

High-Rise Residential Building Evacuation Fact-Check

About Phil Murphy



An independent consultant to landlords and responsible persons in relation to fire safety management of high-rise residential buildings (HRRB).

A former Firefighter and Fire Safety Enforcement Officer (GMFRS 1997-2009), studied Fire Engineering (Tech Eng) through the Institute of Fire Engineers (IFE) & has since gained ten years private sector experience managing fire safety across national portfolios of tall & complex buildings. Author of HHSRS High Rise Addendum. Lived in three HRRBs.

In the third year of researching aspects of HRRB fire safety data with Prof Stu Hodgkinson at University of Leeds

Evacuation of people with disabilities

CFPA-E Guideline No 33:2015 F

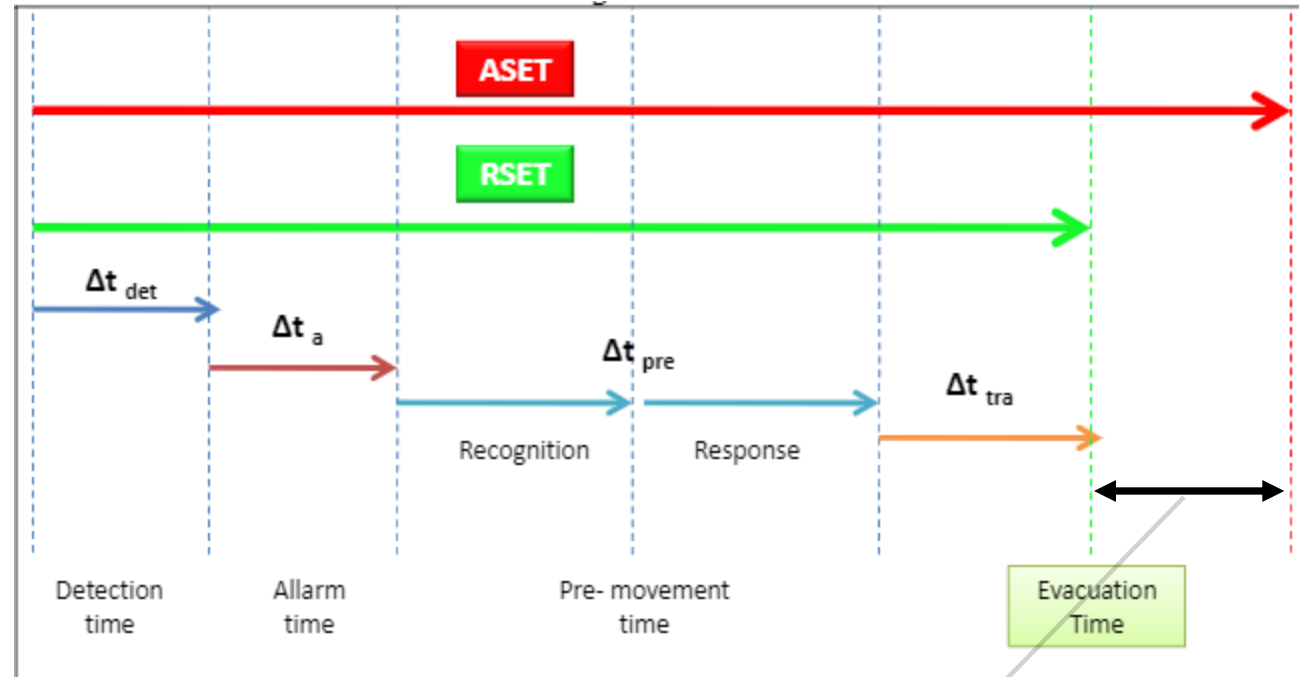


1. Introduction

All people should have access to the whole of society. It places increasing demands on accessibility in buildings and public facilities. But if a fire were to start people with disabilities must be able to get out safely.

A Available Safe Evacuation Time

R Required Safe Evacuation Time



$$A - R = \text{Safety Margin}$$



Relationship with first response time

3.6 As a first step the fatality rates were calculated for all dwelling fires per response time. Response times were banded together into five minute bands starting at 0 to 5 minutes, then 6 to 10 minutes and so forth, in order to provide sufficient data points to support a trend analysis. These are shown in Table 14 along with the results of a similar analysis using data from the previous reporting system (FDR1), as reported in 2006. The results are similar.

Table 14: Fatalities as a per cent of all Fatalities, Casualties (all grades) and Rescues		
Response time minutes	2006 FDR1 analysis	2012 Incident Recording System analysis
0 to 5	2.7%	2.5%
6 to 10	3.2%	3.0%
11 to 15	4.4%	4.4%
16 to 20	6.7%	5.5%
>20	14.0%	17.1%



Figure 15: Per cent of Fatalities, Casualties (all grades) and Rescues that die versus per cent that are rescued against response times

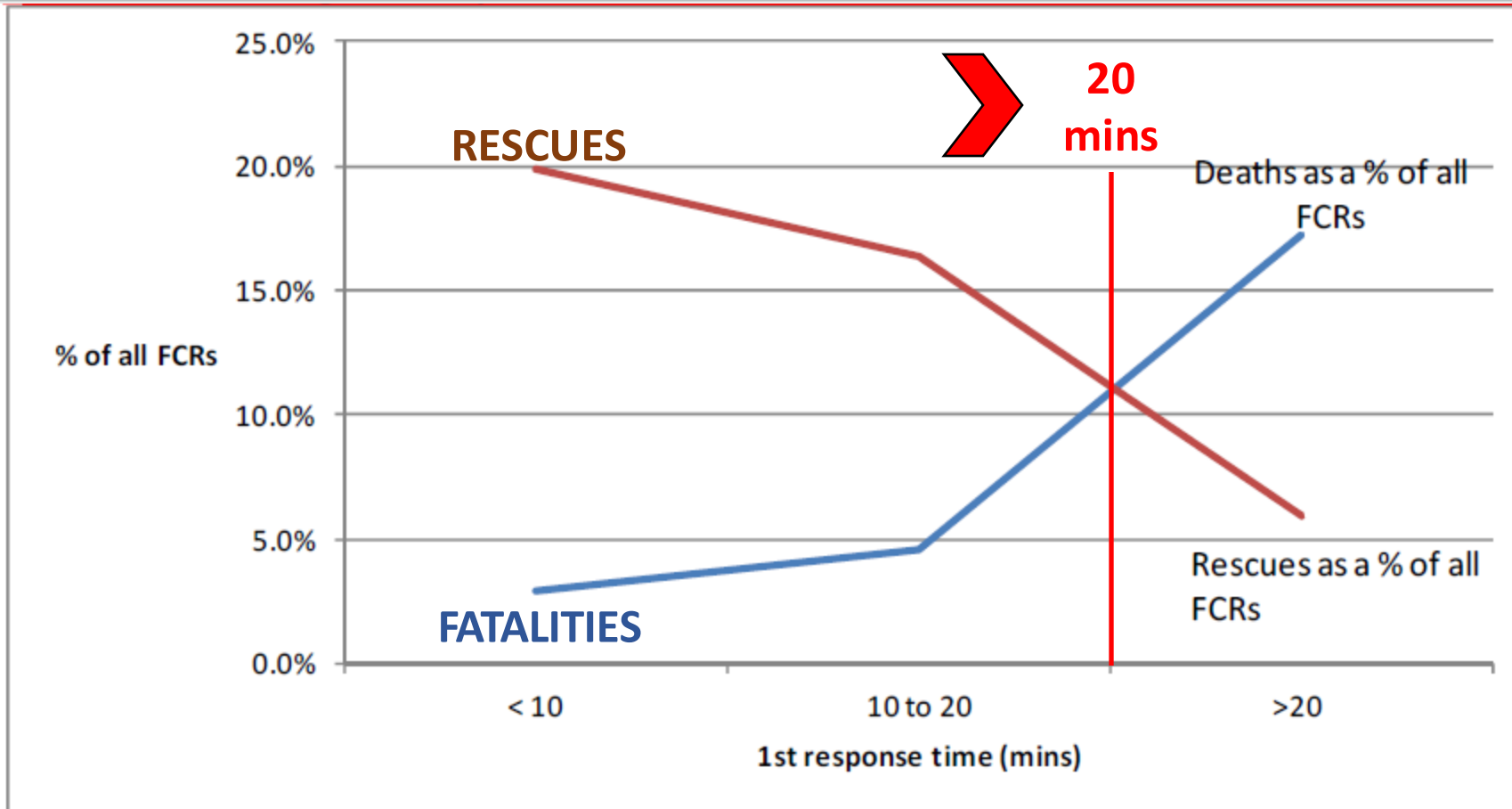
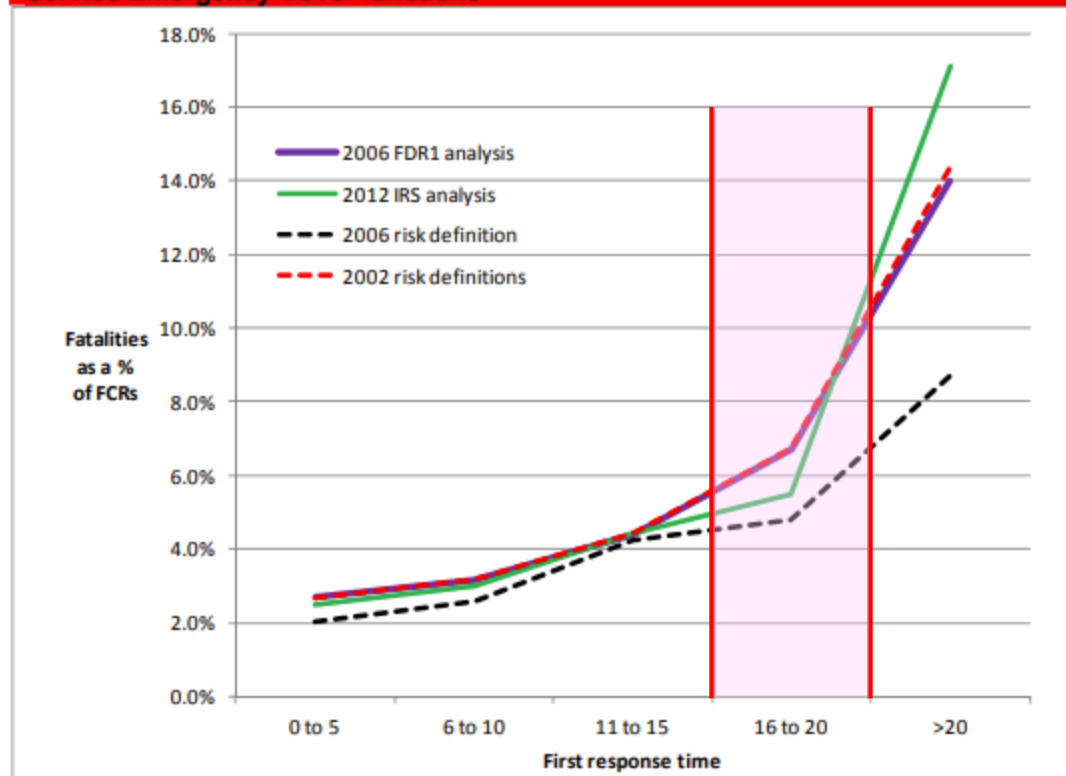
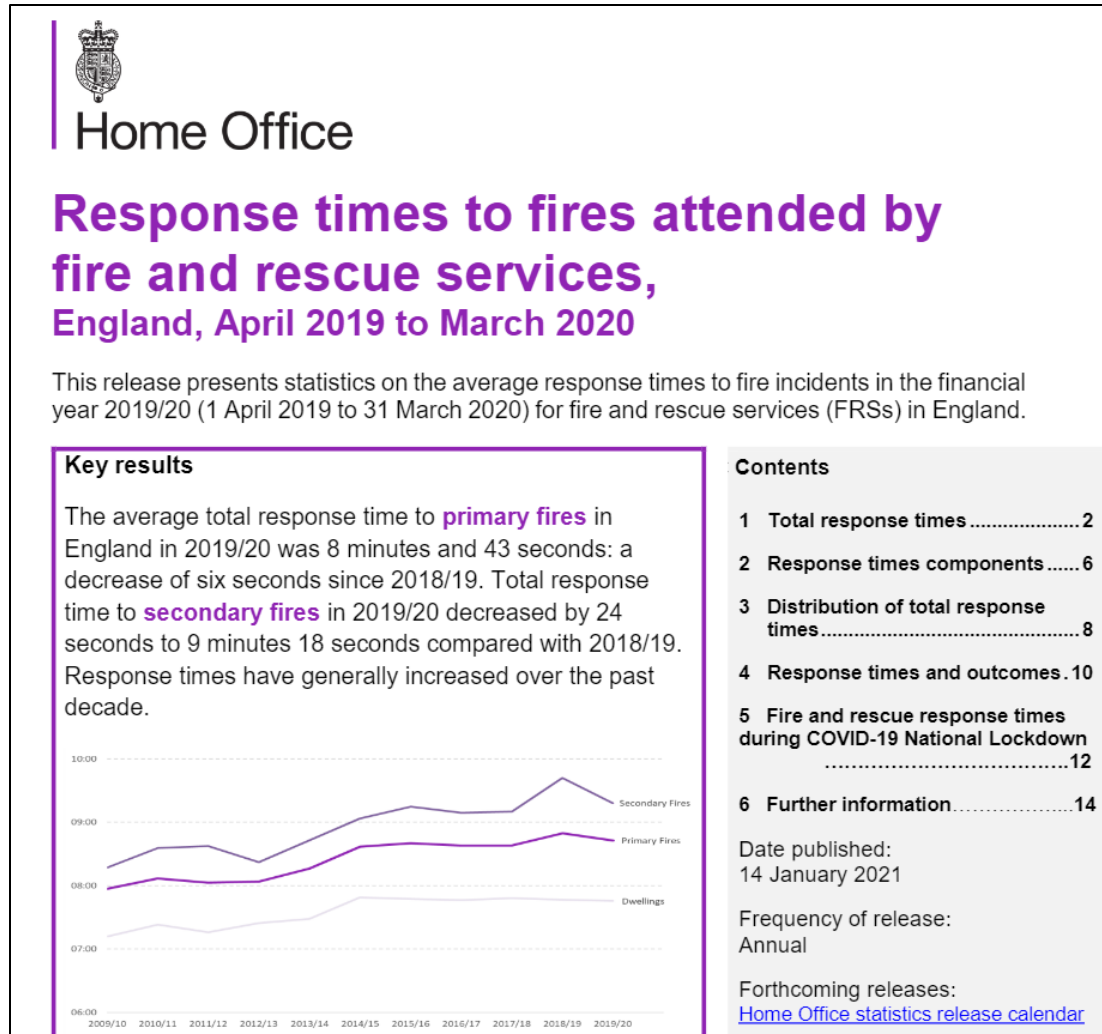





Figure 16: Comparison of observed fatality rate relationships and previous Fire Service Emergency Cover functions



Response Times



 NFCC
National Fire Chiefs Council

About

News

18-01-19

New fire response times statistics published by the Home Office

 FIRE BRIGADES UNION

THE PROFESSIONAL VOICE
OF YOUR FIREFIGHTERS

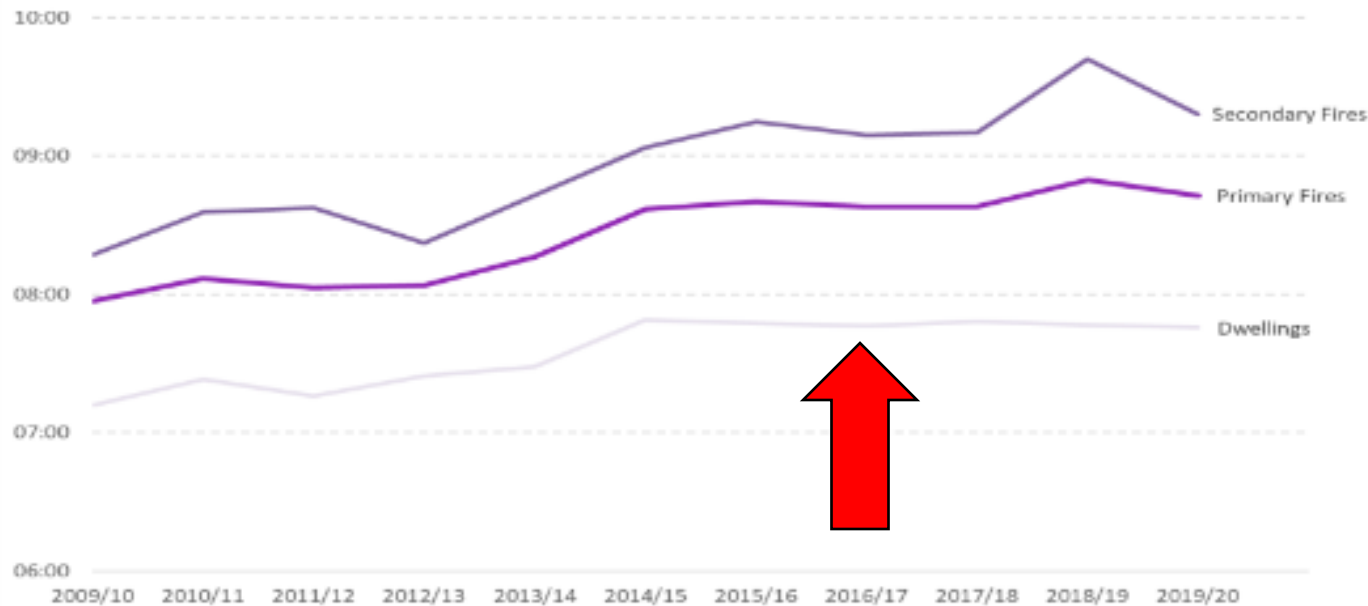
16
Jan

Increase in fire response times could be "difference between life and death"

16 January 2020  Cuts, Professional standards

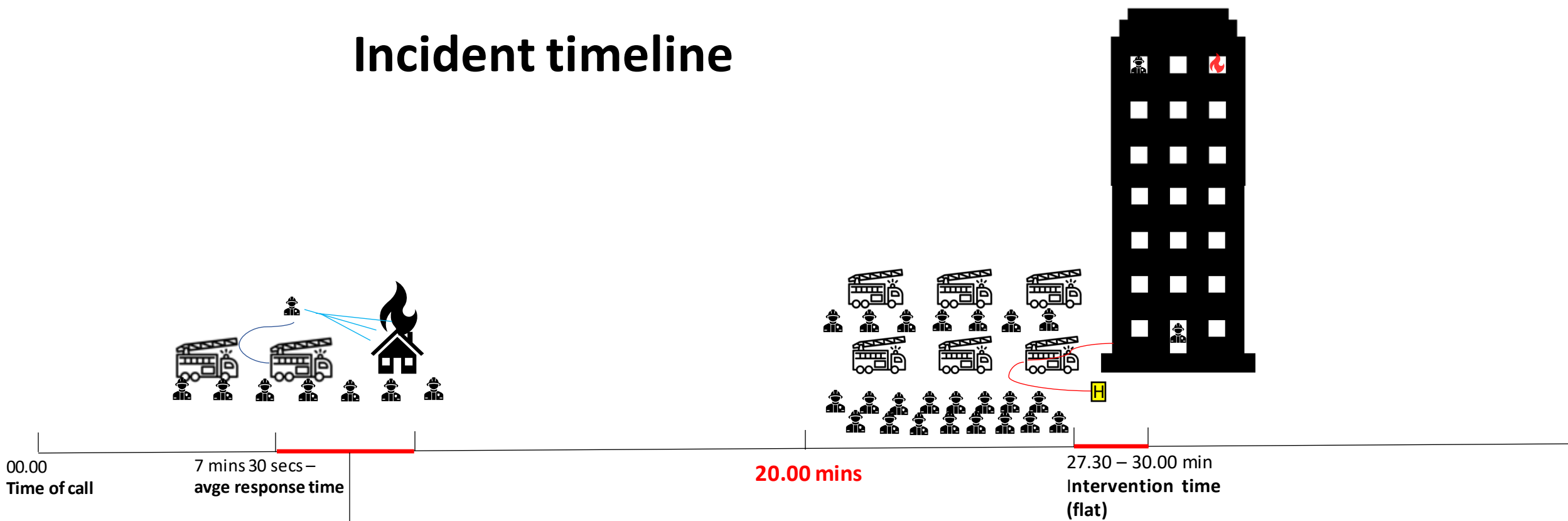
Key results

The average total response time to **primary fires** in England in 2019/20 was 8 minutes and 43 seconds: a decrease of six seconds since 2018/19. Total response time to **secondary fires** in 2019/20 decreased by 24 seconds to 9 minutes 18 seconds compared with 2018/19. Response times have generally increased over the past decade.



Since 2014 – 2015 average response times to dwelling fires have remained between 7 minutes 30 seconds, and eight minutes

Incident timeline



High pressure hose reels are quick, simple, easy, light & fed from an integral water tank.

Firefighting in blocks of flats presents an abundance of challenges, at a time when **every second counts**

Smoke propagation in residential buildings

The main report on the field experiments conducted in a residential building with internal corridors



Research results

Smoke propagation


In all the tests, smoke propagated outside the fire room through several horizontal and vertical routes and sub-routes. This involved both horizontal and vertical smoke propagation to different rooms in the residential building. This means that if only part of a sofa is burning in one room, high-risk situations will occur in several locations in the residential building.


<https://www.ifv.nl/kennisplein/brandpreventie-fire-safety-engineering/publicaties/smoke-propagation-in-residential-buildings>


Smoke propagation in residential buildings


The main report on the field experiments conducted in a residential building with internal corridors


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 Smoke propagation in residential buildings
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 Appendix 1. Comparison between the ISO standard SFPE handbook and AEGL
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 Appendix 12. Data analysis for the possibility of escape and survivability
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 Appendix 16. Overview measurement data per sensor and test
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 Key appendix 16
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 Key appendix 21
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 Appendix 21. Overview calculated times and development different methods for the possibility of escape and survivability
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B. Escape phase (0 - 20 minutes)

Irritant gases

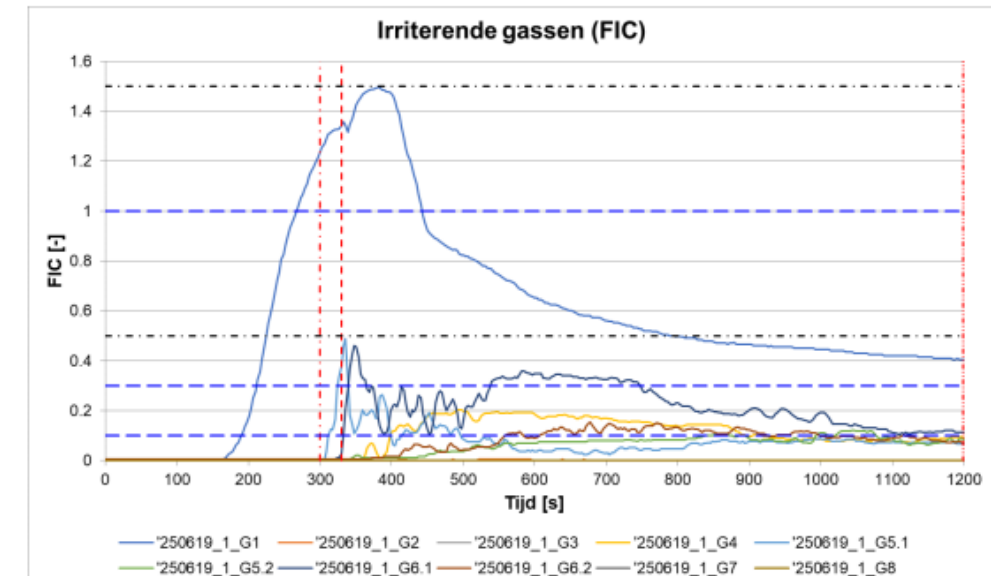
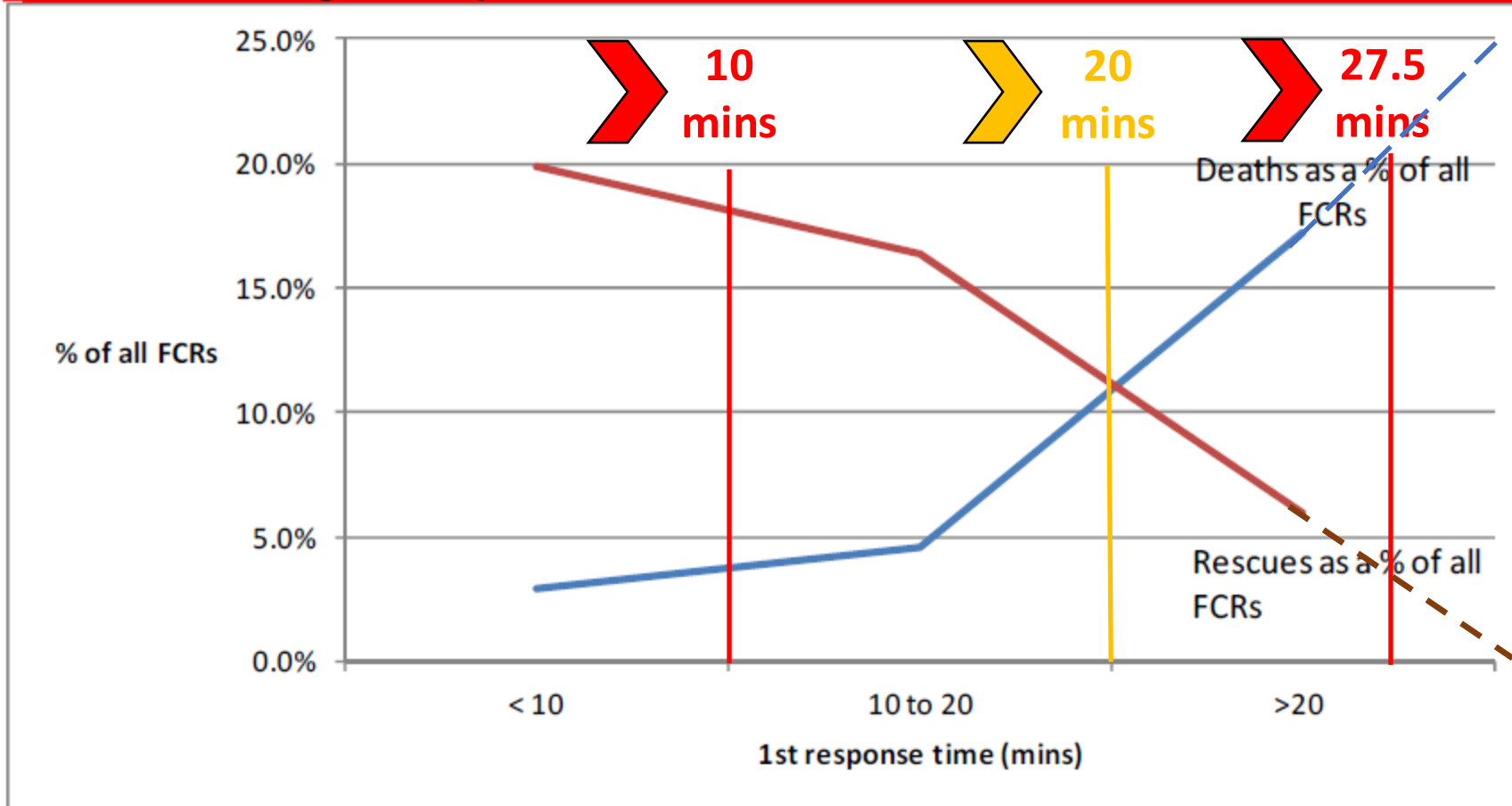




Figure 15: Per cent of Fatalities, Casualties (all grades) and Rescues that die versus per cent that are rescued against response times



Gov data - Fires that spread in blocks of flats

FIRE STATISTICS TABLE 0203: Dwelling fires¹ by dwelling type, spread of fire² and motive³, England

Select a year and a subset of primary dwelling fires⁴ from the drop-down list in the orange boxes below:

2019/20									
Total dwelling fires									
		Dwelling Type							
Spread of fire	Total fires	House - single occupancy	Bungalow - single occupancy ⁵	Converted Flat/Maisonette - single occupancy	Purpose Built Low Rise (1-3) Flats/Maisonettes	Purpose Built Medium Rise (4-9) Flats	Purpose Built High Rise (10+) Flats	Dwelling - multiple occupancy	Other dwelling
Total	28,447	14,553	1,575	2,046	4,840	1,902	775	628	2,128
Limited to item 1st ignited	9,212	4,395	431	716	1,654	824	307	167	718
Limited to room of origin	6,924	3,905	340	502	1,030	458	179	219	291
Limited to floor of origin	1,949	1,108	97	156	344	101	49	50	44
Limited to 2 floors	528	375	7	55	51	21	1	14	4
Affecting more than 2 floors	159	121	0	8	10	8	3	8	1
Whole building	447	228	58	8	13	2	0	1	137
Roofs and roof spaces ⁶	594	423	74	25	38	7	4	11	12
No fire damage ⁷	8,634	3,998	568	576	1,700	481	232	158	921

1 Dwelling fires are fires in properties that are a place of residence i.e. places occupied by households such as houses and flats, excluding hotels/hostels and residential institutions. Dwellings also include non-permanent structures used solely as a dwelling, such as houseboats and caravans, HMOs, Self contained Sheltered Housing, Stately Homes and Castles.

2 Spread of fire is defined as the extent of flame and heat damage only at the fire's stop. This does not include smoke or other damage (such as water damage).

3 The motive for the fire can be recorded as one of: Accidental, Deliberate or Not Known. For the purpose of these tables accidental is defined as when the motive was recorded as accidental.

4 Primary fires are defined as fires that meet at least one of the following conditions:

[FIRE0203: Dwelling fires by spread of fire and motive](#)

2019 – 2020 36 times fire spread over >2 floors, on average every ten days.



C-TEC Hush ActiV Grade C Domestic Fire Alarm Kit (HAK/1)

Product Code: HAK/1 Customer Rating: ★★★★★

C-TEC Hush ActiV Grade C Domestic Fire Alarm Kit (HAK/1) Key Features

- Grade C domestic fire detection & alarm system to BS 5839-6 (2019) for use in individual flats, houses and apartments

£174.77 Ex Vat

£209.72 Inc Vat

In stock: ✓

Quantity:

Add to Basket



<https://www.c-tec.com/domestic-fire-systems/hush-activ/hush-activ-stand-alone-domestic-fire-alarm-kits/>

Age (years)	No. tested devices	No. outside limits	% fail
0-1	11	0	0%
0-2	12	0	0%
0-3	15	1	7%
0-4	25	1	4%
0-5	36	1	3%
0-6	42	1	2%
0-7	50	2	4%
0-8	65	3	5%
0-9	73	4	5%
0-10	76	4	5%
0-11	85	4	5%
0-12	86	4	5%

Table 1: Failure rate of domestic alarms with age

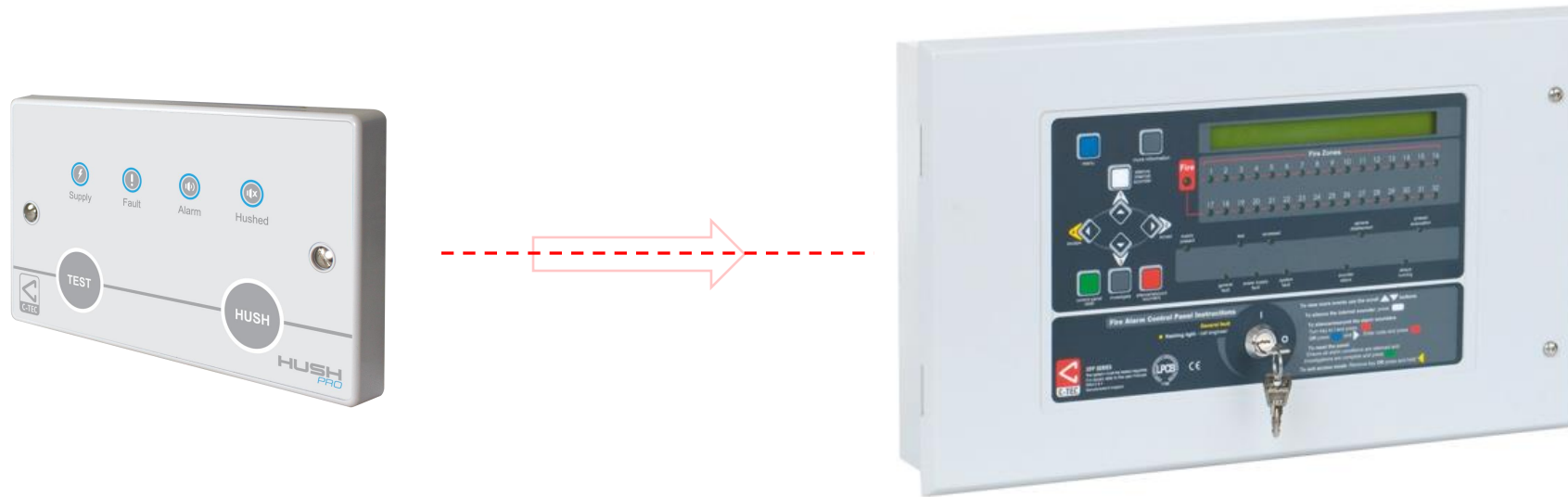
Age (years)	No. tested devices	No. outside limits	% fail
0-5	2	0	0%
0-10	11	0	0%
0-15	52	3	6%
0-20	85	8	9%
0-25	97	8	8%
0-30	107	14	13%

Table 2: Failure rate of commercial alarms with age

Effectiveness of a Voice Smoke Alarm Using the Child's Name for Sleeping Children: A Randomized Trial

Gary A Smith ¹, Thitphalak Chounthirath ², Mark Splaingard ³

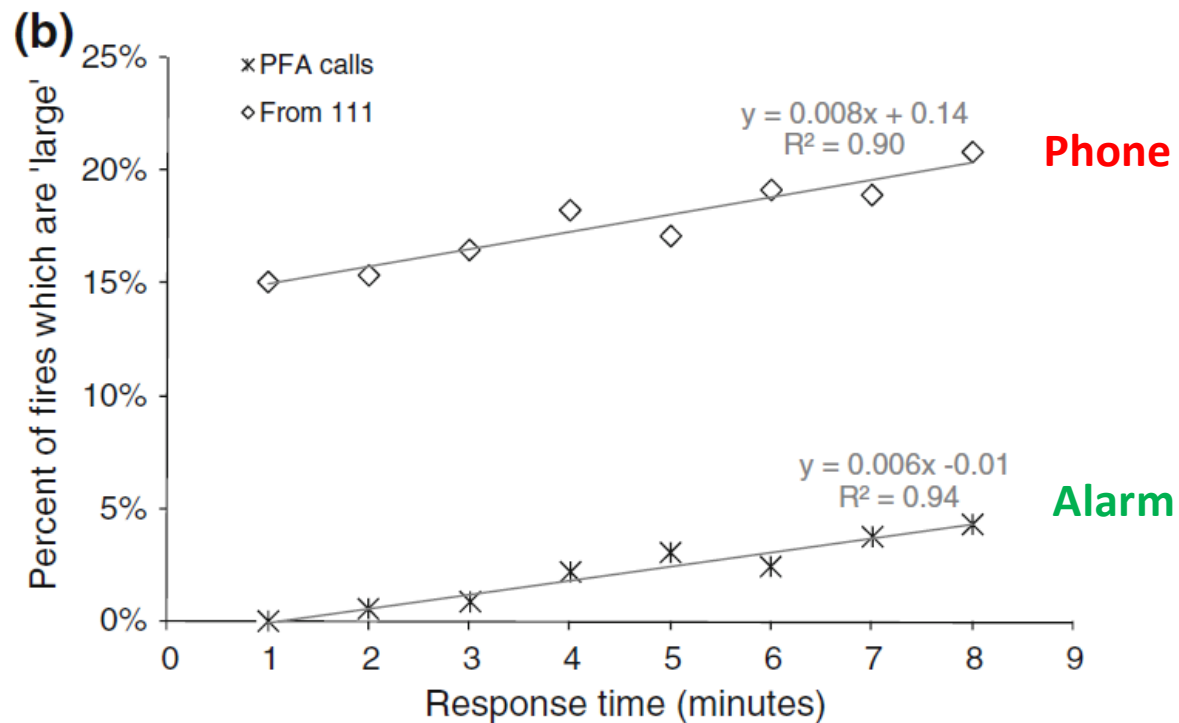
“Maternal voice alarms awakened 86%-91% of children and prompted 84%-86% to escape compared with 53% awakened and 51% escaped for the tone alarm. A sleeping child was 2.9-3.4 times more likely to be awakened by each of the 3 voice alarms than the tone alarm.”



The Relationships Between Fire Service Response Time and Fire Outcomes

Neil Challands*, New Zealand Fire Service, Wellington, New Zealand

Received: 8 February 2009/Accepted: 29 September 2009



List of high-rise facade fires [Ed: since Grenfell Tower]

Index ↕	Date ↕	Building ↕	City ↕	Country ↕	Images ↕	Deaths ↕	Injuries ↕	Number of floors affected by fire ↕
49	August 4, 2017	The Marina Torch ^{[61][62]}	Dubai	UAE	n/a	0	0	64/87
50	February 1, 2018	Yuansheng International ^{[63][64]}	Zhengzhou	China	n/a	0	n/a	20
51	April 5, 2018	Taksim İlk Yardim Hospital ^[65]	Istanbul	Turkey	n/a	0	0	14
52	May 15, 2018	Zen Tower ^{[66][67]}	Dubai	UAE	n/a	0	0	15
53	February 4, 2019	Neo 200 ^{[68][69]}	Melbourne	Australia	n/a	0	0	6
54	March 14, 2019	Kaifeng Apartments ^[citation needed]	Kaifeng	China	n/a	0	n/a	17
55	May 27, 2019	Golden Eagle Shopping Mall ^[70]	Nanjing	China	n/a	0	0	1
56	May 29, 2019	Commercial Building ^[71]	Luoyang	China	n/a	0	0	n/a
57	August 14, 2019	Residential Flats ^[72]	Warsaw	Poland	n/a	n/a	n/a	10
58	November 16, 2019	The Cube Student Housing ^{[73][74][75]}	Bolton	UK	n/a	0	2	1
59	May 5, 2020	Abbco Tower ^{[76][77]}	Sharjah	UAE	n/a	0	12	48
60	July 27, 2020	Business Centre ^[78]	Ankara	Turkey	n/a	0	n/a	n/a
61	August 29, 2020	Madrid Tower Block ^[79]	Madrid	Spain	n/a	0	n/a	3
62	October 8, 2020	Apartment Block ^[80]	Ulsan	South Korea	n/a	0	91	33
63	March 9, 2021	Apartment Building ^[citation needed]	Shijiazhuang	China	n/a	0	0	26

Inside Torre Ámbar, Calle de Dulce Chacón, 17, Madrid, where there was a fire in the external wall system in August 2020. The building evacuated successfully, everybody got out, nobody was hurt.



StaySafe Home Fire Safety Kit

£28.99



Drager 5500 Parat Fire Escape Hood

« MSA S-Cap Hood



Around £100 to £200



Questions?

[@HRRBFireSafety](#)

<https://www.hrrbfiresafety.com>

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