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[Intervention Review]

# General health checks in adults for reducing morbidity and mortality from disease

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## ABSTRACT

### Background

General health checks are common elements of health care in some countries. These aim to detect disease and risk factors for disease with the purpose of reducing morbidity and mortality. Most of the commonly used screening tests offered in general health checks have been incompletely studied. Also, screening leads to increased use of diagnostic and therapeutic interventions, which can be harmful as well as beneficial. It is, therefore, important to assess whether general health checks do more good than harm.

### Objectives

We aimed to quantify the benefits and harms of general health checks with an emphasis on patient-relevant outcomes such as morbidity and mortality rather than on surrogate outcomes such as blood pressure and serum cholesterol levels.

### Search methods

We searched *The Cochrane Library*, the Cochrane Central Register of Controlled Trials (CENTRAL), the Cochrane Effective Practice and Organisation of Care (EPOC) Trials Register, MEDLINE, EMBASE, Healthstar, CINAHL, ClinicalTrials.gov and WHO International Clinical Trials Registry Platform (ICTRP) to July 2012. Two authors screened titles and abstracts, assessed papers for eligibility and read reference lists. One author used citation tracking (Web of Knowledge) and asked trialists about additional studies.

### Selection criteria

We included randomised trials comparing health checks with no health checks in adults unselected for disease or risk factors. We did not include geriatric trials. We defined health checks as screening general populations for more than one disease or risk factor in more than one organ system.

### Data collection and analysis

Two authors independently extracted data and assessed the risk of bias in the trials. We contacted authors for additional outcomes or trial details when necessary. For mortality outcomes we analysed the results with random-effects model meta-analysis, and for other outcomes we did a qualitative synthesis as meta-analysis was not feasible.

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## Main results

We included 16 trials, 14 of which had available outcome data (182,880 participants). Nine trials provided data on total mortality (155,899 participants, 11,940 deaths), median follow-up time nine years, giving a risk ratio of 0.99 (95% confidence interval (CI) 0.95 to 1.03). Eight trials provided data on cardiovascular mortality (152,435 participants, 4567 deaths), risk ratio 1.03 (95% CI 0.91 to 1.17) and eight trials on cancer mortality (139,290 participants, 3663 deaths), risk ratio 1.01 (95% CI 0.92 to 1.12). Subgroup and sensitivity analyses did not alter these findings.

We did not find an effect on clinical events or other measures of morbidity but one trial found an increased occurrence of hypertension and hypercholesterolaemia with screening and one trial found an increased occurrence of self-reported chronic disease. One trial found a 20% increase in the total number of new diagnoses per participant over six years compared to the control group. No trials compared the total number of prescriptions, but two out of four trials found an increased number of people using antihypertensive drugs. Two out of four trials found small beneficial effects on self-reported health, but this could be due to reporting bias as the trials were not blinded. We did not find an effect on admission to hospital, disability, worry, additional visits to the physician, or absence from work, but most of these outcomes were poorly studied. We did not find useful results on the number of referrals to specialists, the number of follow-up tests after positive screening results, or the amount of surgery.

## Authors' conclusions

General health checks did not reduce morbidity or mortality, neither overall nor for cardiovascular or cancer causes, although the number of new diagnoses was increased. Important harmful outcomes, such as the number of follow-up diagnostic procedures or short term psychological effects, were often not studied or reported and many trials had methodological problems. With the large number of participants and deaths included, the long follow-up periods used, and considering that cardiovascular and cancer mortality were not reduced, general health checks are unlikely to be beneficial.

## PLAIN LANGUAGE SUMMARY

### General health checks for reducing illness and mortality

General health checks involve multiple tests in a person who does not feel ill with the purpose of finding disease early, preventing disease from developing, or providing reassurance. Health checks are a common element of health care in some countries. To many people health checks intuitively make sense, but experience from screening programmes for individual diseases have shown that the benefits may be smaller than expected and the harms greater. One possible harm from health checks is the diagnosis and treatment of conditions that were not destined to cause symptoms or death. Their diagnosis will, therefore, be superfluous and carry the risk of unnecessary treatment.

We identified 16 randomised trials which had compared a group of adults offered general health checks to a group not offered health checks. Results were available from 14 trials, including 182,880 participants. Nine trials studied the risk of death and included 155,899 participants and 11,940 deaths. There was no effect on the risk of death, or on the risk of death due to cardiovascular diseases or cancer. We did not find an effect on the risk of illness but one trial found an increased number of people identified with high blood pressure and high cholesterol, and one trial found an increased number with chronic diseases. One trial reported the total number of new diagnoses per participant and found a 20% increase over six years compared to the control group. No trials compared the total number of new prescriptions but two out of four trials found an increased number of people using drugs for high blood pressure. Two out of four trials found that health checks made people feel somewhat healthier, but this result is not reliable. We did not find that health checks had an effect on the number of admissions to hospital, disability, worry, the number of referrals to specialists, additional visits to the physician, or absence from work, but most of these outcomes were poorly studied. None of the trials reported on the number of follow-up tests after positive screening results, or the amount of surgery used.

One reason for the apparent lack of effect may be that primary care physicians already identify and intervene when they suspect a patient to be at high risk of developing disease when they see them for other reasons. Also, those at high risk of developing disease may not attend general health checks when invited. Most of the trials were old, which makes the results less applicable to today's settings because the treatments used for conditions and risk factors have changed.

With the large number of participants and deaths included, the long follow-up periods used in the trials, and considering that death from cardiovascular diseases and cancer were not reduced, general health checks are unlikely to be beneficial.

