanitarians hired by the health department to act as advisers to these small shops might be used to supplement the work of agencies such as the Massachusetts Department of Labor and Industries.

Perhaps the most significant single fact brought out by the Worcester survey is the need for parents of very small children to prevent tiny hands from reaching dangerous materials, such as household poisons. It is even more important for parents to see that children are supervised at all times while playing. Older children, when taking part in organized sports, should be provided with appropriate play areas and equipment and should be under supervision and firm adult leadership at all times.

The health department has a particularly significant role to play in preventing accidents, particularly home accidents, through education and through enforcement of pertinent codes. However, all agencies which have any part in accident prevention should work together.

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Infant Deaths From Coxsackie B Infection

Coxsackie B virus infection caused heart damage fatal to five St. Louis infants during a 2-month period in the fall of 1960. Dr. Robert E. Fechner and Dr. Margaret E. Smith, pathologists at the Washington University School of Medicine in St. Louis, reported on the epidemic at the annual meeting of the American Association of Pathologists and Bacteriologists in Chicago on April 27, 1961.

The infants were delivered in four different hospitals. They died 1 to 5 days after onset of symptoms which included respiratory distress, lack of appetite, and lethargy. Autopsies showed severe inflammation and extensive necrosis of the heart muscle, and also a less severe encephalomyelitis.

Dr. Fechner said that diseases attributed to Coxsackie viruses frequently occur as epidemics but usually are not fatal except in infants.