Manufactured Home Fires

Manufactured home (i.e., mobile home) fire experience, patterns, and trends are analyzed in this report, which also examines the impact of the 1976 federal standards and fire risks relative to other types of dwellings.

Executive Summary

During the five-year period of 2005-2009, U.S. fire departments responded to an average of 12,400 structure fires in manufactured homes per year, with annual losses of 234 civilian deaths, 453 civilian injuries and $186 million in direct property damage. In 2009, 10,100 structure fires were reported in manufactured homes in the U.S.

These fires had associated losses of 206 civilian deaths, 399 civilian injuries, and $241 million in direct property damage. The 2009 damage total was inflated by one Michigan fire coded as involving $40 million damage. It is likely that this incident was miscoded, as no such incident was identified in NFPA's large-loss fires study.

Civilian fire deaths and direct damage, the two loss measures least affected by estimation problems have declined by one-third to one-half since 1980. Civilian injuries, which are slightly under-estimated, have declined by slightly more than half. Fires, which are significantly under-estimated, have declined by roughly two-thirds.

Manufactured homes built after the introduction of the HUD standards have lower rates of civilian deaths per hundred reported fires than those built before the HUD standards were introduced. The 1989-1998 death rate was 54% lower for post-standard manufactured home than for pre-standard manufactured homes. There are too few fires with year of manufacture reported among fires after 1998 to permit any more up-to-date analysis of changes in fire deaths per 100,000 units, but the general trend in manufactured home fires and deaths suggest that the principal factor in declining deaths has been the continued decline in the pre-standard share of the manufactured home inventory.

Looking at manufactured home fires by year of manufacture, the 2005-2009 average fire rate per 100,000 manufactured homes drops around the time when the HUD standards were introduced, but there is no statistical evidence that any change since then has produced enough risk reduction in enough units to produce a noticeable additional drop in the rate of fires per 100,000 units for recently manufactured units.

Manufactured homes had a 2005-2009 fire death rate per 100,000 housing units that was 30-44% higher than the rate for other one- or two-family homes, relative to occupied year-round units. The last published NFPA analysis of manufactured home fires, using 1999-2002 data and different analysis rules (intended to include confined fires), found the manufactured home fire death rate to be only 12-24% higher, but the 1999-2002 results reflected what proved to be two unusually low years for fire deaths in manufactured homes. Also, NFIRS 5.0 was not fully implemented in 1999-2002, and NFPA now advises caution in using results from these years.

In 1999, a category of confined fires was introduced for all structure fires except those that are also mobile or portable property. Fires reported as confined fires do not require detailed reporting and constitute a large share of fires in one- or two-family homes. For most confined fires, it is not possible to determine whether they were manufactured home fires. Because of limits in the new coding rules for fires in 1999 and later years, these estimates do not include fires coded as confined fires. The estimates of civilian fire deaths and property damage are not significantly affected by this omission, but the estimated number of fires is probably greatly understated, and the estimated number of civilian injuries is somewhat understated.

Post-standard manufactured homes are more likely to have fires confined to room of origin, and this correlates with provisions of the standards that are designed to achieve such confinement. Sections 3280.203 – 3280.206 of the HUD standards provide requirements that are intended to slow or limit the spread of a fire by such means as:

- flame spread requirements for interior finish materials on
  - exposed walls,
  - columns,
  - partitions, and
  - ceilings;
- more targeted flame spread requirements for
  - wall and floor coverings near central heating units or water heaters,
  - interior finishes exposed to cooking ranges,

    - kitchen cabinet surfaces, and
    - plastic bathroom fixtures; and
- firestopping requirements.

The percentage of fires confined to room of origin was 15 percentage points higher for post-standard manufactured homes, compared to pre-standard manufactured homes, in 1989-1998.

Smoke alarms are associated with a lower civilian death rate per 100 fires in post-standard manufactured homes and in all manufactured homes.

Smoke alarms reportedly are missing in half (50%) of all manufactured home fires where smoke alarm status was reported. Because all post-standard manufactured homes are required to be sold with smoke alarms installed, this implies a disturbingly high rate of smoke alarm removal by occupants.