

# Impact of proximity of thermoelectric power plants on bronchial obstructive crisis rates

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**Background:** Environmental pollution is a risk factor for cardiorespiratory diseases. Energy generated by thermoelectric power plants (TEPP) represents a relevant source of pollution. The aim of this study was to evaluate the relationship between living near a coal-fired TEPP and the consultation rates for bronchial obstructive crises (BOC) in the province of Concepción, Chile.

**Methods:** Population-based study. The epidemiological weeks from 2012 to 2014 were analyzed.

The dependent variable was the emergency consultation rate for BOC in two health centers within 5 km of a TEPP (Coronel) and two that were more than 40 Km away from a TEPP (Talcahuano). The independent variables were the commune, climatological variables (air temperature and relative atmospheric humidity), environmental pollutants (PM<sub>10</sub>, PM<sub>2.5</sub> and nitrogen oxide), weeks with the highest consultation rate and the years. Rates, Pearson's correlation and gross risk measures were calculated and adjusted for environmental and climatological variables. **Results:** BOC rates were significantly higher in Coronel (RR = 4.9 95% CI 4.0-5.8;  $p < 0.05$ ). The PM<sub>2.5</sub> it showed the strongest correlation with BOC rates ( $r = 0.3$ ;  $p < 0.01$ ) in Coronel, but not Talcahuano. Linear regression modelling indicated that proximity to a TEPP (health center location) and temperature explained 26 and 18% of the variance in BOC rates, respectively. **Conclusions:** Rates of emergency consultation for BOC were significantly higher among a population living within 5 km of a coal-fired TEPP than those living 40 km away. © 2017 The Author(s).

Thermoelectric Power Plants

?Airway Obstruction? [Mesh]

?Chile? [Mesh]

?Environmental Pollution? [Mesh]

?Power Plants? [Mesh]

adolescent

adult

adverse effects

air pollution

analysis

Bronchial Diseases

Chile

electric power plant

environmental exposure

female

geography

human

male

middle aged

risk factor

statistical model

temperature

young adult

Adolescent

Adult

Air Pollution

Bronchial Diseases

Chile

Environmental Exposure

Female

Geography

Humans

Linear Models

Male

Middle Aged

Power Plants

Risk Factors

Temperature

Young Adult