Treatment

Providing free smoke alarms did not reduce fire related injuries in a deprived multiethnic urban population

DiGuiseppi C, Roberts I, Wade A, et al. ***Incidence of fires and related injuries after giving out free smoke alarms: cluster randomised controlled trial.*** *BMJ 2002;**325**:995–7.*

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QUESTION: Does providing free smoke alarms to a deprived, multiethnic population reduce fires and related injuries?

Design
Cluster randomised {allocation concealed},* blinded {clinicians, data collectors, outcome assessors, and data analysts},* controlled trial with 24 months of follow up.

Setting
2 boroughs in inner London, UK.

Participants
147 444 households in 40 electoral wards with Jarman scores ≥ 1 standard deviation above the national mean. (The Jarman score is a measure of material deprivation and increased healthcare needs.)

Intervention
Wards were pair matched by Jarman score. 20 wards (73 399 households) were allocated to the intervention, which comprised distribution (door to door and through key local sites) of smoke alarms, with batteries, fittings, and fire safety brochures (in English and other local languages) targeted to households at high risk. Free installation was offered. One year later, postcards were sent to remind recipients to change the smoke alarm batteries. The aim was to provide smoke alarms to 25% of intervention households. 20 wards (74 045 households) were allocated to the control group and received no intervention.

Main outcome measures
Main outcome was fire related injuries resulting in attendance at an emergency department, hospital admission, or death. Any injury that resulted from fire in an occupied dwelling of a study ward was included. Other outcomes included fires attended by the fire brigade.

Main results
20 050 alarms were distributed to 19 950 households. The intervention and control groups did not differ for total fire related injuries, or hospital admissions and deaths (table). Similar results were found for the 78% of injuries judged to be potentially preventable by smoke alarms (table). The fire brigade attended 1603 residential fires. The groups did not differ for the incidence of attended fires.

Conclusion
Providing free smoke alarms did not reduce fire related injuries in a deprived multiethnic urban population.

*Information provided by author.

Free smoke alarms v control in a deprived multiethnic urban community†

Outcomes at 24 months	Free alarms	Control	Relative risk (95% CI)
All injuries‡	40.3	32.5	1.3 (0.9 to 1.9)
Hospital admissions and deaths‡	9.1	7.2	1.3 (0.7 to 2.3)
Preventable injuries‡	29.4	26.3	1.2 (0.8 to 1.8)
Preventable hospital admissions and deaths‡	5.6	5.6	1.0 (0.5 to 2.0)
Fires attended by fire brigade§	356.3	333.0	1.1 (0.96 to 1.3)

†CI defined in glossary; relative risks account for clustering by ward and matching by Jarman score, with adjustment for baseline rates.
‡Events per 100 000 person years
§Events per 100 000 household years

COMMENTARY

Rarely is a primary prevention trial of personal safety so well designed and conducted as the study by DiGuiseppi *et al.* Although the results were negative, the rigour of the cluster randomised design and the attention to other methodological aspects leaves little doubt as to the veracity of the principal outcome. DiGuiseppi *et al* replicated many of the intervention features of a study by Mallonee *et al*, which was conducted in an economically deprived neighbourhood in Oklahoma City, USA.[1] Both studies distributed similar alarms to a similar proportion of the population, and both involved community members and government and voluntary agencies in the distribution process. However, DiGuiseppi *et al* did not find the favourable results of Mallonee *et al*. In fact, DiGuiseppi *et al* found that the intervention and control households had similar proportions of alarms installed and operational. In other words, the participants did not use the safety device as instructed.

One explanation for the differences in the findings of DiGuiseppi *et al* and Mallonee *et al* might relate to differences in the study populations. DiGuiseppi *et al* suggest that their participants may have had lower literacy levels and greater difficulty understanding the installation and maintenance instructions. Furthermore, factors such as mistrust of people in positions of authority and the fact that most recipients were tenants rather than homeowners may have reduced installation rates in the study by DiGuiseppi *et al*.

The results are important for nurses and others working in the community. The role of community assessment in tailoring interventions to local populations cannot be overemphasised. Furthermore, a community assessment process using multiple culturally appropriate methods, particularly in a multiethnic population such as in the UK study, can support the trust building phase that DiGuiseppi *et al* identified as a key barrier to the implementation of their intervention.

A recurrent theme in injury prevention is the preference for passive prevention strategies rather than the active ones used by DiGuiseppi *et al*.[2] This study suggests a continued role for public health practitioners in advocating for policy changes such as affordable, safe housing, and passive interventions, like sprinkler systems and appropriate building code regulations.[2]

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1 Mallonee S, Istre GR, Rosenberg M, *et al.* Surveillance and prevention of residential-fire injuries. *N Engl J Med* 1996;**335**:27–31.
2 Pless B. Smoke detectors and house fires. *BMJ* 2002;**325**:979–80.