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# Use of the International Classification of Diseases in the analysis of dental absenteeism

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## ABSTRACT

**OBJECTIVE:** To compare the use of disease and injury classification codes in workplace absences requests due to dental causes.

**METHODS:** The study analyzed 240 requests in a federal public agency between January 2008 and December 2009. The use of the International Classification of Diseases - 10th Revision (ICD-10) was compared to the Application of the International Classification of Diseases to Dentistry and Stomatology (ICD-DA). The degree of specificity was determined for the codifications on workplace justifications, as well as for codifications assigned by official dental experts in indirect inspections and expert examinations.

**RESULTS:** Of the total number of dental certificates, 22.9% did not present the ICD, 7.1% used ICD-9, 3.3% used ICD-DA and 66.7% used ICD-10. The majority of codifications were concordant (55.1%), and greater specificity was found in codifications assigned after evaluation by official dental experts.

**CONCLUSIONS:** The results indicate the need to improve use of ICD-10 among dentists and official dental experts. For analysis of work absenteeism, it is suggested the use of ICD-DA and the International Classification of Functioning, Disability and Health, which provide relevant data for monitoring absenteeism due to dental reasons.

**DESCRIPTORS:** Absenteeism. Health Certificate. Dentistry. International Classification of Diseases. International Classification of Functioning, Disability and Health. Diseases Classification.

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## INTRODUCTION

Programs addressing the oral health of workers should be stimulated and developed based on epidemiologic knowledge, in order to promote disease reduction and improve quality of life among workers.

The value of epidemiologic information is reflected in the quality of the information system, which are important tools for planning and decision-making.<sup>8</sup>

Information is central to the health care process. A complete registry is essential for adequate follow-up of workers.

Morbidity data are fundamental for epidemiologic studies and for management, planning, organization and evaluation of health services.<sup>10,13,14</sup> According to the World Health Organization (WHO),<sup>14</sup> morbidity data should be interpreted with an understanding of data quality and diagnostic reliability.

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The method of information collection, processing, evaluation and use should follow effective technical criteria, through methods that study the worker as a whole and their relationship with the environment<sup>16</sup> and that include the complexity and richness of health phenomenon.<sup>1</sup>

WHO classifications are tools that help occupational health professionals in the clinical-epidemiologic approach to individual health in relation to occupation.<sup>16</sup> The concept of a family of health classifications was advanced for more comprehensive analysis of the health-disease process and inclusion of data beyond the diagnosis.<sup>9</sup> The International Classification of Diseases – 10th Edition (ICD-10), the International Classification of Diseases to Dentistry and Stomatology (ICD-DA) and the International Classification of Functioning, Disability and Health (ICF) belong to this group of classification.

Knowledge on the applicability and purpose of WHO classifications is indispensable for strengthening and structuring an occupational health information system. Inclusion of morbidity data on workplace absences is essential in this process.

The sick leave benefit is provided in Law No. 8,112, which discusses the legal administration of public service employees in the federal government, autonomous federal agencies and public federal foundations.<sup>a</sup> Sick leave is allowed upon official expert examination. Sick leave with lack of expert examination is conditioned on presentation of a medical or dental justification that should contain the ICD code or diagnosis.

Indirect inspection involves evaluation of sick leave by official experts based exclusively on the justification and other complementary review. The review committee consists of at least three experts.

The veracity of dental justifications should be respected, unless there is a divergence in opinion of the official dental expert in the institution that performs official reviews and evaluates occupational incapacity.<sup>b</sup>

Recent regulations that delimit the action of dentists in official expert examinations and that standardize dental examinations reinforce the importance of dental professionals in evaluation of occupational incapacity and the strengthening of relevant and consistent morbidity

data. This contributes to the construction of a health information system that supports dental health actions and policies for workers.<sup>b,c,d</sup>

Nonetheless, increased knowledge of WHO classification tools is necessary to improve information from the evaluation of occupational absenteeism.

The objective of the present study was to compare the use of disease and injury classifications in requests for occupational sick leave due to dental reasons.

## METHODS

The study was performed in a federal public service in São Paulo state, Southeastern Brazil, from January 2008 to December 2009. There were 3,518 employees active in December 2009: 1,753 in the capital and 1,765 in 37 other municipalities.

The 240 requests for workplace absence due to dental reasons were analyzed (105 in 2008 and 135 in 2009).

Justifications were classified into four groups: without ICD (no code, with a description of diagnosis or procedure performed); with ICD-9; with ICD-DA; with ICD-10.

The following situations were identified through comparative analysis of codifications on justifications and codifications by official experts: concordant (codification without change or new inclusions); discordant (other codification assigned by official experts, with changes in the three-character categories, four-character subcategories, ICD chapter or inclusion of fourth digit in the three-character category); additional code (no changes and additions with one or more codifications).

The ICD chapters are subdivided into categorical groupings of three characters, which can be divided in up to ten subcategories by use of a fourth character.<sup>14</sup>

For certificates with ICD-DA, classification of the fourth character was analyzed, and for certificates with ICD-9, equivalence with ICD-10 was determined.

The research project was approved by the Ethics Research Committee of the Dental School of São Paulo University (protocol number 111/2009, on 10 August 2009).

<sup>a</sup> Brazil. Law No. 8,112, from 11 December 1990. Describes the legal situation of public civil servants of the country, autonomous federal agencies and public federal foundations. *Diário Oficial Uniao*. 12 December 1990[cited 2010 February 24];23935. Available from: [http://www.planalto.gov.br/ccivil\\_03/Leis/L8112cons.htm](http://www.planalto.gov.br/ccivil_03/Leis/L8112cons.htm)

<sup>b</sup> Federal Dentistry Council. Resolution CFO-87, 26 May 2009. Creates norms for dental expert examination and other orders. *Diário Oficial Uniao*. 01 June 2009[cited 2010 Feb 26]Section:103. Available from: <http://cfo.org.br/servicos-e-consultas/ato-normativo?id=1356>

<sup>c</sup> Norm No. 7,003, from 9 November 2009. Regulates the licensing for health treatment described in articles 202 and 205 of Law No. 8,112, from 11 December 1990, and other orders. *Diário Oficial Uniao*. 10 Nov 2009[cited 2009 Nov 12];2. Available from: [http://www.planalto.gov.br/ccivil\\_03/\\_Ato2007-2010/2009/Decreto/D7003.htm](http://www.planalto.gov.br/ccivil_03/_Ato2007-2010/2009/Decreto/D7003.htm)

<sup>d</sup> Brazil. Law No. 11,907, from 2 February 2009. Describes the restructuring of remuneration of Careers in Official Document Collector and Assistant Document Collector. *Diário Oficial Uniao*. 03 Feb 2009[cited 2010 Feb 24];1. Available from: [http://www.planalto.gov.br/ccivil\\_03/\\_Ato2007-2010/2009/Lei/L11907.htm](http://www.planalto.gov.br/ccivil_03/_Ato2007-2010/2009/Lei/L11907.htm)

## RESULTS

The 240 requests for occupational sick leave for dental cause totaled 482 days of absenteeism. The types of evaluation undertaken are described in Table 1, which shows that the majority of sick leave requests were evaluated by indirect inspection (70.0%).

Of the justifications, 22.9% were not codified according to the ICD; 7.1% were codified by ICD-9 and 3.3% coded according to the ICD-DA. Classification according to ICD-10 was present on 66.7% of justifications.

In 55.1% of cases there was agreement between the classifications on dental justifications and the classifications made by experts. The assignment of different codes was more frequent in evaluations by official dental experts, and the additional code was defined by dental committee (Table 2).

The additions to codes involved the inclusion of code Z54.0 – convalescence following surgery.

Of classifications with three-character categories, 69% were assigned a four-character classification by official dental experts (Table 3). The combination of classifications refers to the use of more than one ICD code on the same justification.

After expert evaluation, 13 cases maintained the three-character classification category, 45 classifications had a residual category (.8 or .9) and three cases were classified as Z54.0 (Table 4).

Table 5 shows the relationship between classifications with a low degree of specificity and type of evaluation

**Table 1.** Requests for occupational sick leave for dental reasons, by type of evaluation. São Paulo, Southeastern Brazil, 2008-2009.

Type of evaluation	n	%
Indirect inspection	168	70.0
Dental expert	54	22.5
Dental committee	18	7.5
Total	240	100.0

**Table 2.** International Classification of Diseases codes after comparative analysis of codes on justifications and codes assigned by expert evaluation. São Paulo, Southeastern Brazil, 2008-2009.

Codification	Experts		Committees		Indirect inspections		Total	
	n	%	n	%	n	%	n	%
Concordant	13	36.1	4	33.3	85	62.0	102	55.1
Discordant	18	50.0	5	41.7	41	30.0	64	34.6
Additional Code	5	13.9	3	25.0	11	8.0	19	10.3
Total	36	100.0	12	100.0	137	100.0	185	100.0

performed. The residual category.9 (without other specification) was most frequent in all types of evaluation performed.

Considering total number of employees (168), the majority (76.2%) presented only one request for occupational sick leave in two years. Employees that were absent two or more times (23.8%) accounted for 46.7% of requests.

The distribution among employees with more than one request was as follows: 26 with two requests (65%), eight with three requests (20%), four with four requests (10%), one with six requests (2.5%) and one with 14 requests (2.5%).

Of the 112 cases of repeat requests, 15 were extensions immediately following expiration of a first request and 26 presented another request for sick leave within 60 days from the end of the first request.

Classifications were distributed in five chapters of ICD-10: Chapter XI – Diseases of the digestive system (n = 209); Chapter XXI – Factors influencing health status and contact with health services (n = 27); Chapter XIX – Injury, poisoning and certain other consequences of external causes (n = 2); Chapter XIII – Diseases of the musculoskeletal system and connective tissue (n = 1); and Chapter XX – External causes of morbidity and mortality (n = 1).

The main reasons for absenteeism, by order of prevalence, were: exodontal; surgery to insert implants; gingivitis and periodontal disease; extraction of impacted teeth; disorders of gingiva and edentulous alveolar ridge; pulpitis; periapical abscess without sinus.

The average duration of sick leave was two days (standard deviation – SD: 2.6; mode: 1 day; median: 1 day).

The shortest average length (1 day; SD: 0) was observed for pulpitis (K04.0), and the longest average duration (1.9 days; SD 0.7) was for impacted teeth (K01.1) among the principal nosological groups.

## DISCUSSION

Of all the justifications evaluated, 22.9% did not present an ICD. Although ICD-10 has been in effect since 1993,

**Table 3.** Codifications of dental justifications according to specificity. São Paulo, Southeastern Brazil, 2008-2009.

Codification	n	%
Codification at four-character level	114	71.3
Codification at three-character level	42	26.2
Combination of codes	4	2.5
Total	160	100.0

**Table 4.** Distribution of codes after expert evaluation, by specificity. São Paulo, Southeastern Brazil, 2008-2009.

Codification	n	%
Codification at four-character level	116	48.3
Combinations of codes	63	26.3
Codification at three-character level	13	5.4
Residual Category (.8)	7	2.9
Residual Category (.9)	38	15.8
Z54.0	3	1.3
Total	240	100.0

**Table 5.** Relationship between less specific codes and type of evaluation. São Paulo, Southeastern Brazil, 2008-2009.

Codification	Indirect Inspection	Expert	Committee	Total
Codification at three-character level	12	1	-	13
Residual Category (.8)	6	1	-	7
Residual Category (.9)	22	12	4	38
Z54.0	3	-	-	3
Total	43	14	4	61

7.1% of justifications presented classification according to ICD-9, suggesting difficulty in use, operationalization or unfamiliarity with the classification tool. In addition, new information was added in 34.6% of cases analyzed by experts.

Dentistry professionals should consider the possibility of more than one classification in order to clarify the health situation analyzed.<sup>12</sup> The possibility of a combination of classifications avoids loss of useful information for expert decision. In cases of classification for multiple diagnoses, the hierarchy of the information should be considered<sup>13</sup> and selection rules for morbidity classification should be respected.<sup>14</sup> In this study, following expert evaluation, a combination of classifications was used in over one quarter of sick leave requests (26.3%); although, the second classification was always Z54.0 (convalescence following surgery), meaning a new diagnosis was not included.

The use of four-character subcategories from ICD-10 provides greater detail in the description of the health condition observed, which allows for detailed analysis of diagnoses established and, therefore, more effective decisions and action. Health professionals that engage in classification should use the most specificity possible when classifying the diagnosis in one of the ICD categories.<sup>2,6,7,14</sup> The ICD-DA provided the highest degree of specificity through a more inclusive and consistent classification of oral diseases and oral manifestations of other diseases.<sup>3,18</sup> ICD-DA was little utilized in the justifications reviewed, which suggests a need to promote the classification among dental surgeons.

The morbidity data with classifications at the four-character level spanned 34 subcategories of the ICD in Diseases of Oral Cavity, Salivary Glands, and Jaws (K00-K14) in Chapter XI Diseases of the Digestive System. For 19 subcategories (55.9%), the ICD-DA provides greater details in diagnosis and could be used for most conditions coded according to ICD-10, supporting decision-making through indirect inspections.

The changes and additional codes that occurred following clinical evaluation suggest that more adequate and complete information could be obtained to describe the worker's health condition.

The main reasons that indirect inspections could include ICD-10 codes, changes and additions were: presence of the diagnostic basis or description of procedures performed in dental justifications and the analysis of clinic records of professionals credentialed by the dental assistance program provided to the federal public service. The description of procedures on justifications was most useful.

For the most specific information possible, the .8 and .9 residual categories should be avoided for classifications.<sup>6,7</sup> The fourth character .8 is used for other conditions that belong to the three character category, and .9 has the same meaning as the title of the three character category, without adding any information, or it is like adding "unspecified" to the category title.<sup>14</sup>

Evaluation by expert dentists allowed for codification with ICD-10 of justifications without an ICD or with ICD-9 codes and the inclusion of the fourth character in three-character codes. There were codifications of low detail categories in 25.4% of the cases, mostly due to indirect inspections, meaning improvement of information through review of justifications was impossible.

The isolated use of code Z54.0 (convalescence following surgery) on three justifications evaluated by indirect inspection does not provide information on the health condition that required surgery,<sup>12</sup> since it does not describe any condition of morbidity. For these cases, expert examination is recommended.

If the information on morbidity is insufficient or deficient on the justifications presented by public service employees, there is an investigative responsibility to improve information quality.

To improve information quality, with assignment of a code and a specific diagnosis, it is important to understand the selection rules of a primary condition for tabulation of morbidity records.<sup>14</sup> When possible, the record should separately describe other conditions or problems that were treated during the visit. It is recommended to perform codifications and analyses of multiple conditions to improve routine data.<sup>5,11,14</sup>

Health conditions codified with residual categories (.9) had greater variance in the average duration of leave, suggesting that more specific codes allow for a more precise estimate of the number of days necessary for occupational absences.

Each individual experiences health conditions differently, even if they have the same pathology.<sup>15</sup> Therefore, the same health condition can require different periods of sick leave. The isolated use of ICD-10 does not permit greater detail in the analysis of these differences, which could be recorded and investigated with the complementary use of ICD-DA and ICF.

Determination of the adequate period of sick leave for patient recuperation is fundamental to guarantee a return to work at the ideal time, without compromising the capacity to work and without promoting premature return to work in detriment to health and employee well-being.<sup>12</sup> The degree of return to work can be an indicator of quality in expert investigations.

Adequate records of health conditions related to extended sick leave contribute to the study of occupational incapacity. For sick leave extensions, the adequate use of ICD-10 can provide additional information, by providing a record of complications from surgical procedures, for example.

A predictor for absence from work is previous work absenteeism.<sup>17</sup> Of employees, 23.8% requested more than one leave from work due to dental causes. In these cases, the codification for each request should be analyzed for more detailed analysis of causes of absenteeism.

The data generated by expert evaluations allows for the organization of a database to better understand the situation<sup>4</sup> and to construct relevant indicators for monitoring absenteeism.

Understanding the logic in selecting a code assignment for a specific diagnosis is fundamental to generate relevant information. It is important to adopt protocols and to establish standards and uniform selection criteria for codes. Therefore, the construction of expert technical protocols and capacity building are fundamental to improve health information.

Since this study was descriptive and retrospective, using secondary data, it was not possible to analyze concordance between and within examiners, which is a study limitation.

The study results show the need to improve use of ICD-10 among dental professionals. It also supports the ICF use in occupational oral health studies and the need to increase dissemination of WHO classification tools among dentists. Further studies with these tools are necessary for comparison of diverse experiences.

Understanding all aspects of the human beings, including expert behavior, is important for definition of prevention strategies and to implement necessary health actions.

Currently, with the implementation of new legislation to standardize expert evaluations and delimit the functions of dentists it is critical to increase detailed analysis of aspects related to sick leave for dental reasons through the adequate use of classification systems.



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