SB 129

Senator Linda Menard

State Capitol, Room 9
Juneau, Alaska 99801

Phone: (907) 465-6600
Fax: (907) 465-3805

Alaska State Legislature

To: Senator Linda Menard, Chair
Senate State Affairs Committee

From: Senator Linda Menard

Date: March 19, 2009

Re: Request for hearing of SB 129

Honorable Senator Linda Menard,

I respectfully request a hearing of Senate Bill No. 129 before the Senate State Affairs Committee

Senate Bill 129 is an act relating to state and municipal building code requirements for fire sprinkler systems in certain residential buildings.

Thank you for your consideration.

Senator Linda Menard

State Capitol, Room 9
Juneau, Alaska 99801

Phone: (907) 465-6600
Fax: (907) 465-3805

Alaska State Legislature

Sponsor Statement for SB 129

Senate Bill 129 is a response to a national movement to require fire sprinkler systems in one and two-family dwellings. This legislation does not prohibit Alaskans from choosing to install these systems in their new or existing homes; it simply prohibits any attempt to make them mandatory on a state or local level.

Residential fire sprinkler systems are expensive. Conservative estimates indicate that Alaskans could expect to pay between 3 to 5 dollars per square foot to have a system included in the construction of their new home

According to the National Association of Home Builders (NAHB), for each additional $1,000 added to the price of a home, 250,000 potential buyers are priced out of the market. The NAHB estimates the entire cost of an average home sprinklers system at $3,000.

Furthermore, changes in residential construction technology over the last twenty years have dramatically dropped the number of fatal fires in the U.S. including Alaska. Code provisions for fire separation, fire blocking and draft stopping, emergency escape and rescue openings, electrical circuit breakers, capacity and outlet spacing, reduced need for space heaters in energy efficient homes and many other improvements have made our homes more "fire safe" without undo financial burden to the homeowner.

More importantly, please keep in mind the number of private wells owned by families in Alaska. According to the United States Geologic Survey, about 33 percent of residents are on private well water systems. Requiring sprinkler systems would be very problematic for these homeowners. Having a sprinkler system in a home can lead to a requirement for a larger well with increased flow and other modifications, again increasing the financial hardship on a homeowner.

What studies do show is the effectiveness of smoke alarm warning systems in homes. Not only are these devices cheaper to install, but they have a proven track record of saving lives because of early warning. According to the NAHB, builders can install a sufficient smoke alarm system for less than $400.

Senate Bill 129 will continue to allow Alaskan homeowners the opportunity to invest in this additional layer of fire safety while ensuring that it will not become an unnecessary and expensive mandate to be forced on Alaskans regardless of their financial or environmental situation.

I hope you will support this bill and prevent undue financial hardships on potential home owners.

FISCAL NOTE

STATE OF ALASKA
2009 LEGISLATIVE SESSION

Fiscal Note Number:
Bill Version: SB 129
() Publish Date:

Identifier (file name): SB129-DPS-FLS-03-17-09
Title "An Act relating to state and municipal building code requirements requirements for fire sprinkler systems . . . buildings."
Sponsor Senator Menard
Requester Senate Community and Regional Affairs

Public Safety
RDU Fire and Life Safety
Component Fire and Life Safety Operations
Component Number 494

Expenditures/Revenues (Thousands of Dollars)

Note: Amounts do not include inflation unless otherwise noted below.

	Appropriation Required	Information					
OPERATING EXPENDITURES	**FY 2010**	**FY 2010**	**FY 2011**	**FY 2012**	**FY 2013**	**FY 2014**	**FY 2015**
Personal Services							
Travel							
Contractual							
Supplies							
Equipment							
Land & Structures							
Grants & Claims							
Miscellaneous							
TOTAL OPERATING	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
CAPITAL EXPENDITURES							
CHANGE IN REVENUES ( )							

FUND SOURCE (Thousands of Dollars)

1002 Federal Receipts							
1003 GF Match							
1004 GF							
1005 GF/Program Receipts							
1037 GF/Mental Health							
Other Interagency Receipts							
TOTAL	**0.0**	**0.0**	0.0	0.0	0.0	0.0	0.0

Estimate of any current year (FY2009) cost: 0.0

POSITIONS

Full-time							
Part-time							
Temporary							

ANALYSIS: *(Attach a separate page if necessary)*

This bill will have no fiscal impact on the department.

Prepared by: Dave Tyler
Division State Fire Marshal
Phone 907-269-5491
Date/Time 3/17/09 12:22 PM

Approved by: Joseph Masters, Commissioner
Department of Public Safety
Date 3/17/2009

(Revised 11/19/2007 OMB)

Southeast Alaska Building Industry Association

1900 Crest Street, Suite 206 • Juneau AK 99801• (907) 463-5774 • Fax (907) 463-5821
E-mail: seabia@gci.net • Web site: http://www.seabia.com

March 11, 2009

Senator Donny Olson
Chairman, Community & Regional Affairs Committee
State Capitol Room 514
Juneau, Alaska 99801

Dear Senator Olson:

As President of the Southeast Building Association I represent over 85 members locally, in turn our association is affiliated with the Alaska State Home Building Association (ASHBA). I want to express my support for ASHBA's push to stop fire sprinkler mandates for the State of Alaska and Northern Southeast in particular.

As such, we strongly support the passage of ***Senate Bill 129 "An Act relating to state and municipal building code requirements for fire sprinkler systems in certain residential buildings."*** This legislation is critical to eliminate any and all future requirements for the State of Alaska or a local jurisdiction to mandate a requirement for the costly installation of fire sprinkler systems in one and two-family dwellings.

It has been proven with the increased safety features being utilized in the construction of newer one and two-family dwellings in recent years that the safety of the occupants has increased dramatically, and injuries due to fires has significantly been reduced during the past twenty years.

We feel due to the burden of increased costs, maintenance issues, and all other concerns pertaining to cold climate installations that it is not necessary to mandate the installation of fire sprinkler systems in one and two-family dwellings. Therefore, we support the ASHBA's position in working to get this legislation passed.

If you have any additional questions you can contact me at 321-3298.

Sincerely,

John Wood
President
Southeast Alaska Building Industry Association

March 11, 2009

Senator Donny Olson
Chairman, Community & Regional Affairs Committee
State Capitol Room 514
Juneau, Alaska 99801

Dear Senator Olson:

I, Chuck Homan, President of the Anchorage Home Builders Association representing over 300 members locally, and affiliated with the Alaska State Home Building Association (ASHBA), want to express that we agree with the intent of the ASHBA for the State of Alaska and Anchorage in particular in supporting the passage of ***Senate Bill 129 "An Act relating to state and municipal building code requirements for fire sprinkler systems in certain residential buildings."*** We desire to have in place a legislative provision that eliminates any and all future requirements for the State of Alaska or a local jurisdiction to mandate a requirement for the installation of fire sprinkler systems, or suppression systems in one and two-family dwellings.

It has been proven with the increased safety features being utilized in the construction of newer one and two-family dwellings in recent years that the safety of the occupants has increased dramatically, and injuries due to fires has significantly been reduced during the past twenty years.

We feel due to the burden of increased costs, maintenance issues, and all other concerns pertaining to cold climate installations, it is not necessary to mandate the installation of fire sprinkler systems or fire suppression systems in one and two-family dwellings. Therefore, we support the passage of Senate Bill 129 and stand ready to assist in any way possible.

If you have any additional questions you can contact me at 522-3605.

Sincerely,

Chuck Homan

Chuck Homan
President
Anchorage Home Builders Association

Interior Alaska Building Association
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Fairbanks, AK 99709
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March 11, 2009

Senator Donny Olson
Chairman, Community & Regional Affairs Committee
Capitol Building Room 514
Juneau, Alaska 99801

Dear Senator Olson:

The Interior Alaska Building Association (IABA) represents over 200 members locally, and is affiliated with the Alaska State Home Building Association (ASHBA) and the National Association of Homebuilders (NAHB).

As the current president of IABA, I wish to express our support for Senate Bill 129 ***"An Act relating to state and municipal building code requirements for fire sprinkler systems in certain residential buildings."***

The State of Alaska needs to have in place a legislative provision that eliminates any and all future requirements for the State of Alaska or any local jurisdiction to mandate a requirement for the installation of fire sprinkler systems, or suppression systems in one and two-family dwellings.

Senate Bill 129 will put this restriction in place while still allowing Alaskans, who so choose, to install these systems in their homes. This legislation would in no way hinder the ability of local municipalities or state agencies to offer incentives for the voluntary installation of these systems. AHFC could offer interest rate reductions for homes built with, or remodeled to include with these systems. Local boroughs and municipalities could still offer property tax credits to homeowners who have fire sprinklers installed.

It has been proven that, with the increased safety features being utilized in the construction of newer one and two-family dwellings in recent years, the safety of the occupants has increased dramatically, and injuries due to fires has significantly been reduced during the past twenty years.

We feel due to the burden of increased costs, maintenance issues, and many other concerns pertaining to cold climate installations it is not necessary to mandate the installation of fire sprinkler systems or fire suppression systems in one and two-family dwellings. Therefore, we support the Senator Menard's legislation and encourage the legislature to get this legislation passed.

If you have any additional questions you can contact me at 907-460-7687.

Respectfully yours,

David Miller
President
Interior Alaska Building Association

Alaska Association of REALTORS
The Voice of Real Estate in Alaska
4205 Minnesota Drive
Anchorage, Alaska 99503
(907) 563-7133

March 13, 2009

The Honorable Linda Menard
Alaska Senate
State Capitol Building
Juneau, Alaska 99801

RE*: SB 129 - *"An act relating to state and municipal building code requirements for fire sprinkler systems in certain residential buildings."

Dear Senator Menard,

The Alaska Association of REALTORS® with over 1,600 members statewide supports Senate Bill 129, which relates residential sprinklers in certain residential buildings.

The Alaska Association of REALTORS® supports SB 129, which is a proactive response to a national movement to require fire sprinkler systems in one and two-family residential dwellings.

Senate Bill 129 would ensure that residential fire sprinklers remain voluntary and still allow local municipalities and private insurance companies to offer incentives to homeowners who choose to make the investment.

The Association would like to extend the exemption in this bill from one and two family up to and including fourplexes which would comply with residential lending guidelines and would offer more affordable housing by decreasing the construction costs of one-four family residential units.

Installation of residential fire sprinkler systems for one-four family residential units should not be required by state or local governments. To require these systems, especially in a cold climate region like Alaska, would raise the cost of affordable housing while providing the least cost efficient increase in fire safety for the homeowner.

The Association encourages the passage of Senate Bill 129.

Sincerely,

Art Clark
AAR President

ASSOCIATION

March 11, 2009

Senator Donny Olson
Chairman, Community & Regional Affairs Committee
State Capitol Room 514
Juneau, Alaska 99801

Dear Senator Olson:

I am writing this letter in support of ***Senate Bill 129 "An Act relating to state and municipal building code requirements for fire sprinkler systems in certain residential buildings."***

I understand the State suffers many fatalities along with millions of dollars in property loss each year. I too feel very strongly that we need to help protect our most vulnerable residents. But unfortunately the most vulnerable are usually on a fixed or very modest income, and I believe that the added cost of fire sprinklers would make it very difficult if not impossible for them to afford a new house with the added protections.

With that being the case, our most vulnerable residents would not benefit at all. I think it would be in everyone's best interest to establish a program to encourage the ***voluntary*** installation of all available fire suppression technologies. I believe if it were like our energy rating for housing, maybe the State through AHFC could give an interest reduction on the mortgage if the house had the highest fire protection possible.

While I believe each Alaskan should be able to choose the appropriate level of home safety for their own dwelling, I am not in favor of ever being required to have **mandatory** fire sprinkler systems in one and two-family residences. I strongly urge legislators to pass this legislation.

As the president of the Mat-Su Home Builders Association representing over 150 members businesses, I hope you take the time to reflect on what the State can do to help all our residents. I truly appreciate you taking the time to read this.

Thank you.

Kyle P. Carr
President

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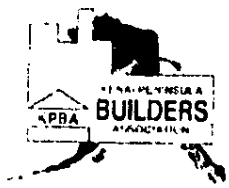
Phone (907) 376-2666 Fax (907) 376-2667 Email mahba@mtaonline.net
www.matsuhomebuilders.com



March 11, 2009

Senator Donny Olson
Chairman, Community & Regional Affairs Committee
State Capitol Room 514
Juneau, Alaska 99801

Dear Senator Olson:

As President of the Kenai Peninsula Builders Association, and on behalf of our membership, I would like to express our concern and opposition to mandating fire sprinklers in one and two family dwellings. We feel that it is vitally important to have legislation in place which would eliminate these requirements.

It is our strong belief that mandating fire sprinklers does not target those homes where fire deaths are occurring, as new technology and more modern and stringent building codes makes today's new homes safer. In addition, we feel that we must consider the collective cost to the community and home buyers, and the actual data which shows that the majority of home fire fatalities occur when there are no operational smoke detectors in place.

Therefore, we wholeheartedly support the passage of ***Senate Bill 129 "An Act relating to state and municipal building code requirements for fire sprinkler systems in certain residential buildings"*** and the Alaska State Home Building Association in their efforts to enact this legislation that would eliminate mandating fire sprinklers in one and two family dwellings.

Please do not hesitate to contact me with any questions you may have, or to further discuss our concerns.

Sincerely,

Jeffrey Twait
President
Kenai Peninsula Builders Association

P.O. Box 1753 • Kenai, Alaska 99611
phone: (907) 283-8071 • fax: (907) 283-8072 • email: kpba@ptialaska.net

Residential Fire Sprinklers .com

USFA Announces Official Support for Residential Fire Sprinklers

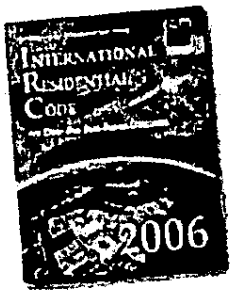
April 28th, 2008 by Ryan J. Smith

On March 28, 2008, the United States Fire Administration (USFA) office delivered a potentially fatal blow to opponents of residential fire sprinkler requirements. For those not familiar with the USFA, it is an entity of the US Department of Homeland Security's Federal Emergency Management Agency (FEMA). In other words, this is the highest government agency in the United States focused on reducing life and economic losses due to fire.

So what impact does this have on residential fire sprinkler requirements? Well, immediately it has little significant impact since the USFA does not directly control the building and fire codes. But, the USFA is a highly visible federal entity that works through research, data gathering and public education to influence the building and fire codes used in the United States.

The USFA's public support of residential fire sprinklers adds a shot of adrenaline to the movement for mandated residential fire sprinklers. Public education on the benefits of residential fire sprinklers will increase and fire service professionals will have a new wave of energy to publicly voice their support.

For many, this official position signals that it is an inevitable reality that residential fire sprinklers will be required in all new home construction in the United States. Others are patiently waiting on the sidelines to see how those opposing residential fire sprinkler requirements will react.



At the center of this intensifying debate are the proposed code changes to the International Residential Code (IRC) which, if passed, will mandate residential fire sprinklers in all new home construction. The IRC is part of the International Building Code (IBC), that is widely adopted as law throughout the United States.

The next revision of the IRC will be published in 2009 and all proposed changes must receive final approval at the September 2008 hearing to be included in this next revision.

A special coalition has been formed with a primary mission to get the votes necessary to pass code changes to the IRC that will require residential fire sprinklers with a zero square foot tolerance. This IRC Fire Sprinkler Coalition is formed as a non-profit organization and provides the many supporters of home fire sprinkler requirements an opportunity to support their voting government officials to ensure these code changes are approved.

Support includes both encouraging voting government officials to vote "yes" on the codes changes and fundraising to cover travel expenses that will be incurred for voting government officials to be present at the September hearing.

The primary opposition has been the National Association of Home Builders (NAHB), which views residential fire sprinkler requirements as unnecessary and too expensive for the benefits they provide; their argument that smoke alarms are sufficient for home fire safety has been countered with firm opposition from the fire prevention and fire fighting communities.

You can bet that with the USFA's official position now made public, the debate of residential fire sprinklers will continue to heat up leading to the September 2008 hearings.

ICC Approves Residential Fire Sprinklers in the International Residential Code

September 21st, 2008 by Residential Fire Sprinklers .com

Voting members of the leading building code body in the nation, the International Code Council (ICC), overwhelmingly supported a residential fire sprinkler requirement for all new one- and two-family homes and townhouses.

Fire service and building code officials united to approve the requirement and countered opposition. The code proposal, RB64, easily overcame a procedural requirement that mandated a super-majority of two-thirds approval. This represents an unprecedented step forward in advancing home fire safety in the United States.

The vote, held today in Minneapolis, was supported by 73 percent of the voting members in attendance.

The IRC Fire Sprinkler Coalition, an association of more than 100 fire service, building code official, and safety organizations representing 45 states, assumed a leadership position and secured unified support for this issue over the past 18 months.

"Our team worked hard to rally support throughout the United States for a residential fire sprinkler requirement, but our supporters deserve the recognition for **showing up en masse in Minneapolis,**" said Ronny J. Coleman, president of the IRC Fire Sprinkler Coalition. "They know from experience that sprinklers are the answer to the nation's fire problem."

Fire deaths in the United States realized a dramatic decline over the past three decades as smoke alarms became common – today, more than 95 percent of homes have them. Still, more than 3,000 people die each year from fire, and a home burns every 80 seconds. Residential sprinklers are the only fire protection technology that works to rapidly contain fire, effectively giving families more time to escape the deadly heat and poisonous gases of an unchecked fire. Therefore, the proposal's passage has also pleased home safety advocates across the country.

"We work with families every day that are directly affected by the ravages of fire," said Meri-K Appy, president of the Home Safety Council. "We are thrilled not only because this moment has taken decades of demanding work to achieve, but because it provides protection for potential victims of future fires."

Kaaren Mann, a fire safety advocate and the mother of a fire victim stated in her testimony, "the cost to put sprinklers into the home where my daughter died would have been less than what I had to pay for the flowers at her funeral."

The sprinkler mandate will first appear in the 2009 International Residential Code® (IRC), which will be published by the end of the year. Forty-six states use the IRC as the basis of regulating new home construction.

"The vote was a historic moment in residential fire safety – and is a significant step in a long journey before sprinklers are installed in every new home," noted Ronny J. Coleman, president of the IRC Fire Sprinkler Coalition. "We're now going to move forward at the state and local level to ensure new code requirement is adopted."

FIRE SPRINKLER TALKING POINTS

Purpose of introducing Senate Bill 129

- Senate Bill 129 is a proactive response to a national movement to require fire sprinkler systems in one and two-family residential dwellings.
- The 2006 International Residential Code (IRC) included residential fire sprinkler requirements as an appendix to the code. This allowed states to adopt the 2006 IRC with the ability to choose whether to adopt or reject the residential fire sprinkler appendix.
- In preparation for the 2008 national meeting to adopt the 2009 IRC, the Fire Sprinkler Coalition, an association of more than 100 fire service, building code officials, and safety organizations held fund raisers and organized the travel for their supporters.
- In September 2008 the 2009 IRC was adopted with the residential sprinkler mandate.
- **According to Ronny J. Coleman, President of the IRC Fire Sprinkler Coalition, "We're now going to move forward at the state and local level to ensure the new code requirement is adopted"**
- Senate Bill 129 would ensure that residential fire sprinklers remain voluntary and still allow local municipalities and private insurance companies to offer incentives to homeowners who chose to make the investment.

New homes are safer than ever before.

- Due in large part to changes in residential construction technology, the number of fatal fires has dropped dramatically in the last 20 years without the installation of sprinklers or the need to mandate them.

- The International Residential Code (IRC) requires hard-wired, interconnected smoke alarms to be installed in all bedrooms, outside of them and on each additional story, including basements.

- Over 90 percent of the occupants survived fires that were reported to have occurred in homes equipped with hard-wired, interconnected smoke alarms from 2000-2004.

- Previously adopted code provisions for fire separation, fire blocking and draft stopping, emergency escape and rescue openings, electrical circuit breakers, capacity and outlet spacing, reduced need for space heaters in energy efficient homes, and many other improvements have allowed today's homes to continue to provide fire protection even as they age.

- A 2006 USFA study on the presence of working smoke alarms in residential fires from 2001-2004 showed that 88 percent of the fatal fires in single-family homes occurred where there were no working smoke alarms. The problem is not homes without sprinklers; **the problem is homes without working smoke alarms.**

Fire sprinklers are not cost effective, and costs are far greater than what advocates say they are.

- Sprinkler costs vary depending on the climate, whether the house is on a public water line, and by the size and layout of the house.
- A conservative cost for Alaska of $4 per square foot for the average 2,400-square-foot house means that a residential fire sprinkler system would cost $9,600.
- A system installed on a home drawing from a private well, as opposed to a municipal water utility, would have an additional cost of $2.50 to $3.00 per square foot.
- For homes on wells, the typical costs are higher because of the need for additional components such as storage tanks and larger pumps and generators for power outages.
- By comparison, whole-house interconnected smoke alarm systems are now being installed for around $50 per alarm.

Significant technical problems still exist.

- Unlike smoke alarms, there is no way to test sprinklers other than applying heat.
- The fire sprinkler valves must be checked periodically to verify the system is activated.
- Sprinkler heads must be checked to make sure they are clear of obstacles.
- Homeowners must be careful not to block them or paint over them.
- Some standards also specify that sprinkler pipes in the antifreeze-type systems installed in colder climates should be emptied and then refilled with an antifreeze solution every winter.
- Sprinklers will discharge water until the fire department has been notified, arrives on the scene, evaluates and determines the structure is safe, and then locates and turns off the water supply.
- Claims that less damage will be caused by a sprinkler than a fire hose are unsubstantiated.

- Additional home flooding risks come from the vulnerability of the pressurized sprinkler heads. They can activate if they are dislodged or disturbed, when there's horseplay or other types of negligence.

- Local requirements for water storage tanks and additional plumbing in the home open up the specter of frozen, pressurized pipes in some parts of the country. Adequately protecting against these problems adds further to the cost of sprinkler systems.

- The reliability of residential fire sprinklers is also questionable. There is no study that shows how long sprinkler systems will last. After smaller recalls by other companies in 1998 and 1999, a major fire sprinkler manufacturer recalled 35 million fire sprinkler heads in 2001.

Installation of residential fire sprinkler systems for one or two-family homes should never be mandatorily required by state or local governments. A homebuilder can arrange for the installation of a sprinkler safety system in your new home or can make the necessary renovations to install one in your existing home. Each homeowner should be able to make their own decision about the type of preventative device they want to use.

To require these systems, especially in a cold climate region like Alaska, would raise the cost of affordable housing while providing the least cost efficient increase in fire safety for the homeowner.

Why is Senate Bill 129 necessary?

Senate Bill 129 is a proactive response to a national movement to mandate the installation of residential fire sprinkler systems in all new one and two-family construction homes.

These two articles are from the pro-sprinkler group ResidentialFireSprinklers.com.

The first article was written before the annual International Code Council (ICC) meeting and it discusses their plan to influence voting members and raise funds for the travel and lodging of fire sprinkler proponents.

The second article was written after they were able to show up en masse and vote to include a mandatory residential fire sprinkler requirement in the 2009 International Residential Code (IRC).

The second article ends with a quote from Ronny J. Coleman, president of the IRC Fire Sprinkler Coalition, **"We're now going to move forward at the state and local level to ensure the new code requirement is adopted."**

While residential fire sprinkler systems are an excellent **option** for homeowners who chose to pay the added expense of installation and upkeep, they should not be forced on Alaskans who are already dealing with a multitude of economic burdens and live in a climate where frozen and burst water pipes are an all too common experience.

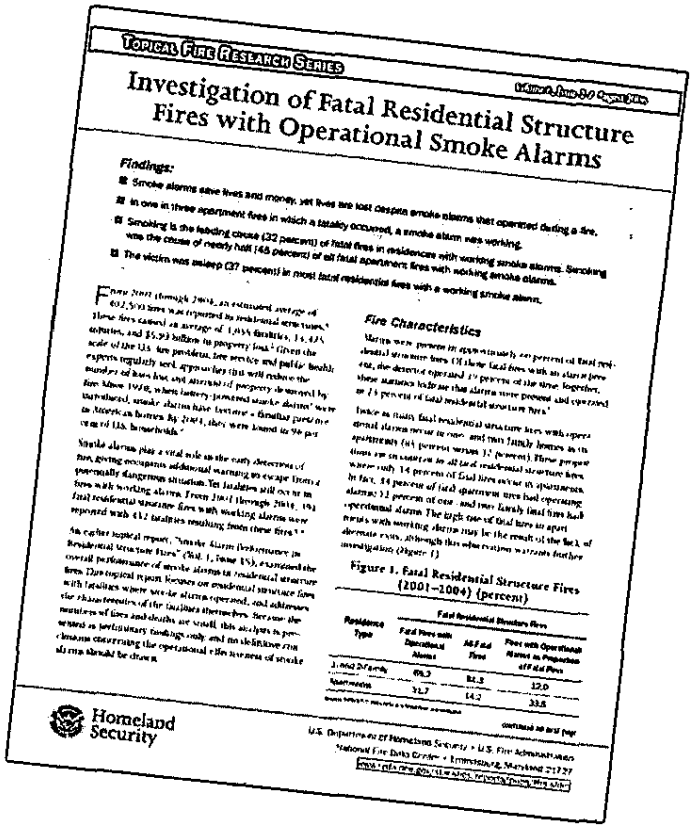
New Homes are Safer

- Mandating fire sprinklers does not target homes where fire deaths are occurring.
- New technology and modern building codes make today's new homes safer
- Code provisions and technological innovations provide safety
  - fire blocking
  - draft stopping
  - emergency escape and rescue openings
  - electrical circuit breakers
  - outlet spacing and capacity
  - fire walls and fire separation
  - Adequate heating systems and energy efficient homes
  - interconnected hardwired smoke detection systems
- Versus older homes with antiquated or nonfunctioning smoke detectors.
  - Must be reached through education and public outreach
  - Very few fire deaths occur in homes with working smoke alarms
  - Smoke alarm technology continues to improve

Smoke Alarms Work

- US Fire Administration and National Fire Protection Association data continue to affirm that the majority of home fire fatalities occur when there are no operational smoke alarms.

- Installing and maintaining smoke alarms is the most practical, cost effective and proven way to reduce home fire fatalities in the U.S.



TOPICAL FIRE RESEARCH SERIES

Investigation of Fatal Residential Structure Fires with Operational Smoke Alarms

Findings:

- Smoke alarms save lives and money, yet lives are lost despite smoke alarms that operated during a fire.
- In one in three apartment fires in which a fatality occurred, a smoke alarm was working.
- Smoking is the leading cause (32 percent) of fatal fires in residences with working smoke alarms. Smoking was the cause of nearly half (45 percent) of all fatal apartment fires with working smoke alarms.
- The victim was asleep (37 percent) in most fatal residences fires with a working smoke alarm.

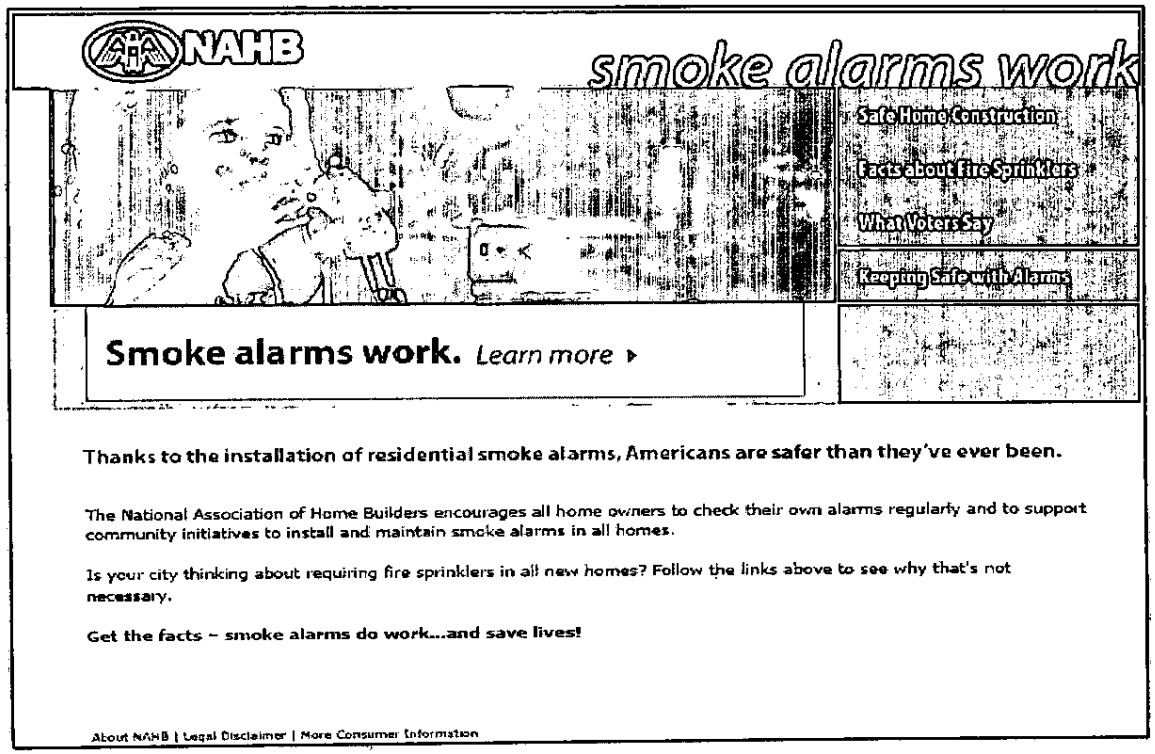
Fire Characteristics

Figure 1. Fatal Residential Structure Fires (2001–2004) (percent)

Homeland Security

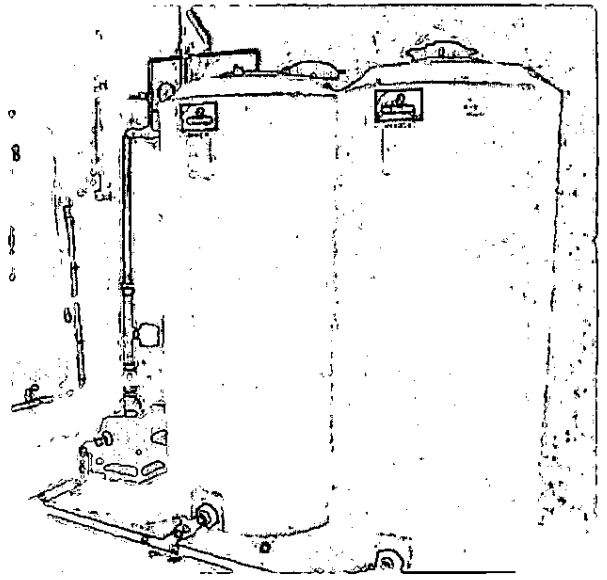
Smoke Alarms Work (cont.)

- Visit www.smokealarmswork.com for more information on keeping today's homes safe.



Home Fire Sprinkler Installation Costs

- Installation costs are typically far greater than what advocates state
- Builder survey reveals actual costs: $2.66 - $6.88 per square foot
- Additional fees include these and others
  - water purveyors
  - tests and inspections
  - backflow devices
  - water storage tanks
  - additional pumps
  - maintenance costs

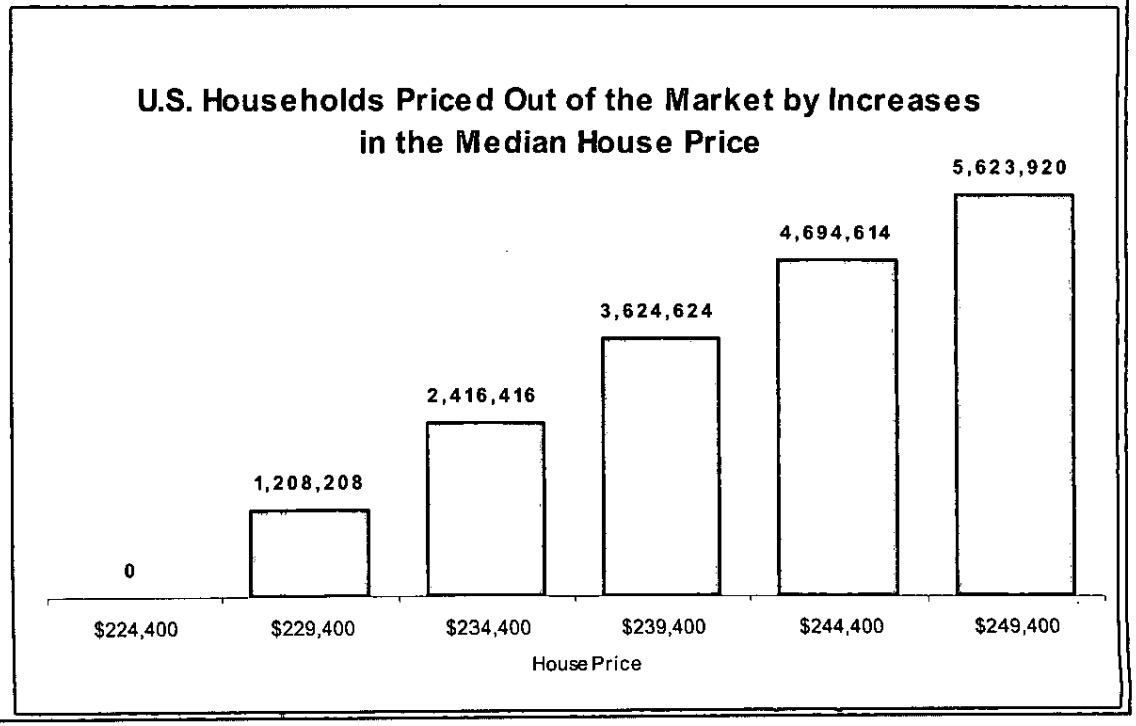


Significant Community Costs

- Must consider collective cost to the community and home buyers - not just on a single home basis.
- No reduction in taxes or fees
- Negligible effect on insurance rates
- Developmental tradeoffs are unrealistic and risky
- Installation costs nearly double the property loss due to fire alone

Impact on Housing Affordability

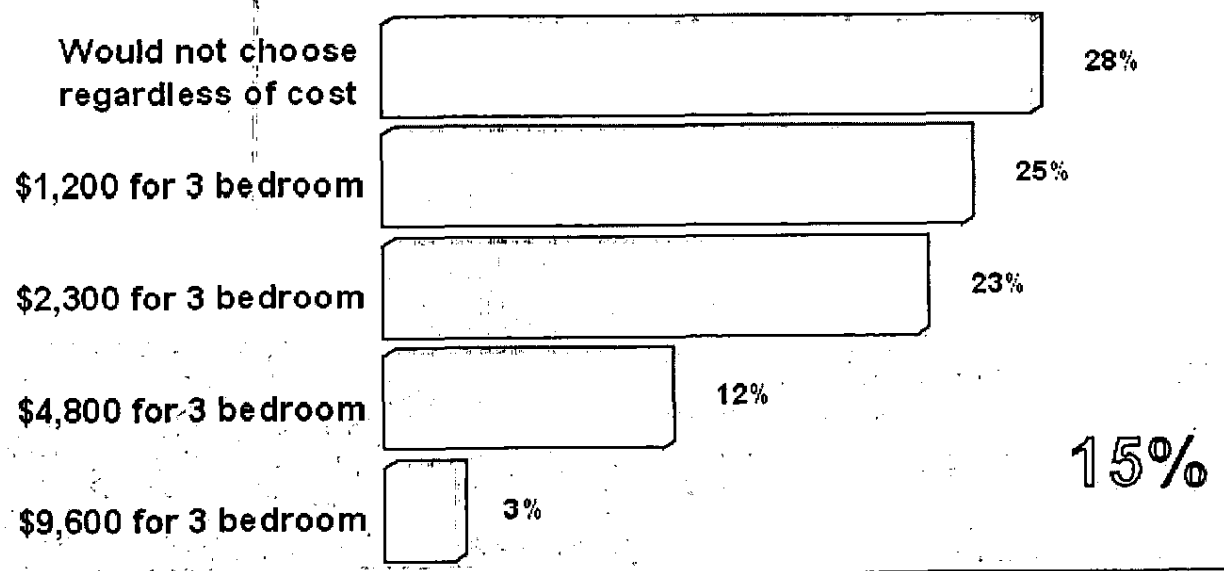
- For each $1,000 added to the price of housing, another 217,000 potential homebuyers are forced to remain on the sidelines.
- At $2.66 per square foot, a conservative estimate of one time costs to install fire sprinklers in all new homes constructed in 2005: **$10,265,405,500.00**
- Pricing consumers out of the newer home market will place them in older homes that were not built to today's more stringent building codes.



NAHB Consumer Survey

Just 15% of voters say they'd be willing to pay as much as $4,800 for a sprinkler system.

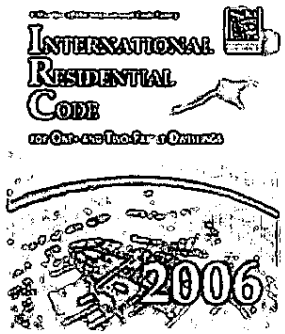
If a sprinkler system was offered as an option for your new home, what is the most you would be willing to pay?



Source: Public Opinion Strategies of Washington, D.C

The Purpose of the IRC

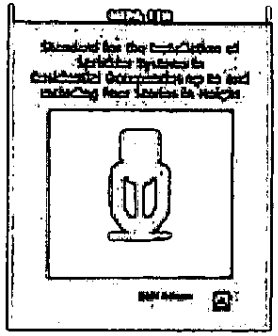
- "to provide minimum requirements to safe guard life or limb, health and public welfare."



- Mandating sprinklers is excessive –
  not a reasonable minimum.

- Sprinkler provisions already exist in Appendix P:
  - Available for jurisdictions to adopt case by case
  - Based on community specific need or want
  - Does not force other jurisdictions to amend the IRC
  - Current approach overwhelmingly endorsed by ICC membership

Significant Technical Concerns



- Complicated design requirements in NFPA 13D Standard
- No prescriptive approach
- Difficult design in custom homes
- Location of heads and spray design is complicated
- Discrepancies on head locations
- Manufacturers have different specifications on coverage areas, operating pressures, and flow rates of their sprinkler heads
- Limited water connection options
- Ongoing monthly and yearly consumer maintenance
- Failures due to non-operational systems as they age
  - water shut off, inadequate maintenance, blocked or painted heads, obstructed water distribution, frozen systems.

The Opposition

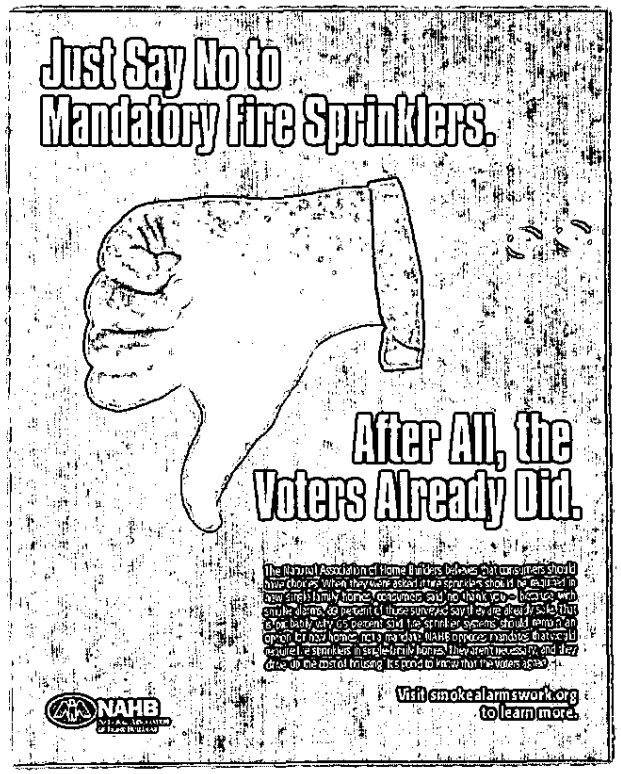
- Hosting seminars to teach sprinkler proponents how to vote at the final action hearings provided by sprinkler manufacturers, installers, and other advocates.
- Often push for votes by playing on the emotions of those attending the hearings.
- Overstate the effectiveness of residential sprinklers by not addressing the leading factor in the safe evacuation of the occupants in a fire- the early warning provided by the smoke alarms.
- Dismissing homebuilder's and the public's concerns over design, installation, inspection, maintenance, effectiveness, and ultimately housing affordability nationwide.

Advocating Against Sprinkler Mandates

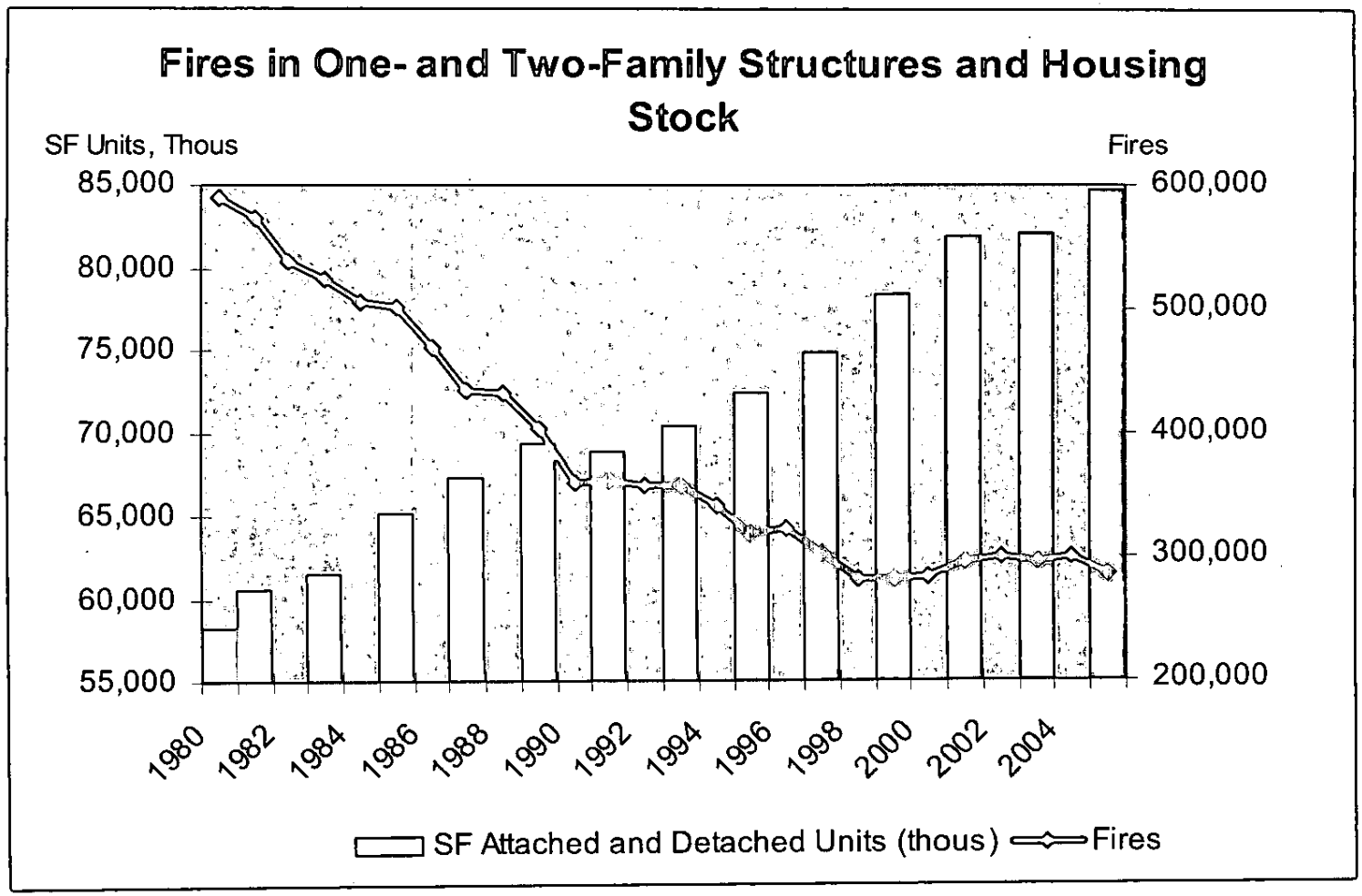
Prepared by the National Association of Home Builders

Fire Sprinklers - Unjustified

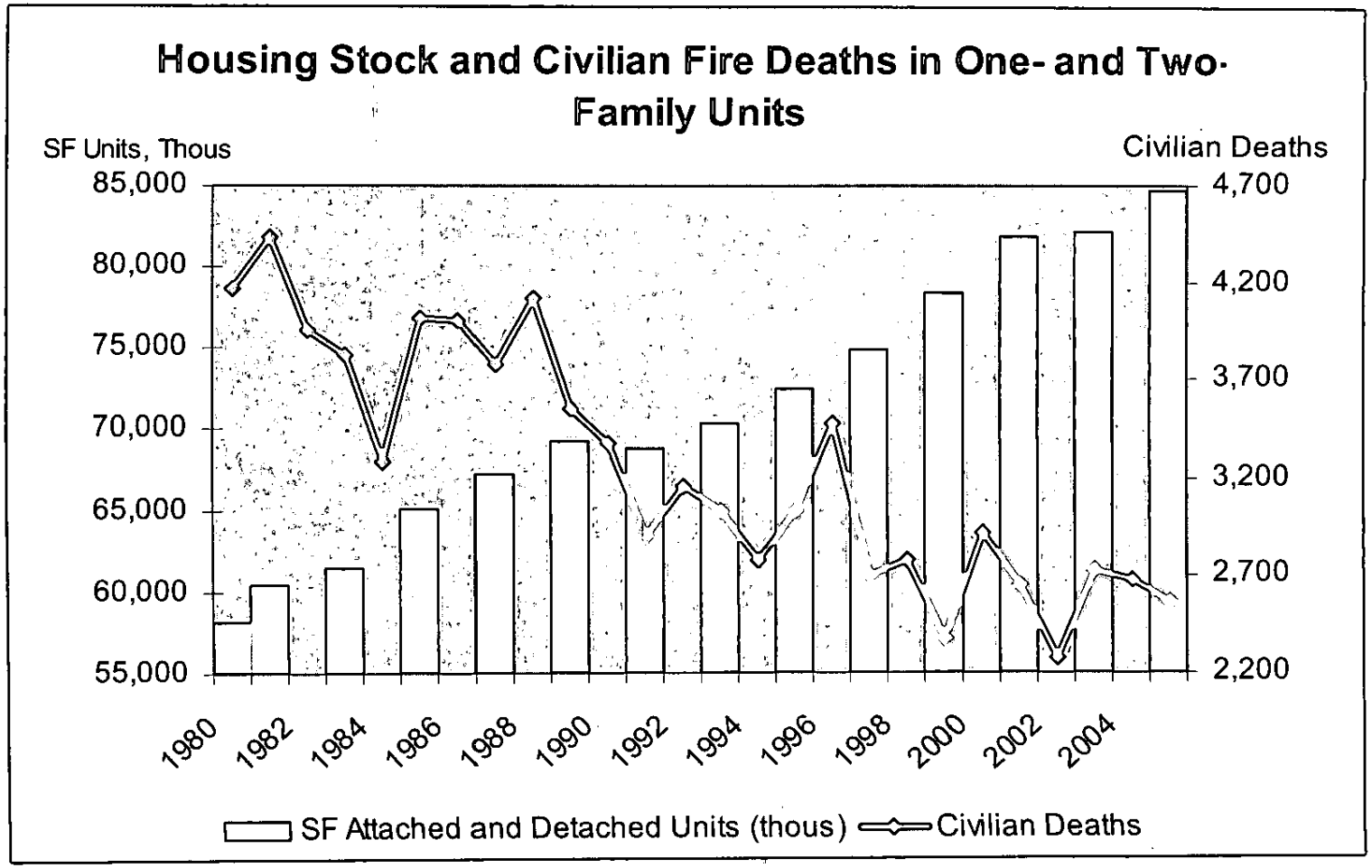
- Current trends in fire incidents do not warrant the installation of fire sprinklers.
- Home fires continue to decline despite the growth in housing stock.
- Fire injuries and deaths continue to decline despite population growth.
- Incidents can be further reduced with new safer housing stock, maintenance of existing smoke alarms, and fire safety education.
- Fires occur in less than four tenths of one percent of existing one- and two-family homes in given year.



The Decline in Home Fires

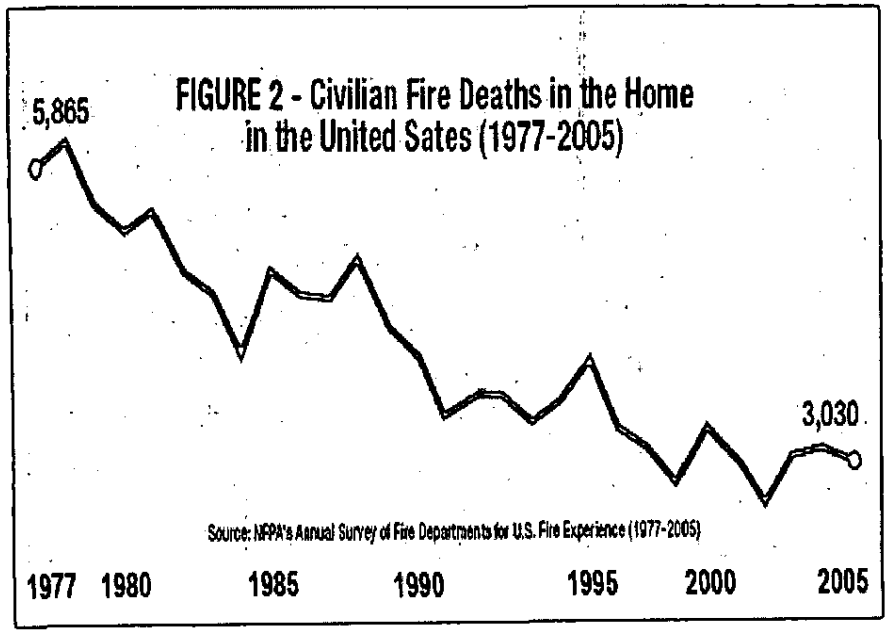


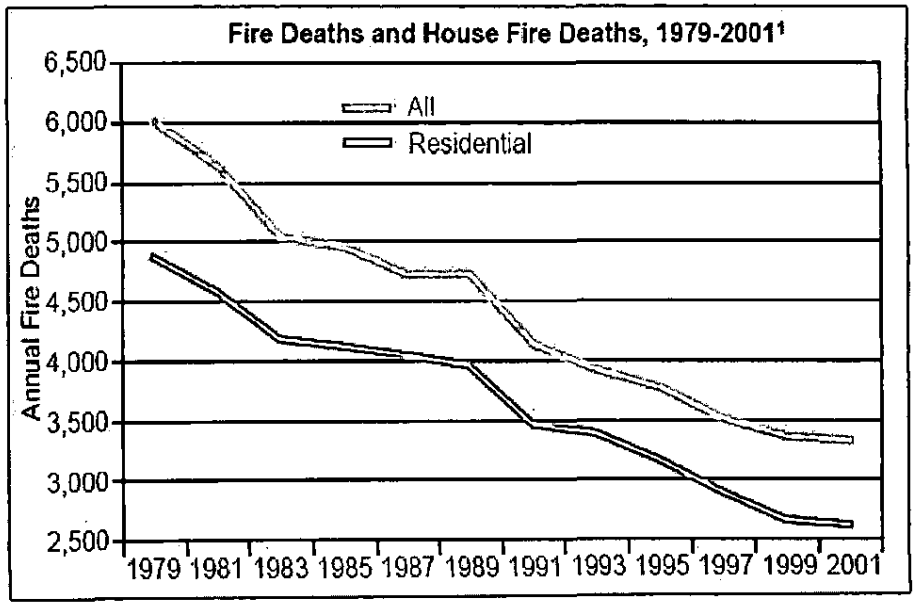
Decline in Home Fire Fatalities



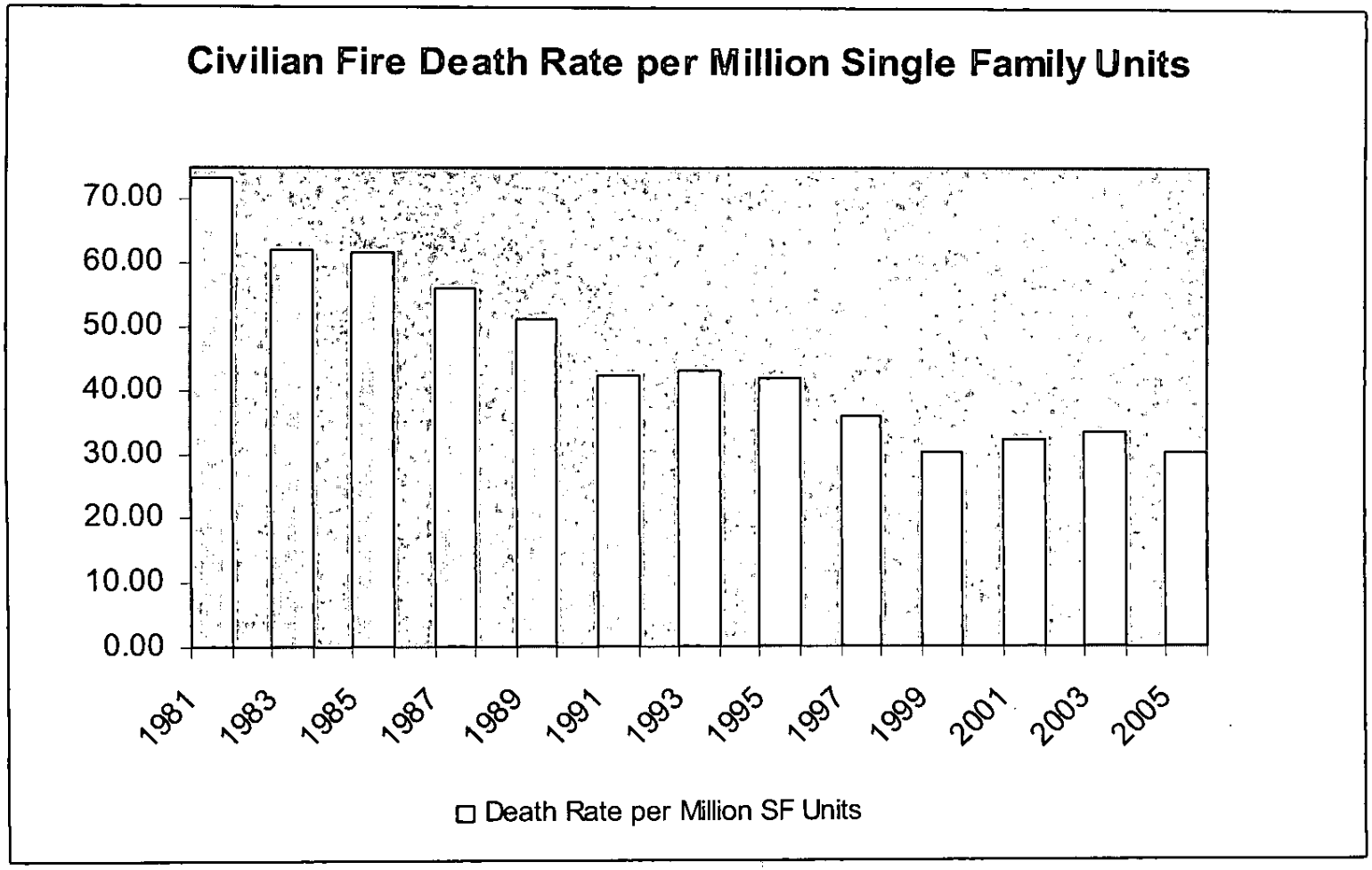
Decline in Home Fire Fatalities (cont.)

- Advances in construction practices and materials, the effectiveness of smoke alarms, and fire prevention and education efforts are working.
- Fire deaths continue to decline year after year.
- 58% drop in the actual fire death rate per million persons from house fires – from 1979 – 2003 according to the Center for Disease Control.



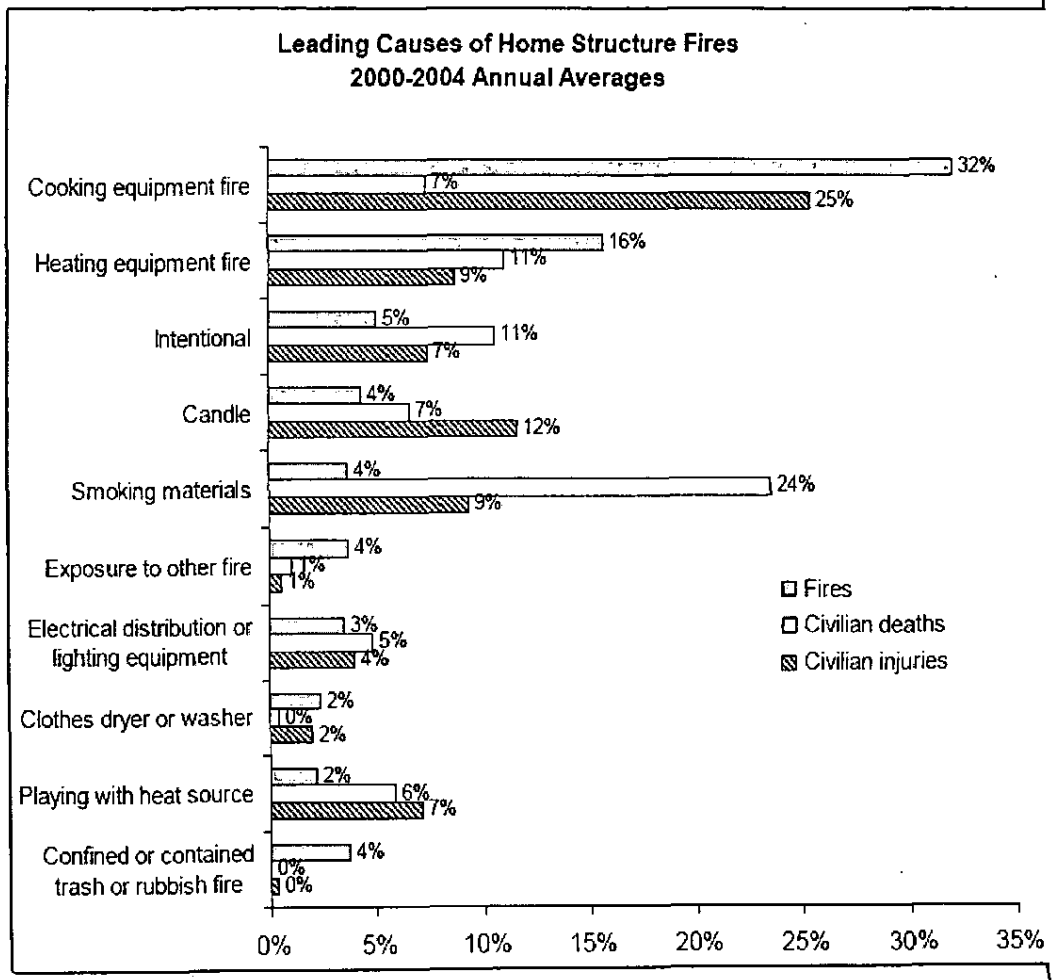


Decline in Fire Death Rate



Leading Causes of Fire

- Smoking materials remain the leading cause of home fire deaths & property damage.
- Only 4% of reported home structure fires were started by smoking materials, but these fires caused 700 or 24% of the home fire deaths.
- Intentionally set fires accounted for 19,000 reported home structure fires and 310 civilian fire deaths.



Source: *Home Structure Fires*, 2007 NFPA

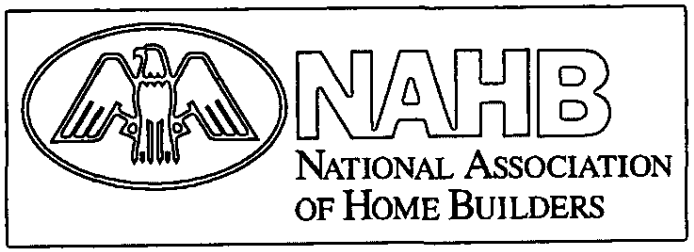
ICC Final Action Hearings

September 17-23,2008
Minneapolis, MN

If we do nothing...
A 2/3 majority vote will overturn the committees decision and mandate sprinklers in the IRC!

Every Vote Will Count!

Thank you!



STOP

Start Over

Every home should have working smoke alarms.

That's the best way to help prevent injury and death from house fires.

In the last 20 years, the number of people who have died as a result of a fire in their homes has plummeted. Why? Experts in the fire protection and building industries agree: The increasing use of smoke alarms, now required in all building codes, is the biggest reason. Technological advances in home construction and better fire safety education are two others.

That's the good news. But we can do more. Even though new homes are significantly safer, there is still plenty of older housing stock in our country that was constructed back in the days when building codes weren't enforced as they are today – or that didn't include today's stringent requirements for electrical safety, heating systems, building materials, construction techniques and emergency escape. Most importantly, everyone would be a lot safer if every house had **working** smoke alarms.

smokealarmswork.com

Think Safety – Today.

The important of operational smoke alarms in preventing residential fire deaths is indisputable. The National Association of Home Builders encourages all home owners to check their own alarms regularly and to support community initiatives to install and maintain smoke alarms in all homes.

Today's Home is Safer.

New homes are built to be more fire-safe than ever before. Technological advancements in construction, more knowledge about how fires start and spread and significant improvements in building science protect today's homes without the need for fire sprinklers. The most significant life-saving advance is the requirement for the installation of sensitive smoke and fire detection systems that are hardwired, interconnected, and have battery back-up. When smoke is detected in any room, every alarm in the home is set off. These systems are in all new homes.

NAHB

SMOKE ALARMS WORK.

Learn the truth about new homes and fire sprinklers.

Some public safety officials and the sprinkler industry have stepped up their campaign to require fire sprinklers in all new single-family homes and townhouses. They say installing sprinklers is cost effective, affordable, and a proven way of making homes safer. They say that the experts are on their side.

They aren't telling you the whole story.

The goal for all public safety officials is to protect against injury and loss of life. In fact, that's a goal we all have in common: fire fighters, sprinkler installers, and home builders, too. But installing fire sprinklers is expensive, and there exists no legitimate study showing that overall, they do a better job of saving lives in home fires.

Most importantly, installing fire sprinkler systems in new homes does not prevent death and injury from fires in older homes. Fire sprinklers may be a solution for those who want them, but they are not a solution for reducing fire deaths where they commonly occur.

Price Does Matter

For each additional $1,000 added to the price of a home, 250,000 potential home buyers are priced out of the market. Using a very conservative estimate of $3,000 for a fire sprinkler system in the average home, 750,000 homebuyers must remain on the sidelines – and not enjoy the safety benefits of a new home.

We also know what it costs to keep fire departments staffed and ready to respond to emergencies. As new homes are built and more families move into a community, it's natural for those costs to rise.

But mandating sprinklers doesn't halt the cost increase. A fire department does lots more than fight fires. Fire fighters field emergency medical requests, respond to traffic accidents, and constantly train and prepare for emergencies. Actual time spent fighting fires? About 3 percent, nationally. Installing sprinklers isn't likely to bring down these fire prevention costs.

Alarms work. Here's why.

Studies show that the risk of fire death is greatest in cases of "delayed discovery," typically when the home's occupants are asleep or when there's a smoldering fire, like one started by an unattended cigarette. Smoke alarms work because they alert occupants in time to react.

Alarms also work because they are cheaper and easier to install – $200-$400 will fully protect a 2,000-square-foot home, while a sprinkler system likely will cost $3,000 and even $4,000 or more for a home of that size. And that's before you take into account the special tanks and pumps the sprinkler system will need if the house is on well water. These estimates are for new construction: Retrofitting an existing home with sprinklers costs significantly more.

Thanks to widespread installation of residential smoke alarm systems in recent years, Americans are safer than they've ever been. In fact, according to an August 2006 U.S. Fire Administration study, only 3.7% of all residential fire deaths from 2001-2004 were reported as occurring in homes with working smoke alarms.

House Fire Deaths

Elliot F. Eisenberg

Over the past two decades the number of individuals dying in fires has fallen dramatically. In 1979 the total number of such deaths was 5,998. By 1999, the latest year for which data are available, the number of such deaths had fallen to 3,354—a decline of 44 percent. This reduction understates the true improvement in fire safety, as the U.S. population grew by almost 50 million persons during this 20-year period. As a result, the fire death rate per million people, a better measure of fire safety, fell from 26.66 in 1991 to 12.30 in 1999—almost 54 percent.

The most common type of fire death is a result of a house fire. Figure 1 shows the total number of fire deaths, and fire deaths that originated in the home, between 1979 and 1999. This excludes arson deaths (which are often categorized as homicides or suicides), fire deaths following car crashes, railway deaths involving fire, and deaths caused by explosive materials. It also excludes forest fires, camp fires, and all other fires that originate outside the home, yet result in the death of an individual in the home. The number of these fire deaths has declined by 45.6 percent, from 4,863 in 1979 to 2,644 in 1999. Taking into account the growth in population, the 45.6 percent decline in house fire deaths translates into a decline in the fire death rate per million persons from 21.6 to 9.7 or 55 percent.

These findings are based on the annual Multiple-Cause-of-Death file collected and compiled by the National Center for Health Services (NCHS), a part of the Centers for Disease Control and Prevention (CDC). Death certificates are coded by local medical authorities and compiled by the states and finally by NCHS. The result is an annual data file that contains a record of all deaths in the United States.

State-by-State

Table 1 looks at fire deaths, and fire deaths per million persons (DPMP) on a state-by-state basis from 1983 and 1999. While the total number of fire deaths is important, it is strongly influenced by the size and population growth of the state. By avoiding these distorting influences fire deaths per million persons (DPMP) is a more useful measure.

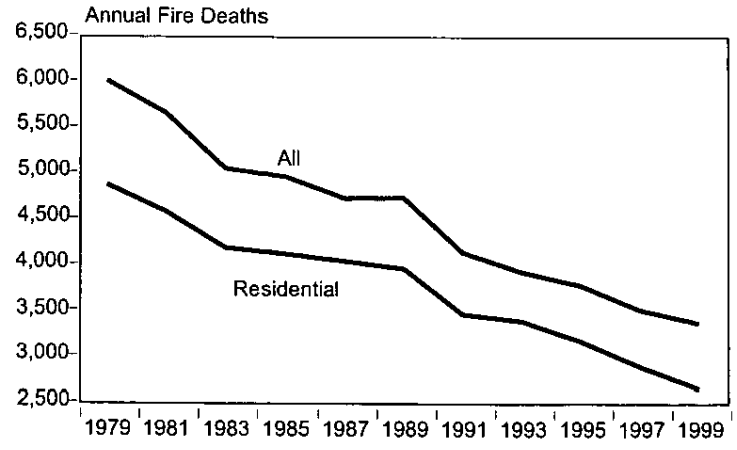
All states did not show a decline in fire deaths between 1983 and 1999 because in some states the number of fire deaths was already so low, or so unusually low in 1983, that a further reduction in the number of fire deaths was not possible.

Fire deaths rates are much higher in the South than in any other region of the nation. Nine of the 10 states with the highest fire DPMP rates are from the South. Fortunately, the DPMP rate in the South, and in other states with relatively high fire death rates, has declined rapidly during the past two decades. Mississippi has seen its rate plummet by 43 percent, while Georgia's rate has fallen by an even larger 57 percent. Other Southern states that have had very large declines in their fire DRMP rate include Louisiana, which enjoyed a reduction of 42.3 percent, and South Carolina who's rate fell by 65.8 percent.

One possible reason for the sharp decline is that due to rapid population growth many southern states have, on average, very new housing stock. Despite that, possible reasons for the continued high fire death rates in these states include lower overall levels of education, a high percentage of the population who live in rural areas, and high percentages of people who smoke and or who are below the poverty line.

A major reason for the large national fall in fire death rates has been due to the many fire safety features in new homes. A combination

Figure 1. Fire Deaths and House Fire Deaths 1979-1999



Source: National Center for Health Statistics, Multiple Cause-of-Death Files 1979-1999.

of improved smoke detector placement and technology, improved fire blocking and stopping—which results in better fire containment which in turn provides more time to escape and or extinguish the fire—better heating and electrical design, resulting in the use of fewer extension cords and space heaters, and improved fire ratings on interior furnishings and building materials have lead the way in reducing U.S. fire deaths.

International

While other countries' fire death rates have fallen over the past 25 years, U.S. rates have fallen significantly faster. Information to help compare the performance of the recent U.S. fire safety record to other countries comes from the National Fire Protection Association (NFPA).

Figure 2 shows that between 1979 and 1999 the decline in the U.S. fire death rate has been the largest in both absolute and percentage terms. In absolute terms the U.S. rate has fallen by over 20 DPMP, which translates to a decline of 57 percent, only France the U.K. and Spain even come close, and in all three cases the decline has been at most 50 percent. Nonetheless, fire death rates are still about 33 percent lower in France and about half as high in Spain and in the Netherlands as they are in the United States.

Closer to home, fire death rates in the U.S. and Canada have been similar for the past 25 years. From 1977 through 1984 the rates were nearly identical in both countries. Since then, however, Canada has consistently had a slightly lower rate than the U.S. with the gap between the two rates fluctuating from a high of 6 DPMP to a low of about 2 in 1999.

While fire death rates in the U.S. have fallen dramatically and are now comparable to rates in some European nations, a recent report by the World Fire Statistics Centre (WFSC) shows that more needs to be done before our rates are in line with most European countries. While the WFSC, and the NFPA get their data from different sources, and thus have results that differ slightly, their conclusions are mutually reinforcing.

The U.S. has traditionally placed greater emphasis on fire suppression than other nations.

It is, however, in fire prevention and safety behavior where the U.S. falls short of the Europeans. In Europe 4 percent to 10 percent of fire department budgets are spent on fire prevention, in the U.S. the rate rarely approaches 3 percent. Also, there is generally much greater cultural awareness of the destructive force of fires in many European and Asian countries due to hundreds of years of experience living in densely populated cities, where fires have periodically threatened large parts of the population and housing stock. Additionally, in the U.S., house fires are considered an inevitable, albeit an unfortunate, part of life, and thus carry no social stigma. By contrast in Europe, and elsewhere, house fires are viewed as preventable. Thus, when they do occur they are a cause of deep personal shame and embarrassment.[1]

Causes of Fires

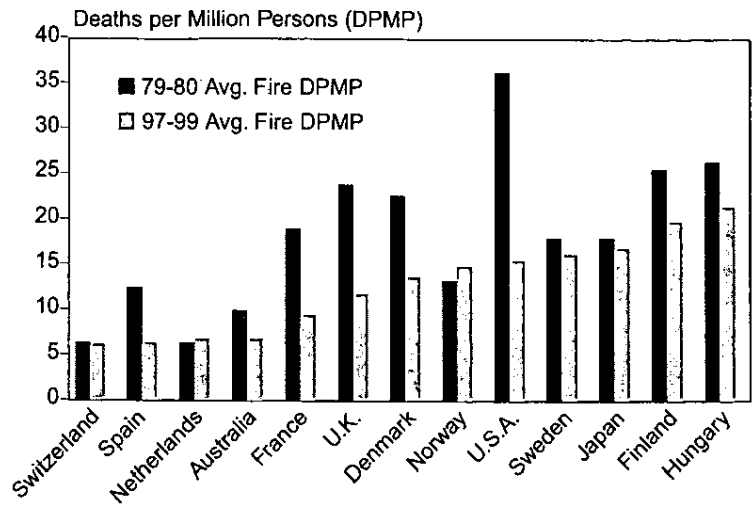
Figure 3 graphs the most common causes of house fire deaths as reported by the United States Fire Administration[2] (USFA). Smoking is the leading cause with more than 25 percent of all residential fire deaths attributable to it. The next most common cause is suspicious activities or arson that accounts for about to 20 percent of residential fire deaths. Cooking fires are next, followed closely by heating, with both cur-

Table 1. State-By-State House Fire Deaths

	Deaths	Per Million		
	1999 Deaths	1983	1999	1999 Rank
United States	2,644	17.8	9.7	NA
Alabama	93	30.8	21.3	50
Alaska	7	35.2	11.3	35
Arizona	35	7.7	7.3	15
Arkansas	33	34.0	12.9	38
California	154	9.4	4.6	6
Colorado	18	8.6	4.4	4
Connecticut	25	7.3	7.6	18
DC	5	33.0	9.6	30
Delaware	10	51.3	13.3	39
Florida	91	13.6	6.0	10
Georgia	110	32.8	14.1	41
Hawaii	2	6.9	1.7	3
Idaho	11	9.1	8.8	26
Illinois	130	17.1	10.7	32
Indiana	59	19.5	9.9	31
Iowa	35	8.6	12.2	37
Kansas	24	12.8	9.0	28
Kentucky	57	23.1	14.4	42
Louisiana	71	28.1	16.2	45
Maine	23	21.8	18.4	48
Maryland	56	22.8	10.8	33
Massachusetts	31	21.2	5.0	7
Michigan	137	17.9	13.9	40
Minnesota	38	14.7	8.0	19
Mississippi	66	41.8	23.8	51
Missouri	49	17.5	9.0	27
Montana	4	19.6	4.5	5
Nebraska	14	12.5	8.4	23
Nevada	12	7.8	6.6	13
New Hampshire	2	18.8	1.7	2
New Jersey	60	15.5	7.4	16
New Mexico	9	7.8	5.2	9
New York	151	12.5	8.3	22
North Carolina	125	24.2	16.3	46
North Dakota	4	11.7	6.3	12
Ohio	126	17.9	11.2	34
Oklahoma	53	26.6	15.8	44
Oregon	29	15.0	8.7	25
Pennsylvania	141	20.5	11.8	36
Rhode Island	5	15.7	5.0	8
South Carolina	56	42.1	14.4	43
South Dakota	6	10.0	8.2	21
Tennessee	111	24.3	20.2	49
Texas	182	19.1	9.1	29
Utah	3	6.9	1.4	1
Vermont	4	53.2	6.7	14
Virginia	59	19.2	8.6	24
Washington	43	10.7	7.5	17
West Virginia	30	26.0	16.6	47
Wisconsin	42	13.5	8.0	20
Wyoming	3	7.8	6.3	11

Source: National Center for Health Statistics, Multiple Cause-of-Death Files 1983-1999.

Figure 2. International Fire Death Comparisons, 1979-1999



Source: World Fire Statistics Centre.

rently accounting for between 10 percent and 15 percent of house fire deaths. The three other most common causes are electrical, open flame and children, each responsible for between 5 percent and 10 percent of all house fire deaths. While there are other causes, none account for more than 4 percent of house fire deaths.

An overarching cause of residential fire deaths is the age of the dwelling. Both known studies that have looked at this question, have found that older structures burn much more frequently than newer ones. A study[3] that examined all residential fire deaths in California between 1986 and 1991 found that the average fatality rate in units that were less than 15 years old was one-eighth as high as the annual average for California's housing stock, and one-tenth as high as the rate for houses more than 15 years old.

Nearly identical results were obtained in a national study conducted by the NAHB in 1987. That study found that the fatality rate for units that were five years old or less was one-fifth as high as the average fatality rate for all housing units and one-sixth as high as the fatality rate for units more than 15 years old.[4]

Conclusion

House fire deaths in the US have fallen dramatically over the past 25 years. During that time the U.S. has gone from being a county where the chances of dying in a house fire were several times higher than in Europe, to being at worst twice as high and in many cases no higher. While any death is a tragedy, the U.S. has made great progress in reducing fire deaths and they no longer represent a large percentage of total deaths.

It was also shown that fire death rates have been decreasing across all states and decreasing most in states with high death rates. Smoking continues to be the number one cause of fatal residential fires, and bedrooms and living rooms are where nearly half of all fire deaths occur. Lastly, older residential structures were shown to have much higher fire death rates than newer ones.

[1] Fire Death Rate Trends: An International Perspective, United States Fire Administration. May 1997.

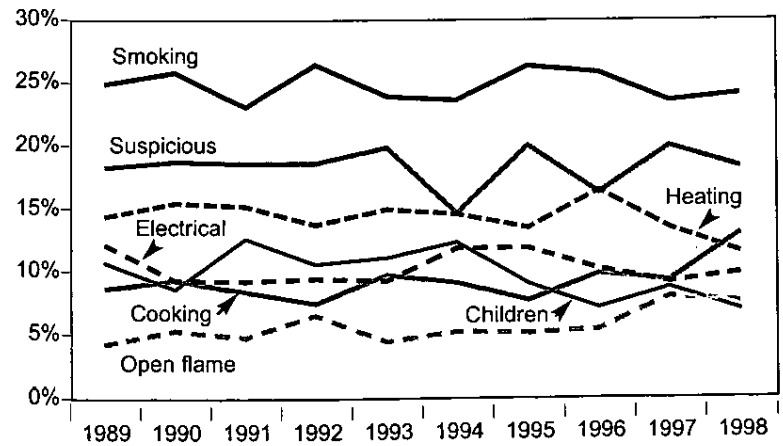
[2] The data are compiled by the USFA but recorded by 13,000 US fire departments that participate in the National Fire Incident Reporting System (NFIRS). Data is available in *Fire in the United States 1989-1998* 12th Ed.

[3] Commissioned by the California Building and Industry Association.

[4] NAHB: Residential Fire Survey, 1987.

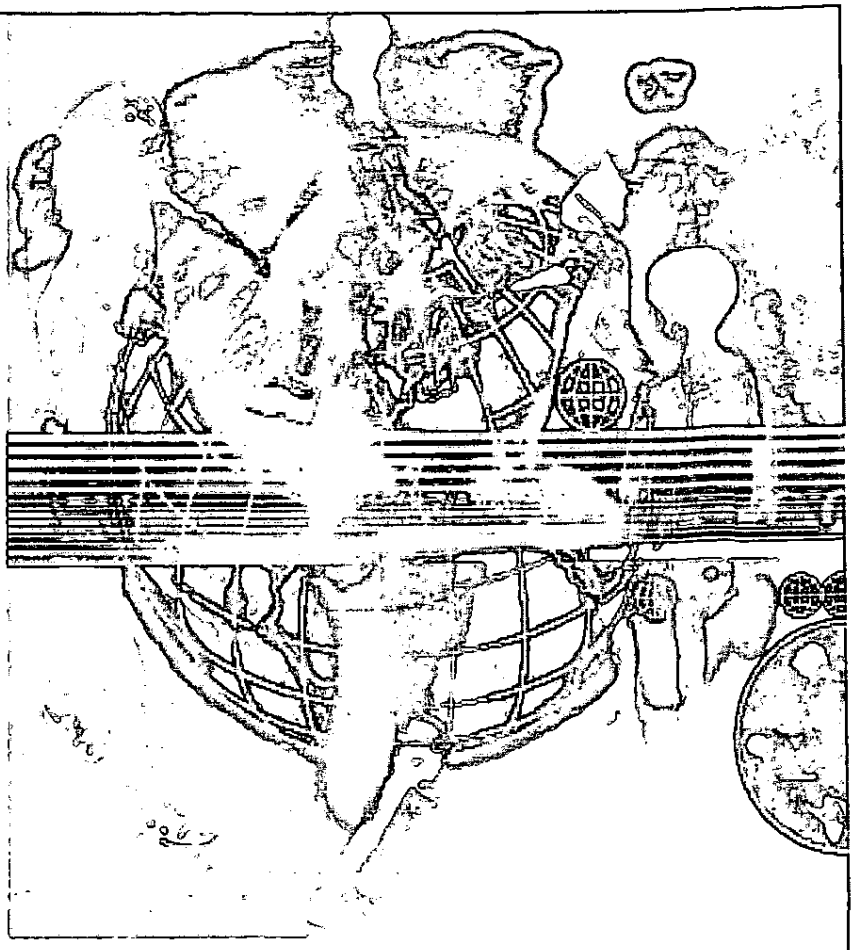
Elliot Eisenberg is an economist with the NAHB Housing Policy Group. For more information he can be reached at eeisenberg@nahb.com.

Figure 3. Leading Causes of Residential Fires, 1989-1998



Source: United States Fire Administration.

Fire Deaths in the United States: How Best to Keep Reducing Them



By Elliot F. Eisenberg, Ph.D.

INTRODUCTION

Over the past 40 years the United States of America has made profound progress reducing all types of fire deaths. Since 1960, the total number of fire deaths has declined by almost 60 percent, and the fire death rate has fallen by over 70 percent. This article begins by showing that these declines have been ongoing for decades, that the improvement has been nationwide (despite wide and persistent variations from state to state), and compared to other western industrialized democracies, the decline in the U.S. fire death rate has been the largest. If, however, the experiences of other nations are a guide, the rate of future improvements in the U.S. may decline.

The article then evaluates which demographic and housing unit characteristics best explain residential fire death rates. To anticipate the findings, inter-county fire death rate differences are strongly correlated with the percentage of new housing stock, differences in household wealth, the percentage of minorities, and the percentage of mobile homes. These findings suggest that a particularly effective way to reduce future fire deaths may be to focus prevention efforts in proportion to the level of these four variables in a community, as opposed to using traditional policies that are largely location invariant.

OVERVIEW

In 1960, the number of fire deaths in the U.S. was 7,645. Five years later, the number had fallen to 7,347.[1] Figure 1 shows that by 1979 the number had fallen to 5,998 and to just 3,326 in 2001, a total decline of more than 56 percent. However, this dramatic decline understates the true improvement in fire safety as the population of the U.S. increased by 105 million people during this 41-year period. Taking this into account, the decline in the fire death rate per million persons (FDPM) fell from 42.3 to 11.7, a decline of over 72 percent.

Equally impressive has been the decline in house fire deaths. Between 1979 and 2001, the number of such fire deaths fell from 4,863 to 2,604, a decline of 46.5 percent, while the residential FDPM declined from 21.7 to 9.13, a drop of 58 percent. Because the decline in residential fire deaths was larger than the reduction in all fire deaths, house fire deaths now account for 78 percent of all fire deaths, down from their recent high of 86 percent in 1993, and are now at their lowest rate since at least 1979.

These findings are based on the annual Multiple Cause-of-Death file collected and compiled by the National Center for Health Services (NCHS), a part of the Centers for Disease Control and Prevention (CDC). Death certificates are coded by local medical authorities and complied by the states and finally by the NCHS. The result is an annual data file that contains a record of all deaths in the U.S.

STATE-BY-STATE VARIATION

Table 1 (page 10) looks at house fire deaths in 2001 and FDPM rates for all 50 states in 1983 (the first year these data were available from this source) and 2001. With the exception of Kansas and Connecticut, every state registered a decline in its FDPM during the 23-year period, suggesting that the steep decline in U.S. residential fire deaths has benefited all states. However, the FDPM rate continues to vary dramatically across the states. In 1983, the rate varied from a low of 6.9 in Utah and Hawaii to a high of 53.2 in Vermont. By 2001, Colorado had the lowest rate in the nation at 2.3, while Arkansas had the highest rate in the land at 28.6.

To further illustrate the dramatic reduction in fire deaths, in 1983, there were four states with FDPM rates greater than 40 – Delaware, Mississippi, South Carolina, and Vermont. However, by 2001, the four states with the highest FDPM ranking were Arkansas, Mississippi, Delaware, and Alabama with FDPM rates of 28.6, 25.5, 21.3 and 19.5, respectively; about half as high as the rates for the four poorest performing states in 1983. Put another way, the average state in 1983 would rank 45th in 2001.

Despite these dramatic improvements, there are some constants. Both Delaware and Mississippi appear in lists of the four least fireworthy states in 1983 and 2001. Also, in 2001, eight of the 12 states with the highest FDPM rate were from the South, while in 1983, 10 of the 15 states with the highest FDPM rates were located in the South. Repeatedly finding the same states with relatively high (or low) FDPM rates suggests that, while improvements have been felt coast-to-coast, systematic unchanging state-specific problems remain.

INTERNATIONAL COMPARISONS

Interestingly, the U.S. findings of declining FDPM rates over time, substantial variation across place, and high rates of path dependence are also in evidence internationally. Figure 2 shows that, between 1979 and 2000, FDPM rates declined in 10 of 13 countries, stayed the same in one, and rose slightly in two others.[2]

FIGURE 1

Fire Deaths and House Fire Deaths, 1979-2001[1]

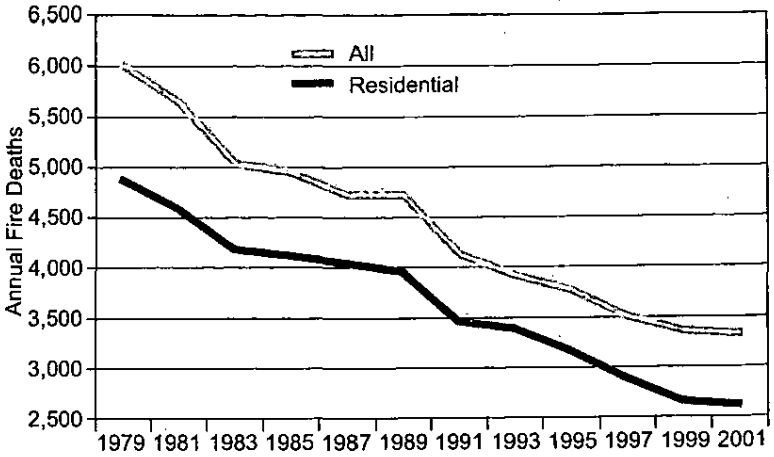


FIGURE 2

International Fire Death Comparisons, 1979-2000 [2]

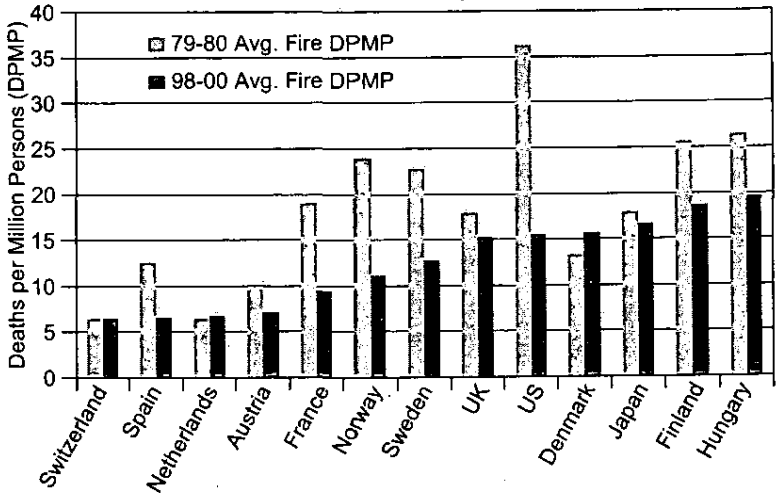
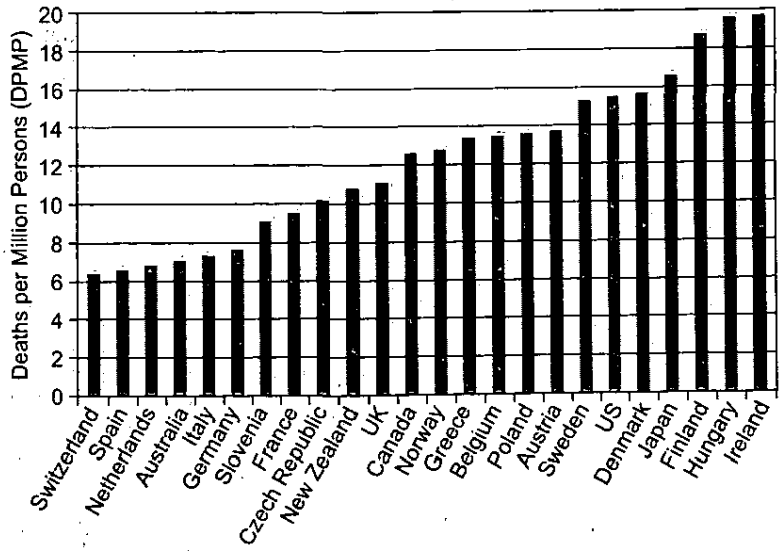


FIGURE 3

International Fire Death Comparisons, 98-00 Average



Even among countries that appear very similar, fire death rates vary considerably. For example, Finland, Denmark, Sweden, and the Netherlands are all Northern European countries with similarly high per capita GDP and small populations. Despite these parallels, their FDPM rates vary noticeably. In Finland, the FDPM is 18.7, while in the Netherlands, it is less than half as high. And these differences have persisted for quite some time.

Figure 2 also shows that improvements have been quite uneven. Between 1979 and 2000, the 57 percent decline in the United States fire death rate was larger than that experienced by any other country. Other countries that experienced very large percentage declines include U.K., France, Spain, and Norway, each of which saw their rates decline by between 47 and 54 percent. By contrast, fire death rates in Switzerland and Netherlands barely budged. This may, in large part, be because rates in those two nations were already so low by 1979 that further improvement is very difficult.

This explanation is given added weight by examining Figure 3 which provides the most recent fire death rate data for all countries that consistently provide data to the World Fire Statistics Centre (WFSC) in Geneva (except for Singapore, as it is not a democracy and because 80 percent of the population live in public housing) ranked by their fire death rates. (The WFSC does not get its data from NCHS. Thus, its fire death rates for the U.S. are different.) Figure 3 clearly shows that, among the top 24 countries, none has a fire death rate below 6.5 FDPM, and that the variation among the best-performing five or six nations is very small.

This observation was also noted in the 2003 WFSC report when they wrote "Progress has... been particularly marked in those countries which had in the 1980s been suffering relatively high losses (particularly fire deaths), while – naturally enough – those countries already enjoying relatively low loss rates have had difficulty in improving much further."[2]

As an aside, the best-performing nations in Europe are generally smaller or warmer than the U.S., and the two that are large (Italy and Germany) and have relatively low fire death rates have much higher population densities compared to the U.S., which works to their advantage. Conversely, the U.S. population is growing much faster than in any Western European state.

As a result of increasing U.S. population, progressively smaller improvements in fire deaths will manifest themselves differently in the U.S. than in Europe. In the U.S., the FDPM rate may continue to decline, but due primarily to increases in population and not declines in the number of fire deaths, while the number of fire deaths remains constant. As a matter of fact, this trend has recently appeared for the very first time. Between 1998 and 2001, the number of fire deaths fell by only 16, or less than one percent, while the FDPM rate fell by four percent due to rising population. While the decline in the FDPM rate looks impres-

TABLE 1. U.S. Fire Death Rates

	Deaths	Per Million		
	2001	1983	2001	2001 Rank
US	2604	17.8	9.1	NA
Alabama	87	30.8	19.5	48
Alaska	12	35.2	18.9	46
Arizona	35	7.7	6.6	14
Arkansas	77	34.0	28.6	51
California	126	9.4	3.6	4
Colorado	10	8.6	2.3	1
Connecticut	25	7.3	7.3	22
Delaware	17	51.3	21.3	49
District of Columbia	9	33.0	15.7	45
Florida	115	13.6	7.0	18
Georgia	124	32.8	14.8	43
Hawaii	3	6.9	2.4	2
Idaho	5	9.1	3.8	5
Illinois	135	17.1	10.8	34
Indiana	65	19.5	10.6	33
Iowa	23	8.6	7.8	24
Kansas	38	12.8	14.1	42
Kentucky	57	23.1	14.0	40
Louisiana	86	28.1	19.2	47
Maine	8	21.8	6.2	13
Maryland	53	22.8	9.8	29
Massachusetts	46	21.2	7.2	19
Michigan	118	17.9	11.8	38
Minnesota	31	14.7	6.2	12
Mississippi	73	41.8	25.5	50
Missouri	66	17.5	11.7	37
Montana	3	19.6	3.3	3
Nebraska	13	12.5	7.6	23
Nevada	9	7.8	4.3	7
New Hampshire	14	18.8	11.1	35
New Jersey	47	15.5	5.5	10
New Mexico	10	7.8	5.5	9
New York	138	12.5	7.2	21
North Carolina	96	24.2	11.7	36
North Dakota	6	11.7	9.4	26
Ohio	119	17.9	10.4	31
Oklahoma	33	26.6	9.5	27
Oregon	25	15.0	7.2	20
Pennsylvania	125	20.5	10.2	30
Rhode Island	7	15.7	6.6	15
South Carolina	57	42.1	14.0	41
South Dakota	9	10.0	11.9	39
Tennessee	88	24.3	15.3	44
Texas	184	19.1	8.6	25
Utah	9	6.9	3.9	6
Vermont	3	53.2	4.9	8
Virginia	48	19.2	6.7	16
Washington	58	10.7	9.7	28
West Virginia	19	26.0	10.5	32
Wisconsin	37	13.5	6.8	17
Wyoming	3	7.8	6.1	11

sive, it masks the serious problem that over the four-year period there was, at best, a very small decline in the number of deaths.

CHANGING U.S. ENVIRONMENT

The large decline in fire death rates in the U.S. has been the result of several factors, including the adoption of increasingly stringent building codes across the country. For example, building and fire codes require improved fire blocking and stopping – which results in better fire containment, which in turn provides more time to escape and/or extinguish the fire – along with better heating and electrical design, which have resulted in the use of fewer extension cords and space heaters. Also, improved fire ratings on upholstered furnishings, bedding and sleeping attire, and the increased use of childproof devices have all helped reduce U.S. fire deaths.

Technological innovation has also played a key role. Table 2 shows how building codes progressively mandated both more and better smoke detectors over time. In 1969, smoke alarms were often unreliable, battery-operated, poorly placed, in few homes, and, most importantly, not required by any of the building codes. Today, all new homes must have hard-wired, interconnected smoke detectors, and many older homes have been retrofitted with them too. In short, homes and their contents are now safer than they have ever been.

In addition, there has also been a strong push to reduce smoking since the first Surgeon General's report linking smoking and lung cancer in 1964.[3] Since smoking is the leading cause of residential fire deaths,[4] any success in reducing it (along with drug and alcohol abuse) necessarily translates into fewer fire deaths. However, since 1990, the percentage of the U.S. population that smokes has declined very little.[5] Thus, this trend will no longer be of much help in reducing the number of fire deaths further.

Collectively, these interventions, public awareness campaigns, and code improvements have cumulatively saved about 155,000 lives since 1960. However, the across-the-board solutions that have worked so well until now are likely to be less effective in the future. In part, this is because many of the most effective solutions have already been adopted, public awareness regarding house fires is quite high, smoking rates are lower than ever, and because fire death rates are much lower than they were in the past. Thus, substantially reducing the number of fire deaths in the future will become increasingly more difficult unless solutions tailored to at-risk populations are considered.

To implement such solutions, more must be known about who is dying, the condition of the house when the fire occurred, as well as any other relevant demographic information. With this knowledge, it would then be appropriate to focus future fire prevention efforts at entire subpopulations, devoting more resources to communities at greater risk – an approach akin to the emergency room practice of triage, where patients with the greatest need get treated first.

Regrettably, much of the available data is not helpful. For example, no data are collected on the age of the structure where a house fire death occurs, despite the obvious link between the two. Similarly, very little data are available linking income, wealth, population density, and other demographic variables to residential fire death rates. And when this information is analyzed, it is done so one variable at a time. For example, a published analysis concluded that "African-Americans and American Indians have significantly higher fire death rates per capita than the national average" and that "male fire death rates exceed that of females by 1.5 to 2 times, or that the elderly of all ethnic groups have the highest fire death rates." [6]

While these results are informative, what is needed is a more complete model that can better account for the many relationships between the different variables. Only this way will it be possible to better understand why fire death rates have behaved as they have in the past and where they may be headed in the future. With this knowledge, targeted interventions can be used and, in the process, save lives.

TABLE 2

Building Code Requirements and Changes Smoke Detectors – 1970s to Present	
1967 National Building Code	No requirements for smoke detectors.
1976 National Building Code	1 smoke detector required.
1979 Southern Building Code	1 smoke detector required.
1983 CABO 1- & 2-Family Dwelling Code	1 smoke detector in sleeping areas (i.e., hallway outside of bedrooms), and smoke detector must be hardwired (not just battery).
1986 CABO 1- & 2-Family Dwelling Code	Smoke detectors now required on each story of structure and in the basement.
1989 CABO 1- & 2-Family Dwelling Code	No changes to the smoke detector requirements.
1992 CABO 1- & 2-Family Dwelling Code	Smoke detectors are required to be interconnected; if one alarm sounds, they all sound.
1995 CABO 1- & 2-Family Dwelling Code	Smoke detectors are now required in each sleeping room in addition to other current requirements.

CABO stands for Council of American Building Officials.

ECONOMIC THEORY

Findings from a number of existing studies consistently show that newer homes experience fewer fire deaths than older homes. A study conducted by the National Association of Home Builders (NAHB) in 1987[7] found that fatality rates increased with the age of homes. For example, houses less than seven years old had fatality rates one-third of houses seven to 17 years old, and one-sixth the rate of houses that were more than 25 years old.

Nearly identical results were obtained in a California Building and Industry Association study released in 1996.[8] That study found that the average fatality rate in residential dwellings in California consistently increased as the housing stock aged. Interestingly, they found this

relationship to be true for every successive four-year period going back all the way to 1956. More recently, it's been found that, in Dallas, residential fire-related injuries declined in every decade for houses built after 1949.[9] That is, houses built in the 1980s were found to be safer than those built in the 1970s, which, in turn, were found to be safer than those built in the 1960s, and so on.

Other research has found[10,11] that those at greater risk include persons living in manufactured or substandard housing. This may be because mobile homes are smaller and depreciate at a faster rate than site-built and modular homes; it is rare to see a 50-year-old or 100-year-old mobile home. By contrast, there are tens of millions of 50-year-old homes and millions of 100 year-old homes. Also, as mobile homes are built to a national building code rather than a local building code, they may be less well-suited to local environmental conditions than other homes. Moreover, it may well be that, as mobile homes reach the end of their useful life, preventive maintenance and replacement of old systems, such as heating and air conditioning units, is not done, as the cost of replacement may be very high compared to the value of the mobile home. As a result, the fire risk of such dwellings may well increase over time, relative to traditional units of comparable age.

In addition to structural variables, wealth is highly correlated with reduced house fire death rates.[12] Wealthier households are less likely to defer maintenance, are more likely to be proactive about eliminating potential

TABLE 3

Summary Statistics

Variable Type	Variable Description	Var. Name	# of Obs.	Minimum	Maximum	Average	Std. Dev.
Dependent Variable	Fire death rate	fdpermill	458	0	75.48	8.94	10.68
Housing Stock Age Variables	Percent of stock built after 1994	pctpost94	458	1.10%	34.64%	10.03%	5.67%
	Percent of stock built after 1989	pctpost89	458	2.09%	50.07%	17.83%	8.82%
	Percent of stock built after 1979	pctpost79	458	5.41%	77.33%	33.98%	14.53%
	Percent of stock built after 1969	pctpost69	458	10.56%	92.05%	52.63%	17.55%
	Percent of stock built after 1959	pctpost59	458	20.91%	96.84%	66.29%	16.85%
	Percent of stock built after 1949	pctpost49	458	35.38%	99.22%	78.77%	13.91%
	Percent of stock built after 1939	pctpost39	458	47.12%	99.56%	85.65%	11.27%
Wealth & Income Variables	Percent high school graduates	pctHS	458	11.72%	49.91%	29.04%	6.58%
	Percent college graduates	pctBA	458	6.64%	33.31%	16.12%	5.22%
	Median household income	medhhinc	458	$24,863	$81,050	$44,423	$10,197
	Median family income	medfaminc	458	$26,009	$92,146	$52,792	$11,350
	Per capita income	percapinc	458	$9,899	$44,962	$21,928	$4,810
	Median rent	medrent	458	$361	$1,185	$600	$131
	Log median house value	lmedhseval	458	10.773	13.816	11.682	11.176
	Median house value	medhseval	458	$47,700	$1,000,001	$118,500	$71,392
	Percent in poverty	pctpov	458	2.48%	35.45%	10.88%	4.83%
Housing Market Control Variables	Percent white	pctwhite	458	21.16%	97.94%	78.43%	15.31%
	Percent mobile homes	pctmb	458	0.03%	37.55%	6.48%	6.45%
	Percent urban	pcturban	458	34.49%	100.00%	83.09%	14.38%
	Population density/sq. mile	popdensity	458	21	66,940	1,229	4,202
	Percent occupied	pctocc	458	64.47%	98.46%	92.33%	4.60%
	Percent owner-occupied	pctown	458	19.54%	88.08%	67.26%	9.28%
	Percent single-family detached	pctsfdet	458	0.29%	83.17%	62.14%	12.02%
	Percent of population over age 54	pctage55up	458	11.19%	49.18%	20.89%	4.83%
	Percent of population over age 64	pctage65up	458	4.60%	34.71%	12.38%	3.80%
	Percent of population over age 74	pctage75up	458	1.70%	16.29%	5.83%	2.00%
	Percent of population over age 84	pctage85up	458	0.04%	4.13%	1.44%	0.05%

fire hazards, and are more likely to install smoke detectors.[13, 14, 15] Moreover, to the extent that wealth and education are correlated,[16] wealthier households are less likely to smoke. As a result, as wealth rises, residential fire death rates are expected to fall. However, the relationship is nonlinear as, beyond some level, the added benefit of more wealth, while always positive, declines. As a proxy for household wealth, average house value is used, and to account for the nonlinear relationship between wealth and education, the logarithm of house value is used.

Other things that may systematically impact residential fire death rates are the characteristics of a housing market. To give an example, the fireworthiness of a unit in Phoenix, AZ, may be quite different than a unit in Birmingham, AL. To account for these differences, it is necessary to include the percentage of the stock that is single-family detached, occupied, owner-occupied, and urban. It has also has been found that the age and race of the occupants are meaningfully related to fire deaths rates.[17, 18] While the signs and coefficients on all the housing market control variables mentioned in this paragraph are not central to the research question being asked, excluding them will bias the coefficients for house stock age, house value, and the percentage of mobile homes – the dependent variables of primary interest – to the extent that any of the housing market variables are correlated with the three variables of primary interest.

For example, were one to regress annual income on the age of a person, the result will be that age appears to increase income. However, the relationship between age and income is more complex; older people are more likely to have more education and more savings. And since education and age, and savings and age, are positively correlated, excluding education and savings will cause the coefficient on age to be larger than it really is. To prevent this, as many variables as possible that affect income should be included in the equation. In fire death research, the housing market variables mentioned in the previous paragraph are analogous to the education and savings variables in this paragraph.

Thus, the multiple regression equation to be estimated is:

$$FDPM = k + \alpha H + \beta M + \gamma WLOG + \delta R + e$$

Where *FDPM* is the county-specific fire death rate per million persons in 2001, *k* is a constant or intercept term, *H* is a measure of housing stock age, *M* is the percentage of mobile homes, *WLOG* is the logarithm of house value, *R* is a vector of real estate market condition control variables, *e* is a normally distributed error term, and the Greek symbols α, β, γ, and δ are the respective coefficients for *H*, *M*, *WLOG*, and *R*.

TABLE 4

Fire Death Rate Regression Results	
Variable	Model 1
Intercept	96.71
	(6.12)
Percent white	-17.01
	(5.55)
Log median house values	-6.43
	(4.80)
Percent post-1989	-9.95
	(1.65)
Percent mobile homes	21.49
	(2.45)
Observations	458
Adj R^2	0.133
F Value	18.53

Absolute value of the t-values are in brackets.

DATA SOURCES

Fire death data come from the NCHS Multiple Cause-of-Death File for 2001. Death certificates are issued and coded by local medical authorities, using internationally agreed-upon codes (ICD-10 codes) defined by the World Health Organization (WHO). Death certificate data are then complied by the states and then the NCHS. As a result, this database includes data on the cause of all deaths in the U.S. for each calendar year. For this study, the fire had to occur in a home, and the death had to be the result of exposure to a controlled or uncontrolled fire in the building (X00, X02), exposure to ignition or melting of nightwear (X05) or other clothing and apparel (X06). It ignores, however, fire deaths from campfires, forest fires, and from ignition of highly flammable material.

Data from the National Fire Incident Reporting System (NFIRS), which is developed by the United States Fire Administration (USFA), or the NFPA National Fire Experience Survey (NFES) were deliberately not used for several reasons. First, NCHS data are available at the county level, while NFIRS and NFES data are not. Second, NCHS data are specifically designed to capture the cause of death, while NFES and NFIRS are primarily designed to measure fires. As a result, deaths from nonreported fires will appear in the NCHS data, but not the NFES or NFIRS data. Lastly, the NCHS database is comprehensive, while both NFIR and NFES rely on sampling.

The county is the unit of analysis for several reasons. First, intercounty variation in the independent variables is much greater than at the state level, and with greater variation, coefficients can be estimated with greater precision. Second, performing a state-level analysis would not provide sufficient enough observations to perform a cross-sectional analysis of this sort. Finally, the smaller the geographic area analyzed, the easier it is to target and implement intervention.

Variable definitions and descriptive statistics are provided for all demographic data in Table 3. The data in the table come from the SF3 (long form) Census 2000 and are at the county level. These data were then merged with the Multiple Cause-of-Death data by county. Since the NCHS suppresses death data for counties that had a population of less than 100,000 in 1990, the sample includes data for the 458 largest counties rather than for all 3,141 counties. Of the counties in the sample, 343 of the counties reported at least one fire death in 2001, and the total population of the counties in the sample is 207 million, or 73 percent of the total U.S. population in 2000.

The county with the highest residential fire death rate in 2001 was Richmond County, VA, with a rate of 75.48 deaths per million persons – almost eight times the national average, but only slightly higher than the next highest county. Not surprisingly, the highest house prices were found in New York County (Manhattan). The county with the newest housing stock, defined as the percentage of its housing stock built after 1979 and after 1989, is Collin County, TX (just north of Dallas-Fort Worth), with half of its stock built after 1989 and 77 percent built after 1979. For purposes of comparison, Clark County, NV, where the fast-growing city of Las Vegas is located, has the eighth-highest percentage of its stock built since 1979 and the second-highest percentage of units built since 1989.

The oldest county in the nation, as measured by percent of housing stock built before 1939, is Schuylkill County, PA – where 53 percent of the stock is more than 60 years old – followed very closely by Suffolk County, MA, and San Francisco County, CA. Manhattan, NY, is the eighth-oldest county in the country, with 43 percent of its housing stock built before 1939.

RESULTS

While several different models were run – some with a slightly larger set of independent variables and some that looked at the FDPM rate in earlier years – the results were surprisingly robust across specifications. Table 4 reports the result for the above cross-sectional FDPM equation with the t-statistics reported for the coefficients in parentheses.

AGE OF STRUCTURE

As expected, the coefficient estimate for the percentage of houses built after 1989 (pctpost89) is negative and statistically significant. This implies that, in counties with newer housing stock, all else equal, the fire death rate is lower. Interestingly, when identical regressions to model 1 were run using different cutoff points for new stock, such as the percentage of houses built after 1979 or 1969 or 1959, the coefficients were of roughly similar size, were always negative, and the associated t-statistics were at least as significant.

MOBILE HOMES

Here, too, the results were as anticipated. The finds show that, in counties with a higher percentage of mobile homes, the fire death rate is higher than in counties that are otherwise identical but with a lower percentage of mobile homes. While this result is not new, the relationship between mobile homes and fire deaths may be complex. For example, it may be that mobile homes are in areas where public services are consistently not as good as elsewhere. In addition, it may be that mobile homes are more likely to be occupied by persons who are relatively old and/or who smoke more.

WEALTH

The negative coefficient for the logarithm of the median house value

(logmedval) was strongly negative and statistically significant. Confirming earlier speculation and research, wealth is inversely related to the chances of dying in a house fire. Thus, all else equal, higher wealth is associated with a lower chance of dying in a house fire. Here, too, when similar regressions to model 1 were estimated, using slightly different functional forms for this variable or a slightly different proxy variable, the results were very similar.

HOUSING MARKET CONTROLS

In addition to the variables discussed, a number of housing market control variables were included in the initial regressions. However, except for race, none were statistically significant. In particular, the percent of houses in urban areas, population density, percent of units occupied, percent of owner-occupied units, percent of units that are detached, and the age of the occupants were not found to be significant regardless of the model specification.

While these findings may seem surprising, it may simply be a result of the sample. Were the sample to have had more than just the biggest counties, it is likely that more of the housing market control variables might have been significant. However, because rural counties are not included, the differences in the control variables across the 458 counties in the sample may not be large enough for a correlation to be found. That limitation notwithstanding, the model is well-suited to analyzing counties with large populations.

FUTURE TREND

At present, the model predicts about 8.9 fire deaths per million persons, if average values for all the independent variables are used. However, to better understand the results shown in Table 3, the model can also be used to simulate alternative scenarios by making slight changes to the values of the independent variables.

For example, assuming that household wealth rises by three percent would reduce the fire death rate to 8.72 FDPM and would save 23 lives. The number is not any larger despite the large fall in the FDPM rate because the population is assumed to grow by three million persons per year as well. If household wealth increases by three percent per year for five years, the cumulative increase in wealth could be expected to lower the fire death rate to about 8 FDPM and save roughly 150 lives annually.

The impact of new home construction on fire deaths is slightly more complex. Newly built houses lower the fire death rate as they are safer than existing homes, but they do not lower the number of fire deaths in existing houses. This is because construction of a new house does not, generally, make an old house safer. However, every year, some

new houses are built simply to replace previously occupied units lost through demolition or disaster. And in those cases, the number of fire deaths can be expected to fall.

In 2003, about two million new residential units were built, and on average, about 200,000 occupied units per year are lost due to demolition or disaster.[19] Assuming production in 2004 is the same as in 2003, the percentage of new housing stock will rise by about 1.4 percent and result in the fire death rate falling to 8.8 FDPM, which translates into roughly 12 fewer fire deaths each year. Over five years, the cumulative impact of building 10 million new homes and losing one million older units will reduce the fire death rate to 8.3 FDPM, an improvement of 7.3 percent, and, in the process, reduce the number of fire deaths by about 60 per year, an improvement of only 2.4 percent.

Collectively, these findings suggest that, over the next decade, fire death rates should continue their graceful and gradual decline, with the rate of decline in the fire death rate substantially outpacing the slower rate of decline in the number of fire deaths because of continued population growth. There is, however, a caveat which will in all likelihood exacerbate this phenomenon.

A TROUBLING TRUTH

Increases in household wealth and new home construction do not occur evenly across the nation. To the extent that they do not, the results just provided in the two simulations are optimistic. For example, a hypothetical scenario could be constructed where households in Los Angeles experience a 10 percent increase in household wealth next year, while household wealth is stagnant everywhere else. While algebraically this may be the same as every household in the U.S. having their wealth rise by one-third of one percent, the impact is quite different. This is because Los Angeles has a very low fire death rate, about 2.5 FDPM, and as a result, the increase in wealth will result in relatively few deaths being prevented. By contrast, were an imaginary city equal in size to Los Angeles but with the average fire death rate to enjoy the same rise in household wealth, the number of fire deaths averted would be almost four times as great.

Thus, the distribution of the increases in household wealth matters, and to the extent that areas with high fire deaths experience smaller increases in household wealth and fewer housing starts, this reduces the impact of these variables.

Looking at this same phenomenon slightly differently, in 1979, Maryland had 100 fire deaths, with half of them in Baltimore City. At that time, Maryland had a population of 4.3 million, while Baltimore had a population of 770,000. As a result, the FDPM rate for Baltimore was 61 while it was only 14.4 outside of Baltimore.

Between 1983 and 2001, Maryland experienced a 50 percent decline in its number of fire deaths – in line with the rest of the nation. And, just like in 1983, half of the fire deaths in 2001 were still in Baltimore. However, between 1983 and 2001, the population of Baltimore fell by 125,000 to 645,000, while the population of the rest of the state grew to 5.4 million persons. As a result, the FDPM rate in Baltimore fell from 61 to 39, while in the rest of the state it fell from 14.4 to 6. That is, between 1983 and 2001, the FDPM rate fell by 36 percent in Baltimore but by a whopping 58 percent in the rest of Maryland. As a result, the relative chances of dying in a fire in Baltimore, compared to the rest of the state, went from being less than four times as high to almost seven times as high.

Because increases in wealth do not move in lock-step across the U.S., and because new home construction does not occur evenly in all counties in the U.S. – because not all counties grow at the same rate – many locations, including, but by no means limited to, Baltimore City, can be expected to suffer an increasingly disproportionate number of fire deaths. As a result, their FDPM rates will decline much more slowly than the rest of the nation, and thus their relative fire death rates will precipitously rise. Also, reducing the number of fire deaths in these cities will become increasingly difficult.

Unless this problem is successfully addressed, these locations will increasingly become home to a higher and higher percentage of all U.S. fire deaths. As new homes are rarely built in these areas, building code improvements will not help much, and since wealth gains in these areas are often small, relying on increased wealth to help is also likely to be disappointing. Rather, to overcome this problem, and in the process drive fire death rates and the number of fire deaths down still further, narrowly focused interventions based primarily on the age of housing stock and the wealth of the occupants, within a defined geographic area, are likely to be much more effective.

APPLICATION

This research offers a very powerful, clear-cut, and proscriptive recommendation for saving lives: increase fire prevention efforts where, for example, the housing stock is old and households are poor, with the magnitude of the intervention increasing the older the housing stock and the poorer the area. Doing otherwise wastes resources and withholds help from those who stand to benefit from it most. ▲

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FIRE SPRINKLER TALKING POINTS

An Overview of the Issues

- Because of changes in residential construction technology, improved building code requirements – especially for electrical and smoke alarm systems – consumer behavior and the concerted efforts of fire fighters, home builders and other safety advocates, the number of fatal fires has dropped dramatically in the last 20 years. This trend continues and the decline is even more impressive given the significant population growth and growth in housing stock our nation continues to see.

- Our population grew 36 percent between 1977 to 2006, according to the U.S. Census, while at the same time the rate of fires per 1,000 population fell 63 percent: from 14.9 in 1977 to 5.5 in 2006.

- Even more dramatic is the drop in the actual death rate per million persons from house fires. In fact, from 1979-2003, the rate dropped by more than 58 percent, based on data from the Centers for Disease Control. That trend will continue as more new housing stock is constructed and especially as the maintenance of smoke alarms by home occupants is improved. Furthermore, the fire safety features now required in our building codes will adequately protect the home throughout its life without the need for fire sprinklers.

- Proponents claim that a residential sprinkler system is reliable in 96-99 percent of the reported structure fires, where the fire was large enough to activate the system. But according to NFPA reports, the number of fires that occur in one- and two-family dwellings equipped with sprinklers are so few, that they are not shown in the studies.

- It is suggested that these sprinklered dwellings are built and maintained better than other one- and two-family dwellings and that the sprinklers often receive the credit for life saving when it was actually the result of the overall integrated system of balanced fire protection and preparedness.

- According to a national poll conducted by sprinkler advocates, 63 percent of participants indicated that they were aware of residential sprinkler systems that were available for one- and two- family dwelling. However, reports have indicated that there is a low market demand for residential sprinklers, except for those areas where sprinkler ordinances have been mandated. The number of homes built annually that are equipped with sprinklers continue to be less than 2 percent, many of which are required to be installed and not elected by the homebuyer.

- USFA and NFPA data continue to affirm that the vast majority of home fire fatalities occur when there are no operational smoke alarms.

- Thanks to widespread installation of residential smoke alarm systems in recent years, Americans are safer than they've ever been. A 2006 USFA study on the presence of working smoke alarms in residential fires from 2001-2004 showed that 88 percent of the fatal fires in single-family homes occurred where there were no working smoke alarms. The problem is not homes without sprinklers, **the problem is homes without working smoke alarms**.

- Home fire sprinklers are a significant expense. Mandates have an unreasonable impact on housing affordability and have not been demonstrated to be a practical, cost-effective assured means for reducing fire fatalities. More lives can be saved by education and other efforts to ensure every home has and maintains working smoke alarms than by mandates for home fire sprinklers.

- Most unintentional fatal residential fires can be prevented if occupants are careful of risky activities such as unattended cooking, candle burning, and smoking. Additionally, changes in smoking habits, fire-safe cigarettes and ignition resistant furnishings all help reduce the risk. As with smoke alarms, fire prevention education is a more practical, effective and proven approach to reducing home fire incidents, injury and fatalities than mandates for home fire sprinklers.

- Sprinklers are not likely to affect fire department staffing levels or the number of fire stations a community may need because in most jurisdictions, staff and facilities are necessary for quick response to EMS calls. Right now, fire fighters spend only about an average of 3 percent of their time on residential fire fighting activity. Adding fire sprinklers to new homes will not reduce fire departments' staffing or equipment needs.

- Not all fires benefit from the presence of a fire suppression system. Nearly half of all residential fires are confined fires that result in minimal smoke and fire damage and often self extinguish without any assistance from the fire department. Yet sprinklers activate at the presence of heat and cannot determine when a fire is confined or non-confined and will likely cause extensive water damage that could have been avoided.

- **Fire sprinkler mandates should remain an option for state and local jurisdictions**. The 2006 IRC Appendix-P adequately provides for this option and this approach was overwhelmingly endorsed by the ICC membership at the previous Final Action Hearings where inclusion of the appendix was approved.

Performance of Residential Sprinklers

- According to the NFIRS data collected in 1998, sprinklers were reported to have been present in 3,892 (roughly 2.5 percent) of the total 156,661 reported residential fires. The sprinklers operated in 1,246 (32 percent) and failed to operate in 2,646 (68 percent), because the fires were too small to activate the sprinkler system. Since that time the number of fires where sprinklers were present have been so miniscule, they have not been reported.

- USFA reported similar findings, showing that in 57 percent of the reported fires the fire was too small to activate the fire sprinklers in residential properties. In 39 percent of the reported fires, the sprinkler did operate and were effective, while in 3 percent the sprinkler activated and was not effective.

One- and two-family fire incidents, injuries and death continue to decline without the installation of fire sprinklers or the need to mandate fire sprinklers in new homes.

- Because of changes in residential construction technology, improved building code requirements - especially for electrical and smoke alarm systems, as well as consumer behavior and the concerted efforts of fire fighters, home builders and other safety advocates, the number of fatal fires has dropped dramatically in the last 20 years without the installation of sprinklers or the need to mandate them. This trend continues and the decline is even more impressive given the significant population growth and growth in housing stock our nation continues to see.

- In fact, the latest NFPA data clearly demonstrates this progressive annual decline.

- From 1980 to 2005, while the existing one- and two-family housing stock grew by more than 45 percent, the number of one- and two-family fires decreased by more than 51 percent.

1980: One- and two-family fires = 590,500
Existing one- and two-family homes in the U.S. = 58,255,000

2005: One- and two-family fires = 287,000
Existing one- and two-family homes in the U.S. = 84,749,000

- From 1980 to 2005, while the population grew by over 30 percent, fire fatalities in one- and two-family homes decreased by over 38 percent. The decline is actually greater as these fatalities include those that resulted from manufactured (HUD Code) home fires.

1980: Loss of life from one- and two-family fires = 4,175
U.S. population = 227,224,000

2005: Loss of life from one- and two-family fires = 2,570
U.S. population = 296,507,000

- In 2005, fires occurred in less than four tenths of one percent (0.35%) of the existing one- and two-family homes. Of those fires, substantially less than percent (0.86%) resulted in fatalities.

- Even more dramatic is the drop in the actual fire death rate per million persons from house fires. In fact, from 1979 to 2003, the rate dropped by more than 58 percent, based on data from the Centers for Disease Control. That trend will continue as more new housing stock is constructed and especially as maintenance of smoke alarms by home occupants is improved. Furthermore, the fire safety features now required by building codes will adequately protect the home throughout its life without the need for fire sprinklers.

- According to data in the U.S. Experience With Sprinklers, of all the reported fires in one- and two-family dwellings from 1980-2003, less than 1.3 percent were reported occurring in dwellings equipped with sprinklers. It was also reported that less than 2 percent of all new residences were equipped with sprinklers at the time. During that same time frame, the number of residential fires dropped by 50 percent and the number of fire fatalities dropped by 35 percent. This demonstrates that there were other contributing factors leading to the decrease in the number of fires and fire fatalities, such as improvements to the building code and the use of smoke alarms.

Smoke alarms work, consumers feel safe without sprinklers and demand is not there.

- According to the most recent NFPA report on smoke alarms, it is estimated that over 890 lives could be saved annually if every home had working smoke alarms. 65% of the fire fatalities reported from 2000- 2004 occurred in homes where smoke alarms were not present or smoke alarms were present and did not operate.

- The International Residential Code requires hard-wired, interconnected smoke alarms to be installed in all bedrooms, outside of them and on each additional story, including basements. When one alarm activates, all other alarms are activated as well. This effective early warning system is the most important way to protect occupants from fire. Over 90 percent of the occupants survived fires that were reported to have occurred in homes equipped with hard-wired, interconnected smoke alarms from 2000-2004.

- Smoke alarm technology is always changing and improving. Innovations in wireless technology and alternate signal noises that are easier for children and for seniors to hear will further improve the already overwhelming success of smoke alarm systems.

- Another study published in the Journal of the American Medical Association found that when public health strategies to reduce residential fire-related injuries and deaths include information about smoke alarm installation, monthly testing of smoke alarms, reduction of residential fire hazards, design and practice of fire escape plans, fire safety education, and implementation of smoke alarm ordinances, residential fire-related deaths will continue to decline. Again, resources should be focused on ensuring every home has and maintains working smoke alarms rather than pushing for mandatory home fire sprinklers.

- When the firm Public Opinion Strategies asked 800 likely voters if fire sprinklers should be required in new homes, an overwhelming 89 percent said that smoke detectors already do an adequate job of protecting them in their homes and 28 percent would not want sprinklers at all, even if they were provided *free of charge.*

- Sprinkler costs vary depending on the climate, whether the house is on a public water line, and of course by the size and layout of the house. A conservative cost of $2 per square foot for the average 2,400-square-foot house means that a residential fire sprinkler system would cost $4,800. The same survey results show that only 15 percent of consumers in the sample are willing to pay that much.

- According to a Harris public opinion poll, only 38 percent of those surveyed said they would likely purchase a home that included residential fire sprinklers, leaving 62 percent indicating they would likely not purchase one. The poll also showed that 55 percent of survey participants responded that a home with fire spinklers was *less* desirable compared to the 45 percent who thought that a sprinklered home was more desirable.

- NFPA claims that it has no record of a fire killing more than two people in a completely sprinklered public assembly, educational, institutional, or residential building -- where the system was properly operating. This allows sprinkler proponents to exclude those fire fatalities that have occurred in sprinklered structures where the system failed due to an explosion, where the system was not properly maintained, or the system was rendered in operable due to human intervention.

- In fact, multiple fire fatalities are rare regardless of the presence of sprinklers, and NFPA reports that most fire deaths occur in ones and twos both inside and outside of the home.

- According NFIRS data collected for single-family dwellings equipped with fire sprinklers, 57 percent of reported fires were too small to cause the sprinkler to operate. In 39 percent of the reported fires the system operated and were effective, in 3 percent the system operated and was in effective, and in the remaining 1 percent the system failed to operate.

- A 2004 USFA report lists situations when the sprinkler system will not be able to prevent the loss of life:

    - When the victim is too close to the source of ignition.
    - When the system is damaged by the fire or an accompanying explosion.
    - When the fire originates in concealed combustible locations.
    - When foreign objects shield the fire from the effective coverage area of the sprinkler.

The effectiveness of sprinklers is based on estimates from laboratory test data, a panel of fire researcher,s and statistics of various fire scenarios and the location of the fire victim in those fires.

Due to the rare presence of fire sprinklers in one- and two-family dwellings (less than 1 percent) and the few fires reported annually, researchers must use other methods to estimate the effectiveness that sprinklers would have in preventing the loss of life and damage.

New homes are safer than ever before.

- Technological innovations introduced in the last 50 years make homes far safer. Even as today's homes get older, they continue to offer fire protection because of previous code provisions for fire separation, fire blocking and draft stopping, emergency escape and rescue openings, electrical circuit breakers, capacity and outlet spacing, reduced need for space heaters in energy efficient homes, and many other improvements.

- These features will protect the home and occupants for the life of the home, unlike older homes that were not constructed with these important design features. New homes do not become more hazardous as they age.

- Little data is collected on the age of homes experiencing a fire, although there is anecdotal evidence that age of the structure is an important factor. Existing fire data showing the continued decline in the rate of fire incidents and fatalities is consistent with the retirement of homes not built to today's stringent code requirements. This trend continues.

Fire sprinklers are not cost effective, and costs are far greater than what advocates say they are.

- Proponents of mandatory requirements claim that cost concerns are exaggerated, often citing figures from Scottsdale, Ariz. ("the Scottsdale study"). However, these concerns are well founded and not exaggerated. Even in Scottsdale where installation costs are considered among the lowest, they are still more than what proponents say.

- There, builders told NAHB that typical costs were just under $1 per square foot, much higher than that+ cited by some proponents. More importantly, the cost is in no way representative of the rest of the country where costs are substantially higher. It would be irresponsible for officials in jurisdictions around the country to rely upon Scottsdale costs as a determinant of what the true costs are to home buyers in their jurisdiction.

- In fact, in August 2006, the NAHB Research Center surveyed home builders in jurisdictions where fire sprinklers have been mandated. Survey results from over 1,500 installations in homes on public water systems in jurisdictions other than Scottsdale show that the costs are substantially higher than what proponents of mandatory fire sprinklers would lead you to believe. The truth? Builder costs of those installations were $2.66 per square foot on average and ranged as high as $6.88 per square foot. When overhead and any other factors are added in, installation costs to home buyers escalate further.

- For homes on wells, the results show that the typical costs are even higher because of the need for additional components such as storage tanks and larger pumps.

- Any jurisdiction considering mandatory sprinklers needs to determine and thoroughly consider what the true total cost to home buyers will be in their community (including additional fees that may be charged by water purveyors) and what their constituents will pay collectively, before making any decision to mandate sprinklers.

- Sprinkler costs do have a dramatic negative impact on housing affordability. For each $1,000 added to the price of a home, another 217,000 potential home buyers are forced to remain on the sidelines. We cannot afford to deny needed housing for the sake of new requirements that are not necessary.

- Costs also vary significantly depending on a home's location, layout, number of stories, and other factors – especially access to water.

- Owners of homes on well water need to consider how the sprinklers will operate if the power goes out or if water pressure is a problem – and solutions, like extra water tanks, pumps and generators, are costly.

- Requiring fire sprinklers will not decrease taxes or fees and has a negligible effect on insurance rates, resulting in almost no payback, if any. For example, using conservative cost estimates of $1.50 per sq/ft in a 2,300 sq/ft home with an annual property insurance premium of $1,000, it would take approximately 35 years even for a 10 percent discount to pay for a system that will most likely never be needed. That does not take into account maintenance costs incurred over the same period.

- The average size of homes built in 2005 was 2,434 square feet, according to the U.S. Census Bureau. Even if an estimate of $2 per square foot is used as the average price, which is conservative, fire sprinklers in that average-sized home would have cost more than $4,800, which could hardly be characterized as inexpensive. Whole-house interconnected smoke alarm systems are now being installed for around $50 per alarm.

- Fire sprinkler manufacturers state that the net cost may be very low per household and cite the possibility of development tradeoffs, like narrower streets and fewer fire hydrants. However, negotiating for those tradeoffs is difficult because local ordinances and planning rules are not consistent from community to community. Furthermore, allowing reductions in passive fire safety provisions if sprinklers are mandated is further evidence that fire safety provisions in building codes and planning are already adequate.

- There is no demonstrable savings in infrastructure costs for local jurisdictions. When as little as 3 percent of a fire fighter's time is spent battling house fires, installing fire sprinklers in new homes cannot have a significant impact.

- Annual sprinkler installation costs (not including maintenance costs) new homebuyers will be forced to pay will greatly exceed property loss nationwide or in any jurisdiction where they are required.

    - For example, if all new homes built in 2005 were required to have sprinklers, the installation cost to builders (would have been $10,183,118,400 based the average square foot of those homes and the average cost of sprinkler installations in jurisdictions where they are currently required ($2.66 sq. ft).
    - NFPA reported the total home property loss due to fire in 2005 was $5,781,000,000. That means that installations costs born by homebuyers would have been nearly *double* the loss.
    - The difference between installation costs and property loss will continue to grow as the number of new homes built annually increases and the number of fires and property loss continues to decrease, which is not a result of sprinklers or sprinkler mandates.

- Furthermore, NFPA has reported as little as an average of a 19 percent reduction in property loss in home fires with sprinklers vs. those without them. With this reduction or even a substantially higher reduction, total installation costs will always greatly exceed total property loss savings because the vast majority of homes where sprinklers are installed will never need them.

Significant technical problems still exist.

- Unlike smoke alarms, there is no way to test sprinklers other than applying heat. Occupants must press the test button or use products that simulate smoke to verify that the smoke alarm is properly functioning and ready to alert occupants. Sprinkler manufacturers must rely on test sampling to see if the sprinkler will react to the presence of heat and activate. Defects with the sprinkler will not be known until the sprinkler fails to activate in a fire and reports are issued later for the recall of the defective sprinkler.

- The fire sprinkler valves must be checked periodically to verify the system is activated. Sprinkler heads must be checked to make sure they are clear of obstacles. Homeowners must be careful not to block them or paint over them. Also, if a backflow prevention device is installed as can be required, an expensive annual inspection may be mandated by the local water purveyor. Standards also specify that sprinkler pipes in the antifreeze-type systems installed in colder climates should be emptied and then refilled with an antifreeze solution every winter, and that monthly inspections and tests of all the water flow devices, pumps, air pressure and water level be performed.

- Having sprinklers provides no guarantee that fire hoses will not be used, flooding even more water into the house. Sprinklers will discharge water until the fire department has been notified, arrives on the scene, evaluates and determines the structure is safe, and then locates and turns off the water supply. Claims that less damage will be caused by a sprinkler than a fire hose are unsubstantiated.

- Additional home flooding risks come from the vulnerability of the pressurized sprinkler heads. They can activate if they are dislodged or disturbed, when there's horseplay or other types of negligence. Local requirements for water storage tanks and additional plumbing in the home open up the specter of frozen, pressurized pipes in some parts of the country. Adequately protecting against these problems adds further to the cost of sprinkler systems.

- Studies have shown those at greatest risk of residential fire injury or death include those who live in substandard housing, where preventive maintenance is less likely. Poorer, less educated Americans are more likely to live in substandard housing than wealthier, educated Americans who are in a position to buy a new home. **Residential fire sprinklers mandated in wealthier communities where their cost is less of a barrier are least likely to protect those who could benefit by them the most.**

- The reliability of residential fire sprinklers is also questionable. There is no study that shows how long sprinkler systems will last. After smaller recalls by other companies in 1998 and 1999, a major fire sprinkler manufacturer recalled 35 million fire sprinkler heads in 2001. By now, any requirements that the manufacturer notify owners of homes where these defective heads have been installed have expired.

- Accidental discharge of sprinkler systems is another major concern. While accidental discharge due to a manufactured defect is rare, there have been several reported incidents where sprinklers

have discharged when fire was not present or the cause of the discharge. Typically the sprinkler activated due to overheating, freezing, mechanical damage, corrosion, and deliberate sabotage.

- Sprinkler systems are expected to work in the event of the fire, but like any system maintenance is required to ensure it will operate when a fire is detected. Proponents claim that a NFPA 13 D requires no maintenance and that the system can be installed and forgotten. The fact is that all sprinkler systems, whether they are commercial or residential, require routine maintenance and inspection. NFPA 13 D states that it is the responsibility of the installer to provide the owner all the maintenance information and educate the owner how the fire suppression system works. If homeowners are led to believe that no precautions are necessary and no preventive maintenance needs to be performed, this will lead to a false sense of security.

Fire sprinklers mandates should remain an option for state and local jurisdictions. This option is already adequately provided for in the appendix of the IRC.

- Should a jurisdiction wish to mandate residential sprinkler systems, a provision for them to do so is now available in the IRC via adoption of Appendix P. Allowing state and local jurisdictions to decide for themselves based on the specific needs and concerns of their communities is the most appropriate approach. That approach was overwhelmingly endorsed by the ICC at the previous Final Action Hearings, where inclusion of the appendix was approved for that very reason -- even by the building officials who do believe sprinklers should be mandated – and that action should be honored and upheld.

- The IRC clearly states, "The purpose of this code is to provide minimum requirements to safeguard life or limb, health and public welfare." The IRC Commentary states that the IRC is intended to provide reasonable minimum standards that reduce the factors of hazardous and substandard conditions that would otherwise put the public at risk to damaging their health, safety or welfare. Any imposition of a mandated sprinkler requirement is excessive and is not a reasonable minimum standard for meeting the "purpose" of the code. It is important to remember that the code is composed of many life-safety standards that have been proven to meet the "purpose" of the code. Proposals to mandate sprinklers as a requirement in the body of the IRC rather than an adoptable appendix exceed this "purpose" and should not approved.

These talking points are based on data from the U.S. Fire Administration (USFA), National Fire Protection Association (NFPA), National Association of Home Builders (NAHB), NAHB Research Center, Public Opinion Strategies, and the U.S. Census Bureau. Please contact NAHB Codes & Standards staff Steve Orlowski at sorlowski@nahb.com or 800-368-5242, ext. 8303, if you have questions on any of these talking points. Additional information is also available on www.nahb.org/sprinklers.

SENATE COMMITTEE REPORT

DATE: 3/20/09

FURTHER: Labor and Commerce

DATE TURNED IN TO OFFICE: 3/24/09

State Affairs Committee considered SENATE BILL NO. 129

SB 129 RESIDENTIAL SPRINKLER SYSTEMS

"An Act relating to state and municipal building code requirements for fire sprinkler systems in certain residential buildings."

and recommends:

[ ] be **replaced** with [ ] **SCS** or [ ] **CS** _____ (_____)

[ ] adopt **previous** [ ] **SCS** or [ ] **CS** _____ (_____)

[ ] attached amendment(s)

[ ] adopt _____ Letter of Intent

[ ] further referral to _____ Committee

SENATE BILL:
[ ] Same Title
[ ] New Title

HOUSE BILL:
[ ] Same Title
[ ] Technical Title Change
[ ] New Title w/ SCR #_____

NEW FISCAL NOTE(S):

Department	Date	Fiscal	Indet	Zero	FN#

PREVIOUS FISCAL NOTE(S):

Department	Date	Fiscal	Indet	Zero	FN#
Public Safety	3/17/09			✓	1

[ ] **APPROPRIATION - no fiscal note**

SIGNATURES AND RECOMMENDATIONS	PRINTED LAST NAME	DO PASS	DO NOT PASS	NO REC	AMEND
	French				X
	Meyer			X	
	Paskvan				X
	Koolman			X	
CHAIR:	MENARD	X			X