Salud, Ciencia y Tecnología. 2025; 5:2267
doi: 10.56294/saludcyt20252267

ORIGINAL

Maxillofacial surgery and waiting lists in the Concepción public health network. Observational study

Cirugía maxilofacial y listas de espera en la red de salud pública de Concepción. Estudio observacional

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Cite as: Fuentes-Barría H, Pérez-Villouta C, Sanchez-Uribe G, Arias-Carrasco V, López-Soto OP, Aristizábal-Hoyos JA, et al. Maxillofacial surgery and waiting lists in the Concepción public health network. Observational study. Salud, Ciencia y Tecnología. 2025; 5:2267. https://doi.org/10.56294/saludcyt20252267

Submitted: 11-03-2025 **Revised:** 18-06-2025 **Accepted:** 25-09-2025 **Published:** 26-09-2025

Editor: Prof. Dr. William Castillo-González

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ABSTRACT

Introduction: to analyze minor maxillofacial surgery care and the accumulated demand on waiting lists in public healthcare facilities of the Concepción Health Service between 2022 and 2024.
Method: observational, descriptive, cross-sectional study based on records from the Concepción Health Service. The sample included six public healthcare centers (Guillermo Grant Benavente Hospital, Víctor Manuel Fernández Primary Health Center, Coronel Hospital, Lota Hospital, Santa Juana Hospital, and Florida Hospital). Absolute and relative frequencies were described, and Pearson's Chi-square test was applied for inferential analysis ($p < 0,05$), complemented by effect size estimation using Cramer's V.
Results: between 2022 and 2024, a sustained increase in consultations and follow-up visits was observed, with the majority concentrated at Hospital Guillermo Grant Benavente (74,3 % and 75 % in 2024). Other centers showed relevant but decreasing participation. The most frequent interventions included minor outpatient surgery and treatment of dentoalveolar trauma, with an increase in procedures performed under general anesthesia in 2024. Significant differences were identified between years and centers ($p < 0,001$), with effect sizes ranging from moderate to low ($W = 0,07–0,71$).
Conclusion: minor maxillofacial surgery in the public system shows a marked gap between demand and response capacity, highlighting a structural deficit in oral healthcare services.

Keywords: Oral Surgical Procedures; Maxillofacial Surgery; Health Services Accessibility; Waiting lists; Health Care Disparities.

RESUMEN

Introducción: analizar las atenciones de cirugía maxilofacial y la demanda acumulada en listas de espera en los establecimientos de la red pública del Servicio de Salud Concepción durante el periodo 2022–2024.
Método: estudio observacional, descriptivo y transversal, basado en registros del Servicio de Salud Concepción. La muestra incluyó seis centros de la red pública (Hospital Guillermo Grant Benavente, CESFAM Víctor Manuel Fernández, Hospital Coronel, Hospital Lota, Hospital Santa Juana y Hospital Florida). Se describieron frecuencias absolutas y relativas, y para el análisis inferencial se aplicó la prueba Chi de Pearson ($p < 0,05$), complementada con el tamaño del efecto mediante la V de Cramer.

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Resultados: entre 2022 y 2024 se observó un incremento sostenido de consultas y controles, concentrándose la mayoría en el Hospital Guillermo Grant Benavente (74,3 % y 75 % en 2024). Otros centros mostraron participación relevante pero decreciente. Las intervenciones más frecuentes incluyeron cirugía ambulatoria menor y tratamiento de traumatismos dentoalveolares, con aumento de procedimientos bajo anestesia general en 2024. Se identificaron diferencias significativas entre años y centros ($p < 0,001$), con tamaños de efecto moderados a bajos ($V = 0,07–0,71$).
Conclusión: la cirugía maxilofacial menor en el sistema público presenta una marcada brecha entre demanda y capacidad de respuesta, evidenciando una deuda estructural en los servicios de salud bucal.

Palabras clave: Procedimientos Quirúrgicos Orales; Cirugía Oral; Accesibilidad a los Servicios de Salud; Lista de Espera; Disparidades en la Atención Médica.

INTRODUCTION

Timely access to specialized care in minor maxillofacial surgery is a structural problem at the national level within the Chilean public health system.[1]

The growing demand for these services has exceeded the capacity of public health facilities, resulting in long waiting lists in various regions of the country, both in urban and peri-urban areas. This situation not only affects the quality of life of patients, who experience delays in the resolution of pathologies that impact their oral health and general well-being, but also compromises fundamental principles of the health system, such as equity, timeliness, and efficiency of care.[2,3,4]

The gap between healthcare needs and effective resolution capacity is due to multiple structural and operational factors. These include the limited availability of maxillofacial surgery specialists, the insufficient supply of operating rooms, the prioritization of pathologies included in the State Health Guarantees (GES) regime over other dental needs, and territorial and organizational planning that is not always based on epidemiological evidence.[5]

These factors converge in the formation of surgical waiting lists, which have become a tangible indicator of a strained system, where low-complexity interventions that could be resolved at lower levels of care end up saturating the capacity of hospitals and primary care centers.[2,3,4,5,6] In addition, waiting lists reflect territorial and socioeconomic inequalities, showing that patients from certain communities or with less access to the health network face significantly longer waiting times. The lack of coordination between levels of care and the limited availability of systematic information on accumulated demand hinder effective planning and optimal resource allocation, perpetuating the saturation of the network.[2,3,4,7]

In this context, having accurate information on the resolution of waiting lists is key to designing management strategies that optimize resources, enable more equitable and efficient care, and align the supply of services with the real needs of the territory.[2,3,4,7] For this reason, the present study aimed to analyze maxillofacial surgery care and the accumulated demand on waiting lists in the public network establishments of the Concepción Health Service during the period 2022 to 2024, in order to provide relevant evidence for decision-making in health policy and surgical management.

METHOD

Design

This cross-sectional study was conducted in accordance with the guidelines *"STrengthening the Reporting of OBservational studies in Epidemiology (STROBE)"* in conjunction with *"Guidelines for Accurate and Transparent Health Estimates Reporting (GATHER)"*.[8,9] The data were obtained through Chilean Law No. 20.285 on access to public information,[10] which means that ethical approval was not required as the data were public according to the Declaration of Helsinki.[11]

Context

In Chile, the province of Concepción has a population of approximately 421 000 people, according to estimates from the 2024 National Census.[12] The province of Concepción has a concentration of establishments of varying levels of complexity, from referral hospitals to primary care centers, forming a heterogeneous healthcare network where dental and surgical care is distributed. This scenario faces structural limitations derived from high demand and insufficient capacity in healthcare centers, which has led to long waiting lists, creating an urgent need to describe and understand the main factors involved in this problem.

Participants

The population of this study considered data from patients over 18 years of age reported on the waiting list for minor maxillofacial surgery in public health facilities belonging to the Concepción Health Service during

the period 2022 to 2024. This data included a network of six health centers in the province of Concepción (Guillermo Grant Benavente Hospital, Víctor Manuel Fernández CESFAM, Coronel Hospital, Lota Hospital, Santa Juana Hospital, and Florida Hospital). The data requested under Chilean Law No. 20,285 on access to public information considered the following eligibility criteria when generating the request:[10]

- Patients over 18 years of age.
- Public establishments with a record of maxillofacial surgery services.
- Maxillofacial surgery procedures recorded in the monthly statistical summaries (REM) A09 between 2022 and 2024.
- Active surgical waiting lists for maxillofacial surgery.

Variables

- New consultations: the first medical care a patient receives at a health facility for a specific condition, with no history of that condition at that center. This indicator allows for the evaluation of the initial demand for services and the system's capacity to absorb new consultations. The proportion of new consultations relative to total care allows for the identification of patterns of health service use and possible barriers to access.[13,14]
- Interconsultation: request for evaluation or care by another specialist within the health facility or network, which allows for analysis of the complexity of the case and the need for referrals within the system.[3]
- Check-ups: in operational terms, these are understood as scheduled medical follow-up appointments for previously diagnosed patients, with the aim of monitoring the evolution of their condition and ensuring the continuity and effectiveness of treatment, allowing for the evaluation of the quality of care, adherence to clinical protocols, and long-term care management. Their proportion also reflects the capacity of a health system to maintain continuity of care.[14]
- Treatments: these include all medical interventions applied during care, such as surgical and pharmacological procedures, which are useful for measuring the intensity and type of care provided, as well as the use of clinical resources within each center.[14,15]
- Treatment of dentoalveolar trauma: Specific procedures aimed at repairing traumatic injuries to teeth and surrounding tissues, relevant for identifying the frequency of emergency and trauma care.[3]
- Type of surgery: classification of surgical procedures performed, including minor outpatient surgery, major outpatient surgery, and major non-outpatient surgery, to analyze the distribution of the surgical burden according to complexity.[16]
- Care under general anesthesia: record of procedures performed under general anesthesia, used as an indicator of complexity and resources required in surgical care.[17]
- Administrative discharges: these correspond to hospital discharges that do not result directly from the medical resolution of the patient's condition, but rather from administrative processes such as transfers to other facilities, changes in coverage, deaths, or administrative records. They are useful for measuring administrative efficiency and hospital flow management, as well as for correctly interpreting discharge rates in institutional performance analyses.[18,19]
- Post-discharge follow-ups: these refer to medical follow-ups performed after hospital discharge to monitor the patient's recovery, detect possible complications, and ensure continuity of treatment. This variable allows for the evaluation of the effectiveness of care transition processes and coordination between levels of care.[18,19]

Sample size

The sample size was calculated using population data from the province of Concepción according to the 2024 Census, which reports 421 000 inhabitants.[12] To determine a representative sample, a confidence level of 95 %, a margin of error of 5 %, and an estimated proportion of 0,5 were considered, since there were no previous data on the distribution of the variables of interest. Applying the formula for a finite population: n= E2 (N−1) + Z2 p(1−p) N Z2 p(1−p)

The calculation yielded an approximate sample size of 384 participants, sufficient to reliably represent the province's population in relation to the variables studied. This approach ensures that the results are generalizable and statistically robust within the established parameters, since the six health centers provided information on 14 619 for the period 2022, 17 731 for 2023, and 12 844 for 2024.

Biases

This study presents several potential sources of bias that should be considered when interpreting the results. First, there is a geographical bias, given that the research is limited to the province of Concepción, which limits the generalization of the findings to other areas with different demographic, epidemiological, or health

service access characteristics.[20] Second, there is a selection bias, as only patients registered on waiting lists in public facilities during the study period were included, excluding those who were not formally registered or whose information was incomplete, which may underestimate the true demand for care.[21] Finally, a bias due to administrative coding was identified, resulting from the absence of a unique code to differentiate between pediatric dentistry and maxillofacial surgery procedures in the allocation of operating rooms; this makes it difficult to accurately determine the actual number of scheduled maxillofacial surgeries and may bias the estimate of demand. For these reasons, the results should be interpreted taking into account these limitations inherent in the design and administrative records used.[21]

Statistical analysis

The data were analyzed using IBM SPSS Statistics software for Windows, version 27. Absolute and relative frequencies were used to describe the qualitative variables. In the inferential analysis, Pearson's chi-square test was applied, considering a significance level of $\alpha = 0,05$ for all analyses.[22,23] Additionally, the effect size for qualitative variables was calculated using Cramer's V, considering the classification values according to the degrees of freedom.[23]

RESULTS AND DISCUSSION

Table 1 shows the annual distribution of activities related to maxillofacial surgery and traumatology in different health centers between 2022 and 2024. The Guillermo Grant Benavente Hospital stands out as the main care center, concentrating the majority of new consultations and check-ups, with a progressive increase in its share from 48,5 % to 74,3 % in new consultations and from 44,9 % to 75,0 % in check-ups. The other centers, including CESFAM Víctor Manuel Fernández, Hospital Coronel, and Hospital Lota, contribute smaller but relatively stable volumes. The proportion of admissions for treatment showed greater variability, with a notable increase in 2024 at Guillermo Grant Benavente Hospital, which accounted for 74 % of admissions. Statistical analyses confirmed significant differences in the distribution of activities between centers and years ($p < 0,001$), although with a small effect size (W between 0,07 and 0,16), indicating that the differences, while significant, are of moderate magnitude.

Table 2 details the distribution by maxillofacial surgical specialty between 2022 and 2024, showing the absolute and relative number of procedures such as third molar surgery, minor and major surgery, treatment of dentoalveolar trauma, and care under general anesthesia. Here too, the Guillermo Grant Benavente Hospital accounts for the majority of procedures, with a particularly marked increase in 2024, reaching 78,7 % in third molar surgery and 70,7 % in minor outpatient surgery. Other centers have lower and heterogeneous proportions depending on the type of procedure. Statistical analysis shows a highly significant association between health center and type of procedure ($p < 0,001$) with a large effect size (Cramer's $V = 0,71$), reflecting substantial differences in the distribution of maxillofacial surgical specialties among centers. Taken together, these results suggest that maxillofacial surgery and traumatology care is heavily centralized at the Guillermo Grant Benavente Hospital, with statistically significant impacts on the distribution of activities and specialties between centers and years.

This study shows that minor maxillofacial surgery in the public network of the Concepción Health Service is heavily centralized in the Guillermo Grant Benavente Hospital, accounting for more than 70 % of new consultations and check-ups in 2024. This concentration confirms the existence of a structural gap between the demand for care and the capacity of secondary and tertiary facilities to meet that demand, resulting in long waiting lists and inequalities in access to low-complexity surgical procedures. The findings are consistent with previous studies that indicate that hospital saturation and the limited availability of maxillofacial surgery specialists contribute to significant delays in the treatment of dental and traumatic pathologies.[2,3,5]

The results obtained in this study show that, despite the existence of CESFAMs that could perform minor procedures, most new consultations and post-discharge check-ups are concentrated in referral hospitals. This trend has continued in subsequent years, indicating that secondary-level hospitals absorb a disproportionate burden of cases, even though minor surgery could be performed in primary health care, according to the literature on the decentralization of minor surgical procedures.[24,25,26] In this context, it is known that concentration in hospitals creates bottlenecks, increases waiting times, and perpetuates overload in referral centers, confirming the relevance of organizational and structural factors in the management of surgical waiting lists.[2,3,27]

In terms of analysis by specialty, this study reveals that surgery accounts for a significant proportion of interconsultations in all centers, being particularly high at Guillermo Grant Benavente Hospital, with 45,6 % in 2022 and increasing to 78,7 % in 2024, indicating a growing dependence on this center for critical and outpatient maxillofacial procedures. This concentration suggests that, despite the existence of infrastructure and trained personnel in other hospitals, the lack of integration of primary health care and the limited training of general dentists in minor procedures keeps the burden at the secondary level.

Table 1. Association between maxillofacial surgery and treatment and health centers

Period	Health Centers	New Consultation (n / %)	Follow-up (n / %)	Treatments		Follow-up after discharge (n / %)	Administrative discharges (n / %)	Statistics		
				Admissions	Discharges			df	p-value	W
2022	Guillermo Grant Benavente Hospital	1 946 (48,5 %)	5593 (52,7 %)	195 (14,0 %)	791 (35,7 %)	NR	NR	15	< 0,001	0,16
	CESFAM Víctor Manuel Fernández	1 380 (34,4 %)	3 340 (31,5 %)	800 (57,3 %)	950 (42,9 %)	2 (66,7 %)	146 (66,7 %)			
	Coronel Hospital	539 (13,4 %)	1 029 (9,7 %)	397 (28,5 %)	357 (16,1 %)	1 (33,3 %)	73 (33,3 %)			
	Lota Hospital	151 (3,8 %)	641 (6,0 %)	3 (0,2 %)	118 (5,3 %)	NR	NR			
	Santa Juana Hospital	NR	NR	NR	NR	NR	NR			
	Florida Hospital	NR	NR	NR	NR	NR	NR			
2023	Guillermo Grant Benavente Hospital	2439 (59,0 %)	6103 (44,9 %)	468 (26,6 %)	816 (31,2 %)	NR	NR	12	< 0,001	0,12
	CESFAM Víctor Manuel Fernández	1130 (27,3 %)	4996 (36,7 %)	860 (48,9 %)	1198 (45,8 %)	NR	2 (66,7 %)			
	Coronel Hospital	424 (10,3 %)	1691 (12,4 %)	412 (23,4 %)	428 (16,4 %)	NR	1 (33,3 %)			
	Lota Hospital	141 (3,4 %)	807 (5,9 %)	18 (1,0 %)	171 (6,5 %)	NR	NR			
	Santa Juana Hospital	NR	NR	NR	NR	NR	NR			
	Florida Hospital	NR	NR	NR	NR	NR	NR			
2024	Guillermo Grant Benavente Hospital	2856 (74,3 %)	6747 (75,0 %)	1531 (74,0 %)	1003 (60,7 %)	NR	NR	9	< 0,001	0,07
	CESFAM Víctor Manuel Fernández	167 (4,3 %)	433 (4,8 %)	158 (7,6 %)	196 (11,9 %)	NR	NR			
	Coronel Hospital	548 (14,3 %)	1,229 (13,7 %)	271 (13,1 %)	320 (19,4 %)	NR	NR			
	Lota Hospital	273 (7,1 %)	591 (6,6 %)	110 (5,3 %)	134 (8,1 %)	NR	NR			
	Santa Juana Hospital	NR	NR	NR	NR	NR	NR			
	Florida Hospital	NR	NR	NR	NR	NR	NR			

Notes: NR: Not reported.

Table 2. Association between care specialties and health centers

Period	Health Centers	Response Interconsultation (n / %)	Surgery				Dentoalveolar trauma treatment (n / %)	Care under general anesthesia (n / %)	Statistics		
			Third molar (n / %)	Minor outpatient (n / %)	Major outpatient (n / %)	Major non-outpatient (n / %)			df	Third molar (n / %)	Minor outpatient (n / %)
2022	Guillermo Grant Benavente Hospital	384 (100 %)	411(45,6 %)	388 (42,8 %)	27 (100 %)	NR	NR	12 (100 %)			
	CESFAM Víctor Manuel Fernández	NR	189 (21,0 %)	278 (30,7 %)	NR	NR	42 (60 %)	NR			
	Coronel Hospital	NR	277 (30,7 %)	171 (18,9 %)	NR	NR	14 (20 %)	NR	12	< 0,001	0,41
	Lota Hospital	NR	1 (0,1 %)	46 (5,1 %)	NR	NR	14(20 %)	NR			
	Santa Juana Hospital	NR	23 (2,6 %)	23 (2,5 %)	NR	NR	NR	NR			
	Florida Hospital	NR	NR	NR	NR	NR	NR	NR			
2023	Guillermo Grant Benavente Hospital	359 (100 %)	699 (51,0 %)	N/R	NR	NR	NR	65 (100 %)			
	CESFAM Víctor Manuel Fernández	NR	276 (20,1 %)	424 (44,5 %)	NR	NR	36 (66,7 %)	NR			
	Coronel Hospital	NR	322 (23,5 %)	402 (42,2 %)	NR	NR	NR	12 (22,2 %)	16	< 0,001	0,87
	Lota Hospital	NR	39 (2,8 %)	84 (8,8 %)	NR	NR	6 (11,1 %)	NR			
	Santa Juana Hospital	NR	35 (2,6 %)	42 (4,4 %)	NR	NR	NR	NR			
	Florida Hospital	NR	NR	NR	NR	NR	NR	NR			
2024	Guillermo Grant Benavente Hospital	305 (100 %)	2619 (78,7 %)	2224 (70,7 %)	139 (17,5 %)	133 (93,7 %)	6 (40 %)	140 (44,2 %)			
	CESFAM Víctor Manuel Fernández	NR	336 (10,1 %)	432 (13,7 %)	438 (55,0 %)	6 (4,2 %)	6 (40 %)	NR			
	Coronel Hospital	NR	259 (7,8 %)	342 (10,9 %)	146 (18,3 %)	2 (1,4 %)	2 (13,3 %)	118 (37,2 %)	24	< 0,001	0,71
	Lota Hospital	NR	113 (3,4 %)	148 (4,7 %)	73 (9,2 %)	1 (0,7 %)	1 (6,7 %)	59 (18,6 %)			
	Santa Juana Hospital	NR	NR	NR	NR	NR	NR	NR			
	Florida Hospital	NR	NR	NR	NR	NR	NR	NR			

Notes: NR: No reportd

Previous studies have shown that the transfer of minor procedures to primary health care, through specific training and clear referral protocols, can significantly reduce waiting times and improve the efficiency of the health system.[2,3,4,27,28,29] This scenario highlights an ethical and social problem, where vulnerable patients experience additional barriers to accessing timely care, reproducing structural inequalities in oral health.

In this context, differences between centers also reflect territorial inequality. Municipalities such as Coronel and Lota lack maxillofacial surgery specialists, which necessitates frequent referrals to the Guillermo Grant Benavente Hospital. This lack of specialists and the high social vulnerability of these municipalities reflect a worrying Community Vulnerability Index, the consequences of which amplify barriers to access and force patients and families to face long journeys and additional costs, increasing inequality in care.

On the other hand, a relevant finding is the low use of REM A09 as a strategic management tool. Although this registry allows for the capture of demand for dental services at all levels of care, its operational use for prioritization and planning is limited, which prevents the efficient allocation of minor surgical resources and consolidates administrative bottlenecks. This leads to the need for effective integration that would allow not only the prioritization of cases according to functional and clinical urgency, but also the planning of interventions in areas of high demand and vulnerable populations, optimizing the use of operating rooms and available personnel.[7]

Limitations

Among the main limitations of this study are insufficient infrastructure and underutilization of primary care in the resolution of minor maxillofacial surgery procedures.

In terms of infrastructure, the limited availability of operating rooms assigned to minor surgery is a critical factor affecting the capacity of hospitals to resolve cases. In many facilities, this specialty shares space with more complex procedures, creating direct competition for the use of operating rooms.[31] On the other hand, the limited capacity of primary health care is another significant constraint. Procedures that could be performed at CESFAM, such as complex extractions or drainages, are often referred to secondary hospitals due to a lack of staff training, adequate equipment, or clear referral criteria. Procedures that could be performed atCESFAM, such as complex extractions or drainages, are often referred to secondary hospitals due to a lack of staff training, adequate equipment, or clear referral criteria. This dynamic increases the burden on referral centers and directly contributes to longer waiting lists. Both limitations reflect operational and organizational barriers that affect accessibility and equity in minor maxillofacial surgery care, constituting a key challenge for strategic planning and resource optimization in the public health network.

Similarly, the study presents several potential sources of bias that must be considered. First, there is a geographical bias, as the research is limited to the province of Concepción, which limits the generalization of the findings to other regions with different demographic, epidemiological, or health service access characteristics.[20] Second, there is a selection bias of individuals, which, added to a potential coding bias, may have generated incomplete records or type I and II errors that could lead to an underestimation of the true demand for care.[21]

Future lines of research

As future lines of research, it is suggested to evaluate strategies that optimize the resolution of waiting lists for minor maxillofacial surgery by transferring low-complexity procedures to primary health care, training general dentists in CESFAM to perform extractions and drainages, which could reduce the burden on secondary-level hospitals and improve care times. Likewise, it is proposed to strengthen healthcare agreements with universities and postgraduate programs, incorporating students and specialists in community service, especially in rural and vulnerable areas, in order to bring specialized care closer to the population with less access. The implementation of mobile or rotating maxillofacial surgery teams is presented as an effective alternative to reduce territorial gaps, bringing direct care to areas without specialists and avoiding unnecessary referrals, following successful experiences such as mobile dental clinics in India and mobile maxillofacial trauma units in Europe.[28,29,32] Finally, it is recommended to expand hospital surgical infrastructure by creating dedicated operating rooms or allocating specific hours for minor surgery, which would allow for more efficient rotation of operating rooms, reduce competition with major surgeries, and ensure more timely and quality care.

CONCLUSIONS

Minor maxillofacial surgery in the public network of Concepción shows a marked gap between demand and response capacity, with centralization of care, long waiting lists, and inequality between centers. These findings highlight the need to optimize resource distribution, strengthen the healthcare network, and improve surgical planning based on territorial evidence.

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FUNDING

The authors did not receive funding for the development of this research.

CONFLICTS OF INTEREST

The authors declare that there are no conflicts of interest.

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