**Brief communication**

# Oral diagnosis in preschool children living in a marginal urban area

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**Abstract**
**Introduction.** Dental caries is a public health problem, in 2016 it affected 3500 million people. In children under six years of age, the progression of the lesion is faster, exposing them to early childhood caries and premature dental loss. **Objective.** To determine the health/disease status of the oral component of nursery school children from a school with social and economic vulnerability in the municipality of San Salvador, in 2018, according to the index and prevalence of dental caries disease. **Methodology.** The study is descriptive, quantitative, cross-sectional, prospective. The units of analysis are children between four and five years of age, respecting all ethical aspects and confidentiality. The total of the universe made up of 96 children was taken. **Results.** The frequency of dental caries in the study population is 95 %, the decayed, missing and filled caries index is 6,38, which according to the World Health Organization is very high. The most affected tooth surface is occlusal, in the upper quadrants with approximately 40 % and in the lower quadrants with approximately 20 %. **Conclusion.** The majority of the population under study suffers from dental caries, being a minority that maintains the oral cavity in an optimal state.

**Keywords**
Dental caries, oral health, oral diagnosis, DMF index, mouth diseases.

**Resumen**
**Introducción.** La caries dental es un problema de salud pública que para el año 2016 afectaba a 3500 millones de personas. En los menores de seis años, la progresión de la lesión es más rápida, exponiéndolos a la caries de la temprana infancia y pérdidas dentales prematuras. **Objetivo.** Determinar el estado de salud/enfermedad del componente bucal de niños de parvularia de un centro escolar con vulnerabilidad social y económica del municipio de San Salvador, en el año 2018, según el índice y la prevalencia de la enfermedad de caries dental. **Metodología.** El estudio es descriptivo, cuantitativo, de corte transversal, prospectivo. Las unidades de análisis son niños de cuatro y cinco años de edad, respetando todos los aspectos éticos y la confidencialidad. Se tomó el total del universo, conformado por 96 niños. **Resultados.** La frecuencia de caries dental en la población en estudio es del 95 %, el índice de dientes cariados, extraídos y obturados es de 6,38, que según la Organización Mundial de Salud es muy alto. La superficie dental más afectada es la oclusal, en los cuadrantes superiores, con un aproximado del 40 %, y en los inferiores, un aproximado del 20 %. **Conclusión.** La mayoría de la población en estudio padece de caries dental, siendo una minoría la que mantiene la cavidad bucal en estado óptimo.

**Palabras clave**
Caries dental, salud bucal, diagnóstico bucal, índice CPO, enfermedades de la boca.



**Diagnóstico bucodental en niños de parvularia residentes de una zona urbanomarginal**

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The authors declare there are no conflicts of interest.

## Introduction

The world population is affected by diseases of the stomatognathic system throughout the life cycle, which cause pain, disorders such functional, aesthetic, communication and even death; among these diseases, tooth decay is the most prevalent[1]. According to data from the World Health Organization (WHO) on the global burden of disease in 2016, tooth decay affects 3500 million people, being the most frequent disorder in permanent teeth[2].

Caries in permanent teeth has a prevalence of 40 % on a global scale, and is the most frequent condition, according to the processes evaluated by the World Dental Federation (FDI)[3]. In Asia and Latin America, the prevalence of tooth decay in schoolchildren ranges from 32,5 % to 52,7 %[4–6].

In children under six years of age, caries in early childhood is common, which is rapidly progressive and represents an international public health problem[7,8]. The disease begins in the dental enamel, demineralizing the inorganic components of the tooth; afterwards, it causes severe tooth decay, even more so if the modulating factors of the disease are not in balance[9,10].

As for oral health, the causal factors are biological, lifestyle, socioeconomic and the intervention of the dental professional who provides preventive treatments. Inequality is associated with the multicausal factors of dental caries, which determine the conditions of quality of life[11]. The most affected people by oral diseases are the most socially and economically disadvantaged, who are in a situation of vulnerability from the moment of conception, taking into account that their mother is not well nourished; if their basic needs are not met throughout the life cycle, these disparities break again the state of homeostasis of the health-disease process in the population[12].

To quantify and measure how the dental organs are affected by caries, it is not enough to present the prevalence, since it only reflects its presence; therefore, it is necessary to use the index that adds the decayed, missing and filled teeth (DMF-T) for permanent dentition. The dmf-t index is used for deciduous or temporary teeth[13].

A study on the prevalence of caries in Salvadoran school children aged seven to eight years identified that each child had an average of 9,52 teeth affected by caries, according to the criteria of the international system of detection and evaluation of caries[14]; and another study aimed at the adult population presented a prevalence of 95 %[15].

Likewise, a high rate of caries was identified in children aged six to eight, who were from economically and socially vulnerable communities in El Salvador from 2014 to 2019. Therefore, it is suggested to investigate more about socioeconomic factors and the risk of dental caries in order to reinforce oral health strategies to cover the family group[16].

The objective of this study is to determine the state of health/disease of the oral component of pre-school children of a school with social and economic vulnerability in the city of San Salvador in 2018, according to the index and prevalence of dental caries disease.

## Methodology

The study design is descriptive, cross-sectional, prospective, with a quantitative approach. For this research the entire universe was taken as the study population, which was made up of 96 children without noncommunicable diseases, between four and five years of age, from a public school located in a marginal urban area of the city of San Salvador, El Salvador, enrolled in kindergarten grades four and five.

The inclusion criteria were: children aged four to five years of age without the presence of permanent teeth; the exclusion criteria were: suffering systemic diseases that present alterations in the stomatognathic system. The variables in this study were gender, dental caries and reinfection by caries in already restored teeth. The dmf-t index was used from the variable of dental caries according to parameters established by the WHO[17].

The data was collected, through observation, by two dentists and recorded in a clinical record, as a data-collection instrument; this was taken from the file that is used in the pediatric dentistry clinic of the Dental School of the Evangelical University of El Salvador. Aspects that allowed the collection of data more effectively were simplified and validated for this study.

For the analysis of the information, a database was developed in the *Statistical Package for the Social Sciences* version 23, where the tables and frequency graphs and the mean of the dental caries index were designed, which were compared with the severity criteria established by the WHO[17] that were established on the basis of the number of decayed or lost teeth due to caries with the following categories: very low with a score from 0,0 to 1,1; from 1,2 to 2,6 is low; 2,7 to 4,4 is moderate and 4,5 to 6,5 is high.

For the development of this research, the approval of the National Committee of Ethics of Health Research of El Salvador was obtained, the parents of the participating children signed an informed consent for the development of the diagnosis and an assent was obtained from the schoolchildren where anonymity and confidentiality were always safeguarded.

## Results

In relation to the sex distribution of the population, 54,2 % were female; 85 % were

five years old, residents of an urban-marginal neighborhood of San Salvador.

Regarding the number of teeth affected by caries, 46,2 % of the study population presented from six to ten teeth with caries; 43 % of them had zero to five affected teeth and 10,7 % of them had from 11 to 17 decayed teeth (Figure 1).

24 % of the study population had reinfection due to caries in teeth that had already been previously treated. 76 % of them presented restorations in good condition.

Besides, the average is six for the dmf-t index, which means that 20 of teeth present, six or more have already had a caries experience; this reveals a prevalence of more than 95 % of caries in the study population, with a total population score of dmf-t 6,38, which is a high score according to the WHO[17]. 70,9 % of the population has a dmf-t score between 5 and 17, placed in a very high range (Table 1).

The consolidation of the dental surfaces most affected with carious lesions per quadrant highlights that the most affected is the occlusal surface both in the upper and lower arcade; quadrant III is affected by 79,1 % and quadrant IV by 78,1 %. It is followed by the mesial surface of the upper dental arch, with 21,9 % affected in quadrant I and 18,8 % in quadrant II (Table 2).

## Discussion

The prevalence of dental caries in the study population was very high and affects the majority of the population. A study conducted in schoolchildren in 2018 identified a prevalence of caries of 26,6 %[14]. The results of this research contrast with this percentage, as they show that in this sector of the population, far from decreasing the prevalence, it shows a considerable increase in the disease, which may be due to the low motivation in oral health care, the lack of oral hygiene habits and little attendance at preventive dental services[18,19].

The dmf-t score of the population under study is high, considered according to the WHO classification, which implies that of 20 primary teeth that a child between four and five years old has, six teeth already have carious lesions, which throughout the life cycle will generate premature losses of

**Table 1.** dmf-t index observed in four to five year old children in a school in San Salvador, El Salvador

| dmf-t index | Frequency | % |
|---|---|---|
| 0 | 3 | 3,1 |
| 1 | 4 | 4,2 |
| 2 | 5 | 5,2 |
| 3 | 4 | 4,2 |
| 4 | 12 | 12,5 |
| 5 | 4 | 4,2 |
| 6 | 16 | 16,7 |
| 7 | 9 | 9,4 |
| 8 | 11 | 11,5 |
| 9 | 5 | 5,2 |
| 10 | 7 | 7,3 |
| 11 | 4 | 4,2 |
| 12 | 6 | 6,3 |
| 14 | 3 | 3,1 |
| 15 | 2 | 2,1 |
| 17 | 1 | 1,0 |
| Total | 96 | 100 |

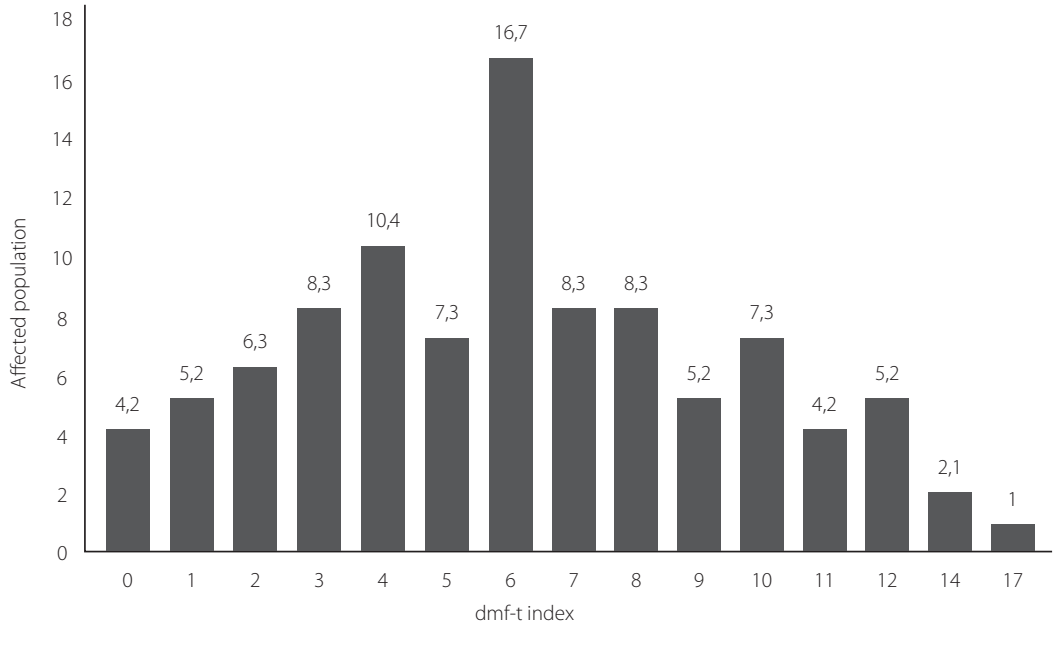


**Figure 1.** Number of teeth with caries in children between four and five years of age in a school in San Salvador, El Salvador

teeth. These results are comparable to those found by Ramírez Puerta in 2017[20], who states that in the first years of life, specifically in early childhood, the control of carious disease represents a greater challenge that must be faced and treated through preventive approaches from conception on and that cannot be faced from a germ-disease approach. It must be considered that in order to improve the oral health status of the populations, the social determinants of health must be taken into account, being crucial in the first years of life: the prevention of the spread of *Streptococcus mutans* cariogenic, the establishment of oral care habits, specifically the correct tooth brushing and a balanced diet[18].

The most affected tooth surface was the occlusal face. The occlusal surfaces belong to the molars, which due to their anatomy with grooves and fissures are more vulnerable to dental caries, since this particularity in the anatomy does not allow adequate tooth brushing[19]. The results of the research are consistent with data from a study conducted with preschool children aged four and five years of both sexes in Argentina, where it was reported that the occlusal surface was the most affected in 42,6 %[21]; Likewise, in Cuba, a study was carried out that reported the affection of the first permanent molar in children aged 6 to 11 years, in which it was found that the occlusal surfaces of the molars were the most affected by caries in 36,5 %[22].

In a study published in a population in Peru, low educational level and family income are directly related to the number of carious lesions[23]. In El Salvador, the condition of poverty in 2021 still affected 31 % of the Salvadoran population[24]. Homelessness is a real problem, given the inability of offering urbanized land, housing and adequate living conditions, it places them in a "vulnerable" condition. Therefore, it is necessary to generate alternative housing and habitat solutions, which, in principle, in the face of the expectation of a concrete urban solution, are considered transitory, but which are consolidated over time, at the edge of the increasingly intricate urban boundaries, in the so-called urban slums[25].

The population for this study is located in a geographical area classified as marginal urban, which meets the vulnerabilty characteristics described.

The main limitation was that socio-economic data were not obtained due to the security vulnerability of the area. Likewise, the sample size of the study was limited, due to the capability of the institution and the demand for initial education from the place of origin of the population, so the study had a small population that extrapolation of results is not allowed.

To control dental caries, it is necessary to propose strategies of action at an early age, covering the three levels of prevention, and thus avoid premature tooth loss[13].

It is important to establish plans and public policies that involve the health sector in the prevention of dental caries in early childhood, which allows an optimal development of the child in the first years of life: without pain when eating, being able to express themselves and smile without any health problems in their oral cavity. Therefore, it is necessary to implement preventive and educational strategies, accompanied by the placement of sealants of pits and fissures sealants in these dental organs[26]. It is important to take into account in public health policies the placement of sealants on deciduous teeth and thus reduce the condition on the occlusal surface, which is the most affected surface by its anatomy.

Morbidity from oral diseases must have a comprehensive approach that allows its reduction through public health interventions directly focused on the most common risk factors[9]. Preventive strategies begin from pregnancy, with the mother having

**Table 2.** Carious lesions by quadrant of children aged four to five in a school in San Salvador, El Salvador

| Presence of carious lesions by surface and quadrants | Quadrant I Frequency | % | Quadrant II Frequency | % | Quadrant III Frequency | % | Quadrant IV Frequency | % |
|---|---|---|---|---|---|---|---|---|
| None | 21 | 21,9 | 20 | 20,8 | 14 | 14,6 | 17 | 17,7 |
| Occlusal | 40 | 41,7 | 39 | 40,6 | 76 | 79,2 | 75 | 78,1 |
| Buccal | 6 | 6,3 | 8 | 8,3 | 0 | 0,0 | 1 | 1,0 |
| Mesial | 21 | 21,9 | 18 | 18,8 | 1 | 1,0 | 2 | 2,1 |
| Lingual/palatal | 2 | 2,1 | 3 | 3,1 | 0 | 0,0 | 0 | 0,0 |
| Distal | 6 | 6,3 | 8 | 8,3 | 5 | 5,2 | 1 | 1,0 |
| Total | 96 | 100 | 96 | 100 | 96 | 100 | 96 | 100 |

adequate diet, health education, among others. When the child is born, it is advisable not to share eating utensils to reduce the bacterial load; when the first tooth appears, attend control according to cariogenic risk at least every six months, and appropriate oral hygiene techniques allow to maintain the oral cavity without diseases[8,9]. Adequate tooth brushing with fluoride toothpaste (500 ppm in children under seven years of age), at least twice a day[8], maintains a low and constant level of fluoride in the oral cavity, and in the long term determines lower levels of incidence and prevalence of dental caries at any age, being effective preventive strategies[8].

## Conclusion

In reference to the diagnosis of oral health, the majority of the population in study suffers from dental caries, being a minority that keeps the oral cavity in optimal condition. The dmf-t score was considered high, and the most affected tooth surface is the occlusal.

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