

**Reducing Fire Deaths in Older Adults:
Optimizing the Smoke Alarm Signal
Research Project**

Summary technical report



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Prepared by

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FOREWORD

Smoke alarm and signaling systems are a proven strategy for reduction of fire fatalities in the general population. However, studies have shown that the elderly do not fully benefit from conventional smoke alarm systems, particularly during the sleeping hours. In April of 2005, the Fire Protection Research Foundation was awarded a Fire Prevention and Safety Grant by the US Fire Administration for a new project to study this topic.

The overall goal of the project was to optimize the performance requirements for alarm and signaling systems to meet the needs of an aging population. This reports presents the results of the study, which involved several tasks including a risk assessment to estimate the potential impact in lives saved of changes in waking effectiveness of smoke alarms for older adults, quantifying the human behavior aspects of the problem, developing benchmark performance criteria for alarm and signaling systems, and reviewing new and promising technologies that address the performance criteria.

A portion of the study involved the conduct of human behavior studies to investigate the arousal thresholds from sleep in older adults to the current US smoke alarm and compare these thresholds to several alternative signals, and to investigate the performance abilities of older adults when awoken suddenly by an alarm. The detailed results of this portion of the study are presented in a companion report entitled "Investigation of Auditory Arousal With Different Alarm Signals in Sleeping Older Adults".

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The content, opinions and conclusions contained in this report are solely those of the authors.

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