

Demystifying Sprinklers

Alan Brinson

Brussels, 19 November 2019



EUROPEAN FIRE
SPRINKLER NETWORK

Common myths and misconceptions

- ❖ Sprinklers activate without a fire
- ❖ Smoke activates sprinklers
- ❖ All the sprinklers activate together
- ❖ Smoke kills, sprinklers don't help
- ❖ Sprinklers are expensive
- ❖ Sprinklers are unreliable

These are all untrue!



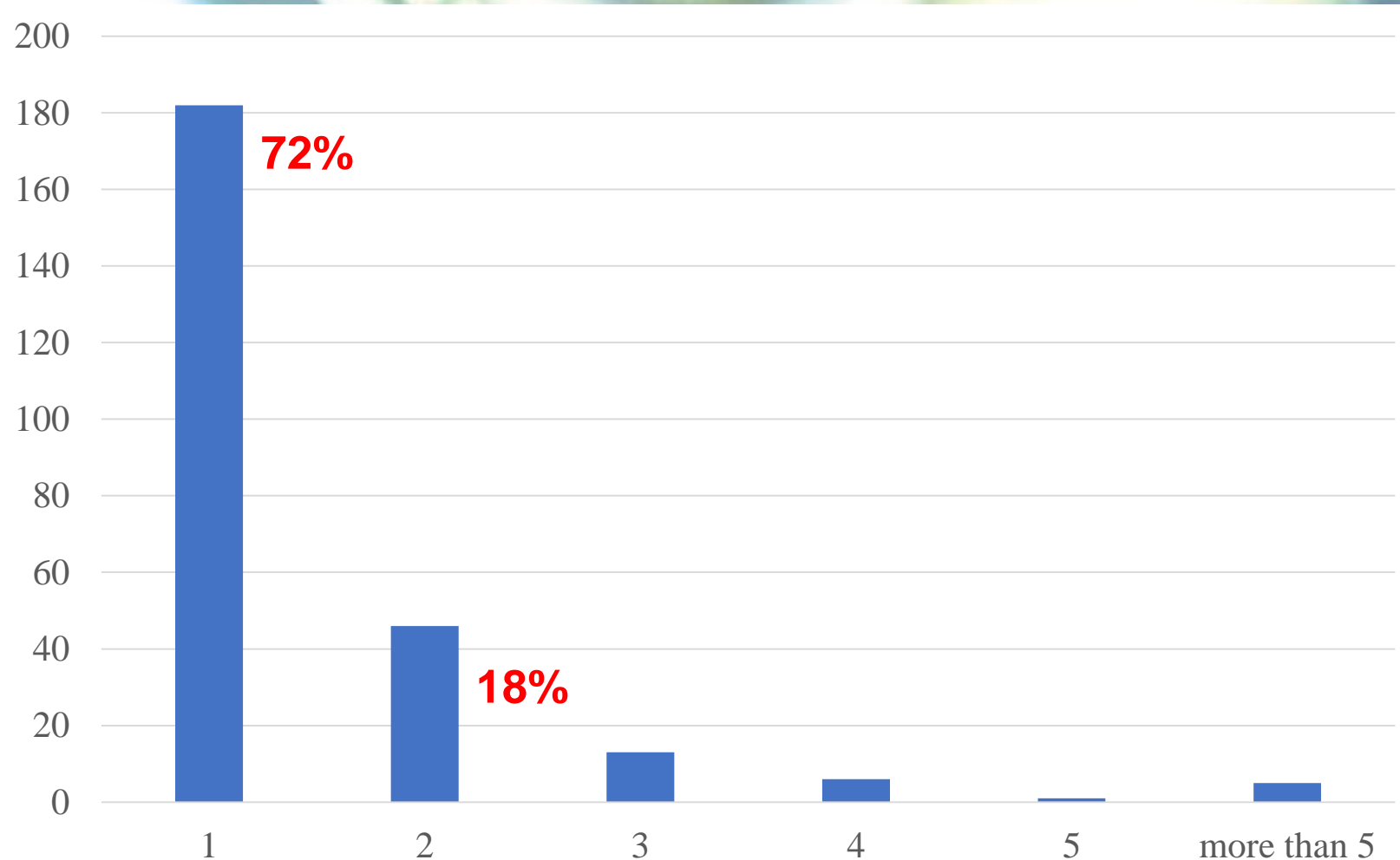
EUROPEAN FIRE
SPRINKLER NETWORK

- ❖ Fire heats liquid, which expands
- ❖ Vapour bubble is compressed
- ❖ Above a set temperature (68°C) the bulb breaks, seal is released
- ❖ A simple, mechanical device
- ❖ No connection to other sprinklers
- ❖ Only heat activates a sprinkler



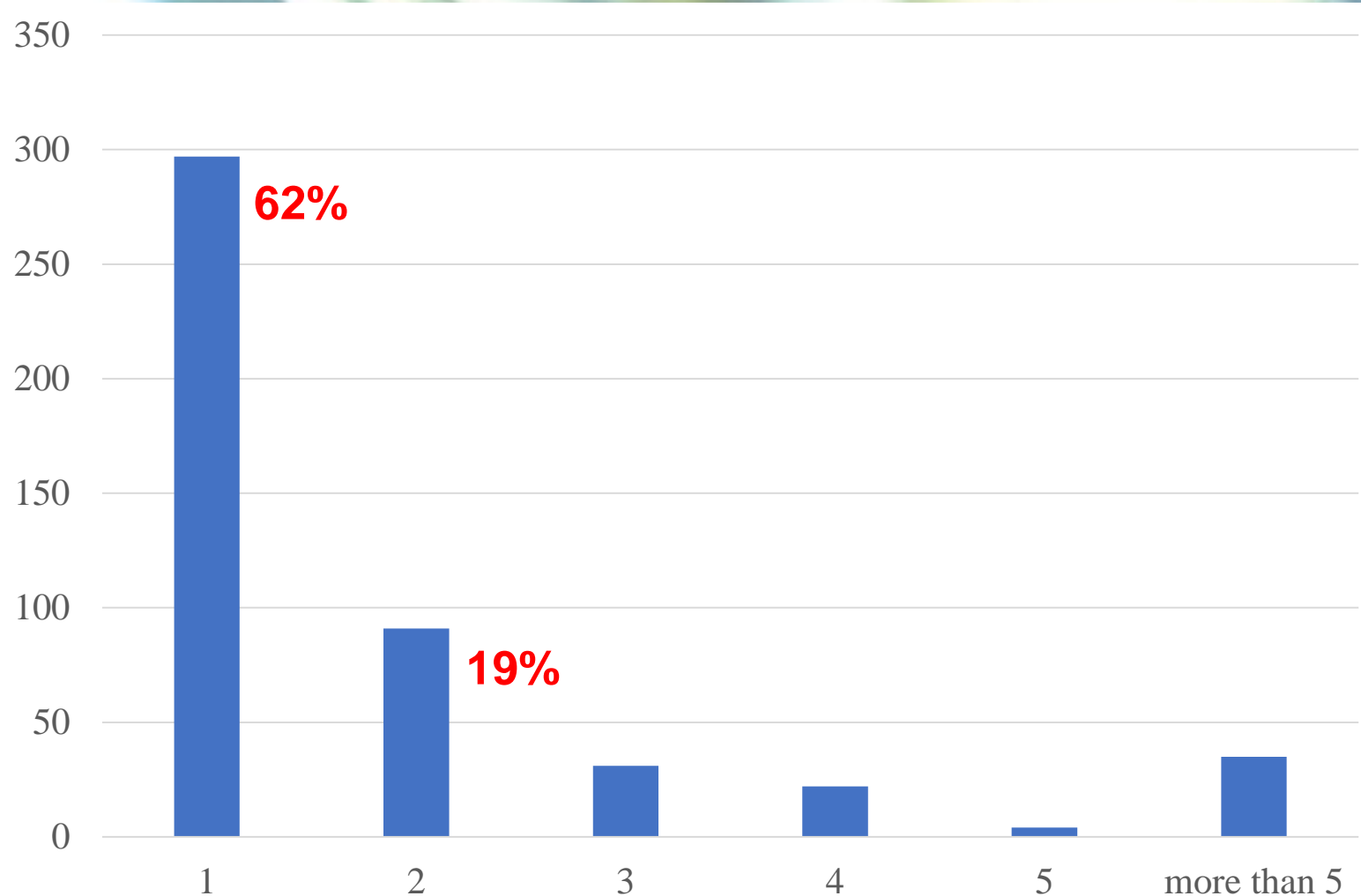
Analysis of UK fire incident reports

Number of dwelling fires by numbers of heads activated



Analysis of UK fire incident reports

Number of non-residential fires by numbers of heads activated



False sprinkler activations are very rare!

Probability around 1 in a million

Based on insurer experience and insider knowledge



EUROPEAN FIRE
SPRINKLER NETWORK

Common myths and misconceptions

- ❖ Sprinklers activate without a fire – **False!**
- ❖ Smoke activates sprinklers – **False!**
- ❖ All the sprinklers activate together – **False!**
- ❖ Smoke kills, sprinklers don't help
- ❖ Sprinklers are expensive
- ❖ Sprinklers are unreliable



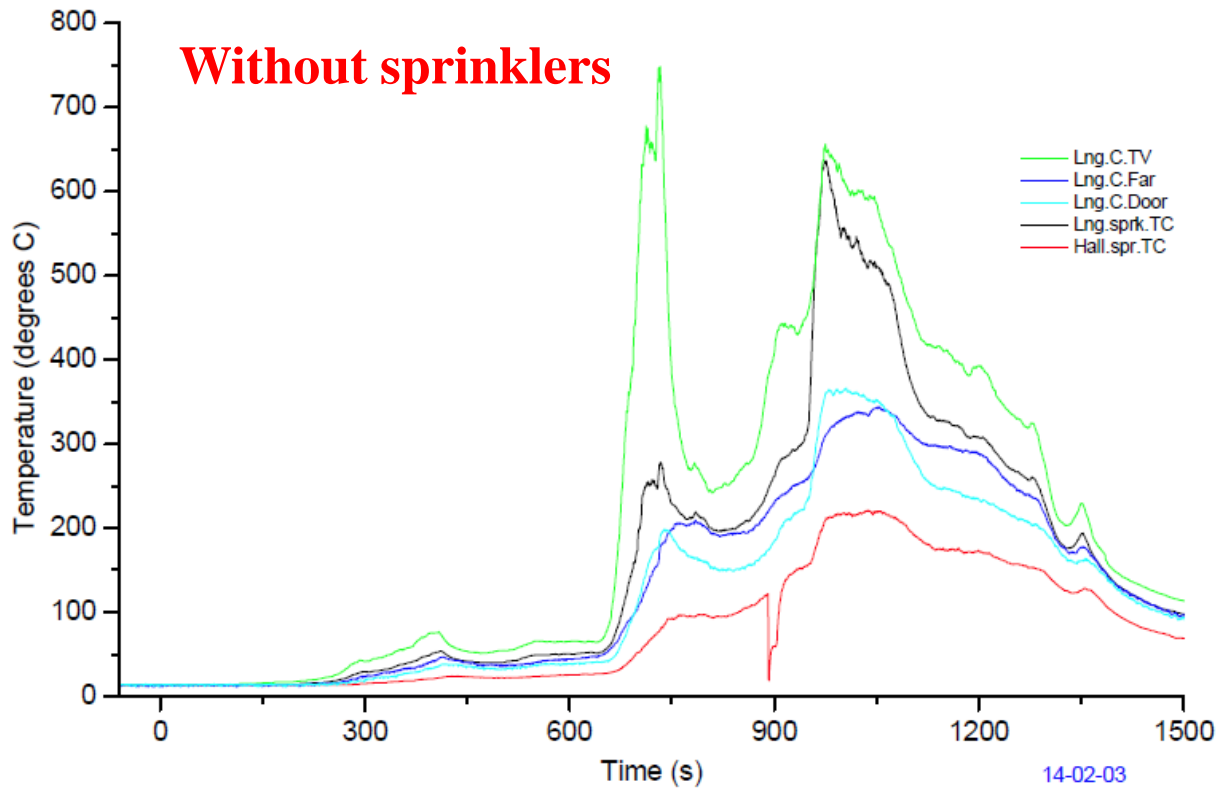
Benefits of sprinklers

Residential Sprinklers Project : House Fire 1

Door open, unsprinklered

Lounge ceiling and sprinkler temperatures

Without sprinklers

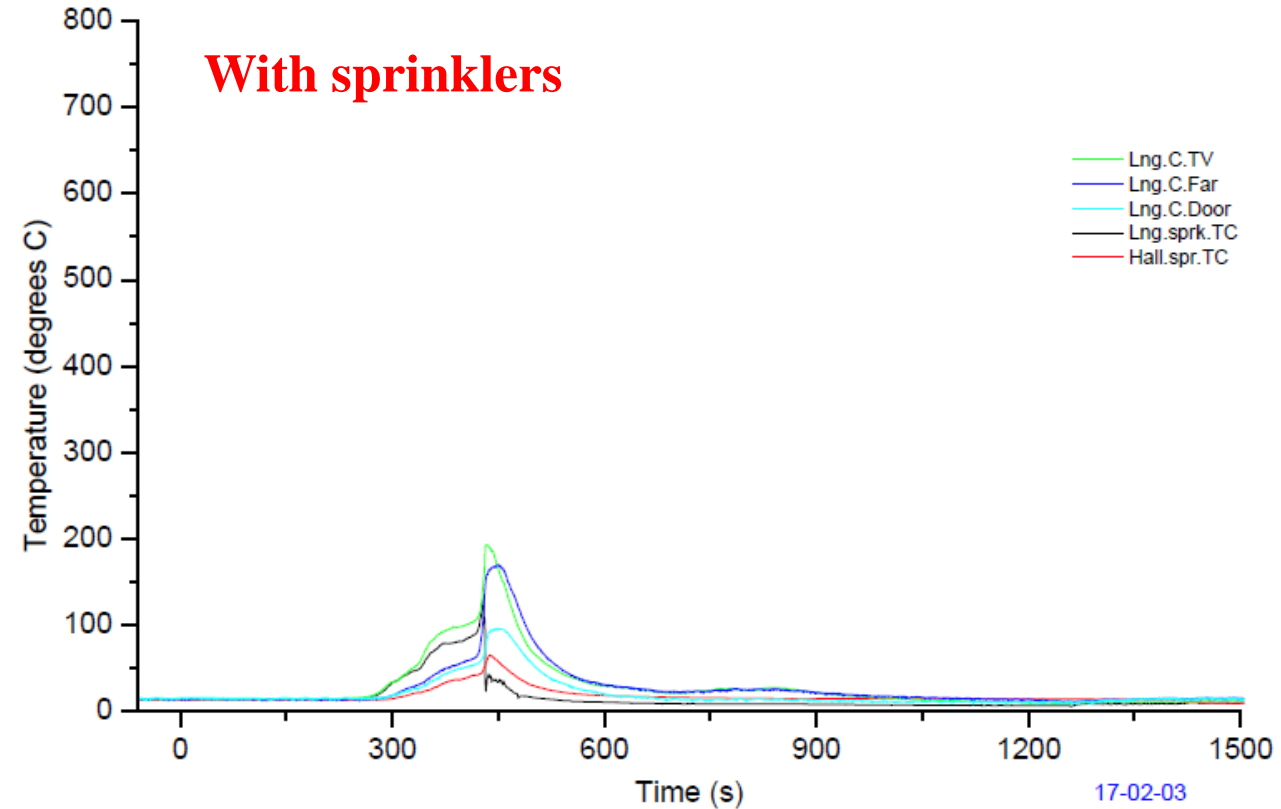


Residential Sprinklers Project : House Fire 2

Door open, sprinklered (type A)

Lounge ceiling and sprinkler temperatures

With sprinklers



Source: BRE fire tests for British Government



EUROPEAN FIRE
SPRINKLER NETWORK

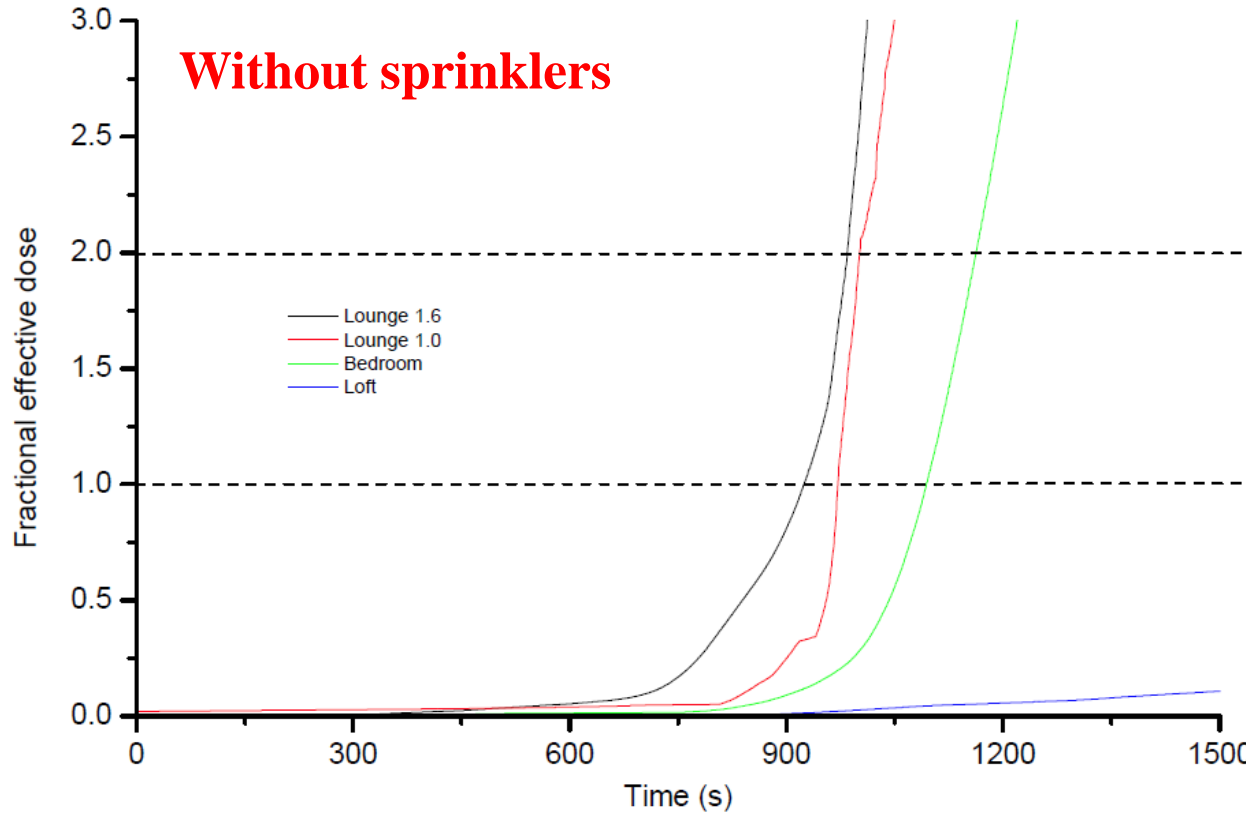
Benefits of sprinklers

Residential Sprinklers Project : House Fire 1

Door open, unsprinklered

Tenability time - Fractional Effective Dose of Asphyxiants

Without sprinklers

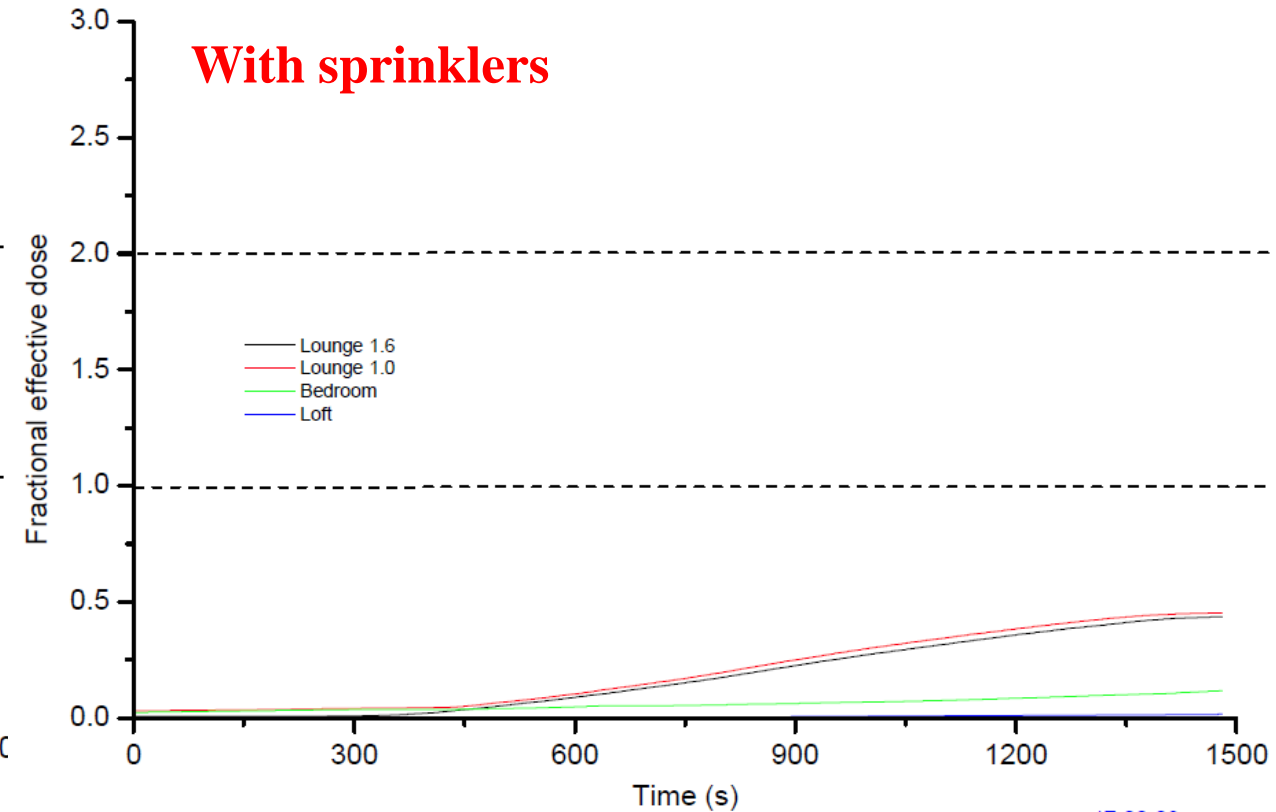


Residential Sprinklers Project : House Fire 2

Door open, sprinklered (type A)

Tenability time - Fractional Effective Dose of Asphyxiants

With sprinklers



Source: BRE fire tests for British Government



EUROPEAN FIRE
SPRINKLER NETWORK

Statistical experience – Fire deaths

USA: NFPA 2010-2014

Application	Number of fires	Percentage of buildings with sprinkler protection	Fire deaths per thousand fires with/without sprinkler protection		Reduction with sprinkler protection
			Without	With	
Hospitals	770	67%	0.9	0.1	83%
Nursing homes	1,780	67%			
Elderly homes	1,900	50%	7.2	1.5	80%

Source: US Experience with Sprinklers, M. Ahrens, NFPA, 2017



Retrofit of Sprinklers



Sprinkler!



**Where is the
sprinkler?**

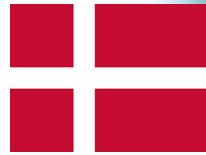


Here!

MEAN FIRE
SPRINKLER NETWORK

Statistical analyses of sprinkler system reliability

Denmark

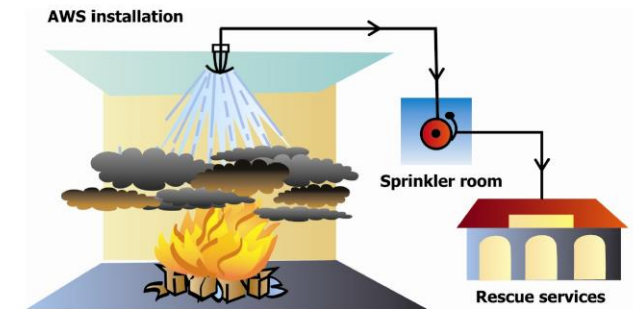


- Studies by DBI in 2003 and 2008
- Each study inspected and tested 600
- Concluded 98%, 97% reliable



Reliability of Automatic Water Sprinkler systems (AWS systems)

DBI Report 2008:02
2008-12-02

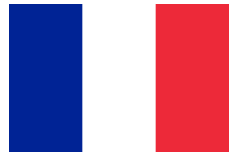


Statistical analysis of AWS systems inspected in 2007

Rolf Knudsen
Henrik Bygbjerg

Statistical analyses of sprinkler system reliability

France



- Study by CNPP in 2012
- Fires in sprinklered buildings and field ins
- Concluded reliability is 97-100%



CNPP
BP 2265
27060 SAINT MARCEL
Tél : 02 32 53 64 33
Fax : 02 32 53 64 68




(MVDépartement Feu/03-04-12)

Facteurs d'influence sur la capacité d'une installation sprinkleur à fonctionner correctement

ETUDE N°EP – 09.04 Incend

DEMANDE PAR : **FFSA**
26 Boulevard Haussmann
75009 PARIS

DIFFUSION : FFSA (3 exemplaires)
Service Emetteur (1 exemplaire)
Direction Technique (1 exemplaire)

		Nom	Signature	Date
Soumis	Rédacteur	Matthieu VANDEWALLE		04/04/12
Approuvé	Chef de Service	Armelle MULLER		04/04/12
Bon pour Diffusion	Direction Etude et Recherche	Armelle MULLER		04/04/12

- Le présent rapport d'étude comporte : 195 pages

Statistical analyses of sprinkler system reliability

Germany



- Study by GDV 1971-1992, quoted by Munich
- 97.9% reliable (industrial risks only)
- DIN 18230 recommends 98% reliability



Statistical analyses of sprinkler system reliability

Sweden



- Study by Brandkonsulten in 2017
- 3,299 sprinklered fires over 10 years
- 99% reliability

B

Tillförlitlighet för
automatiska
vattensprinkler-
anläggningar

Djupstudie av MSB:s insats-
rapporter avseende bränder i
byggnader som är försedda med
automatiska vattensprinklersystem

Markus Melin
Brandingenjör/Civilingenjör riskhantering
Brandkonsulten AB

Statistical analyses of sprinkler system reliability

UK



- Every sprinklered fire over five years – 2,29
- 93% reliable
- 96% reliable in dwellings; 98% in care homes



Efficiency and Effectiveness of Sprinkler Systems in the United Kingdom: An Analysis from Fire Service Data



May 2017



Common myths and misconceptions

- ❖ Sprinklers activate without a fire – **False!**
- ❖ Smoke activates sprinklers – **False!**
- ❖ All the sprinklers activate together – **False!**
- ❖ Smoke kills, sprinklers don't help – **False!**
- ❖ Sprinklers are expensive – **False!**
- ❖ Sprinklers are unreliable – **False!**





Thank you!

Alan Brinson

brinson@eurosprinkler.org



EUROPEAN FIRE
SPRINKLER NETWORK