the most common brand (3, 4). CDC laboratory test results of BAL fluid samples from 29 patients submitted to the CDC from 10 states found vitamin E acetate in all the samples (1). Vitamin E acetate is an oil used to thicken e-cigarette liquid. Although all the CDC BAL analyses were of THC-containing vape liquids, a recent report from South Korea showed vitamin E acetate present in nicotine-containing products, including JUUL pods (5). Eissenberg and Maziak suggest that lipid materials in e-cigarette liquids, particularly vegetable glycerin, are the likely cause of EVALI in patients who only used nicotine-containing products. Whether the lipid is vitamin E acetate or vegetable glycerin or another agent, inhaling lipid-containing aerosol generated by high heat can lead to the generation of lipid-laden macrophages, recently reported by Maddock and colleagues in cases of EVALI from Utah (6). Electronic nicotine delivery systems can play a beneficial role in tobacco smoking cessation, but only if the e-cigarette liquid is properly and safely prepared. I fully agree with Eissenberg and Maziak's call for strict regulation of e-cigarette liquid contents. ■

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Check for updates

Patient Registries in Idiopathic Pulmonary Fibrosis: Don't Forget Socioeconomic Status

To the Editor:

We appreciated the article by Culver and colleagues emphasizing the importance of large registries of patients with idiopathic pulmonary fibrosis (IPF) and the increased need for biobanking to identify relevant biomarkers to better understand this disease (1).

We fully agree with the comment of Nett and colleagues regarding the need to include in IPF registries data on occupational and environmental exposures, although it is currently difficult to obtain accurate information about a patient's lifetime exposure unless a specialized consultation is available (2). Another benefit of reporting occupational activities in IPF registries would be to provide information on the patient's socioeconomic status (SES), a critical health determinant of chronic lung diseases such as chronic obstructive pulmonary disease, asthma, and lung cancer (3). However, published data on the role of SES in IPF are exceedingly rare. A study conducted in the United States on lung transplant candidates suffering from IPF showed that black and Hispanic patients had increased mortality compared with white and Asian patients, likely owing to a lower SES (4). Based on a U.S. database of hospitalized patients, Gaffney and colleagues suggested that patients with IPF and lower incomes or poorer insurance coverage had reduced access to transplantation, rehabilitation, and lung biopsy, but no difference in hospital mortality (5). SES data can be useful for assessing patients' access to healthcare and health management, which is relevant in the varied contexts of national welfare systems. The evaluation of SES is complex because it is multidimensional and can change throughout the life cycle. Yet, it has been established that income is one of the most significant socioeconomic markers of the health social gradient. Unfortunately, income data are often missing in IPF registries, and it is difficult to specify this information retrospectively. Interestingly, if permission has been granted to obtain the patient's geocoded residential address, it is possible to impute to each patient an area-level income, as a proxy from national databases. In addition, collecting patient geocoded residential addresses enables the assignment of various environmental exposure data to each individual from air quality measurement stations, land cover (i.e., greenspaces), and distances from major polluted roads. Several studies observed a negative role of air pollution in IPF natural history (6), and large, collaborative registries involving several countries with different levels of air pollution would provide an opportunity to confirm these results. Indeed, disadvantaged individuals are more significantly exposed to air and occupational pollution than others. Environmental epidemiology traditionally has focused on the one-to-one relation between environmental exposures and health. However, in the last decade, an exposome approach has emerged for the study of factors associated with the occurrence of

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chronic diseases over a long period of time through a holistic multidisciplinary evaluation, including the wider SES and psychological influences on the individual, over the lifespan. In the case of IPF, this approach may be crucial for understanding its onset, evolution, and complex gene–environment interactions. The development of modern tools such as mobile health devices and remote sensors enables an exposomic approach through the generation of big data, which can be implemented in IPF registries. To sum up, to accurately investigate IPF, it is important to take into account the impact of air pollution, occupational exposure, and SES in patient registries, and to apply these factors through the lens of the exposome. This approach is closely connected with multidisciplinary research involving population epidemiology, environmental justice, and science and technology studies examining patients' living conditions. ■

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Erratum: Lung Ultrasound for Critically Ill Patients

The article by Mojoli and colleagues (1), published in the March 15, 2019, issue of the *Journal*, contained incomplete disclosure information for two of the authors. Dr. Francesco Mojoli and Dr. Silvia Mongodi have supplied corrected conflict of interest disclosure forms, which may be accessed from the Supplements link in the online article. The updated disclosure summaries, which previously stated that the authors had nothing to disclose, are included below:

Dr. Mojoli reports personal fees from Hamilton Medical; personal fees from General Electric Healthcare, outside the submitted work; and at the time of this amendment, a consultancy agreement between University of Pavia and Hamilton Medical, outside the submitted work, is upcoming.

Dr. Mongodi reports personal fees from General Electric Healthcare, outside the submitted work. ■

Reference

1. Mojoli F, Bouhemad B, Mongodi S, Lichtenstein D. Lung ultrasound for critically ill patients. *Am J Respir Crit Care Med* 2019;199:701–714.