

Fatal domestic fires 2011

Abstract

The Netherlands Institute for Safety (NIFV)¹ studied the causes, the conditions and the course of domestic fires with fatal endings in the Netherlands in 2011: the so-called 'fatal domestic fires'. The NIFV conducted this research on the authority of the WODC², the Research and Documentation Centre of the Netherlands Ministry of Security and Justice.

The NIFV has been collecting data on fatal domestic fires since several years (2003 and 2008 till 2010) on a structural basis. Now, the data of the domestic fires in 2011 are added to this series. The NIFV collects the data in close collaboration with the National Fire Service Documentation Centre (NBDC) and the fire service officers and fire investigation teams involved in the fatal domestic fires. To this end, the fire service officers and fire investigation teams involved fill out a detailed questionnaire for each fatal domestic fire. From the data thus obtained, the state of affairs concerning fatal domestic fires in the Netherlands is evaluated. When this research is conducted several years, a representative picture is obtained of the critical factors in fatal domestic fires and any trends can be discerned. Insight in critical factors in fatal domestic fires is indispensable for pursuing an effective fire safety policy.

In this report the results of the analysis of the fatal domestic fires in the Netherlands in 2011 are described. These results subsequently have been analysed in relation to the data on the fatal domestic fires in 2003, 2008, 2009 en 2010. The results of this comparative analysis are described in a separate report.³

The fatal domestic fires in 2011 were traced based on press releases, supplied by the National Fire Service Documentation Centre. The heart of this research is a survey conducted amongst the fire service officers and fire investigation teams involved in the fatal domestic fires in 2011.

In 2011 26 fatal domestic fires took place, according to the press releases and information obtained from the fire service officers and fire investigation teams involved. In these fires, 28 people died. All of these fires were caused by accident: fires caused by intent (arson⁴, murder or suicide) were excluded from this study.

This study only concerns the fatal domestic fires in 2011: domestic fires in which no people were killed, were not included in this research.

A note on comparability

Because of the small number of fatal domestic fires each year, the characteristics of the fatal domestic fires in 2011 are not necessarily comparable to the characteristics of fatal domestic fires in other years. As the NIFV has been conducting this research for several years now, the picture of the critical factors in fatal domestic fires is

¹ NIFV: Nederlands Instituut Fysieke Veiligheid (Netherlands Institute for Safety).

² WODC: Wetenschappelijk Onderzoek- en Documentatiecentrum (Research and Documentation Centre).

³ *Fatal domestic fires 2003 and 2008 – 2011: a comparison*, (in Dutch), NIFV, 2012.

⁴ Not included in the definition of 'arson' are fires caused by children or adults of unsound mind.

taking shape. This is shown in the report 'Fatal domestic fires 2003 and 2008 – 2011: a comparison'.⁵

The results and conclusions presented in the report at hand only concern the fatal domestic fires in 2011, unless otherwise indicated.

Conclusions

The main characteristics of the fatal domestic fires in 2011 and the relationships of the different characteristics are summarised as conclusions.

In some of the conclusions the number (n) of the various characteristics of the fatal domestic fires and the characteristics of the victims are given. When a percentage is given, a certain characteristic is related to the total number of fatal domestic fires in 2011 (n=26) or the total number of fatalities in the fatal domestic fires in 2011 (n=28). The percentages are rounded off to whole numbers.

Conclusions on causes and materials, fatal domestic fires 2011

1. The main causes of the 26 fatal domestic fires in 2011 were:
 - smoking (n=10, 38% of the total number of fatal domestic fires);
 - short circuit (n=7, 27%).

Of 2 (8%) of the 26 fatal domestic fires the cause is unknown.

6 of the 7 fatal domestic fires caused by short circuit, occurred during daytime, between 06.00 - 18.00 hours. No relationship was found between the cause of the other fatal domestic fires in 2011 and the time at which the fires started.

2. The factors most mentioned by the respondents as being the crucial factor determining the fatality of the fire, were: smoke development, late discovery and limited mobility of the victim.
3. In most of the fatal domestic fires the technical characteristics of the building, such as the installations, materials, building construction and glazing, did not influence the development of the fire, according to the respondents.
4. For 17 (65%) of the fatal domestic fires the respondents mentioned the presence of one or more factors that stimulated fire development. Indicated were the presence of foam and textile in furniture and bed/mattress (n=6), a more than usual amount of combustible material (n=5); and further clothes (n=3), wood (n=2), plastics (n=2) and oxygen (n=1) were mentioned.

No relationship was found between the mentioned presence of a fire development stimulating factor and the size of the fire at the moment the fire brigade arrived on scene.

5. For 13 (50%) of the fatal domestic fires the respondents mentioned the presence of one or more factors that stimulated smoke development. Indicated were the presence of foam/textile in furniture and bed/mattress (n=5), plastics

⁵ *Fatal domestic fires 2003 and 2008 – 2011: a comparison* (in Dutch), NIFV, 2012.

(n=4), household goods/other combustible materials (n=3), wood (n=1) and paper (n=1).

No relationship was found between the mentioned presence of a smoke development stimulating factor and the measure of smoke development at the moment the fire brigade arrived on scene.

6. 6 of the fatal domestic fires (23%) started in furniture and 3 (12%) in a bed/mattress; 8 of these fires were caused by smoking. 5 of the fatal domestic fires started in electrical equipment (19%; all caused by short circuit) and 4 in the heating/stove (15%; most of them caused by a defect of or accident with the heating/stove). For 1 fatal domestic fire (4%) it is not known in which object the fire started.
7. There is a relationship (in 2011) between smoking as a cause of fire and the presence of (possibly) foam containing objects and clothing. 8 of the 10 fatal domestic fires caused by smoking started in furniture and a bed/mattress; 1 of the 10 fatal domestic fires caused by smoking, started in clothing.
8. 5 of the 6 (23%) fatal domestic fires in 2011 which started in furniture, had not developed further than the object in which the fire started at the moment the fire brigade arrived on scene. The fires that started in a bed/mattress (n=3, 12%) or clothing (n=2, 8%) were all limited to the room in which the fire started, at the moment the fire brigade arrived on scene. No further relationship was found between the size of the fire at the moment the fire brigade arrived on scene, and the object in which the fire started.

No relationship was found between the mentioned presence of a fire development stimulating factor and the size of the fire at the moment the fire brigade arrived on scene.

9. No relationship was found between the object in which the fire started and the spread of smoke at the moment the fire brigade arrived on scene.

Also, no relationship was found between the mentioned presence of a smoke development stimulating factor and the spread of the smoke at the moment the fire brigade arrived on scene.

Conclusions on victim characteristics, fatal domestic fires 2011

10. 9 (32%) of the victims of the fatal domestic fires were 80 years old or older; 8 (29%) of the victims were between 60 and 80 years old; 8 (29%) of the victims were between 40 and 60 years old, 1 victim (4%) was between 20 and 40 years old; there were no victims in the age category 0 -20 years old in 2011. The age of 2 (7%) of the victims is unknown.

11. 6 of the 9 victims older than 80 years were limitedly self-reliant⁶; 4 of them lived by themselves. 3 of the 10 victims in the age category 60 - 80 years were limitedly self-reliant; 1 of them lived alone.
12. 14 (50%) of the victims lived by themselves; 6 of them were older than 80 years and 5 of them were between 60 and 80 years of age. 5 (18%) of the victims lived in an institutional household⁷.
13. 3 (11%) of the victims were limitedly independently mobile⁸; all of these victims were older than 70 years and 2 of them lived by themselves. 6 (21%) of the victims were not independently mobile; they all were between 59 and 90 years of age and 1 of them lived alone.
14. 8 (29%) of the victims were asleep or probably asleep and 19 (68%) of the victims were awake or probably awake when the fire started.
15. At least 1 (4%) victim was possibly under the influence of alcohol and 1 (4%) victim was under the influence of medication.

Conclusions on fire location, fatal domestic fires 2011

16. 11 (42%) of the fatal domestic fires occurred in flats/apartment buildings and 11 (42%) in a single-family dwelling.
17. Most of the fatal domestic fires (n=20, 77%) started in the living room or bedroom. Almost half of these fires started in furniture (n=6, 23%) or in a bed/mattress (n=3, 12%). 5 of the 6 fires which started in furniture and all 3 fires which started in a bed/mattress were caused by smoking.
18. 14 of the victims (50%) were found in the room in which the fire started. This implies that these people were unable to escape the fire.

Conclusions on smoke detectors, fatal domestic fires 2011

19. For 8 (31%) of the fatal domestic fires it is known that a smoke detector(s) was present in the house. These 8 fires caused 10 victims (36%). In all 8 cases the smoke detector(s) functioned.

⁶ For 'self-reliant' the following definitions were applied:

- *self-reliant* is someone who has no visual, hearing or cognitive limitations, nor limitations in mobility;
- *limitedly self-reliant* is someone who has one or more limitations in visual, hearing and/or cognitive respect and/or with respect to his/her mobility.

With respect to the conclusions on the self-reliance of the victims of the fatal domestic fires, the reservation is made that it can be difficult for the respondents to properly assess this characteristic.

⁷ Institutional household: one or more persons living in a housing accommodation in which the daily necessities are professionally taken care of. The housing is professionally organised.

⁸ With respect to the conclusions on the mobility of the victims of the fatal domestic fires, the reservation is made that it can be difficult for the respondents to properly assess this characteristic.

20. Of the 10 (36%) victims of fatal domestic fires in which functioning smoke detectors were present, 7 were limitedly self-reliant (being of limited mobility and/or having a limited visual, hearing and/or cognitive capability)⁹. 2 of the 10 victims (probably) were asleep during the fire; 8 of 10 victims (probably) were awake. None of the victims was, as far as is known, under the influence of alcohol, medication or drugs.

Conclusions on fire fighting escape and rescue, fatal domestic fires 2011

21. 2 (7%) of the victims died during a rescue attempt. 2 (7%) of the victims died during an attempt to extinguish the fire.
22. In 2 (8%) of the fatal domestic fires others than the occupants/victims and the fire brigade attempted to extinguish the fire.

In 7 (27%) of the fatal domestic fires at least one rescue attempt was made by others than the occupants (i.e. fire brigade and others); in total this adds up to at least 22 rescue attempts and the rescue of 14 people in these 7 fires.

23. 16 (57%) of the victims had already died before the fire brigade arrived on scene; 7 (27%) of the victims died after arrival of the fire brigade, on scene or during or after transport to the hospital. For 5 (18%) of the victims the time of death is not known.
24. In 1 (4%) of the fatal domestic fires the location of the house was less attainable, being located in the environs. For 3 (12%) of the fires the location had, according to the respondents, a positive influence on the time of arrival of the fire brigade (amongst others because of the closeness to the fire station).

Recommendations

The results of the study of the fatal domestic fires in 2011 leads to the following recommendations for further research.

1. The base of the research 'fatal domestic fires' has some limitations. In order to improve the research, the following is recommended:
 - to register fatal domestic fires always and centrally and to investigate how to realise a conclusive system for registration;
 - to acquire data on fatal domestic fires timely, i.e. shortly after occurrence of fatal domestic fires;
 - to acquire data on fatal domestic fires in a standardised and structured way.

⁹ With respect to the conclusions on the self-reliance of the victims of the fatal domestic fires, the reservation is made that it can be difficult for the respondents to properly assess this characteristic.

2. It is recommended to structurally study the causes, conditions and course of domestic fires which did not cause fatalities as well. This could provide understanding of the factors critical for surviving a domestic fire and offers the opportunity to study the effectiveness of policy measures. The research 'fatal domestic fires' does not give full insight in the effectiveness of policy measures.
3. It is recommended to always and immediately have the scene of a fatal domestic fire investigated by trained fire investigators.