Fire Safety in the United States since 1980

Through the Lens of the NFPA Fire & Life Safety Ecosystem

Birgitte Messerschmidt | Director of Research

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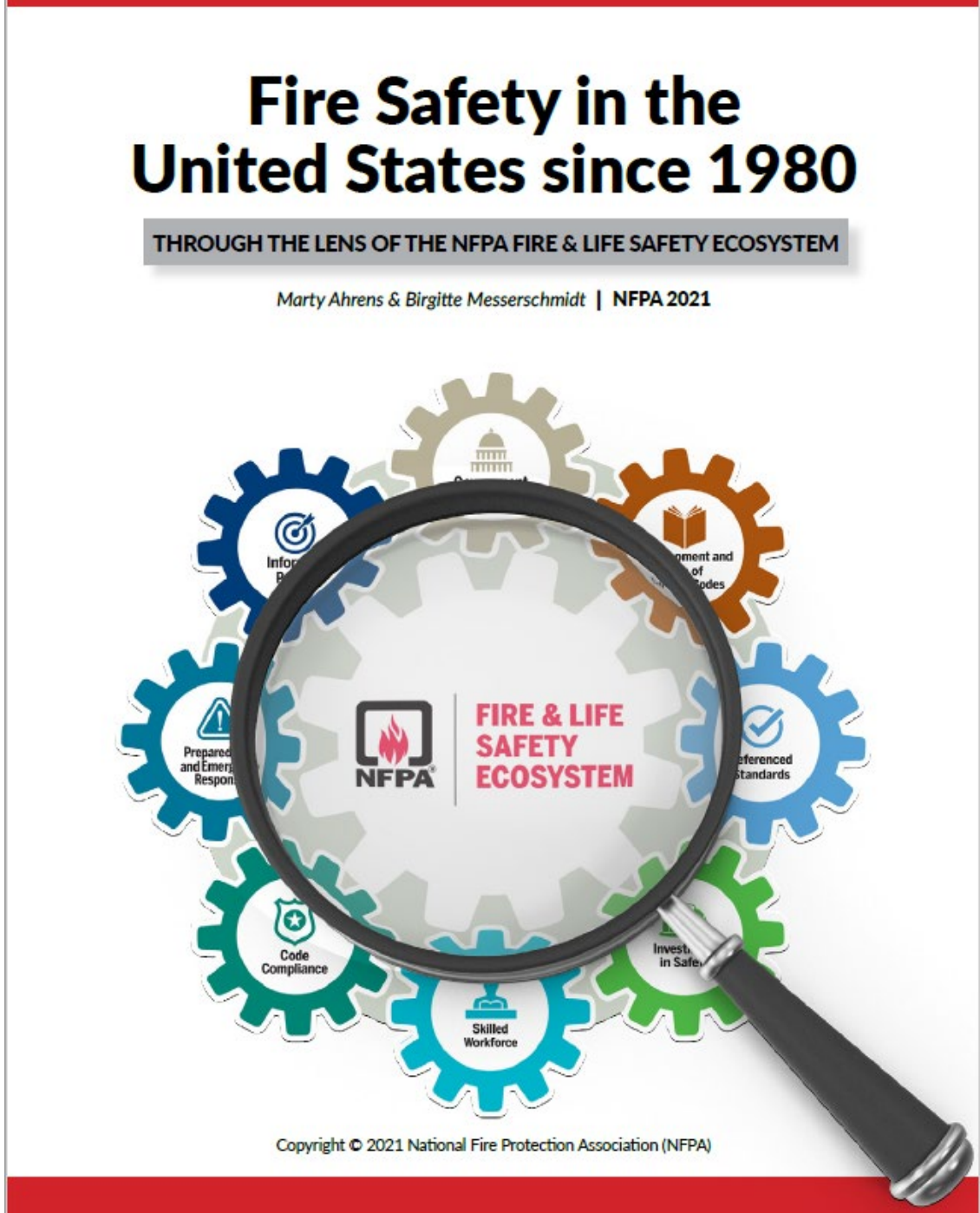
https://www.nfpa.org/fireprogress



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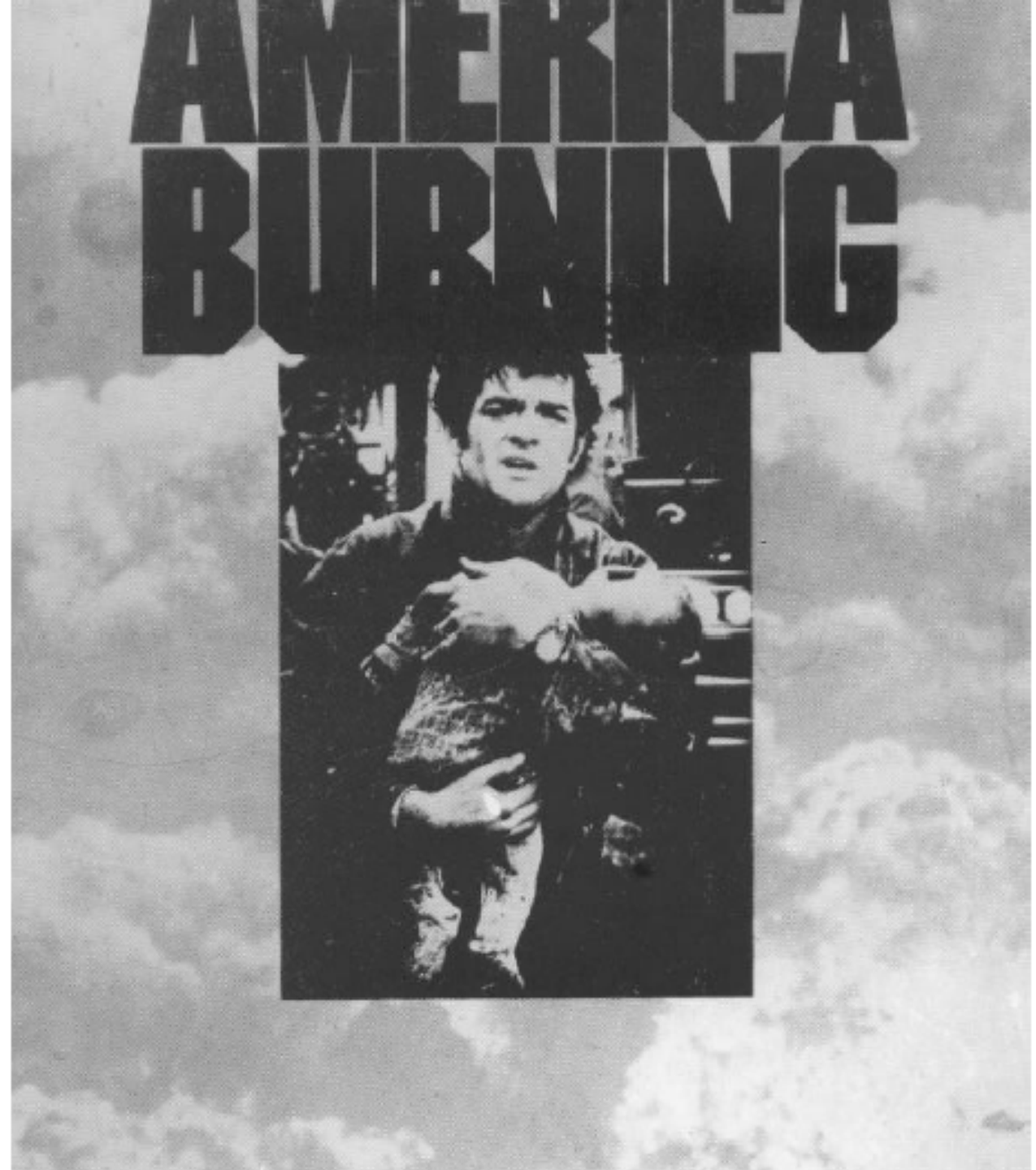

America Burning 1973

There needs to be more emphasis on fire prevention.

Americans must be educated about fire safety.

The fire protection features of buildings need to be improved.

NFIRS - National Fire Incident Reporting System

Data reported by Fire Departments to US Fire Administration.

Provides info on incidents and equipment involved.

Includes approximately 75% of all annual fires.

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Data sets unique to NFPA

FES – Fire Experience Survey

- Survey of nearly 30,000 Fire Departments

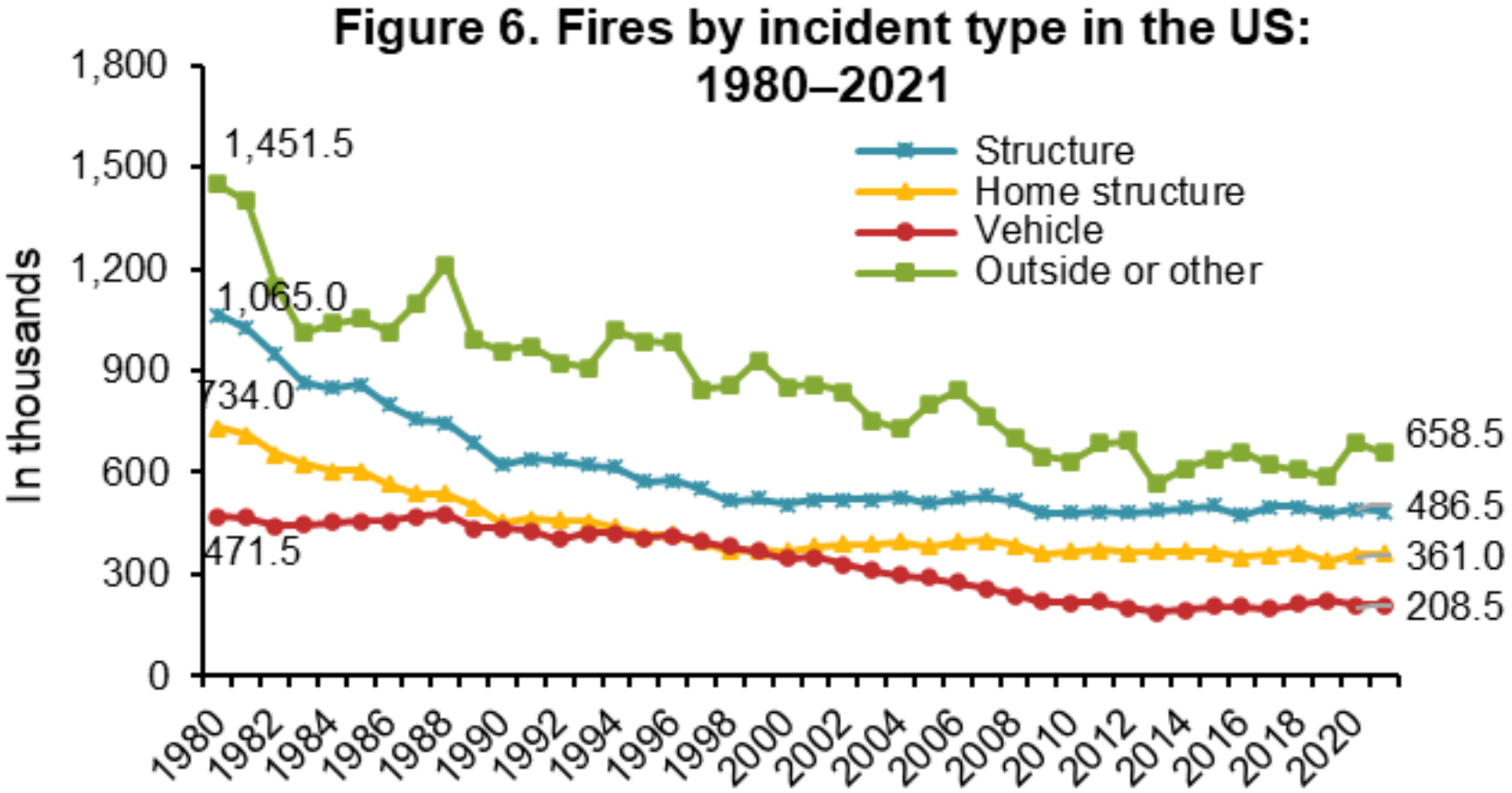
FSI – Fire Service Inventory

- List of US Fire Departments and their inventory

FIDO – Fire Incident Data organization

- Significant fire incidents and fires of technical interest, worldwide
- All U.S. firefighter fatalities since 1974
- All Catastrophic Multiple Death (5 or more) fires
- Large-loss fires
- Incidents of special interest

https://www.nfpa.org/News-and-Research/Data-research-and-tools/US-Fire-Problem/Fire-loss-in-the-United-States



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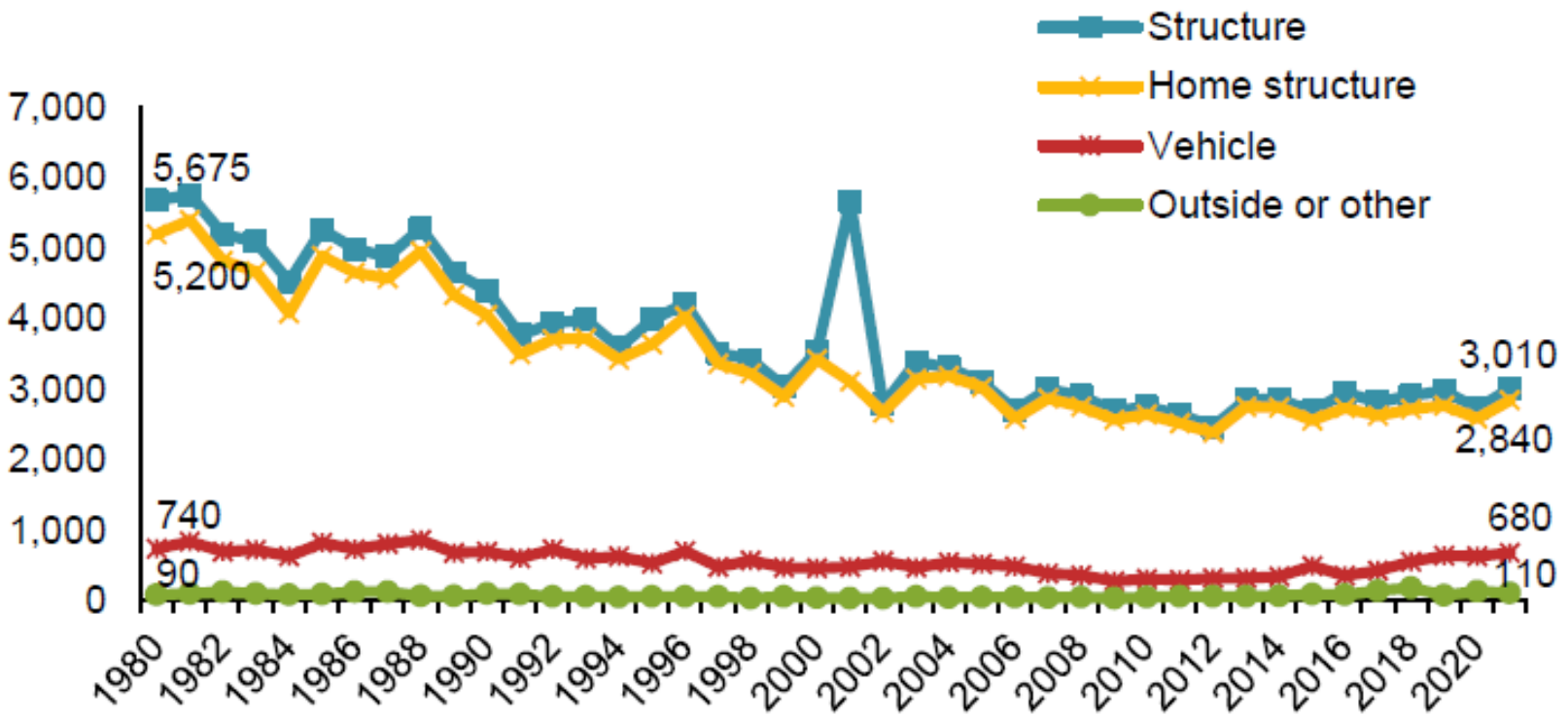
https://www.nfpa.org/News-and-Research/Data-research-and-tools/US-Fire-Problem/Fire-loss-in-the-United-States

Figure 7. Fire deaths by incident type in the US: 1980–2021



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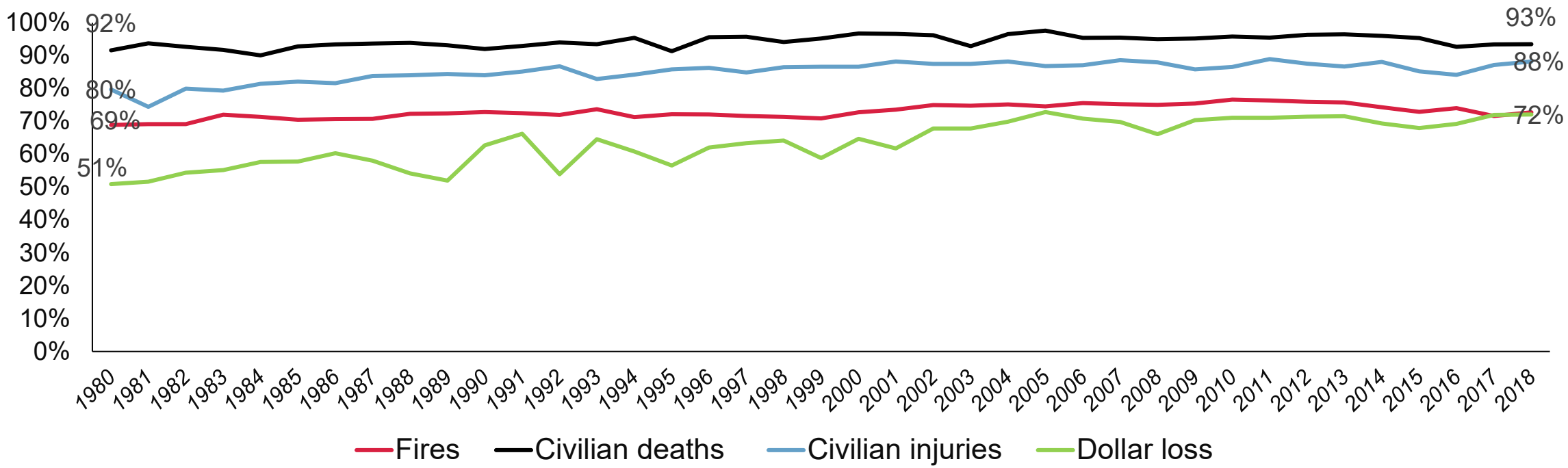
Home Fires

Percentage of structure fire losses caused by home fires

Homes still account for majority of structure fires and associated losses



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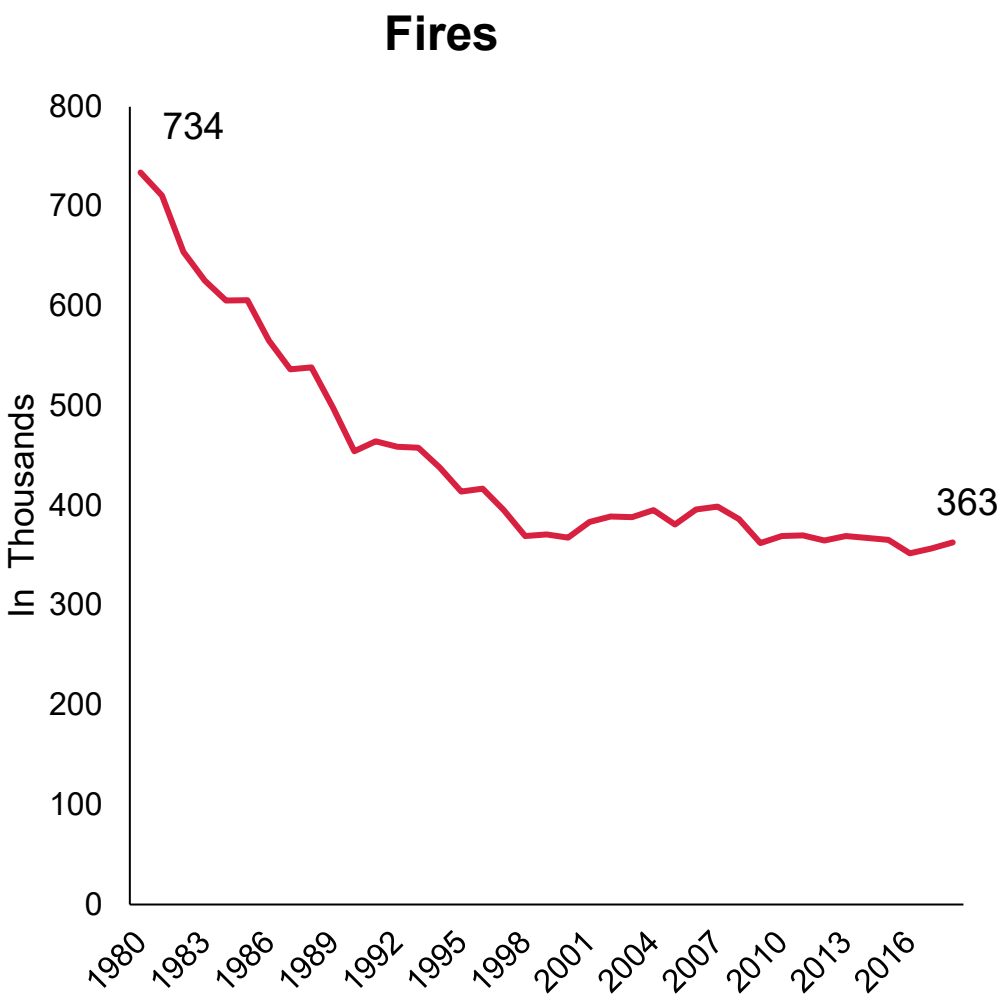
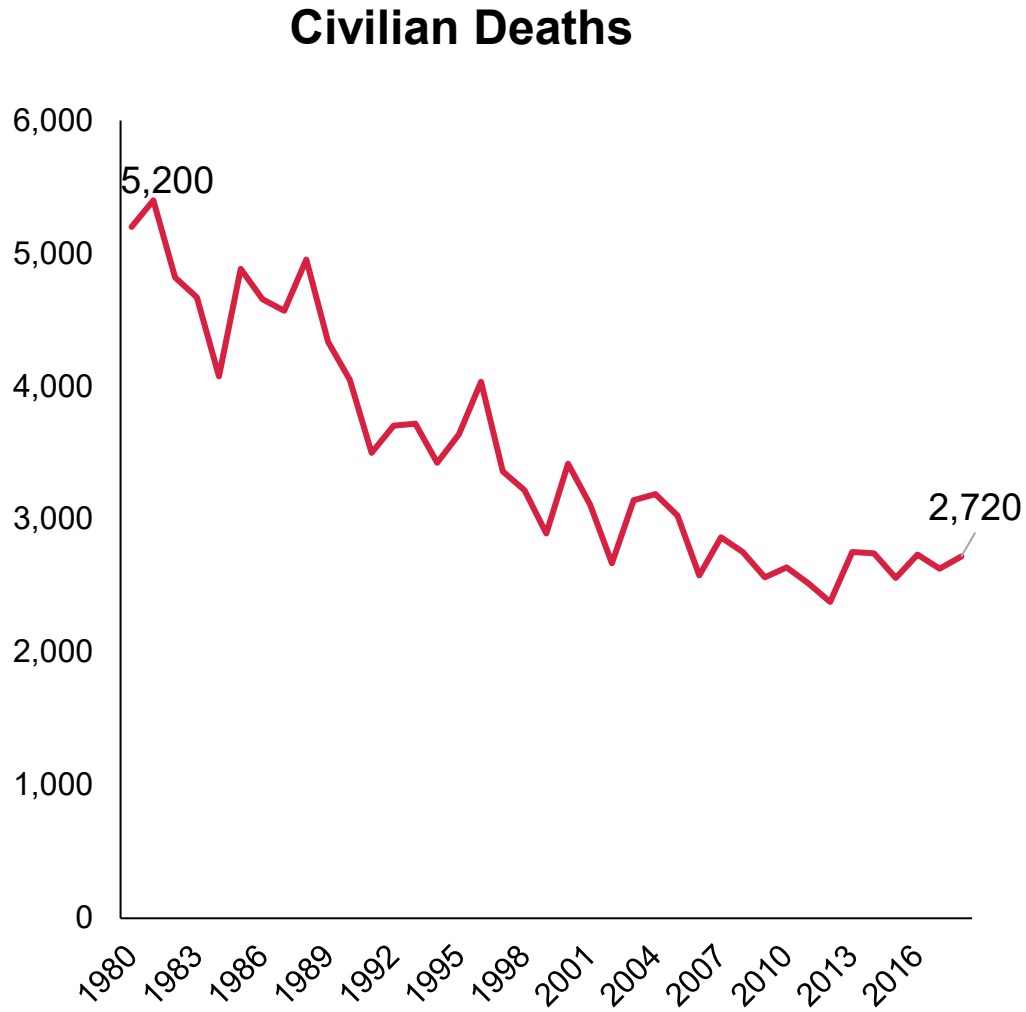
Home Fires





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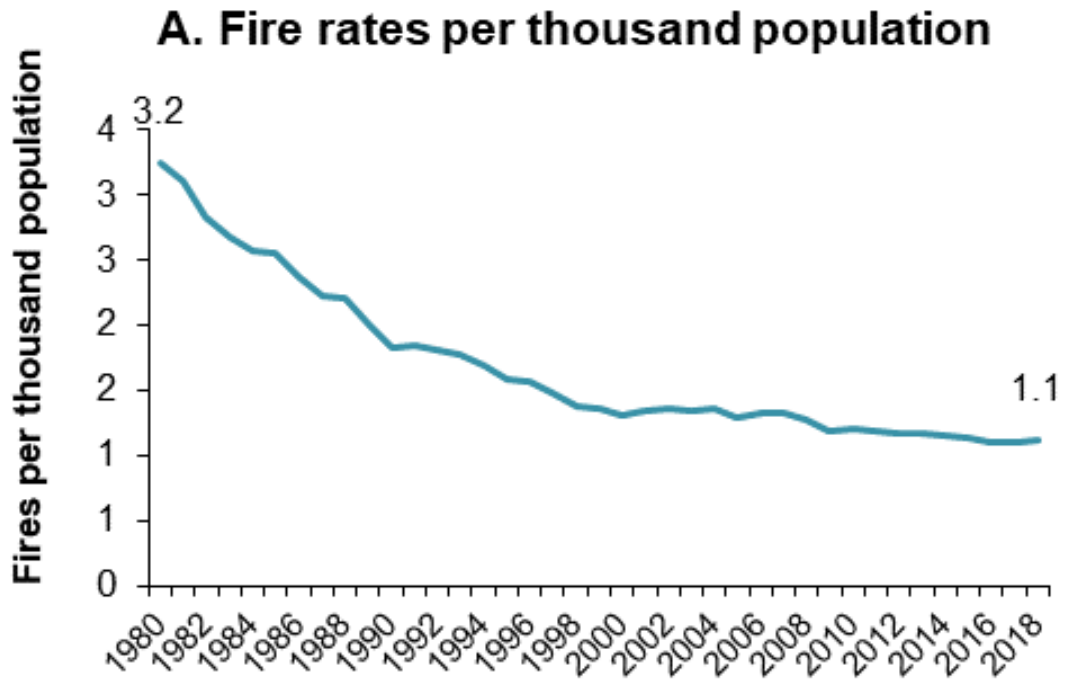
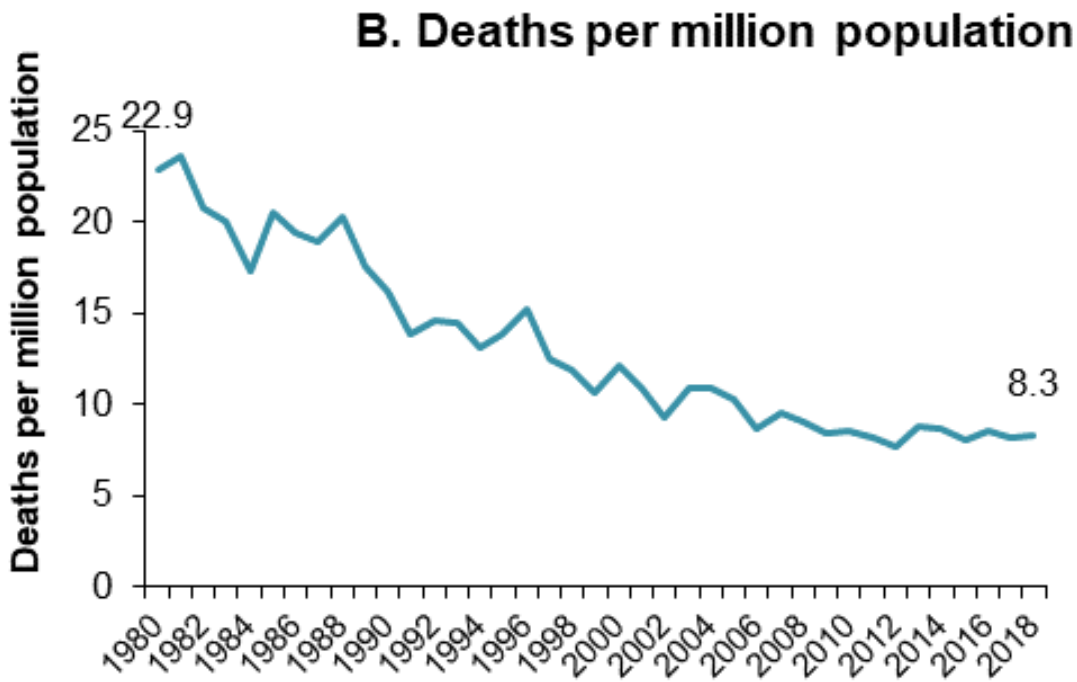
Home Fires





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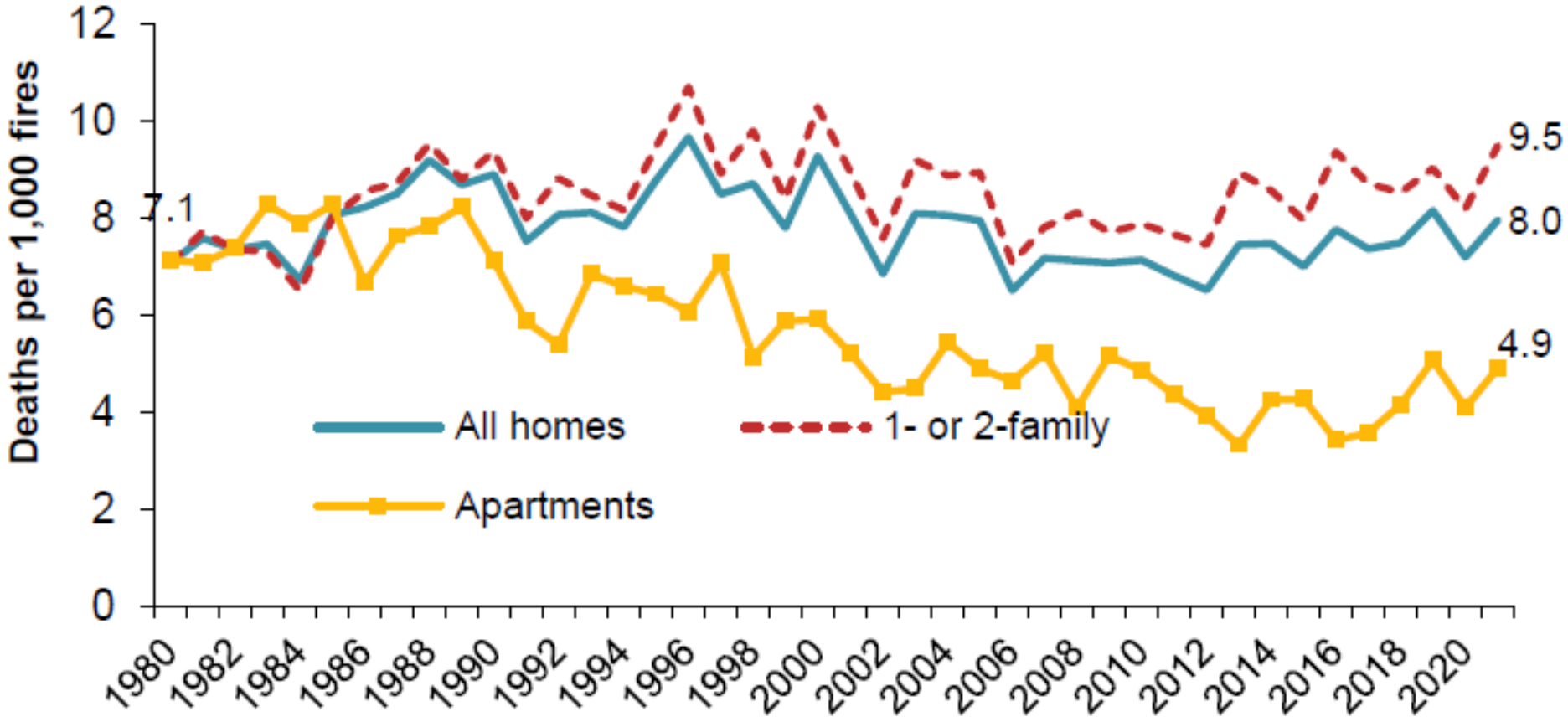
Not all Homes are created equal



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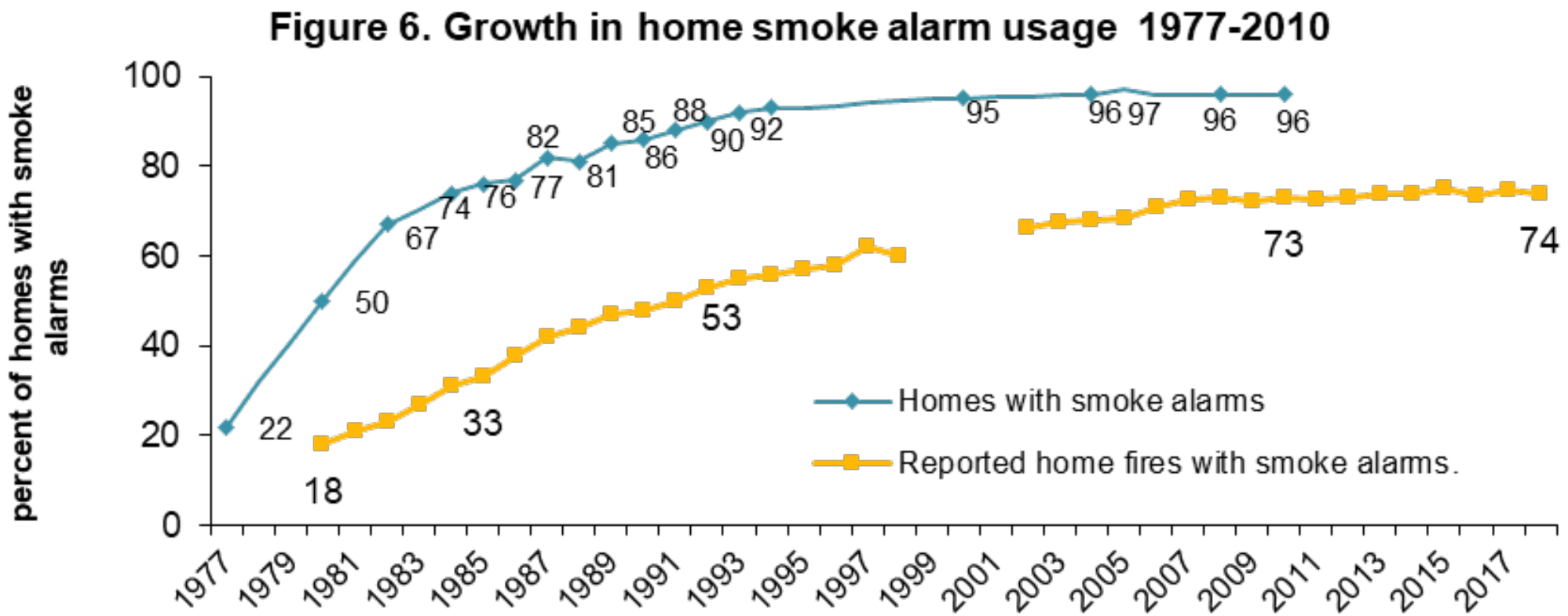
Impact of Fire Protection Technologies



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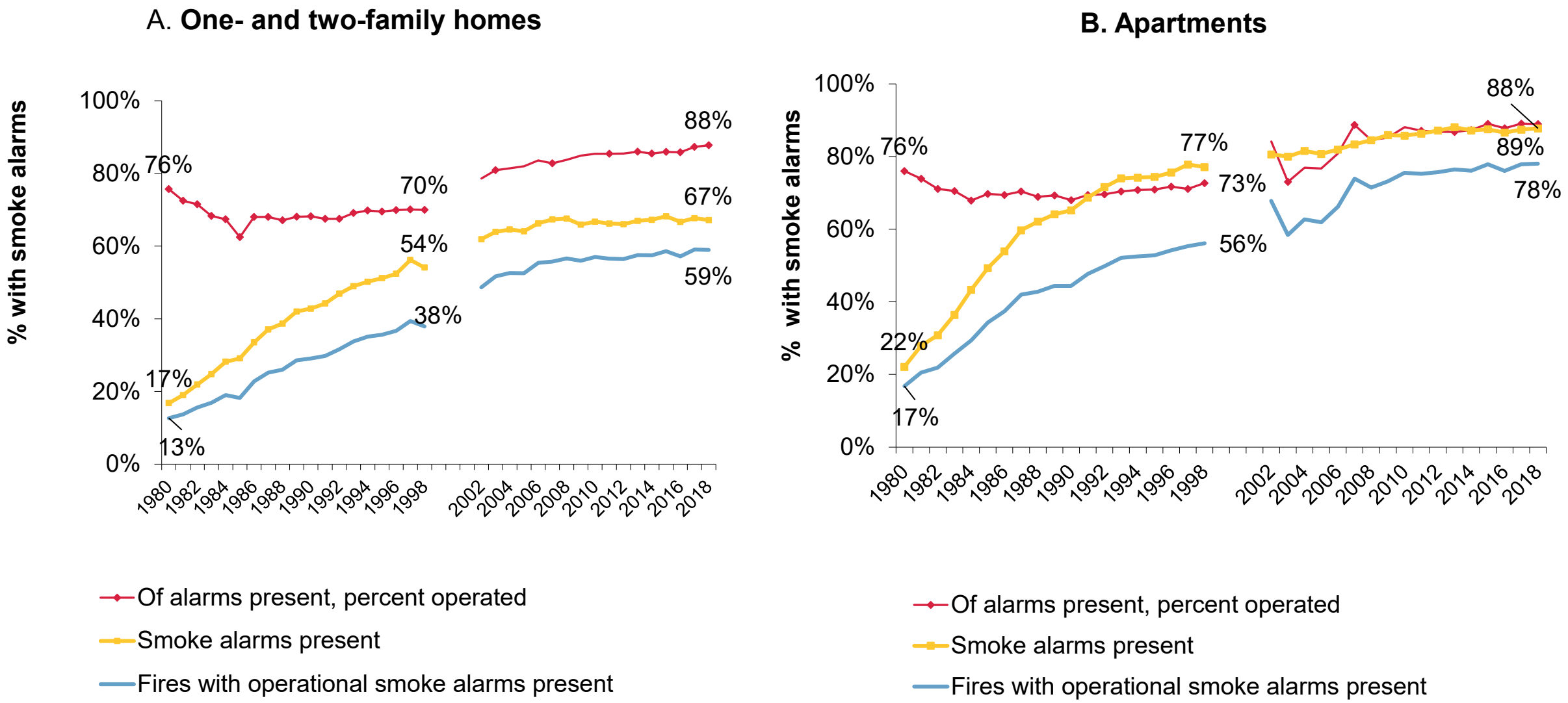
Smoke alarms in reported home fires by occupancy



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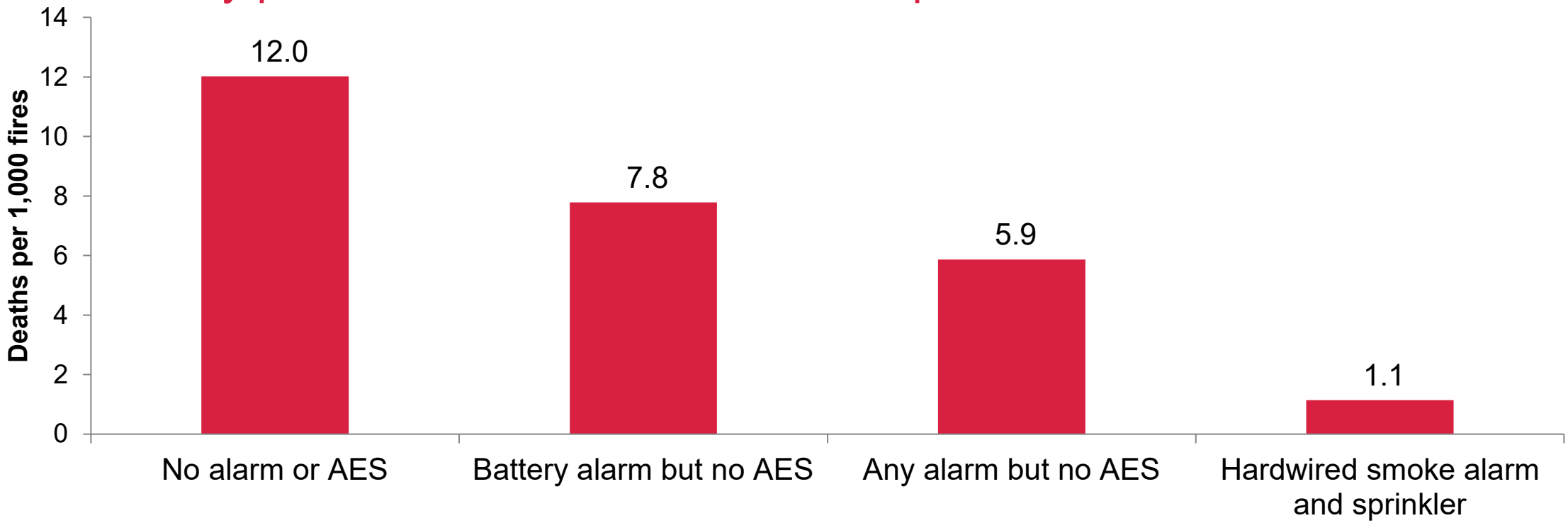
Impact of Fire Protection Technologies

Average fire death rate per 1,000 reported home fires by presence of smoke alarms and sprinklers: 2014–2018



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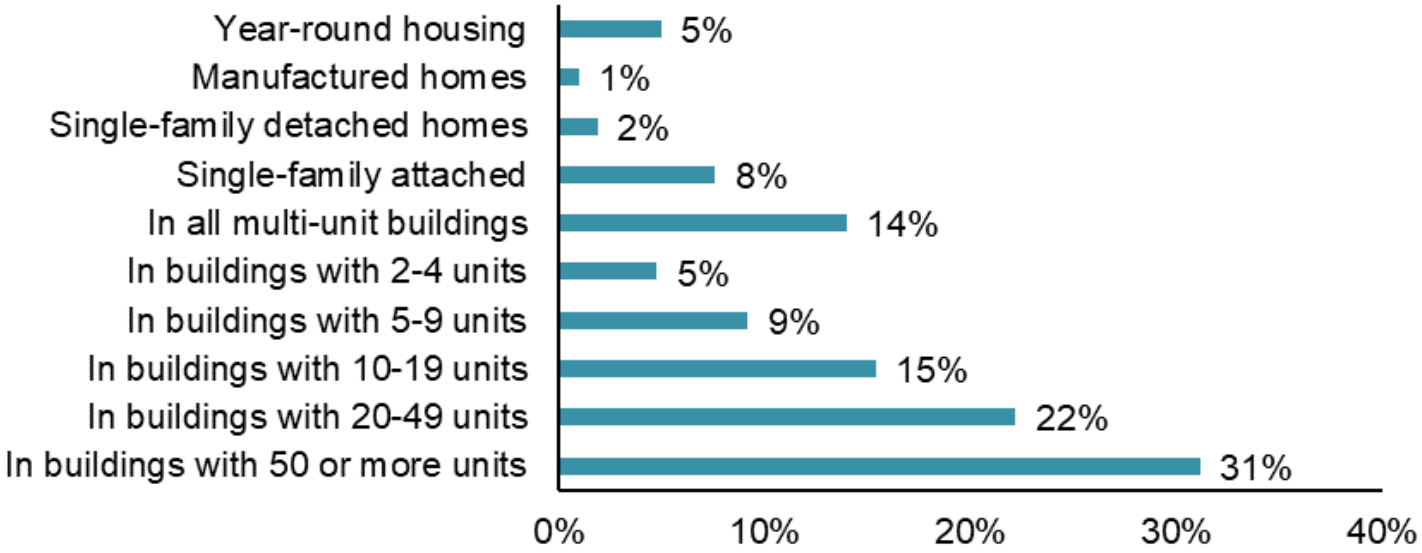
Impact of Fire Protection Technologies

Taller buildings → More Fire Protection (Active as well as Passive)

Figure 9. Percentage of occupied units with sprinklers in 2011 American Housing Survey



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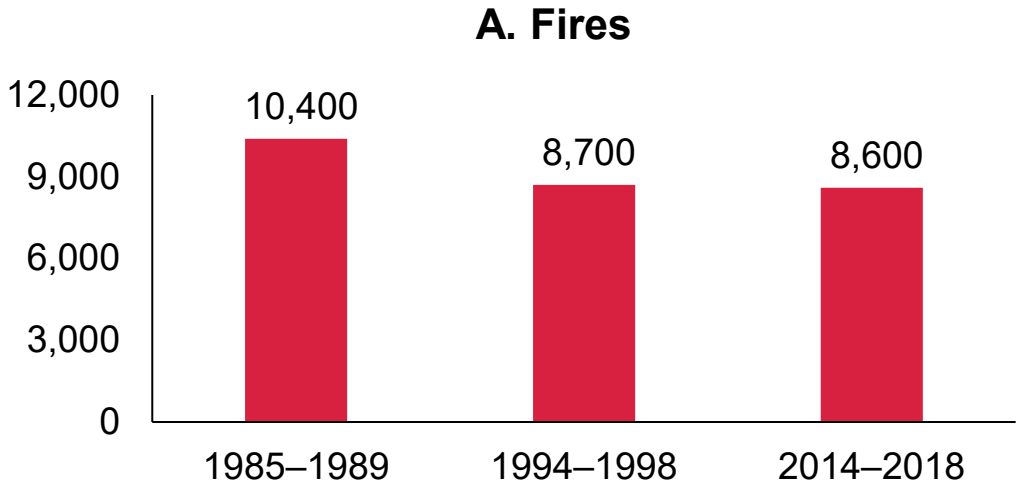
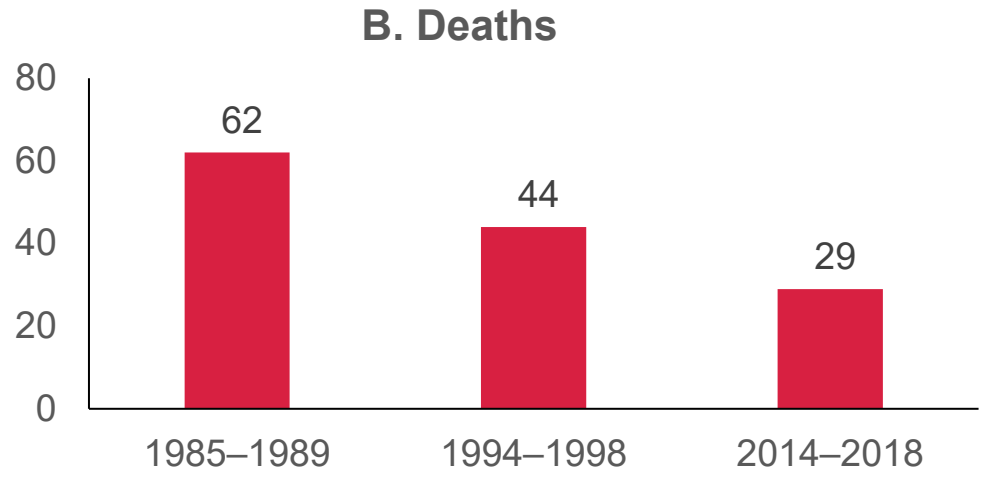
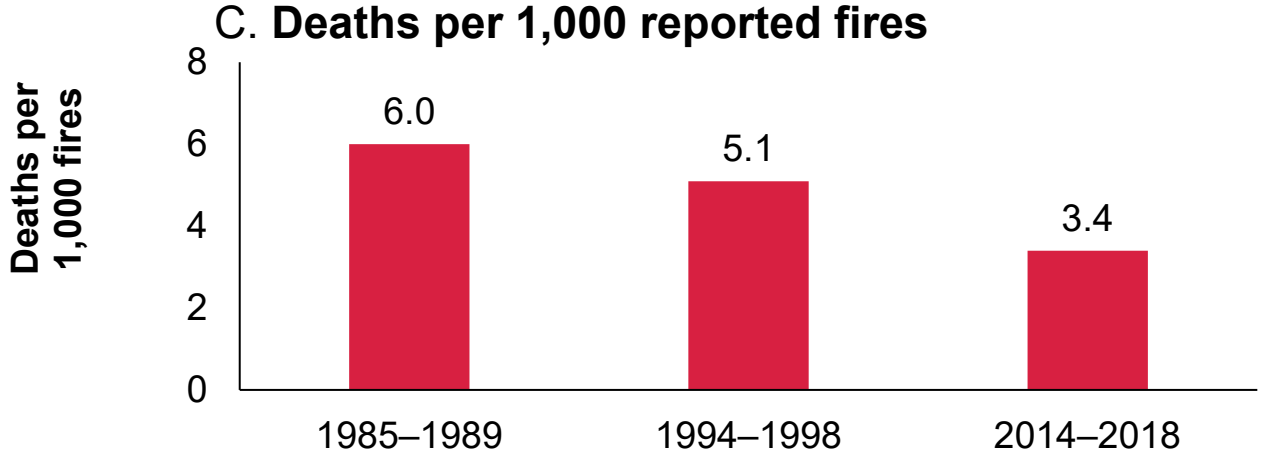
Reported fires, fire deaths, and death rates per 1,000 fires in high-rise apts: 1985–1989, 1994–1998, and 2014–2018







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Government Responsibility

Smoke Alarms!

National Impact

Home Fire Sprinklers!

Local Impact

Development and use of current codes

Smoke Alarms!

1976 Introduced in NFPA 101,® Life Safety Code,®.

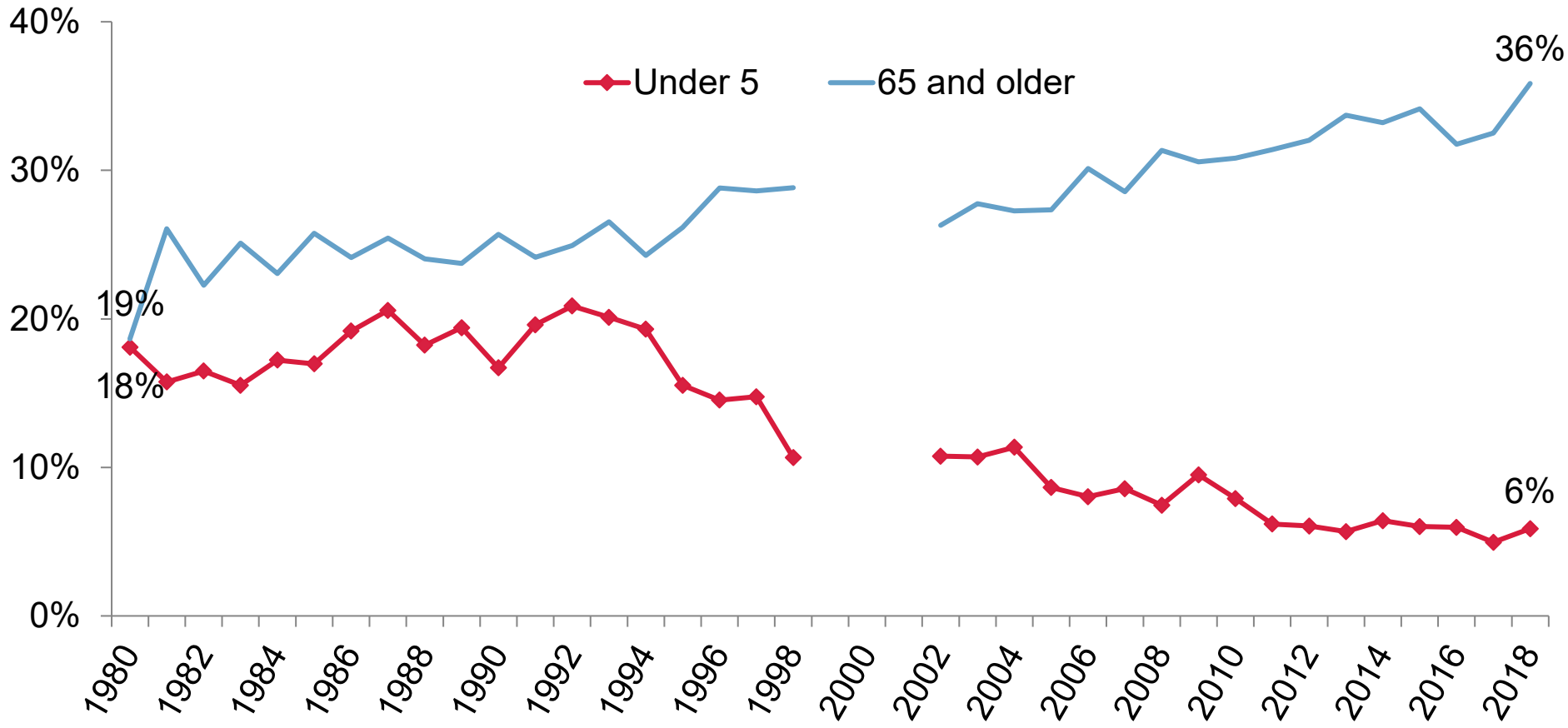
Informed Public

Smoke Alarms!

Fire Prevention Week theme in 1977, 1988, 2016 and 2021!

Home Fire Victims

Percentage of fatal home fire victims who were under five or at least 65 years of age by year



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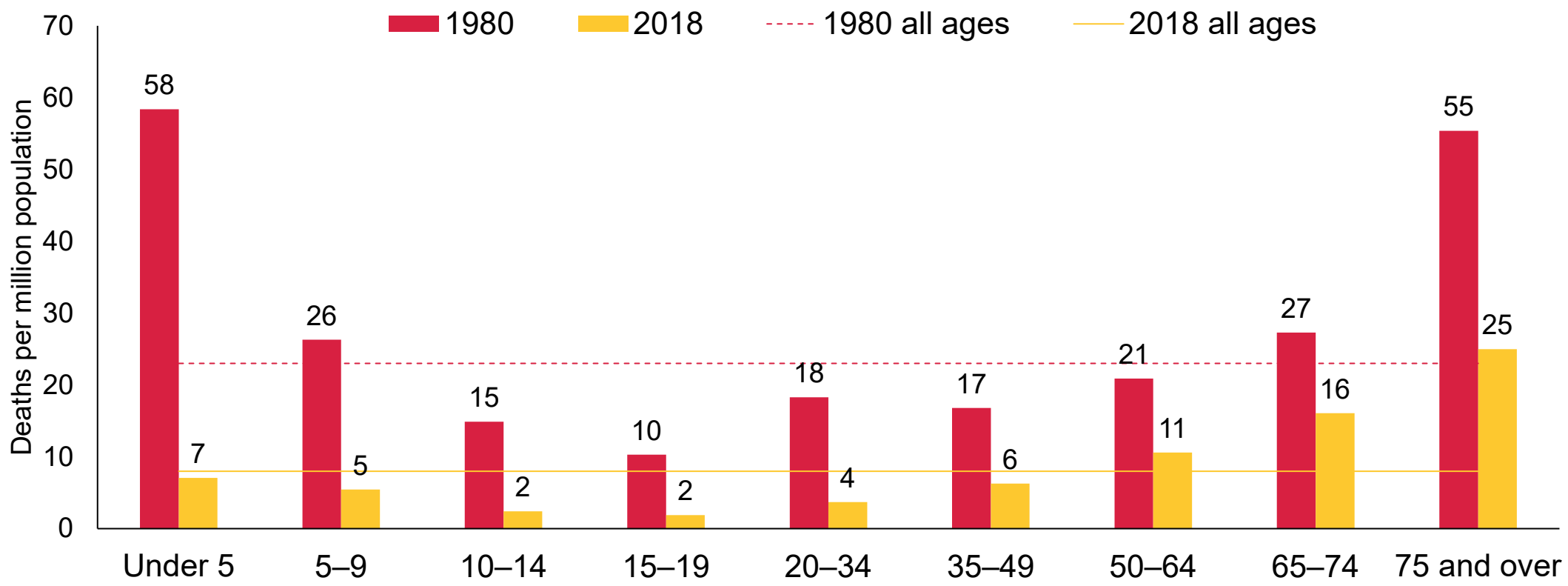
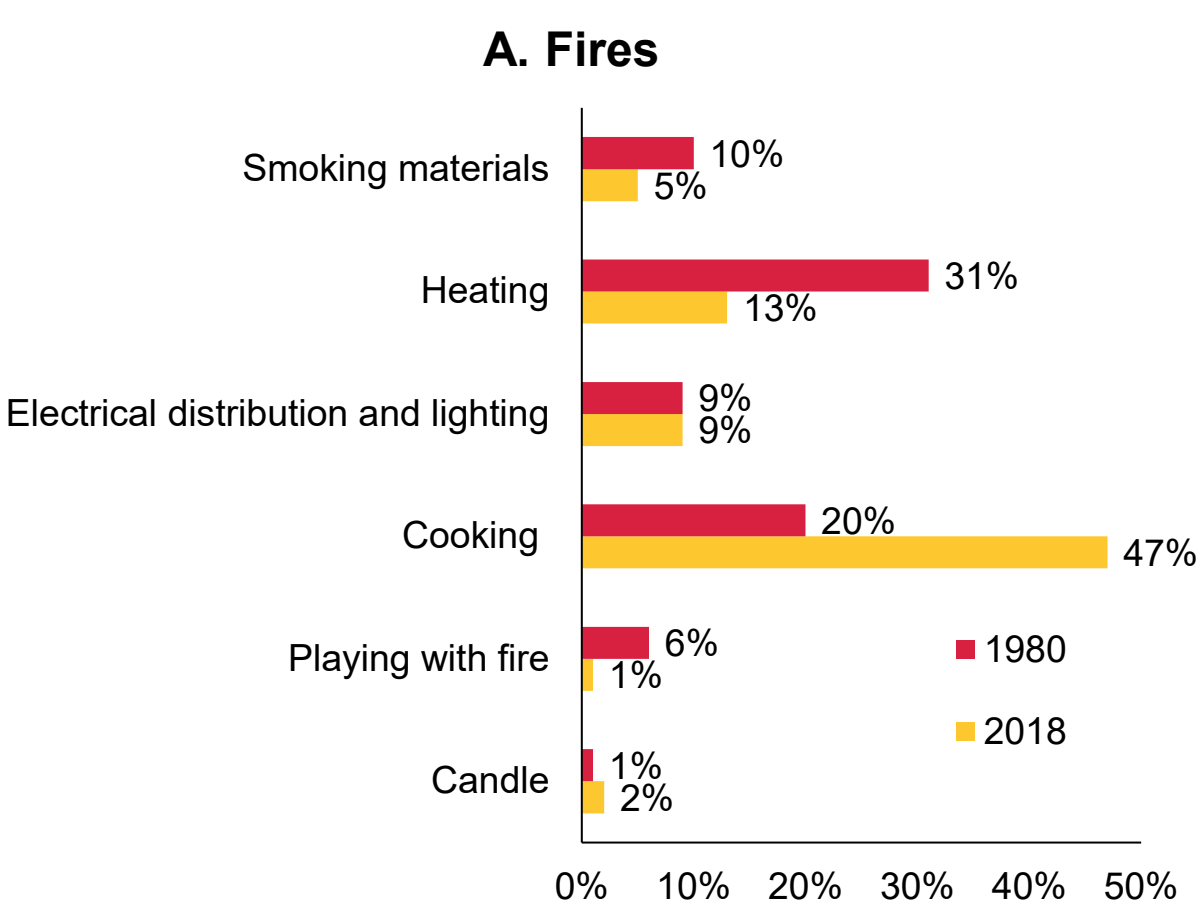
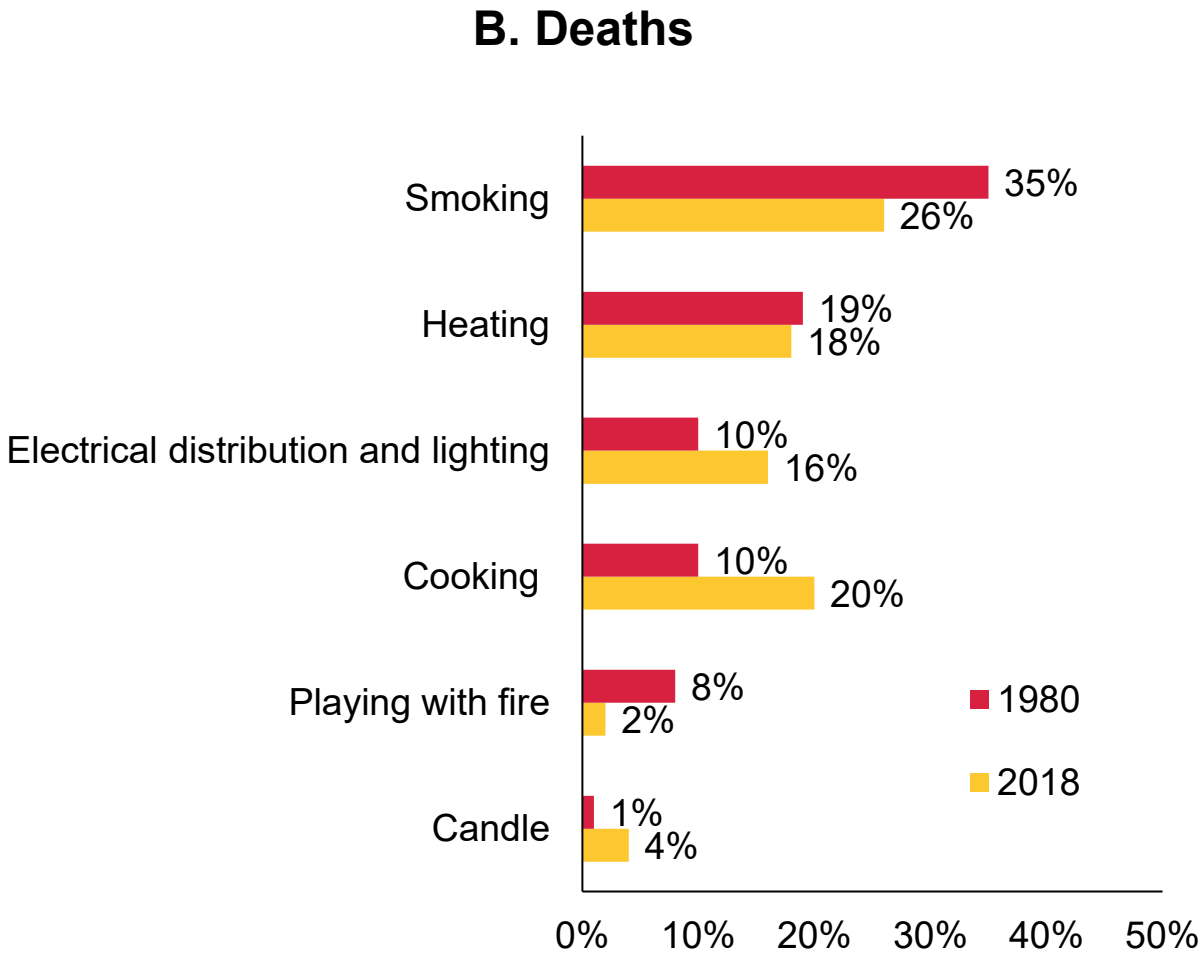
Home fire deaths per million population by age group: 1980 and 2018



Causes of Home Fires and Home Fire Deaths

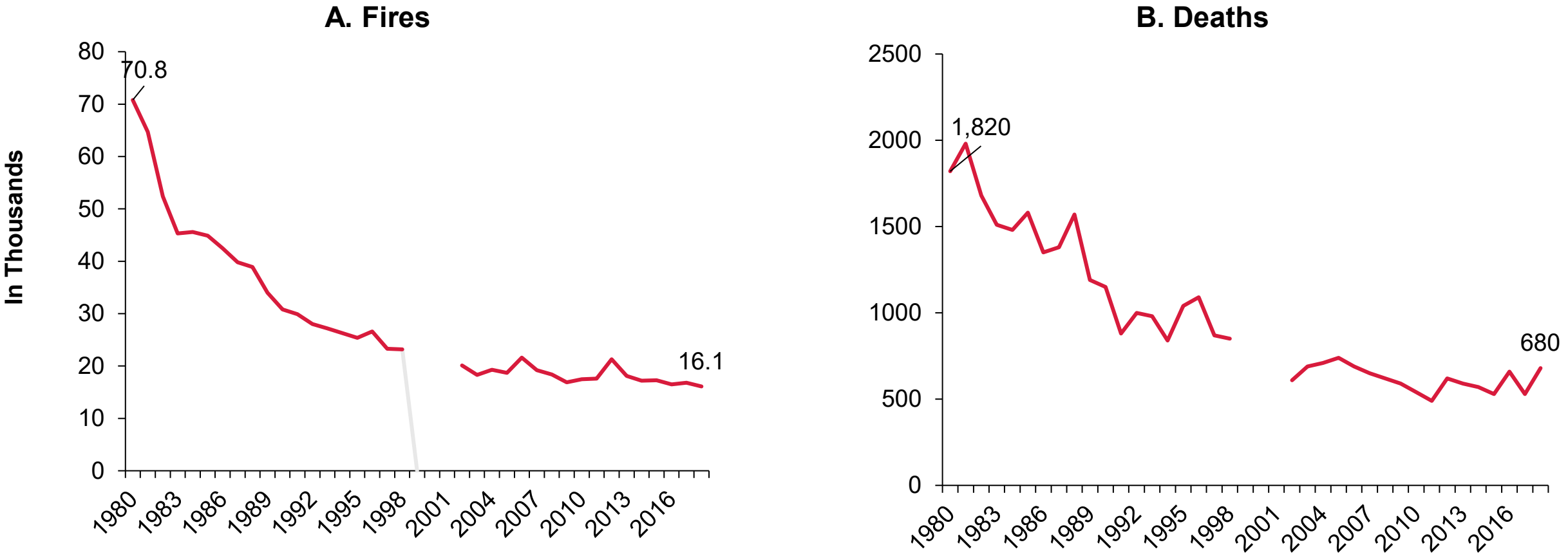
Percentage of home fires and fire deaths by fire cause: 1980 and 2018



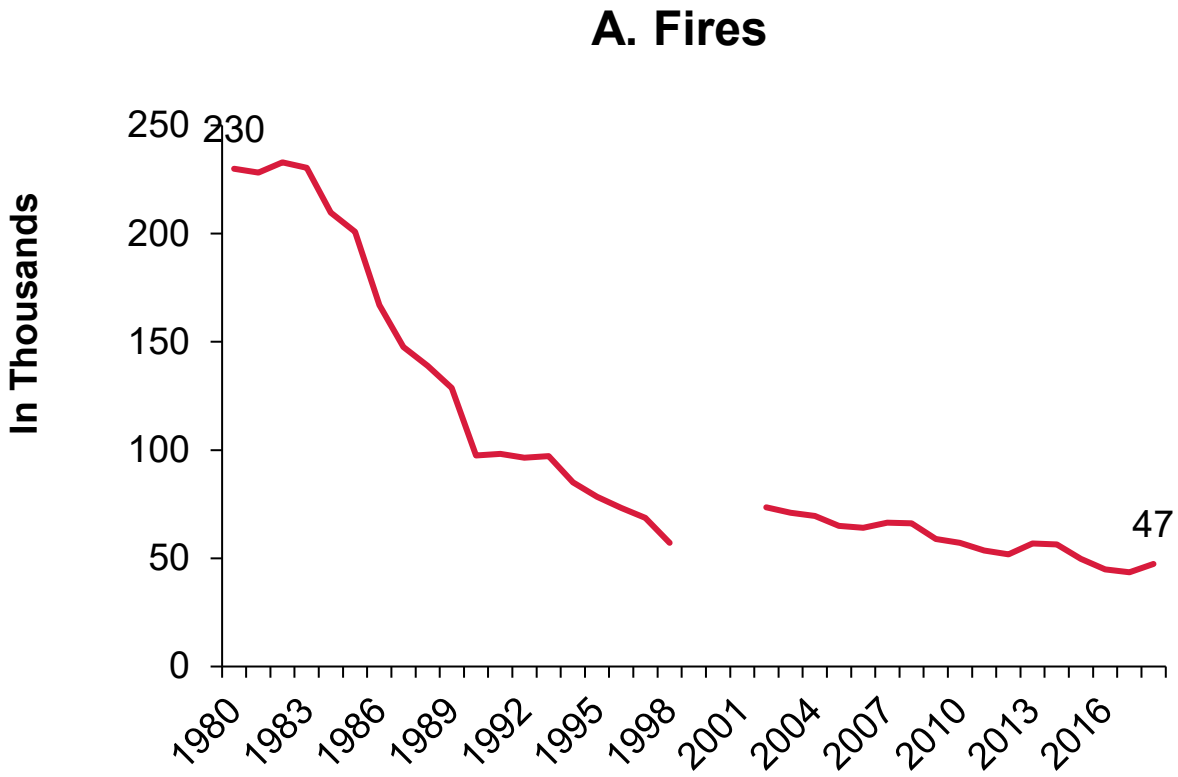


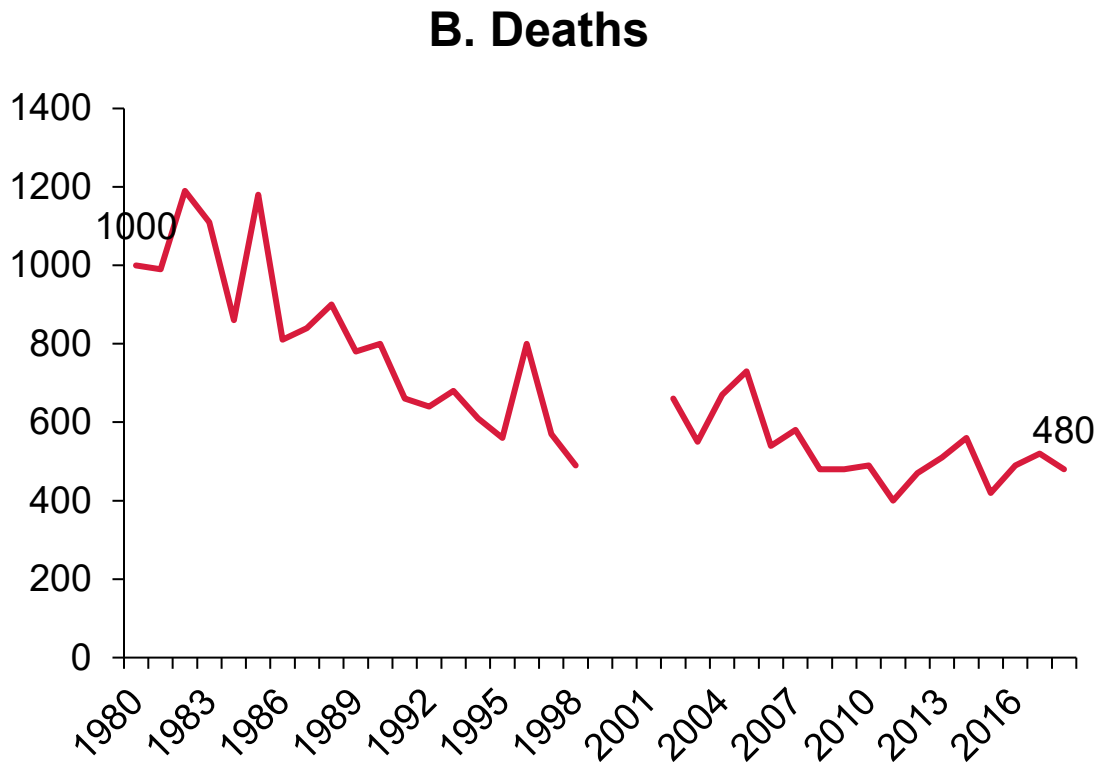
Home fires started by smoking materials

Remains the leading cause of home fire deaths nationally in five-year averages.
Less common today, but more likely to be deadly than in the early 1980s



Reported home structure fires started by heating equipment





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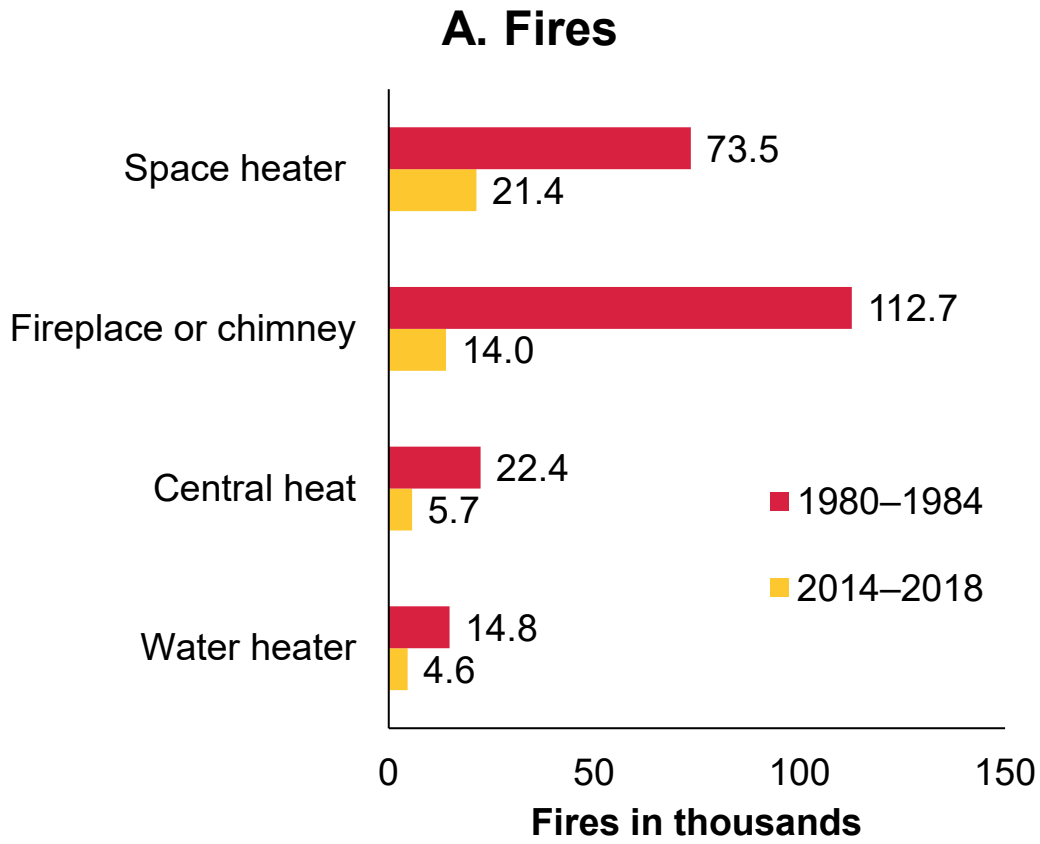
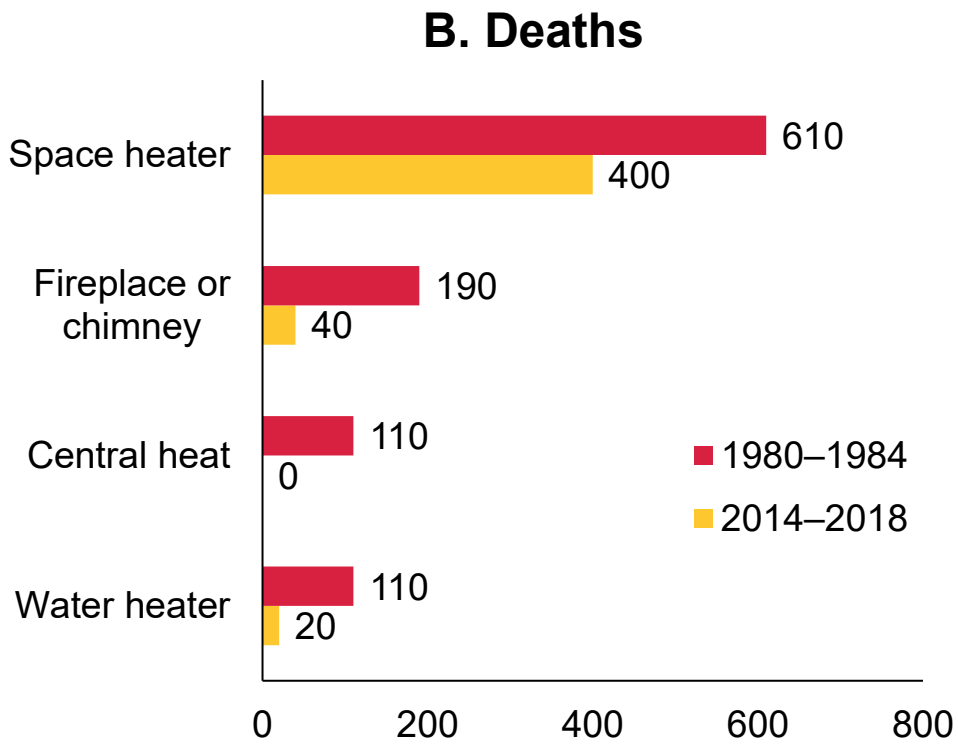
Leading types of heating equipment in home fires 1980-1984 and 2014-2018 annual averages





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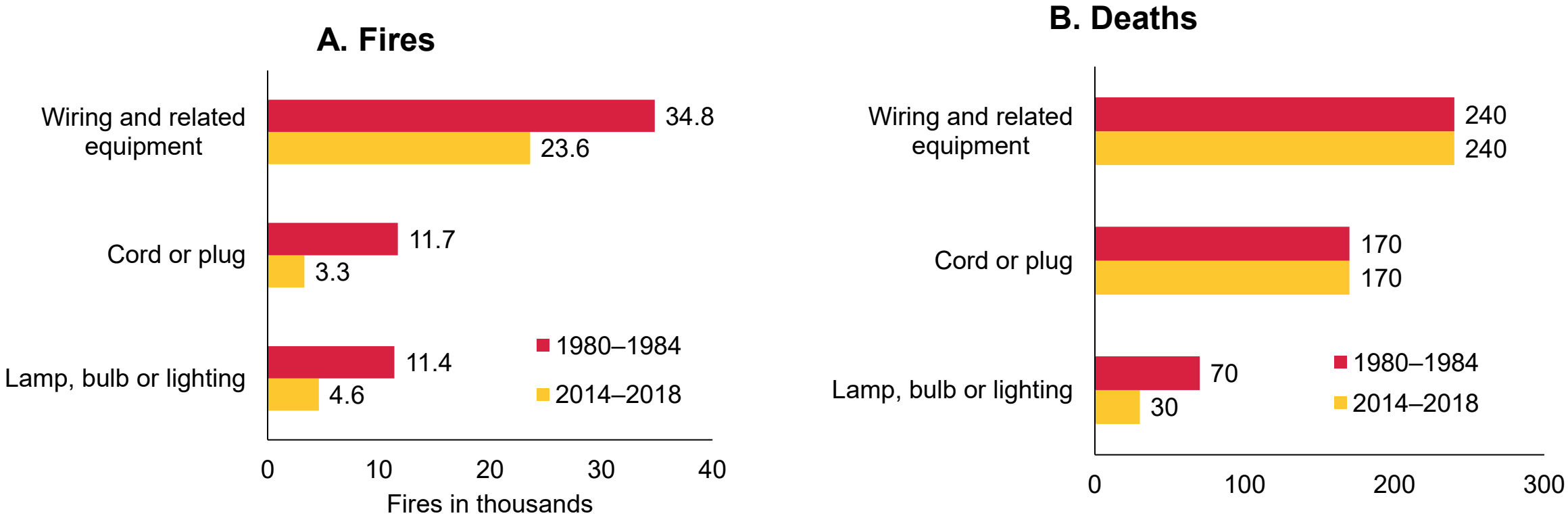
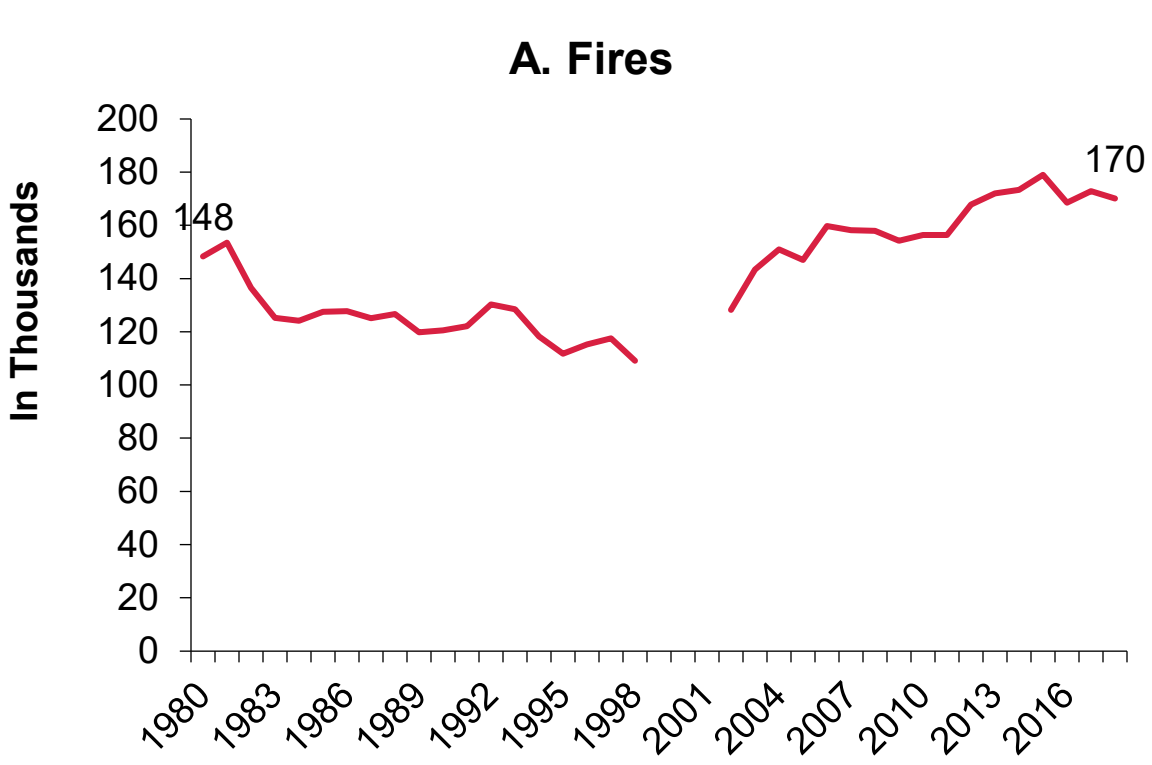
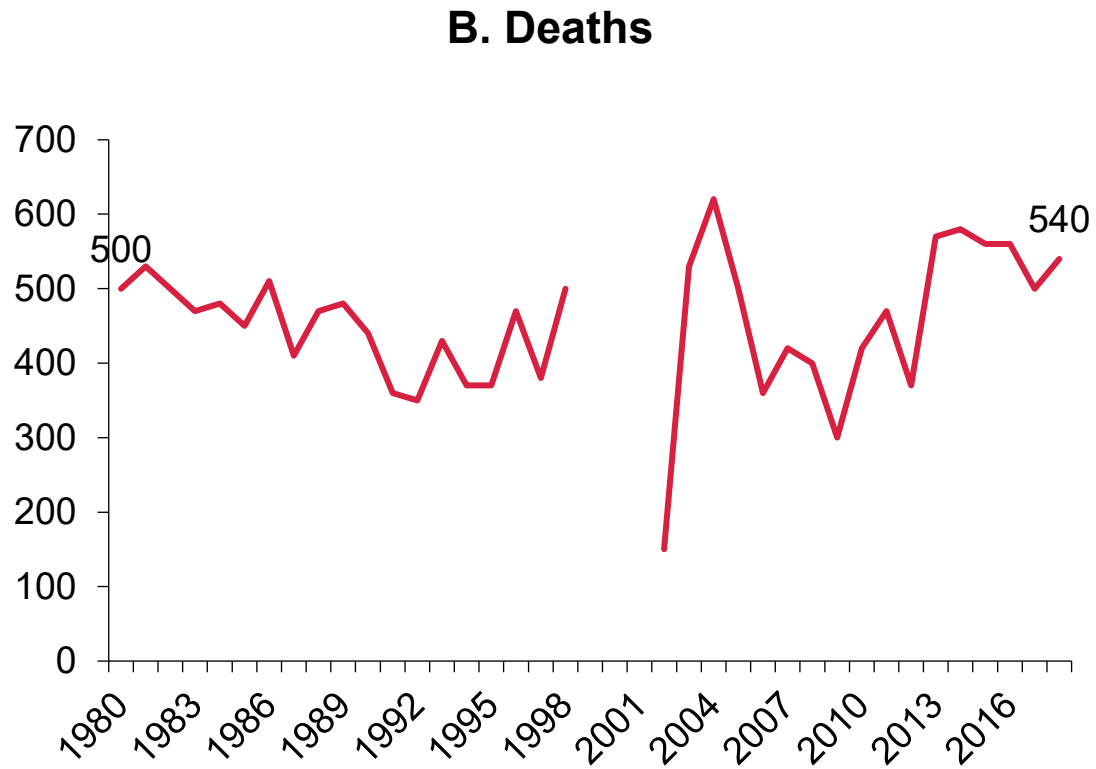
Electrical distribution and lighting equipment in home fires, by type of equipment: 1980-1984 and 2014-2018 annual averages



Reported home structure fires started by cooking, by year: 1980-2018





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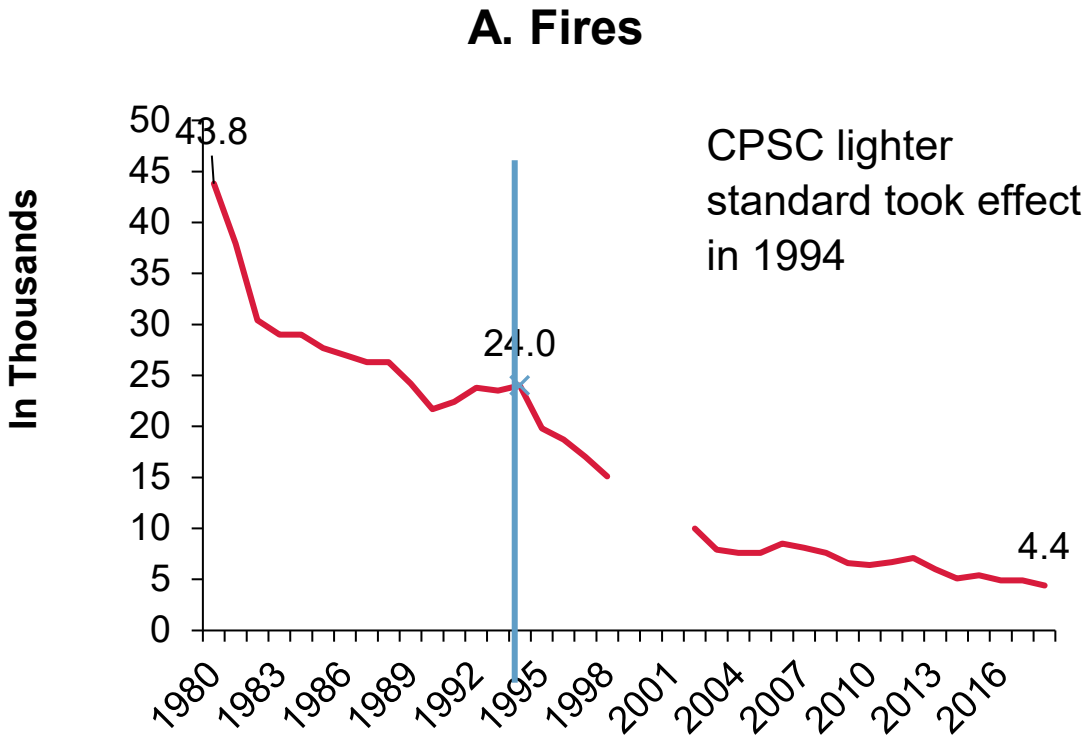
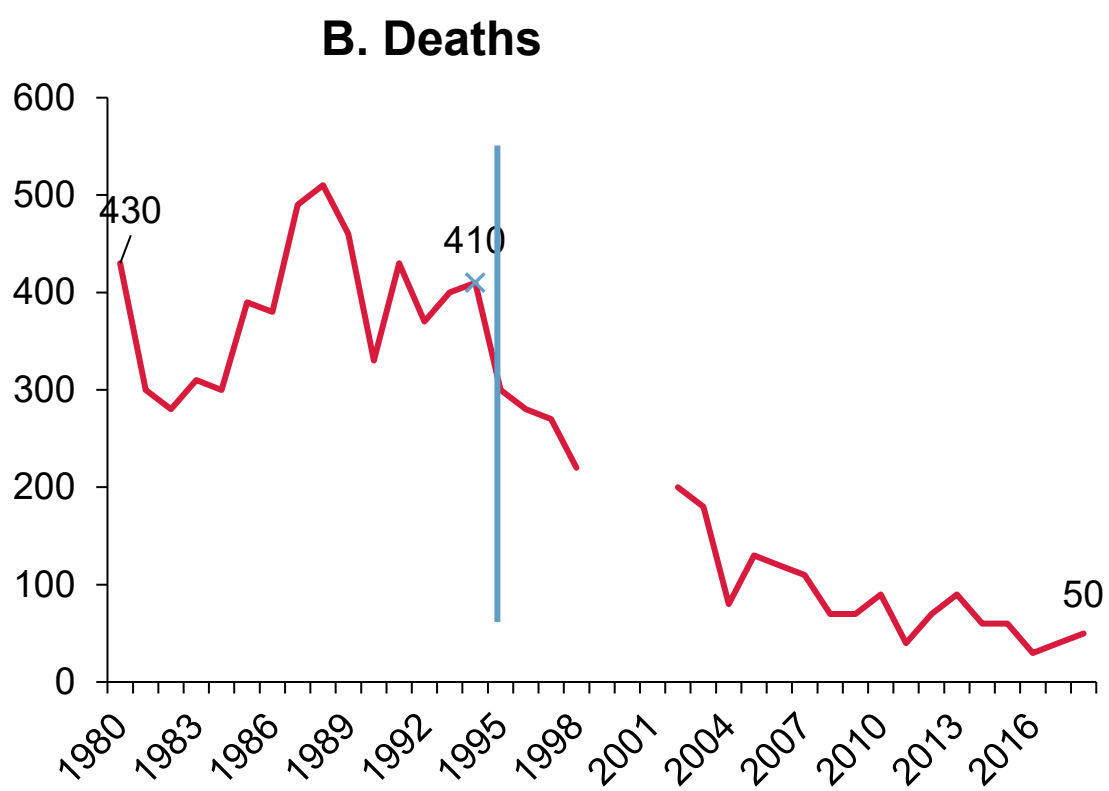
Reported home structure fires started by someone playing with fire





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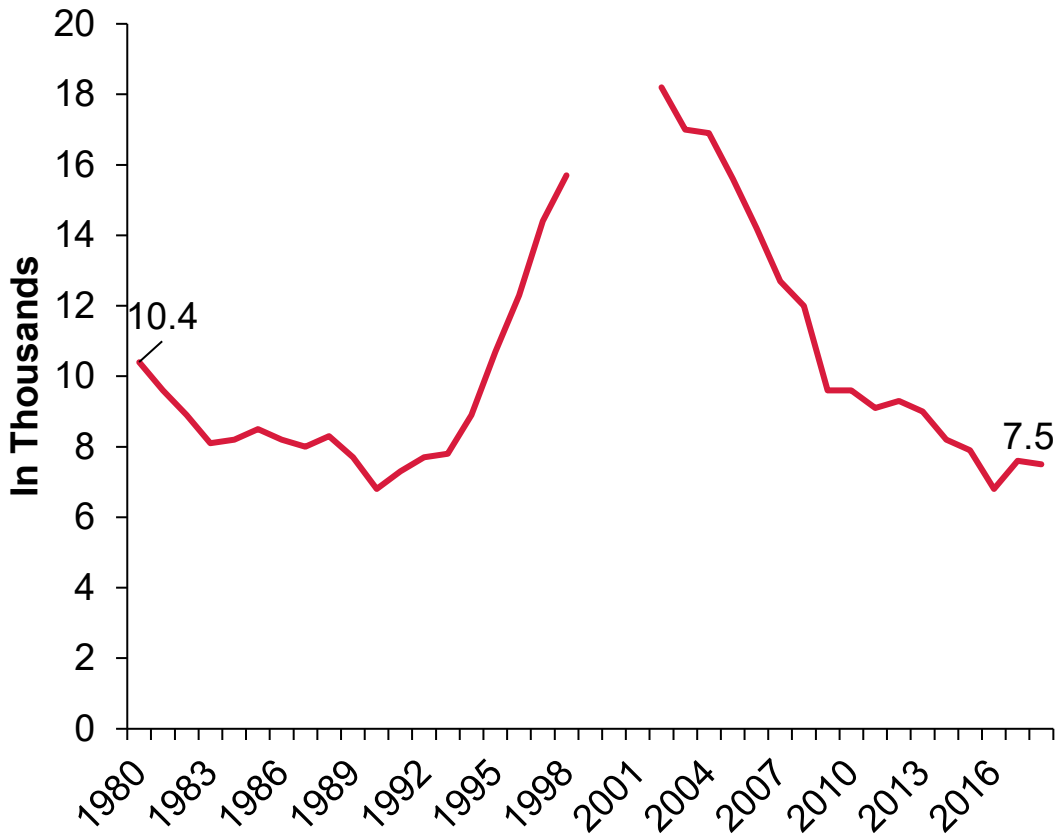
Reported home structure fires started by candles by year: 1980–2018



Candles caused

- 1% of home fires in 1980
- 5% in 2002
- 2% in recent years

No relevant standards when candle popularity increased in 1990s

The role of our Furniture

Low-frequency - high-consequence fires.

1 of every 12 Furniture Fires Result in death!

Figure 33. Deaths per 1,000 fires that began with uphostered furniture or mattresses and bedding 1980–1984 vs. 2014–2018

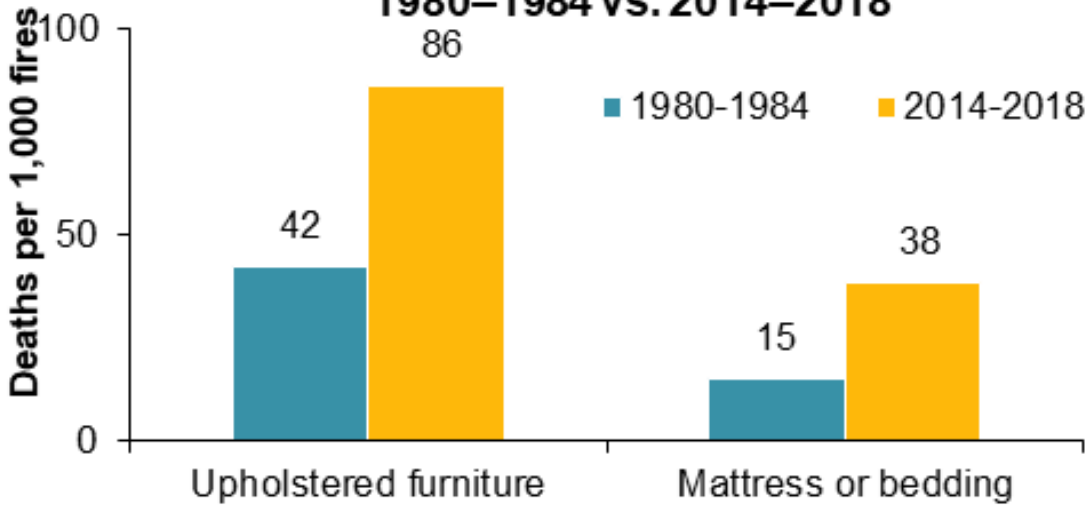
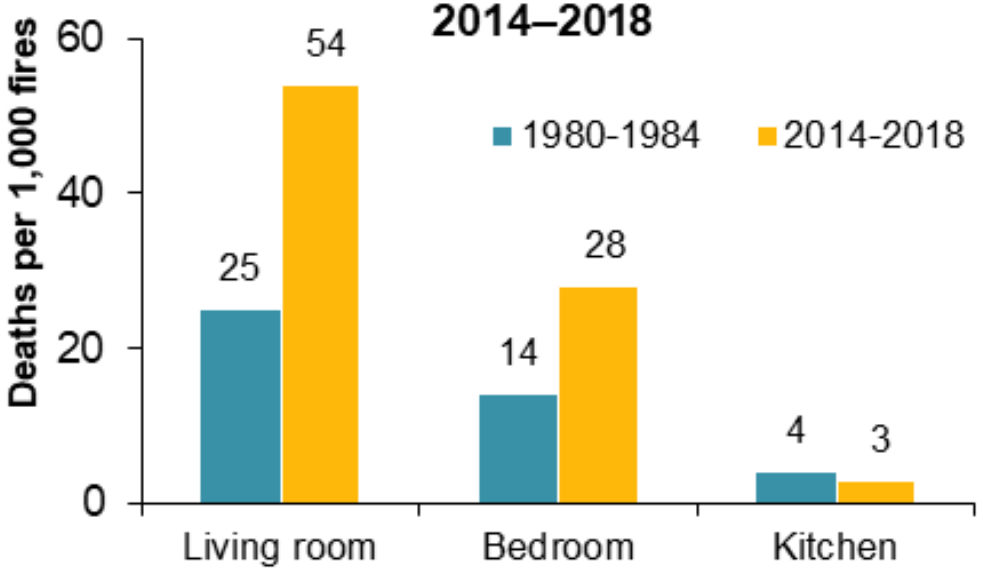


Figure 34. Deaths per 1,000 reported fires in selected areas of origin: 1980–1984 vs. 2014–2018



Government Responsibility

CPSC: US safety standard for child resisting cigarette lighters.

CPSC's 2007 furniture flammability regulation.

Development and use of current codes

UL 858, Standard for Household Electric Ranges, including cooking oil ignition prevention requirement

ASTM Voluntary standards for Candles

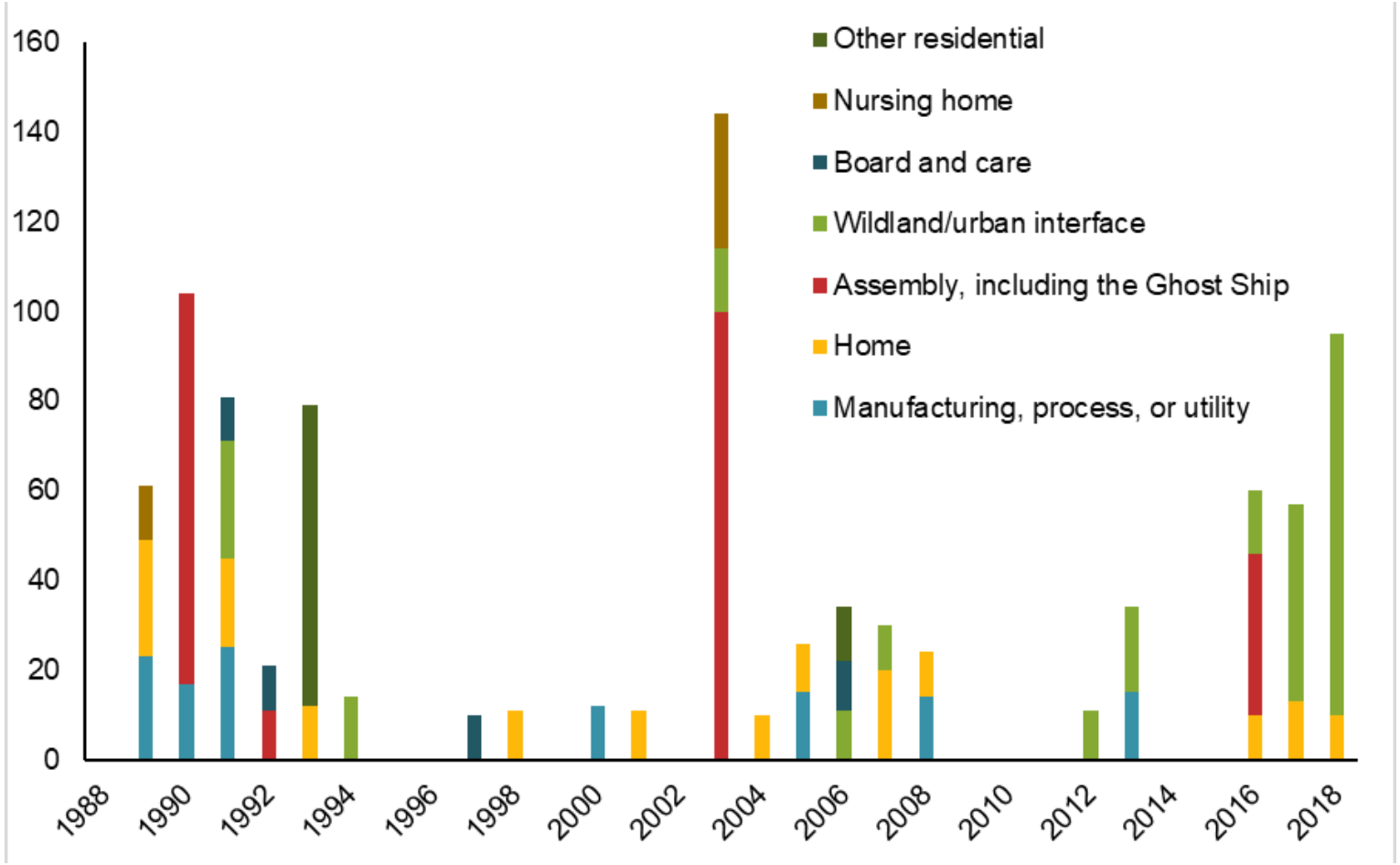
Informed Public

Cooking!

Fire Prevention Week theme in 2020!

Fires that killed 10 or more people

Deaths from fires killing at least 10 people by type of fire



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Government Responsibility

Or lack thereof:

Slow or no adoption of WUI codes!

Code Compliance

Or lack thereof:

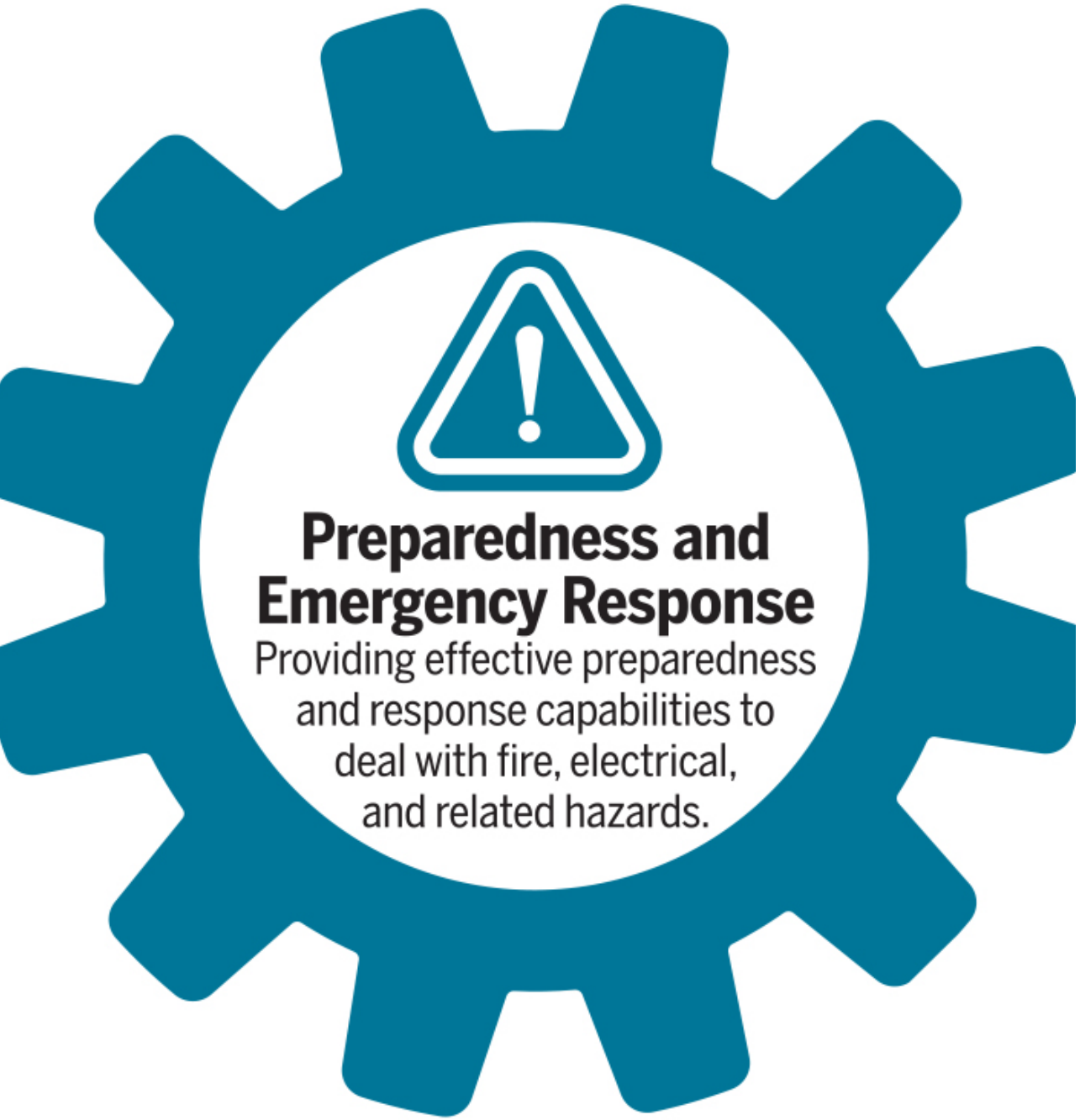
Assembly/Nightclub fires!

Informed Public

NFPA®

FIREWISE USA™

Residents reducing wildfire risks



Preparedness and Emergency Response

Almost **3/4** (71 percent) of the fire departments that perform wildland firefighting or fight structure fires in the WUI have not formally trained all their firefighters for such work.

2/3 of the departments that fight these fires have personnel who do not have personal protective clothing designed for wildland firefighting.

Around **29%** of the departments have firefighters who have not received specialized training in firefighting in the wildland/urban interface.

What we learned

What we learned

We’ve been successful in bringing down the number of fires and fire deaths

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The most successful recipe
for fire safety in the built environment
is the implementation of fire safety
technologies through mandated codes
and standards

Most obvious impact

- Government Responsibility,
- Development & Use of Current Codes,
- Informed Public

Investing in Safety

- This relates also to Code Compliance and a Skilled Workforce.
- Night Club Fires are a typical example of lack of Code Compliance and investing in Fire Safety Technologies.
- Also an issue in many Home fires:
  - Operating smoke alarms
  - Untrained people doing electrical or heating work
  - Old homes with inadequate wiring for today's needs

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Higher risk of fire death

Disability

Poverty

Smoking

Rural living

Living alone

Cooking Fires

Cooking is the only major cause that shows more fires and fire deaths in 2014-2018 than in 1980-1984.

We need to focus on our Seniors

Increasing share of fire fatalities.

Living alone.

High rate of disabilities.

Often living in older homes.

OUTTHINK™
WILDFIRE
WILDFIRE ACTION POLICIES

The Wildfire Problem

Getting bigger.

Higher losses.

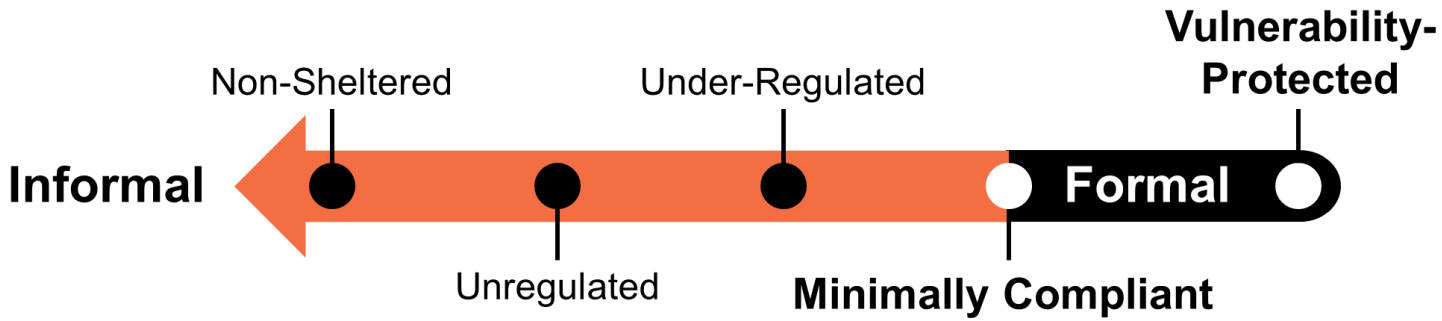
More people in the WUI.

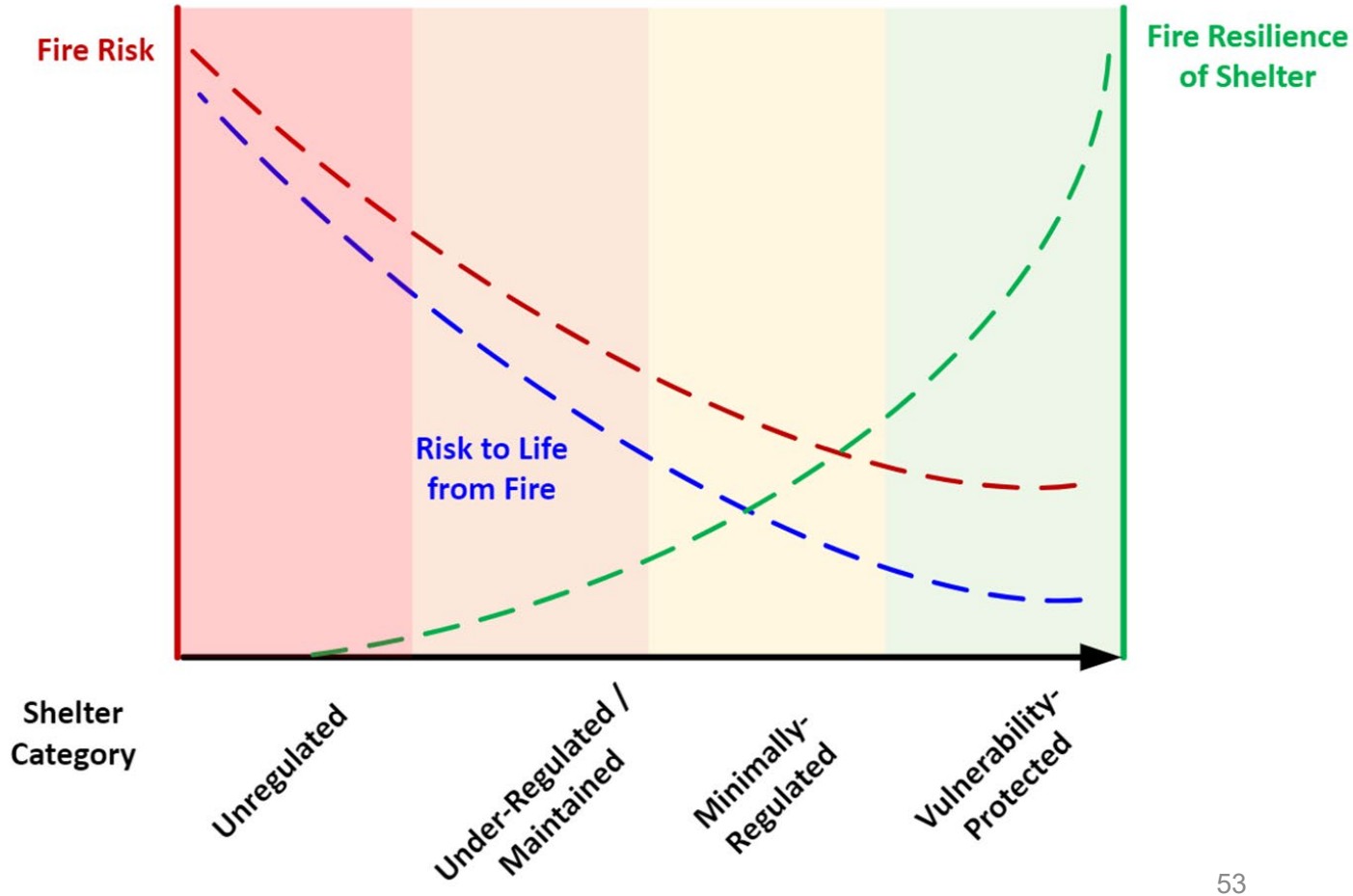
We cannot fight them all.

Informed Public a good start – but not enough.

Approaching fire safety as a system, and not individual bits and pieces, provides the opportunity to unravel this complex and ongoing challenge to society and reduce further loss.

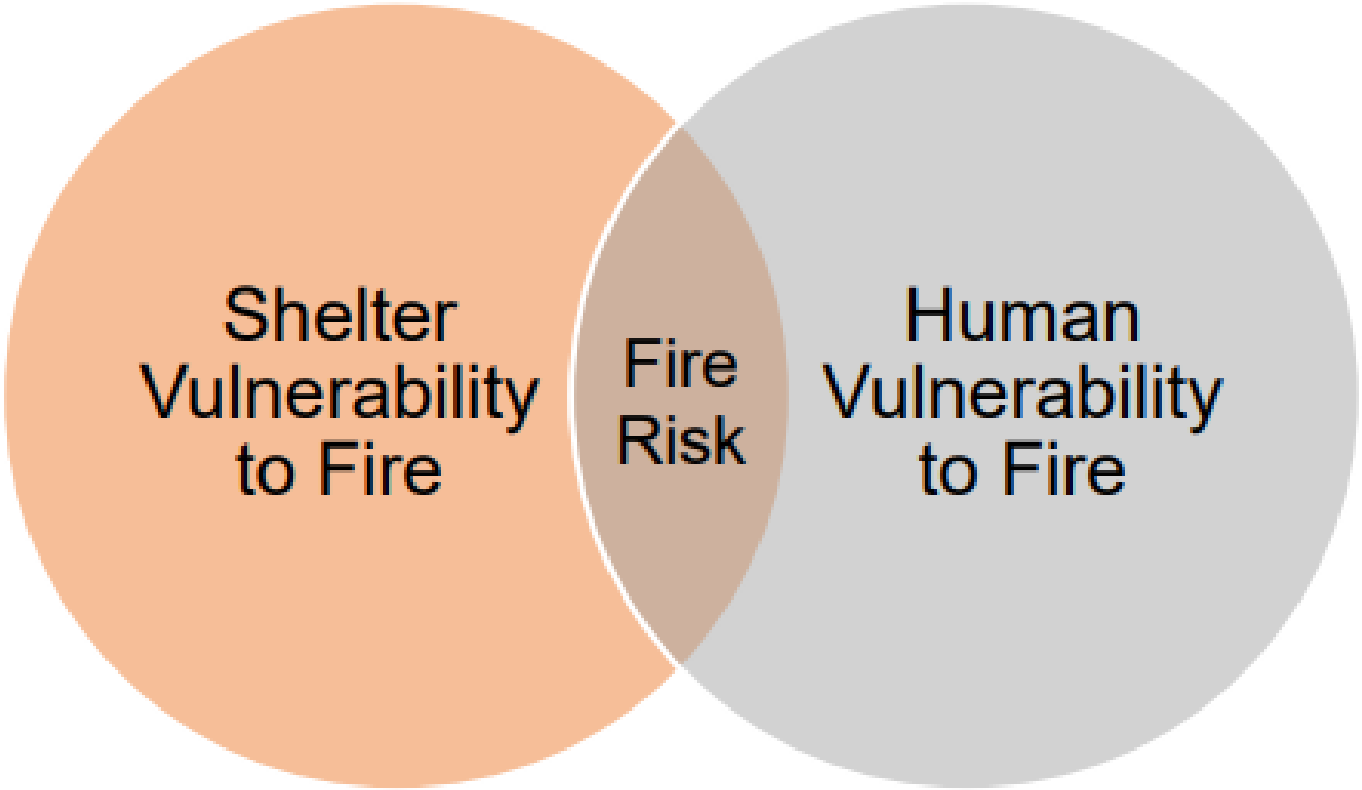

A
Kindling
Publication
The Invisible US Fire Problem
This report is sponsored by:
NFPA
The Kindling Mission
Our mission is to connect fire safety knowledge with local and global humanitarian and development efforts aimed at reducing the unequal impact of fire on people, property andlivelihoods in vulnerable communities around the world


Vulnerability-Protected
Non-Sheltered
Under-Regulated
Informal
Formal
Unregulated
Minimally Compliant


Fire Risk
Fire Resilience of Shelter
Risk to Life from Fire
Shelter Category
Unregulated
Under-Regulated / Maintained
Minimally-Regulated
Vulnerability-Protected

Fire Risk is a product of the probability of a credible fire event occurring and the measure of the possibility of death or injury to an occupant resulting from that event

Attributes of the building or shelter that can lead to potentially dangerous fire



Attributes of the population that may make it more vulnerable to fire.

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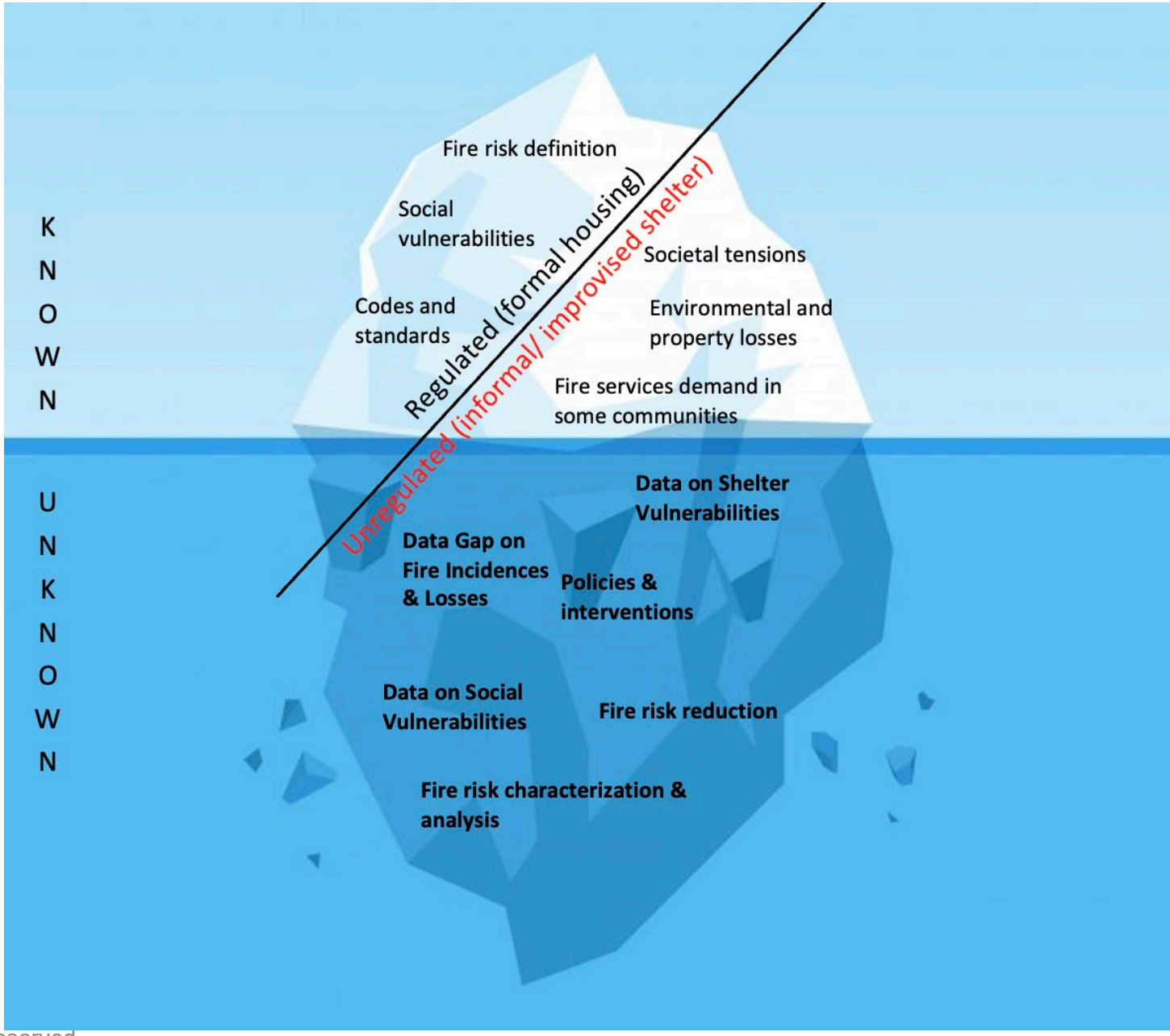
Kindling

Gaps

There are significant gaps in research, policy, and action pertaining to fire safety of insecurely and vulnerably sheltered populations in under-regulated, unregulated, and non-sheltered living conditions.



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What is needed to tackle holistically and urgently the identified gaps

- Collaboration of researchers, advocates, and practitioners across many domains.
- Research, policy and action that addresses the full spectrum of economic, social, and technical issues.
- Extensive data collection and analysis is a priority to better understand the problem, enabling substantial progress.
- Funding opportunities recognizing the ‘invisible’ fire problem as an important component of broad disciplines of fire safety, urban planning, social services, and public health.

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