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BUDGET IMPACT OF TREATING PATIENTS WITH METASTATIC CANCER IN A SPECIALIZED PALLIATIVE CARE HOSPITAL

Impacto orçamentário do tratamento de pacientes com câncer metastático em um hospital especializado em cuidados paliativos

Impacto presupuestario del tratamiento de pacientes con cáncer metastásico en un hospital especializado en cuidados paliativos

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RESUMO

Objetivo: avaliar o impacto orçamentário da ampliação da oferta de cuidados paliativos (CP) no Hospital do Câncer IV (HC 4), unidade especializada do Instituto Nacional do Câncer. **Metodologia:** estudo baseado nas Diretrizes da REBRATS para Análise de Impacto Orçamentário, com modelagem em horizonte temporal de cinco anos, comparando um cenário de referência (14% de cobertura de CP) com três cenários alternativos de ampliação (25%, 35% e 45%). Foram considerados custos médicos diretos e evitáveis, usando a técnica de microcusteio bottom-up. **Resultados:** o cenário de referência implicou um custo de R$ 8.210.969,26 em cinco anos. Os cenários alternativos apresentaram economias progressivas: R$ 1.384.036,95 (25%), R$ 2.568.103,06 (35%) e R$ 3.752.169,17 (45%), demonstrando que quanto maior a cobertura de CP, maior a economia.

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Conclusão: ampliar a oferta de CP no HC 4 é custo-efetivo, reduzindo custos hospitalares e promovendo melhor alocação dos recursos do SUS.

DESCRITORES: Cuidados paliativos; Neoplasias; Análise de impacto orçamentário; Economia da saúde; Sistema único de saúde.

ABSTRACT

Objective: to assess the budgetary impact of expanding the offer of palliative care (PC) at Cancer Hospital IV (HC 4), a specialized unit of the Brazilian National Cancer Institute. **Methodology:** a budget impact analysis was conducted following REBRATS guidelines, using a five-year time horizon and comparing a reference scenario (14% PC coverage) with three alternative expansion scenarios (25%, 35%, and 45%). Direct and avoidable medical costs were estimated using a bottom-up micro-costing approach. **Results:** in the reference scenario, the total cost over five years was BRL 8,210,969.26. The alternative scenarios showed increasing savings: BRL 1,384,036.95 (25%), BRL 2,568,103.06 (35%), and BRL 3,752,169.17 (45%), demonstrating that higher PC coverage leads to greater savings. **Conclusion:** expanding PC at HC 4 is cost-effective, reduces hospital expenses, and improves the allocation of SUS financial resources.

DESCRIPTORS: Palliative care; Neoplasms; Budget impact analysis; Health economics; unified health system.

RESUMEN

Objetivo: evaluar el impacto presupuestario de la ampliación de la oferta de cuidados paliativos (CP) en el Hospital de Cáncer IV (HC 4), unidad especializada del Instituto Nacional del Cáncer de Brasil. **Metodología:** se realizó un análisis de impacto presupuestario siguiendo las directrices de REBRATS, utilizando un horizonte temporal de cinco años y comparando un escenario de referencia (14% de cobertura de CP) con tres escenarios alternativos de ampliación (25%, 35% y 45%). Se estimaron los costos médicos directos y evitables mediante la técnica de microcosteo bottom-up. **Resultados:** en el escenario de referencia, el costo total a cinco años fue de BRL 8.210.969,26. Los escenarios alternativos mostraron ahorros crecientes: BRL 1.384.036,95 (25%), BRL 2.568.103,06 (35%) y BRL 3.752.169,17 (45%), lo que demuestra que una mayor cobertura de CP genera más ahorro. **Conclusión:** ampliar la oferta de CP en el HC 4 es costo-efectivo, reduce los gastos hospitalarios y mejora la asignación de recursos financieros del SUS.

DESCRIPTORES: Cuidados paliativos; Neoplasias; Análisis de impacto presupuestario; Economía de la salud; Sistema único de salud.

INTRODUCTION

With longer life expectancy, there has been a change in the causes of death, which are mainly due to Chronic Non-Communicable Diseases (CNCDs), accounting for 71% of all causes of death worldwide.[1]

Among CNCDs, cancer is the second leading cause of death, according to The Global Burden of Disease (GBD), and is undoubtedly a global public health problem. The conditions involved in the increase in the number of cases and mortality are related to changes in the distribution and prevalence of risk factors for this disease, especially those associated with socio-economic development, environmental and political conditions, ageing and population growth.[2-4]

According to the Oncology Observatory, late diagnosis of cancer can result in clinical and economic consequences, directly impacting on quality of life and treatment costs, which can be seven times higher than the cost of preventive actions.[5]

In the last 10 years, there has been an increase in demand for palliative care (PC) in the SUS, especially for metastatic patients with advanced-stage disease.[1]

The International Association for Hospice and Palliative Care defines palliative care as active holistic care, offered to people of all ages who are in intense suffering related to their health, due to severe illness, especially those at the end of life. The aim of Palliative Care is therefore to improve the quality of life of patients, their families and their caregivers.[6]

In the SUS, the National Cancer Institute (INCA) is the auxiliary body of the Ministry of Health in the development and coordination of integrated actions for the prevention and control of cancer. The Institute is a reference for the comprehensive treatment of cancer patients in the state of Rio de Janeiro and has four hospital units that are considered to be highly complex. These are Cancer Hospital 1 (CH 1), Cancer Hospital 2 (CH 2), Cancer Hospital 3 (CH 3) and Cancer Hospital 4 (CH 4), the latter a reference in PC in the SUS.[7]

CH 4 is the Palliative Care Unit and is designed to provide multidisciplinary care to patients when there are no more therapeutic interventions that can modify the course of the disease. CH 4 exclusively treats patients referred by CH 1, CH 2 and CH 3.[7]

CH 4 was founded 24 years ago and is a national reference for PC care, teaching and research. It offers outpatient, inpatient and home care services, with a multidisciplinary team specializing in PC, working in an integrated and interdisciplinary manner.[7]

Between 2023 and 2024, the four care units of the National Cancer Institute (INCA) recorded a total of 20,552 hospitalizations, of which 42.4% (n. 8,730) occurred in CH 1 and 13.8% (n. 2,844) in CH 4, which recorded the lowest number of hospitalizations among the four units. In the last 5 years, approximately 7,550 patients were cared for in CH 4.[8]

A cost-utility analysis that retrospectively analyzed a cohort of 97 inpatients distributed among INCA's four units concluded that providing palliative care in CH 4 may be the most cost-effective alternative depending on willingness to pay. The study reported an average cost per patient over 30 days of R$25.72 in CH 4 and R$223.22 in the other units.[8]

Under the understanding that health cost analysis refers to the identification, quantification and monetary valuation of all the resources consumed during health care, based on the principles of welfare economics [9], the research question in our study is: what is the budgetary impact of expanding the supply of PC in CH 4?

The aim of this study was to assess the budgetary impact of expanding the provision of palliative care in CH 4.

METHODOLOGY

The methodological reference was the Guidelines for Budget Impact Analysis of the Brazilian Network for Health Technology Assessment (REBRATS).[10]

The study population was estimated at 7,522 patients based on management data provided by INCA, which reported a total of 20,552 hospitalizations between 2023 and 2024, considering that 36.6% of these patients will require PC.[11]

To estimate the size of the population over the time horizon of the analysis, an annual incidence rate of 7.5% of new patients requiring PC at INCA was applied.[12]

The base case consisted of four scenarios: a reference scenario and three alternative scenarios. In the reference scenario, 14 % of the patient cohort receives PC in CH 4. In the three alternative scenarios, the proportions of patients in the cohort who would receive PC at CH 4 was defined arbitrarily, taking into account the limitations of the unit's physical space and human resources, in terms of outpatient care, home and hospital admissions.[8] Thus, in alternative scenario 1, 25% of the patients in the cohort would receive PC at CH 4, in alternative scenario 2 there would be an increase in supply to 35%, and 45% in alternative scenario 3.

The time horizon for the analysis was 5 years, with a half-cycle correction, a discount rate of 3% and average annual inflation of 5% [10]. A rate of increase in admissions to CH 4 of 5% in the first year of the time horizon was considered, with an annual increase of a further 5% each year, up to 30% in the fifth year. The analysis was carried out considering the SUS perspective at INCA level.

This rate was defined arbitrarily, taking into account the unit's installed capacity and the need to restructure the physical plant and human resources in order to meet the increase in demand over the five years.[8]

The bottom-up micro-costing technique was used to estimate the direct medical costs in the base case[9], using as a reference a study[8] that analyzed a cohort of 97 patients admitted over 30 days to the four INCA units. All the patients included in the cohort had invasive cancer (stage IV) due to the presence of metastases and were therefore considered to be patients with advanced cancer. At this stage of the disease, the care plan is expected to include a PC approach.

The costs of per diems, exams, medication and blood therapy were taken into account. The costs of chemotherapy, radiotherapy, immunotherapy and hormone therapy were also included, but only considered as avoidable costs. This is because, with the exception of CH 4, these treatments are used in INCA's other care units, but only for some patients.

Therefore, based on the number of patients who were treated with these resources in these units, 167 avoidable events (treatments) were estimated per 1,000 hospitalizations in units that do not specialize in PC, resulting in a total saving of R$ 1,115,453.33, or R$ 1,115.45 for each patient if they were receiving PC in CH 4.[8]

RESULTS

The budget impact over five years in the reference scenario, in which specialized PC coverage is only 14%, adjusted for inflation and discounts, was estimated at R$8,210,969.26. The annual cost ranged from R$1,523,560.83 in the first year, considering a population of 7,804 patients, to R$1,765,274.39 in the fifth year, considering a population of 9,042 patients. The average cost per patient was estimated at R$198.38.

In alternative scenario 1, in which PC coverage in CH 4 was increased to 25%, the annual cost adjusted for inflation and discounts ranged from R$1,434,206.84 in the first year,

considering a population of 8,086 patients, to R$1,262,115.10 in the fifth year, for a population of 10,799 patients.

The budgetary impact over five years of alternative scenario 1 compared to the reference scenario, considering avoidable costs, was estimated at -R$1,384,036.95, which would represent a saving in resources compared to the reference scenario of -16.9% over five years (table 1).

Table 1 - Evolution of annual costs over five years in alternative scenario 1 compared to the reference scenario considering avoidable costs.

Time horizon	Cost	Difference
Year 1	-R$ 89.353,99	-5,9%
Year 2	-R$ 160.371,22	-10,1%
Year 3	-R$ 258.740,01	-15,8%
Year 4	-R$ 372.412,45	-21,9%
Year 5	-R$ 503.159,28	-28,5%
In 5 years	-R$ 1.384.036,95	-16,9%

Source: Prepared by the author (2025)

Table 2 shows the evolution of annual costs in alternative scenario 2, in which the supply of PC in CH 4 is increased to 35%, compared to the reference scenario (14% coverage). The budget impact over five years was estimated at -R$2,568,103.06, representing a 17% greater saving in resources compared to alternative scenario 1.

It can be seen that, as was the case in the comparison between alternative scenario 1 and the reference scenario, in alternative scenario 2, the savings increase with each year of the analysis time horizon, with 12.6% in the first year and 50.7% in the fifth year compared to the reference scenario.

Table 2 - Evolution of annual costs over five years in alternative scenario 2 compared to the reference scenario considering avoidable costs.

Time horizon	Cost	Difference
Year 1	-R$ 192.429,85	-12,6%
Year 2	-R$ 319.056,16	-20,2%
Year 3	-R$ 485.619,80	-29,6%
Year 4	-R$ 676.519,99	-39,8%
Year 5	-R$ 894.477,26	-50,7%
In 5 years	-R$ 2.568.103,06	-31,3%

Source: Prepared by the author (2025)

As expected, following the same trend of saving resources by increasing the supply of PC in CH 4 to 45%, the budgetary impact, in the comparison between alternative scenario 3, the budgetary impact over five years was estimated at - R$ 3,752,169.17, a saving of 45.7% in relation to the reference scenario (Table 3) and 21% in relation to alternative scenario 2, demonstrating that the greater the supply of PC in CH 4, the greater the saving of resources at INCA.

Table 3 - Evolution of annual costs over five years in alternative scenario 3 compared to the reference scenario considering avoidable costs.

Time horizon	Cost	Difference
Year 1	-R$ 295.505,72	-19,4%
Year 2	-R$ 477.741,10	-30,2%
Year 3	-R$ 712.499,59	-43,4%
Year 4	-R$ 980.627,53	-57,6%
Year 5	-R$ 1.285.795,24	-72,8%
In 5 years	-R$ 3.752.169,17	-45,7%

Source: Prepared by the author (2025)

It should be noted that the population size in alternative scenarios 2 and 3 and the evolution over the five-year time horizon of the analysis were exactly the same as those estimated in alternative scenario 1.

DISCUSSION

Delaying death as part of the natural history of a disease, whether through hospitalization or interventions for diagnostic and therapeutic purposes, is a problem that goes beyond prolonging the suffering of patients and their families.

PC has been part of the line of care for cancer patients in the SUS since 2005, and is considered the gold standard of care for terminally ill patients.[7]

The results of the model suggest that the budgetary impact of expanding the offer of PC at CH 4 tends to increase the savings in resources, the greater the number of patients with an indication for PC assisted at this INCA unit. Similar results were reported in a literature review on the direct costs and cost-effectiveness of PC interventions, which included 46 articles. The authors concluded that PC is less expensive than usual care.[13]

In the same vein, a study carried out in the United States which evaluated 592 patients in a hospital with a PC service, reported that the monitoring of patients by this team led to a reduction in hospital costs due to a reduction in complementary tests, a drop in the rate of use of mechanical ventilation, a reduction in emergency room visits and in hospitalizations due to the shorter length of stay of patients. This is all associated with high levels of satisfaction among providers and family members.[14]

Another study analyzed the costs of end-of-life care in patients treated with PC and without it (what they called aggressive care). As a result, the authors found that the average costs per patient in the last month of life were 43% higher in the group of patients who received aggressive care.[15]

The cost of care for patients who were hospitalized in CH 4 was lower than in the other INCA units, which corroborates the data found in the literature that predicts lower costs when patients receive PC.[13-17]

SUS financial resources are scarce and limited, which is why one must always consider the opportunity cost and efficiency of the Brazilian state in meeting the population's health needs. In a scenario of uncertainty, with limited and finite resources, it is of fundamental importance that managers pay attention to the best possible allocation of available resources. In this sense, adopting or expanding the coverage and supply of PC in specialized hospitals can improve the allocative efficiency of resources in the SUS.

CH 4 is a specialized PC unit that receives patients with advanced cancer who are no longer undergoing curative treatment, but may be using therapies aimed at improving symptoms and maintaining quality of life.

Currently, due to physical and human resource limitations, CH 4 would not be able to meet the demand to care for all patients from the beginning of the cancer diagnosis, as is recommended, and it is unable to receive patients who are undergoing palliative treatments in other units, whether chemotherapy and/or radiotherapy.

The problems associated with late initiation of palliative care imply a rapid deterioration in the quality of life of these patients and their caregivers and a financial burden on the health system, as they almost always result in high costs for maintaining and providing care, which is unjustified because the patients do not get the expected benefits.

Furthermore, it has to be considered that many patients arrive late at PC units, when there is little or almost nothing

to be done in terms of palliation. Therefore, PC is often not provided as expected if these patients were being cared for in a specialized unit.

The use of interventions that do not benefit the patient in PC, despite the advanced disease, has to consider some issues according to the patient's prognosis. In cases where the patient's clinical situation is limited to such an extent that there is no possibility of obtaining benefits from curative treatment, the suspension of therapeutic measures is acceptable and needs to be considered.[18]

The National Academy of Palliative Care (ANCP) and the Brazilian Society of Geriatrics and Gerontology issued an official position on decision-making in PC, reinforcing the need for a mutualist model of shared decision-making involving health professionals, patients and families, emphasizing the importance of professionals being able to reflect on how their own cultural perspective interferes in this relationship. He also emphasized that futile interventions would be those that do not achieve the desired physiological objectives and that potentially inappropriate treatments should be reassessed, rediscussed and reconsidered in order to make an appropriate decision.[19]

Potentially inappropriate treatments should not be indicated at the request of a patient or family member in a compassionate manner. Professionals should always communicate and obtain consent when they decide to discontinue or not introduce life-prolonging treatments and should always avoid conflicts of interest by reducing the intensity of drug use, including high-cost drugs, radiotherapy, chemotherapy and hormone therapy. Complementary tests at the end of the life of patients with advanced cancer, especially in hospital, can also be considered therapeutic obstinacy.[19, 20]

In cases where the patient's clinical situation is limited to such an extent that there is no possibility of obtaining benefits from curative treatment, the suspension of therapeutic measures is acceptable and needs to be considered, which is why prognostic indices should guide medical conduct, always paying attention to the individualization of care, Professionals should repeatedly question the patient's prognosis, what benefit such a measure will bring to the patient (beneficence), what damage it may cause (non-maleficence), what the patient and family think about it (autonomy) and what implications it will have for other patients (justice), in order to guide the conduct appropriately and within the principles of bioethics.[18]

CONCLUSION

Assisting patients with advanced cancer in hospitals specializing in PC such as CH 4 or in those with specialized teams, by contributing to a reduction in therapeutic obstinacy and in the demand for hospital beds, since these patients could be assisted in their own homes, has the potential to save resources and enable managers to redirect them towards the expansion of early diagnosis and safer and more effective treatments, thus improving the allocative efficiency of the financial resources available to the health service.

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