

COSTS OF CANCER CARE ACROSS THE DISEASE CONTINUUM: AN ANALYSIS FROM A HEALTH PAYER PERSPECTIVE IN BRAZIL

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BACKGROUND

As a leading cause of morbidity and mortality, a cancer diagnosis creates a human and financial impact, being a major public and private health challenge that represents a significant economic burden to society. In Brazil, total spending for cancer exceeds almost US\$ 800,000 million in 2022 concerning public system.

Estimates indicate that, due to population growth and aging, there will be a 66% increase in the number of new cases and 81% in cancer deaths in Brazil between 2020 and 2040. If nothing is done, and the trend of increasing cases continues at the same speed, Brazilian health authorities project that the federal government will spend US\$ 1,568 billion in 2040.

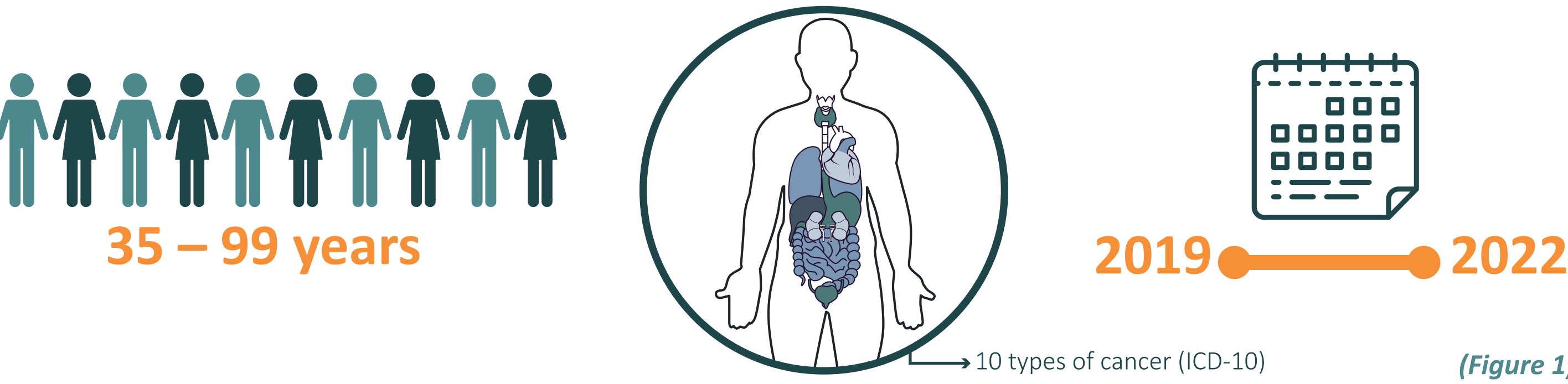
Despite declining cancer incidence, national expenditures for cancer care over the continuum are projected to increase further through next years, due to the new technologies and treatment availability.

OBJECTIVES

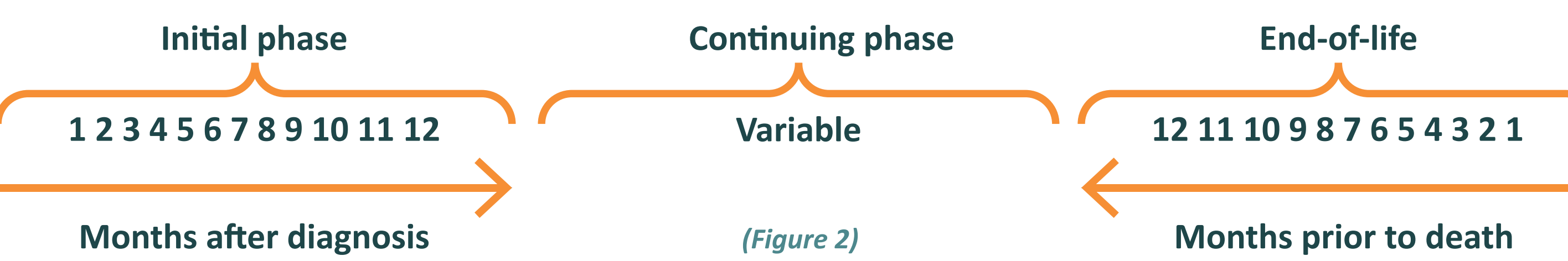
This analysis aims to estimate health plan payments for cancer care during the initial, continuing, and end-of-life phases of care for 10 malignancies and to examine variation in expenditures according to patient characteristics and the type of cancer.

METHODS

Retrospective non-interventional study using population-based health administrative database to identify 35–99 years patients diagnosed with one of the following cancers: breast, prostate, colon, rectum, lung, myeloma, ovary, bladder, pancreas, or stomach, from 2019 through 2022 (Figure 1).



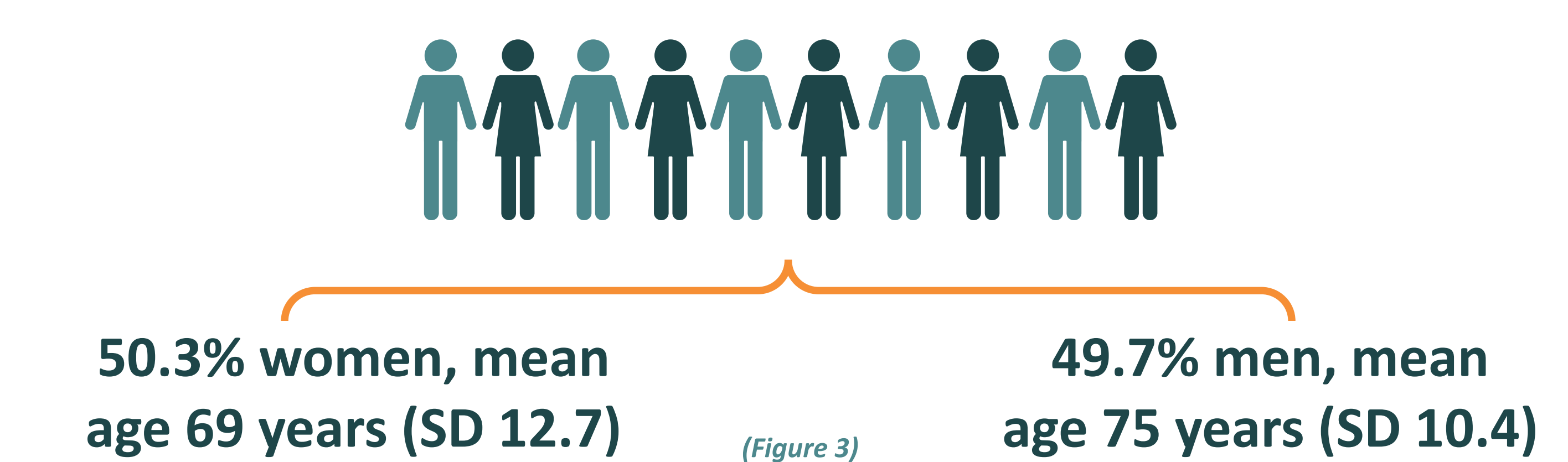
We attributed payments for each patient to a phase of care, based on time from diagnosis until death or end of study interval: the initial phase (first 12 months post-diagnosis), the continuing phase (period between initial and end-of-life) and the end-of-life (the last 12 months of life). We summed payments for all claims attributable to the primary cancer diagnosis and analyzed the overall and phase-based costs and then by differing cancer type and year of diagnosis (Figure 2).



Statistical: OpenEpi software for relative and absolute frequencies, means and standard deviation. For significance, Chi-square tests (Mantel-Haenszel and Fisher's Exact), when $p < 0.05$. Confidence intervals (CI) 95%.

RESULTS

543 patients, diagnosed with one of the studied malignancies. Annual payments were generally highest during the end-of-life. Per-patient annualized average costs were highest in the last year of life, followed by the initial and continuing phases (medical services: US\$39,645, US\$10,115, US\$6,793 and prescription drugs: US\$26,208, US\$22,581, and US\$17,685, respectively) (Figure 3).



WHAT
Retrospective non-interventional study using population-based health administrative database

WHERE
Health payer perspective in Brazil

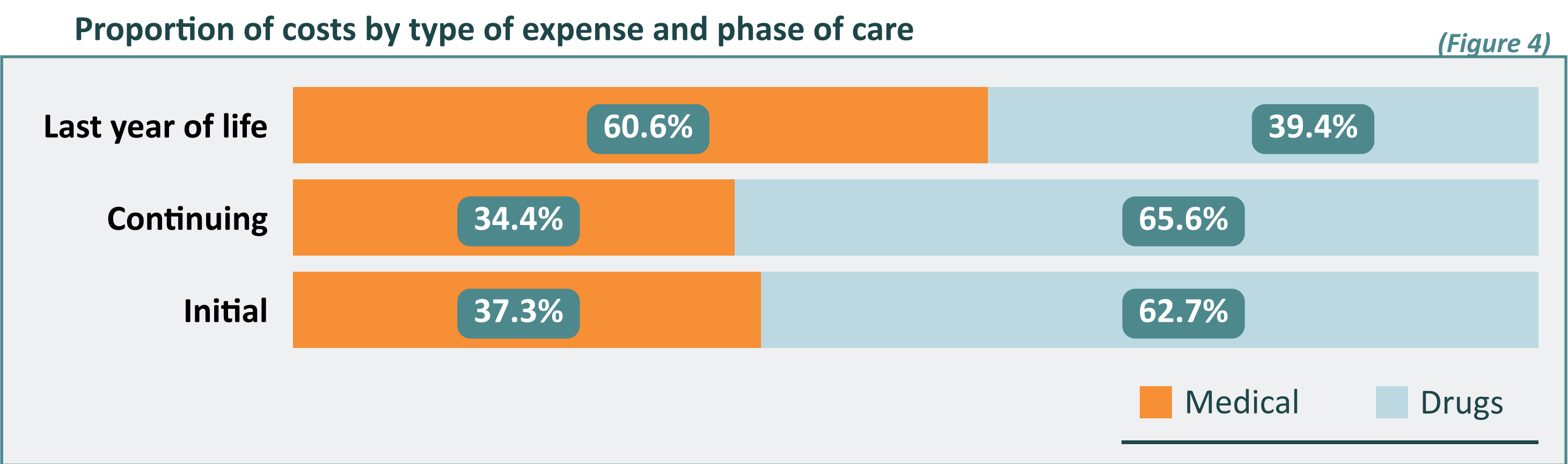
WHY
To estimate health plan payments for cancer care during the initial, continuing, and end-of-life phases of care for 10 malignancies and to examine variation in expenditures according to patient characteristics and the type of cancer

WHO
35–99 years patients diagnosed with one of the following cancers: breast, prostate, colon, rectum, lung, myeloma, ovary, bladder, pancreas, or stomach

WHEN
From January 2019 to December 2022

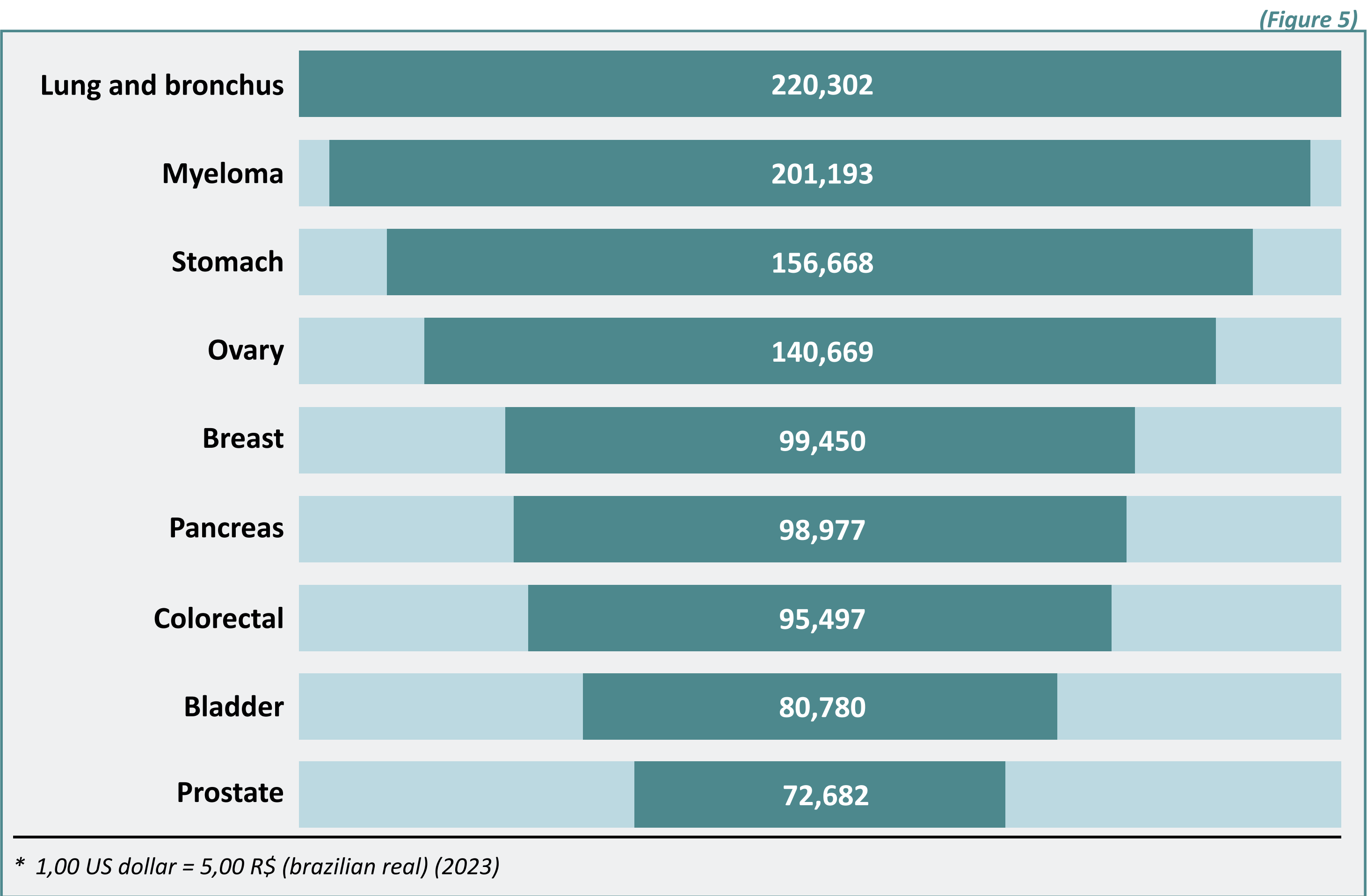
HOW
We attributed payments for each patient to a phase of care, based on time from diagnosis until death or end of study interval: the initial phase (first 12 months post-diagnosis), the continuing phase (period between initial and end-of-life) and the end-of-life (the last 12 months of life). We summed payments for all claims attributable to the primary cancer diagnosis and analyzed the overall and phase-based costs and then by differing cancer type and year of diagnosis

In the last year of life, we observed a difference in the pattern of expenses, with medical services predominating rather than drug expenses (Figure 4).



There was considerable variation in costs cancer by site (Figure 5).

Average (per patient) annualized 2019-2022 cancer costs in US dollars* by cancer site and all phase of care



In tables 1 and 2, detail of the costs involved in each phase of care (Table 1 and 2).

Average (per patient) annualized 2019-2022 cancer costs by cancer site and phase of care

Cancer Site	Initial Care	Continuing Care	Last Year of Life
All Sites	\$32,696	\$24,478	\$65,853
Bladder	\$17,468	\$4,364	\$58,949
Breast	\$28,347	\$15,624	\$55,478
Colorectal	\$32,659	\$18,173	\$44,666
Lung and Bronchus	\$74,727	\$53,718	\$91,858
Myeloma	\$68,021	\$35,412	\$97,760
Ovary	\$44,344	\$37,417	\$58,908
Pancreas	\$37,413	\$19,396	\$42,168
Prostate	\$15,839	\$13,205	\$43,638
Stomach	\$42,467	\$45,326	\$68,876

* 1,00 US dollar = 5,00 R\$ (brazilian real) (2023)

Average (per patient) annualized 2019-2022 cancer costs for prescription drugs by cancer site and phase of care

Cancer Site	Initial Care	Continuing Care	Last Year of Life
All Sites	\$20,500	\$15,348	\$41,290
Bladder	\$10,952	\$2,736	\$36,961
Breast	\$17,774	\$9,797	\$34,785
Colorectal	\$20,477	\$11,395	\$28,005
Lung and Bronchus	\$46,854	\$33,681	\$57,595
Myeloma	\$42,649	\$22,203	\$61,296
Ovary	\$27,803	\$23,461	\$36,935
Pancreas	\$23,458	\$12,161	\$26,440
Prostate	\$9,931	\$8,280	\$27,361
Stomach	\$26,627	\$28,419	\$43,185

* 1,00 US dollar = 5,00 R\$ (brazilian real) (2023)

Annualized average costs varied by stage in all phases of care. Stages III and IV posed the greatest annual cost burden for all cancer type (Table 3).

Average (per patient) annualized 2019-2022 cancer costs by TNM stage at diagnosis and treatment initiation

Cancer Site	Initial Care	Continuing Care	Last Year of Life
All Sites	32,696	24,478	65,853
Early-stages (I/II)	31,663	22,853	81,666
Late-stages (III/IV)	37,814	36,020	83,428

* 1,00 US dollar = 5,00 R\$ (brazilian real) (2023)

Overall payments increased significantly across year, especially, the end-of-life phase (Table 4).

Average (per patient) annualized 2019-2022 cancer costs by year at diagnosis and treatment initiation

Cancer Site	Initial Care	Continuing Care	Last Year of Life
All years	\$32,696	\$24,478	\$65,853
2019	\$32,791	\$30,411	\$58,665
2020	\$30,170	\$15,533	\$44,685
2021	\$35,528	\$21,430	\$105,913
2022	\$32,503	\$19,555	\$134,033

* 1,00 US dollar = 5,00 R\$ (brazilian real) (2023)

CONCLUSIONS

Considerable differences exist in expenditures across phases of cancer care, between the variety of patient's characteristics. Frequently updated cost information for cancer types is needed to guide discussions of anticipated short-term and long-term cancer-related costs. Only by understanding the drivers of such payment variations across patient (for example: gender, age, race, stage...), tumor characteristics, and time at diagnosis, we can decrease payments, expand access to new therapies and increase quality, thereby reducing the burden of cancer care.

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