

Analyses of cataract surgery performed by the Unified Health System in Brazil, 2006–2007

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ABSTRACT

Objective. Estimate cataract surgical rates (CSR) for Brazil and each federal unit in 2006 and 2007 based on the number of surgeries performed by the Unified Health System to help plan a comprehensive ophthalmology network in order to eliminate cataract blindness in compliance with the target set by the World Health Organization (WHO) of 3 000 cataract surgeries per million inhabitants per year.

Methods. This descriptive study calculates CSR by using the number of cataract surgeries carried out by the Brazilian Unified Health System for each federal unit and estimates the need for cataract surgery in Brazil for 2006–2007, with official population data provided by the Brazilian Institute of Geography and Statistics. The number of cataract surgeries was compared with the WHO target.

Results. To reach the WHO goal for eliminating age-related cataract blindness in Brazil, 560 312 cataract surgeries in 2006 and 568 006 surgeries in 2007 needed to be done. In 2006, 179 121 cataract surgeries were done by the Unified Health System, corresponding to a CSR of 959 per million population; in 2007, 223 317 were performed, with a CSR of 1 179. With the Brazilian Council of Ophthalmology estimation of 165 000 surgeries each year by the non-public services, the CSR for Brazil would be 1 842 for 2006 and 2 051 for 2007. The proportions needed to achieve the proposed target were 38.6% in 2006 and 31.6% in 2007.

Conclusions. Human resources, technical expertise, and equipment are crucial to reach the WHO goal. Brazil has enough ophthalmologists but needs improved planning and infrastructure in order to eliminate the problem, aspects that require greater financial investment and stronger political commitment.

Key words

Cataract extraction; eye health services; Unified Health System; Brazil.

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Cataract is an increase in lens opacity that decreases visual acuity and generally occurs in people over the age of 50. It is the main cause of blindness globally and is more prevalent in developing countries (1). Prevalence varies from 12.0% to 50.0% in people over 65 years old (2).

In Brazil, in 2000, 14 536 029 inhabitants were over the age of 60, an increase of

26.0% since 1991 (3) and a larger increase than the general population growth. In addition, largely because of a fall in fertility and mortality rates, Brazilian life expectancy almost doubled during the last century, changing the age structure of the population (4).

There is a need for better understanding of the health profile of this new de-

mographic reality in order to plan for interventions that can provide more attention for the elderly on a humanitarian level and that are compatible with the socioeconomic situation of the country (4).

One goal of the World Health Organization (WHO) Vision 2020 program is to organize a comprehensive and sustainable eye health system integrated with existing health services that is able to provide high-quality eye care to all in need (5). The estimated number of blind persons age 60 or older worldwide will reach 54 million in 2020 and more than 50 million of them will be in developing countries (6). In the absence of the ability to prevent or delay cataract progression, the aging of the population will result in a significant increase in the number of persons blind due to cataract (6).

The cataract surgical rate (CSR)—the number of cataract operations per million population per year—is a quantifiable measure of the delivery of cataract surgical services. In 2005, WHO set the targets for Vision 2020 for the years 2000–2020: the global target CSR would be 3 000 per million population for the year 2010 and 4 000 per million population for the year 2020 (7).

The CSR in Brazil in 2000 was 1 344 per million population and reached 1 832 per million inhabitants in 2002, 1 787 in 2003, 1 667 in 2004, and 1 692 in 2005 (8).

In Brazil, the Ministry of Health provides funds for eye surgery to each municipality (mainly for extracapsular extraction and phacoemulsification with implanted intraocular lenses) through the Unified Health System (SUS). It is estimated that approximately 80.0% of the population and 77.0% of the elderly are SUS users (9).

Funding resources for cataract surgery underwent two changes in the past few years in Brazil. From 1999 to 2005, the Ministry of Health carried out massive cataract campaigns and resources were allocated in special payment systems, not linked to population numbers. From 2006 forward, massive strategies were abandoned and resources were allocated by projects received from municipalities according to their specific needs (10).

The aim of this study was to estimate the CSR for Brazil and each federal unit for 2006 and 2007 based on the number of surgeries performed by the SUS and to compare it with the target set by WHO to eliminate cataract-related blindness.

MATERIALS AND METHODS

This descriptive study uses secondary data sources in which population data were obtained from the Brazilian Institute of Geography and Statistics (3) and the number of age-related cataract surgeries performed in the years 2006 and 2007 was collected from the database for clinic health information of the governmental health system (DATASUS) (11).

Brazil is a South American country divided into five macro regions (north, south, northeast, southeast, and central-west) and is composed of 26 states or federation units and the Federal District of Brasília. The estimated population of Brazil for 2007 was 189 335 191 inhabitants (3). The proportion of the population age 60 or older in Brazil is 9.6%. The federation unit with the largest number of inhabitants was São Paulo, with 41 663 568, followed by Minas Gerais, with 19 719 285, both in the southeast region. The federal unit with the smallest population was Roraima, located in the north region, with 415 281 inhabitants (3).

The CSR for each unit of the federation and macro regions performed by the SUS was calculated using Excel (Microsoft, Inc., Redmond, Washington, United States of America) and did not include surgery funded by private funds and health insurance, because data for these types of surgery are not available. An indirect estimate for the number of nonpublic cataract surgeries was obtained from the Brazilian Council of Ophthalmology (CBO) (12) and was included to calculate the CSR for Brazil.

This calculation was done by using the number of surgeries performed as the numerator and the general population for 2006 and 2007 as the denominator. The target adopted for Brazil—macro regions and federal units—in compliance

with the WHO target (7) and the CBO (13) is 3 000 per million population.

The number of cataract surgeries required to meet the goal of 3 000 surgeries per million inhabitants was also calculated and the proportion of the target that was achieved was estimated. This proportion was calculated by using the number of age-related cataract surgeries performed as the numerator and the target number of surgeries (3 000) as the denominator.

RESULTS

According to official data, 179 121 cataract surgeries were performed in Brazil in 2006 (excluding privately funded surgeries), corresponding to a CSR of 959 surgeries per million inhabitants. In 2007, 223 317 surgeries were performed, corresponding to 1 179 surgeries per million inhabitants (Table 1) (11). Between 2006 and 2007, there was an increase in the number of cataract surgeries carried out, corresponding to a 22.9% increase in the CSR.

Using the CBO estimate of 165 000 surgeries done each year by the nonpublic services (12), the CSR for Brazil would be 1 842 for 2006 and 2 051 for 2007.

To reach the WHO goal for elimination of age-related cataract blindness in Brazil, a total of 560 312 cataract surgeries would need to be performed in 2006 and 568 006 in 2007. In 2006, the share needed to achieve the proposed target was 38.6% and in 2007 it was 31.6%.

Regarding macro regions, the north had the best performance in 2006, while the southeast region had the worst performance. In 2007, all regions increased their CSR, with the southeast and central-west showing the largest improvements (37.4% and 32.8%, respectively). The north region came closest to the goal of elimination (Table 1).

TABLE 1. Cataract surgeries performed by the Brazilian Unified Health System, cataract surgical rate per million population per year, and proportion of target achieved, Brazil and macro regions, 2006 and 2007

Macro region	2006			2007		
	Surgeries	CSR	% of target achieved	Surgeries	CSR	% of target achieved
North	19 714	1 312	43.7	21 464	1 399	46.6
Northeast	55 719	1 080	36.0	64 040	1 227	40.9
Southeast	63 935	804	26.8	89 128	1 105	36.8
South	28 202	1 033	34.4	33 068	1 196	39.9
Central-west	11 551	870	29.0	15 617	1 155	38.5
Total	179 121	959	43.7	223 317	1 179	39.3

Note: CSR: cataract surgical rate.

Figure 1 shows the distribution of CSR by federal unit in the year 2007 for Brazil. The CSR varied among the federal units, ranging from 0 in Acre to 3 195 in Roraima, both located in the north region.

Figures 2, 3, and 4 compare the CSR for 2006 and 2007 in the federal units of Brazil. In 2006, the federal units closest to the goal were Pará (59.2%), Paraíba (49.7%), and Mato Grosso do Sul (48.4%), while the worst results were observed in Amapá (1.3%) and Acre (2.2%).

In contrast, in 2007 federal units with the best performance in reaching the target were Roraima (106.5%), Alagoas (74.7%), Pará (66.1%), Espírito Santo (66.0%), and Mato Grosso do Sul (60.7%). No surgeries were performed in Acre by the public system that year, while Amapá continued its low performance (0.7%), followed by Rio de Janeiro (19.6%).

DISCUSSION

The National Agency for Supplementary Health of the Ministry of Health shows that coverage of the population by private health insurance in Brazil is 20.1%, ranging from 3.9% in Maranhão to 38.1% in São Paulo for the year 2007. Only five Brazilian federal units have health insurance coverage for more than 20% of their population. As most of the population uses the SUS for medical care, data analyzed for cataract surgery represent what is being utilized by a great majority of the Brazilian population (9). The decision to single out public data for the primary calculations of the study was made not only because of the availability and consistency of the data but also because the poorer segment of the population, which potentially is more vulnerable and with more difficult access to eye care services, is the major clientele of the public system.

In its definition of cataract surgical rates, WHO stated that this quantifiable measure of the delivery of cataract surgical services is meaningful only when it includes all cataract operations performed in a country, including those in the private sector and during outreach and when the population size and age structure can be defined (14).

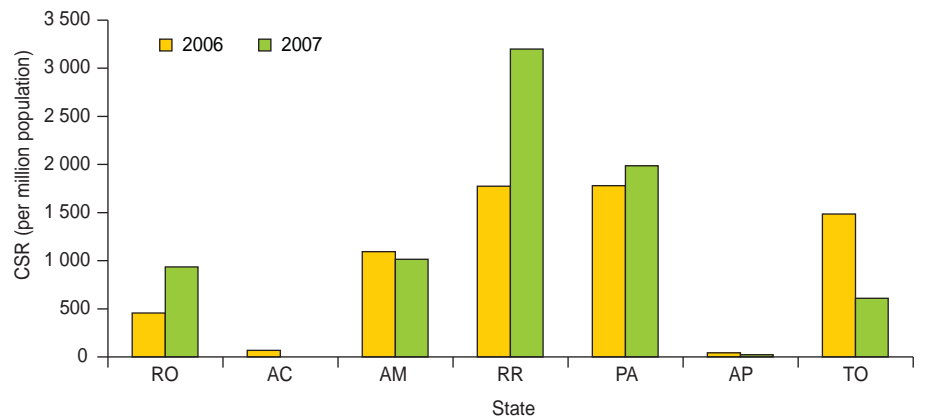
Due to the unavailability of data regarding surgeries done by nonpublic services, information was obtained from a publication of the CBO in which an indirect estimate for Brazil was made after lens manufacturers were queried (12);

FIGURE 1. Cataract surgical rate per state, Brazil, 2007



Source: P. Vieira and P. Opromolla, Nugeo-NIVE Division of Epidemiological Surveillance Center, State Health Secretariat, São Paulo, Brazil.

FIGURE 2. Cataract surgical rate per state, north region, Brazil, 2006 and 2007



Note: CSR: cataract surgical rate, RO: Rondonia, AC: Acre, AM: Amazonas, RR: Roraima, PA: Pará, AP: Amapá, TO: Tocantins.

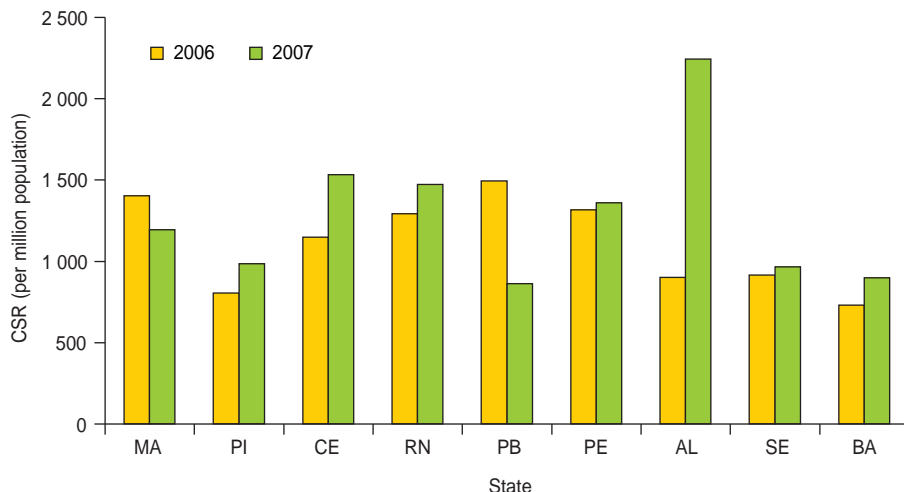
therefore, it is impossible to calculate the CSR by macro region or federal unit.

Data from WHO for 2006 showed Brazil with a cataract surgical rate of 2 234 per million inhabitants (14). Even adding the CBO estimated number obtained from the nonpublic sector, the CSR for Brazil would be 1 842 for 2006 and 2 051 for 2007, rates lower than the

number presented by WHO. Discrepancies in the numbers registered—even adding nonpublic procedures—may be due to estimates of the total number of surgeries, encompassing both public and private sectors.

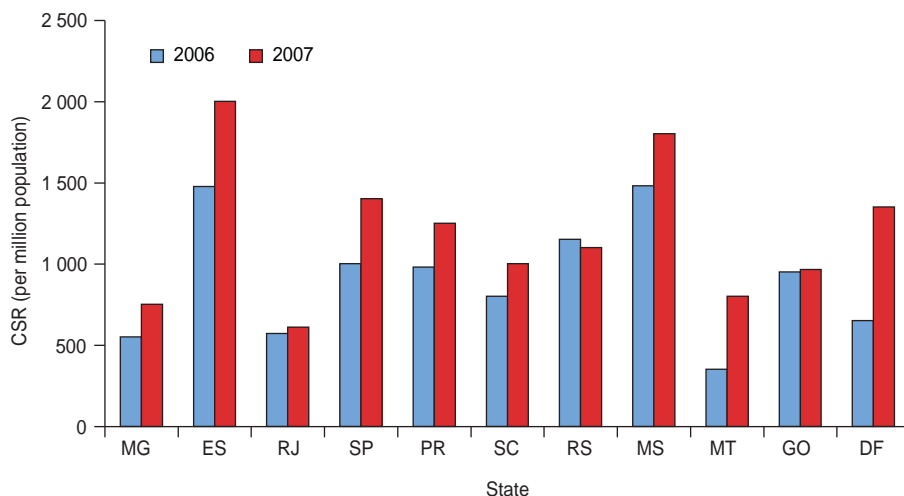
Comparing the resulting CSR for Brazil of 2 051 for the year 2007 with the WHO data indicates that Brazil had bet-

FIGURE 3. Cataract surgical rate per state, northeast region, Brazil, 2006 and 2007



Note: CSR, cataract surgical rate, MA: Maranhão, PI: Piauí, CE: Ceará, RN: Rio Grande do Norte, PB: Paraíba, PE: Pernambuco, AL: Alagoas, SE: Sergipe, BA: Bahia.

FIGURE 4. Cataract surgical rate per state, southeast, south, and central–west regions, Brazil, 2006 and 2007



Note: CSR: cataract surgical rate, MG: Minas Gerais, ES: Espírito Santo, RJ: Rio de Janeiro, SP: São Paulo, PR: Paraná, SC: Santa Catarina, RS: Rio Grande do Sul, MS: Mato Grosso do Sul, MT: Mato Grosso, GO: Goiás, DF: Distrito Federal.

ter performance than other Latin American countries, such as Argentina (1 900), Chile (1 860), and Colombia (1 700) but worse performance than Costa Rica (2 210) (14).

Brazil did not reach 50.0% of the goal proposed by WHO for 2006, partially due to a change in the way surgeries were financed by the Ministry of Health in that year. In 2007, despite better adaptation to the changes, there was little improvement in coverage, which was still far short of what is necessary.

In the five macro regions, the southeast had the overall worst performance,

despite having major ophthalmologic centers, university-trained ophthalmologists, and the largest number of ophthalmologists per capita. This area is the most developed area in Brazil, with a population age profile very similar to that of developed countries, which might require a higher CSR to eliminate blindness due to cataract (15).

Explanations for the CSR being so different among the units are that in some units few ophthalmologists work for the public health services or most of them are concentrated in the state capital, equipment is not available, or it is not in

good enough condition to undertake the task in the public services. In Brazil, due to its continental size, especially in the north, rural areas such as Acre are unreachable, even by boat, during some seasons.

Cataract surgery rates represent only part of the data needed to assess the overall situation regarding demand. To reach the goal, improved human resources, technical expertise, material, and available equipment are needed to detect cataract cases and perform surgeries (7).

Another important aspect of cataract surgery is outcome. Quality should not be sacrificed for quantity. Thus, even if the CSR increases, outcomes should remain the same or improve. In the São Paulo Eye Study, the percentage of patients having best-corrected visual acuity $\geq 20/63$ was 69.3%, and those operated on by SUS constituted 64.4% of all patients (16).

According to the CBO, in 2007, the number of ophthalmologists in Brazil was 14 055, or 1 ophthalmologist per 13 091 inhabitants (17), more than enough to cover population needs and to ensure Brazil a privileged situation in the world in relation to the ophthalmologist/population ratio.

The role of primary care teams is crucial for inclusion of elderly patients with visual problems in the eye health system, identifying those with low vision by screening, especially in difficult access areas. Strategies for promoting eye health should be designed to identify the barriers that prevent the elderly from accessing services, to increase awareness that cataract surgery can restore sight, and to encourage the acceptance of surgery (18).

When interpreting the results of this study, certain factors should be kept in mind, including that the study used secondary data, that the number of cataract surgeries done by nonpublic services was not included in the calculation for macro regions and federal units, and that different methods were used in acquiring public and nonpublic data, making them not directly comparable.

Brazil has enough ophthalmologists for the task but may be lacking the type of planning and infrastructure that would enable detection of cataracts in the elderly and achievement of the required number of cataract surgeries to eliminate blindness due to cataract.

Thus, in assembling the network for the National Policy of Ophthalmologic Care (19), planning the surgical needs of the

population in 2020 and ensuring the necessary funding should be high priorities associated with a strong political com-

mitment to eliminating age-related cataract blindness in 2020, complying with the goals stated by WHO.

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RESUMEN

Análisis de las intervenciones quirúrgicas de cataratas efectuadas en el Sistema Único de Salud del Brasil en el 2006 y el 2007

Objetivo. Calcular las tasas de cirugía de cataratas (TCC) correspondientes al 2006 y el 2007 en todo el Brasil y en cada estado según la cantidad de intervenciones efectuadas en el Sistema Único de Salud, con el objeto de planificar una red integral de atención oftalmológica tendiente a eliminar la ceguera por cataratas, en cumplimiento de la meta fijada por la Organización Mundial de la Salud (OMS), de 3 000 intervenciones quirúrgicas de cataratas por millón de habitantes por año.

Métodos. En este estudio descriptivo se calculó la TCC según la cantidad de intervenciones quirúrgicas de cataratas llevadas a cabo en el Sistema Único de Salud del Brasil en cada estado, y se calculó la necesidad de intervenciones quirúrgicas de cataratas en el Brasil en el 2006 y el 2007 según los datos oficiales de la población proporcionados por el Instituto Brasileño de Geografía y Estadística. Se comparó la cantidad de intervenciones quirúrgicas de cataratas con la meta de la OMS.

Resultados. Para alcanzar la meta de la OMS de eliminar la ceguera producida por cataratas seniles en el Brasil, deberían haberse efectuado 560 312 intervenciones quirúrgicas de cataratas en el 2006, y 568 006 en el 2007. En el 2006, se efectuaron 179 121 intervenciones quirúrgicas de cataratas en el Sistema Único de Salud, lo que representa una TCC de 959 por millón de habitantes; en el 2007, se realizaron 223 317, con una TCC de 1 179. Si estos datos se consideran junto con la estimación del Consejo Brasileño de Oftalmología de 165 000 intervenciones quirúrgicas efectuadas cada año en los servicios no públicos, la TCC correspondiente al Brasil sería de 1 842 para el 2006 y de 2 051 para el 2007. Las proporciones faltantes para lograr la meta propuesta fueron de 38,6% en el 2006 y de 31,6% en el 2007.

Conclusiones. Los recursos humanos, los conocimientos técnicos especializados y el equipo son esenciales para alcanzar la meta de la OMS. Brasil tiene suficientes oftalmólogos pero, para eliminar el problema, necesita una mejor planificación y más infraestructura, aspectos que requieren una mayor inversión financiera y un compromiso político más firme.

Palabras clave

Extracción de catarata; servicios de salud ocular; Sistema Único de Salud; Brasil.