

LIBRARY REFERENCE ONLY

M.O.T. AND F.O.C.
FIRE RESEARCH
ORGANIZATION
REFERENCE LIBRARY
No. A99FR. N751



**Fire Research Note
No. 751**

FIRES IN POST-WAR MULTI-STOREY FLATS IN
LONDON, 1966.

by

J. F. Fry.

February 1969

0
**FIRE
RESEARCH
STATION**

FIRES IN POST-WAR MULTI-STOREY FLATS IN LONDON, 1966

by

J. F. Fry

SUMMARY

As part of a continuing series of analyses reports of fires in post-war multi-storey flats in inner London have been studied. They show that the rates of incidence of these fires are lower than those in dwellings in general if fires in rubbish chutes are discounted; that fires start most frequently in kitchens (again discounting those in rubbish chutes); that fires in common service areas are frequently associated with accumulations of rubbish; and that most fires which spread beyond the room of origin are confined to the flat or maisonette in which they start.

There is little evidence of special escape or fire-fighting problems although two persons were rescued from one fire by turn-table ladder.

KEY WORDS: Flats, building - multi-storey, fire statistics.

Crown copyright

This report has not been published and should be considered as confidential advance information. No reference should be made to it in any publication without the written consent of the Director of Fire Research.

FIRES IN POST-WAR MULTI-STOREY FLATS IN LONDON, 1966

by

J. F. Fry

INTRODUCTION

Analyses of reports of fires in post-war multi-storey flats and maisonettes in the inner London boroughs have been reported in earlier notes^{1,2}. A further study has now been made of fires in these buildings during 1966. The analysis is similar to those previously reported, but provides some additional information on the fires which occurred in "common service areas" and on those which spread beyond the floor of origin.

FIRE INCIDENCE

The Department of Architecture and Civic Design of the Greater London Council provided information on the numbers of flats and maisonettes in blocks of three or more storeys constructed between 1st January 1946 and 31st December 1966. Rates of incidence of fires attended by the London Fire Brigade have been calculated from these figures and are given in Table 1.

Table 1

Rates of incidence of fires in post-war flats and
maisonettes in inner London, 1966

Height of building	Number of flats and maisonettes at risk	Number of fires attended	Incidence rate per 10,000 at risk per annum
3 to 5 storeys	103 697	319	30.8
6 to 8 storeys	30 693	97	31.6
9 or more storeys	30 140	72	23.9

As in previous analyses the rate of incidence was highest in blocks of 6 to 8 storeys and lowest in the very tall blocks of 9 or more storeys. The overall rate (29.6 per 10 000 dwellings at risk) appears to be high in comparison with the average rate of 19-20 per 10 000 at risk for all dwellings; however, when fires in rubbish chutes (almost half the total) are excluded, this is reduced to 16.5 per 10 000 dwellings at risk. This figure is slightly above the rate recorded in 1965, but is still appreciably lower than the average for all dwellings.

CAUSES OF FIRES

The sources of ignition of the fires are shown in Table 2, together with the causes of all fires in dwellings in the United Kingdom.

Table 2

Sources of ignition of fires

Source of ignition	Fires in London post-war flats		Fires in dwellings in the United Kingdom		
	No.	Per cent	No.	Per cent	
Ashes, soot	163	33.4	759	2.2	
Electrical	Total	90	18.4	12 745	37.2
cookers	29	5.9	5 059	14.8	
heaters	11	2.3	1 487	4.3	
wire and cable	11	2.3	2 751	8.0	
radio and T.V.	13	2.7	1 098	3.2	
blankets	10	2.1	1 459	4.3	
other	16	3.3	891	2.6	
Gas	Total	49	10.0	3 274	9.6
cookers	45	9.2	2 644	7.7	
heaters	1	0.2	287	0.8	
other	3	0.6	343	1.0	
Smoking materials	59	12.1	3 050	8.9	
Children with fire	42	8.6	1 900	5.6	
Oil	Total	14	2.9	2 991	8.7
heaters	12	2.5	2 290	6.7	
blow lamps, etc.	1	0.2	554	1.6	
other	1	0.2	147	0.4	
Solid fuel	Total	1	0.2	4 771	13.9
fire in grate	1	0.2	2 465	7.2	
slow combustion stove	-	-	199	0.6	
chimney, flue	-	-	1 967	5.7	
other	-	-	140	0.4	
Cookers (other and unspecified)	13	2.7	763	2.2	
Malicious ignition	11	2.3	462	1.4	
Explosives, fireworks	6	1.2	72	0.2	
Naked light, paper, etc.	11	2.3	756	2.2	
Other	3	0.6	797	2.3	
Unknown	26	5.3	1 911	5.6	
All sources	Total	488		34 251	

As in previous years a high proportion of the fires in the London Flats was attributed to "ashes and soot", and most of these were in rubbish chutes. If these are discounted the proportions of fires due to gas appliances (18.0 per cent), children with fire (15.4 per cent) and smoking materials (21.7 per cent) are all appreciably higher in the flats than in dwellings as a whole.

In general the cause patterns of the fires in blocks of different heights were similar, but it was noted that no fires in the high rise flats (9 storeys or more) were attributed to space heating equipment. If the chance of such a fire were evenly distributed in accordance with the number of flats at risk, the number expected in the high rise flats would have been seven. This absence of heating appliance fires may be the chief reason for the lower rate of incidence in high rise flats already referred to.

LOCATION OF FIRES

The locations of the points of origin of the fires are shown in Table 3.

Table 3

Location of fires

Location	Fires in London flats	
	No.	Per cent
Dust chute, refuse room	216	44.3
Kitchen	105	21.5
Bedroom, bedsitting room	36	7.4
Store room (other than fuel)	15	3.1
Hall, corridor, stairs	16	3.3
Lounge, living room	6	1.2
External structure and fittings	4	0.8
Lift	8	1.6
Bathroom, lavatory	2	0.4
Garage	1	0.2
Roof space	1	0.2
Boiler room	2	0.4
Laundry, wash-house	1	0.2
Airing cupboard	4	0.8
Power house, switchgear, generator	1	0.2
Workshop	1	0.2
Not stated, unknown	69	14.1
Total	488	

The proportions of fires associated with the various locations are similar to those in previous analyses. Almost half the fires started in dust chutes and refuse rooms, and almost 40 per cent of the remainder in kitchens.

SPREAD OF FIRE

The extent to which the fires spread is indicated in Table 4 both in total and separately for each height of building considered. There appears to have been little difference between fires in blocks of different heights.

Table 4

Spread of fire

Extent	Total		3-5 storeys		6-8 storeys		8+ storeys	
	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent
Confined to:								
Exterior components	4	0.8	4	1.3	-	-	-	-
Dust chutes	216	44.3	138	43.3	42	43.4	36	50.0
Appliance originating	52	10.7	28	8.8	14	14.4	10	13.9
Common service space	18	3.7	12	3.8	2	2.1	4	5.6
Room of origin	177	36.3	122	38.2	37	38.1	18	25.0
Floor of origin	17	3.5	12	3.8	2	2.1	3	4.2
Building of origin	4	0.8	3	0.9	-	-	1	1.4
Total	488		319		97		72	

Only 4.3 per cent of the fires were reported as spreading beyond the room (or the common service area) in which they originated. However, although most of the fires were small, the extent of some and the location of others rendered them potentially dangerous to occupants attempting to escape from the building. For this reason reports of the fires (a) which started in common service areas, and (b) which spread beyond the room of origin, were further examined and are summarised in Appendix 1.

Of the 25 fires which started in common service areas, 17 were in stairways, halls, passages etc. and 8 in lifts and lift shafts. None of these reports indicated that the incident was serious or that there had been any rescue or escape problems; nor did the fire brigade find it necessary to use breathing apparatus. The most potentially dangerous fire among them (No.25 on the list in Appendix 1(a)) spread up the lift shaft and damaged lift doors on all landings of the 18 storey building. The building was, however, not yet in occupation.

Ten of the fires in common service spaces resulted from the ignition of accumulation of rubbish.

The majority of the fires which were recorded as spreading beyond the room of origin (listed in Appendix 1(b)) were confined to the flat or maisonette in which they started and where this was not so the spread was generally minimal. In four of the incidents, however, there was damage to more than one floor (Nos 18-21) and one of these (No.20), which involved several flats in a 10 storey block, required the use of breathing apparatus; one occupant was assisted down an internal staircase and two others were helped from the building down a turn-table ladder.

CASUALTIES

There were 21 casualties, two of which were fatal, in the London flats during 1966. These are listed in Appendix 2 which also gives information on the injuries received and on the fires which caused them. None of the fires which resulted in casualties was of a type peculiar to tall buildings and none of the injuries

appears to have been attributable to deficiencies in escape routes. In two of the casualty fires the cause was recorded as "unknown", but in all of the others it was clear that the casualty was actually at or very near the point of origin of the fire when it occurred.

FIRE FIGHTING

The methods used to extinguish the fires are given in Table 5.

Over a quarter were extinguished before the brigade arrived and, of those requiring fire brigade action, the majority were dealt with either by small means or by hose reel jets. Seven fires required the use of jets from pumps or hydrants.

Table 5

Method of extinction

Method	Fires extinguished before brigade arrived	Fires extinguished by brigade	Total
Removal	18	23	41
Chemicals, and hand-extinguishers	1	11	12
Smothering	19	3	22
Water from buckets	68	11	79
Other small, non-chemical means	21	2	23
Burned out	3	-	3
Water from garden hose etc.	1	-	1
Hose reel jets (using water in tank only)	-	291	291
Hose reel jets (more water than in tank)	-	7	7
Jets from inside hose reel or hydrant	1	1	2
Jets from pumps and hydrants	-	7	7
Total	132	356	488

CONCLUSIONS

The overall rate of incidence of fire in London post-war flats in blocks of 3 or more storeys appears to be higher than that in dwellings in general, but when the fires in rubbish chutes are discounted becomes appreciably lower. The rate is lower in the high rise flats (of 9 or more storeys) than in the other categories and this may be attributable to the absence of fires caused by heating equipment.

Fires in the flats (discounting those in dust chutes) start most frequently in kitchens. Those which start in common service areas (staircases, landings, lifts, etc.) are frequently associated with accumulations of rubbish.

Most of the fires which spread beyond the room of origin are confined to the flat or maisonette in which they start and it is unusual for more than one floor to become involved.

There is no evidence that occupants of the flats are more likely to be trapped by fire than those in other dwellings, or that the fires are likely to present special fire-fighting problems, although two persons were rescued from one fire by turn-table ladder.

Most of the casualties in fires in the flats are at or near the point of origin of the fire.

REFERENCES

1. FIRTH, J. M. Fires in post-war multi-storey flats in London during 1962. Joint Fire Research Organization Fire Research Note No.543, 1964.
2. FRY, J. F. Fires in post-war multi-storey flats in London, 1965. Joint Fire Research Organization Fire Research Note No.674, 1968.

ACKNOWLEDGEMENTS

Thanks are due to the Department of Architecture and Civic Design of the Greater London Council for obtaining information on the numbers of flats erected, and to Mrs. I. C. Day of the Joint Fire Research Organization who sorted and tabulated the information contained in the fire reports.

APPENDIX 1

(a) Fires starting in common service areas

Point of origin	Cause	Damage
1. Basement, stair well	Children with rubbish	Nil
2. Ground floor, hallway	Cigarette in rubbish	Nil
3. Ground floor, passage	Cigarette in rubbish bin	1 door
4. Ground floor, covered way	Cigarette in rubbish	Nil
5. Ground floor	Children with rubbish	2 doors
6. Airing cupboard in passage	Short circuit	Contents
7. Ground floor, room	Doubtful	1 door
8. Ground floor, passage	Malicious	1 door
9. Ground floor, passage	Children with rubbish	Pram shed door
10. 3rd floor, corridor	Doubtful	Pram and door
11. Ground floor, hallway	Children with fireworks	Door and curtain
12. 4th floor, landing	Cigarette in rubbish box	Skirting and plaster
13. Ground floor, passage	Hot ashes in rubbish	Nil
14. Ground floor, staircase and 2nd floor passage	Arson	1 door and rubbish
15. 1st floor, hallway	Cigarette on floor covering	Floor covering and 2 doors
16. Ground floor, passage	Faulty elec. light holder	Light fitting
17. Ground floor, cupboard under stairs	Short circuit	Fuze box and wiring
18. Lift car	Unknown	Slight to veneer
19. Lift door motor	Motor overheated	Motor
20. Control panel of lift car	Short circuit	Lift car
21. Lift shaft	Children with rubbish	Nil
22. Lift shaft	Dropped light ignited dust and grease	Nil
23. Lift motor room on roof	Overheated driving belt	Driving belt
24. Lift car	Short circuit on roof of car	Junction box
*25. Lift cage	Unknown	Lift, lift shaft, lift doors on landings.

*Building not in occupation

/Cont'd

APPENDIX 1 (cont'd)

(b) Fires which spread beyond the room of origin

Room of origin	Spread
1. Bath-room, 2nd floor	Bedroom of flat
2. Front room, ground floor	Passage of flat
3. Back room, 3rd floor	Kitchen of flat
4. Kitchen, 1st floor	Entrance hall of flat
5. Front room, 1st floor	Heat and smoke damage to rest of flat
6. Kitchen, ground floor	Passage and street door of flat
7. Store room, basement	Basement passage
8. Kitchen, 1st floor	Remainder of flat (some smoke in flat above)
9. Bedroom, 4th floor	Landing and staircase of maisonette
10. Front room, 1st floor	Remainder of flat
11. Front room, 5th floor	Remainder of flat
12. Front room and bedroom	Remainder of flat
13. Front room, top floor of 12th floor maisonette	Remainder of floor of maisonette
14. (a14) Ground floor staircase and 2nd floor passage	Spread to door of flat on top floor
15. (a15) Hallway, 1st floor	Spread to doors of flat on 1st floor
16. Basement	Remainder of basement, smoke damage to 2nd flat
17. (a5) Ground floor	Slight damage to glazing of staircase at 1st floor level
*18. (a25) Lift cage	Lift shaft and lift doors on all landings of 18 storey block
19. Front room, 1st floor	Three floors (all timber)
20. Front room, 8th floor	Flat and landing. Heat damage to 3 other flats on 8th floor and smoke damage to 2 on 9th floor
21. Kitchen, 2nd floor	Timber service trunking and airing cupboard on 3rd floor

Note: Nos in brackets indicate numbers of same fires where they appear also in Appendix 1(a)

*Building not in occupation.

-APPENDIX 2-

Casualties

Floor of origin	Age and sex	Cause of fire	Injuries sustained	Damage
1	36 F 21 M (FB)	Bed linen ignited by electric fire placed too near	Severe shock Overcome by smoke	First, second and ground floor
Ground	59 F 52 M (FB)	Pan of fat on gas cooker overheated and ignited	Burns to hand " " "	Contents of room
Ground	57 F 30 M 20 M	Radiated heat from electric fire ignited bedding	Burns to hand & wrist Cuts to hand Cuts to hands	50 per cent of room and contents
1	17 M	Careless disposal of cigarette ignited settee	Burns to back	Room and contents
3	45 F	Careless disposal of cigarette by person under influence of drugs ignited bed linen	Shock	Contents of room
3	54 F	Careless disposal of cigarette or match ignited settee and bedding	Overcome by smoke	Contents of flat
2	43 F	Unknown	Overcome by smoke and shock	Room and 5 per cent of contents
Ground	45 M	Flame on gas cooker ignited vapour from petrol based rubber solution	Burns to face, hands, arms and foot	50 per cent of room and contents
Ground	51 F 16 M	Calor gas leaking from burner of portable cooker ignited and flashed back	Superficial burns " "	2 per cent of contents of room

/Cont'd

APPENDIX 2 (cont'd)

Floor of origin	Age and sex	Cause of fire	Injuries sustained	Damage
1	38 M	Unknown	Burns to face	50 per cent of flat and contents
Not stated	46 F	Pan of oil on electric cooker overheated and ignited	Burns to hands and shock	5 per cent of contents of room
2	45 F	Pan of oil on gas cooker overheated and ignited	Burns to arm and leg	Qty of cooking oil
3	57 M	Careless disposal of cigarette ignited wearing apparel	Burns to neck and chest	Wearing apparel
2	83 F 46 F	Flame from overturned oil heater ignited wearing apparel	Death due to extensive burns Slight burns and shock	Room and contents
7	73 M	Careless disposal of cigarette or match ignited settee	Death by asphyxiation	Two per cent of contents

