

# European Respiratory Society Annual Congress 2013

**Abstract Number:** 97  
**Publication Number:** P1904

**Abstract Group:** 6.2. Occupational and Environmental Health

**Keyword 1:** Occupation **Keyword 2:** Spirometry **Keyword 3:** Epidemiology

**Title:** Lifetime exposure to welding fume and lung function in the German WELDOX study

Dr. Martin 691 Lehnert lehnert@ipa-dguv.de MD <sup>1</sup>, Dr. Frank 692 Hoffmeyer hoffmeyer@ipa-dguv.de MD <sup>2</sup>, Mrs. Katarzyna 693 Gawrych gawrych@ipa-dguv.de <sup>1</sup>, Mrs. Anne 694 Lotz lotz@ipa-dguv.de <sup>1</sup>, Mrs. Evelyn 695 Heinze heinze@ipa-dguv.de <sup>1</sup>, Mr. Hans 696 Berresheim berresheim@ipa-dguv.de <sup>2</sup>, Prof. Dr Rolf 697 Merget merget@ipa-dguv.de MD <sup>2</sup>, Prof. Dr Volker 698 Harth volker.harth@uniklinikum-saarland.de MD <sup>3</sup>, Mr. Rainer 699 Van Gelder rainer.van.gelder@dguv.de <sup>4</sup>, Dr. Jens-Uwe 700 Hahn jens-uwe.hahn@dguv.de <sup>5</sup>, Dr. Tobias 701 Weiss weiss@ipa-dguv.de <sup>6</sup>, Dr. Beate 702 Pesch pesch@ipa-dguv.de <sup>1</sup>, Prof. Dr Andrea 703 Hartwig andrea.hartwig@kit.edu <sup>7</sup> and Prof. Dr Thomas 707 Brüning bruening@ipa-dguv.de MD <sup>8</sup>. <sup>1</sup> Epidemiology, Institute of Prevention and Occupational Medicine of the German Social Accident Insurance (IPA), Institute of the Ruhr-University Bochum, Bochum, Germany ; <sup>2</sup> Medicine, IPA, Bochum, Germany ; <sup>3</sup> Institute for Occupational Health, Environmental Medicine and Public Health, Saarland University, Homburg Saar, Germany ; <sup>4</sup> Information Technology, Risk Management, Institute for Occupational Safety and Health of the German Social Accident Insurance (IFA), Sankt Augustin, Germany ; <sup>5</sup> Chemical and Biological Hazards, IFA, Sankt Augustin, Germany ; <sup>6</sup> Toxicology, IPA, Bochum, Germany ; <sup>7</sup> Institute for Applied Bioscience, Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany and <sup>8</sup> Director, IPA, Bochum, Germany .

**Body:** Introduction Adverse effects on lung function by long-term exposure to welding fume are inconsistently reported. The ratio of forced expiratory volume in one second (FEV1) and forced vital capacity (FVC) is a proven indicator of a chronic obstructive pulmonary disease. Aims and objectives We studied statistical effects of life-time exposure to respirable particles and airborne chromium on the FEV1/FVC ratio in 219 male welders from the cross-sectional WELDOX study. Methods Individual cumulative exposures to respirable particles and chromium were estimated considering formerly applied welding techniques and working conditions and their influence on shift exposure observed in WELDOX. Exposures were categorized as low, medium and high using tertiles. Spirometry was performed in accordance to American Thoracic Society criteria. Potential determinants of FEV1/FVC were estimated by multiple linear regression models including physical workload and tobacco smoking. Results Twelve welders did not reach 80% of predicted FEV1. FEV1/FVC ratio of 0.70 was failed by 29 welders. FVC of one welder was below 80% of prediction. There was no decline in lung function by exposure to particles or chromium. Low, medium and high particle exposure presented FEV1/FVC medians of 0.77, 0.77 and 0.75. Corresponding medians for chromium exposure were 0.77, 0.76 and 0.75. Cumulative exposure, smoking and physical workload together explained 10% of the variance of FEV1/FVC. Only smoking exerted a significant influence (p=0.0001). Conclusions Based on a comprehensive exposure assessment we did not observe an influence of lifetime

exposure to respirable particles or chromium on FEV1/FVC as an indicator for chronic obstructive lung disease.