

## Public Health Association of Australia:

### Policy-at-a-glance – Smoke Alarms in Residential Housing Policy

- Key message:**
1. *Each year in Australia an average of 110 people are killed in residential fires.*
  2. *In the decade to 1999-2000, 88 per cent of fire deaths occurred in dwellings with no smoke alarms or smoke alarms that had been disconnected.*
  3. *There are two main types of smoke alarm technologies in common usage: ionisation and photoelectric. Photoelectric smoke alarms are significantly better at detecting fire in the earliest, smouldering stage.*
  4. *The Australian Fire & Emergency Service Authorities Council and the Fire Protection Association of Australia both recommend the use of photoelectric smoke alarms in all Australian homes.*

**Summary:** PHAA will advocate for Commonwealth, State and Territory Governments to enact legislation or regulations (where not currently in place) to mandate the installation of photoelectric smoke alarms in all residential facilities. PHAA will also seek complementary education campaigns to raise awareness and address related maintenance and disposal issues.

**Audience:** Australian, State and Territory and Local Governments, policy makers and program managers.

**Responsibility:** PHAA's Injury Prevention Special Interest Group (SIG)

**Date policy adopted:** September 2011

**Contact:** Richard Franklin & Patsy Bourke, Co-Convenors, Injury Prevention SIG – [rfranklin@rlssa.org.au](mailto:rfranklin@rlssa.org.au) & [Patsy.Bourke@hnehealth.nsw.gov.au](mailto:Patsy.Bourke@hnehealth.nsw.gov.au)

## SMOKE ALARMS IN RESIDENTIAL HOUSING POLICY

*The Public Health Association of Australia notes that:*

1. Each year in Australia an average of 110 people are killed in residential fires.<sup>1</sup>
2. Most deaths in residential fires occur at night, when the occupants are asleep and almost half of the deaths are as a result of smoke inhalation, not burns. Those who die from burns are often first incapacitated by smoke. Fire Brigades figures show that in the decade to 1999-2000, 88 per cent of fire deaths occurred in dwellings with no smoke alarms or smoke alarms that had been disconnected. As in other areas of injury prevention, data on burns injuries and deaths provides limited information on the circumstances of the injury.
3. Smoke alarms are designed to give early warning in the event of a residential fire, allowing the occupants to safely exit the building. Published reports indicate that the risk of death in a house fire is reduced by 60 per cent if a smoke alarm is installed and that programs to increase the installation of smoke alarms can reduce death and property loss (the latter because emergency services are called earlier).<sup>2</sup>
4. Since 1997 smoke alarms have been mandatory in most new Australian homes in most States and Territories. Since 2005 most States and Territories now require smoke alarms in ALL residential dwellings, ie old and new ones.
5. The Building Code of Australia requires that hard wired<sup>3</sup> smoke alarms be fitted in all new residential properties. Additionally, some insurance policies now make it compulsory to have smoke detectors fitted.
6. In NSW under the Building Legislation Amendment (Smoke Alarms) Bill, a "building" includes a manufactured home, a moveable dwelling or associated structure, and a building erected before the commencement of the section.<sup>4</sup>
7. The NSW Building Legislation Amendment (Smoke Alarms) Bill also amends the *Residential Tenancies Act* (NSW) to provide for a landlord's access to residential premises to install an alarm in accordance with a requirement under proposed section 146A of the *Environmental Planning and Assessment Act*. All rental properties will be covered by these amendments, and further regulations to be developed under the Conveyancing Act 1919 will require people selling their homes to state whether smoke alarms are installed.<sup>5</sup>
8. It is estimated that the percentage of homes with smoke alarms installed has risen from 28 per cent in the early 1990s to approximately 73 per cent in 2004, as a result of community

education campaigns encouraging home owners and occupants to install smoke alarms. Subsequent legislation should ensure near complete coverage over the coming years.

9. There are two main types of smoke alarm technologies in common useage: ionisation and photoelectric. Ionisation alarms use a small amount of radioactive material to detect sub-micron (invisible) particles of combustion. Photoelectric alarms detect the change in light level caused by visible smoke.<sup>6 7</sup>There are also less commonly used fire detection devices available that utilise carbon monoxide and heat sensing technologies.
10. Photoelectric smoke alarms are significantly better at detecting fire in the earliest, smouldering stage. Ionisation smoke alarms are marginally better at detecting fire in the flaming stage.<sup>8</sup>
11. Ionisation alarms have a significantly high false alarm rate, eg from cooking. Research shows over 20% of ionization alarms are deactivated in the first 12 months due to false alarms, compared to 5% for photoelectric alarms.<sup>9,10</sup>
12. Several US states and cities have recently mandated photoelectric smoke alarm technology in residential applications due to safety concerns with the ionization alarms inability to safely detect smouldering fires in a timely manner. Five European countries have had bans in place on ionisation alarms for several years due to radioactivity concerns when non radioactive (photoelectric) alarms are readily available.<sup>11</sup>
13. The Australian Fire & Emergency Service Authorities Council (AFAC) is the peak representative body for all Australasian Fire Brigades. The Fire Protection Association of Australia (FPAA) is Australia's major educational and technical fire safety organisation. Both organizations, and several others, recommend the use of photoelectric smoke alarms in all Australian homes<sup>12</sup>.
14. In dwellings where more than one alarm is installed, most authorities recommend a combination of photoelectric and ionisation alarms. In particular, photoelectric alarms are recommended in hallways and paths of egress to enable earlier detection of fires spreading through households.
15. Since May 2004, the Australian Building Codes Board requires that all sleeping areas and exit paths in commercial buildings be equipped with photoelectric smoke detection technology in accordance with Australian Standard 1670.1<sup>13</sup>
16. As of May 2011 the NT Government is debating its Smoke Alarms Bill. The NT Government has indicated that it is soon to become the first Australian jurisdiction to mandate installation of photoelectric alarms in all dwellings when new alarms are installed or old ones replaced.<sup>14</sup>
17. All smoke alarms can either be hardwired to the dwelling they are installed in and have battery backup, or they can be powered solely by batteries. Battery options include standard 9V which need replacing annually, or 10 year long life lithium batteries.

18. The radioactive material used in ionisation smoke alarms is Americium-241, which is produced in nuclear reactors. The Americium is extracted from spent nuclear fuel rods. It takes billions of years for Americium to complete its radioactive decay process.
19. When installed in dwellings the health risks associated with the small amounts of radioactive material in ionisation smoke alarms are considered insignificant.<sup>15</sup>
20. Most smoke alarm units require replacing every 10 years.
21. The most cost effective method of disposal for individual or small numbers of ionisation smoke alarms is to include them in the domestic rubbish, and subsequently being placed in an approved landfill site. However, more than ten ionisation alarms disposed of together must be treated as radioactive waste and buried in a specialised radioactive waste repository.<sup>16</sup> It is expected that when governments and councils promote community-wide replacement of outdated smoke alarms there will be thousands of ionisation alarms potentially entering landfill in a short space of time.

***The Public Health Association of Australia recommends that:***

22. All homes should be fitted with photoelectric smoke alarms to allow occupants sufficient time to safely escape.
23. Dwellings should exclusively use non-ionisation smoke alarms given that:
  - Ionisation smoke alarms have an unacceptable false alarm rate
  - Ionisation smoke alarms cannot be relied upon solely to detect fires at an early stage in dwellings
  - Ionisation smoke alarms depend on the nuclear industry for their manufacture and they generate long lived low level radioactive waste
24. Photoelectric smoke alarms should be installed:
  - In all sleeping areas
  - In paths of travel between sleeping areas and exits to the open air or to common corridors
  - Near kitchens and bathrooms
  - At least one alarm should be installed on every level
25. 9V battery operated alarms are inferior to 10 year battery operated and hardwired alarms as they can be easily inactivated or the battery can discharge.
  - Smoke alarms in new dwellings should be hard-wired to 240 volt electrical circuits and fitted with battery back-up
  - Existing dwellings with battery-operated smoke alarms should be encouraged to have their smoke alarms hardwired where feasible
  - Existing dwellings without smoke alarms should be encouraged to install hardwired smoke alarms where feasible and otherwise to install battery-operated smoke alarms

- The preferred type of battery powered smoke alarms are those with 10 year built-in batteries
26. All smoke alarms installed in residential accommodation must meet Australian Standard 3786 or Australian Standard 12239.
27. Governments have an obligation to protect the occupants of public housing through installation of smoke alarms in publicly owned residential housing. Landlords also have an obligation and in some states are required by law to ensure that smoke alarms are installed in their properties.
28. The insurance industry, which has a substantial stake in property protection, should examine its responsibilities and obligations in relation to the provision of smoke alarms, particularly in areas where there are low numbers of smoke alarms. In particular, the industry can look at ways of assisting residents in low-income areas who may have reservations about purchasing smoke alarms.

***The Public Health Association of Australia resolves that:***

29. The Board and Branches, advised by the Injury Prevention Special Interest Group, should request all State and Territory governments to work with AFAC and the FPAA to initiate public education campaigns to:
- Work toward compulsory use of smoke alarms in all dwellings across ALL States and Territories
  - Encourage families to practice fire-drills and to test escape routes
  - Test smoke alarms monthly to ensure the battery and the alarm sounder are operating
  - Clean smoke alarms with vacuum cleaners annually to remove particles that may affect smoke alarm performance
  - Replace removable batteries annually, including those in alarms powered primarily by 240 volt mains power
  - Replace smoke alarms as recommended in the manufacturer’s warranty acknowledging that smoke alarm units have a limited life span
30. The Board and Branches, with advice from the Injury Prevention Special Interest Group and the Environment Health Special Interest Group, will alert Commonwealth, State and Territory governments of the need to:
- Enact legislation or regulations (where not currently in place) to mandate the installation of photoelectric smoke alarms in all residential facilities
  - Install, or continue to install, smoke alarms in publicly-owned housing
  - Consider alternative options to disposing of ionisation smoke alarms in landfill. One such option is to encourage people to return ionisation smoke alarms to a centralised location to then be responsibly re-sited for the long term
31. The Injury Prevention Special Interest Group will involve its members in supporting:

- Public education campaigns advocating the installation and maintenance of smoke alarm units, and the use of fire reduction measures, particularly in low-cost rental housing

32. The Environment Special Interest Group will involve its members in:

- Monitoring of issues regarding safe disposal and storage of old ionisation smoke alarms

**ADOPTED 1992, REVISED AND RE-ENDORSED IN 1996, 2002, 2005, 2008 AND 2011**

***Adopted at the 1992 Annual General Meeting (AGM) of the Public Health Association of Australia (PHAA), amended at the 1996, 2002, 2005, 2008 and 2011 AGMs of the PHAA.***

## References:

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- <sup>1</sup> Accidental Fire Fatalities in Residential Structures *Who's at Risk?* March 2005. Commissioned and published by the Queensland Fire and Rescue Service.
- <sup>2</sup> Cited in Ozanne-Smith J. Watson W. A review of product related fires. Monash University Accident Research Centre. Melbourne 1991.
- <sup>3</sup> [http://www.nt.gov.au/pfes/documents/File/fire/community/NTFRS\\_sheet\\_smoke\\_alarms.pdf](http://www.nt.gov.au/pfes/documents/File/fire/community/NTFRS_sheet_smoke_alarms.pdf)
- <sup>4</sup> <http://www.parliament.nsw.gov.au/prod/parlment/hansart.nsf/V3Key/LA20050621024>
- <sup>5</sup> Refer fn 4
- <sup>6</sup> Radioactivity in Domestic Smoke Alarms. Fact Sheet #6. Australian Radiation Protection and Nuclear Safety Agency
- <sup>7</sup> Policy on Disposal of Ionisation Chamber Smoke Detectors. Radiation Safety Policy. Queensland Health. December 2002
- <sup>8</sup> Performance of Home Smoke Alarms, National Institute of Standards and Technology, July, 2004. summary, page 253, clause 1, para 1
- <sup>9</sup> [www.theWFSF.org/brk](http://www.theWFSF.org/brk)
- <sup>10</sup> Mueller BA, Sidman EA, Alter H, Perkins R, Grossman DC. Randomized controlled trial of ionization and photoelectric smoke alarm functionality Injury Prevention 2008 14: 80-86
- <sup>11</sup> [www.theWFSF.org/legislation](http://www.theWFSF.org/legislation)
- <sup>12</sup> [www.theWFSF.org/afac](http://www.theWFSF.org/afac)
- <sup>13</sup> <http://www.homemods.info/files/SmokeAlarmsSummBullJulyO6.pdf>
- <sup>14</sup> Letter from Chief Minister of the NT re Smoke Alarm Legislation 2011
- <sup>15</sup> Refer fn 6 and 7
- <sup>16</sup> National Health and Medical Research Council, Code of Practice for the Near-Surface Disposal of Radioactive Waste in Australia, 1992.