Economic burden of Advanced Non-Small-Cell Lung Cancer (NSCLC) Patients harboring KRAS^{G12C} mutation in Spain

RWD89

Carla Fernández-Barceló[1], Ismail Abbas[1], Xavier Botella[2], Mónica Aguiló[2], Francesc Cots[3], Cristina Siles Cuesta[3], Edurne Arriola[3], Maria Eugenia Gas Lopez[4], Carlos López Gómez[4], Oscar Juan-Vidal[5], Laura Planellas[6], Ariadna Lloansí[6], Joan Sánchez[1], Noemí Reguart[1], Laura Sampietro-Colom[1]

1. Hospital Clínic de Barcelona, Barcelona, Spain; 2. Consorci Sanitari de Terrassa, Terrassa, Spain; 3. Hospital del Mar-CIBERONC, Barcelona, Spain; 4. The Health Research Institute Hospital La Fe, Valencia, Spain; 5. Hospital La Fe de Valencia, Valencia, Spain; 6. Amgen S.A., Barcelona, Spain.

Introduction

- Around 15% of patients with NSCLC harbor the *KRAS^{G12C}* mutation[1,2].
- In the changing landscape of *KRAS^{G12C}* treatment, robust and updated real-world evidence on treatment patterns, outcomes and resource use is needed.
- Moreover, characterization of use of resources in different health systems brings key information to advance in strategies to improve the management of these patients.
- Studies on health resources used and economic burden in these patient population are lacking in Europe.

Objective

- To characterize the use of hospital resources in the treatment of patients with locally advanced (not candidate for radical treatment) or metastatic NSCLC harboring KRAS^{G12C} mutation and estimate their associated direct health costs in Spain.

Methods

Study design and patients

- SILK was an observational, retrospective, single-country, multicenter, cohort study.
- The study collected clinical and economic data from routine clinical practice from medical records and administrative databases from 1st January 2016 to 9th March 2022 (diagnosis period: Jan 2016-Oct 2021).

Key inclusion criteria

- Adult patients (≥ 18 years) with pathologically confirmed diagnosis of locally advanced (not candidate for radical treatment) or metastatic NSCLC from 1st January 2016 onwards harboring *KRAS^{G12C}* mutation at baseline , as confirmed by local molecular testing in solid biopsy

Key exclusion criteria

- Participation in clinical trials evaluating *RAS* inhibitors prior to or during the study period*

*Patients participating in clinical trials evaluating other medicinal products/medical devices could be included in the study if the trial was already finalized. These patients were included in the analyses for the clinical part. When assessing human resources utilization and costs per patient, these patients were completely excluded from the analysis.

Statistical analysis

- Descriptive analysis was performed to calculate the mean cost, along with a 95% confidence interval (CI) for global (total resources used by patients in any hospital area) and disease-related (d-r, total resources used by patients in oncology and respiratory units) health resources used and associated costs.
- A sub-analysis was conducted by treatment line and received therapy (alone or in combination: chemotherapy, immunotherapy, or other systemic therapies) for d-r costs.

Results

Patients

- A total of 127 patients were included in the study. Their baseline characteristics are summarized in **Table 1**.
- Data on global health resources were available for **125 patients**, whereas **104 patients** had data on d-r health resources. During the studied period, one patient had a treatment line (line 3) under a clinical trial. Therefore, this patient was excluded when analyzing resources per patient; when analyzing per line of treatment, the patient only was excluded from the line of treatment affected by the clinical trial.
- Mean overall survival was 11.7 months for both patients with global health resources data (N=124) and patients with d-r data (N=103).

Healthcare costs

- Over the study period (6 years), the estimated **total global cost** associated to the patient population was **€5,725,934** (**mean cost per patient: €46,177** [95%CI: €37,680-€54,674]) and the **total d-r cost** was **€4,238,525** (**mean cost per patient: €41,151** [95%CI: €32,343-49,958]).

Table 1. Baseline demographic and disease characteristics

	Full Analysis Set (N=127)
Male, n (%)	90 (70.9)
Median age, years (min, max)	65.0 (43.0, 87.0)
Ethnic origin: Caucasian, n (%)	125 (98.4%)
Smoking status, n (%):[a]	
Never smoked	1 (0.8)
Former smoker	69 (54.3)
Current smoker	55 (43.3)
Passive	1 (0.8)
ECOG performance status, n (%):[b]	
0	27 (21.3)
1	46 (36.2)
2	31 (24.4)
3	14 (11.0)
4	4 (3.1)
Tumour stage at first diagnosis, n (%):	
IIIa	4 (3.1%)
IIIb	1 (0.8%)
IIIc	2 (1.6%)
IV	120 (94.5%)
Date of diagnosis, n:[c]	
Jan 2016-Sep 2017	24
Oct 2017-Oct 2021	66

ECOG, Eastern Cooperative Oncology Group. [a]Missing data for 1 patient (0.8%); [b]Unknown for 5 patients (3,9%); [c]Selected timeframes due to a major standard of care change in Spain: Immunotherapy can be used as first line of treatment from October 2017 (only patients who received chemotherapy and/or immunotherapy are shown [N=90])

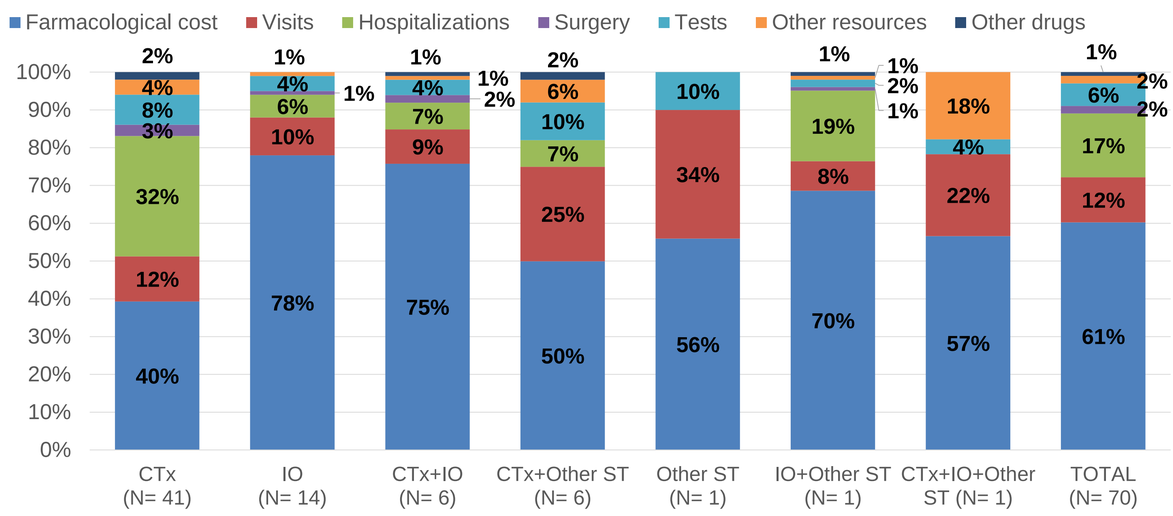
- **Table 2** shows global and d-r costs by treatment line.
- Mean d-r cost per patient was €39,860 in 1st line (1L), and €23,969 in pooled 2nd line (2L) and 3rd line (3L) (**Figure 1**).
- Use of drugs was the main cost driver: 61% in 1L, and 51% in 2L+3L. Main cost driver among other healthcare resources used were hospitalizations (17% in 1L; 22% in 2L+3L) and healthcare professionals visits (12% in 1L; 18% in 2L+3L) (**Figure 1**).
- Chemotherapy (CTx) alone was the most common therapy at 1L (59%).
- The highest cost burden was in “Other health resources” among patients treated with CTx (60% in 1L and 72% in 2L+3L) and in “Pharmacological cost" among patients treated with Immunotherapy (IO) (78% in 1L and 60% in 2L+3L) (**Figure 1**).
- Among other health resources used in 1L, hospitalizations represent the most relevant cost in patients treated with CTx, while in patients treated with IO it appears to be the visits to healthcare professionals (follow-up and day hospital).

Table 2. Costs by treatment line

	1st Treatment Line	2nd Treatment Line	≥3rd Treatment Line
Global cost	€3,975,372 (N=92)	€802,511 (N=29)	€379,973 (N=20)
Disease-related cost	€2,790,184 (N=70)	€720,851 (N=27)	€357,730 (N=18)
Mean Duration of Treatment	10.0	5.8	6.9
Mean cost per patient (95% CI)	€39,860 (€30,337 – €49,383)	€26,698 (€16,938-€36,458)	€19,874 (€1,965-€37,783)
Mean Pharmacological cost	€24,138	€13,556	€10,120
Mean Other healthcare cost	€15,722	€13,143	€9,754

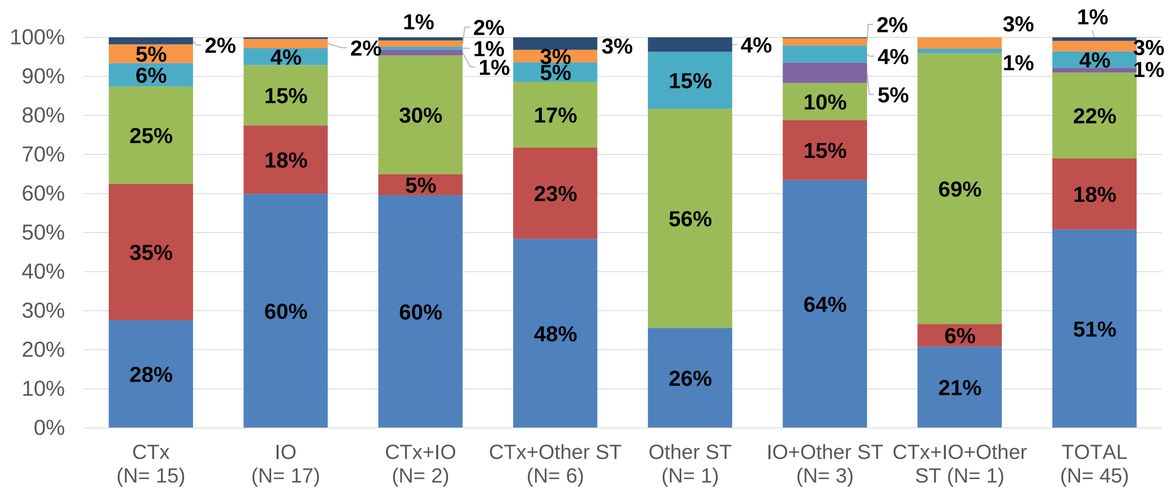
Figure 1. Disease-related cost per patient

A) 1st Line



	CTx (N= 41)	IO (N= 14)	CTx+IO (N= 6)	CTx+Other ST (N= 6)	Other ST (N= 1)	IO+Other ST (N= 1)	CTx+IO+Other ST (N= 1)	TOTAL (N= 70)
Average DoT (months)	6.2	19.8	10.8	8.9	4.4	38.0	6.8	10.0
TOTAL COST	**€26,580**	**€75,089**	**€59,859**	**€22,236**	**€13,519**	**€124,087**	**€19,007**	**€39,860**

B) 2nd and 3rd Line



	CTx (N= 15)	IO (N= 17)	CTx+IO (N= 2)	CTx+Other ST (N= 6)	Other ST (N= 1)	IO+Other ST (N= 3)	CTx+IO+Other ST (N= 1)	TOTAL (N= 45)
Average DoT (months)	5.2	5.8	2.4	6.2	0.4	14.7	2.0	6.2
TOTAL COST	**€9,890**	**€24,313**	**€26,233**	**€19,707**	**€3,794**	**€77,411**	**€110,186**	**€23,969**

CTx, Chemotherapy; DoT, Duration of Treatment; IO, Immunotherapy; ST, Systemic Therapy

Conclusions

- **The present real-world study provides evidence on the economic burden of advanced NSCLC harboring KRAS^{G12C} mutation in Spain, being the first study in Europe to measure the cost of this type of cancer.**
- **Mean cost per patient decreased across treatment lines, as well as the relevance of pharmacological costs among the overall management cost.**
- **This real-world data study emphasizes that the management of NSCLC harboring KRAS^{G12C} represents a relevant burden for patients and health systems. Thus, evaluating the impact of new and effective targeted therapies is warranted.**

References

[1]Finn SP, et al. J Thorac Oncol. 2021;16(6):990-1002. [2]Marin E, et al. Cancers (Basel). 2020;12(5)

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Conflict of interests

EA: Honoraria, invited speaker or advisory role from Astra Zeneca, BMS, Boehringer Ingelheim, Guardant Health, Lilly, MSD, Pfizer, Roche, Takeda, Thermo Fisher Scientific and Trialing Health. **OJ-V**: Honoraria or advisory role from Bristol-Myers Squibb, Merck Sharp & Dohme, Roche/Genetech, AstraZeneca, Pfizer, Eli Lilly, Takeda and Janssen. Travel, accommodations, expenses from Takeda, Astra-Zeneca. **LP** and **AL** are employees and stakeholders of Amgen S.A. **NR**: Invited speaker or advisory role from Amgen, Astra-Zeneca, Bayer, BMS, Boehringer, Guardant, Janssen, MSD, Novartis, Pfizer, Roche, Sanofi and Takeda. The rest of authors declare no conflict of interests.