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EXECUTIVE SUMMARY

Efficiency in operating rooms and
prioritization of patients for elective surgery.

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Enhancing Surgical Care in the Public Health System: Efficiency in operating rooms and prioritization of patients for elective surgery.

The importance of better surgical care in the public health system

The National Health Services System (SNSS) meets the health demands of 80% of the population. It was created in 1979 and is represented by the Ministry of Health (MINSAL) and its dependent bodies: (i.) the 29 health services; (ii.) the National Health Fund (FONASA); (iii.) the Public Health Institute (ISP); and (iv.) the Supply Center (CENABAST).

In the last 70 years, the system has achieved very relevant accomplishments such as the reduction of infant mortality (by 93%) and maternal mortality (by 94%), reducing malnutrition in children under five years old from 63% to 0.5%, and raising life expectancy from 50 to 80 years (one year more than the United States). However, since the implementation of explicit health guarantees (GES), this system has faced significant challenges, reflected (on the one hand) in the substantial increase in resources in the sector (at a real average annual rate of 9% in 2000-2016). Although the AUGES (Universal Access with Explicit Guarantees in Health) has meant a significant improvement in care for the included pathologies, among other aspects, there are still excessive waiting times for non-guaranteed pathologies, and the volume of care has not changed significantly (same number of discharges).

The challenges are multiple, and they translate into constant stress in the system, both among the incumbents who seek to propose improvements to the system from their perspectives (MINSAL, DIPRES, Health Services, Medical Association, FENATS, etc.) and in the population, which demands more timely attention to their health needs. In this context, President Michelle Bachelet mandated the National Productivity Commission to study this to address efficiency in the use of elective operating rooms and the management of the non-GES surgical waiting list. President Sebastián Piñera subsequently ratified this mandate. To achieve the proposed objectives, this Commission worked in conjunction with various health sector entities (at the central level and hospitals) and consultants (national and international),

gathering information, discussing the identified findings, and the different solution alternatives, always based on evidence and the experience of the various health representatives.¹

Among the identified findings, essential gaps are observed between the supply of medical specialists and the demand for care, both nationally and in specific areas of the country. For example, according to estimates from this study, the institutional supply of anesthetists currently covers only 75% of the institutional time allocated to elective surgeries. In general, it is observed that the proportion of doctors and nurses per inhabitant represents half (or less) of the OECD average value. The SNSS has made great efforts, particularly in improving surgical waiting times. Proper management of surgical waiting times allows the system to work more efficiently while allowing people to receive timely care that translates into better recovery and quality of life. Indeed, GES surgical cases currently represent the improvement in waiting times.

On the contrary, non-GES surgical cases represent the adjustment the system had to make once priorities were established by law. Proof of this is that most cases on the surgical waiting list are non-GES (99%). On the other hand, there is significant heterogeneity in waiting times for non-GES elective surgery among the different health services in the country (and hospitals), reaching gaps of over 400 days, even for the same services. In addition, the productive capacity for surgical care is low (compared to benchmarking). While an elective operating room in Chile performs about 750 surgeries a year, international references do over 1,000.

The identified findings (based on the information collected) represent an approximation to the reality of the current state of the system's capacity to respond to surgical health problems.

¹ Regarding the data used, the study relied on the main official health sources from the period 2014-2018. These sources included information on the aggregated activity of the public health sector, its infrastructure, human resources, expenditures, and purchases of services associated with hospital activity, as well as waiting lists for both GES (Explicit Health Guarantees) and Non-GES procedures. Additionally, two new sources of information were accessed. The first is the database known as Diagnosis-Related Group (DRG), which allows for the comparison of the care profile of similar patients discharged from the hospital system. The second is information on 80,000 elective surgical interventions performed during the period 2016-2017.

The orders of magnitude in some cases are significant. For example, regarding bed management, hospital gaps of up to 12 days can be observed in patients' stays with similar procedures, diagnoses, and risk factors. In the case of surgical rooms, there are establishments with very few daily hours of use (3.7 hours out of 9), while others show a capacity similar to that of establishments in referring systems (6.4 hours out of 9). This last point proves that some of the solutions to improve surgical capacity lie within the system itself, and it is only necessary to promote more discussion through evidence.

This study proposes 25 recommendations for more effective and better use of the resources associated with elective operating rooms that would increase the surgical resolution supply for both GES and non-GES cases. Additionally, it would improve the surgical waiting time on the non-GES list, thus providing more timely and fair care. The recommendations are mainly based on the collected findings and the good practices identified, both nationally and internationally. In this sense, each of these alone has a marginal impact, but applied together; can generate a positive and significant impact. In fact, at the end of the development of this study, some of the suggested policies, particularly those related to the financing scheme, began to be implemented.

Main findings and recommendations for better hospital management

Firstly, to understand the barriers to the productivity of operating rooms and the performance of elective surgeries, it was necessary to characterize the surgical care process adequately. This allowed for the proper measurement of efficiency in operating rooms. The surgical care process originates from the medical indication (provided in clinical services or the emergency room), followed by a pre-surgical process (exams, evaluation, monitoring, and admission). Following that, the surgical intervention and, finally, the post-surgery period (stay and discharge). All these processes can be performed during the day (outpatient) or may require the patient to stay overnight in the hospital (inpatient). Depending on whether the care is outpatient or inpatient, each type of patient is treated at an operating room suited to their condition, distinguishing between elective and emergency operating rooms. The elective operating rooms (the focus of this study) must operate in an institutional schedule of 9 hours on weekdays and emergencies, 24 hours a day.

The surgical intervention and the recovery stage are the most critical parts of the surgical process. To be carried out, they require Nursing Technicians or TENS (at least three, as scrub nurses, instrument nurses, and anesthesia support), nurses, and doctors (surgeons, two per surgery, and anesthesiologists, one per surgery). The assignment by specialty is made according to schedule blocks (commonly two blocks per week). In contrast, the distribution of hours per block is defined according to the establishment's schedule (monthly or biannual).

Based on the above, we can determine the operating room use efficiency through different means. The first consists of the times each operating room uses to perform elective surgeries within the assigned operating hours (institutional hours). The second consists of the number of elective surgeries performed per operating room per day or year to measure the capacity to resolve the demand. The third consists of the excellent use of the available hours and the fulfillment of the schedule, defined as the start time of each surgery and the delay time.

When applying these ways of measuring efficiency in the use of elective operating rooms in public hospitals (the focus of the study), it is found that an average operating room uses 4.8 out of 9 institutional hours, compared to the United Kingdom (benchmarking) where 6.4 out of 9 institutional hours are used (Finding 1). Regarding the number of daily surgeries per operating room, Chile performs only 3.3 surgeries per day versus 5.1 daily surgeries in the United Kingdom. Finally, the first surgery in Chile starts (on average) with a 40-minute delay, and the last one ends almost 2 hours earlier. In the case of the United Kingdom, the delays and early terminations are less (at most 5-10 minutes on average). Additionally, for each of these indicators in Chile, there is a significant gap between hospitals, such that some reach the international benchmark while others show significantly low performance (Finding 2).

The experiences of OECD countries present several good practices associated with the management of operating rooms. For example, we highlight the use of complementary shifts of the support team during peak hours, daytime and evening shifts (Recommendation 1 and Recommendation 2), and the use of management tools and incentives that induce a better use of surgical blocks (Recommendation 3, Recommendation 4, Recommendation 9, and

Recommendation 10). On the other hand, there is a need to fill some resource gaps, in particular anesthesiologists, and to better use the resources that are available to work 9 hours a day: surgeons, nurses, and TENS (Recommendation 5, Recommendation 6, Recommendation 7, and Recommendation 8). Finally, it is necessary to address the severe issues of non-medical staff absenteeism² (nurses and TENS), reflected in Findings 5 and 6.

To improve the productivity of elective operating rooms in Chilean public hospitals, the National Productivity Commission (CNP) proposes a series of recommendations in line with developed countries (OECD). It is necessary to make better and more efficient use of the current 9-hour workday, for which we propose establishing two shifts for the critical staff in the operating room operation: nursing and TENS. In particular, we suggest having two shifts, each into operating room activities or other hospital activities (such as pre-surgical care), separated by a lunch break so that both shifts overlap. The activities in the operating room would be continuous, and there would be adequate rest for the workers in the rooms.

It could also extend the use of operating rooms to 12 hours, which would require a shift system similar to the one previously described but with three shifts. Moreover, to reward the stress that involves the operating room activity and given the salaries that nurses and TENS earn, we propose having monetary incentives to reduce absenteeism and delays. These economic incentives should be associated with competencies and skills accreditation.³ Financial incentives (and non-monetary ones) can also reward the medical team in exchange for better occupancy of the operating room and to condition the purchase of services to the medical team's performance during institutional hours.⁴ Finally, better use of the available medical hours, better management practices (especially coordination and preparation of

² It is argued that various stressors in the work environment, especially for technical and nursing teams, contribute to high levels of absenteeism. These stressors may include factors such as a lack of natural light, constant exposure to clinical risk situations, challenges in leaving the workplace, and more.

³ In the case of technical nursing specialists (TENS), except for arsenal management, their activities in the operating room are not part of their training curriculum as professional technicians. The TENS are not recognized as such in the health code or regulation and are therefore hired as assistants. Consequently, the technician and the institution where they work must create opportunities to acquire additional skills, which need to be explicitly compensated.

⁴ In the context of non-pecuniary incentives, block schedule hours and the investment in medical equipment and training or courses are defined.

patients, use of operating room information, patient traceability, and use of information technologies), and monetary incentives to the heads would significantly increase the availability and use of elective operating rooms (Recommendation 11, Recommendation 12, Recommendation 13, and Recommendation 14).

Other hospital aspects, while they do not directly belong to the operating room activity, also influence its performance. For example, there is a deficient level of outpatient surgeries, which leads to a misuse of hospital beds (Findings 7 and 8) that, additionally, involves a high use of the hospital budget since the system (up until 2019) paid for each day of a patient's stay, incentivizing excessive stays (Findings 9 and 10) (Recommendation 15 addresses this). The changes being made to the health sector budget law align with this last recommendation.

On the other hand, adequate management of emergency admissions (many of which are not necessarily urgent cases but people waiting for too long) is also necessary, especially considering that most urgent entries are of low severity (Finding 11). It is also essential to reduce the high number of surgical suspensions. These are the consequence of deficits in hospital management, such as prolonged use of operating rooms, no-show patients (or untraceable patients), and scheduling errors (Findings 15 and 16). Finally, it is necessary to better manage the significant clinical variability existing in hospitals (for example, the high number of unnecessary cesareans), aiming at the standardization of surgical procedures, dispelling the logic that "each patient is a universe" (Findings 12, 13, and 14). Implementing the Diagnosis Related Group (DRG) as a management tool, along with the use of information technologies, can be of great help. Still, they must be complemented through incentives to hospital executives and greater autonomy of executives concerning political authorities (Recommendation 16, Recommendation 17, Recommendation 18, Recommendation 19, Recommendation 20, and Recommendation 21).

Main findings and recommendations for waiting list management

An essential part of better management of surgical patients is related to an acceptable way of managing patient waiting times. Although the average waiting time has decreased in recent years, we estimate that, for Non-GES surgeries, the average waiting time between hospitals

for 2017 was still over a year (375 days), with hospital gaps more significant than 400 days (Finding 17 and Finding 18). Additionally, based on the information on the waiting list, it is concluded that the bulk of cases on hold (40%) are of low complexity (Finding 19), so a significant proportion of them could be operated on an outpatient basis, thus allowing more efficient use of resources and better patient care and recovery.

Based on national and international evidence, part of the improvement in managing surgical waiting times in Non-GES cases comes from establishing maximum reference periods. For this, the type of benefit, diagnosis, and risk factors of the patient are considered. This type of policy was observed in the UK and Catalunya systems. In the first case, all the benefits have guaranteed maximum terms, the full-time being one year. In Catalonia, a subset of services has associated terms with guarantees, while the rest only have top reference terms associated. It is necessary to make improvements to the waiting list registry to implement this type of health policy institutionally. With the information available on the waiting list in Chile, it is impossible to perform a clinical prioritization, except for the use of time, due to the lack of a standard diagnostic registry, which prevents prioritization considering risk factors (Finding 21 and Finding 22). A sound registration system through technology is needed to follow up on pending cases. At the national level, two hospitals were identified that collected the information to start prioritizing Non-GES surgeries. From this effort, a first exercise was born at the central level to carry out said implementation to the rest of the establishments. However, today there needs to be clarity on the status of the stated policy. Given this, the CNP recommends reinforcing the implementation of prioritization policies from MINSAL in conjunction with hospitals to generate clear prioritization criteria (Recommendation 23). Standardized diagnoses and procedures are recommended using the international ICD-10 and ICD 9-CM⁵ coding (Recommendation 23) and rendering the information transparent

⁵ Regarding the information used, we worked with the primary official health sources within the period 2014-2018, which relate to the aggregate activity of the public health sector, its infrastructure, human resources, expenses and purchases of services associated with hospital activity, and the waiting lists, both GES (Explicit Health Guarantees) and non-GES. In addition, we had access to two new sources of information, the first is the database called Diagnosis Related Group (DRG), which allows comparing the care profile of similar patients who were discharged from the system hospitals, and the second, is the information from 80 thousand elective surgical interventions performed during the period 2016-2017.

regarding prioritization by publishing the maximum terms of reference and the prioritization rule (Recommendation 24).

Main Findings and Recommendations for Public Hospital Financing

Despite the significant budgetary and spending increases, Chile's current public hospital financing scheme has yet to lead to an increased volume of hospital care, improved operating room management, or reduced waiting times. International evidence from developed countries suggests the need to transition from the current financing scheme to a resolution-based payment system (such as DRG) while considering the unique aspects of the Chilean case. The evidence indicates a need to modify the financing system in Chilean public hospitals. In line with international experience, it is crucial to study the costs of services beforehand to reflect actual costs and implement better cost accounting systems (Recommendation 25).

Conclusions

The main findings of this study reveal significant opportunities for improvement in the productivity of elective operating rooms within public network hospitals. Implementing these measures is expected to yield considerable benefits for citizens, as it would result in a higher volume of surgical care provided in a timely, fair, and transparent manner. The estimated increase in the care volume would be at least 27% compared to the current volume, with an additional cost of only 7%. Furthermore, the volume could increase by 106% with an additional cost of less than half (50%).⁶ This spending effort, mainly focused on allocating inputs and personnel, is minimal compared to its benefits for patients (more people receiving treatment) and the treasury (better utilization of installed capacity at a fraction of current average costs). It is akin to "building a second hospital" within the first, which is a much more cost-effective alternative to constructing a new hospital.

⁶ Currently, each surgery has an approximate cost of 3000 USD, but extending the operating room hours to 9 would reduce the unit cost to 2600 USD with just one additional surgery per day (and to 2300 USD if the production pace similar to benchmarking is maintained). Likewise, an efficient extension to 12 hours would initially reduce the average cost to 2500 USD and keep the pace at 2200 USD.

It is essential to emphasize that; ultimately, implementing the 26 recommendations proposed in this study would enable individuals to receive timely care, resulting in improved well-being, recovery, and quality of life.