CRD summary
The review concluded that population-based screening for abdominal aortic aneurysm significantly reduced abdominal aortic aneurysm-related long-term mortality by four deaths per 1,000 in men aged 65 years or over compared with no screening. There were some methodological problems and a small number of events, so a degree of caution is required when interpreting results.

Authors' objectives
To determine if population-based screening for abdominal aortic aneurysm reduced all-cause long-term mortality in men.

Searching
PubMed, EMBASE, and the Cochrane Central Register of Controlled Trials (CENTRAL) were searched to June 2009 for articles published in English. Search terms were reported. Reference lists of relevant articles and reviews were scanned.

Study selection
Population-based randomised controlled trials (RCTs) of men randomly assigned to an invitation to attend abdominal aortic aneurysm screening versus no invitation were eligible for inclusion. The primary outcomes were long-term (10 years or over) abdominal aortic aneurysm-related mortality, and long-term all-cause mortality.

The men in included trials were aged 65 years and over.

Two reviewers performed study selection.

Assessment of study quality
Quality assessment was based on the US Preventive Services Task Force criteria. Each trial was scored as good, fair or poor quality.

The authors did not state how many reviewers performed the validity assessment.

Data extraction
Data were extracted on all-cause mortality and long-term abdominal aortic aneurysm-related mortality, and used to calculate odds ratios (ORs) and hazard ratios (HRs), together with 95% confidence intervals (CIs). Where hazard ratios were not reported, risk ratios (RRs) were estimated using mortality data.

The authors did not state how many reviewers performed the data extraction.

Methods of synthesis
A fixed-effects meta-analysis was undertaken to calculate pooled odds ratios or hazard ratios, together with 95% confidence intervals. If statistical heterogeneity was present, a random-effects meta-analysis was conducted. Statistical heterogeneity was assessed using the $X^2$ test and $I^2$. The absolute risk reduction was calculated, and the number needed to screen was estimated.

Publication bias was assessed using funnel plots and Egger's test.

Results of the review
Four RCTs were included in the review (n=114,376 participants). One trial was rated as good quality and three were rated as fair quality. The length of follow-up ranged from 10 to 15 years.

**All-cause mortality**: There was a statistically significant reduction in the rate of abdominal aortic aneurysm-related all-cause mortality (OR 0.55, 95% CI 0.36 to 0.86; I²=78%; three RCTs) with abdominal aortic aneurysm screening compared with no screening. This equated to an absolute risk reduction of four deaths per 1,000 men aged 65 years or over compared with control (unscreened men), and a number needed to screen to detect an aneurysm of 238.

**Long-term mortality**: There was a non-significant reduction in abdominal aortic aneurysm-related long-term mortality (OR 0.98, 95% CI 0.95 to 1.00; I²=0%; four RCTs) with screening compared with no screening. This equated to an absolute risk reduction of five deaths per 1,000 men. The number needed to screen was 217.

The analyses using hazard ratios produced similar results.

There was no evidence of significant publication bias.

**Authors’ conclusions**
Population-based screening for abdominal aortic aneurysm significantly reduced abdominal aortic aneurysm-related long-term mortality by four per 1,000 over no screening in men aged 65 years or over. Screening also reduced all-cause long-term mortality by five deaths per 1000 men, but this result was not significant.

**CRD commentary**
Inclusion criteria for the review were clearly defined. Several relevant data sources were searched. There was the potential for language bias, as only English language articles were included. Publication bias was assessed and was not detected, although the assessment had less meaning with less than ten studies. Attempts were made to reduce reviewer error and bias during study selection, but it was unclear if such attempts were made for data extraction and quality assessment.

Quality assessment was undertaken using a predefined criterion, which indicated the fair to good quality of the included trials. Trials were pooled using random-effects or fixed-effects meta-analysis; statistical heterogeneity was assessed. However, details on patients and trial methods were limited, which made it difficult to assess whether pooling of trials was appropriate.

The small absolute risk reductions, the low number of events and the high level of statistical heterogeneity in the analysis of abdominal aortic aneurysm-related long-term mortality, means that a degree of caution is required when interpreting the results of the pooled analysis.

**Implications of the review for practice and research**
The authors did not state any implications for practice or research.

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