

Data Basics Applications Solutions

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Exercises

Identify study components

Identify (i) the cases, (ii) the variables and their types, and (iii) the main research question in the studies described below.

1. Researchers collected data to examine the relationship between pollutants and preterm births in Southern California. During the study air pollution levels were measured by air quality monitoring stations. Specifically, levels of carbon monoxide were recorded in parts per million, nitrogen dioxide and ozone in parts per hundred million, and coarse particulate matter (PM₁₀) in $\mu g/m^3$. Length of gestation data were collected on 143,196 births between the years 1989 and 1993, and air pollution exposure during gestation was calculated for each birth. The analysis suggested that increased ambient PM₁₀ and, to a lesser degree, CO concentrations may be associated with the occurrence of preterm births.¹
 - i. The cases are 143,196 eligible study subjects who were born in Southern California between 1989 and 1993.
 - ii. The variables are measurements of carbon monoxide (CO), nitrogen dioxide, ozone, and particulate matter less than $10\mu m$ (PM10) collected at air-quality-monitoring stations as well as length of gestation. All of these variables are continuous numerical variables.
 - iii. The research question was **Is there an association between air pollution exposure and preterm births?**
2. The Buteyko method is a shallow breathing technique developed by Konstantin Buteyko, a Russian doctor, in 1952. Anecdotal evidence suggests that the Buteyko method can reduce asthma symptoms and improve quality of life. In a scientific study to determine the effectiveness of this method, researchers recruited 600 asthma patients aged 18-69 who relied on medication for asthma treatment. These patients were split into two research groups: one practiced the Buteyko method and the other did not. Patients were scored on quality of life, activity, asthma symptoms, and medication reduction on a scale from 0 to 10. On average, the participants in the Buteyko group experienced a significant reduction in asthma symptoms and an improvement in quality of life.²
 - i. The cases are 600 adult patients aged 18-69 years diagnosed and currently treated for asthma.

¹B. Ritz et al. "Effect of air pollution on preterm birth among children born in Southern California between 1989 and 1993". In: Epidemiology 11.5 (2000), pp. 502-511.

²J. McGowan. "Health Education: Does the Buteyko Institute Method make a difference?" In: Thorax 58 (2003).

- ii. The variables were whether or not the patient practiced the Buteyko method (categorical) and measures of quality of life, activity, asthma symptoms and medication reduction of the patients (categorical, ordinal). It may also be reasonable to treat the ratings on a scale of 1 to 10 as discrete numerical variables.
- iii. The research question was **Do asthmatic patients who practice the Buteyko method experience improvement in their condition?**

File Creation Information

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