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JOINT FIRE RESEARCH ORGANIZATION

**FIRES IN HOSPITALS, 1956**

by

Marion A. Weston,

Summary

A survey has been made of the 123 reports of fires in Hospitals and Homes received from Fire Brigades in the United Kingdom which were included in a one-in-four random sample of all reports received for 1956. The causes of most of the fires were not peculiar to hospitals, but were similar to those of fires in dwellings. Most of the fires did not cause serious damage and about 40 per cent of them were extinguished by hospital staff without fire brigade assistance. Two fatal and 1 non-fatal casualties occurred and no rescues or escapes from fire were necessary.

An appendix describing some fires of interest in Hospitals and Homes has been added.

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## FIRES IN HOSPITALS, 1956

by

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### INTRODUCTION

Each year Fire Brigades report about 500 fires occurring in hospitals, homes and institutions for the care of the sick and infirm. As these fires may involve patients unable to help themselves the dangers of death or injury are greater than in fires in other types of premises and the Joint Fire Research Organization has received some enquiries regarding them. This report gives the results of the work prompted by these enquiries. A similar survey was made for the years 1946-9(1).

### SAMPLING PROCEDURE

In 1956 a random one-in-four sample of all reports from Fire Brigades in the United Kingdom was used for the production of Annual Tables of Fire Statistics. In this sample 125 reports were concerned with fires occurring in hospitals, homes and institutions, these were extracted and studied and the results obtained from them are given in this report.

### TYPES OF INSTITUTION IN WHICH FIRE OCCURRED

Table 1 shows the types of institution in which fires took place. Forty-seven per cent of the incidents occurred in general and maternity hospitals, 12 per cent in mental hospitals and 11 per cent in old peoples homes.

### USE OF ROOM IN WHICH FIRE ORIGINATED

Table 2 shows the use of the room or enclosure in which fire originated. Seventeen per cent of the fires started in kitchens, 15 per cent in stores of various kinds, 11 per cent in wards and 7 per cent in boiler houses.

### CAUSES OF FIRE AND MATERIALS FIRST IGNITED

In Table 3 are given the supposed causes of fire. Five fires were reported as being caused by specialised hospital equipment. Smoking in bed caused 5 fires and might be considered as a practice more likely to be indulged in in hospitals than elsewhere. Two incidents were due to a common hospital practice, that of shielding the glare from an electric bulb by draping round it a towel or cloth. One fire was caused by the flame from a lighted sulphur fumigating cone placed on a mattress. The other causes were of a more general nature. Fifteen per cent of the fires were caused by cookers or fish frying ranges. The materials ignited first are shown in Table 4.

### RESCUES, ESCAPES AND CASUALTIES

There were 2 fatal casualties among the fires included in this survey. Both were elderly women in nursing homes. One caught her clothing alight on an electric fire, the other, who was a cripple, burnt herself severely on an electric radiator. One non-fatal casualty requiring more than first aid treatment was reported; this was a young man who burnt his hand with hot fat in a hospital kitchen. No rescues or escapes were reported.

### EXTENT OF FIRE AND DAMAGE BY FIRE AND HEAT

In 92 per cent of the incidents studied the fire did not spread beyond the compartment of origin; in 4 per cent it spread to neighbouring compartments only, and in the remaining 4 per cent it involved the whole building.

In 71 per cent of the incidents structure, contents, or structure and contents suffered slight damage; in 21 per cent contents received severe damage while structure received little or none, and in the remaining 8 per cent of incidents severe damage was caused to structure only.

#### METHODS OF EXTINCTION

Of the incidents examined 42 per cent were extinguished by the hospital staff, using mainly buckets of water and chemical extinguishers (see Table 5). A further 30 per cent were tackled by the staff and extinguished by the brigade. 25 per cent were extinguished by the brigade alone and 3 per cent of the fires burned out. Therefore in over half of the incidents adequate fire-fighting equipment was available at the scene of the fire for extinction to be attempted and in most cases accomplished.

#### CONCLUSIONS

In the 123 reports studied only a few causes of fire were of a nature peculiar to hospitals or homes and most fires did not cause very serious damage. Two fatal and 1 non-fatal casualties occurred and no rescues or escapes were necessary. The provision of fire-fighting equipment seems to have been adequate in most of the incidents studied as about 75 per cent of the fires were tackled by hospital staff who extinguished 42 per cent without fire brigade assistance. A comparison with the results of the previous note<sup>(1)</sup> shows that the pattern of fires in hospitals has not radically changed since 1949.

#### REFERENCES

1. WALLACE, J. and TURNER, J.D. Fires in hospitals and in homes and institutions for the care of the sick and infirm I. Supposed causes of outbreaks, 1946-9. F.S. Note No.112/1950.

Table 1

FIRE INCIDENT BY OCCURRENCE OF FIRE IN VARIOUS TYPES OF INSTITUTION

Type of Institution	No. of fires
<b>Hospitals</b>	
Children's .....	3
Eye .....	1
Isolation .....	3
General .....	50
Maternity .....	6
Mental .....	15
Hospital for Nervous Diseases .....	1
Tuberculosis and Chest .....	2
<b>Homes and Institutions</b>	
Blind Institution (for adults) .....	1
Children's home .....	4
Convalescent home .....	3
Ex-servicemen's training centre .....	1
Old people's home .....	13
Special school for handicapped children .....	2
<b>Clinics</b>	
Blood Transfusion Service centre .....	1
Chest clinic .....	1
Child guidance clinic .....	1
Industrial health centre .....	1
Public health centre .....	1
Welfare Hall .....	1
<b>Other and private institutions</b>	
Day nursery .....	3
Nature Cure Resort .....	1
Nursing Home .....	6
<b>Total ....</b>	<b>123</b>

Table 2

LOCATION OF ORIGIN OF FIRE

Room or enclosure	No. of fires
Kitchen .....	21
Ward .....	13
X-ray department .....	3
Nurses' quarters .....	4
Duty room .....	3
Corridors, etc. ....	4
Living room .....	9
Bedroom .....	6
Store - linen and bedding	4
Chemical .....	2
Other .....	12
Boilerhouse, stokehole ..	9
Roof .....	9
Office .....	1
Laundry .....	3
Other .....	20
<b>Total ...</b>	<b>123</b>

Table 3

SUPPOSED CAUSE OF FIRE

Causes	No. of fires
Cookers and frying ranges (all fuels) .....	18
Heating equipment	
Boiler, furnace .....	6
Fire, coal .....	8
electric .....	8
oil .....	2
Slow combustion stove .....	2
Chimney or flue .....	7
Hospital Equipment	
Immersion heater in X-ray developing tank	2
Sterilizer - electric .....	1
gas (coal) .....	2
Electric - lights .....	4
refrigerator .....	5
wire and cable (installation and leads) .....	6
wireless .....	2
other apparatus .....	3
Gas (coal) apparatus .....	2
Blowlamps .....	9
Smoking materials .....	13
Smoking in bed .....	5
Children playing with matches .....	2
Other causes .....	7
Unknown .....	9
<b>Total .....</b>	<b>123</b>

Table 4

MATERIALS FIRST IGNITED

Materials	No. of fires
Electrical insulation	18
Structural woodwork	25
Anaesthetics .....	2
Food and fat .....	16
Bedding .....	6
Clothing on person ..	1
Other contents .....	45
Unknown .....	10
Total .....	123

Table 5

METHODS OF EXTINCTION OF FIRES IN HOSPITALS

Methods used	Extinguished by hospital staff	Extinguished by brigade	Extinguished by staff and brigade	Burned out	Total
(a) Removal, beating, smothering with blankets or sand etc.	15	6	1	-	22
(b) Water from buckets, stirrup pumps or garden hose; chemical extinguishers	35	6	13	-	54
(c) Hose reel jets	1	13	13	-	27
(d) Jets from pumps and hydrants	1	5	-	-	6
(e) One or more of methods (a) and (b) and jets	-	-	10	-	10
(f) Burned out	-	-	-	4	4
Total .....	52	30	37	4	123

#### APPENDIX

Below are listed brief accounts of some fires of special interest which have occurred in hospitals or homes since 1950.

1. Forty-six aged male patients were evacuated from dormitories above a day-room in which a fire had developed, probably as a result of careless smoking habits. The fire caused severe damage to the contents and decorations of the room but did not spread beyond it.
2. A fire occurred in the bio-chemistry laboratory of a general hospital when a Winchester of ether was spilt near an electric radiator. One-third of the second floor, where the fire started, and one-third of the roof were destroyed.
3. A patient undergoing an operation died as a result of an explosion of flammable anaesthetic in his mouth. The explosion was caused by a spark from an electrically operated surgical diathermy knife, the anaesthetic contained a small amount of ether which had leaked from a bottle supposed empty.
4. A fire which involved the whole building was caused by a stove-pipe igniting flooring and joists in a nursing home. The babies' ward was situated above the outbreak, 13 babies died from the effects of smoke and heat, 2 babies suffered shock and a nurse suffered severe burns and shock received whilst rescuing the babies.
5. The fibreboard lining of a small kitchen attached to a ward was ignited by a faulty gas stove lighter. The fire spread rapidly through several rooms, though not to the ward from which 36 persons were evacuated.
6. A fire involving a sterilizing room and its contents was started by a method of sterilizing known as "flaming". This consists of burning a little methylated spirits in the vessel to be sterilized and then cleansing it with ether. In this case the flame was not out when the ether was added and the Winchester of ether caught alight. The room contained bottles of various flammable liquids which contributed to the fire.
7. This fire caused severe damage to the operating theatre, its neighbouring rooms and one ward in a hospital made up of single-storey wooden buildings with asbestos sheet roofs. The fire was probably caused by an electrical fault in the roof space and spread quickly through the roof space. Four wards were evacuated.
8. Three patients were rescued from the top floor of a mental hospital where they were sleeping while the wards were being redecorated. The fire started in the next room, which was used as a cloakroom by the staff, and spread into the roof space damaging about 60 ft. of roof and the rooms below. The fire was probably caused by smoking materials. Twenty-seven other patients, some bedridden, were evacuated.
9. The recreation room in a social rehabilitation unit, and its contents were severely damaged as a result of a fire which may have been intentionally ignited. The fire was fed by gas from a fractured gas supply pipe and by the tarred felt roof covering.
10. Ether escaping through an open valve on an anaesthetic trolley was ignited by a spark caused by a static charge set up during the cleaning of the trolley. The fire did not spread beyond the trolley, the nurse cleaning it received slight burns.
11. Severe damage was caused to the laundry section of a hospital by a fire of unknown cause. The buildings involved were originally occupied only as a temporary measure and were known to be a potential danger.
12. Painters' blowlamps set fire to the bitumastic felt roof lining of a wooden ward. The fire damaged the roof and ceiling below of 3 wards. Patients were evacuated from these and neighbouring wards.

13. Fire originated in a film store in the basement of the main building and spread rapidly to the pathological laboratory due to production of flammable gases. A doctor and a nurse lost their lives and patients were evacuated from threatened wards.