Prevalence of chronic diseases in the communities of Miramar and Puerto de Jobos in the municipality of Guayama: one investigation per survey.

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Historical background

- During the month of February 2018, a survey study was carried out in the communities of Miramar and Puerto de Jobos of the municipality of Guayama by Dr. Luis Bonilla Soto and his graduate students of the Environmental Health Principles course (SAAM 6528).

- The experience consisted of repeating the study made by biostatistics and epidemiology students of the Graduate School of Public Health during its research project in the summer of 2016 led by Dr. Gilberto Ramos and Dr. Rosa Rosario.

- Our purpose was to determine if the prevalence of chronic diseases found in communities of interest, during 2016, had changed over a period of two years.
The images shown below describes the general process of probabilistic sampling used to select the study sample in Miramar and Puerto de Jobos.

At the end of a comparative table is presented with prevalence’s found both in the 2016 study and in the 2018 study.

The last column of the table shows the percentage difference found, due to chronic illness, between the 2016 study and the 2018 study.
Satellite Image of the communities of Miramar and Puerto de Jobos, Guayama, Puerto Rico

Google Maps Communities of Puerto de Jobos and Miramar of the municipality of Guayama. In an near area, the AES coal plant can be observed.
Map of Miramar showing the sampling conglomerates
Satellite image of Puerto de Jobos showing the sampling conglomerates

Aerial picture of Puerto de Jobos, Guayama, Puerto Rico, with conglomerates of houses identified by numbers.

Legend: Blue = conglomerate that was included in the sample.
Red - conglomerate that was not included in the sample.
Comparative table of chronic diseases prevalence in the communities of Miramar and Puerto de Jobos, Guayama (2016 and 2018)

<table>
<thead>
<tr>
<th>Type of disease or event</th>
<th>Prevalence 2016 (%)</th>
<th>Prevalence 2018 (%)</th>
<th>SE** prevalence 2018</th>
<th>95% CI Prevalence 2018</th>
<th>Difference (%) between years 2016 &amp; 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respiratory diseases</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asthma</td>
<td>17.8</td>
<td>25.5</td>
<td>0.013</td>
<td>18.3-32.1</td>
<td>-7.4</td>
</tr>
<tr>
<td>Respiratory failure</td>
<td>5.8</td>
<td>11.5</td>
<td>0.025</td>
<td>6.4-16.2</td>
<td>+5.5</td>
</tr>
<tr>
<td>Bronchitis</td>
<td>&lt;2%</td>
<td>2.5</td>
<td>0.012</td>
<td>0.10-4.9</td>
<td>+1.5</td>
</tr>
<tr>
<td>Emphysema</td>
<td>&lt;2%</td>
<td>2.5</td>
<td>0.012</td>
<td>0.10-4.9</td>
<td>-1.5</td>
</tr>
<tr>
<td>Allergic rhinitis</td>
<td>4.0</td>
<td>8.9</td>
<td>0.022</td>
<td>4.6-13.2</td>
<td>+4.9</td>
</tr>
<tr>
<td>Chronic bronchitis</td>
<td>5.8</td>
<td>8.2</td>
<td>0.022</td>
<td>3.9-10.4</td>
<td>-2.4</td>
</tr>
<tr>
<td>Lung fibrosis</td>
<td>&lt;2%</td>
<td>3.1</td>
<td>0.014</td>
<td>0.4-5.8</td>
<td>+2.1</td>
</tr>
<tr>
<td>Sinusitis</td>
<td>18.5</td>
<td>28.3</td>
<td>0.032</td>
<td>22.0-34.6</td>
<td>+9.8</td>
</tr>
<tr>
<td>Cardiovascular diseases</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All CVD</td>
<td>31.7</td>
<td>52.0</td>
<td>0.040</td>
<td>41.1-60.7</td>
<td>+19.7</td>
</tr>
<tr>
<td>Hypertension</td>
<td>29.0</td>
<td>43.4</td>
<td>0.035</td>
<td>34.6-52.2</td>
<td>+14.4</td>
</tr>
<tr>
<td>Cardiac arrhythmias</td>
<td>22.2</td>
<td>57.0</td>
<td>0.017</td>
<td>2.4-9.0</td>
<td>+3.5</td>
</tr>
<tr>
<td>Myocardium stroke</td>
<td>2.9</td>
<td>3.8</td>
<td>0.014</td>
<td>1.1-4.5</td>
<td>-0.0</td>
</tr>
<tr>
<td>Skin diseases</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Allergic contact dermatitis</td>
<td>2.2</td>
<td>11.9</td>
<td>0.027</td>
<td>6.6-17.2</td>
<td>+9.7</td>
</tr>
<tr>
<td>Hives</td>
<td>2.3</td>
<td>3.8</td>
<td>0.014</td>
<td>1.1-4.5</td>
<td>-1.5</td>
</tr>
<tr>
<td>Cancer diagnosis</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All cancers</td>
<td>4.3</td>
<td>9.4</td>
<td>0.022</td>
<td>5.1-13.7</td>
<td>-5.1</td>
</tr>
<tr>
<td>Diabetes</td>
<td>14.5</td>
<td>20.2</td>
<td>0.046</td>
<td>23.1-27.3</td>
<td>-15.7</td>
</tr>
<tr>
<td>Spontaneous abortions</td>
<td>21.6</td>
<td>9.5</td>
<td>0.023</td>
<td>5.0-14.0</td>
<td>-12.1</td>
</tr>
</tbody>
</table>

* 2018 data gathered during the month of February. The median age of the interviewed people was 64.0 years. Regarding educational level only 29.2 % of the residents completed secondary school and 44.0% had completed 11th grade or less. Therefore, 73.2% of the residents have an educational level of secondary school or less. The age group studied was ≥ 21 years old.

**SE = standard error
CONCLUSION

- The prevalence of all chronic diseases found during the 2016 study (respiratory diseases, cardiovascular diseases, diabetes, skin diseases and cancer) increased by 2018, except spontaneous abortions. The latter decreased from 21.6% (in 2016) to 9.5% (in 2018). In other words, a 12.1% decrease.

- A plausible explanation for the high prevalence of spontaneous abortions in communities of interest in Guayama, for the year 2016, is that Puerto Rico was at the height of the Zika virus epidemic. Precisely, one of the side effects of an infection of this virus in a pregnant woman is spontaneous abortions.
CONTENT ANALYSIS ARTICLE

Volume 64, Issue 1, January 2019

Springer Nature

Special issue: Environmental and health equity

Issue Editors:

• Fabian Mendez
• Yara Velez-Torres
• Martine Virieux

ISSN: 1561-8556 (Print) 1661-8564 (Online)

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Editorial

Equity, a necessary consideration in the interface between health and the environment

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Original Article

United States Congressmen support the legalization of environmental health injustice in Puerto Rico

Luis A. Bonilla-Soto Pages 59-66
United States Congressmen support the legalization of environmental health injustice in Puerto Rico

Abstract

Objectives

Analyze the role of two members of the United States Congress, two private enterprises, and the government of Puerto Rico in the approval of the counterproductive law “Ban on the Deposit and Disposal of Coal Ash or Coal Combustion Residues in Puerto Rico” (Law No. 40) in the framework of the four principles for environmental policy making.

Methods

The gathered text documents were structured, reviewed, and coded using a content analysis protocol to produce coding categories and the final analysis.

Results

Two US congressmen, apparently influenced by private enterprises, had a decisive role in the approval of Law No. 40 which failed to comply with any of the four principles for environmental public policy making.

Conclusions

Puerto Rico’s Government succumbed to the extortion strategy of two US congressmen and private economic interests, and finally approved Law No. 40 which misdirects the general public and the environmental health of two low socioeconomic status communities in the municipalities of Guayama and Ponce. This law has the potential to negatively affect public health and the environment island-wide.
SUBMISSION TO THE U. N. HUMAN RIGHTS COMMITTEE IN RELATION TO THE
LIST OF ISSUES OF THE UNITED STATES CONCERNING THE UNSAFE DUMPING AND
MISMANAGEMENT OF COAL ASH IN PUERTO RICO.
Submitted January 14, 2019

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Also on the submission:
Eduardo Cisneros
Deborah Ragbir
Trent Rehush
Dante Violette
Renlin Pan
The operation, emissions and handling of coal ash from the company AES in Puerto Rico is a case of environmental injustice, public health and violation of basic human rights.

According to the "National Academy of Sciences", in the study "Hidden Cost of Energy: Unpriced Consequences of Energy Production and Use" of 2009 the environmental and public health impact of a coal plant is $177.2 million per year (data adjusted for inflation through 2017).

The AES produces an average of 800 tons per day of coal ash because of the burning of about 8,000 tons of coal per day.

According to Frumkin (2016) the approval of environmental public health policy must comply with the following principles:

1. Environmental Justice
2. Precautionary Principle
3. The polluter pays
4. Ecological sustainability
5. Health and sustainability in all public policies.