

## Lung function

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### Effect of long-term exposure to air pollution on lung function in university students

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**Background:** The chronic impact of air pollutants on lung function in adults is not fully understood.

**Aim:** The aim of the study was to evaluate the effect of air pollution in place of residence during childhood and adolescence on respiratory function in early adulthood.

**Material and methods:** 220 female and 160 male students of universities in Krakow and Wroclaw performed spirometry tests and filled questionnaire. Lifetime pollution exposure were assessed based on the data acquired by the Polish Chief Inspectorate for Environmental Protection.

**Results:** The analysis showed differences in all spirometric parameters depending on benzene exposure, in FVC% and FEV1/FVC depending on PM<sub>2.5</sub> concentrations, and in FVC% depending on NO<sub>2</sub> exposure. Although other results were not statistically significant, it was noted that in all cases with increasing levels of air pollution FVC% and FEV1% decreased, while FEV1/FVC increased. Statistically significant differences in spirometric parameters were also observed in relation to the degree of urbanization of place of living prior to the study period. The higher the degree of urbanization, the higher FVC% and FEV1% and the lower FEV1/FVC. For inhabitants of large cities, differences in spirometric parameters across areas with different air quality were higher than for those living in villages. Additionally, students of university in Krakow have impaired lung function in comparison to students of university in Wroclaw. Students from Krakow tested at the time when smog filled the city had worse spirometry parameters than those tested a year earlier.

**Conclusion:** Differences in lung function in early adulthood are the result of both air pollution in the place of residence during childhood and adolescence, and current exposure to pollutants.