

DIRECT MEDICAL COSTS (DMC) OF TREATING CHRONIC LYMPHOCYTIC LEUKEMIA (CLL) PATIENTS IN THE PRIVATE HEALTHCARE SYSTEM IN BRAZIL: RESULTS FROM A 24-MONTH RETROSPECTIVE ANALYSIS OF AN ADMINISTRATIVE DATABASE.

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OBJECTIVE

The aim of this study is to determine 2-year direct medical costs of treating patients with Chronic Lymphocytic Leukemia (CLL) based on the Brazilian Private Healthcare System.

METHODS

The Orizon database, an administrative database containing inpatient and outpatient claims from a pool of 102 HMOs representing 34% of the total Private Health System, was reviewed from Jan/2010 to Dec/2014. Eligible patients included those starting CLL (ICD-10 code C911) treatment from Jan/2010 to Dec/2012. Direct medical costs (DMC) per patient-year were calculated as the sum of medical claims for each patient included in the analysis, for a maximum period of 24-months or death or loss of follow-up, whichever came first. DMC was categorized in chemotherapy, hospitalizations, and other outpatient costs. Further analysis was conducted for chemotherapy and hospitalizations.

RESULTS

From 535 patients with CLL identified in the database, 175 met eligibility criteria and were included in this analysis, representing a total of 212 patients-years. Total DMC in this population was R\$25,597,927 (mean cost of R\$120,744 per patient-year), from which R\$15,778,157 (62%) were related to chemotherapy, R\$5,689,887 (22%) to hospitalizations and R\$4,129,883 (16%) to other outpatient costs. Outpatient laboratory exams accounted for only a small fraction (R\$989,990, 4%) of DMC. A total of 265 hospitalizations were identified in 53 (30%) patients, with an average cost of R\$21,471 ± 55,938 per hospitalization. Chemotherapy drugs accounted for 68% of the total costs within chemotherapy treatment, the rest divided between other drugs (12%), disposable devices (6%), hospital facility fees (5%) and other costs (6%).

CONCLUSIONS

Patients with CLL represent a significant economic burden to private payers. Chemotherapy and hospitalization costs account for about 80% of total costs. Further research will elucidate the cost-effectiveness of novel targeted agents such as ibrutinib, which is administered orally and does not incur costs associated with in-clinic infusions or related adverse effects.

INTRODUCTION

Although chronic lymphocytic leukemia (CLL) is the most common type of leukemia in adults (22-30% of total leukemia cases)¹, it is still considered a rare disease with low incidence rates. In the US, the numbers of new cases and deaths represent 4.5/100,000 and 1.4/100,000 per year, respectively².

Despite low incidence rates, healthcare costs for the treatment of CLL have a significant budget impact. In Germany it is estimated that the annual cost of treating patients with CLL are between 9,753 and 10,828 euros^{3,4}, and in the US the estimated total cost per patient is \$ 87,1515.

In Brazil, chemotherapy with spending for CLL in the Unified Health System totaled R\$ 8.6 million in 2015⁵.

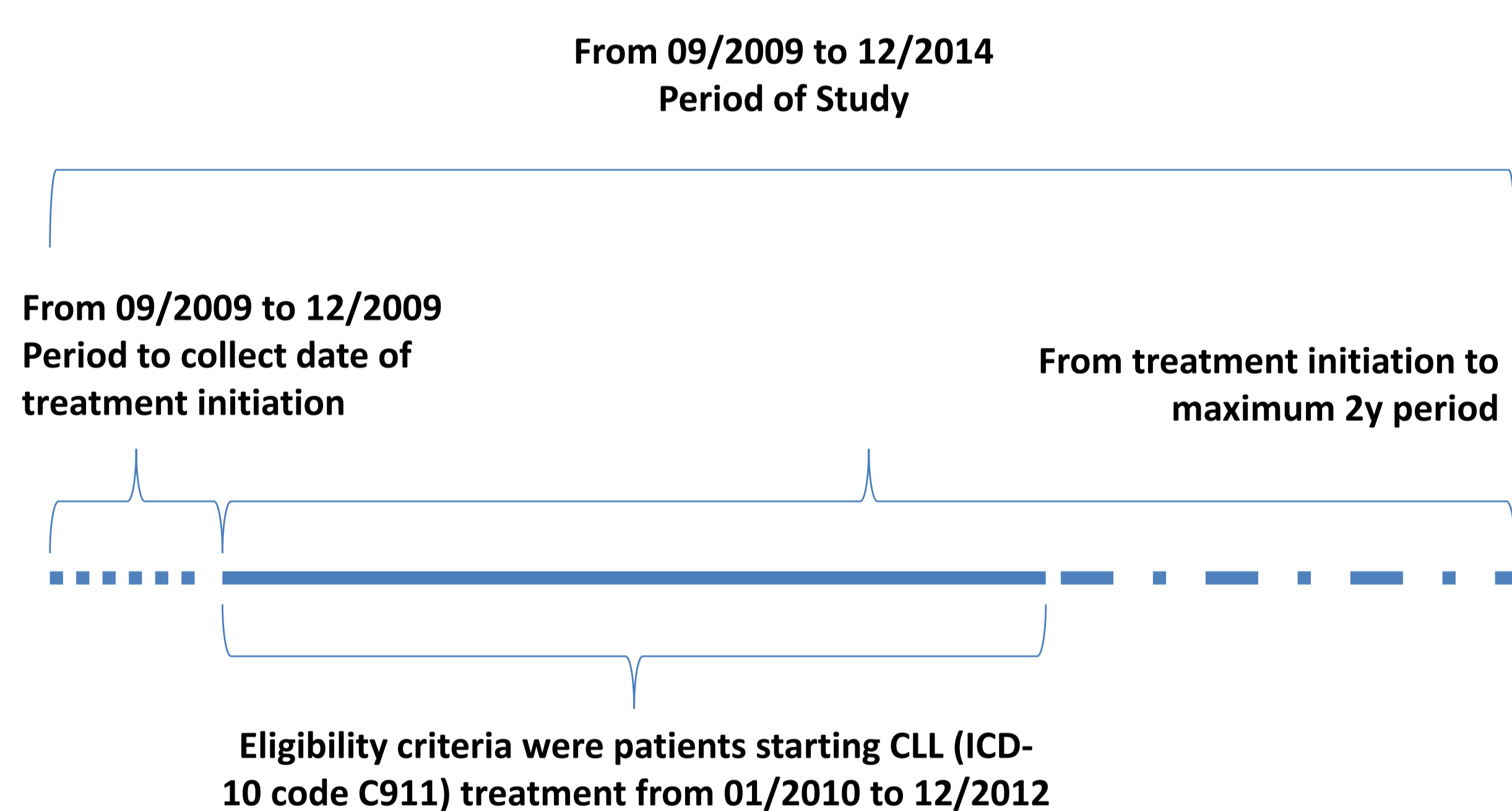
The aim of this study is to determine 2-year direct medical costs of treating patients with Chronic Lymphocytic Leukemia (CLL) based on the Brazilian Private Healthcare System.

METHODS

Retrospective analysis of the Orizon company database, which contains administrative data inpatient and outpatient, with 18 million members and 102 health plans representing approximately 34 % of total private health system.

Eligibility criteria: patients with ICD-10 C911 registration between January 2010 to December 2014, were followed up for a maximum period of 24 months (starting chemotherapy from January 2011 to December 2012), death or loss of follow-up, whichever comes first (figure 1).

Figure 1. Study timelines for data collection and analysis



Direct medical costs (DMC) per patient-year were calculated as the sum of medical claims for each patient included in the analysis, for a maximum period of 24-months or death or loss of follow-up, whichever came first. DMC was categorized in chemotherapy, hospitalizations, and other outpatient costs. Further analysis was conducted for chemotherapy and hospitalizations.

RESULTS

From 535 patients with CLL identified in the database, 175 patients met the eligibility criteria and were included in the analysis (figure 2). The median follow-up was 16.8 months (212 patient-years) and patients were mostly male with average age of 65.9 yrs and average 1.6 lines of treatment for CLL (table 1).

Figure 2. Eligible patients for analysis

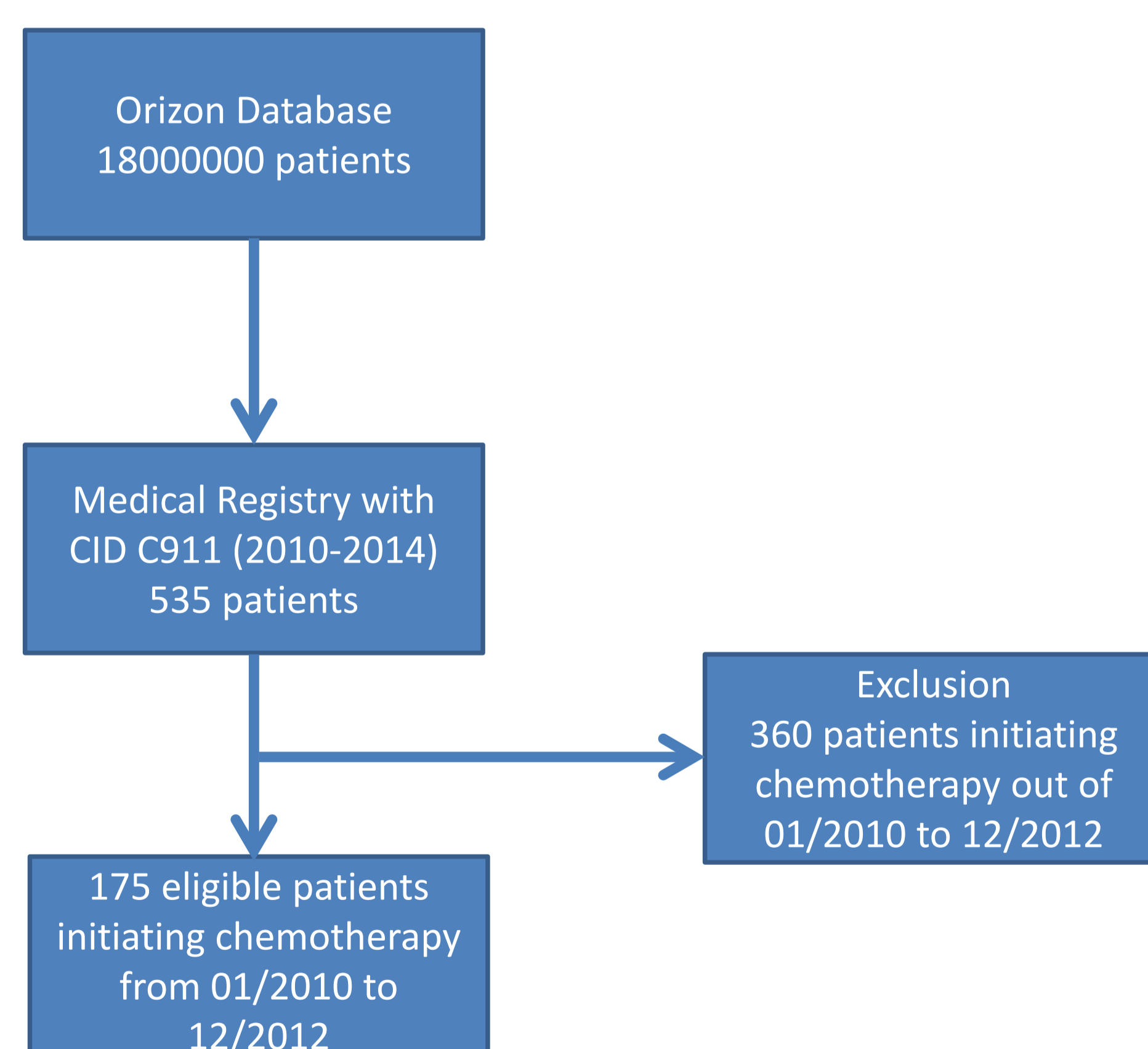


Table 1. Patient Information: age, sex, HMO

Patient Characteristics	%	
Mean age (yrs; ±SD)*	65.9±15.5	
% Male patients*	69.4	
Average CLL treatment lines/patient	1.6	
HMO category	Patients (n)	%
Insurance Company	100	57.14%
Self Management	41	23.43%
Medical Cooperative	27	15.43%
Medical Association	4	2.29%
Others	3	1.71%
Total	175	100%

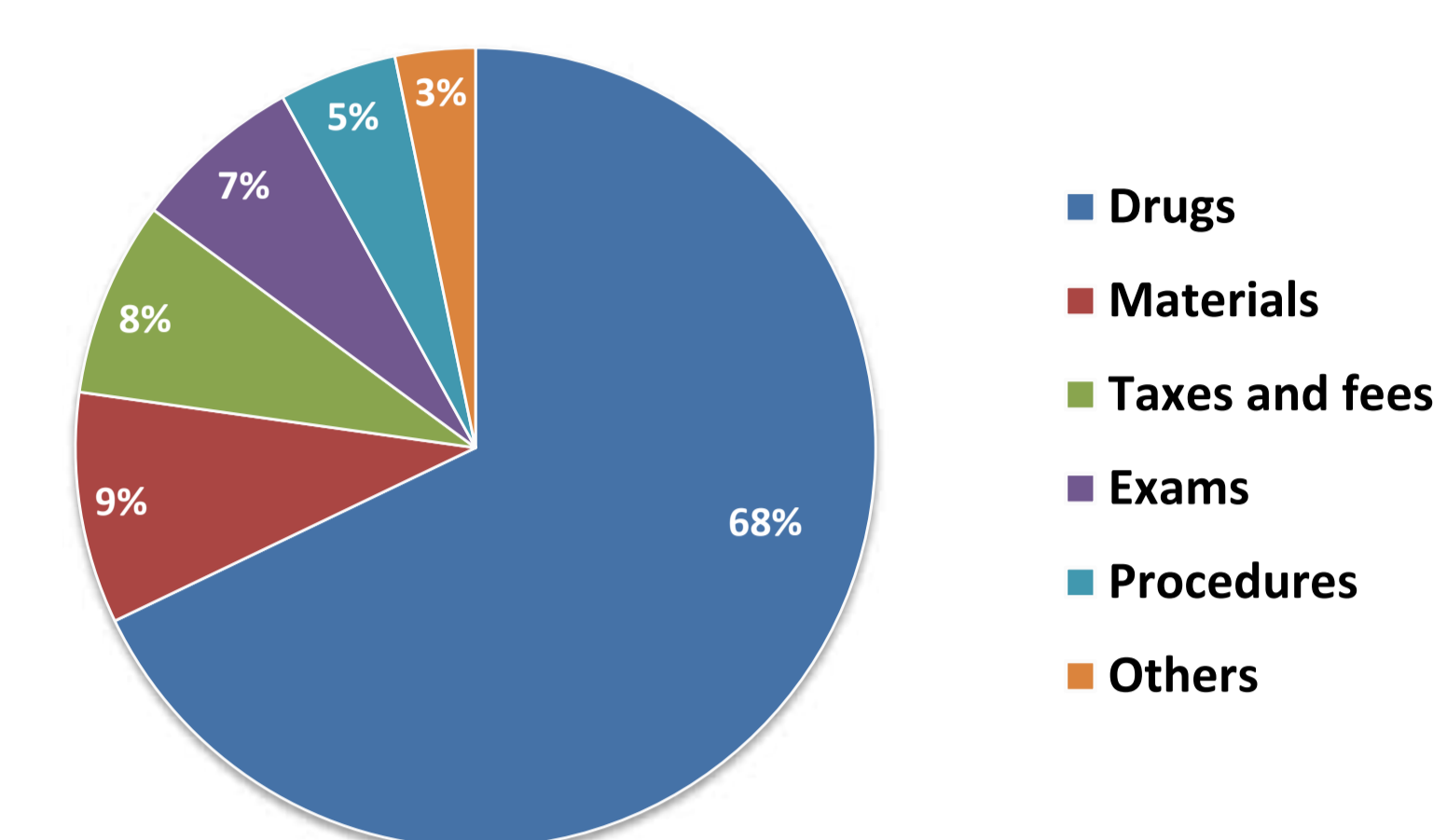
*based on data of 48 patients

Total DMC in this population was R\$25,597,927 (mean cost of R\$120,744 per patient-year), from which R\$15,778,157 (62%) were related to chemotherapy (table 4), R\$5,689,887 (22%) to hospitalizations (table 3) and R\$4,129,883 (16%) to other outpatient costs. Drugs accounted for 68% of total costs for treatment of CLL patients: 49.79% of total for chemotherapy drugs (representing 73.36% of costs with drugs) and 18.09% for other drugs (26.64%). The remaining costs are divided in: materials (7%), taxes and fees (5%), exams (4.87%), clinical procedures (3%) and other costs (gases and packet services) (2%) (table 2 and figure 3).

Table 2. Microfunding total costs

Cost Description	Total [R\$]	%
Drugs	17,375,350.02	67.88%
Materials	2,393,122.32	9.35%
Taxes and fees	2,022,361.39	7.90%
Exams	1,757,925.01	6.87%
Procedures	1,220,121.73	4.77%
Others	829,046.45	3.24%
Total	25,597,926.92	100%

Figure 3. Microfunding: Total Cost with Treatment of CLL Patient



Costs for hospitalization of CLL patients represented 22% of total DMC (median of R\$7,742.37 per hospitalization – Figure 6). For these patients, non-chemotherapy drugs represented 43% of total costs and the remaining costs are divided in: taxes and fees (18%), materials (17%), clinical procedures (9%), exams (7%) and other costs (6%) (table 3 and figure 4). Chemotherapy (whether inpatient or outpatient care) compromised 61.64% of total DMC: chemotherapy drugs accounted for 49.79% of total DMC and represented 80.78% of total chemotherapy costs (table 4 and Figure 5). Together, hospitalization and chemotherapy represented 83.87% of DMC.

Table 3. Microfunding for hospitalization costs (CID C911 and others)

Cost Description - Hospitalization		
Cost Description	Total [R\$]	%
Drugs	2,452,644.65	43.11%
Taxes and fees	1,036,722.88	18.22%
Materials	988,286.72	17.37%
Procedures	479,203.26	8.42%
Exams	369,893.88	6.50%
Others	363,135.38	6.38%
Total	5,689,886.77	100%

Figure 4. Microfunding: Costs with Hospitalization

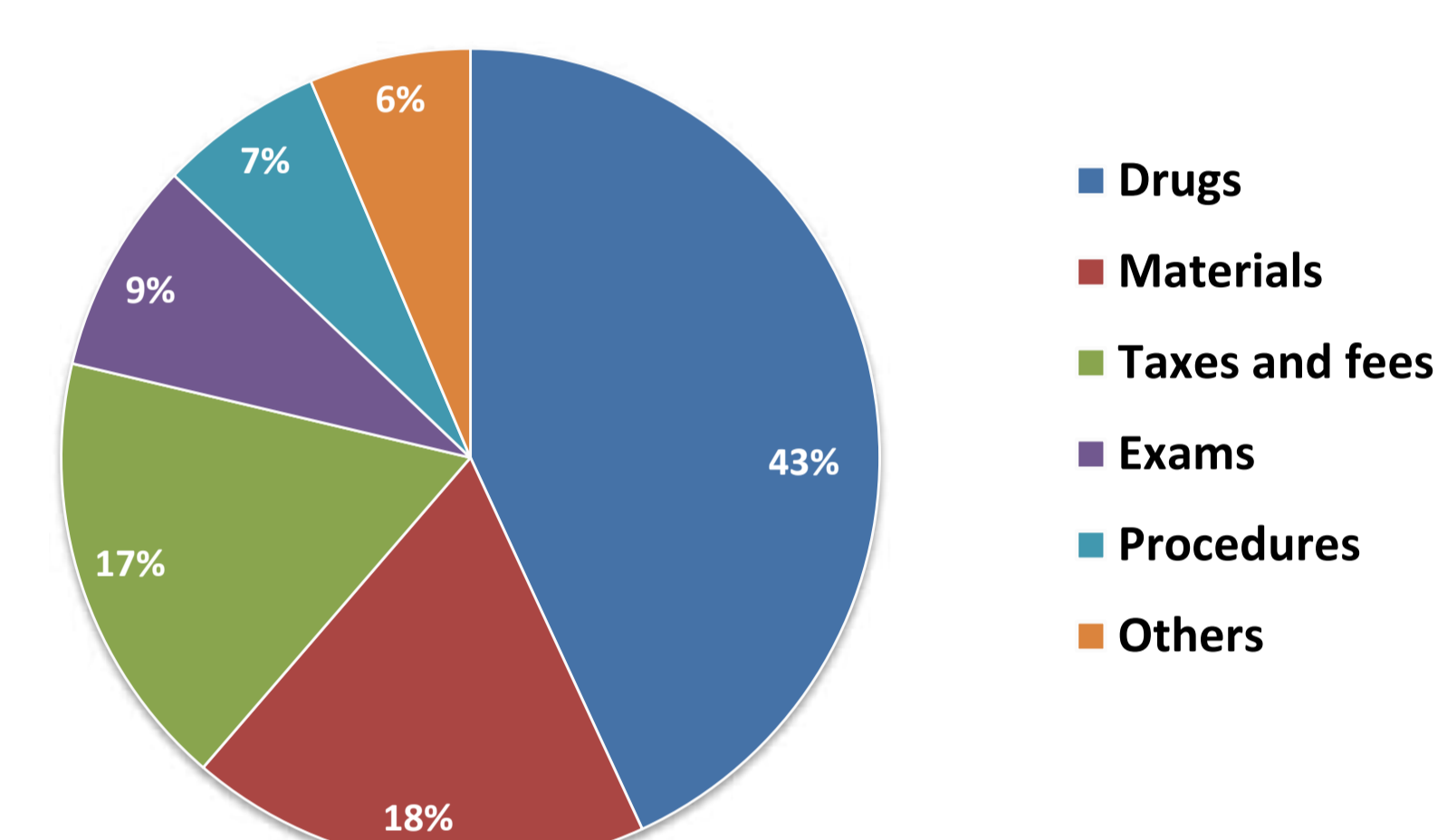


Table 4. Microfunding for chemotherapy costs

Cost Description - Chemotherapy		
Cost Description	Total [R\$]	%
Drugs	12,745,757.02	80.78%
Materials	1,083,644.21	6.87%
Taxes and fees	784,240.56	4.97%
Others	417,986.33	2.65%
Procedures	348,488.08	2.21%
Exams	398,040.93	2.52%
Total	15,778,157.13	100%

Figure 5. Microfunding: Costs with Chemotherapy

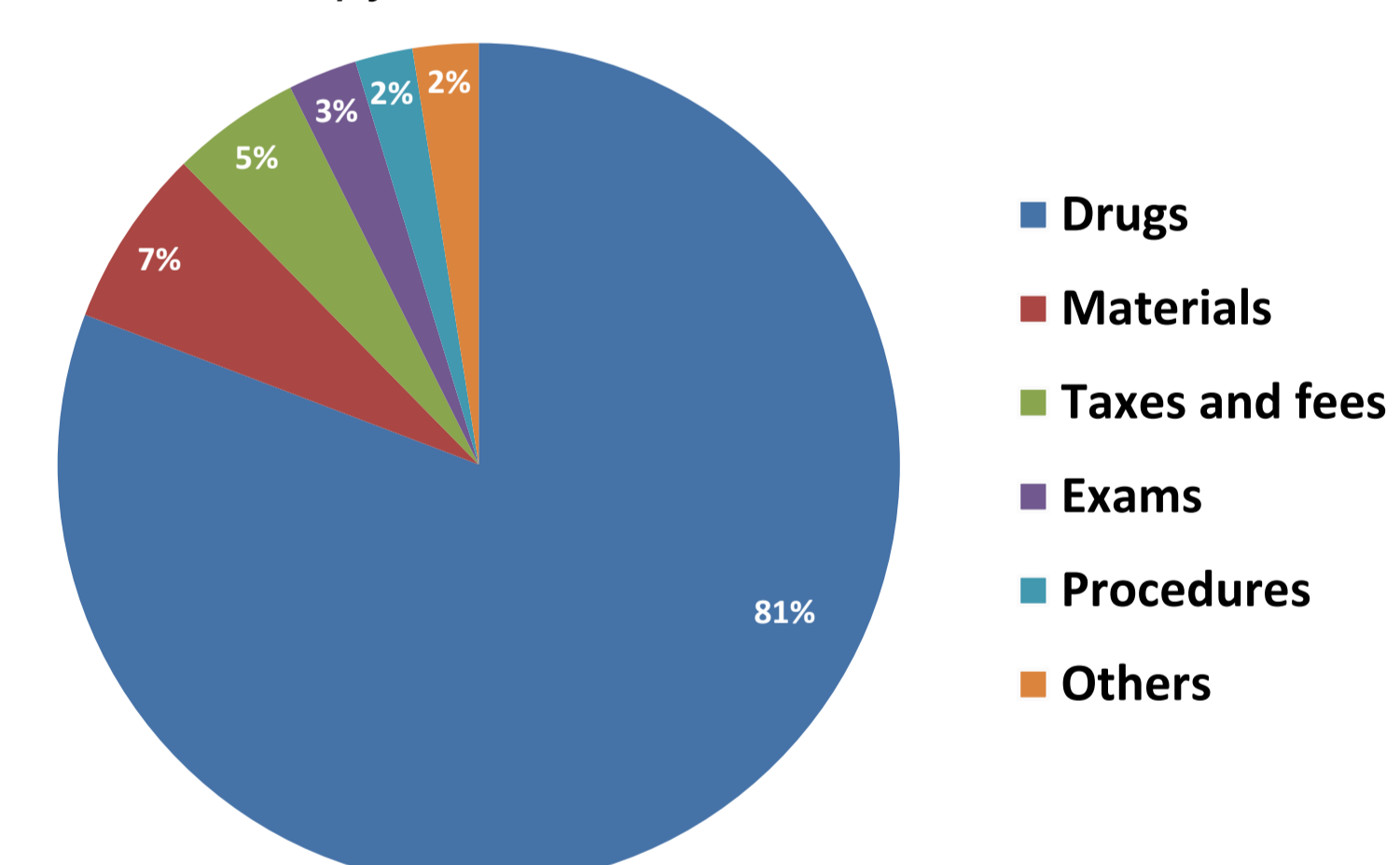
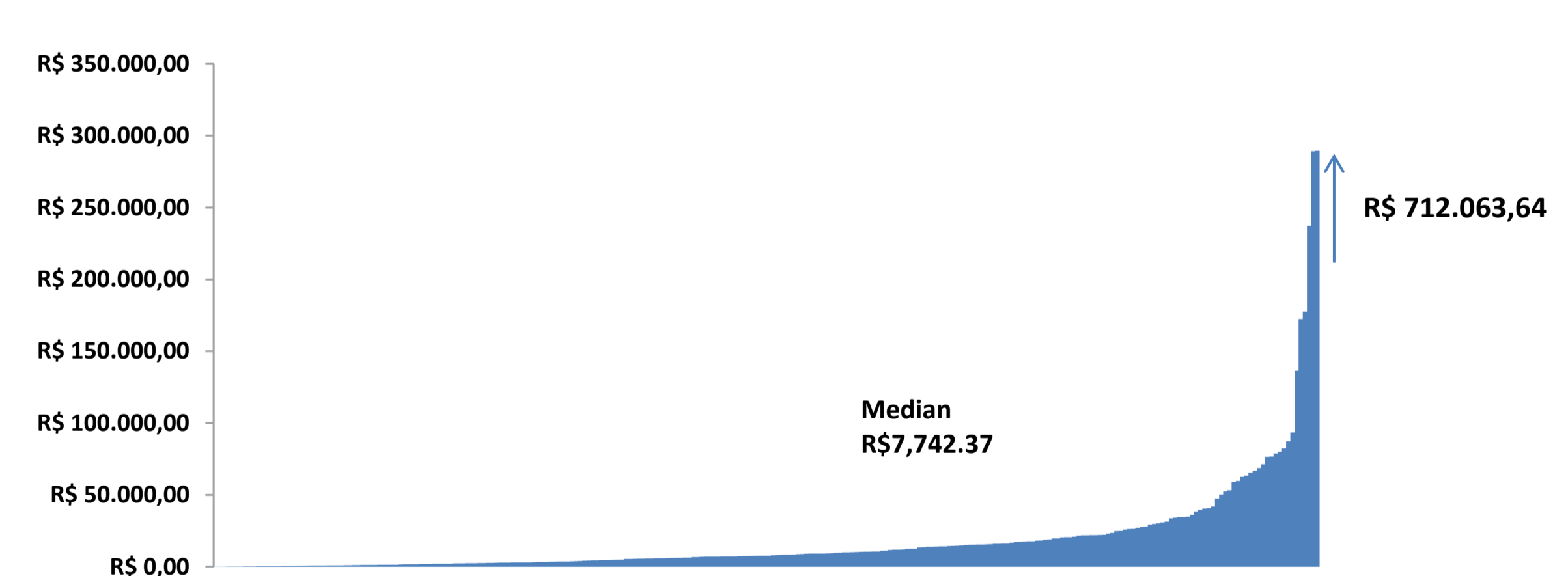


Figure 6. Distribution of Cost per Hospitalization



During the follow-up period, a total of 265 hospitalizations were identified for 104 CLL patients (41 for CLL treatment exclusively and 87 for other non-CLL treatment), representing average of 2,55 hospitalization/patient and 8,98 days/hospitalization with an average cost of R\$21,471 per hospitalization and R\$54,710 per patient (table 5).

Table 5. Hospitalization data

Hospitalization	
Patients (total)	104
Hospitalization (total)	265
Days of hospitalization (total)	2,379
Averages	
hospitalization/patient	2,55
days/hospitalization	8.98
Cost per patient [R\$]	54,710.45
Cost per hospitalization [R\$]	21,471.27
Cost per day [R\$]	2,391.71

LIMITATIONS

- It was not possible to determine which treatment line patients were starting treatment;
- CID information is not available for 100% of the records;
- As in any other retrospective study, analysis is limited to the accuracy and precision of how the information was included in the database;

CONCLUSIONS

Patients with CLL represent a significant economic burden to private payers. Chemotherapy and hospitalization costs account for about 80% of total costs. Further research will elucidate the cost-effectiveness of novel targeted agents such as ibrutinib, which is administered orally and does not incur costs associated with in-clinic infusions.