Does screening asymptomatic adults for disease save lives?

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New paper published online today in the *International Journal of Epidemiology* says that randomized controlled trials (the gold standard method of evaluation) show that few currently available screening tests for major diseases where death is a common outcome have documented reductions in disease-specific mortality.

Screening for disease is a key component of modern healthcare. However, several popular screening tests have met with controversy, with breast cancer screening for women aged 40-49 and prostate cancer screening in healthy men losing their endorsement in the United States.

Researchers from the Stanford School of Medicine evaluated evidence on 39 screening tests for 19 major diseases from 48 randomized controlled trials (RCTs) and 9 meta-analyses identified via the Cochrane Database of Systematic Reviews, and PubMed - to find out whether screening asymptomatic adults for major disease led to a decrease in disease-specific and all-cause mortality.

Randomized trials were available only for 19 tests on 11 diseases (abdominal aortic aneurysm, breast cancer, cervical cancer, colorectal cancer, hepatocellular cancer, lung cancer, oral cancer, ovarian cancer, prostate cancer, type 2 diabetes, and cardiovascular disease). The authors' show that there is evidence of a reduction in mortality in only 30% of the disease-specific mortality estimates and 11% of the all-cause mortality estimates from the randomised controlled trials they evaluated. In the case of disease-specific mortality, findings from the individual

randomised controlled trials are backed up by evidence from 4 meta-analyses, but none of the 6 meta-analyses that included estimates of all-cause mortality produced evidence of a reduction in mortality.

Professor John Ioannidis, senior author on the paper, says: "Our comprehensive overview shows that documented reductions in disease-specific mortality in randomized trials of screening for major diseases are uncommon. Reductions in all-cause mortality are even more uncommon. This overview offers researchers, policy-makers, and health care providers a synthesis of RCT evidence on the potential benefits of screening and we hope that it is timely in the wake of recent controversies."

The researchers argue that randomised evidence should be considered on a case-by-case basis, depending on the disease, adding that screening is likely to be effective and justifiable for a variety of other clinical outcomes besides mortality. "However," they conclude, "our overview suggests that expectations of major benefits in terms of reductions in mortality from screening need to be cautiously tempered".

The *International Journal of Epidemiology* also publishes three commentaries on this paper online today. Peter G&ostroke;tzsche of the Nordic Cochrane Center in Copenhagen argues that although screening is popular and has "great public and political appeal", we must "demand much stronger evidence" that it is effective. Paul Shekelle of UCLA, makes the point that too much screening has been allowed to get into routine practice without adequate evaluation. However, he also points out that mortality is not the only outcome and patients may value screening tests that decrease the risk of serious morbidity. Paul Taylor of UCL is more circumspect in his commentary, stating that "the cautious tempering of expectations advised by Saquib, Saquib, and Ioannidis is prudent but shouldn't be overdone".

More information: 'Does screening for disease save lives in asymptomatic adults? Systematic review of meta-analyses and randomized trials' by Nazmus Saquib, Juliann Saquib, and John Ioannidis, *International Journal of Epidemiology*, DOI: 10.1093/ije/dyu140