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INTRODUCTION

Oncologic treatment can be costly to the healthcare system as well as to individuals. Out-of-pocket health expenditures directly reflect the burden of health expenses that households bear, whose primary intent is to contribute to the restoration or enhancement of the health status.¹ Despite having a tendentially free (at the point of delivery) and universal health coverage through a publically financed public healthcare system (*Serviço Nacional de Saúde*), in Portugal out-of-pocket expenditure represent 28.6% of the current health spending, being among the highest in OECD countries.² This paradigm highlights the importance of studies that can provide a better understanding of the extent of these costs, across specific diseases.

OBJECTIVE

To estimate annual out-of-pocket health expenditures of Leukemia and Lymphoma adult patients in Portugal and to evaluate if these expenditures vary according to the treatment phase.

METHODS

This cross-sectional study was based on the application of a questionnaire to adult patients diagnosed with leukemia or lymphoma;

The questionnaire was shared online, with the support of three national Patient Associations: *Associação Portuguesa de Leucemias e Linfomas* (APLL), *Associação Portuguesa Contra a Leucemia* (APCL), *Associação de Apoio aos Doentes com Leucemia e Linfoma* (ADL);

Patients self-reported their out-of-pocket expenditures due to Leukemia or Lymphoma, within four pre-defined categories: medications and pharmacy products, consultations in the private sector, travelling costs to hospital, and alternative medicine (e.g., reiki, acupuncture), over the last 12 months.

Analyses

- Independent t-test was used to explore differences in out-of-pocket health expenditures of patients according to treatment phase (in-treatment versus pre- or post-treatment), within each disease category: **acute leukemia**, **chronic leukemia**, **Hodgkin's lymphoma** and **non-Hodgkin's lymphoma**.

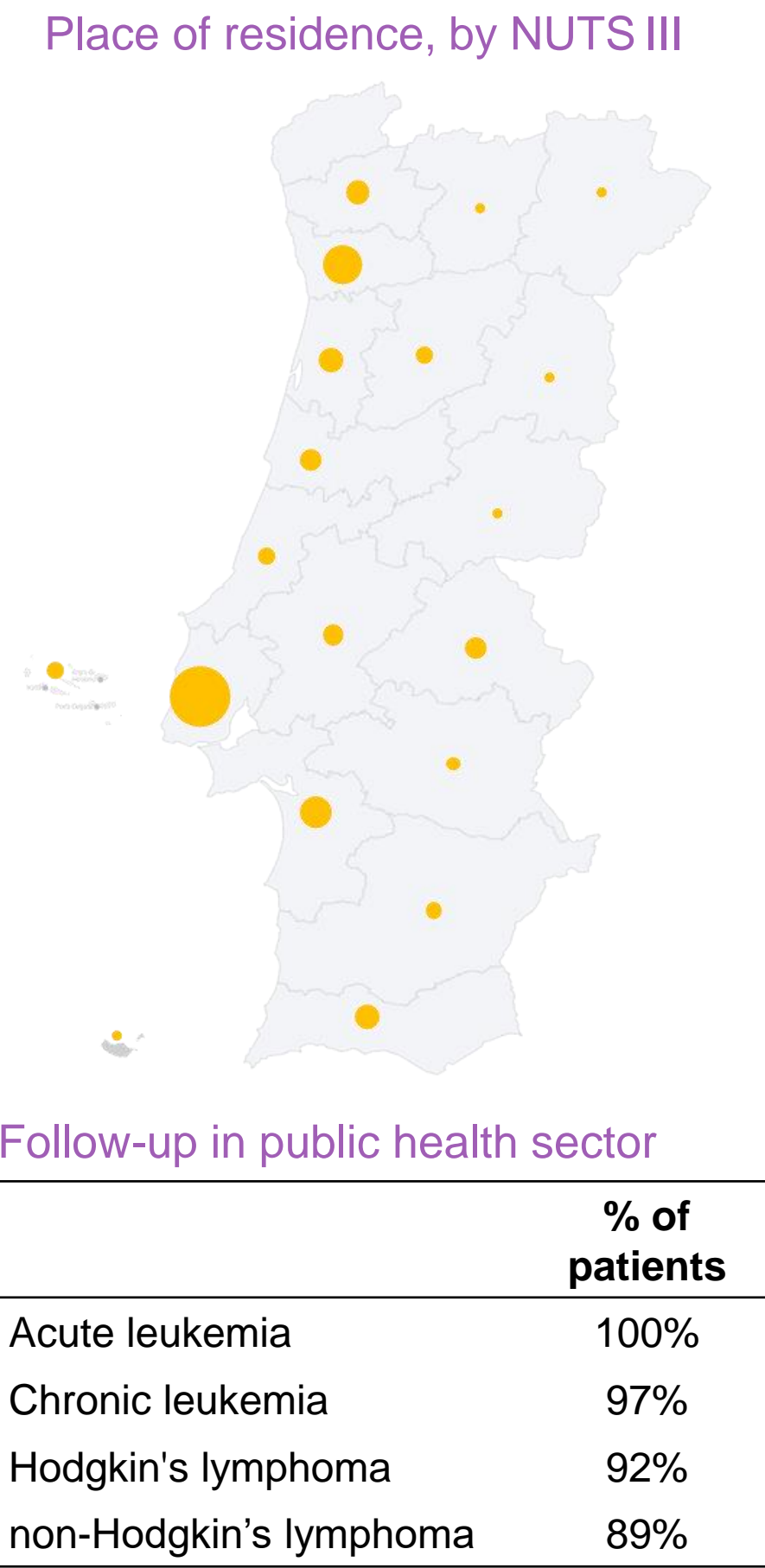
RESULTS

Descriptive analysis

Between October to December 2022, **212 patients** answered to the questionnaire.

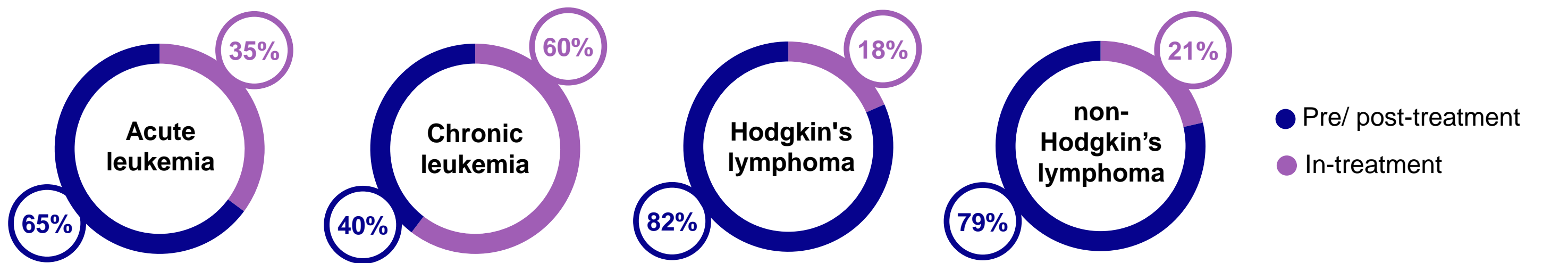
1. Socio-demographic characteristics

	Acute leukemia N=37	Chronic leukemia N=53	Hodgkin's lymphoma N=38	non-Hodgkin's lymphoma N=84
	N (%)	N (%)	N (%)	N (%)
Sex				
Male	12 (32%)	25 (47%)	9 (24%)	16 (19%)
Female	25 (68%)	28 (53%)	29 (76%)	68 (81%)
Age				
18 to 40 years	16 (43%)	4 (8%)	14 (37%)	11 (13%)
41 to 65 years	18 (49%)	38 (72%)	19 (50%)	57 (68%)
> 65 years	2 (5%)	11 (20%)	5 (13%)	16 (19%)
n/a	1 (3%)	-	-	-
Level of education ³				
Basic	3 (8%)	3 (6%)	1 (3%)	6 (7%)
Intermediate	14 (38%)	21 (40%)	21 (55%)	40 (48%)
Advanced	16 (43%)	29 (55%)	16 (42%)	37 (44%)
n/a	4 (11%)	-	-	1 (1%)
Gross monthly income				
< 500€	8 (22%)	7 (13%)	2 (5%)	7 (8%)
500€-1000€	7 (19%)	14 (26%)	16 (42%)	29 (35%)
1000€-1500€	8 (22%)	15 (28%)	9 (24%)	16 (19%)
>1500€	9 (24%)	17 (32%)	8 (21%)	21 (25%)
n/a	5 (13%)	-	3 (8%)	11(13%)



Considering all respondents (n=212), most participants were in the 41-65 age group (n=132, 61%), and 150 (71%) were female. The geographical distribution of participants covered 17 (of 18) districts of mainland Portugal and Islands.

2. Treatment phase



Overall, 70 (33%) patients are currently undergoing treatment, while the remaining have not yet started or have already finished their treatment.

3. Out-of-pocket health expenditures

Annual *out-of-pocket* expenditures per patient, by disease type, in Euros

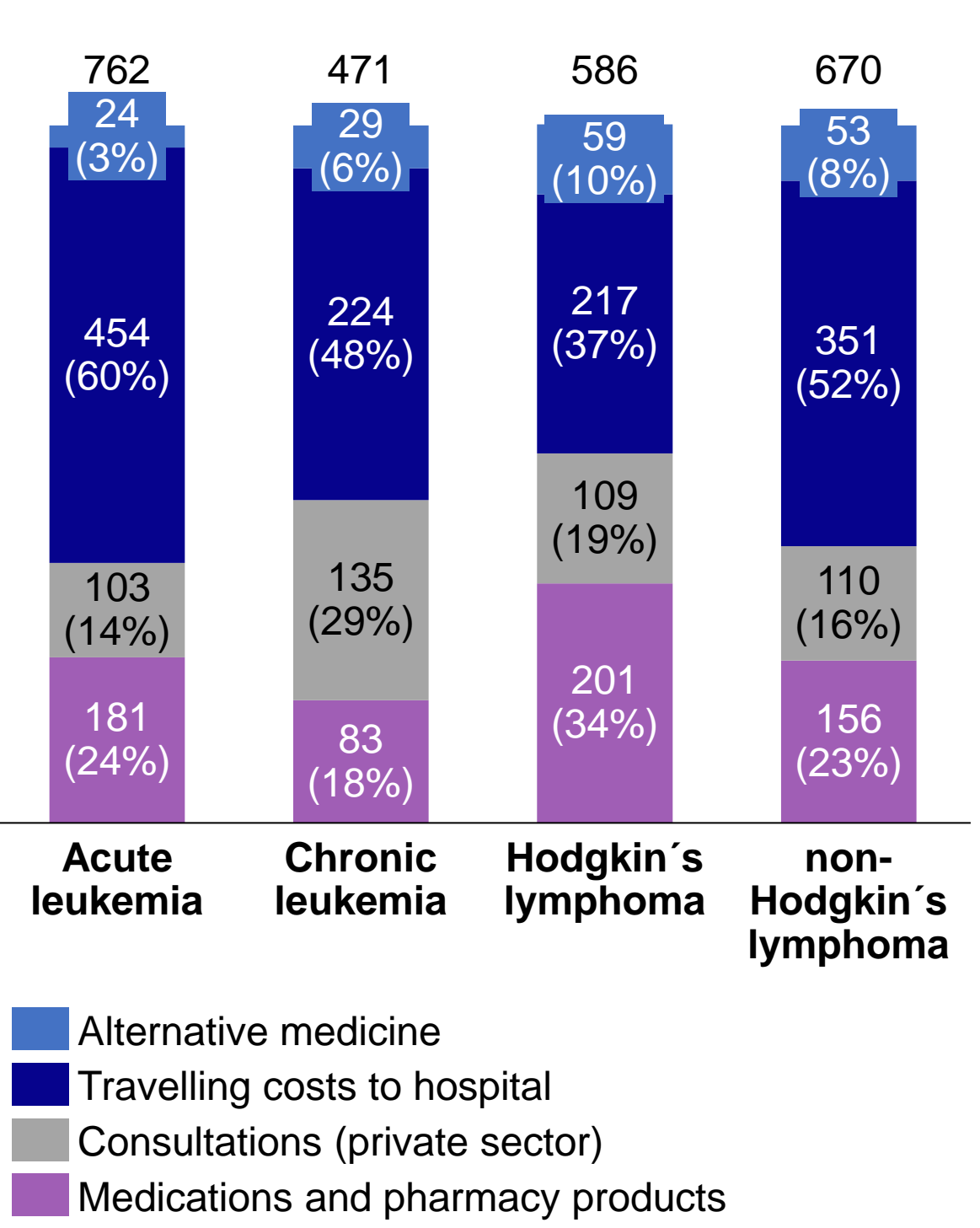
	Acute leukemia N=37	Chronic leukemia N=53	Hodgkin's lymphoma N=38	non-Hodgkin's lymphoma N=84
Mean (SD)	762 (1,073)	471 (588)	585 (613)	670 (1,256)
Min; Max	0; 4,250	0; 2,500	0; 2,560	0; 8,250

Note: SD = standard deviation

Mean annual out-of-pocket expenditures **vary by disease type**, being highest for acute leukemia

Travelling costs to hospital were responsible for most of the *out-of-pocket* expenditures, followed by medications, consultations, and alternative medicine, except for chronic leukemia, where the mean expenditures with private consultations were higher than those with medicines.

Annual *out-of-pocket* expenditures per patient, by disease type, and cost category, in Euros



Number of travels to hospital per patient a year, and unit cost per travel, in Euros

	Acute leukemia	Chronic leukemia	Hodgkin's lymphoma	non-Hodgkin's lymphoma
Number of travels to hospital per patient a year, Mean (SD)	16 (29)	9 (12)	15 (22)	11 (16)
Cost per travel, in Euros, Mean (SD)	26 (31)	25 (37)	21 (25)	26 (30)

Inferential analysis

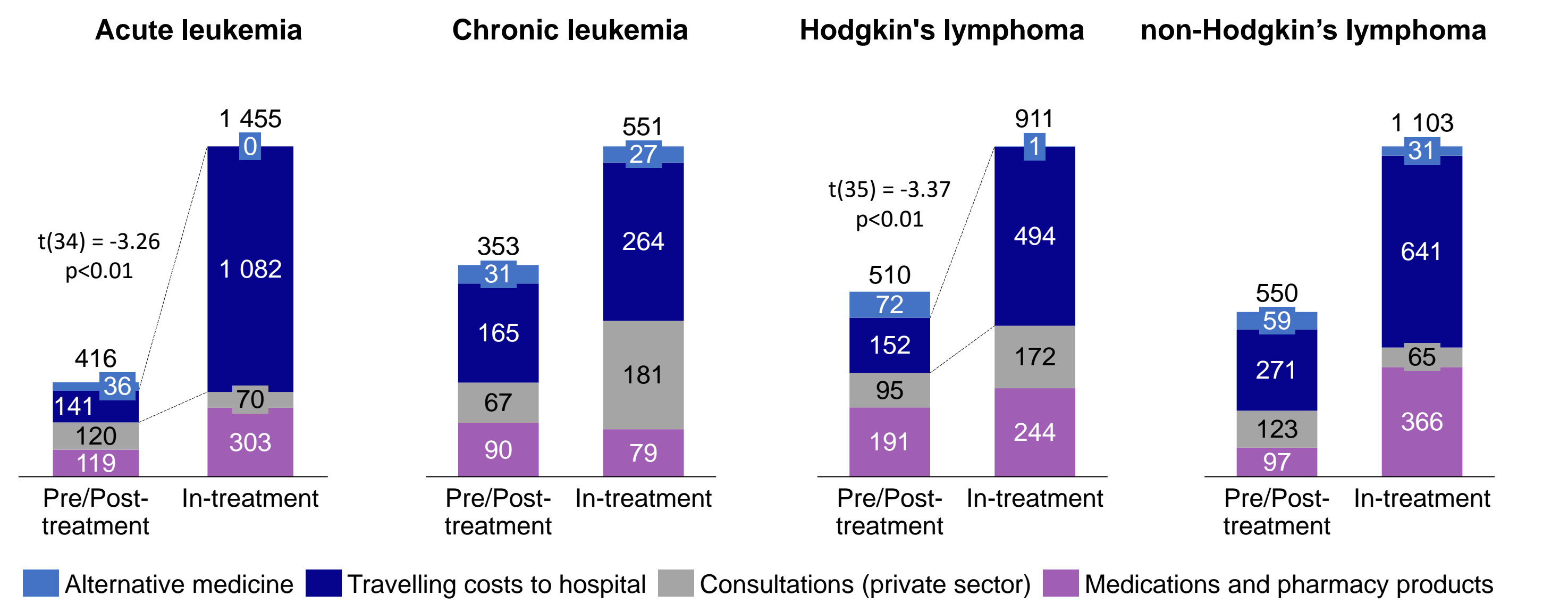
Differences in out-of-pocket health expenditures of patients according to treatment phase, for each disease type, in Euros

	Pre/ post-treatment (Mean, SE)	In-treatment (Mean, SE)	Diff (Mean, SE)	t test
Acute leukemia	415 (130)	1455 (412)	-1040 (432)	t(34) = -3.05, p<0.01
Chronic leukemia	352 (102)	551 (117)	-198 (166)	t(50) = -1.20, p=0.24
Hodgkin's lymphoma	510 (110)	910 (226)	-400 (252)	t(35) = -1.59, p=0.12
non-Hodgkin's lymphoma	549 (144)	1103 (391)	-554 (341)	t(76) = -1.62, p=0.11

Note: SE = standard error; statistical significance was set at p<0.05

Within all disease types, patients in-treatment had higher overall out-of-pocket health expenditures in comparison to patients pre- or post-treatment, however, this difference was only statistically significant for acute leukemia.

Differences in mean out-of-pocket health expenditures of patients according to treatment phase in each cost category, for each disease type, in Euros



Statistically significant differences in mean out-of-pocket expenditures according to treatment phase (patients in-treatment *versus* pre- or post-treatment) were found for annual travelling costs to hospital, for patients with acute leukemia and with Hodgkin's lymphoma, for whom treatment options are not based in oral medications.

Limitations

- This is an exploratory study, based on an online questionnaire. This methodology may have contributed for a selection bias, since patients from lower socio-economic levels have a lower probability of enrollment (a large proportion of respondents have an advanced level of education);
- Further studies, with a larger number of participants, should be conducted to better explore and quantify differences in out-of-pocket health expenditures through multivariate analysis.

TAKE HOME MESSAGES

- This exploratory study suggest that, in Portugal, patients diagnosed with leukemia or lymphoma have significant *out-of-pocket* expenditures, especially during treatment;
- Travelling costs to hospital are the main cost drivers;
- Statistically significant differences for travelling costs were found for patients with acute leukemia and Hodgkin's lymphoma, being significantly higher during the treatment phase versus pre/post-treatment.