A poorly reversible and chronic airflow obstruction is the cardinal feature of chronic obstructive pulmonary disease (COPD). However, the condition is heterogeneous in many other ways. Our vigorous attempt to phenotype or endotype COPD testifies this fact. It is not the disease entity mechanism alone but its interaction with a whole host of socio-environmental factors that have created the kind of COPD burden we see today. Some years ago, Tan et al. highlighted that there were more deaths and disability suffered in COPD in Asia region than developed western countries and showed high and varied trends of hospital admissions and mortality in the various Asia countries. The emphasis was on confronting the high smoking prevalence in Asia as well as optimal deployment of health care resources. The picture is obviously larger than this. In Burden of Obstructive Lung Disease (BOLD) analysis of 22 study sites (including those in Asia), Burney et al. showed that poverty, not cigarette consumption, has greater association with lung function restriction that correlates significantly with COPD mortality. This finding thrusts forward poverty as a bigger threat than does cigarette smoking in COPD. Byrne et al. showed in their recent systematic review that COPD was three times more likely in adults over 40 years old with history of tuberculosis (TB) and affected more never smokers and younger individuals. Indoor air pollution including biomass burning is now a well-established risk factor of developing COPD. Povertv, TB and indoor biomass burning are traditionally huge issues in Asia. Furthermore COPD phenotypes in Asia may be somewhat different from those in the West in having fewer ‘chronic bronchitic’ presentation. This will affect the way we screen for COPD. These, together with many other issues like rapid urbanization of many Asia sites, will paint an evolving COPD landscape for this region.

Such is the research aspiration of Asian Network for Obstructive Lung Disease (ANOLD), an initiative by Prof. S.-D. Lee from Asan Medical Center, University of Ulsan College of Medicine in Seoul. Beginning with 11 countries’ representatives in 2008, ARNOLD collaborators has now grown to 14 countries’ representatives. They are South Korea, Japan, China, Taiwan, India, Malaysia, Thailand, Singapore, Philippines, Sri Lanka, Vietnam and Hong Kong. Key prominent researchers from the West also sit in the steering committee as advisory members. Our vision is to facilitate collaboration of obstructive lung disease research to provide a more integrative and comprehensive understanding of COPD from an Asian perspective. To this end, this non-industry funded research collaboration seeks to collect standardized etiomic, genomic, clinomic and other relevant data of the various cities and regions in Asia.

Our first collaborative findings are published in 2013 of 922 stable COPD patients treated in pulmonary clinics from seven Asian cities. These were convenient sampling cohorts that showed obvious variations of disease severity, symptoms, airflow obstruction and health outcomes among one another. Although variable between cities, the overall history of exposure to biomass fuel and dusty jobs were 32 and 44%, respectively. After adjustment with multivariate analysis for age, gender, GOLD severity and city, exposure to dusty job remained an independent risk for cough, phlegm and chronic bronchitis, with adjusted odd ratios approximately 1.5 times. Biomass fuel and cigarette smoking were not significant factors after multivariate analysis. We did not show any associations with past history of pulmonary TB, but this might be due to our exclusion of subjects with TB-destroyed lung of exceeding one lobe on chest radiograph. Interestingly, the highest ranking comorbidity in our cohort was diabetes (8.8%) while ischemic heart disease...
ranked third at 3.6%. Treatment prescriptions understandably differed significantly between cities, except for the prevalent use of theophylline in most cities.

In another analysis of 1022 patients, 10 cities were categorized into four regions, i.e. China/Taiwan, India/Sri Lanka, Philippines/Thailand/Malaysia/Vietnam and Korea/Japan. Cluster analysis based on variables identified from factor analysis revealed three subgroups with distinct phenotypes. They were ‘milder severity’ (59%), ‘milder severity but more comorbidity’ (14%) and ‘severe severity’ (27%). The ‘milder severity but more comorbidity’ subgroup was particularly prominent in the China/Taiwan region while ‘severe severity’ was prominent in all but more so in India/Sri Lanka and Philippines/Thailand/Malaysia/Vietnam regions. This observation remains circumstantial as we now plan to incorporate data from more new sites for fresh analysis to obtain as thorough as possible the picture of Asian subgroups or phenotypes.

ANOLD is now in its Phase 2 of recruiting COPD subjects. More Asian sites are now included, e.g. Hong Kong and north India. Together with Phase 1 subjects, we currently have in our centralized database in Clinical Research Center for Chronic Obstructive Airway Disease, Asan Medical Center, of over 1500 patients from 14 sites. The center is also responsible for quality control and governance of data sent from all sites. In Phase 2 recruitment, we now have the kind permission of the International BOLD Research Platform to use their BOLD biomass questionnaire. This should improve the quality of our biomass information. The Phase 2 project also includes longitudinal data on mortality, standardized lung imaging by high-resolution CT and blood DNA for genomic studies.

A clear research strategy in approaching a complex disease like COPD is necessary. The standardized data from our combined longitudinal cohorts of different Asian sites will provide valuable host and environmental information to help dissect COPD heterogeneity and identify phenotypes or subgroups relevant in Asian context. We hope to further collect biologic samples for identifying novel biomarkers and genotyping, and to improve understanding of COPD morphology and functions using novel imaging approaches in CT and MRI. It is also necessary that ANOLD collaborates with other global COPD research networks like ECLIPSE and COPDGene to expand and interact on our research insight of this challenging global condition.

Conflict of interest: None declared.

References
6. Loh LC. Chronic bronchitis is not necessary to define COPD. Respirology 2011; 16:574.