

AIR QUALITY INDEX AND ITS SIGNIFICANCE IN ENVIRONMENTAL HEALTH RISK COMMUNICATION

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Abstract: Air Quality Index (AQI) is a standardized summary measure of ambient air quality used to express the level of health risk related to particulate and gaseous air pollution. The index, first introduced by US EPA in 1998 classified ambient air quality according to concentrations of such principal air pollutants as PM₁₀, PM_{2.5}, ozone, SO₂, NO₂ and CO. Subsequently similar, index-based approach to express health risk was developed in France, Great Britain and Germany. No such environmental warning system exists in Poland, although some test-trials took place in Katowice area and the city of Gdańsk. However, the operational value of AQI under environmental circumstances in Poland remains unknown. The aim of the study was to examine current air pollution levels in Katowice area and to confront AQI categories with local air quality, also in terms of health impact on the population as expressed by daily total and specific mortality. The data on daily average PM₁₀ and sulphur dioxide concentrations available in regional network (PIOŚ in Katowice) and data on daily number of total deaths and deaths due to cardiorespiratory diseases from the Central Statistical Office in Warsaw were collected. The data covered the period 2001–2002. The percentage of days with individual Air Quality Index, created by American, French, British and German method of indexation was calculated. Then, the relationship between values of air quality indexes and daily total and specific mortality according to Spearman correlation coefficients was assessed. Finally, the obtained results were verified according to ANOVA Kruskal-Wallis test. The obtained results suggest significant discrepancy in the range of air quality categories depending on applied system of classification. Percentage of days with “unhealthy” air quality (in the period 2001–2002) was running from 0.1% (American method of indexation) to 11.2% (British method) and usually referred to winter season. Statistically significant Spearman correlation coefficients were obtained for the relationship between air quality and total number of deaths, as well as the number of deaths due to cardiovascular and respiratory diseases in elderly population (aged 65 and more). The observed values of correlation coefficients are very low and do not exceed value 0.2 for each chosen method of indexation.