Peer Review File

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Reviewer A

Comment 1: This is an important meta-analysis of international lung cancer screening trials over the last decade that produced evidence about the psychological outcomes of participants in those trials. Although an important subject, there is relatively little research on psychological barriers to lung cancer screening, and many of those studies are small, so this analysis based on the large, sufficiently powered trials is welcome. One could wish that the different trials had agreed to use the same survey instrument to be a little cleaner, but there is no way around that. You might also have noted the fact that different trials had different language for some results. For instance, in the NLST, nonspecific small solid nodules were considered a "positive" result, whereas in NELSON they were called "indeterminate". I believe that in the US, the development and use of LUNG-RADS since the NLST has led to a better conceptualization of these nonspecific findings.

Response 1: We appreciate the Reviewers positive comments on our manuscript as well as the suggestions to acknowledge the different language used for communicating some of the LDCT results. We have amended the manuscript to mention this important difference.

Changes in the text 1: We have added the following text to the narrative discussion (page 3, final paragraph): "*It is important to note here that the NLST did not differentiate indeterminate results from those which were immediately suspicious for lung cancer*"

Reviewer B

Comment 2: The authors present a critical review of the evidence from studies evaluating the psychological impact of lung cancer screening on individuals, largely focused on those conducted in the LDCT screening trials. The stated justification for this review is to help inform implementation about population-based screening for lung cancer, specifically with respect to psychological harms and benefits. Their narrative is balanced and well structured, starting with a summary of the psychological responses and effects that have been measured in the screening process, followed by a discussion of sociodemographic and other factors that appear to influence these responses and of intervention strategies that may promote psychological well-being and benefit.

Appropriately, the authors suggest that further research should be conducted to evaluate psychological outcomes of lung cancer screening in real-world practice. However, such research is only vaguely described. For example, there is a call to use "diverse measures of condition-specific distress". However, a number of measures exist as noted in Table 1. It would be informative to know whether certain measures are preferred over others, particularly to evaluate responses at specific points in the screening process or among certain subgroups of individuals. Similarly, what types of intervention and communication strategies could be applied to promote psychological well-being in the context of lung cancer screening? Are there certain strategies that have been effectively used in screening for other cancers or managing incidental pulmonary nodules that could be tested? Including more specific recommendations on how best to address knowledge gaps in this area would enrich this review.

Response 2: We also appreciate this Reviewers positive evaluation of our manuscript as well as the opportunity to provide more specific suggestions for how best to address knowledge gaps in this area. We have edited the manuscript in line with their suggestion.

Changes in the text 2: We have detailed more specific recommendations for research designs to address research gaps in this area to the summary section of the manuscript. The additional text is as follows (pages 9-10, final paragraph of page 9 running over to page 10): "*Future research should also seek to examine psychological outcomes longitudinally within real-world LDCT lung cancer screening services for individuals taking part in repeated screening intervals, and compared, if possible, against a matched community sample. These studies should prioritise the use of specific over generic measures, which are designed to be sensitive to lung cancer-specific distress (e.g., cancer worry scale), the screening and results communication 'events' (such as the IES and the COS-LC), as well as those sensitive to clinically significant anxiety (such as the HADS). There would also be benefit in quantitatively understanding the frequency, duration and magnitude of potential positive psychological responses from LDCT screening so that these can be capitalised on. for which psychometric development studies are needed. Exploratory qualitative studies with screening participants and health care professionals are also needed to understand current communication practices, preferences and outcomes in the LDCT lung cancer screening context. This work may be especially important for those under surveillance for pulmonary nodules or undergoing diagnostic work up. This research could be directed by the conceptual model of person-centred communication for incidental pulmonary nodule proposed by Slatore and Wiener (45) in order to systematically build evidence for and test communication interventions aiming to promote psychological well-being and patient benefit.*"