Dental Cavities in Schoolchildren Residents, in Cerro Rico from Potosí-Bolivia. 2018

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Abstract
The Research work, had as objective quantify the presence of dental cavities, using the Index CPO-D and ceo-d, in schoolchildren residents from Cerro Rico Potosí-Bolivia and that are sheltered at the Cepromin centres (La Plata, Pailaviri and Robertito), coming from families dedicated in mining, they live in poverty and they don't have access to water drinking in a proper way.

The total population was 54 students, 28 correspond to female sex and 26 to male, varying their presence in number and sex in the different centers and are between the ages of 2 to 14 years old.

In the population index of dental cavities CPO-D, for permanent tooth parts, it was evident the more serious degree that corresponds to Plata with 6.08; Follows Robertito with 4.23, both without access to water, in addition to distant; Then there is Pailaviri with 3.32, the only one that has water in restricted time and the nearest a to the city.

In the population Index ceo-d, for temporary tooth parts, The highest cavities affection found, In Pailaviri with 7.44, contrary in relation to the permanent parts, continuous La Plata with 5.5 and finally Robertito with 5.4. The high values of both indices are listed as serious.

Keywords: Dental Cavities; Schoolchildren; Poverty Altitude; Water

Introduction
Tooth decay disease is known from prehistory, currently taking more importance, for its consequences or alterations that cause such as: chewing, deglutition, phonation and respiration they are altered by cavities and in the worst case the loss of tooth parts leads to nutritional deficiencies as severe infections.

It is a chronic, multifactorial disease, susceptible to prevention; But its prevalence is still very high and varied in the world population. Data from the World Health Organization (WHO) have shown, that by measuring this pathology, using the DMFT index at 12 years old, It is relatively high in the American continent (2.8) and in Europe (2.6), being lower in The African continent [1-3].

Epidemiological studies carried out in recent years, they have demonstrated the extraordinary reduction of dental cavities in children and young people, mainly in the industrialized countries, although it is a childhood disease that has been controlled to a certain extent, Due to the combination of different factors, such as the increase in the use of preventive products by the population, the availability of fluoride toothpastes, the efficacy of water fluorination in the sourcing and the validity de Programs in Public health.

We also have the advance in the Industrialization Process, society modernization and the changes of criteria for the diagnostic and prevention of the disease unlike the underdeveloped countries such as in Latin America where the prevalence is still high.

In America is indicated for example: In Mexico study was carried from 2012 to 2013, in six primary schools located in the territorial area of the Iztapalapa delegation, the general average of dental cavities in permanent dentition was 2.9. In Peru for the year 2009, the CPO-D index was 5.7 and in children from 12 to years old was 3.9.

According to a study in Colombia in the municipality of Andes, it was obtained with the CPO-D index, in 12-year-olds children, that 60.4% had cavities experience. In Ecuador the prevalence of dental cavities schoolchildren between 6 and 15 years old, was estimated at 75.6%, in Chile the number of damaged parts by cavities in the definitive dentition is 3.42 at the age of 12 and in children from 6 to 8 years old is 5.2 affected tooth and in the population older than 17 years 66% has cavities.

In Bolivia is mentioned according to the data from the Ministry of Health that 95% of the population suffers from it, varying according to geographical areas in a non-meaningful way. In the year of 2003 the College of Dentists, conducted a study of the CPO-D index in children under 12 years old, reaching an index of 6.7 which determines a very severe situation, in children of 9 years old was found with 6.6 and for untreated cavities at the national level it was found 84.6%. In the ceo-d index in children 5 to 9 years old was obtained 4.75, to rank according to severity ranges as serious; Another example is the Desaguadero Township, in the Department of Oruro where it was found an CPO-D Index of 6.3, it is to be noted that in our country, still missing data base, in the dental field.

Politically Bolivia is divided into nine departments, Potosí is located in the Andean region next to La Paz and Oruro, the capital of the department is the city of Potosí, its location is purely Altiplano, located at the foot of Cerro Rico, which average height of this mountain is 4800 meters above sea level, dry climate and frigid most of the year.

It is in this colossus Cerro Rico, which gave fortune from the colony, to the present day, by the inexhaustible source of its mineral wealth and attracts people looking for better conditions life; To the present are established whole families, most of them from the field or rural areas and living in subhuman conditions, because do not count in their generality, with essential basic services; as drinking water in their homes, their supply is through tank trucks and those that have such supply have a limited schedule for its supply; The living places where they reside, are made of mud and stone, located in a scattered form throughout the hill, most of these inhabitants, move on foot from one place to another and they have to travel long distances, due to the lack of bus transport lines, the common component is that they are families dedicated to mining in their various forms.

**Methodology**

The present study aims to make known the presence of dental cavities, in a quantitative way, using the Indexes of dental cavities CPO-D and ceo-d, in schoolchildren and adolescents, that are housed in the different centers, located in the periphery of Potosí city, The average height where there is inhabit is 4200 meters above sea level, the common factor is that they are: low income, they come from parents or guardians dedicated to the mining and lacking drinking water for the most part; Properly these pedagogical sites are located, in the vicinity or slopes of Cerro Rico from Potosí, which are: La Plata, Pailaviri and Robertito, administered by CEPROMIN (Mining Promotion Center) under financiamiento of foreign aid.

**Material and Methods**

This study was transversal, descriptive and observational type, performing the oral exam to schoolchildren between 2 and 14 years old, that were present at the time of the review, with the consent of the parents and the students housed in these centers, it was made under the daylight and artificial, with basic instrumental for dental exploration (mouth mirror, probe and exploratory forceps), gauze, cotton and disinfectants (DG6 and sodium hypochlorite), according to biosafety standards.

It was used for the tooth dental cavities determination, criteria or components of the Indexes CPO-D and ceo-d, which are: tooth piece with cavities, missing tooth piece, dental part clogged and tooth piece with mining indicated on the teeth unit; to obtain an average or index of cavities population Index, it is take into account the sum of each component of the index, come in the total population studied, according to WHO conformity, it was also made by a single examiner, by direct observation, all the characteristics mentioned were annotated on a form previously elaborated. Subsequently the data were tabulated and they were systematized using the EXCEL and EPI INFO programs, as well as MICROSOFT WORD.
Dental Cavities in Schoolchildren Residents, in Cerro Rico from Potosí-Bolivia. 2018

Results

<table>
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<tr>
<th>Years</th>
<th>Pailaviri</th>
<th>Sex</th>
<th>Number</th>
<th>La plata</th>
<th>Sex</th>
<th>Number</th>
<th>Robertito</th>
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<td>12</td>
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Table 1: Schoolchildren population according age and sex.
Source: Own elaboration.
Key: F: Female; M: Male.

Graph 1: School population according to age and sex
Source: Own elaboration.
Table 2: Index of dental cavities in schoolchildren of the pailaviri center.

Source: Own Elaboration

Key: INDEX CPO-D- C: Cavity Tooth; P: Lost Tooth; O: Rebuilt Tooth; INDEX ceo-d- c: Cavity Tooth; e: Extracted Tooth; o: Rebuilt Tooth.

Graph 2: CPO-D index of the pailaviri center.
### Table 3: Index of dental cavities in schoolchildren of the Plata center.

Source: Own Elaboration

**Key:** INDEX CPO-D: C: Cavity Tooth; P: Lost Tooth; O: Rebuilt Tooth; INDEX ceo-d: c: Cavity Tooth; e: Extracted Tooth; o: Rebuilt Tooth.

<table>
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<th>ceo-d Index</th>
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<td>4 years</td>
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<td>11 years</td>
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<tr>
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<tr>
<td>14 years</td>
<td>4</td>
<td>28</td>
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</tbody>
</table>

**Graph 3:** ceo-d index of the Pailaviri center

Source: Own elaboration.
**Table 4:** Index of dental cavities in schoolchildren of the Robertito Center.

Source: Own Elaboration

Key: INDEX CPO-D- C: Cavity Tooth; P: Lost Tooth; O: Rebuilt Tooth; INDEX ceo-d- c: Cavity Tooth; e: Extracted Tooth; o: Rebuilt Tooth.

**Graph 4:** Index CPO-D of Centro la Plata.

Source: Own elaboration.
Graph 5: Index ceo-d of centro la plata.
Source: Own elaboration.

Graph 6: ICPO-D index of the robertito center.
Source: Own elaboration.
Comparing the three centers, the highest CPO-D index is found in La Plata, with 6.08 which is the most distant center of all, it follows Robertito with 4.23 which has a proximity not very close to the city, both do not have drinking water and finally is Pailaviri with 3.32 the nearest and easily accessible, besides being the only one that has water.

In the ceo-d-D index unlike the previous we found greater presence of cavities in Pailaviri with 7.44, due to greater accessibility to the malls where they sale sweet it follows La Plata with 5.5 and Robertito with 5.4, data almost similarly between the two.

By the high values found in La Plata in the index of cavities as well as in the index ceo-d of 7.44 in Pailaviri, it shows us according to the cataloguing of severity of this pathology as serious, another aspect that we relate is the lack that they have in access to water which limits many of their basic needs because they influence exceedingly, being an essential element for the personal hygiene and cleaning not having this vital component, it is left aside prevention aspects for many diseases and one of them is tooth decay, so we deduce that currently it continues to be marginalized, to these populations with low resources.

The high values in tooth decay rates found in these places, show us the little attention in the dental aspect, either by the same ignorance of the population, by giving little value to the teeth and especially to temporary tooth parts or milk tooth, because they have the popular belief that it “is something transient in the mouth of the child” and it would not have an impact on permanent tooth, which turns out to be false, because many of them reach infectious processes due to the severity of their cavities.

Another point to take into account, is the lack of attention of these areas, that are not properly cared by local governments and also to general level, because there are no adequate policies in public health by ignoring the existence of these places and populations, therefore
the deduces that there are no baselines in the dental field or appropriate policies at all geographical areas; although currently the government implemented the school breakfast by existing malnutrition, which in some way helps indigent families; but it not yet managed to cover [4-22].

**Conclusions**

The observation was carried out to 25 sheltered in the center Pailaviri, 15 of them correspond to the male sex and 11 to the feminine. There were 12 in the center La Plata, 4 male and 8 female. In the center Robertito was reached at 17, 8 male and 9 were female.

It is evident of a greater number of school population in the Pailaviri center, for being the closest to the city and also because there is the largest population in general in this place; In addition it is the only center that has water in an established schedule and restricted in their homes; Unlike the other centers where, there are not drinking water in their homes, their supply is by tank trucks or wells that exist in the area.

In relation to the sex there is a greater presence in the male sex with 14 schoolchildren in Pailaviri, in relation to the other centers where there is more female presence, 8 in Robertito and 9 in La Plata, with differences between the two in not significant way.

With reference to the age it is observed taking into account the stage group from 2 to 5 years old, its presence is not very large, 10 in Pailaviri, 1 in La Plata and 4 in Robertito, because the childrens care is exclusivity of the mother, according to the Bolivian idiosyncrasy. In the group of 6 to 14 years old is more representative, 15 in Pailaviri, 11 in La Plata and 13 in Robertito, because it is school time.

In terms of the dental cavities rates we see that, in the Index CPO-D for permanent dental parts of the Pailaviri center, it was reached of 83 affected parts, in relation of the total of 25 schoolchildren, it was reached a population index of cavities with 3.32. Taking into account the ceo-d Index in temporary or milk dental pieces, it has 186 affected parts, reaching an index of cavities of 7.44.

For La Plata center, the index CPO-D is 73 permanent teeth committed, taking the total population that is 12, we reached 6.08. As for the index ceo-d we have 66 affected temporary teeth reaching an index of 5.5.

In the center Robertito was reached in the CPO-D index to 72 permanent dental pieces affected, in relation to the total of 17 schoolchildren, it was obtained an index of cavities of 4.23. And in relation to ceo-d, there are 92 temporary pieces committed, reaching an index of 5.4.

In the center Robertito was reached in the CPO-D index to 72 permanent dental pieces affected, in relation to the total of 17 schoolchildren, it was obtained an index of cavities of 4.23. And in relation to ceo-d, there are 92 temporary pieces committed, reaching an index of 5.4.

**Thanks**

To all the Staff of the Cepromin centers, that provided their accessibility for research, as well as all parents and schoolchildren of the same centers, for their detachment and collaboration.

**Annexes**

![Photo 1: Cerro rico of Potosí.](attachment:photo1.jpg)
Photo 2: Pailaviri center.

Photo 3: Robertito center.
Growth Hormone Deficiency Secondary to Intrasellar Arachnoidcele?

Photo 4: La plata center.

Photo 5: Children of the centers.

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