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**Title:** Tobacco smoke in patients with pulmonary hypertension

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**Body:** Background: We aimed to assess active and passive tobacco smoke exposure in a larger PH-collective and to compare it with epidemiological data from presumptively healthy subjects. Methods: This is an international, multicenter, case-control study including patients with differently classified precapillary PH from Germany (DE), Austria (AUT) and Switzerland (CH). All patients were asked specific questions about active and second-hand tobacco smoke exposure. Presumptively healthy controls were retrieved from the Swiss Health Survey (SHS) and the SHIP-cohort (Germany). Results: We analyzed 494 PH-patients (61.9% females) from CH (46%), DE (48%), and AUT (6%). The mean age was 57.7, BMI 26.9, and the 6 minute walking distance 372m. Patients were classified as pulmonary arterial (idiopathic (37.0%), associated (24.7%)), chronic thromboembolic (24.5%), PH in left heart disease (0.6%), miscellaneous PH (3.2%) and 8.7% had PH in chronic lung disease. Overall, tobacco smoke exposure was common in PH, 51.8% were smokers, 22.3% persistent smokers. Smoking rates were comparable in the different centers/countries. Men with pulmonary arterial hypertension were significantly more smokers compared with the Swiss control group but not with the SHIP cohort. Second-hand smoke exposure was found more frequent in women of all PH classes compared with Swiss controls. Conclusions: Tobacco smoke exposure is common in all PH-classes, especially in men, with half of the patients being ever exposed and over a fifth of patients being persistent smokers. We found no overall difference of tobacco smoke exposure between PH-patients and controls, however, PH-women were significantly more exposed to second-hand smoke than healthy controls.