Should we screen for lung cancer in Australia?

To the Editor: Lung cancer screening is a controversial issue, as clearly discussed by Hew and colleagues, who focus on the high false-positive rate, generalisability and cost.[1]

Nonetheless, the United States Preventive Services Task Force concludes that screening is beneficial, awarding a Grade B draft recommendation, meaning that, if approved, screening will qualify for US Medicare coverage.[2] Preliminary data from the National Lung Screening Trial (NLST) suggest an incremental cost-effectiveness ratio of US$67 000 (cost per quality-adjusted life-year; Christine Berg, member of the NLST Executive Committee and Research Team, personal communication). Beyond the NLST, potential improvements to screening efficacy are emerging. For example, Kovalchik shows that using lung cancer risk factors in addition to age and smoking to select patients for screening substantially improves efficacy.[3] Our Australian data (from the Queensland Lung Cancer Screening Study[4]) support this strategy. We used NLST eligibility criteria except for an age range of 60–74 years instead of 55–74 years, and detected lung cancer in 5% (13 of 256 patients) with three annual scans. All cancers clustered in the two highest quintiles when stratified by a published risk model,[5] while false-positive scan results were evenly distributed.

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We agree that smoking prevention remains the cornerstone of lung cancer control. However, most lung cancer in Australia now occurs in former smokers. Thus, the best overall strategy to reduce lung cancer mortality might be a combined approach of continued tobacco control together with risk-stratified screening and an embedded smoking cessation program.

The NLST has proven the value of screening in principle, and emerging data could help translate this to real-world settings. We must evaluate these findings in the context of our national Population Based Screening Framework,[6] while being mindful of the stigma and nihilism often associated with lung cancer.

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1 Hew M, Stirling RG, Abramson MJ. Should we screen for lung cancer in Australia? *Med J Aust* 2013; 199: 82-83.

2 United States Preventive Services Task Force. Screening for lung cancer. Draft recommendation statement. Agency for Healthcare Research and Quality publication no. 13-05196-EF-3. http://www.uspreventiveservices taskforce.org/uspstf13/lungcan/lung candraftrec.htm (accessed Aug 2013).

3 Kovalchik SA, Tammemagi M, Berg CD, et al. Targeting of low-dose CT screening according to the risk of lung-cancer death. *N Engl J Med* 2013; 369: 245-254.

4 Marshall HM, Bowman RV, Crossin J, et al. Queensland Lung Cancer Screening Study: rationale, design and methods. *Intern Med J* 2013; 43: 174-182.

5 Tammemägi MC, Katki HA, Hocking WG, et al. Selection criteria for lung-cancer screening. *N Engl J Med* 2013; 368: 728-736.
6 Australian Population Health Development Principal Committee Screening Subcommittee. Population based screening framework. Canberra: Australian Government Department of Health and Ageing, 2008. ❑

To the Editor: The United States National Lung Screening Trial demonstrated a 20% reduction in lung cancer deaths among smokers screened with three low-radiation-dose computed tomography scans at yearly intervals. Hew and colleagues recently outlined the challenges in implementing such a screening program in Australia.[1] However, the potential for saving lives is enormous.

Currently only 14.1% of lung cancer patients survive 5 years — a marginal improvement from 8.7% over the period from 1982–1986 to 2006–2010.[2] We estimate that the survival benefit of screening the approximately 80% of eligible smokers would push the 5-year survival rate from 14.1% to 29%. Screening beyond 3 years is likely to give even greater benefit.

A recent Victorian study indicated that 62% of smokers presenting with lung cancer had already quit smoking a median of 12 years earlier.[3] The suggestion by Hew and colleagues that further smoking cessation measures are an alternative to screening would be of no benefit to those who, despite having quit, will get lung cancer over the next 10–20 years.

Measures to reduce smoking are essential, but are not an alternative to screening. Suggesting that they are is akin to saying that we shouldn't screen for breast cancer in women taking hormone replacement therapy until it is no longer being used. This would prompt a general outcry from both the public and cancer specialists. It is also, unfortunately, another example of therapeutic nihilism in lung cancer. Uncertainty around the costs and benefits can be allayed by screening those at higher risk.[4] Screening offers the only way to substantially alter survival in this disease over the next 10–20 years.

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1 Hew M, Stirling RG, Abramson MJ. Should we screen for lung cancer in Australia? *Med J Aust* 2013; 199: 82-83.
2 Australian Institute of Health and Welfare. Cancer survival and prevalence in Australia: period estimates from 1982 to 2010. Canberra: AIHW, 2012. (AIHW Cat. No. CAN65; Cancer Series No. 69.) http://www.aihw.gov.au/WorkArea/DownloadAsset.aspx?id=10737422721 (accessed Oct 2013).
3 Mitchell PLR, Thursfield VJ, Ball DJ. Lung cancer in Victoria: are we making progress? *Med J Aust* 2013; 28 Oct [Epub ahead of print].
4 Kovalchik SA, Tammemagi M, Berg CD, et al. Targeting of low-dose CT screening according to the risk of lung-cancer death. *N Engl J Med* 2013; 369: 245-254. ❑

In reply: We welcome the opportunity to respond to correspondence from Marshall and colleagues and Mitchell and colleagues about the impact of the National Lung Screening Trial (NLST)[1] on three distinct issues: (i) current medical practice; (ii) developing public health policy; and (iii) implementation of future screening.

Current medical practice: We do not currently recommend community screening. In the absence of resourced, educated, and coordinated referral and management pathways (which are essential to replicate successful NLST outcomes), we advise clinicians to focus on the *available* method of reducing lung cancer mortality — smoking cessation. For non-smokers, we urge doctors not to embark on ad-hoc screening outside appropriate frameworks, as this may harm patients.[2]

Public health policy: Whether coordinated screening should proceed depends on the final balance between numerous factors, including efficacy, affordability and equity. Screening efficacy continues to evolve,[3] with refinements in selecting individuals at high risk, determining screening intervals, and managing screen-detected nodules. Cost-effectiveness and risk–benefit ratios will likely improve.

Formal cost-effectiveness data for screening are still pending.[4] In the interim, we estimated the relative cost-effectiveness of screening and smoking cessation in our editorial.[5]

"For non-smokers, we urge doctors not to embark on ad-hoc screening outside appropriate frameworks"

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These figures favoured smoking cessation, so we emphasised the importance of intensified tobacco control. We are surprised that Mitchell and colleagues view this as therapeutic nihilism, as even the NLST authors argue: "cost-effectiveness of low-dose CT screening must also be considered in the context of competing interventions, particularly smoking cessation".[1]

Screening offers greatest survival benefit to a high-risk group (comprising current and recent former heavy smokers) who develop early lung cancer.[1] However, effective tobacco control and smoking cessation averts even more lung cancer deaths by preventing cancer in the first place.[6] We should advocate just as strongly for this far larger (but future, and, as yet, anonymous) at-risk group, as we do for our immediate and identifiable high-risk group with early cancer.

Screening implementation: Our editorial indicated that results from the Queensland Lung Cancer Screening Study would be pivotal to guide the implementation of screening.[5] Preliminary data from Marshall and colleagues are therefore timely and welcome. Decisions to implement screening beyond this pilot initiative should await publication of full results. We concur that integration of screening with national tobacco control and smoking cessation programs will be vital.

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1 National Lung Screening Trial Research Team, Aberle DR, Adams AM, Berg CD, et al. Reduced lung-cancer mortality with low-dose computed tomographic screening. *N Engl J Med* 2011; 365: 395-409.
2 Bach PB, Gould MK, Silvestri GA. Computed tomography screening for lung cancer. *Ann Intern Med* 2013; 159: 155-156.
3 Field JK, Oudkerk M, Pedersen JH, Duffy SW. Prospects for population screening and diagnosis of lung cancer. *Lancet* 2013; 382: 732-741.
4 Manser R, Lethaby A, Irving LB, et al. Screening for lung cancer. *Cochrane Database Syst Rev* 2013; (6): CD001991.
5 Hew M, Stirling RG, Abramson MJ. Should we screen for lung cancer in Australia [editorial]? *Med J Aust* 2013; 199: 82-83.
6 Moolgavkar SH, Holford TR, Levy DT, et al. Impact of reduced tobacco smoking on lung cancer mortality in the United States during 1975–2000. *J Natl Cancer Inst* 2012; 104: 541-548. ❑