

Frequency of ocular diseases among recipients of disability benefits in the metropolitan region of Recife, Brazil

Incapacidade para o trabalho por doenças oculares na população segurada da Previdência Social da região metropolitana do Recife, Brasil: um estudo de frequência

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ABSTRACT | Purpose: To identify the frequency of ocular diseases among recipients of disability benefits in the metropolitan region of Recife, Brazil. **Methods:** A review was performed of 217,221 cases of disability benefits granted between 2010 and 2015 by the executive managerial department of the Brazilian National Institute of Social Security (Instituto Nacional do Seguro Social [INSS]) in Recife, which encompasses 14 municipalities of the metropolitan region, including the capital. The frequencies of the identified cases of ocular morbidity were then determined according to their group in the International Classification of Diseases, 10th Revision (ICD-10), their cause, the age, sex, and income of the recipient, and the type and duration of the benefit. **Results:** Of all disability benefits granted, 5,324 (2.5%) were due to ocular disease, the majority (91.1%) consisting of sick pay. Most of the beneficiaries (64.6%) were males, were 20 to 59 years of age, and 61.2% earned the minimum wage or less. The principal ocular diseases for which sick pay benefits were granted were cataract (24.5%), conjunctivitis (21.1%), and pterygium (8.8%). Blindness and low vision were the principal ocular diseases in cases of accident indemnity and disability retirement. **Conclusions:** The results highlight the magnitude of the problem of ocular diseases to the social security system,

with serious economic and social losses, and emphasize the need for measures aimed at their prevention. Moreover, integration between the national departments of health and social security needs to be improved.

Keywords: Eye diseases; Disabled persons; Social Security; Insurance benefits; Visually impaired persons

RESUMO | Objetivo: Identificar a frequência das doenças oculares entre os segurados com benefícios por incapacidade. **Métodos:** Estudo retrospectivo de 217.221 benefícios por incapacidade concedidos pelo Instituto Nacional do Seguro Social (INSS) da gerência executiva de Recife, que engloba os 14 municípios da região metropolitana, incluindo a capital, no período de 2010-2015. Os casos de doenças oculares foram avaliados quanto à frequência considerando seu grupo na CID-10. Foi feita ainda uma análise do perfil dos benefícios concedidos por estas doenças com relação à causa, idade, sexo, faixa salarial, espécie e duração do benefício. **Resultados:** Do total dos benefícios concedidos, 5.324 foram decorrentes de doenças oftalmológicas (2,5%) e entre estes, a maioria como auxílio-doença (91,1%). Houve predomínio do sexo masculino (64,6%), faixa etária dos 20 aos 59 anos e valor de até 01 salário mínimo (61,2%). Entre as concessões de auxílio-doença a principal causa foi a catarata (24,5%), seguida pela conjuntivite (21,1%) e pterígio (8,8%). A cegueira e baixa visão foi a principal causa de auxílio-acidente e aposentadoria por invalidez. **Conclusões:** Os resultados destacam a magnitude do problema das doenças oculares para a Previdência Social, com graves perdas econômicas e sociais, e enfatizam a necessidade de medidas que visem sua prevenção e maior integração entre os serviços de saúde e o INSS (Instituto Nacional do Seguro Social).

Descritores: Oftalmopatias; Pessoas com deficiência; Previdência social; Benefícios do seguro; Pessoas com deficiência visual

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INTRODUCTION

Ocular disorders are among the most important diseases at present and constitute a major public health issue in Brazil, not only because of their impact on patients' quality of life but also because of the resulting occupational, economic, and social restrictions, including inability to work⁽¹⁾.

Loss of vision in one eye can result in a 40% decrease in an individual's ability to work, and loss of vision in both eyes can result in a complete inability to work⁽²⁾. In the work environment, different hazards may affect the eyes, including physical, chemical, microbial, and ergonomic risks, with significant harmful effects on occupational health⁽³⁾.

The Brazilian National Institute of Social Security (Instituto Nacional do Seguro Social [INSS]) uses the criteria established in the World Health Organization International Classification of Impairments, Disabilities and Handicaps to define inability to work and the impossibility of performing the specific functions involved in an activity (or occupation) as a result of morphological, psychological, or physiological alterations caused by disease or accident⁽⁴⁻⁶⁾.

The package of benefits granted by the INSS to its insured population includes three types of benefit for disability resulting from disease or accident: sick pay in the event of temporary inability to work; accident indemnity, when after the injuries have been resolved there is a definitive sequel that implies partial inability; and disability retirement, when there is total and definitive inability to work⁽⁶⁾.

In Brazil, few published studies have evaluated the reasons for granting social benefits resulting from inability to work from illness, despite the increase in benefits granted in recent years^(7,8). Studies of disability retirement are almost nonexistent, and no studies were found of the frequency of sick pay and accident indemnity granted as a consequence of ocular diseases and specific types of ocular diseases.

The main objective of the present study was to establish the importance of ocular disorders as a cause of occupational disability. The study aimed to determine the frequency of these disorders in relation to other diseases and to analyze the characteristics of the benefits granted due to ophthalmologic causes.

METHODS

This was a retrospective, descriptive, cross-sectional study including the data for all recipients of disability

benefits granted between 2010 and 2015 by the INSS in Recife, which encompasses 14 municipalities of the metropolitan region, including the capital. Benefits denied following an unfavorable report issued by the social service's medical expert were excluded from the analysis.

The data were obtained from the executive managerial department of the INSS in Recife and originated from a benefits database containing the records of all disability benefits granted (sick pay, disability retirement, and accident indemnity). The diagnoses were classified according to the International Classification of Diseases, 10th Revision (ICD-10) code registered in the records, and the percentages of benefits granted for ocular diseases were evaluated. The ocular diseases were then placed into specific groups for analysis. The groups were defined according to the similarity of the characteristics defining the nature of the lesion, the ocular tissue affected, and the frequency with which diseases belonging to that group were registered as the reason for granting the benefit.

The data on ocular diseases were evaluated according to the cause of the disease, the age, sex, and income of the recipient, the type of benefit, and the mean duration of sick pay (in days). Age groups were defined as ≤19, 20-29, 30-39, 40-49, 50-59, and ≥60 years. Income groups were defined based on the minimum wage, as recorded in the database. The mean duration of sick pay was calculated by dividing the total number of benefit days for a specific ICD-10 class by the number of benefits granted for that class.

The chi-square test was applied to compare the differences in proportions between sexes. *P* values <0.05 were considered to indicate statistical significance. The data were analyzed by the Statistical Package for the Social Sciences, version 20.

Ethical approval

The study was conducted in compliance with the ethical principles contained in the Helsinki Declaration (1964, revised in 1975, 1983, 1989, 1996, and 2000) of the World Medical Association, and those determined in Resolution 466/2012 of the Brazilian National Health Council. The consent term was waived due to the nature of the study, and the protocol was approved by the internal review board of the Federal University of Pernambuco on October 5, 2016, under reference number 1.763.461 (CAAE: 58994816.4.0000.5208).

RESULTS

During the period analyzed, 217,221 disability benefits were granted. Of these, 5,324 (2.5%) were due to ocular diseases, with 4,851 cases (91.1%) of sick pay, 428 (8%) of disability retirement, and 45 (0.9%) of accident indemnity. More than half the benefits were granted to males (64.6%) and to individuals whose income did not exceed the minimum wage (61.2%) (Table 1).

Table 2 shows the disability benefits granted as a function of different medical causes based on the 10 chapters of the ICD-10 that include the diseases that are the most frequent reasons for granting benefits. Ocular diseases, listed in chapter VII, were the eighth most common reason for granting benefits, accounting for 2.5% of all benefits and 2.3% of sick pay benefits. Ocular diseases were the seventh most common reason for granting disability retirement benefits, accounting for 4.4% of benefits. Ocular diseases were the third

most common reason for granting accident indemnity benefits, accounting for 4.7% of benefits, behind only those diseases listed in ICD-10 chapters XIX and XIII, which include external causes of injury and diseases of the musculoskeletal system and connective tissue, respectively.

The majority of benefits were granted to individuals 20 to 59 years of age. Significantly more males than females were granted all types of benefits ($p < 0.001$) (Table 3).

Cataracts (24.5%), conjunctivitis (21.1%), and pterygium (8.8%) were the most frequent reasons for granting sick pay benefits, while blindness and low vision were the most common reasons for granting disability retirement and accident indemnity benefits, accounting for 43.2% and 60% of these benefits, respectively. Glaucoma (15.6%) and retinal diseases (15.2%) were the second most common reasons for disability retirement benefits. Keratitis was the second most common reason for accident indemnity benefits, with 9 cases (20%), exceeded only by blindness and low vision, with 27 cases (60%) (Figure 1).

Diabetic retinopathy was responsible for the longest periods of sick pay, with a mean duration of 122 days, followed by blindness and low vision (94 days), retinal diseases (84.4 days), and glaucoma (74.2 days). Cataract, conjunctivitis, and pterygium, although more frequent than other conditions, required less time away from work, resulting in shorter periods of time spent on benefits (Figure 2).

DISCUSSION

Ocular diseases are prevalent in the adult Brazilian population and are consequently also among the most common causes of occupational disability^(1,9), figuring among the 10 most common causes according to the results of the present study. Other studies have shown similar results with respect to ocular diseases as the most common cause of incapacity⁽⁸⁻¹¹⁾. With regard to accident indemnity, despite the small number of cases in absolute terms (45 cases), the frequency of ocular diseases was high in comparison with other reasons for granting benefits, representing the third most common reason for this type of benefit and accounting for 4.7% of cases, coming after the leading cause, external causes of injury (87.3%), and very closely behind diseases of the musculoskeletal system and connective tissue (5.9%). The importance of ocular diseases as reasons for disability retirement and, particularly, accident indemnity benefits highlights their debilitating nature.

Table 1. General characteristics of the sample

Characteristic	n	%
Disability benefits*	217,221	100.0
Benefits due to ocular diseases	5,324	2.5
Age group (yr) [†]		
≤19	43	0.8
20-29	895	16.8
30-39	959	18.0
40-49	1,175	22.1
50-59	1,639	30.8
≥60	613	11.5
Sex [†]		
Male	3,441	64.6
Female	1,883	35.4
Income (×minimum wage) [†]		
≤1	3,257	61.2
1-2	1,516	28.5
2-3	302	5.7
3-4	176	3.3
4-5	73	1.4
Type of benefit ^{††}		
Sick pay	4,851	91.1
Accident indemnity	450	0.9
Disability retirement	428	8.0

*= Overall number of benefits granted as sick pay, accident indemnity, and disability retirement during the entire evaluation period; †= Analysis based exclusively on benefits granted for causes related to ocular diseases according to the International Classification of Diseases, 10th Revision (ICD-10) H00–H59.9.

Table 2. Benefits granted as a function of different medical causes based on the International Classification of Diseases, 10th Revision (ICD-10)

ICD-10 chapter	Sick pay			Disability retirement			Accident indemnity			Total		
	n	%	Rank order	n	%	Rank order	n	%	Rank order	n	%	Rank order
XIX - Injury, poisoning, and certain other consequences of external causes	62,086	30.1	1	1,242	12.8	4	832	87.3	1	64,160	29.5	1
XIII - Diseases of the musculoskeletal system and connective tissue	40,191	19.5	2	1,739	17.9	2	56	5.9	2	41,986	19.3	2
XI - Diseases of the digestive system	23,003	11.1	3	137	1.4	11	-	-	-	23,140	10.7	3
IX - Diseases of the circulatory system	14,863	7.2	4	2,474	25.5	1	1	0.1	7	17,338	8.0	4
II - Neoplasms	13,897	6.7	5	1,250	12.9	3	-	-	-	15,147	7.0	5
V - Mental and behavioral disorders	11,891	5.8	6	589	6.1	5	-	-	-	12,480	5.7	6
XIV - Diseases of the genitourinary system	7,927	3.8	7	351	3.6	8	-	-	-	8,278	3.8	7
VII - Diseases of the eye and adnexa	4,851	2.3	8	428	4.4	7	45	4.7	3	5,324	2.5	8
VI - Diseases of the nervous system	4,050	2.0	9	500	5.2	6	13	1.4	4	4,563	2.1	9
IV - Endocrine, nutritional, and metabolic diseases	2,512	1.2	10	312	3.2	9	1	0.1	7	2,825	1.3	10
Other chapters	21,301	10.3	NA	674	7.0	NA	5	0.5	NA	21,980	10.1	NA
Total	206,572	100.0	NA	9,696	100	NA	953	100.0	NA	217,221	100.0	NA

NA= not applicable.

Table 3. Benefits resulting from ocular diseases as a function of the type of benefit, recipient's sex, and recipient's age group

Type of benefit	Age group (yr) and sex													
	≤19		20-29		30-39		40-49		50-59		≥60		Total	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Sick pay	26	13	444	431	545	362	749	306	924	515	375	161	3,063	1,788
Disability retirement	2	-	8	3	22	15	83	25	153	40	67	10	335	93
Accident indemnity	2	-	8	1	14	1	12	-	7	-	-	-	43	2
Total	30	13	460	435	581	378	844	331	1,084	555	442	171	3,441	1,853

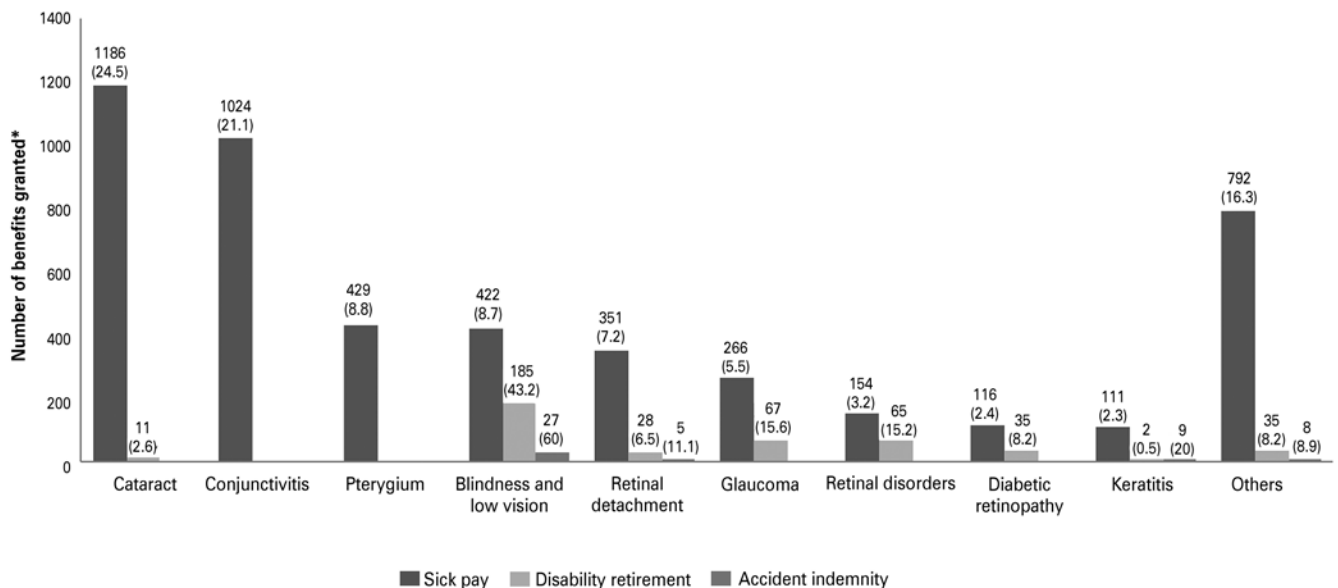


Figure 1. Principal ocular causes of sick pay, disability retirement, and accident indemnity benefits.

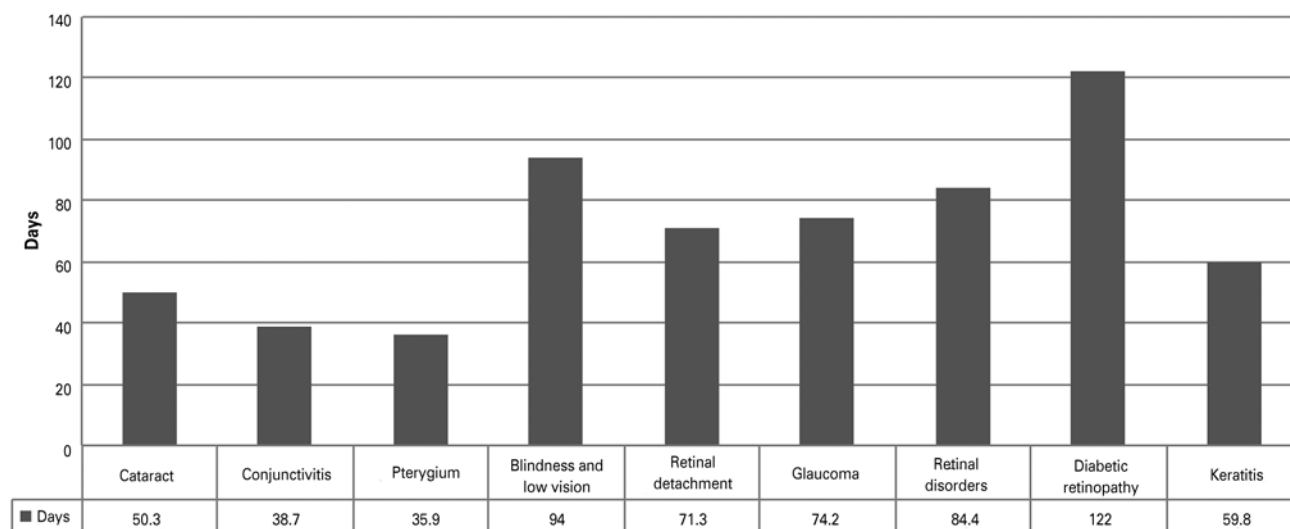


Figure 2. Mean number of days away from work for different ocular diseases.

The majority of the recipients (64.6%) were male, irrespective of the type of benefit granted or the recipient's age. Despite the increase in women's participation in the workplace in Brazil in recent years, most jobs are still held by men, with consequently greater social security coverage and greater exposure to workplace risks. Another issue that may contribute to the greater proportion of men is the fact that health policies tend to be aimed more at children, the elderly, and women, all of whom are considered vulnerable population groups, possibly resulting in the exclusion of men from agendas, from priorities, and from access to healthcare services^(7,12).

The highest proportion of benefits is granted to the 20- to 59-year age group, which corresponds to the economically active population. These data reflect the higher proportion of this population covered by social security and show the extent to which workers are affected at the peak of their productivity, resulting in severe social and economic losses^(9,12).

The low income (<1 minimum wage) of the majority of the beneficiaries (61.2%) probably reflects the fragile work contracts in the retail and service provision markets or the large proportion of self-employed freelance or unregistered workers in the geographical region evaluated in this study. Furthermore, workers with higher incomes are potentially better able to access healthcare, which will affect the outcome of disease, resulting in a lesser need for social security benefits^(9,13,14).

Of the ocular diseases recorded as a reason for sick pay benefits, cataract was the most common, being res-

ponsible for 24.5% of all cases during the period evaluated. In the general population, cataract is the principal cause of reversible blindness and is considered a public health issue in view of the number of individuals with the disease, being responsible for more than 45% of cases of low vision in Brazil⁽¹⁵⁾. Because it is easily reversible with surgery, the disability caused by cataracts is temporary in most cases⁽²⁾. Nevertheless, it should be emphasized that the INSS cannot force an individual who is receiving sick pay to undergo surgical treatment⁽⁶⁾. This, together with the fact that complications related to this disease are rare, may explain the few cases of incapacity associated with this condition (11 cases).

In addition to cataract, other common ocular disorders responsible for a considerable proportion of the ophthalmologic consultations conducted in Brazil include conjunctivitis, pterygium, glaucoma, sequelae of traumatic injury, diabetic retinopathy, uveitis, and retinal detachment^(15,16). This situation is mirrored in social security benefits, in which these diseases appear among the most common reasons for sick pay.

Blindness and low vision resulting in total and definitive incapacity for work, which are included in ICD-10 H54, were the main disorders responsible for disability retirement benefits (43.2%). In a recent study, disorders classified under ICD-10 H54 constituted the second most common overall causes of disability retirement benefits paid by INSS in Brazil, exceeded only by disorders classified under ICD-10 M54⁽¹⁰⁾. Other than blindness

and low vision, the diseases identified in this study as the principal causes of incapacity were glaucoma, retinal disorders, diabetic retinopathy, and retinal detachment, in that order. It is well known that glaucoma is the second most common cause of blindness worldwide, next to cataract, and the main cause of irreversible blindness. Diabetic retinopathy is the principal cause of preventable blindness in the working-age population^(17,18). Because glaucoma and retinal diseases, including diabetic retinopathy, affect the posterior segment of the eye, which consists of nervous tissue that does not regenerate, these diseases generally have permanent and severe visual sequelae⁽¹⁸⁾.

Keratitis was the second most frequent reason for accident indemnity, accounting for 20% of these benefits, behind blindness and low vision (60%). This is probably due to the greater exposure of the cornea to trauma, numerous microorganisms, and harmful substances, which makes it subject to the sequelae resulting from contact with these agents⁽³⁾.

Due to their greater severity or more prolonged treatment, diabetic retinopathy, retinal diseases, and glaucoma can almost double or triple the amount of time on sick pay compared with cataract, conjunctivitis, and pterygium, which are much more common. Although it is useful to compare the mean duration of sick pay for the most common ocular diseases, as analyzed here, this measure does not necessarily reflect the period required for the individual to recover clinically from the disease, since the duration of the benefit is also affected by the prolonged waiting time involved in obtaining it, that is, the delay between the request and the performance of the medical examination due to the demands on the INSS.

The findings of the present study regarding the ocular causes of disability retirement benefits are similar to those of other studies^(8,19). It was impossible to compare the results regarding sick pay and accident indemnity with those obtained by other investigators, since to the best of our knowledge there are no studies of these subjects in the peer-reviewed literature on ophthalmology. Nevertheless, the present results permit us to conclude that ocular diseases have an important role as causes of permanent and temporary occupational disability, reflecting workers' difficulty in accessing specialist healthcare services and interventions.

The aim of this study was limited to providing an epidemiological overview of the benefits granted for occupational disability, with a focus on ocular impairment.

As mentioned previously, the sole criterion used for selecting database records was based on cases containing properly filed information on the ICD-10 reference; therefore, it is impossible to discuss or speculate on the quality of the data with respect to any other variable included in the analysis. Furthermore, the generic way in which the ICD-10 classification is presently adopted by the INSS and by all the official organs should be reviewed in order to improve the accuracy of diagnosis, since various diagnoses, such as retinal disorders, are grouped together under the same label, while others, such as blindness and low vision, are vague.

Despite this limitation, this study represents an opportunity to include the benefits database as one more source of information on ocular diseases for use in epidemiological surveillance. A more defined picture of the disease profile in workers can be used to sensitize both healthcare professionals and workers to the close relationship between occupational activities, the work environment, and healthcare services and the implications of these factors for workers' health, as well as the managerial aspects involved in this relationship.

As defined in the Brazilian constitution, the social security system consists of the National Health Service (SUS) and the Social Services Department, which should act together in the prevention and control of diseases and in guaranteeing social rights. Although both institutions form part of the Social Security system, neither the SUS nor the Social Security Medical Expert Department possesses the necessary mechanisms with which to develop a system for exchanging information on diagnoses, treatments, and tests conducted on the population claiming disability benefits. The social security benefit often has to be extended until examination results are obtained and treatment at healthcare services is complete.⁽²⁰⁾ This lack of integration certainly contributes toward increasing the number of individuals unable to work because of treatable diseases, as shown in this study.

Some recommendations proposed in the study include increasing connections between the Social Services Department and the National Health Service, with the elaboration of proposals of a systemic nature, solidifying a social security model, with actions in the area of disease prevention and epidemiological surveillance. This integration may contribute toward reducing the number of disability benefits granted, reducing the time required to schedule an expert evaluation, and providing medical experts with better access to data, including updated guidelines for managing ocular diseases, as the internal manual was last reviewed in 2004⁽²¹⁾.

Another timely recommendation aimed at improving the management and granting of disability benefits consists of reviewing the medical expert's protocols in light of the new concepts of inability to work, such as those defined in the International Classification of Functioning, Disability and Health (ICF).

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21. Brasil. Ministério da Previdência Social. Instituto Nacional do Seguro Social. Diretoria de Benefícios. Orientação Interna INSS/DIRBEN No. 96/2004. Anexo I: Avaliação Médica Pericial em Doenças Oculares.