Equity impact of population-level interventions and policies to reduce smoking in adults: a systematic review

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CRD summary
Only limited conclusions could be drawn on the type of tobacco control intervention or policy that could reduce socioeconomic inequalities in smoking cessation in adults. The clearest and most consistent evidence was for price or tax increases on cigarettes. The authors appropriately raised concerns about the generalisability of findings and how well the results could be attributed to each intervention.

Authors' objectives
To assess the effectiveness of adult population-level interventions or policies to address socioeconomic inequalities in smoking cessation.

Searching
Ten electronic databases, including MEDLINE and The Cochrane Library, were searched in January 2013 for English-language articles published after 1995. Search terms were reported. Four key journals were manually searched up to February 2013, and relevant reviews and reference lists were screened. Topic experts were contacted for additional studies.

Study selection
Eligible for inclusion were studies that assessed the effectiveness of any population-level intervention or policy and smoking cessation support (as defined in the review), for any smoking-related outcome. Eligible studies had to compare outcomes between people from at least two different socioeconomic groups, in a country at stage four of the tobacco epidemic or in the World Health Organization (WHO)'s European Region. Participants had to be at least 18 years old, but studies of children's reports of parental smoking were included.

Just under half the included studies (46%) were conducted in the USA, about 18% were conducted in the UK, about 9% were in the Netherlands, and the rest were in various other countries. Various healthy or at-risk individuals, households, or retailers were included in the studies. Various methods were used to measure socioeconomic status. The interventions included smoking restrictions in public places, mass media campaigns, and increased tobacco price or tax. The outcomes included smoking status, smoking-related morbidity and mortality, and smoke-free policy adoption.

Two reviewers independently screened studies for inclusion; discrepancies were resolved by discussion or referral to a third reviewer.

Assessment of study quality
Quality was assessed using the Six Item Checklist of Quality of Execution, covering representativeness of the study sample, randomisation, comparability of treatment groups, credibility of data collection tools, attrition rate, and ability to attribute to the intervention. The generalisability of the findings to a regional or national level was determined.

One reviewer assessed the quality of the included studies, except where quality was referred to in the study. A second reviewer checked the assessment for accuracy.

Data extraction
One reviewer extracted all smoking-related outcomes, by socioeconomic status, to calculate relative and absolute differences. A second reviewer checked the data.

Methods of synthesis
Given the variability between studies, findings were presented in tables and in a narrative synthesis by type of intervention and separately by outcome for smoke-free and mass-media interventions or policies.
The equity of impact of each intervention or policy was defined as positive, neutral, negative, mixed or unclear. Positive impact indicated that lower socioeconomic groups were more responsive to the intervention or policy; neutral impact indicated no difference; negative impact indicated that high socioeconomic groups were more responsive; and mixed impact indicated differences across outcomes or other variables.

**Results of the review**

One hundred and seventeen studies (120 articles) of 130 interventions or policies, were included; samples ranged from 40 to over six million people. Three were randomised controlled trials (RCTs), two were controlled trials, and one was a quasi-experimental trial; none had comparable groups at the start, and only one RCT reported the results for all its randomised groups. Most of the other studies were population-based and observational, with methodological limitations, such as selection and measurement bias and confounding (full results reported). Follow-up ranged from a single time point to 20 years.

**Price or tax increases:** In 27 studies, these were associated with greater reductions in smoking prevalence, consumption, or both in lower compared with higher socioeconomic groups. Fourteen studies showed a positive equity impact, six were neutral, one was mixed, and two were unclear. Four studies showed a negative equity impact in HIV-positive adults and pregnant women.

**Smoke-free policies:** In 25 studies, voluntary, regional, and partial policies generally increased socioeconomic inequalities; most studies (19) showed a negative equity impact. Of the 19 studies on comprehensive, compulsory national policies, two showed positive impacts, nine were neutral, six were negative, one was mixed and one was unclear.

**Other:** The findings were mixed for mass media campaigns (30 studies), controls on advertising, promotion and marketing of tobacco (nine studies), population-level cessation support interventions (nine studies), settings-based interventions (seven studies), and studies involving multiple policies (four studies).

**Authors’ conclusions**

Few conclusions could be drawn on the type of tobacco control intervention or policy that would reduce inequalities in smoking cessation. The clearest and most consistent evidence was that low socioeconomic smokers were more responsive to price or tax increases on cigarettes.

**CRD commentary**

The review question and supporting inclusion criteria were broad, but clearly stated. A comprehensive search of the literature was performed, but the language restrictions may have resulted in relevant data being missed; the authors acknowledged this limitation. Study quality was assessed and fully reported, but indicated that most studies had limitations. Each stage of the review was performed by two people, minimising the potential for review error and bias. A large amount of evidence was identified, but the studies were very varied, so a narrative synthesis was appropriate.

The authors raised concerns about the generalisability of their findings and how well the results could be attributed to each intervention. They highlighted the limited conclusions that could be drawn, and their conclusions seem appropriate.

**Implications of the review for practice and research**

**Practice:** The authors stated that there was an urgent need to assess the evidence for effective equity-orientated tobacco control strategies.

**Research:** The authors stated that research was needed to improve the methods of measuring and interpreting equity, to inform future equity-oriented policies.

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