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Implications of overpopulation in the incidence of lung cancer

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Implications of overpopulation in the incidence of lung cancer

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Abstract: *Physical activity helps to improve respiratory symptoms. However, validated endpoints are scarce and there is limited consensus on significant clinical improvement for patients.*
Key words: *overpopulation, lung cancer,*

Introduction

Physical activity helps to improve respiratory symptoms. However, validated endpoints are scarce and there is limited consensus on significant clinical improvement for patients.

Time spent in moderate to vigorous physical activity is a recently validated endpoint (1) that correlates with exercise capacity and quality of life.

Beyond exercise, physical activity includes activities of daily living such as leisure, household, transportation, and work activities.

The ability to meet the physical requirements of daily life is relevant not only for the treatment of disease, but also for improving quality of life. However, there is limited consensus on the meaningful measurement of physical activity in patients presenting with pulmonary disease.

The aim of this paper is to investigate the relationship between physical activity and incidences of lung disease in terms of its suitability as an endpoint for both patients and clinical trials.

Research question

Based on this problem, the question arises:

How does overpopulation affect lung disease by locality in Mexico?

Hypothesis

Due to the production levels required to meet the needs of the growing humanity, the pollutants to which we are exposed are increasingly harmful, resulting in the increase of respiratory diseases such as lung cancer.

Previous investigation

In recent decades, it has become widely accepted that physical activity ameliorates worsening respiratory symptoms. There is consistent evidence linking low levels of physical activity with increased frequency of exacerbations and mortality in patients with respiratory disease. For example, there is increasing evidence that increased physical activity improves asthma control and reduces exacerbation rates and health care utilization (2).

Development

Social Implications

Research on the benefits of physical activity is often promoted within the medical discourse in order to reduce the probability of disease occurrence.

Recent studies point to sedentary lifestyles as a factor that accompanies the onset and

severity of a significant number of chronic diseases. In the Latin American context, there are quite worrying figures that estimate that more than a quarter of the population over 14 years of age does not practice physical activity or sport (3).
Against this background, it is important to point out that physical activity is not properly incorporated into the collective imagination. The consequence is that a large number of citizens, in the field of health, are placed in the category of population at risk, i.e., they are potentially vulnerable to the possibility of contracting a disease.

In this sense, the lack of promotion of the habit of physical activity not only threatens the quality of life of a population, causing the appearance of diseases, but also represents an economic cost for the country.

Data Sources

- Defunciones Generales 2012 - datos.gob.mx/busca. (2012). Datos Abiertos de México. https://www.datos.gob.mx/busca/dataset/defunciones-generales-2012
- Defunciones Generales 2016 - datos.gob.mx/busca. (2016). Datos Abiertos de México. https://www.datos.gob.mx/busca/dataset/defunciones-generales-2016
- Encuesta Nacional de Salud y Nutrición. (2012). ENCUESTAS. Recuperado 23 de mayo de 2022, de https://ensanut.insp.mx/encuestas/ensanut2012/index.php
- Encuesta Nacional de Salud y Nutrición. (2016). ENCUESTAS. Recuperado 23 de mayo de 2022, de https://ensanut.insp.mx/encuestas/ensanut2016/index.php

Challenges of data sources

One of the challenges we encountered in the search for information was the lack of documentation by locality for different indicators in Mexico.

Of all the sources consulted, those mentioned above were selected because they have the information by locality that allowed us to cross-check the data.
Additionally, the data selection was reduced to the years 2012 and 2016 due to the fact that the National Health and Nutrition Survey is conducted with that periodicity.

Independent variables and dependent variable

Variable dependiente:

- Frequency of respiratory condition.

Variables independientes:

- Location
- Year of occurrence
- Average vigorous activity
- Average moderate activity
- Average walking activity

Preprocessing and data cleaning

This process consisted of eliminating duplicate records, eliminating those columns or variables that were not relevant to the analysis, transforming the records with a weighting variable, renaming the variables with names that would facilitate the understanding of the development, grouping our data by locality and filtering those records that were only for deaths due to respiratory diseases.

In addition, in order for outsiders to understand the work, a dictionary was

created with all the variables resulting from this process.

Preliminary exploratory data analysis

In the preliminary analysis of the data, we obtained that malignant bronchial or lung tumor and lung tuberculosis are the type of diseases that have a higher frequency in our data. Also, men are the ones who present more deaths of this type compared to women. Regarding the level of schooling, it is interesting to note that "Primary" or "Incomplete primary" are the levels of schooling that present more deaths. In terms of zones, the urban zone is where there are more records of deaths due to pulmonary diseases.

General approach for the model to be implemented

Is it a supervised or unsupervised learning problem?

It is a supervised learning problem since we have the dependent variable (deaths caused by lung diseases).

Is it a regression or classification problem?

This problem is classified as a regression problem because the objective of our model will be to estimate the effect of overpopulation on lung disease.

Will it prioritize prediction or inference?

The model will prioritize inference since we want to explain physical activity on health, we will not try to predict disease incidences by physical activity.

Conclusions

Exercise is a low-cost intervention, with benefits in other areas of health and quality of life. However, its effect on respiratory diseases is not clear, so for this particular purpose it is not possible to evaluate its cost-benefit ratio, due to the very low certainty of the existing evidence.

Bibliography

(1) Rocco, & Bravo-Soto. (2018, 18 agosto). Is the exercise effective for the prevention of upper respiratory tract infections? Medwave. Recuperado 24 de mayo de 2022, de https://www.medwave.cl/medios/medwave/Julio-Agosto2018/PDF/medwave-2018-04-7225.pdf

(2) Rist. (2021). Physical activity end-points in trials of chronic respiratory diseases: summary of evidence. ERJ Open Research.

(3) Ramírez, & Vinaccia. (2004, 18 agosto). El impacto de la actividad física y el deporte sobre la salud, la cognición, la socialización y el rendimiento académico: una revisión teórica. Revista de Estudios Sociales. Recuperado 24 de mayo de 2022, de http://www.scielo.org.co/pdf/res/n18/n18a08.pdf