Community programs for the prevention of cardiovascular disease: a systematic review

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CRD summary
This review concluded that community programmes aimed at reducing cardiovascular disease risk in people without evidence of cardiovascular disease resulted in generally favourable changes in overall cardiovascular disease risk. Because of problems related to the quality of included data, applicability to current conditions and methods of data synthesis, the authors’ conclusions should be treated with caution.

Authors' objectives
To assess the effectiveness of community programmes for preventing cardiovascular disease.

Searching
MEDLINE, EMBASE, CINAHL, PsycINFO, HMIC, ASSIA and The Cochrane Library were searched from January 1970 to July 2008. Search terms were provided. Books, book chapters, theses and dissertations were excluded.

Study selection
Controlled studies such as randomised controlled trials (RCTs), controlled before-after studies and controlled interrupted time series were eligible for inclusion. Studies needed to assess primary prevention programmes aimed at whole communities and at changing cardiovascular risk factors. Risk factors had to include at least two of smoking, poor diet, insufficient physical activity, high blood pressure, high blood cholesterol levels, obesity or overweight, diabetes, psychosocial stress and high alcohol consumption. Studies had to report on at least one of mortality, morbidity, biochemical precursors of disease (cholesterol, blood pressure, body mass index), associated behaviours (smoking, diet, physical activity, alcohol consumption) and knowledge, attitudes and intention regarding cardiovascular disease or adverse effects. Studies in people diagnosed with or at high risk of cardiovascular disease were excluded. Studies in countries other than those in the Organisation of Economic Co-operation and Development were excluded.

In the included studies, intervention programmes all included media-based methods to communicate health messages to whole communities (radio, television and printed material). Studies variously included screening, individual or group counselling and environmental changes. Programme length ranged from one to 20 years. Start dates ranged from 1972 to 2000.

One reviewer selected studies for inclusion. In cases of uncertainty a second reviewer was consulted.

Assessment of study quality
The quality of studies was assessed using the controlled before-after checklist in National Institute for Health and Clinical Excellence (NICE) guidance. Studies were scored on eight aspects (contemporaneous data collection, appropriate choice of control site, similarity at baseline, similarity of study/control providers, blinding of outcome assessment, protection against contamination, reliability of outcome measures and follow-up of individuals (for cohort studies). The highest achievable score was 8.

Study quality was assessed by two authors independently. Disagreements were resolved by consensus.

Data extraction
Where possible, data for cardiovascular disease mortality were extracted. Otherwise, data for total mortality were used. Net changes in mortality were calculated as the difference between the change in the intervention group and the change in the control group measured before and after the intervention. Where at least two relevant risk factors were reported, average cardiovascular disease 10-year risk scores were calculated for each study using mean net changes in individual risks and the Framingham equation. Where an individual value was missing, a default value based on data derived from the Health Survey for England 1998 was used. In cross-sectional data, baseline age was used to calculate follow-up risk and in cohort studies, baseline age plus length of follow up was used. Net changes in cardiovascular disease risk scores
Methods of synthesis

Results for mortality in individual studies were described in text and tables. Overall average net changes in risk factors were calculated, where possible differentiated by sex. Net changes in 10-year cardiovascular disease risks were calculated overall and separately for cohort data and for cross-sectional data.

Results of the review

Thirty-six programmes were identified. Twenty-eight programmes were evaluated by data collection using independent cross-sectional surveys and 15 using followed-up cohorts; some programmes used both methods. Thirty-three programmes were evaluated using a before-and-after method. Three programmes used controlled interrupted time series. Total participants were more than 6,075,693 (range approximately 600 to 3,000,000), but numbers of participants assessed in cohorts and surveys was not clear. Start dates for studies ranged from 1972 to 2000 and most started before 1990.

Quality scores ranged from 2 to 6 (out of 8). In most studies, protection against contamination was unclear. In some studies, baseline characteristics of intervention and control groups were not similar and only self reported outcome measures were used.

Net changes in mortality were reported for five programmes, compared to control all showed improvements in cardiovascular disease/total mortality with programmes (net changes ranged from -0.5% to -9.6% in women and -2.8% to -27.4% in men). Only one subgroup (of men) in one study showed a statistical significant change (-27.4%, p<0.04).

Net changes in individual cardiovascular disease risks were calculated using data from 10 programmes; results were mixed, but generally showed a trend towards a positive effect of programmes.

Average net reduction in 10-year cardiovascular disease risk was 0.65% (0.32% for cross-sectional data and 0.88% for cohort data).

Authors' conclusions

Community programmes for prevention of cardiovascular disease appeared to result in generally favourable changes in overall cardiovascular disease risk. Adapted to circumstances, they deserve consideration as a possible approach for prevention of cardiovascular disease.

CRD commentary

The aims of the review were clearly stated in terms of inclusion criteria for participants, intervention and study design. The search covered a number of relevant sources. It was unclear whether any language restrictions were applied, which made it difficult to assess the risk of language bias. Studies published in some formats were excluded and so the possibility of missed studies and publication bias could not be ruled out. Study selection was by one reviewer and so risked error and bias. Data extraction and quality assessment were undertaken in duplicate, which reduced risks of reviewer error and bias. As the authors commented, the method of synthesis may have been unreliable. A lack of relevant data made it impossible to calculate confidence intervals and the overall statistical significance of results remained unclear. Included data came from observational studies (generally considered lower quality because of the possibility of confounding factors affecting results). Study quality was generally low and (the authors acknowledged) much of the data came from studies that were conducted some years ago and attitudes and habits have changed over time.

Problems with the quality of included data, applicability to current conditions and methods of data synthesis mean that the authors conclusions should be treated with caution.

Implications of the review for practice and research
Practice: The authors stated that community programmes for preventing cardiovascular disease needed to be adapted to current circumstances and re-evaluated before widespread implementation.

Research: The authors did not state any implications for research.

Funding
Centre for Public Health Excellence, NICE, UK.

Bibliographic details

PubMedID
20667932

DOI
10.1093/aje/kwq171

Original Paper URL
http://aje.oxfordjournals.org/content/172/5/501.abstract

Indexing Status
Subject indexing assigned by NLM

MeSH
Blood Pressure; Cardiovascular Diseases /mortality /prevention & control; Community Health Services /methods /statistics & numerical data; Health Education /methods /statistics & numerical data; Health Promotion /methods /statistics & numerical data; Humans; Lipids /blood; Primary Prevention /methods /statistics & numerical data; Risk Factors; Smoking /epidemiology

AccessionNumber
12010006895

Date bibliographic record published
22/12/2010

Date abstract record published
08/06/2011

Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.