

## Relationship between risk classifications used to organize the demand for oral health in a small city of São Paulo, Brazil

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**Abstract** *Oral health teams can work with both information of the people related to the family context as individual epidemiological through risk ratings, considering equity and service organization. The purpose of our study was to evaluate the association between tools that classify individual and family risk. The study group consisted of students from the age group of 5-6 years and 11-12 years who were classified regarding risk of caries and whether their parents had periodontal disease, in addition to the family risk. There was an association between the risk rating for decay in children (n = 128) and family risk classification with Coef C = 0.338 and p = 0.01, indicating that the higher the family's risk, the higher the risk of caries. Similarly, the association between the risk classification for periodontal disease in parents and family risk classification with Coef C = 0.5503 and p = 0.03 indicated that the higher the family risk, the higher the risk of periodontal disease. It can be concluded that the use of family risk rating tool is indicated as a possibility of ordering actions of the dental service, organizing their demand with greater equity, in this access door.*

**Key words** *Risk, Equity, Family health, Oral health*

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## Introduction

Family Health Strategy (FHS), adopted by the Brazilian Ministry of Health (MS) as a means of reorganizing Primary Health Care (PHC), brought important advances in health and living conditions of Brazilians, reaching more than half of its population<sup>1</sup>. The Oral Health Teams (OHT), inserted in the FHS, through Ordinance-MS 1,444, dated 12/28/2000, in the expectation of expansion of actions in oral health has been consolidated within the Brazilian Unified Health System (SUS)<sup>2</sup>. However, equity in access to their actions is still a problem to be faced, mainly due to the relationship of oral diseases and unfavorable socioeconomic conditions<sup>3</sup>.

SUS advocates the use of equity as a way to resolve the inequities caused by these adverse social conditions. In practice of access to health services, the use of this principle tends to be a feasible alternative from the local point of view, considering that social inequalities almost always reflect the health-disease pattern of the population and hence it is necessary to use information about the living conditions of the population<sup>3</sup> and thus prioritize those who need it the most.

OHT have a basic instrument of recognition of the reality of the territory, the register of the families of each unit. It contains basic information on the living conditions of each family and their social insertion – Form A of the Primary Health Care Information System (SIAB). Based on this instrument, Coelho and Savassi elaborated a family risk classification, aiming at establishing priorities and being a tool for evaluating and monitoring the social and economic reality in the context of the life of each family<sup>4</sup>. This tool, applied to families assigned to a health team, intends to determine their social and health risk, reflecting the potential of illness in each family unit. It is an objective tool for analyzing family risk through the use of the so-called “Sentinels of Risk”, which are the information presented in Form A and selected for their epidemiological, health and potential impact on family dynamics. Families are classified from low risk to high risk, from the sum of the scores that each sentinel receives: R1 – Low risk (score 5 or 6); R2 – Moderate risk (score 7 or 8) and R3 – High risk (score greater than 9)<sup>5</sup>.

Although the Ministry of Health is committed to the restructuring of the Primary Health Care Information System (SIAB), aiming at improving the quality of health information, through the new Health Information System for

Primary Health Care (SISAB) (SISAB), more specifically the eSUS AB with its computerized character<sup>6</sup>, where Form A is being abandoned, the proposed family risk classification thought by Coelho and Savassi will not be jeopardized, since the information collected is contemplated in the new eSUS AB proposal.

In order to provide for the principle of equity, ensuring that priority attention is given to where and for whom it is necessary, to the data on the family condition, epidemiological information should be added for the population assigned to the unit’s coverage area, considering the classification of risk to oral diseases<sup>7</sup>. This risk classification is a procedure that has been widely used to organize the demand, since it is a dynamic process of identification of patients who need immediate treatment, according to the potential of risk, health problems or suffering degree<sup>8,9</sup>.

It is well known that the adult population is at greater risk of developing periodontal disease, while children are at greater risk of developing tooth decay, and, in order to establish individual risk for planning purposes, it can be considered the most significant event for the population group to be examined and classified<sup>6</sup>. For such purpose, the Department of Health of the State of São Paulo proposes the individual risk classification, considering the disease activity to determine the priority in health care, for tooth decay and periodontal disease<sup>10</sup>, using two tools that classify individuals in three categories for the mentioned morbidities, which are: Low risk – no signs of disease activity and no previous history of disease; Moderate risk – no signs of disease activity, but with a previous history of disease; and High risk – with presence of disease activity, with or without previous history of disease<sup>7</sup>.

Studies relating the household socioeconomic context and oral morbidities (tooth decay and periodontal disease) show that families at risk are twice as likely to present dental caries disease<sup>11</sup> and that gingivitis and periodontitis present higher prevalence in populations with worse socioeconomic indicators such as income and education level<sup>12</sup>.

It is known that a major problem of the FHS, still under construction in Brazil, refers to disorderly demand, which continues to suppress organized demand within the Family Health Units (FHU). It is evident the need for tools that enable to prioritize the actions within the work process of the multiprofessional teams inserted in FHU<sup>4</sup>.

Thus, this research seeks to evaluate the relationship between the tools that make the family

and individual risk classifications for dental caries and periodontal disease in the families of the city of Ubirajara, SP, aiming to improve health care.

## Methodology

### Design, location, and period of study

This is an exploratory cross-sectional study, carried out from June 2014 to May 2015 in the city of Ubirajara, SP, Brazil, with an estimated population of 4,662 inhabitants, comprising 68.98% of the municipalities in the country, with a population of up to 20,000 inhabitants<sup>13</sup> and with fluoridation of the water supply since 21 years ago. It has 100% population coverage by the Family Health Strategy (FHS), and is assisted by three Oral Health Teams and a ratio of 1.554 inhabitants to each Surgeon-Dentist in the city.

### Population

The subjects of this study were the students of the age groups of 5-6 years, 11-12 years of age and their parents/guardians, all covered by local Family Health Units. A census was chosen with the students, because it is recommended for practical and statistical purposes, when the reference population is less than or equal to 250 individuals<sup>14</sup>, while parents/guardians were selected through simple random sampling by numerical identification of families, considering all ten micro-areas of the local FHS after the examinations of the participating students, since the numerical identification of the families by the students was already known, and also because the parents/guardians were in the residences, which would take a long time for all identified families of schoolchildren to be examined, hence the number of parents/guardians to be sampled and not to follow the census of schoolchildren.

We included all schoolchildren who were enrolled in the only two schools in the city, 140 aging 5-6 years; 98 aging 11-12 years, totaling 238 students, of both sexes. As exclusion criteria, the absence of more than three examination opportunities, families not enrolled in the FHS, and non-authorization through the Informed Consent Form were adopted.

### Research Tools

Two tools were used for individual risk classifications proposed by the Department of Health

of the State of São Paulo (SES/SP), for caries and periodontal disease, presented on Charts 1 and 2, and another for family risk classification proposed by Coelho & Savassi<sup>5</sup>, presented on Chart 3. The risk ratings for caries and periodontal disease were divided into three categories: low, moderate and high risk, considered as dependent variables according to the activity and history of the disease and scored the worst situation found.

The family risk classification was divided into four categories: no risk (score less than 5), low (score 5 or 6), moderate (score 7 or 8) and high risk (score above 9), according to the sum of scores, considering that the score of each condition or "sentinel" is attributed to the number of individuals that present it within the family, that is, if there are two hypertensive, it is scored with two (2), if two are in condition of drug addiction, it is scored with four (4), considered dependent variables.

### Data collection

The researcher responsible was the only one to collect the data, after a period of 8 hours of discussion and theoretical training of the adopted criteria, with a standard examiner. The examinations of the students took place in a school environment, under natural light, seated and using a wooden spatula; they were classified according to risk for dental caries, while the parents were examined in their homes, under natural light, seated and using a wooden spatula and classified according to risk for periodontal disease, both following the SES/SP recommendations for the adopted classifications<sup>15</sup>. A 10% rate of reviews was established to assess intra-examiner agreement. After the examination phase, the data on the Form A of the Primary Health Care Information System (SIAB) were collected, through the use of files for the family risk classification, also performed by the researcher responsible for the study. There were three opportunities for the exams to be carried out, and a meeting was held with the parents and/or persons responsible for exposing the research project and presenting the Informed Consent Form in order to be authorized and to minimize losses and non-responses, while selection bias.

### Data analysis

3x4 contingency tables were created with frequencies and percentages of individuals according to the risk of caries and periodontal dis-

**Chart 1.** Individual risk classification for dental caries, proposed by the Department of Health of the State of São Paulo.

Classification	Group	Individual Situation
Low Risk	A	Absence of carious lesion, no plaque, no gingivitis and/or active white spot lesion
	B	History of restored tooth, no plaque, no gingivitis and/or active white spot lesion
Moderate Risk	C	One or more cavities in chronic caries, but without plaque, without gingivitis and/or active white spot lesion
	D	Absence of caries lesion and/or restored tooth, but with presence of plaque, gingivitis and/or active white spot lesion
High Risk	E	One or more cavities in acute caries lesion situation
	F	Presence of pain and/or abscess

Source: Municipal Health Department of São Paulo, SP, 2012.

**Chart 2.** Individual risk classification for periodontal disease, proposed by the São Paulo State Department of Health.

Classification	Group	Individual Situation
Low Risk	0	Element with healthy periodontium
	X	Absence of element in the sextant
Moderate Risk	1	Element with gingivitis
	2	Element with supragingival calculus
	B	Sequel of previous periodontal disease
High Risk	6	Element with subgingival calculus
	8	Element with irreversible mobility and loss of function

Source: Municipal Health Department of São Paulo, SP, 2012.

**Chart 3.** Family risk classification, proposed by Coelho and Savassi<sup>5</sup>.

Form A Data (SIAB)	Score
Bedridden	3
Physical Disability	3
Mental Disability	3
Low Sanitation Conditions	3
Severe Malnutrition	3
Drug Addiction	2
Unemployment	2
Illiteracy	1
Children under 6 months	1
Over 70 years old	1
Arterial hypertension	1
Diabetes Mellitus	1
Residents/room relation	
More than 1	3
Equal to 1	2
Less Than 1	1
	<b>Low risco – Score 5 or 6</b>
	<b>Moderate risk – Score 7 or 8</b>
	<b>High risk – Score above 9</b>

Source: Nascimento et al.<sup>4</sup>.

ease according to family risk, with a significance cut-off point of 5% for significant associations. Data were analyzed according to the Coefficient of Contingency C (Coef C), indicated to analyze magnitude of associations of variables measured at the ordinal level, arranged in contingency tables k x r. Biostat 5.3 software was used.

#### Ethical aspects

The research was approved by the Research Ethics Committee of the School of Dentistry of Piracicaba – UNICAMP.

#### Results

The study included 128 students from the 238 initially identified for the census, for not presenting the authorized Informed Consent Form, absence in more than three examination opportunities and families not registered in the local FHS; 81 were of the age group of 5-6 years, and 47 of the age group of 11-12 years. From the 128 school-

children examined, 124 families were composed, because in four of them there were two brothers; from these, 30 families (24.2%) composed the parents/guardians sample with 32 subjects, since only two of them were both present and consenting to participate in the study. There was an intra-examiner agreement of 92.86% of the exams performed with the students and 87.5% of the exams performed with the parents/guardians.

Table 1 shows the distribution of the 128 students who were classified for dental caries according to the family classification:

According to this distribution, the percentage of individuals as for the risk of caries, according to family risk, shows an association between family risk and caries risk (Coef C = 0.338 and  $p = 0.0113$ ). When family risk is increased, the distribution of the subjects in the classification of caries accompanies this increase, demonstrating that the higher the family risk, the higher the risk of dental caries.

Table 2 shows the distribution of the 32 subjects (parents/guardians) who were classified for periodontal disease according to the family classification.

According to this distribution, the percentage of individuals as for periodontal risk, according to family risk, shows an association between family risk and periodontal risk (Coef C = 0.5503 and

$p = 0.0307$ ). When family risk is increased, the distribution of the subjects in the classification of periodontal risk accompanies this increase, showing a tendency of association between the two variables.

## Discussion

The guidelines of the *Política Nacional de Saúde Bucal* (Brazilian Oral Health Policy – PNSB) are aimed at ensuring that dental actions and services result from an adequate knowledge of the health reality of each locality, and, in doing so, build an effectively resolute practice<sup>16</sup>. Knowing the health reality of areas under the responsibility of FHS teams means knowing the most important individual conditions in terms of severity and prevalence of the main diseases and the family context in which they are inserted. In this study, we chose risk ratings to know this health reality. The classifications used signaled an association between family risk and individual risk, that is, when the social vulnerability of families increases, the greater the possibility of finding the higher individual risks for caries and periodontal disease. This means that those most in need of health care can be found through active family search.

**Table 1.** Frequency and percentage of schoolchildren, according to caries risk in relation to family risk. Ubirajara, SP, 2015.

Family Risk	Caries Risk							
	Low Risk		Moderate Risk		High Risk		Total	
	n	%	n	%	n	%	n	%
No Risk	43	61.43	18	25.71	9	12.86	70	100
Low Risk	15	55.56	6	22.22	6	22.22	27	100
Moderate Risk	9	42.86	2	9.52	10	47.62	21	100
High Risk	2	20.00	4	40.00	4	40.00	10	100

**Table 2.** Frequency and percentage of parents/guardians, according to periodontal risk in relation to family risk. Ubirajara, SP, 2015.

Family Risk	Periodontal Risk							
	Low Risk		Moderate Risk		High Risk		Total	
	n	%	n	%	n	%	n	%
No Risk	12	66.67	5	27.78	1	5.56	18	100
Low Risk	2	33.33	3	50.00	1	16.67	6	100
Moderate Risk	1	14.29	2	28.57	4	57.14	7	100
High Risk	0	0.00	0	0.00	1	100	1	100

Considering that the results of the study point to a tendency that the higher the family risk, the higher the individual risk of caries and periodontal disease, the identification of family risk may precede the identification of the individual risk, and the higher risk families may be the first ones to participate in the registration of oral health conditions, in order to identify individual risk<sup>7</sup>. Proactive action by OHT in this perspective, using the family risk classification tool as an ordering of actions, would allow for openness in terms of greater accessibility with fairness and organization, as spaces could be created in the agendas for the families of higher risk, and consequently their most needy members would have the opportunity to access the service. Such a proposal seems to be more feasible in the daily practice of the dental service, in terms of achievement and adherence, than to propose, for example, a general screening of all individuals, to be classified individually and to organize the demand, as demonstrated by a study by Cheachire *et al.*<sup>17</sup> in which only 7.8% of the individuals participated in a screening, with this purpose.

This sequence of action proposed, from the family to the individual field meets the guidelines of the PNSB, since it agrees with the actions that must be developed by the FHS, when performing household registration, developing activities according to planning and programming based on situational diagnosis and focusing on the family<sup>18</sup>.

In this sequence, when considering the social determinants of health and the integrality of actions, one of the factors to consider is family risk. A risk classification scale proposed by Coelho and Savassi, based on the Form A of the Primary Health Care Information System (SIAB), was used to establish priorities in the actions to families, thus emerging as a tool that allows knowing the social and economic reality of families<sup>4</sup>, as well as to organize demand, since this classification was related to individual classifications, justifying the proposition.

Some studies have already been carried out using the same risk classifications proposed by the present study, and pointed out that a high family risk ratio indicates a greater chance of developing dental caries, but also indicates that most individuals at high risk of caries belong to high-risk families<sup>11,19</sup>, corroborating our proposal in ordering the demand for family risk, showing the association between individual and family risks, which must be considered.

In a study carried out to evaluate the association of family risk with caries risk and peri-

odontal disease in the city of Santo André, SP, the authors concluded that the instruments and risk criteria used should be restructured and reassessed in other populations so that they can contribute more effectively to plan the oral health teams in the FHS<sup>17</sup>. Such study adopted the same individual risk classifications for caries and periodontal disease, proposed by the SES/SP; however, a classification of family risk elaborated by the employees of the local Health Department was used unlike the classification used in our study, a tool used and analyzed in previous studies<sup>11,19</sup>, which is the Coelho & Savassi Scale, and may be indicative that the data obtained are more reliable. In addition, we worked with different populations for individual risks (caries and periodontal disease), while in the study conducted in Santo André, SP, we applied classifications for adults, differently from what was adopted in this study.

The fact that the present study addressed the most prevalent groups for the morbidities studied, that is, caries in schoolchildren and periodontal disease in the parents/guardians, it was decided to consider the most significant aggravation for the group to establish the individual risk to be examined and classified, which would enable early identification, control and prevention of oral diseases and a search for equity in health care<sup>7</sup>. Pereira *et al.*<sup>20</sup> states that the classification of caries risk proposed by the Department of Health of the State of São Paulo (SES/SP), which was used in this study, is based on scientific evidence and also on several municipal experiences carried out in the state, and which is certainly not the only way to classify individuals, but it is a tool that is widely used because of its ease and practicality<sup>20</sup>. Another classification of caries risk, proposed by the Department of Health of the Federal District, has shown to be very different in determining the priority of dental care focused on caries when compared with that of the state of São Paulo, however it indicates that it should be prioritized together with a family risk classification<sup>10</sup>, as adopted in our study. It was not sought to analyze the limitations that such classifications may present, as several studies have shown, that the diagnostic threshold from cavity lesion does not inform epidemiologists and health managers about which lesions/individuals need preventive and non-invasive treatment. We still encounter an old view of the disease being treated in public services only through its sequel, the cavity<sup>21</sup>; but we should rather use them as recommended by the practicality that the service often demands.

In Brazil, the majority of epidemiological studies on oral health are focused on the child population, particularly in schoolchildren, mainly addressing dental caries, and there is a lack of periodontal health studies, which may hinder better planning of health services<sup>11</sup>. Therefore, we chose to classify the parents/guardians for periodontal disease because it is the population most affected by such disease. International studies have shown that gingivitis and periodontitis present higher prevalence in populations with worse socioeconomic indicators<sup>22,23</sup>, which may corroborate our findings, which proposes to adopt the family classification as an ordinator of the actions, since higher risk families tend to have greater individual problems of periodontal nature.

Barros et al.<sup>24</sup> identified that the FHS showed greater coverage among the population with worse social status; however, this coverage was still inadequate, since a small proportion of this population, precisely composed of the neediest people, did not have access to services. In addition, actions focused on these families, through the classification and providing opportunity for care, can be a palpable alternative to reach this small portion of the population.

A possible limitation of this study is the fact that the sample of parents/guardians was small (32 subjects). Another limitation is due to the fact that the initial proposal of classification of family risk adopted used the Form A of SIAB, considering that such form is in the process of being replaced. However, it does not make it infeasible, since all information or “sentinels” are part of the new information methodology to be employed by MS, the eSUS AB.

## Conclusion

We can conclude that the use of the family risk classification tool is indicated as a possibility of ordering the actions of the dental service, by the OHT, given the association evidenced among the classifications studied, pointing to a trend that the higher the family risk, the greater the individual risks for caries and periodontal disease. Such tool has the possibility to classify the families of the territory for which they are responsible in a practical way and to plan the actions, organizing their demand in its prioritization, with greater equity.

## Collaborations

J Peres Neto worked on conception, methodology, research and final writing; MLR Sousa participated in conception, methodology and final writing; KLC Mendes participated in the final writing and RS Wada participated in the statistical analysis.

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Article submitted 10/01/2015

Approved 05/10/2016

Final version submitted 05/12/2016