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**Title:** Temporal stability of asthma phenotypes identified by a clustering approach: An ECRHS-SAPALDIA-EGEA study

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**Body:** Background: The temporal stability over time of asthma phenotypes identified using clustering methods has never been addressed. Aims: To assess whether repeated Latent Class Analysis (LCA) applied in asthma a decade apart leads to the identification of comparable phenotypes, and to characterize the transition between them. Methods: The LCA was applied twice, 10 years apart, on data from 2399

asthmatic adults recruited in 3 epidemiological surveys using standardized protocols: ECRHS (European Community Respiratory Health Survey, n=1450), SAPALDIA (Swiss cohort study on air pollution and lung disease, n=589) and EGEA (Epidemiological study on Genetics and Environment of Asthma, n=360). 14 variables covering personal characteristics, asthma symptoms, treatment, age of asthma onset, allergic characteristics, lung function and bronchial hyperresponsiveness were considered at both time points. Results: A model with four latent classes was selected at each time point (prevalence between 14%-36%, mean posterior probability 84%). Two of them were predominantly composed of subjects with active asthma, mainly differing by allergic status and age at onset. Two others were predominantly composed of subjects with inactive-mild asthma, mainly differentiated by allergic status. Most of the population (60%) was assigned to the same asthma phenotype at both time points, although stability varied between phenotypes (from 47% for “active adult-onset asthma” to 68% for “inactive-mild non-allergic asthma”). Conclusion: Asthma phenotypes identified by a clustering approach 10 years apart were comparable. Further analyses will be conducted using Latent transition analysis.