

Post-Traumatic Reconstructive Rhinoplasty in the Brazilian Unified Health System: National Epidemiological Analysis (2015–2024)

Rinoplastia reconstrutiva pós-traumática no Sistema Único de Saúde: Análise epidemiológica nacional (2015–2024)

Serge Maurice Delgado Briceño¹  Isabella de Castro Affonso dos Santos¹ 

¹ Department of [colocar], Faculdade de Medicina do ABC (FMABC), Santo André, São Paulo, Brazil

Address for correspondence Serge Maurice Delgado Briceño, MS, Faculdade de Medicina do ABC (FMABC), Av. Lauro Gomes 2000, Vila Sacadura Cabral, Santo André, SP, 09060-870, Brazil (e-mail: sergemdb1@gmail.com).

Rev Bras Cir Plást 2026;41:s00461827776.

Abstract

Introduction Nasal deformities resulting from trauma are common and are associated with relevant functional, aesthetic, and psychosocial consequences. Despite the importance of post-traumatic reconstructive rhinoplasty within reconstructive plastic surgery, national epidemiological studies evaluating this procedure in the Brazilian Unified Health System (SUS) remain scarce.

Objective To describe temporal trends, regional distribution, admission type, length of hospital stay, and approved amounts associated with post-traumatic reconstructive rhinoplasty performed within the SUS between 2015 and 2024.

Methods This ecological, descriptive, and retrospective study was based on secondary data from the Brazilian Hospital Information System (SIH/SUS), obtained through DATASUS. All approved Hospital Admission Authorizations (AIHs) for the procedure “rhinoplasty for correction of post-traumatic defects” (SIGTAP code 04.04.02.032-1) recorded between January 2015 and December 2024 were included, with the year of care used as the temporal reference. The variables analyzed included number of approved AIHs, regional distribution, admission type, mean length of hospital stay, and approved amounts.

Results During the study period, 11,735 post-traumatic reconstructive rhinoplasties were performed within the SUS. Procedure volume decreased by more than 50% in 2020 and partially recovered in subsequent years, without returning to pre-pandemic levels by 2024. The Southeast region accounted for 57.6% of all procedures. Among AIHs, 81.3% were elective and 18.7% were emergency admissions. The mean length of hospital stay ranged from 1.1 to 1.4 days. The total amount approved by the SUS was R\$ 5,532,972.79, with a mean amount approved per AIH of R\$ 471.49.

Conclusion Post-traumatic reconstructive rhinoplasties performed within the SUS were predominantly elective, associated with short hospital stays and relatively stable

Keywords

- rhinoplasty
- plastic surgery
- facial injuries
- epidemiology
- Unified Health System

received
April 7, 2026
accepted
June 1, 2026

DOI <https://doi.org/10.1055/s-0046-1827776>.
ISSN 2177-1235.

Editor-in-Chief: Dov Charles
Goldenberg.

© 2026. The Author(s).

This is an open access article published by Thieme under the terms of the Creative Commons Attribution 4.0 International License, permitting copying and reproduction so long as the original work is given appropriate credit (<https://creativecommons.org/licenses/by/4.0/>)
Thieme Revinter Publicações Ltda., Rua Rego Freitas, 175, loja 1, República, São Paulo, SP, CEP 01220-010, Brazil

costs. The COVID-19 pandemic markedly reduced procedure volume. Although volumes partially recovered in subsequent years, they did not return to pre-pandemic annual levels during the study period. Procedures were also unevenly distributed across regions.

Resumo

Introdução As deformidades nasais decorrentes de trauma são frequentes e apresentam repercussões funcionais, estéticas e psicossociais relevantes. Apesar da importância da rinoplastia reconstrutiva pós-traumática no contexto da cirurgia plástica reconstrutiva, ainda são escassos os estudos epidemiológicos nacionais que avaliem esse procedimento no Sistema Único de Saúde (SUS).

Objetivo Descrever a evolução temporal, a distribuição regional, o caráter do atendimento, o tempo de permanência hospitalar e os valores aprovados para as rinoplastias reconstrutivas pós-traumáticas realizadas no SUS entre 2015 e 2024.

Métodos Estudo ecológico, descritivo e retrospectivo, baseado em dados secundários do Sistema de Informações Hospitalares do SUS (SIH/SUS), obtidos por meio do DATASUS. Foram incluídos todos os registros de Autorizações de Internação Hospitalar (AIHs) aprovadas referentes ao procedimento “rinoplastia para correção de defeitos pós-traumáticos” (SIGTAP: 04.04.02.032-1), realizado entre janeiro de 2015 e dezembro de 2024, tendo o ano da internação como referência temporal. As variáveis analisadas incluíram número de Autorizações de Internação Hospitalar aprovadas, distribuição regional, caráter do atendimento, tempo médio de permanência hospitalar e valores aprovados pelo SUS.

Resultados No período analisado, foram realizadas 11.735 rinoplastias reconstrutivas pós-traumáticas no SUS. Observou-se redução superior a 50% no número de procedimentos em 2020, com recuperação progressiva a partir de 2022. A região Sudeste concentrou 57,6% das cirurgias. Do total analisado, 81,3% dos atendimentos tiveram caráter eletivo e 18,7%, caráter de urgência. O tempo médio de permanência hospitalar variou de 1,1 a 1,4 dias. O valor total aprovado pelo SUS foi de R\$ 5.532.972,79, com valor médio aprovado por AIH de R\$ 471,49.

Conclusão As rinoplastias reconstrutivas pós-traumáticas realizadas no SUS tiveram caráter predominantemente eletivo, curta permanência hospitalar e custos relativamente estáveis. A pandemia de covid-19 reduziu acentuadamente o volume de procedimentos, com recuperação progressiva nos anos subsequentes, sem retorno aos níveis anuais pré-pandêmicos no período analisado. Observou-se também distribuição regional desigual.

Palavras-chave

- rinoplastia
- cirurgia plástica
- traumatismos faciais
- epidemiologia
- Sistema Único de Saúde

Introduction

Nasal deformities resulting from trauma are common in clinical practice and have relevant functional, aesthetic, and psychosocial consequences.^{1,2} Because of its central position and projection on the face, the nose is particularly susceptible to traumatic injury. In this context, nasal fractures are the most common type of facial fracture, accounting for approximately 41.8% of all facial fractures in Brazil, and are frequently associated with traffic accidents, interpersonal violence, and sports-related trauma.³⁻⁵

Post-traumatic reconstructive rhinoplasty is therefore a fundamental procedure in reconstructive plastic surgery, aimed at restoring both respiratory function and facial

harmony.^{6,7} Unlike aesthetic rhinoplasty, this procedure is directly relevant to public health because nasal trauma predominantly affects individuals aged 19 to 29 years.⁸ In this regard, studies indicate that up to 50% of patients with nasal trauma may develop post-traumatic deformities requiring rhinoplasty or septorhinoplasty.¹

In Brazil, research on post-traumatic rhinoplasty is based predominantly on case series and single-center studies focusing on surgical techniques and functional outcomes.⁹ Despite their clinical relevance, these studies do not permit for assessment of the population-level magnitude of the procedure or its regional distribution within the SUS.

The COVID-19 pandemic substantially affected the provision of elective and reconstructive surgical procedures

worldwide. Approximately 28.4 million elective surgeries are estimated to have been canceled or postponed worldwide during the 12 weeks of greatest pandemic disruption, with an abrupt reduction in surgical activity in 2020 and gradual recovery in subsequent years.¹⁰ In Brazil, SUS data showed a 46% reduction in elective procedures in 2020, corresponding to approximately 828,429 canceled procedures, followed by gradual recovery.¹¹

Post-traumatic reconstructive rhinoplasty was selected as the focus of this study because it is a typical reconstructive plastic surgery procedure, has important functional and aesthetic implications, and is assigned a specific procedure code in the SUS, enabling consistent and reproducible epidemiological analyses.

To date, no national epidemiological studies have integrated temporal trends, regional distribution, and approved amounts associated with post-traumatic reconstructive rhinoplasty in the SUS over an extended historical series that includes the COVID-19 pandemic period. Given this gap, the present study aimed to describe these aspects within the Brazilian public health system.

Methods

An ecological, descriptive, and retrospective study was conducted using publicly available secondary data from the Brazilian Unified Health System Hospital Information System (SIH/SUS), provided by DATASUS.¹²

The procedure analyzed was rhinoplasty for correction of post-traumatic defects (code: 04.04.02.032-1). All records of approved Hospital Admission Authorizations (AIHs) for this procedure performed between January 2015 and December 2024 were included, with the year of admission used as the temporal reference.

The variables analyzed were the number of approved AIHs, the region where the procedure was performed, admission type (elective or emergency), mean length of hospital stay (in days), total amount approved by the SUS, and mean amount approved per AIH.

For the admission-type variable, only the elective and emergency categories were considered, according to the classification recorded in the AIH. Records assigned to other categories not corresponding to care type were excluded from this specific analysis, and the total number of valid records is reported in the Results section.

Data were extracted in CSV format and organized, consolidated, and analyzed using spreadsheet software (Google Sheets). Analyses were exclusively descriptive, including absolute and relative frequencies, simple arithmetic means, and percentage variations.

To assess the impact of the COVID-19 pandemic, the period was stratified as follows: pre-pandemic period (2015–2019), acute pandemic phase (2020), transition period (2021), and post-pandemic period (2022–2024).

As this study used publicly available aggregated data, ethical approval was waived in accordance with Resolution No. 466/2012 of the National Health Council.

Table 1 Number of Post-Traumatic Reconstructive Rhinoplasties Performed within the SUS by Year of Admission, Brazil (2015–2024)

Year	Procedures (n)
2015	1,646
2016	1,405
2017	1,493
2018	1,419
2019	1,506
2020	660
2021	753
2022	1,068
2023	1,002
2024	783
Total	11,735

Results

Between January 2015 and December 2024, 11,735 post-traumatic reconstructive rhinoplasties were performed within the Brazilian Unified Health System, according to SIH/SUS records available through DATASUS.

Temporal Evolution of Procedures

The annual distribution of post-traumatic reconstructive rhinoplasties is presented in ►Table 1. During the pre-pandemic period (2015–2019), the mean annual number of procedures was 1,493.6. In 2020, 660 procedures were performed, representing a 55.8% reduction relative to the mean for the preceding period. In 2021, 753 procedures were recorded. The number increased to 1,068 in 2022 and subsequently decreased to 1,002 in 2023 and 783 in 2024.

Regional Distribution

The regional distribution of post-traumatic reconstructive rhinoplasties is presented in ►Table 2. The Southeast region accounted for 6,753 procedures (57.6%), followed by the South region, with 2,239 procedures (19.1%), and the

Table 2 Regional Distribution of Post-Traumatic Reconstructive Rhinoplasties Performed within the SUS, Brazil (2015–2024)

Region	n	%
North	248	2.1
Northeast	680	5.8
Southeast	6,753	57.6
South	2,239	19.1
Central-West	1,815	15.5
Brazil	11,735	100

Table 3 Admission Type of Post-Traumatic Reconstructive Rhinoplasties Performed within the SUS, Brazil (2015–2024)

Admission Type	n	%
Elective	9,470	81.3
Emergency	2,186	18.7
Total analyzed	11,656	100

Central-West region, with 1,815 (15.5%). The lowest proportions were observed in the Northeast region, with 680 procedures (5.8%), and the North region, with 248 (2.1%).

Admission Type

Of the 11,735 AIHs analyzed between 2015 and 2024, 11,656 had a valid admission-type classification. Of these, 9,470 (81.3%) were classified as elective, while 2,186 (18.7%) were performed on an emergency basis, as shown in ►Table 3.

Mean Length of Hospital Stay

The mean length of hospital stay remained low throughout the study period, ranging from 1.1 to 1.4 days, with no clinically relevant variation over time.

Approved Amounts

The amounts approved for post-traumatic reconstructive rhinoplasties are presented in ►Table 4. The total amount approved by the SUS during the analyzed period was R\$ 5,532,972.79, with an overall mean value per AIH of R\$ 471.49.

Discussion

The present study provides a comprehensive national epidemiological analysis of post-traumatic reconstructive rhino-

plasties performed within the SUS over a 10-year period, encompassing 11,735 procedures between 2015 and 2024. By integrating national data on temporal trends, regional distribution, and approved amounts, this study expands the available epidemiological knowledge on post-traumatic reconstructive rhinoplasty in the Brazilian public health system, including the COVID-19 pandemic period.

The temporal analysis showed a marked reduction in procedure volume during the pandemic. In the pre-pandemic period, the mean annual number of procedures was approximately 1,490, followed by an abrupt reduction of more than 50% in 2020. This pattern reflects the reorganization of healthcare systems during the acute phase of the pandemic, including the suspension of elective procedures and prioritization of emergency care, a trend widely described in the international surgical literature.¹³

The partial recovery observed in 2021 (753 procedures) and the increase in 2022 (1,068 procedures) characterize the transition to the post-pandemic period, consistent with the gradual resumption of surgical care. International studies have shown that, globally, plastic surgery volumes reached up to 99.8% of pre-pandemic levels during the post-vaccination period.¹⁴ However, in the present study, the volumes recorded between 2022 and 2024 (1,068, 1,002, and 783 procedures, respectively) remained below the pre-pandemic annual mean of 1,493.6 procedures, indicating that recovery did not occur uniformly during the study period. This finding may reflect particularities of the Brazilian healthcare system, as well as differences related to the type of procedure analyzed, especially post-traumatic rhinoplasty.

Regarding regional distribution, the Southeast region accounted for 57.6% of all post-traumatic rhinoplasties performed in the country. This concentration may be related to the region's higher population density, greater concentration of tertiary hospitals, and greater availability of specialized reconstructive plastic surgery services.¹⁵ The South and Central-West regions accounted for intermediate

Table 4 Amounts Approved for Post-Traumatic Reconstructive Rhinoplasties Performed within the SUS by Year of Admission, Brazil (2015–2024)

Year	Total Approved Amount (R\$)	Mean Approved Amount per AIH (R\$)
2015	799,497.05	485.72
2016	637,790.41	453.94
2017	683,644.21	457.9
2018	664,013.02	467.94
2019	681,541.01	452.55
2020	305,916.82	463.51
2021	344,259.10	457.18
2022	492,362.58	461.01
2023	484,554.23	483.59
2024	439,394.36	561.17
Total (2015–2024)	5,532,972.79	—
Overall mean	—	471.49

Abbreviation: AIH, Hospital Admission Authorization.

participation, suggesting relatively structured availability of the procedure. In contrast, the North and Northeast regions accounted for substantially lower proportions, possibly reflecting access barriers, lower availability of specialized services, or the need for interstate patient travel.

The predominance of elective admissions, observed in approximately 81% of AIHs, suggests that most post-traumatic reconstructive rhinoplasties in the SUS are performed in a planned manner, after clinical stabilization and appropriate surgical planning. This profile is consistent with reconstructive plastic surgery practice, in which definitive correction of traumatic nasal deformities often occurs outside the acute setting.¹⁶ The proportion of emergency admissions highlights the heterogeneity of clinical scenarios associated with nasal trauma.

The mean length of hospital stay remained low throughout the study period, ranging from 1.1 to 1.4 days, without clinically relevant differences between the analyzed periods. This finding indicates a short-stay hospital care profile and shows that the mean duration of hospitalization varied little, even during the temporary reduction in surgical volume during the pandemic.

From an economic perspective, the total amount approved by the SUS during the study period was R\$ 5,532,972.79, with an overall mean of R\$ 471.49 per AIH, remaining relatively stable over time. The stability of the mean amount suggests that the financial impact of the pandemic was more related to the reduction in the number of procedures performed than to changes in unit values defined by the SUS reimbursement table.

Limitations

The limitations of this study are inherent to the use of secondary administrative databases, such as the absence of individual-level information, including sex, age group, surgical technique employed, mechanism of injury, and injury severity.

Despite these limitations, SIH/SUS data allow the national volume of the procedure to be estimated and temporal trends, regional patterns, and approved amounts to be analyzed, which are relevant to healthcare planning and the development of public policies in reconstructive plastic surgery.

Conclusion

Rhinoplasties for correction of post-traumatic defects performed within the SUS between 2015 and 2024 were predominantly elective, associated with short hospital stays and relatively stable costs, with a marked reduction in procedure volume during the COVID-19 pandemic, followed by progressive recovery in subsequent years, although pre-pandemic levels were not fully reestablished. An unequal regional distribution was also observed, with greater concentration in the Southeast region, reflecting disparities in the availability of specialized services. Therefore, this study provides an updated national overview of the healthcare and

economic profile of post-traumatic reconstructive rhinoplasty in the SUS, contributing to the planning of reconstructive plastic surgery within the public health system.

Data Availability Statement

Data will be available upon request to the corresponding author.

Authors' Contributions

SMDB: Conception and design of the study, data analysis and interpretation, drafting of the manuscript; ICAS: Critical revision of the manuscript and final approval.

Financial Support

The authors declare that they did not receive funding from agencies in the public, private, or non-profit sectors to conduct the present study.

Conflict of Interest

The authors declare that they have no conflict of interest.

References

- Higuera S, Lee EI, Cole P, Hollier LH Jr, Stal S. Nasal trauma and the deviated nose. *Plast Reconstr Surg* 2007;120(7, Suppl 2):64S–75S. Doi: 10.1097/01.prs.0000260722.91183.50
- de Lima Ramos S, Hochman B, Gomes HC, et al Effect of nasal deviation on quality of life. *Plast Reconstr Surg* 2011;128(01): 132–136. Doi: 10.1097/PRS.0b013e3182173d51
- Sindi A, Abaalkhail Y, Malas M, Alghamdi A, Joharji M. Patients With Nasal Fracture. *J Craniofac Surg* 2020;31(03):e275–e277. Doi: 10.1097/SCS.00000000000006269
- Hwang K, Ki SJ, Ko SH. Etiology of Nasal Bone Fractures. *J Craniofac Surg* 2017;28(03):785–788. Doi: 10.1097/SCS.00000000000003477
- de Lucena AL, da Silva Filho GF, de Almeida Pinto Sarmento TC, de Carvalho SH, Fonseca FR, de Santana Sarmento DJ. Epidemiological Profile of Facial Fractures and Their Relationship With Clinical-Epidemiological Variables. *J Craniofac Surg* 2016;27(02): 345–349. Doi: 10.1097/SCS.00000000000002381
- Corey CL, Most SP. Treatment of nasal obstruction in the post-traumatic nose. *Otolaryngol Clin North Am* 2009;42(03): 567–578. Doi: 10.1016/j.otc.2009.03.002
- Jadczak M, Krzywdzińska S, Rozbicki P, Jurkiewicz D. The Crooked Nose-Surgical Algorithm in Post-Traumatic Patient-Evaluation of Surgical Sequence. *J Clin Med* 2024;14(01):87. Doi: 10.3390/jcm14010087
- Sun Y, Zhang L, Wang P, et al Study of 2,881 Nasal Bone Fractures using Multivariate Analysis. *Altern Ther Health Med* 2024;30(05): 180–184
- Arruda F, Gonçalves P, Florencio P, Valadao W, Valle T. Epidemiological profile of patients undergoing rhinoplasty in a hospital rehabilitation center. *Revista Brasileira de Cirurgia Plástica (RBCP)* -. *Br J Plast Surg* 2021;36;. Doi: 10.5935/2177-1235.2021RBCP0007
- COVIDSurg Collaborative. Elective surgery cancellations due to the COVID-19 pandemic: global predictive modelling to inform surgical recovery plans. *Br J Surg* 2020;107(11):1440–1449. Doi: 10.1002/bjs.11746
- Frio GS, Russo LX, de Albuquerque CP, et al The disruption of elective procedures due to COVID-19 in Brazil in 2020. *Sci Rep* 2022;12(01):10942. Doi: 10.1038/s41598-022-13746-5
- BRASIL. Ministério da Saúde. Departamento de Informática do Sistema Único de Saúde (DATASUS). Sistema de Informações

- Hospitales do SUS (SIH/SUS). Brasília: Ministério da Saúde; 2025 [cited 2025 Jan]. Available from: <https://datasus.saude.gov.br>
- 13 Mylonakis A, Kalfoutzou A, Panagakis A, Despotidis M, Yfantopoulos J. The Impact of the COVID-19 Pandemic on Surgical Activities: A Single-Center Experience and Literature Review. *Cureus* 2022;14(10):e30785. Doi: 10.7759/cureus.30785
 - 14 Ghoshal S, Rigney G, Cheng D, et al Institutional Surgical Response and Associated Volume Trends Throughout the COVID-19 Pandemic and Postvaccination Recovery Period. *JAMA Netw Open* 2022;5(08):e2227443. Doi: 10.1001/jamanetworkopen.2022.27443
 - 15 BRASIL. Ministério da Saúde. Regionalização da atenção à saúde no Sistema Único de Saúde. Brasília: Ministério da Saúde; 2018
 - 16 Ishii LE, Tollefson TT, Basura GJ, et al Clinical Practice Guideline: Improving Nasal Form and Function after Rhinoplasty. *Otolaryngol Head Neck Surg* 2017;156(2_suppl, suppl):S1–S30. Doi: 10.1177/0194599816683153