**Air quality mapping and health risk assessment for long-term carbon monoxide exposure of preschool children in Niš**

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We monitored ambient air concentrations of carbon monoxide (CO) in the City of Niš continually until 2012. Analysis of CO concentrations for the period between 1994 and 2011 indicates an increase in concentrations for as much as 48.1 %. In 2009, 2010, and 2011, the mean annual concentrations exceeded the maximum allowable level. High CO concentrations can cause health risks in the exposed population if their annual level exceeds 3 mg/m3.

Effects of air pollutants on human health vary depending on the factors such as type of pollution, duration and level of exposure, sensitivity of individual organisms, and toxic properties of the pollutant. The most common effects of air pollutants on human health are the following: diminished pulmonary function; asthma attacks; respiratory diseases; cardiovascular diseases; reduced activity; low immunity; and carcinogenic diseases.

In order to determine the causal relationship between excess maximum allowable CO concentrations in ambient air and the occurrence of unwanted health effects in the sensitive population, we monitored the incidence of respiratory diseases in preschool children. The presented 2013 analysis of respiratory disease incidence in preschool children includes seven kindergartens in the City of Niš. We selected the kindergartens after mapping air quality by means of an RBF network and establishing the health risk zones. The locations of all analyzed kindergartens within the City of Niš have been predicted to have high mean annual CO concentrations, ranging from 3.28 mg/m3 to 7.8 mg/m3.

Based on the predicted CO concentrations at the analyzed kindergarten locations, we assessed the health risk by calculating the hazard quotient for the assumed two-hour and four-hour daily exposures. Hazard quotient values for the two-hour exposure were up to 1.7, whereas the values for the four-hour exposure were up to 4.5.

**Key words**: exposure, health risk, hazard quotient, carbon monoxide, radial basis function network.