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3-A

POW!
ZAP!



BIFF!

HELP SPARKY

FIGHT FIRE

15

FIRE SAFETY EDUCATION

Among the many measures that can be taken to reduce fire losses, perhaps none is more important than educating people about fire. Americans must be made aware of the magnitude of fire's toll and its threat to them personally. They must know how to minimize the risk of fire in their daily surroundings. They must know how to cope with fire, quickly and effectively, once it has started. Public education about fire has been cited by many Commission witnesses and others as the single activity with the greatest potential for reducing losses.

In the Commission's poll of those who live daily with destructive fire-fire service personnel-98 percent of those who replied agreed that there is a need for greater education of the public in fire safety. Two-thirds agreed that most fires occur because of public apathy toward good fire prevention practices. (The larger the population served, the stronger was the tendency to be in agreement with this view.) To what extent apathy would be better labeled "ignorance" or merely "low priority concern" can only be guessed,

In the Commission's estimate, about 70 percent of the fires that occur in buildings can be attributed to the careless acts of people,' and together

these fires caused by human action account for more than \$800 million in property losses (Table 15-1). It is these fires that should be the special target of educational efforts designed to prevent them from happening.

The prevention of fires due to human carelessness is not all that fire safety education can hope to accomplish. Many fires caused by faulty equipment rather than carelessness could be prevented if people were training to recognize hazards. And many injuries and deaths could be prevented if people knew how to react to a fire, whatever its cause.

As one writer has summed up the problem, "A significant factor contributing to the cause and spread of fire is human failure-failure to recognize hazards and take adequate preventive measures, failure to act intelligently at the outbreak of the fire, failure to take action which would limit damage."² These failures cannot be

¹ The Commission's estimate is at variance with other estimates, but all such efforts involve approximations, if only because a large number of building fires are reported in which the cause is unknown.

² Deuel Richardson, "The Public and Fire Protection," *NFPA Quarterly*, July 1962, p. 4.

Table 15-I. Estimated Percentage of Building Fires and Losses Attributable to Human Action

Cause	(1) Percent attributed to human action	(2) Number of fires ¹	(3) Number of fires attributed to human action (Col. 1X2)	(4) Property loss ¹	(5) Property loss attributed to human action (Cal. 1X4)
Heating and cooking equipment....	75	157,700	118,275	\$172,895,030	\$129,671,250
Smoking and matches.....	100	118,400	118,400	98,344,000	98,344,000
Electrical.....	50	160,900	80,450	271,269,000	135,634,500
Rubbish, ignition source unknown...	75	34,400	25,800	21,754,000	16,315,500
Flammable liquid fires.....	75	64,900	48,675	53,931,000	40,448,250
Open flames and sparks.....	75	74,100	55,575	100,156,000	75,117,000
Lightning.....	0	22,200	—	40,335,000	—
Children and matches.....	100	70,400	70,400	72,285,000	72,285,000
Exposure (to another fire).....	0	23,200	—	42,148,000	—
Incendiary (suspicious).....	100	72,100	72,100	232,947,000	232,947,000
Spontaneous ignition.....	33	15,700	5,233	25,606,000	8,535,000
Gas fires and explosions (not reported elsewhere).....	50	8,200	4,100	21,074,000	10,537,000
Explosions (miscellaneous and unclassified).....	50	4,400	2,200	5,212,000	2,606,000
Totals		826,600	601,208 ²	\$1,158,046,000	\$822,440,500 ³

¹ Loss data from "Fires and Fire Losses Classified," *Fire Journal*, September, 1972 (pp. 65-69). Data in this table exclude two categories where human action cannot be estimated (i.e.: "Unknown or Unidentified" and "Miscellaneous Known"). -

² 72.8 percent.

³ 71.2 percent.

legislated out of existence; they must be dealt with through education.

Day in and day out, firefighters see the evidence of human failure. They see pennies in fuse boxes and 30-ampere fuses where 15-ampere fuses ought to be. They see the tragic consequences of trash or flammable liquids stored near furnaces, overloaded electrical circuits, gas heaters improperly vented. They find the victims of fire who have died in their sleep because they failed to take the routine precaution of always sleeping with bedroom doors closed. And when they can get to them, they find the charred bodies of those who took a fatal gamble with fire: who opened a hot door, who dashed through smoke instead of crawling along the floor, who might have survived the gauntlet if they had held a wet cloth over nose and mouth. Organizations like the National Fire Protection Association and the National Safety Council have based their fire safety messages on these common failings (see box, page 115). Firefighters and others have brought these messages into the homes and classrooms of

America. And still, thousands of Americans die needlessly every year.

Public Education Reduces Deaths and Injuries

A cynic might remark that this widespread ignorance shows that Fire Prevention Week, school programs in fire safety, and all the posters and pamphlets on fire prevention are wasted efforts. Yet we do not know how much worse the Nation's fire record would be if there were no educational efforts. Moreover, we do know that public education programs can dramatically reduce fire losses. Two studies supported by the Bureau of Community Environmental Management, an arm of the Department of Health, Education, and Welfare, provide evidence of this. Though small in scope, the studies are among the few in which results of fire prevention efforts have been measured.

Between 1966 and 1969, an intensive fire safety education program was directed at an area of southeast Missouri where the fire death rate was far higher than the national average. The

first step was to study the pattern of fires and burn injuries and their causes. Then a field staff was trained to administer the program, Civic groups, fire departments, local officials, and the mass media cooperated with the program. The public got fire safety messages every way they turned-from audiovisual demonstrations, educational programs, and media broadcasts. The result: The fire death rate dropped 43 percent in 3 years-from 12.9 to 7.4 per 100,000 population. For each dollar invested in the program, 20 dollars were saved in anticipated property losses, medical expenses, and earning losses. Two years after the pilot program was terminated, the death rate was still falling-five times faster than that of the rest of the State.

A similar study had been carried out 8 years earlier in Mississippi County, Arkansas. There, studies showed that misuse of electrical wiring systems and petroleum products, plus use and storage of flammable products near heating units, led other causes of fire. The public education program emphasized these problems. Following the first year of the education program, there were only half as many burn injuries requiring medical treatment as the year before. This favorable trend continued during ensuing years.

A number of incidents in recent years have demonstrated that when people have fire safety on their minds, fires decrease in number. In each incident, people were fire-conscious because they knew normal fire protection was not available to them. It happened in a midwestern city when a severe snowstorm immobilized all traffic, including fire trucks. It happened in several American cities in the late 1960's when fire departments were tied up in riot-torn areas. It has happened when fire departments have been battling landslides or coping with floods. In each case, the number of fires dwindled to a fraction of the normal.

A striking example of long-term success in fire safety education is the Smokey Bear campaign. That effort, supported by Federal and State forest agencies, has been described as the country's most successful program of environmental protection.

For 30 years public service advertising has urged Americans to prevent forest fires. During these years man-caused forest fires have been re-

duced from about 200,000 annually to about 105,000 in 1971. This reduction was achieved even though the land area for which statistics are kept has doubled and the number of days of recreation use has increased about tenfold. A doubling of the acreage alone would be expected to have resulted in 400,000 fires annually, but, as indicated, only 105,000 occurred. This overall reduction by 75 percent in the number of fires which would otherwise be expected to occur (assuming that the increased exposure to people leads in equal measure to chance of fire and the chance of early detection) has helped save \$17 billion in natural resources over the 30-year period. The cost of this program to Federal and State agencies is about \$488,000 per year, with approximately \$40 million in service donated by the Nation's radio and television stations, newspapers, magazines, and the Advertising Council,

Current Efforts to Reach the Public

Though we as a Nation have not made the commitment to fire safety education that we ought, a number of efforts-by professional societies, the insurance industry, fire departments and other governmental agencies-are reaching some portion of the American people effectively.

Private organizations. Through posters and pamphlets (17 million distributed last year), the National Fire Protection Association brings a fire safety message to millions of Americans every year. The National Fire Protection Association is instrumental in promoting the annual Fire Prevention Week campaign, the Sparky the Fire Dog campaign in schools, and seasonal fire prevention campaigns in the spring and at Christmas.

The American Insurance Association annually distributes more than 26 million pamphlets to schools, hospitals, and other organizations. Its films reach an audience of more than two million people each year. Through the special training it provides to thousands of fire inspectors working for insurance companies, the American Insurance Association has an indirect but considerable effect on public education.

Insurers in the industrial and commercial sectors, notably the Factory Mutual System and the Factory Insurance Association, affect the safety of millions of Americans at their places of work, through counsel on fire prevention engineering,



Sparky the Fire Dog, a creation of the National Fire Protection Association, teaches fire safety to children.

inspections, and distribution of publications, films, and posters.

In addition, a number of insurance companies reach the public with fire safety messages. Pilot efforts have been made to teach fire safety in deteriorated neighborhoods where the Fair Access to Insurance Requirements (FAIR) plan is in operation. (Under the FAIR plan, subject to the Federal Insurance Administration, companies agree to insure properties that would not qualify under ordinary requirements.) Limited experience has shown that the efforts work only if support is won from local community leaders.

Lastly, the Fire Equipment Manufacturers Association distributes about 200,000 fire extinguisher selection charts and several million extinguisher operation manuals every year.

The Federal Government. With the very contrasting exception of the Forest Service's Smokey Bear program, the Federal Government is involved in only a limited way in fire safety educa-

tion-except as it affects Government installations. Each Federal agency has responsibility for internal fire prevention. There is a Federal Fire Council that pulls together Federal fire-loss statistics, serves as a clearinghouse and central library of fire literature for the Federal agencies, and sponsors a limited program of fire safety training for Government personnel. Unfortunately, the activities of the Federal Fire Council have been extremely limited in recent years. There is no program in the Federal Government directed toward the public at large to prevent fire losses.

Fire departments. Local fire departments make significant contributions to public education--through inspections of dwellings and commercial establishments, through distribution of reading material on fire safety, and through cooperation with schools.

In sum, a variety of ways are being tried to heighten public consciousness of fire safety. The very fact that the educational efforts come from a

multiplicity of sources in a variety of ways probably serves to heighten public awareness of fire safety. Yet it is safe to assume, given the sheer number of efforts, that some programs are far less effective than others. What is needed is a mechanism for evaluating these programs so that weak efforts can be replaced by coordinated support of efforts of proven effectiveness.

Fire Safety Education in the Schools

Habits of fire safety are best instilled during the years of childhood, especially since youngsters are particularly prone to fire accidents. That fire safety education in schools can be effective is illustrated by a pilot study supported by the Bureau of Community Environmental Management of HEW.

In 1971, a demonstration project was begun in Memphis, Tenn., to determine the effectiveness of teaching safety concepts to young school children. Forty-three elementary school teachers attended a 22-hour series of workshops on an injury control curriculum. Emphasis was placed on teaching burn prevention concepts. The teachers returned to their classes and taught what they had learned to 1,016 children, ranging from kindergarten to the third grade. In the study area, burn injuries have decreased by 17 percent, while in a control area with similar population, burn injuries have increased by 100 percent. Because of the success of the pilot project, safety education is now being taught to all elementary school children in the Memphis school system.

How do other schools measure up? In an attempt to learn how much fire safety education in schools is required throughout the Nation, we wrote to the board of education in each of the 50 States, asking about programs in fire safety. Forty-two States replied to our request. Of these, seven reported that they have no State program of fire education. Four of these—Arkansas, Kansas, Tennessee, and Alaska (which has the highest fire fatality and personal loss record in the Nation)—expressed interest in starting a fire education program and asked the Commission's help. It seems safe to assume that the eight that did not reply have no program.

Among the States requiring fire safety education, Iowa, Minnesota, and New York appear to have the most complete curricula in the field.

New York law calls for 15 minutes of fire education a week in all grades, kindergarten through ninth grade (over and above time spent on fire drills), while Minnesota requires 60 minutes a week of health and fire education. While some States do have legal requirements and well developed curricula, conversations with State officials reveal that implementation of these programs is not well enforced or programs are non-existent in many schools. One State teaches the dangers of ammunition, homemade bombs, and fireworks in the second grade but does not get around to the subject of matches until the third grade.

We need to point out that the absence of a statewide fire education program does not necessarily mean that there is no fire education in the State. Local school boards, fire departments, or other groups may be filling the void—at least in part. Some communities have exemplary programs. In Santa Ana, Calif., a city of 165,000 people, an imaginative program in the classrooms is supplemented by demonstrations by the fire department, a parade at the end of Fire Prevention Week, a poster contest, and a carnival for schoolchildren in May. Civic groups are as deeply involved in the program as the schools and the fire department.

But the Santa Anas are the exception, not the rule. The Nation's widespread ignorance about fire safety and the failure of many States to provide even minimal education in the subject underscore the need for Federal intervention. **The Commission recommends that the Department of Health, Education, and Welfare include in accreditation standards fire safety education in the schools throughout the school year. Only schools presenting an effective fire safety education program should be eligible for any Federal financial assistance.**

Because fire safety has been ignored in the education of teachers, there are few educators with the knowledge or qualifications to teach it. **The Commission recommends that the proposed United States Fire Administration sponsor fire safety education courses for educators to provide a teaching cadre for fire safety education.**

The Commission recommends to the States the inclusion of fire safety education in programs educating future teachers and the requirement of



As a prelude to teaching fire safety to children, many fire departments demonstrate their apparatus for them.

knowledge of fire safety as a prerequisite for teaching certification.

Our concern over the lack of public education, and particularly education of the young, is by no means new. In fact, it was expressed a quarter of a century ago by the 1947 President's Conference on Fire Prevention, many of whose recommendations, unfortunately, remain to be implemented.

That the Federal Government shows more interest in protecting its trees than its citizens from fire merely reflects the long-standing indifference of Americans to the problem of fire losses. But the imbalance deserves to be rectified. While the National Fire Protection Association and others are doing significant work in fire safety education, the Nation is not realizing anywhere near the benefit of the potential loss reduction possible through fire safety education. The Commission believes that a significant increase in effort is necessary and that this will only come about by the involvement of the Federal Government.

The Commission recommends that the proposed U.S. Fire Administration develop a program, with adequate funding, to assist, augment, and evaluate existing public and private fire safety education efforts. The program should be directed, first of all, toward encouraging local governments and the private sector to do more, reinforcing efforts with incentives when necessary. Secondly, it should seek effective ways to reach critical target areas where special educational efforts are warranted, such as young children and the vast numbers of the poor whose education is limited. Thirdly, it should develop model programs and guide local governments in their adaptation to local circumstances.

Further, **the Commission recommends that the proposed U.S. Fire Administration, in conjunction with the Advertising Council and the National Fire Protection Association, sponsor an all-media campaign of public service advertising designed to promote public awareness of fire safety.** In developing this campaign, the U.S. Fire Administration should provide for test marketing, evaluation, and periodic revision of the messages. Major emphasis should be placed on fire prevention in the home. This campaign should include national and regional efforts by all communications media directed toward specific fire-prone groups, such as the young and the

elderly. The campaign should cover seasonal fire hazards, and should be geared through language, background, and program timing to the important recipients. Mass media education should not only create an awareness of fire hazards and fire safety, but should provide specific instruction on what to do and what not to do and motivate changes in attitudes and behavior.

Evaluation is an especially important phase of the recommended programs. Effectiveness of fire safety messages is best not left to guesswork. The best techniques of persuasion (admittedly, a field undeveloped as a science) must go into the message; the most exacting standards of testing must go into the evaluation of results. The latter is true whether results are being measured in terms of attitude changes, elimination of hazards, or decline in fire accidents. In all such testing, results should be compared with a control group, consisting of a similar population, that has not received the fire safety message. It would be appropriate for the U.S. Fire Administration to assist non-profit organizations, such as the National Fire Protection Association, in evaluating their efforts in fire safety education. It would also be appropriate for the U.S. Fire Administration to underwrite basic studies of techniques for motivating target audiences.

Special Opportunities

While it is premature to say what techniques work best, two pilot projects sponsored by the Department of Health, Education, and Welfare suggest approaches that could be adopted on a much wider scale. The first of these was tried in Norfolk, Va., in 1969. Specially trained paraprofessionals, called Injury Control Technicians, went from house to house in the target area in the company of housing-hygiene inspectors. The technicians acted as home environment counselors to help residents of the area identify injury hazards and, where possible, eliminate them. (All kinds of hazards were pertinent, but fire hazards were a major consideration.) The advice of the technicians was welcomed by the residents and, as a result, an average of five important hazards per household were eliminated.

In the second project, now in its fifth year, 500 specially trained paraprofessionals, called Health Educator Aides, are working in 36 cities. Re-

cruited mostly from the poor neighborhoods they serve, they have proven effective in reaching the poor and altering their behavior for their own good. While most of their work has been in rodent control, HEW's Bureau of Community Environmental Management is confident H.E.A.'s could be used to improve fire safety in poor neighborhoods. If H.E.A.'s spent 10 percent of their time on fire safety, as the Bureau recommends, it would cost \$14.6 million to bring fire safety education to the Nation's 15 million disadvantaged families. The Bureau estimates that if the program reduced fire losses among this population by only 2.6 percent, the expenditure would be economically justified, but that a reduction of 10 percent is easily attainable.

In addition to health aides, there are a number of other Americans in occupations where, if they had special training in fire safety, they could favorably influence the safety of others:

- *Attendants in nursing homes, hospitals, and institutions for the handicapped* should have special training to handle their difficult responsibilities during fire emergencies. Evacuation is usually a slow process and, with certain patients, sometimes impossible; and emergencies can be compounded by irrational behavior of patients.
- *Employees of restaurants, hotels, and places of public assembly* should be trained to lead patrons to exits, to extinguish small fires, and to render first aid.
- *Physicians* are valued counselors on a host of subjects ranging from nutrition to behavioral problems. Their advice on fire safety could be especially important to families with young children or elderly relatives in their care.
- Millions of preschool children spend part of their time under the care of *teachers and workers* in nursery schools, day care centers, and *Head Start programs*. In these contacts lie valuable opportunities for lessons in fire safety appropriate to the preschool age group.
- There are approximately 20,000 *resident managers* of major (150-330 units) federally assisted housing facilities for low-income families. Currently these managers are being offered training opportunities in such subjects as administration, management of physical facilities, and human and family relations by the feder-

ally funded National Center for Housing Management. If these resident managers had special training in fire safety, they could affect the well-being of 10 million Americans who live in these federally assisted housing projects.

These special situations merit special attention. **The Commission recommends that the proposed U.S. Fire Administration develop packets of educational materials appropriate to each occupational category that has special needs or opportunities in promoting fire safety.** In many instances, these packets could be distributed by professional organizations in the private sector on a shared-cost basis.

While Health Educator Aides and other paraprofessionals can supplement the residential inspection programs of fire departments by calling citizens' attention to hazards and sound practices of fire safety, they in no way diminish the need for thorough inspection programs by fire departments. Trained firefighters can bring to residential inspections an expertise exceeding that of paraprofessionals for whom fire safety is a part-time concern.

A National Program for Fire Safety Education

The Commission believes that an overall reduction of at least 2 percent per year in life loss, property loss, and injuries is a realistic and conservative goal for a national fire safety education program. We believe that the three-part program outlined in Table 15-2 will reach that goal in the early years of implementation, based on current fire loss statistics. We emphasize that parts of the program must be designed to provide feedback information on program effectiveness-information which is essential to achieving optimum benefit, yet is usually not collected.

Multimedia public service education. This nationwide program should be directed to the public at large through all forms possible, with an approach similar to the Smokey Bear campaign. The \$1.5 million annual cost is a realistic estimate, based on previous public service campaigns.

Intensive local education. This part of the program should be aimed at that 5 percent of the Nation's population in areas suffering the highest loss of life from fire: Alaska, several Southern States, and the poor sections of large

Table 1-52. Estimated Annual Savings and Costs of a Fire Safety Education Program

Program	Estimated savings			Estimated Federal cost
	Lives	Injuries	Property	
Nationwide multimedia public service education program..	120	3,000	\$27,000,000	\$1,500,000
Intensive local education programs (directed to 5 percent of Nation's population with highest life loss risks).....	76	1,900	4,300,000	2,100,000
Nationwide elementary schoolchild education.....	66	1,600	8,700,000	6,000,000
Total.....	262	6,500	\$40,000,000	\$9,600,000

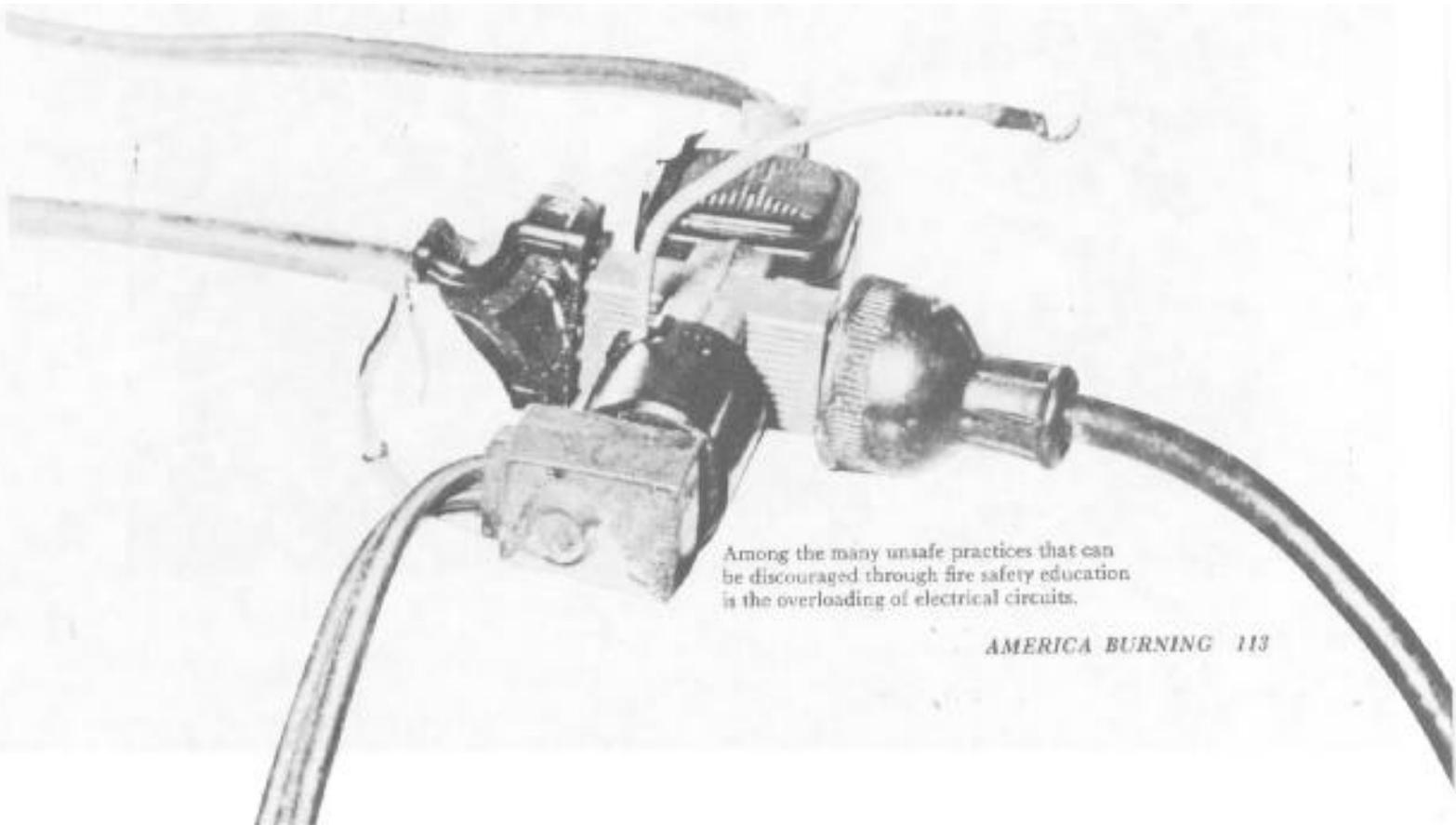
cities. Various pilot projects have achieved significant reductions of fire incidence and burn injuries and deaths. The Arkansas pilot project mentioned earlier achieved a 50 percent reduction in burn injuries, while the one in Missouri resulted in a 14 percent reduction per year in fire deaths. The volunteer fire department of East Aurora, N.Y., reported a 28 percent reduction in the number of fires and a 52 percent reduction in dollar losses, achieved through a public education campaign. In Rochester, N.Y., spot announcements on television during station breaks contributed to a 15 percent annual reduction in smoking-related fires and an 18 percent annual reduction in fires caused by children and matches.

Cost-effectiveness as high as 20 to 1—that is, \$20 saved in losses prevented for every dollar spent on education—has been reported. Where

volunteers are used or the media donate space or time, cost-benefit ratios can be even higher.

Past experience shows that the 760 lives lost in the high risk 5 percent of our population could be reduced by 10 percent year year. An investment of \$2.1 million each year to reach this segment of the population could be expected to reduce fire injuries by 1,900 and property losses by \$4.3 million annually.

Education of children in schools. Continuous education of children of elementary school age can, we believe, result in an annual 10 percent reduction in deaths and injuries within that group and an equal reduction in child-caused fires, especially those involving children and matches. We have estimated that for an annual cost of \$6 million, specialized training can be provided for a corps of fire safety educators, including both



Among the many unsafe practices that can be discouraged through fire safety education is the overloading of electrical circuits.

teachers and firefighters. While the payoffs from these expenditures will not be especially high in the beginning, the attitudes and habits instilled should last a lifetime, thus having a cumulatively greater effect in future years.

The projected program should result in an annual saving of at least 260 lives, 6,500 injuries, and \$40 million in property at an annual cost of

\$9.6 million: a cost-benefit ratio for property of four dollars return for every dollar invested, not to mention the incalculable savings in lives and injuries.

We recognize that not everyone will respond to or even be reached by public education, but we firmly believe that it can contribute significantly to reduction of fire losses.



Educational efforts must be made to reach those especially prone to fire accidents, such as the poor in cities

FIRE'S DO'S AND DON'T'S

Educational materials distributed by the National Fire Protection Association, the National Safety Council, the American Insurance Association, and others emphasize the major gaps in everyday knowledge and practice:

Before the Fire Starts

- Remove trash and stored items of outlived usefulness, particularly from the vicinity of furnaces and heaters and from hallways and exit areas.
- Exercise care in the use of electricity. Do not overload electrical outlets with many appliances, use only appropriate fuses, and do not hang electrical cords over nails or run under carpets. Have cords replaced when they begin to fray or crack, and have electrical work done by competent electricians.
- Do not store gasoline or flammable cleaners in glass containers, which can break, and avoid storing them inside the home. Do not keep more flammable liquids on hand than you really need.
- To avoid the danger of spontaneous ignition, dispose of rags wet with oil, polishes, or other flammable liquids in outdoor garbage cans.
- Inspect your home and workplace often for these and other hazards.
- Plan for escape from every area of the home, discuss escape routes with your family, and actually rehearse escape. Look for exits upon entering restaurants, theaters, and other public buildings. You might have to find your way out in thick smoke or darkness.
- Sleep with bedroom doors closed. In the event of a fire, you will gain precious minutes to escape.
- Learn how to extinguish common fires in early stages the best way. Roll a person whose clothing is on fire; use a proper portable extinguisher or even a handful of baking soda to extinguish a fire on your stove.
- Clothing afire is a prelude to tragedy. Buy

garments, such as children's sleepwear, that meet Federal flammability standards as they become available. Do not wear (or permit children to wear) loose, frilly garments if there is any chance at all of accidental contact with a stove burner or other source of fire.

- Exercise extreme care with smoking materials and matches, major causes of destructive fire. Do not leave these where children can reach them.
- Invest in fire extinguishers, escape ladders, and-most important-early warning (smoke or products-of-combustion) fire detector and alarm devices.

After a Fire Starts

- If you see, smell, or hear any hint of fire, evacuate the family immediately, but don't compound tragedy by attempting a rescue through a gauntlet of flames or thick smoke. Call the fire department as soon as possible. Don't attempt to extinguish a fire unless it is confined to a small area and your extinguishing equipment is equal to the task.
- If your clothing ignites, roll over and over on the ground or the floor. Running will just fan the flames. Teach the proper procedure to your children.
- Before opening your door when you suspect fire in another part of the building-as in a hotel, for example-feel the inside of the door with the palm of your hand. If it's hot, don't open it. Summon aid, if possible, and go to a window and await rescue. If smoke is pouring 'into the room under the door, stuff bedding or clothing into the crack.
- In smoke, keep low. Gases, smoke, and air heated by fire rise, and the safest area is at the floor. Cover mouth and nose with a damp cloth, if possible. Don't assume that clear air in a fire situation is safe. It could contain carbon monoxide, which, before it kills you, affects judgment, hampering escape.



16

FIRE SAFETY FOR THE HOME

Of the 8,000 Americans who die in building fires every year, nine out of ten die at home. Firefighters find their bodies beyond the wall of fire or smoke that blocks escape, sometimes only a few feet from a window or door. But often, too, they are found where they slept: Smoke and toxic gases never gave them a chance.

The nearly 700,000 fires that occur in American homes annually produce losses exceeding \$874 million. That figure tells only part of the story. In addition to structural damage, the losses include personal possessions—often acquired after years of work and saving, often objects of sentimental attachment whose value cannot be described in dollar figures.

The losses will grow. Presently there are about 68 million occupied dwelling units in the United States, and new units are being added at the rate of 2 million a year. Considering this growth and taking into account the demolition of old units, we can project annual property losses from residence fires approaching \$1 billion by 1980—unless major steps are taken to combat the problem.

Residence fires are not a simple problem but a welter of interacting factors. Combustible interior finishes and furnishings, flammable clothing, and poor interior design from the standpoint of fire

safety contribute to the heavy toll. The ignorance, confusion, or panic in people's response to fire helps to account for the fatalities. So does the lack of even elementary precautions, such as never smoking in bed and never leaving children home alone. So, too, does the lack of positive steps, such as installing early-warning fire detectors or extinguishing devices and rehearsing with the family various escape plans.

Fire Awareness in the Home

In Chapter 15 we recommended a concerted national effort in fire safety education, including a multiple-media public service advertising campaign. Obviously a major emphasis in this broad-based effort should be fire safety in the home. Americans must be educated to sound practices in the home to prevent fires from starting, and they must also be educated to react properly when a fire is discovered to save their lives and those of their families.

Thousands of Americans die needlessly because they react counterproductively when they discover a fire. Many waste precious minutes trying to put out a fire before awakening the family or calling the fire department. Others open hot doors, attempt a dash through thick smoke, or,

in confusion (or under the influence of a toxic gas), fail to think of the most obvious measures for escape.

The National Fire Protection Association and the Fire Marshals Association of North America have devised a program called Operation EDITH (Exit Drills In The Home). In a community that adopts Operation EDITH, well-publicized efforts are made to encourage families to devise-and rehearse-plans for getting the family out of the house in the event of a fire. The publicity often includes demonstration of such steps as installing escape ladders and, when a fire happens, covering the nose and mouth with a wet cloth and crawling along the floor to avoid smoke. **The Commission supports the Operation EDITH plan and recommends its acceptance and implementation both individually and community-wide.**

Dwelling Inspections by Fire Departments

Though regrettably few fire departments conduct adequate evaluations of their programs, some have reported as much as 15 to 30 percent reduction in dwelling fires or life loss as a result of undertaking a program of home inspections. In 1972, Baltimore reported a 47 percent decrease in dwelling fires and a 38 percent reduction in lives lost from the year before, and attributed a significant portion of these reductions to the city's dwelling inspection program. Not surprisingly, inspection programs appear to be most effective in neighborhoods where losses are ordinarily high.

Only a portion of the Nation's 27,500 fire departments conduct residential inspections. In the Commission's survey of fire departments, only 20 percent of the 10,000 respondents reported inspecting more than 10 percent of the residences in their community each year.

In addition to locating fire hazards in the home, residential inspections can serve to heighten citizens' awareness of fire's threat and to teach them life-saving precautions and emergency procedures. Inspections can promote respect for the fire department and underscore its interest in saving lives and minimizing losses. In addition, inspections can serve to attract new members to the fire service.

Most important, residential inspections-used as educational opportunities as well as for identi-

fying hazards-could save thousands of lives a year. **The Commission recommends that annual home inspections be undertaken by every fire department in the Nation. Further, Federal financial assistance to fire jurisdictions should be contingent upon their implementation of effective home fire inspection programs.** This recommendation is not meant to preclude Federal planning and implementation assistance to help fire jurisdictions undertake a program of residential inspections.

Small and volunteer fire departments that have manning problems, particularly during daytime hours, should be encouraged to use women volunteers as residential fire prevention inspectors. Cities that have health educator aides or other community workers in low-income neighborhoods (as described in Chapter 15) could utilize these workers to supplement the fire department's residential inspection program,

It is important that inspectors be carefully selected and trained. They must be able, not only to spot hazards, but to deal graciously and effectively with the public. In this regard, it would be appropriate for the proposed National Fire Academy to develop model curricula for the training of residential inspectors. Care must also be taken to assure citizens that the inspections are advisory only and limited to matters of fire safety. (Inspectors will not be welcomed into homes when they are suspected of searching for unlicensed dogs or housing code violations.)

To be successful, inspection programs must be evaluated. It is important for the Nation to know what kinds of inspection programs work and what kinds don't. At the very least, comparisons should be made between the 12 months' preceding a new inspection program and the first 12 months following, as well as between the last year of a program and the year after it is dropped.

Home Fire Detection

Most Americans who die in home fires die during the nighttime hours. Usually it is smoke, toxic gases, or lack of oxygen-not fire itself--that kills them.

In countless instances these lives would be saved if the victims were awakened to the presence of a fire in its early stages. There are on the market approved devices designed to detect smoke

or other products of combustion-not heat alone, which can be detected only in a fire's advanced stage-and sound an alarm. In a Canadian study,¹ the investigators concluded that 41 percent of recent fire victims in Ontario could have been saved if their dwellings had been equipped with early-warning detectors. Extrapolated to the United States, this would be a saving of 2,600 lives every year.

¹ J. H. McGuire and B. E. Ruscoe, "The Value of a Fire Detector in the Home," Fire Study No. 9 of the *Division of Building Research, National Research Council*, Ottawa, December 1962.



In addition to locating fire hazards in the home, residential inspections can serve to heighten citizens' awareness of fire's threat.

The National Fire Protection Association, the Department of Housing and Urban Development, and the International Association of Fire Chiefs, among others, support the use of early-warning detectors in homes. Those who testified to this Commission on fire safety in the home were unanimous in favoring widespread use of early-warning detectors. At a minimum, most advocates feel, there should be an early-warning detector on the ceiling near each sleeping area in the house. Some believe a system of heat detectors is an adequate substitute, but only if there are many more of them located throughout the house. There is a consensus that only devices approved by nationally recognized testing laboratories, such as Underwriters' Laboratories or Factory Mutual Research Corporation, should be used. **The Commission urges Americans to protect themselves and their families by installing approved early-warning fire detectors and alarms in their homes.**

Fire departments should encourage the installation of approved early-warning fire detectors in the course of their residential inspections. In the course of subsequent inspections, they should then check to see that the devices are in working order.

Representatives of numerous insurance companies have expressed to the Commission the desire to increase their efforts to reduce life and property losses and injuries by fire. Encouraging Americans to provide fire protection in their homes would be a major contribution, and **the Commission recommends that the insurance industry develop incentives for policyholders to install approved early-warning fire detectors in their residences.**

There could also be tax incentives. **The Commission urges Congress to consider amending the Internal Revenue Code to permit reasonable deductions from income tax for the cost of installing approved detection and alarm systems in homes.** Such a provision would not only offer a financial incentive but would serve to draw public attention to the importance of fire safety in the home.

Public awareness of the value of early-warning fire detectors would be enhanced if, as we recommended in Chapter 11, all of the Nation's model codes would specify at least a single-station early-

warning detector outside sleeping areas in every dwelling unit.

Here and there fire detection systems have become legal requirements for residences. Since 1958, Quincy, Mass., has required fire detection and alarm devices in all new single-family dwellings. The Village of Bayside, Wis., has a similar ordinance, and also requires that occupants perform maintenance checks on the detection systems and report on a standard form to the chief of public safety annually or face a \$200 fine. In Ohio, the State fire code now requires a single-station fire detector in all new one-, two-, and three-family dwellings. At the Federal level, the Department of Housing and Urban Development requires early-warning fire detectors in multiple-family dwellings and care facilities, such as hospitals and nursing homes, insured or assisted by the Department. HUD recently extended the requirement to insured or assisted one- and two-family dwellings.

The 18,000 mobile homes that HUD provided to Pennsylvania's victims of Hurricane Agnes in 1972 were equipped with early-warning detectors and are serving as a testing ground for the devices. The National Bureau of Standards is collecting data on the experience with these detectors to evaluate their performance (including any tendency of causes other than fire to activate the alarm) and to aid in the development of installation and maintenance requirements.

Certainly the technology of early-warning detectors can be improved, and with a substantial market assured, the costs of these devices can be brought within the reach of low-income families. Manufacturers are working toward improvements in both directions, and their efforts are likely to accelerate when the devices "catch on." The National Aeronautics and Space Administration, the National Science Foundation, and the National Bureau of Standards are supporting work to improve the detectors. All of these efforts deserve coordination, and **the Commission recommends that the proposed United States Fire Administration monitor the progress of research and development on early-warning detection systems in both industry and Government and provide additional support for research and development where it is needed.** Long-term studies might investigate the possibility of coupling early-

warning detection with household commodities, such as electrical wiring or telephones, or with such commonly used objects as lamps or light bulbs.

In addition to on-premises detectors and alarms, another avenue of exploration is the coupling of fire detection with cable television. The Federal Communications Commission requires commercial suppliers of cable TV to provide the capability to transmit a signal "upstream" from the subscriber as well as "downstream" from the transmitter. Several cities, including Pensacola (Florida), Atlanta, and a suburb of Chicago, are experimenting with means of transmitting fire alarms automatically by cable to summon aid.

Automatic Fire Extinguishing Systems

Where early-warning detectors and automatic extinguishing systems are used in combination, the protection to lives and property is enhanced greatly over that afforded by detectors alone. Automatic sprinklers are expensive; while they are feasible for high-rise and other large buildings, they are too costly for installation in the average home. Research and development are needed toward automatic extinguishing systems that will be cheap, aesthetically acceptable, and adaptable to existing homes as well as new construction. **The Commission recommends that the Proposed U.S. Fire Administration support the development of the necessary technology for improved automatic extinguishing systems that would find ready acceptance by Americans in all kinds of dwelling units.**

Automatic extinguishing systems in residences would not only save lives and reduce direct losses from fire, but would also reduce other expenses to the Nation, such as the costs of treating burn and smoke injuries, insurance costs (both premiums and payouts), and the costs of maintaining fire departments. The developers of Disney World in Florida, who have installed sprinkler systems in residential buildings such as hotels and apartments (and smoke detectors in single-family dwellings), report that there have been savings in insurance rates and, just as important, savings in the costs of maintaining fire departments.

Protection of Mobile Homes

Mobile homes possess some special fire danger

EARLY-WARNING (SMOKE) AND HEAT DETECTORS



“Three types of fire detectors are most commonly used in this country. These are known by the generic terms as heat detectors, smoke detectors, and flame detectors. Only heat and smoke detectors appear to have application to the household fire detection system. Heat detectors may be of the type that sense temperature of the environment, rate of rise of the environment temperature, or combinations of these. Smoke detectors of two different types are available. Optical detectors are designed to sense the scattering of a light beam by smoke particles; combustion products detectors are designed to detect the presence of particulate products of combustion by electrical means. . . Each detector type has advantages and disadvantages associated with any particular application. . .

“In the late 1950’s, self-contained non-electrical fire alarm units were being sold door-to-door. A unit of this type consisted of a heat detector.... a horn or bell to sound the alarm, and a source of stored energy.... Because these units respond only to a temperature rise, they are intended for use in areas where a fire producing a great deal of heat is likely to occur, such as near a furnace, but they have also been employed throughout other rooms in a home. Hard sell techniques were employed in marketing these units. . . .

“In order to be of value in providing life safety, a fire detection system must make provision for detecting a small smoldering fire soon enough that alarm can be given and the building evacuated before untenable smoke conditions are reached. In addition, but of less relative importance, the fire detection system ought to be capable of early detection of rapidly developing hot fires.

“Smoke detectors of the photoelectric and ionization types provide means for detecting smoke from either type of fire; and the most critical factor in determining the speed of response is the location of the detector. Heat detectors, on the other hand, provide early warning of hot fires in their immediate area only. . . .

“The most favorable locations for smoke detectors which protect the bedroom area, either alone or in conjunction with detectors located throughout the house, depend of course on the building configuration. In general, the smoke detectors should be located so that smoke from any fire which originates outside of the bedroom area must pass over the smoke detector before entering the bedrooms.”

---From testimony to the Commission (Oct. 4, 1972) of William J. Christian, consulting engineer, Underwriters’ Laboratories, Inc.

characteristics. Among these are their small size, close proximity of heaters and kitchens to sleeping areas, the concentration of combustible materials, lack of adequate escape doors in many cases, and a higher combustibility of interior finishes than in most site-built homes. Mobile homes are the fastest-burning of all homes.

More than seven million Americans live in mobile homes, and mobile homes currently account for 95 percent of homes sold for under \$15,000. Mobile homes presently are being manufactured at a rate well exceeding 500,000 per year.

While the incidence of fire in mobile homes is about the same or less than in conventional homes, data indicate, results are often more serious when a fire occurs. The office of the State Fire Marshal of Oregon has compiled some of the most complete records available on fire losses in mobile homes. They have reported, from data covering the period 1965 through 1971:

- The ratio of fatalities per fire in mobile homes is 2.74 times greater than for standard dwellings;
- The loss-to-value ratio per fire in mobile homes is 3.84 times greater than standard dwellings;
- Average mobile home fire losses are greater than average losses in standard dwellings by a ratio of 1.62 to 1 (\$1,477 per fire average to \$909 average for standard dwellings).

A number of individuals and organizations have pursued improvements in mobile home safety. Congressman Lou Frey, Jr., of Florida, introduced in 1972 the first national mobile home safety act. Federal action to protect owners of mobile homes is justified, since the Federal Government buys mobile homes for disaster victims and other uses and, through the Federal Housing Administration, provides mortgage insurance for a limited but growing number of mobile homes.

In addition, the National Fire Protection Association has devised a standard, NFPA 501B, which has been approved by the American National Standards Institute for the design and construction of mobile homes to provide fire safety. This standard has been criticized as not stringent enough; for example, there are no interior finish requirements for molding, doors, trim, cabinets, and splash panels, all of which can contribute to the rapid spread of fire. Nor are early-warning fire detectors required. **The Commission recommends that the National Fire Protection Asso-**





Many deaths from fires in the home can be attributed to ignorance of how to react and escape when a fire happens.



One important measure for averting tragedy is to rehearse, with all members of the family, plans for escaping various kinds of fires.

ciation and the American National Standards Institute jointly review the Standard for Mobile Homes and seek to strengthen it, particularly in such areas as interior finish materials and fire detection.

The NFPA/ANSI standard is advisory only, and many State and local jurisdictions have failed to enact a code for mobile homes equivalent to that standard. **The Commission recommends that all political jurisdictions require compliance with NFPA/ANSI standard for mobile homes together with additional requirements for early-warning fire detectors and improved fire resistance of materials.** These requirements will be effective only if they are enforced adequately—through inspection both at the point of manufacture and the final site of each mobile home.

Because of zoning requirements, mobile home parks are frequently located outside of cities and, hence, far from fire departments and adequate water supplies. This means that the parks themselves must provide safeguards against destructive fire, as the National Fire Protection Association has recognized in its Standard on Mobile Home Parks (NFPA 501A). **The Commission recommends that State and local jurisdictions adopt the NFPA Standard on Mobile Home Parks as a minimum mode of protection for the residents of these parks.**

Citizens' Responsibilities

There are millions of Americans who invest heavily in chain locks and burglar alarms, who keep guns in their homes and under store counters to supplement the protection they get from police departments. Very few of these Americans have paused to consider the wisdom of providing their own fire protection.

Consistent with the prevailing American attitude toward fire protection in the home, the burden of protecting lives and property in residential fires is borne overwhelmingly by the public, in the form of fire departments. The inadequacy of this reliance is conveyed by a single word: time. It takes time to discover a fire, time to notify the fire department, time for the fire department to reach the scene, and time for firefighters to bring the fire under control. Every passing second weighs the odds more heavily in favor of the fire and against the victims.

The attitude of the Japanese, who for centuries built their homes of very flammable materials, contrasts sharply. There, a destructive fire disgraces the person who allows it to happen; once upon a time, it was sufficient cause for crucifixion. A Japanese proverb translates: "There is no one who fails to get excited when the neighbor's house is on fire." That is, distant troubles do not interest people; it is only when a problem comes close to home that they are willing to do something.

Before Americans will take the steps to protect themselves and their families, the threat of fire must be brought "close to home." Thus, a need underlying many others is to educate Americans to recognize the dangerous enemy they have in destructive fire.

If fire consciousness could be instilled in Americans, then one could envision the day when every American home will have its own automatic fire department: an alarm that rescues the family and automatically activates the extinguishers that put out the fire. Then thousands of lives would be saved every year, millions of dollars of the Nation's resources would be saved from ruin, hospitals could be emptied of beds for burn and smoke injury patients, fire departments could be pared to a fraction of their present size, and fire insurance might be as cheap as dog licenses.



Other measures for averting tragedy include using and storing flammable liquids away from potential sources of ignition.



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FIRE SAFETY FOR THE YOUNG, OLD, AND INFIRM

There are millions of Americans against whom fire holds heavy odds. These are people with limited capacities—the very young, the old, the physically and mentally handicapped. Lacking the ability to cope adequately with fire accidents, these Americans deserve protective watchfulness from their families—that is, when they are with their families. When they congregate with peers of similar disabilities, a fire accident can threaten many lives. The situation is ripe for major tragedies in nursery schools, day care centers, homes for the physically or mentally retarded, and homes for the elderly.

In many such institutions, a combination of built-in fire protection and attentive staff has kept fire accidents under control. But there are poignant exceptions. In February of 1972, six children died in an apartment in Chicago that had been licensed by the State of Illinois as a day care center. At the time of the fire, the operators of the day care center had won two delays of a court case involving code violations found by the Chicago building department. Many such programs for preschool children are not subject to strict building code requirements because they are located in private homes, churches, or other

buildings not designed for the purpose of child care.

The National Fire Protection Association has amended its Life Safety Code (NFPA 101) to govern construction, exit facilities, and fire detection systems in facilities for groups of preschool children in day care centers, group day care homes, and family day care homes. Included are provisions for early-warning fire detection devices where children sleep. The Department of Health, Education, and Welfare has urged the States to adopt these provisions as licensing requirements for these facilities. **The Commission strongly endorses these new provisions of the Life Safety Code for child day care centers and recommends that they be adopted and enforced immediately by all the States as a minimum requirement for licensing of such facilities.**

Among fire's victims, one large group stands out as a special and growing concern: the occupants of nursing homes and homes for the elderly. Annually, 3,500 to 4,000 fires break out in these facilities. During the 20 years from 1951 to 1970, 496 residents of facilities for the aged died in multiple-death fires (those killing three

or more). No one keeps a national record of single-fatality fires in nursing homes, but by conservative estimate the toll is 500 persons a year.

According to Government and industry estimates, about one million older Americans live in 23,000 nursing homes and other care facilities across the Nation. Most of these facilities are licensed by their respective States and hence may be regulated, to some degree, concerning fire safety. About 14,000 of these are subject to Federal certification (under Medicare and Medicaid programs) and must comply with the 1967 edition of the Life Safety Code of the National Fire Protection Association.

Perhaps another million elderly Americans live in "housing for the elderly" insured or assisted by the Department of Housing and Urban Development and thus subject to some fire safety requirements, though not as stringent as they could be.

Untold hundreds of thousands of older Americans live in nursing homes that are not State-regulated (usually because they dispense no nursing services) and in unregulated boarding houses, hotels, and other room-and-board facilities that cater mostly to the elderly.

Thus, fire protection for the elderly ranges from excellent to totally inadequate and, on balance, is far less than senior citizens deserve. It is a blemish on the American conscience that those who contributed to our prosperity are allowed to live their retiring years where even minimal fire safeguards are absent. The problem of fire safety in special housing for the elderly deserves attention, with growing urgency each passing day. The elderly population is expanding, as is the portion of Americans living out their years in nursing homes and housing for the elderly.' A stronger Federal role in attacking the problem is justified, since many homes for the elderly receive assistance from HUD or old age assistance payments.

Fire-resistive building construction, we should add, is not a panacea. In November of 1972, 10 people died of smoke inhalation in an Atlanta fire in a new 11-story apartment house that cost \$3.5 million to build. It appeared, in general, to

⁴The over-65 group is expected to increase 30 percent by 1985, while the total population will grow by only 18 percent. In the 6 years from 1963 to 1969, while the elderly population grew by 21 percent, the number in nursing homes increased by two-thirds.

meet the appropriate provisions of Atlanta's building code, the NFPA Life Safety Code, and the standards of the Department of Housing and Urban Development for housing for the elderly.

Moreover, many safeguards meant to avert multiple-death fires by limiting the spread of fire and smoke do not prevent the accidents that cause single deaths. Safeguard which only prevent multiple deaths cannot be considered adequate to the needs of the elderly.

It is not difficult to see why the elderly are especially prone to tragic fire accidents. Many lack the physical coordination to handle matches, cigarettes, or hot appliances safely. Others, mentally impaired or despondent, set fires deliberately. When a fire occurs, physical or mental impairment can hamper the chances of escape. As firefighters have discovered over and over, many elderly patients are reluctant to leave the room that houses their few worldly possessions. Compounding the problem of fires in nursing homes is the fact that many homes are sparsely staffed, especially during the nighttime hours.

Better Protection is Needed

The National Fire Protection Association recently revised the Life Safety Code and, in so doing, gave added attention to the problem of single-death fires. Stricter flammability requirements have been imposed on gowns, bedding, cubicle curtains, and draperies. Early-warning detectors are recommended requirements for all new nursing homes, hospitals, and other care facilities. In recognition that building alterations and extinguishing systems are expensive, the fire protection standard is flexible, permitting reduction in compartmentation requirements if automatic sprinklers are installed or deleting the sprinkler requirements where compartmentation standards are met in fire-resistive and protected non-combustible buildings.

The Department of Housing and Urban Development, too, has revised its standards for institutional and residential occupancies for the elderly, to require more extensive, yet not complete, coverage by automatic sprinklers and early-warning detectors.

State requirements vary widely. Since 1967, Massachusetts, which has some of the most stringent standards, has required that all new and

existing facilities for the aged (except those strictly providing housing for the elderly) be equipped with automatic sprinklers if they have three or more residents. On the other hand, there are seven States with no sprinkler requirements of any kind.

Reliable estimates place the cost of automatic sprinkler systems between \$0.65 and \$1.25 per square foot, depending on the difficulty of installation. While this is roughly similar to the

cost of carpeting, we recognize that the cost could be burdensome to many owners of facilities for the aged, particularly if the owners must also invest in early-warning detectors. Such facilities are an expanding need in our society, hence any increase in financial burdens must be carefully weighed against its possible effect of discouraging private enterprise to provide these facilities. Yet the fire safety of the elderly should



Lack of mobility or physical coordination compounds the problem of rescuing nursing home patients from a fire.

yield to no compromise. **The Commission recommends that early-warning detectors and total automatic sprinkler protection or other suitable automatic extinguishing systems be required in all facilities for the care and housing of the elderly.**

The recommendation applies to residences for the elderly as well as to care facilities. Some financial incentives may be necessary. Federally guaranteed low-interest loans, tax incentives such as accelerated depreciation and exclusion of fire extinguishing systems from tax assessments, reduced fire insurance premiums, and concessions in structural fire protection requirements would offer desirable inducements to builders and owners.

In putting forth this recommendation, the Commission recognizes that it exceeds standards of the NFPA Life Safety Code at a time when Federal agencies and many States still lag behind current provisions of the code. We believe the Federal agencies and States should be making every effort to keep up with changes in the NFPA standards. **The Commission recommends to the Federal agencies and the States that they establish mechanisms for annual review and rapid upgrading of their fire safety requirements for facilities for the aged and infirm, to a level no less stringent than the current NFPA Life Safety Code.**

It is appropriate to pause and note here that the recommendations we have thus far put forth in this chapter, and the ones that are to follow, could apply equally well to other kinds of facilities for the infirm and handicapped in our society. We have focused on nursing homes and housing for the elderly because these have been a major source of tragic fires. But other kinds of institutions, such as homes for the physically or mentally handicapped, have conditions very similar to those of facilities for the aged. Thus, it would be appropriate for Federal and State authorities also to review periodically the extent of coverage provided by their fire safety regulations—that is, to include various kinds of institutions for the handicapped as well as facilities for the elderly.

The limited capabilities of the physically handicapped and the elderly to escape from fire in institutions and public buildings need special attention. A deaf person cannot hear a fire alarm bell. A blind person cannot see an exit sign.

The crippled person in a wheelchair needs ready access to a safe refuge from fire that does not require the use of stairs or elevators. Audible and visual fire alarms, wide doorways, and ramps are some of the needs. **The Commission recommends that the special needs of the physically handicapped and elderly in institutions, special housing, and public buildings be incorporated into all fire safety standards and codes.**

No standards are useful, of course, if they are not enforced. **The Commission recommends that the States provide for periodic inspection of facilities for the aged and infirm, either by the State's fire marshal's office or by local fire departments, and also require approval of plans for new facilities and inspection by a designated authority during and after construction.**

Lowering the amount of combustibles in nursing homes—including interior finishes, furnishings, and fabrics—is a matter of utmost priority. Here the experience of the Veterans Administra-



Though set afire simultaneously, the flame-resistant pajamas burn far more slowly than standard cotton pajamas.

tion is instructive. The VA is furnishing every one of the 80,000 patients in its hospitals with pajamas made of a flame-resistant cloth. Eventually all bath robes will be of this material, and the VA is evaluating the material for possible use in bedding. While the fire-resistant material used is four times as expensive as cotton, it lasts 10 to 15 times longer. The garments have been readily accepted by patients; while the 1 percent of patients who are risks to themselves (most because of their smoking habits) are required to wear fire-resistant clothing, few of the others reject the garments.

Among the elderly in nursing homes, acceptance of uniform garments is less likely. Many have developed sentimental attachment to their own clothing and to the individuality it gives them. It would still be appropriate, however, to require fire-resistant clothing on patients prone to fire accidents. Other fabrics in nursing homes, such as bedding and draperies, should meet high standards of non-flammability, as should furnishings and interior finishes. **The Commission recommends that the National Bureau of Standards develop standards for the flammability of fabric materials commonly used in nursing homes with a view to providing the highest level of fire resistance compatible with the state-of-the-art and reasonable costs.**

Other measures can be taken to reduce the life losses from fires in nursing homes. Specially protected, supervised areas can be set aside for smokers. Smoking can be prohibited in bedrooms

unless an attendant is present.

State and local governments can regulate the location of nursing homes-prohibiting them at great distances from fire departments. They can require that alarm systems be tied directly and automatically to the local fire departments. **The Commission recommends that political subdivisions regulate the location of nursing homes and housing for the elderly and require that fire alarm systems be tied directly and automatically to the local fire department.**

The Department of Health, Education, and Welfare, and other governmental bodies which inspect Medicare and Medicaid institutions, can aid local fire departments by transmitting their findings relating to fire and life safety to the departments.

Finally, loss of life can be reduced through the education of staff, residents, and families of residents on fire safety. It is particularly important to train staff how to handle a fire emergency, and in Chapter 15 we recommended that the proposed United States Fire Administration develop training aids for just this purpose.

An incident that happened in Virginia several years ago underscores the importance of education for all who enter nursing home doors. After returning home from visiting an elderly relative, a man called the nursing home to confess that he had given forbidden matches to the relative. The call was too late. The patient had already burned to death.



Multiple-death tragedies could be averted if all nursing homes were required to have built-in fire protection.