this finding, the authors suggested that using the LLN criterion may miss some older individuals who could benefit from intervention.

This conclusion was based on the analysis where all "potentially overdiagnosed" participants classified as GOLD stages I–IV were grouped together and compared with the "normals", with a resulting mortality hazard ratio (HR) of 1.3 (95% CI 1.1 to 1.5). However, as noted above, the controversy focuses on individuals classified in GOLD stage I. Persons with $FEV_1/FVC < 0.70$ and $FEV_1/FVC \geq LLN$ within GOLD stage I represent the majority (72%) of the "potentially overdiagnosed" individuals[2] who would theoretically benefit from further clinical evaluation and treatment through adherence to the GOLD criteria. The adjusted mortality HR for this subgroup was 1.1 (95% CI 0.96 to 1.3) compared with the "normal" group.[6] The magnitude of the HR is quite small and the confidence interval includes 1.0. This contrasts with the significantly raised adjusted mortality HR of 1.4 (95% CI 1.1 to 1.7) for the GOLD stage I subgroup with $FEV_1/FVC < LLN$. The study results therefore do not substantiate a significant increase in all-cause mortality among the GOLD stage I subgroup that is "potentially overdiagnosed".

The authors report a small but statistically significant increase in the risk of hospitalisation with mention of COPD in the GOLD stage I subgroup of "potentially overdiagnosed" individuals compared with the "normal" group. However, individuals with respiratory symptoms but normal lung function (ie, GOLD stage 0 in the paper) had a similar increase in hospitalisations, both before and after adjustments. Because the "potentially overdiagnosed" subgroup included individuals with symptoms consistent with COPD, the observed increases in hospitalisations with mention of COPD could be attributable to the presence of respiratory symptoms rather than to any lung function abnormalities. The authors could address this confounding of lung function differences by symptoms by re-analysing the hospitalisations after excluding individuals with symptoms in the "potentially overdiagnosed" subgroups.

An additional concern with the study relates to the potential for diagnostic bias. The authors indicate that they analysed hospitalisations "with mention of COPD" but do not indicate whether or not these hospitalisations were attributable to COPD. Because the entire study population underwent initial spirometric testing, it is possible that some of the treating physicians were aware of the spirometry report and may therefore have been more likely to have mentioned COPD on discharge for those patients with an FEV_1/FVC ratio <0.70, even if COPD did not actually contribute to the hospitalisation. The authors could address this potential for diagnostic bias by re-analysing the results, restricting the outcome of interest to hospitalisations for which COPD or other respiratory illness was the primary discharge diagnosis.

Adherence to the $FEV_1/FVC < 0.70$ criterion in GOLD stage I will potentially identify an additional 5.4 million individuals (58%) in the US population as having COPD compared with use of the LLN criterion.[2] This large group of individuals will experience anxiety as well as financial costs, but we do not believe there is sufficient documentation of a potential benefit.[6] We agree with others who recommend reconsideration of the FEV_1/FVC ratio <0.70 as a criterion for identifying mild COPD.[2–5]

Edward L Petsonk, Eva Hnizdo, Michael Attfield
Division of Respiratory Disease Studies, National Institute for Occupational Safety and Health, Morgantown, West Virginia, USA

Correspondence to: Dr Edward L Petsonk, National Institute for Occupational Safety and Health, Morgantown, West Virginia 26505, USA; elp2@cdc.gov

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Authors' reply

We thank Drs Enright, Miller and Petsonk *et al* for their insightful comments regarding our recently published paper.[1] Their concerns can be summarised as follows: (1) use of the fixed forced expiratory volume in 1 s/forced vital capacity (FEV_1/FVC) ratio of 0.70 rather than a lower limit of normal greatly "overdiagnoses" chronic obstructive pulmonary disease (COPD) and is thus detrimental to both public health and the psychological health of patients; (2) GOLD stage I COPD does not represent disease but is, in most people, simply normal ageing; and (3) our measure of "COPD-related hospitalisations" probably included many hospitalisations not caused by COPD.

While we recognise the potential for overdiagnosis posed by use of the GOLD fixed ratio criterion, historically the greater public health problem has been the underdiagnosis (and corresponding undertreatment) of COPD, especially lung function impairment that clinicians would consider clinically relevant (GOLD stage II or more severe).[2 3] We have seen many patients with misdiagnosed lung disease, and the misdiagnosis is almost always a result of either not having performed spirometric tests or having poorly done spirometric tests. We therefore believe that the lack of spirometric testing in clinical practice is the larger threat to misdiagnosis and hence that, from a public health and educational perspective, the emphasis should probably be on underdiagnosis rather than on overdiagnosis. The problem of underdiagnosis is further exacerbated by poor quality spirometry and underestimation of FVC owing to inadequate emptying of the lungs. This is not to say that we should ignore the problem of potential overdiagnosis. The debate that is going on at present about the different criteria for airflow obstruction is a healthy one that can best be informed by analyses such as ours and the subsequent discussion that such analyses generate. This is how knowledge advances, and we are happy to have stimulated a lively discussion and anticipate that it will lead to further studies and analyses.

The question of whether the GOLD stage I classification really just represents "normal" ageing in most people is another area of ongoing debate. Although we do not dispute that the FEV_1/FVC decreases with ageing and that not everyone meeting GOLD stage I criteria has "disease", we also know that, on average, older individuals with better lung function tend to live longer and are more healthy than those with worse lung function.[4] We also know that those with respiratory symptoms fare worse than do those without such symptoms. Finally, while we acknowledge the potentially negative psychological consequences of labelling someone as having a chronic disease, patients understand the concept of disease staging, and telling someone that they have potentially early stage COPD may in fact have some positive public health consequences. For instance, one study has noted that patients who underwent spirometric tests and were found to have "mild" disease were more likely than subjects with "normal" lung function to stop smoking, and that cessation rates were even higher in those who were told they have "moderate" and "severe" disease.[5] Again, we anticipate that trying to address the questions surrounding normal ageing versus the development of early disease will lead to further studies and analyses of longitudinal data.

As to whether our measure of COPD-related hospitalisations was too inclusive, we agree that not all of these hospitalisations were for COPD exacerbations per se. The link between COPD and other diseases (such as pneumonia, congestive heart failure and lung cancer) has been well established, and many hospitalisations in patients with COPD are for these comorbid conditions.[6] However, lung function impairment does consistently seem to increase the risk of such hospitalisations.

In conclusion, the letters published here raise some important issues at the intersection of how we define disease (particularly in epidemiological studies) and how we treat it. In practice, while we use the GOLD criteria to classify the severity of disease in our patients with respiratory disease, we use clinical criteria such as the presence of symptoms or quality of life impairment to guide treatment. This is particularly true in mild disease where the best interventions are smoking cessation, weight loss and exercise.

David M Mannino
Division of Pulmonary, Critical Care and Sleep Medicine, University of Kentucky Medical Center, Lexington, Kentucky, USA

A Sonia Buist
Department of Medicine, Oregon Health and Science University, Portland, Oregon, USA

William M Vollmer
Kaiser Permanente Center for Health Research, Portland, Oregon, USA

Correspondence to: Dr David M Mannino, Division of Pulmonary and Critical Care Medicine, University of Kentucky Medical Center, 740 S Limestone, K-528, Lexington, Kentucky 40536, USA; dmannino@uky.edu

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LUNG ALERT

Prophylactic cranial irradiation can reduce symptomatic brain metastasis in extensive SCLC

▲ Slotman B, Faivre-Finn C, Kramer G, *et al*. Prophylactic cranial irradiation in extensive small-cell lung cancer. *N Engl J Med* 2007;**357**:664–72.

Survival rates for extensive small cell lung cancer (SCLC) have not improved dramatically in the past 3 years. Brain metastases are common in this disease and indicative of a poor prognosis. This study evaluated the effect of prophylactic cranial irradiation (PCI) on the incidence of symptomatic brain metastasis in extensive SCLC.

A multicentre, randomised trial was conducted on patients with histological or cytological confirmed SCLC with evidence of extension beyond the hemithorax. All patients included had responded to chemotherapy. Patients with history of previous radiotherapy to head or neck, corticosteroid use or previous cancer were excluded.

The primary endpoint was development of symptomatic brain metastasis and secondary endpoints included survival, quality of life, toxic effects and treatment costs. There was a statistically significant lower risk of symptomatic brain metastasis in the irradiation group compared with the control group. Symptomatic brain metastasis were observed in 24 of 143 in the irradiation group (16.8 %) and 59 of 143 in control group (41.3%). The cumulative incidence of brain metatasis was much lower in the irradiation group than the control group at 6 and 12 months. Overall survival was also significantly higher in the irradiation group (median survival 6.7 months compared with 5.4 months for the control group).

This study shows a greater reduction in symptomatic brain metastasis in patients treated with PCI. The authors suggest PCI should be standard care in all patients with extensive SCLC who respond to chemotherapy.

Dr Ahmed Fahim
Specialty Registrar Respiratory, Castle Hill Hospital, Cottingham