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PRO AND CON EDITORIALS

What makes large epidemiological studies comparable?

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Repeated cross-sectional surveys have been largely used to assess temporal trends in the prevalence of diseases. To be reliable, these should respect the following simple, but essential, rules: 1) the same source population should be randomly sampled and studied on different occasions, using the same sampling frame; 2) similar numbers of subjects should be selected; 3) the disease should be diagnosed by using the same criteria and identical protocols; and 4) the data should be analysed by specific statistical techniques with appropriate adjustments of the differences in response rates.

In the respiratory field, repeated cross-sectional studies have been successfully used to monitor the prevalence of asthma [1–4] and also risk factors, such as smoking [5]. The epidemiological diagnosis of asthma, being mainly based on symptoms, requires only validated questionnaires, and the only stringent requirement is that neither questions nor instructions are modified [6, 7]. For chronic obstructive pulmonary disease (COPD), owing to the greater complexity of diagnosis, even in a clinical setting, it is glaringly obvious that epidemiological studies meet more methodological difficulties than those for asthma. A crucial point in this respect is the use and interpretation of spirometry.

In this issue of the *European Respiratory Journal*, two papers present the results of two repeated cross-sectional surveys, one reporting a decrease in the prevalence of COPD in Spain over a period of 10 yrs [8], the other reporting no change in Finland over 20 yrs [9]. Although the findings that COPD did not increase in either country are comforting, there are important differences between the two studies.

The Spanish study, by SORIANO *et al.* [8], does not completely satisfy the rules reported above. In the first survey (IPERBOC study), the source population was from seven Spanish areas [10], whereas in the second survey (EPI-SCAN study) it was that from 10 Spanish cities, with only five being in the same areas as previously [11]. The sampling frame was different, being the census database in the IPERBOC study (thus including all subjects of the target population) and an advertisement database of residents in the selected area (including only subjects with an available phone number). In the IBERPOC study, the sample was an age- and sex-stratified random sample of 729 individuals aged 40–69 yrs, whereas in the EPI-SCAN study it was a random sample of 369 subjects aged 40–80 yrs living in an administrative area covered by a reference hospital in each area. In contrast, the Finnish study by VASANKARI *et al.* [9] was based on two similar samples representative of the general population with participation rates exceptionally high for comprehensive surveys like these and the second survey was specifically designed to be comparable with the first.

Although the American Thoracic Society and the European Respiratory Society have jointly established standards for spirometry equipment, procedures, interpretation and quality control [12], no specific recommendations are given for large-scale epidemiological surveys. Nevertheless, strict quality control of spirometry was maintained in large-scale studies conducted in North America [13], Europe [14, 15], Latin America [16] and internationally [17]. Moreover, the specific characteristics of the spirometry quality control for epidemiological studies have been extensively detailed [18] and particular emphasis was given to the need for standard training and supervision of spirometry, even if high-quality spirometers are used [19]. More difficult is the direct comparison of quality control when small spirometers intended for home measurements are used instead of laboratory-based spirometers. Thus, an essential requirement for repeated cross-sectional surveys is the use of the same type of spirometer, as was the case in the Finnish study [9]. Unfortunately, the IPERBOC study [10] used a turbine spirometer, which was very different from the pneumotachograph used in EPI-SCAN [11]. Because of the known increase of internal resistance, it probably contributed to an overestimation of the airflow obstruction.

A common merit of both the Spanish and Finnish studies is that they applied the same diagnostic criteria in both surveys, by using a definition of airflow obstruction based on the ratio of forced expiratory volume in 1 s to forced vital capacity (FEV_1/FVC) predicted for age and sex, thus avoiding the overestimation of COPD prevalence that results from the use of the fixed ratio $FEV_1/FVC < 0.7$, as recommended by Global Initiative for Chronic Obstructive Lung Disease guidelines [20–22].

We think that the wide methodological differences between the two repeated surveys in Spain make direct comparison of COPD prevalence between 1997 and 2007 very difficult. The authors themselves seem to be completely aware of the

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numerous limitations of their study, spending the major part of the discussion on these aspects. Thus, we agree with their conclusions stressing the difficulties of comparing repeated cross-sectional surveys of spirometry in the absence of correct practical conditions [8]. Conversely, the findings showing no change among males and only a slight increase among females in the prevalence of COPD in Finland conform well to the trends in smoking among males and females in the same period [9]. Although their results are not directly applicable to other countries, we agree with the authors on the fact that their results suggest that the prevalence of COPD can be expected to vary along with changes in the factors predisposing to obstruction. Because COPD was mostly mild or moderate, we also agree with their conclusions on the need of early prevention.

In summary, taking into account that no other disease responsible for a growing global burden is probably neglected by healthcare providers as much as COPD, population studies on this disease continue to be welcome. By heeding proper methodological considerations, they can offer accurate estimates of trends in the prevalence of COPD, thus guiding future projections of its worldwide burden and helping the growing demand for services to be met.

STATEMENT OF INTEREST

None declared.

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