

# A European Perspective on Health Resource Utilization (HRU) and Cost Outcomes in Patients with Relapsed/Refractory Multiple Myeloma (RRMM): A Systematic Literature Review

María-Victoria Mateos, MD<sup>1</sup>, Ken Hasegawa, PhD<sup>2</sup>, Taha Itani, PhD, MPH<sup>2</sup>, Monique Giordana, PharmD, BCOP<sup>2</sup>, Enrique Granados, MD<sup>2</sup>, Jie Ting, PhD, MSPH<sup>3</sup>, Rebecca J Chan, MD, PhD<sup>3</sup>, Ana Kostic, MD<sup>3</sup>, Noor-E Zannat, MA (Econ)<sup>4</sup>, Pardis Lakzadeh, MSc<sup>4</sup>, Doris K Hansen, MD<sup>5</sup>

1. University Hospital of Salamanca/IBSAL, Salamanca, Spain; 2. Kite, A Gilead Company, Santa Monica, CA; 3. Arcellx, Inc., Redwood City, CA; 4. RainCity Analytics, Vancouver, Canada; 5. H. Lee Moffitt Cancer Center & Research Institute, Tampa, FL

## INTRODUCTION

- Globally, an estimated 176,404 people were diagnosed with multiple myeloma (MM) in 2020.<sup>1</sup>
- With increasing survival rates and the resulting increased resource use, the financial strain associated with MM exceeds that of most other malignancies, with costs continuing to escalate.<sup>2,3</sup> This growing economic burden is exacerbated by the increasing incidence of MM and the substantial proportion of patients experiencing relapsed and refractory disease.
- This systematic literature review aimed to characterize the economic burden of MM, focusing on RRMM-related costs and healthcare resource utilization (HRU) in Europe.

## METHODS

### Systematic Literature Review

- Searches were conducted on MEDLINE, Embase, EconLit, and NHS-EED (January 2012-March 2024). Relevant conference proceedings were also reviewed.
- Observational studies and trials focusing on hospitalization-related outcomes were eligible for inclusion. The systematic literature review protocol was prospectively registered with PROSPERO (CRD42023467098).

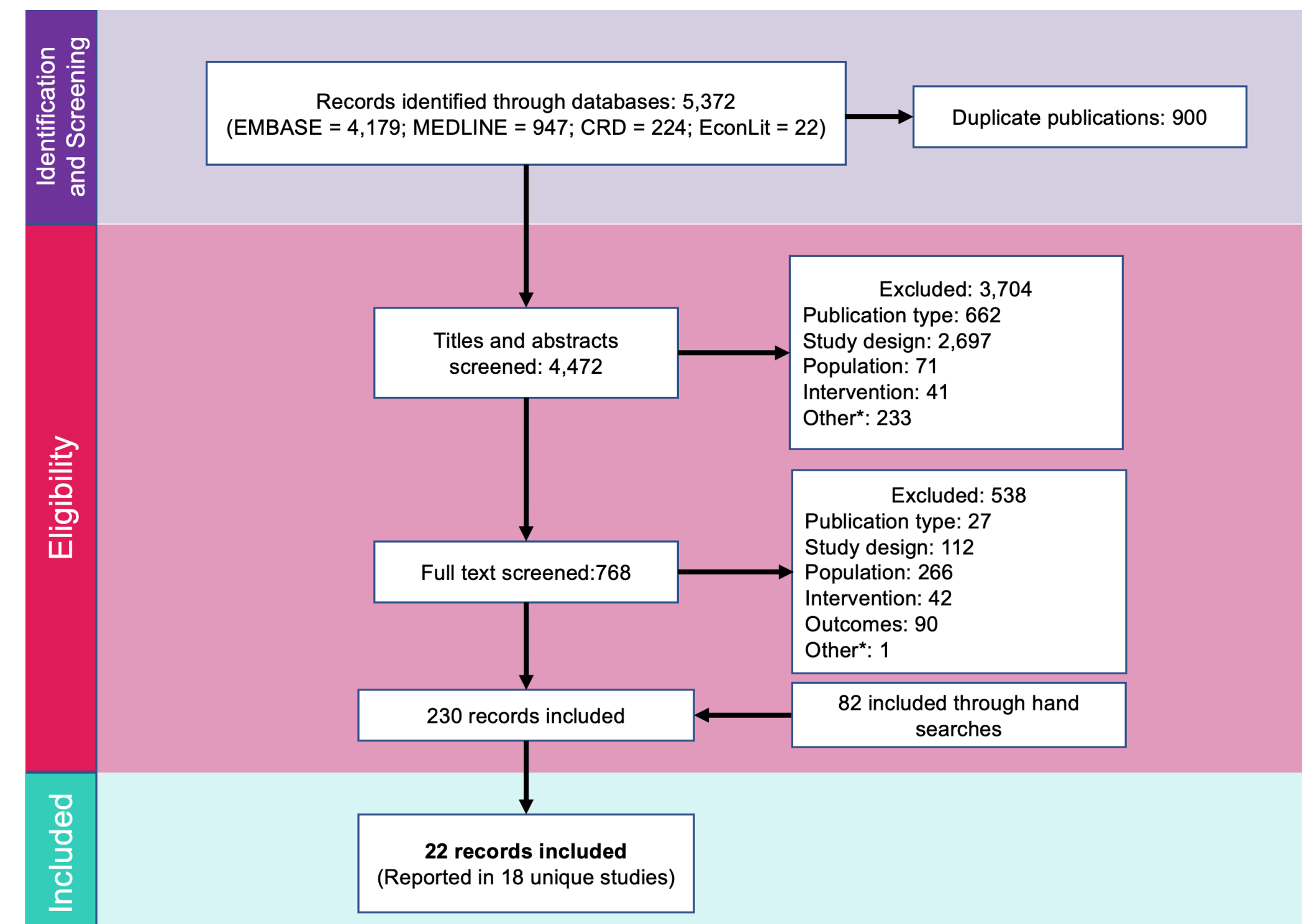
### Descriptive Summary

- Results were descriptively summarized for studies reporting direct costs and HRU in Europe. All costs were adjusted to 2024 EUR using the harmonized index of consumer prices (HICP) and converted to monthly estimates to improve comparability. The one study using British pounds was converted using the historical currency conversion rate first.
- The synthesis aimed to focus on general trends and patterns rather than direct comparisons due to considerable heterogeneity in outcomes.

## RESULTS

- Figure 1** presents the study selection process. Of the 5,372 records identified, 22 records reporting on 18 unique eligible studies were identified. These focused on Europe-based outcomes (**Figure 2**).

**Figure 1. PRISMA Diagram**

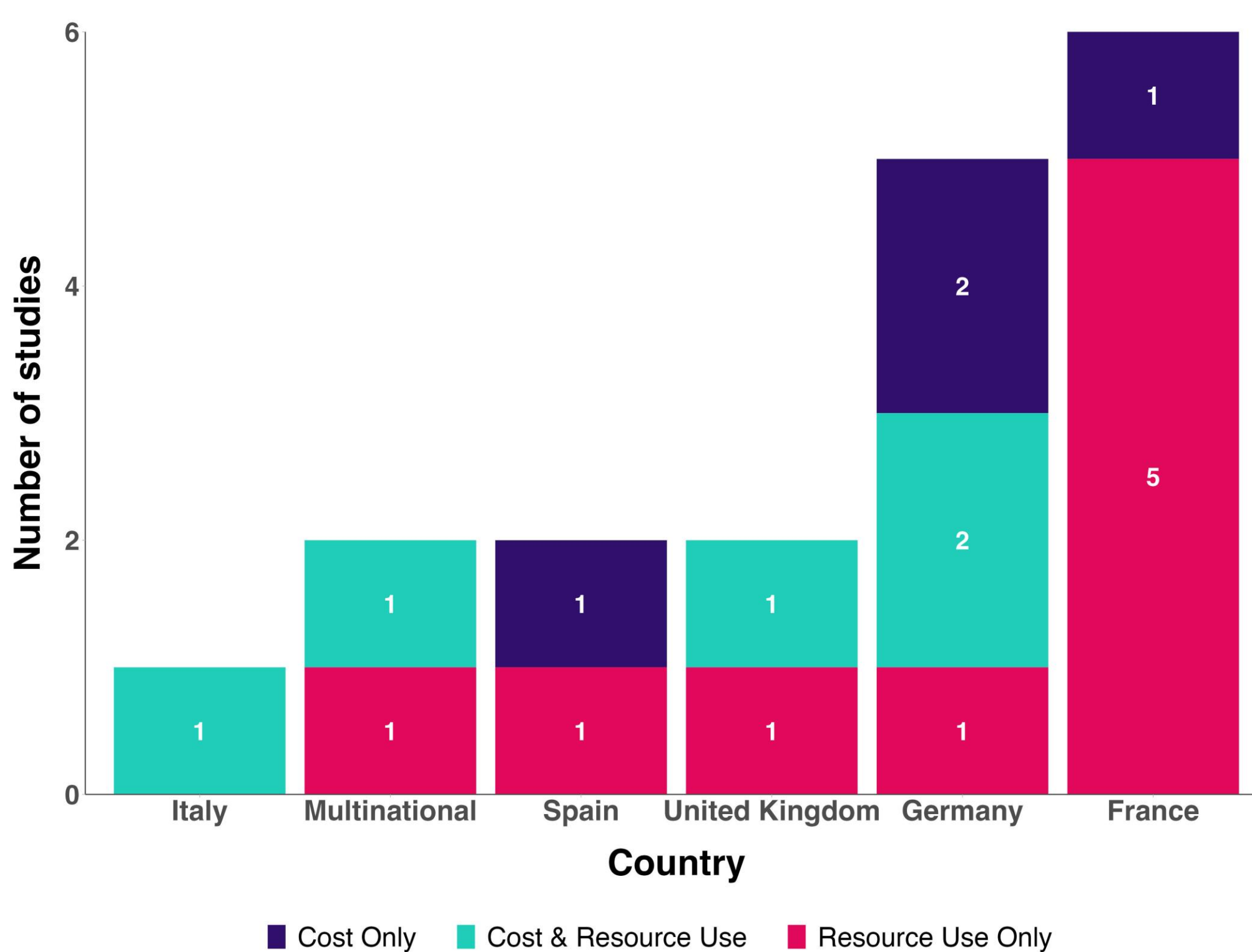


\*Records excluded due to language and study period constraints (i.e., Pre-2012).

- Cost outcomes reported as per-patient year or per administration measure were also excluded from narrative synthesis.
- The descriptive summary included 6 unique studies reporting on cost outcomes and 16 unique studies reporting on HRU outcomes.

## RESULTS (CONTINUED)

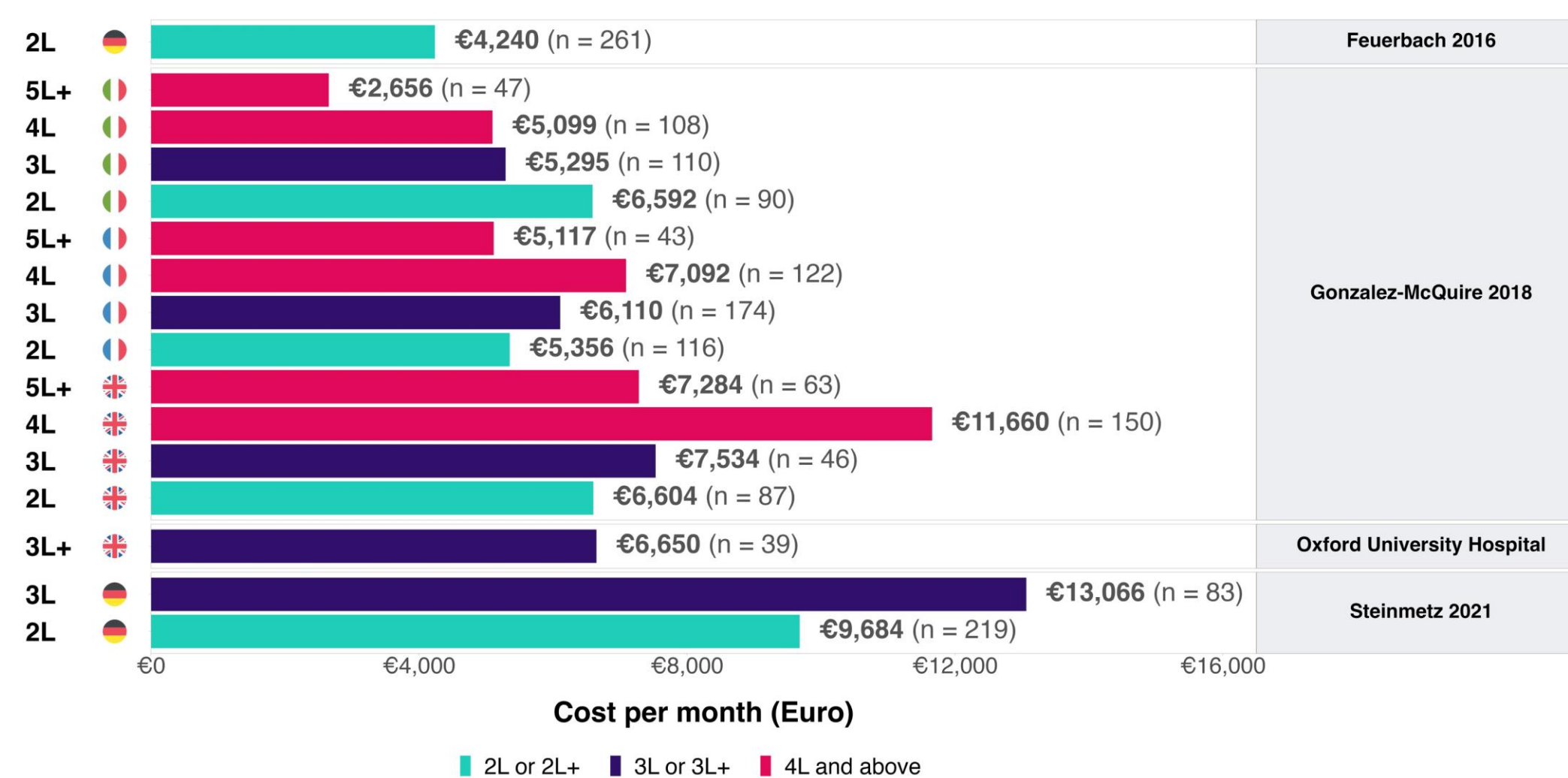
**Figure 2. Distribution of Studies by Country**



### Overall Healthcare Costs (Per month, 2024 EUR)

- Overall, healthcare costs varied significantly across studies and countries, likely due to variability in the data sources, methodologies (e.g., what components were included in the costs such staff, overhead, etc.), and analytical approaches, which further limits reliable cross-study comparisons.
- Within study trends indicate that overall healthcare costs tended to increase with each LOT from 2L-4L and appear to decrease in 5L+; UK had the highest total healthcare cost in the 4L setting (€11,660), followed by France (€7,092) and Italy (€5,099) (**Figure 3**).

**Figure 3. Summary of Overall Healthcare Costs, by Country (Per Month; 2024 EUR)**



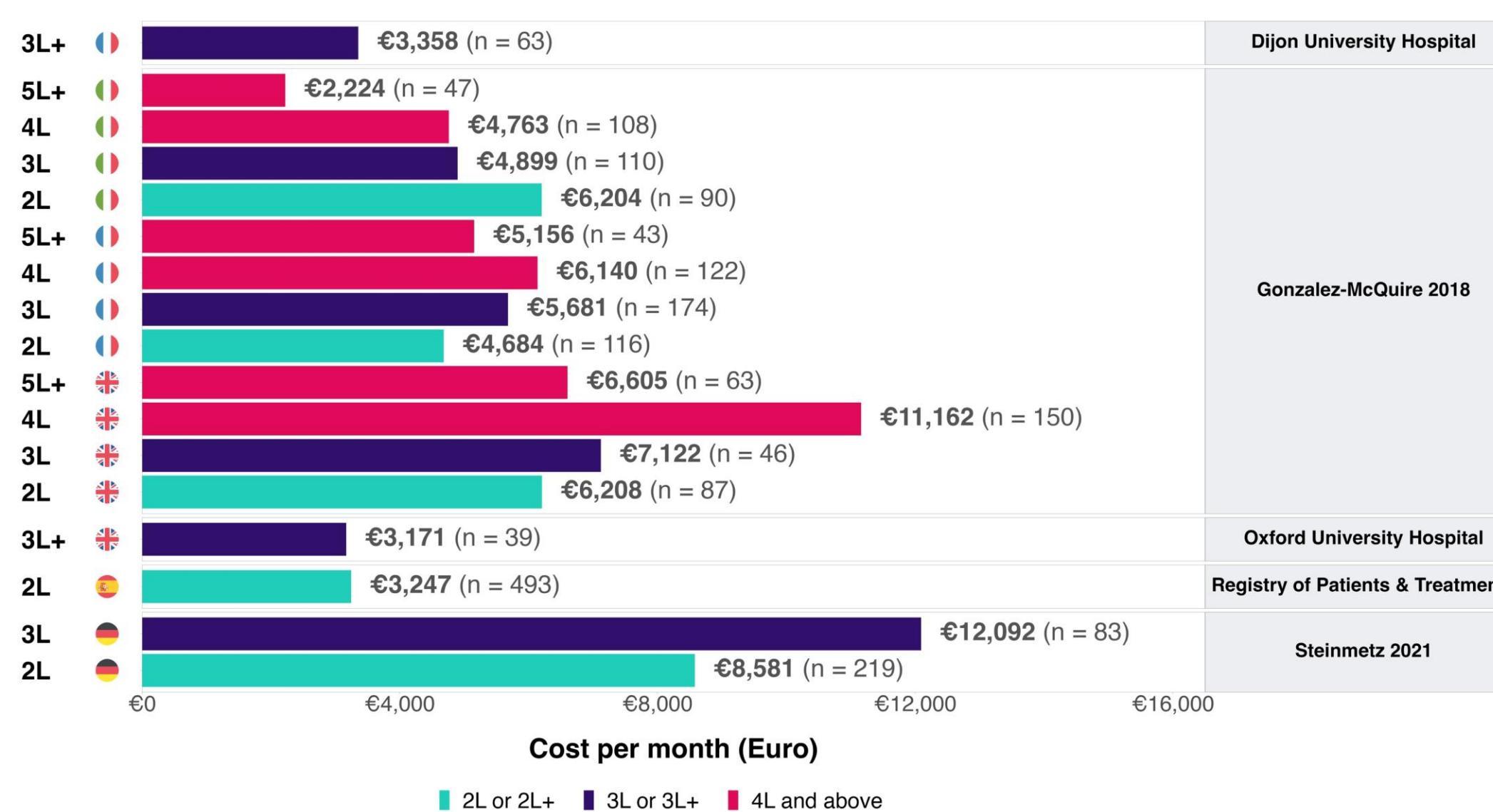
**Abbreviations - LOT:** Line of therapy

### Treatment-Related Costs (Figure 4)

- Trends of increasing medication costs as LOTs increase from 2L-4L (and tend to decrease beyond this) were consistent with overall healthcare costs. Similarly, reported medication costs varied significantly across studies and countries (**Figure 4A**).
- In absolute terms, inpatient admission costs were lower than medication costs across most studies, regardless of country (**Figure 4B**).
- Costs associated with clinician visits were reported by country in one study<sup>4</sup>, with UK reporting the lowest cost (**Figure 4C**).

**Figure 4. Treatment-related Costs for RRMM (Per Month, 2024 EUR)**

### A. Medication Costs by LOT



### B. Inpatient Admission/Stay Costs by LOT



### C. Clinician Visits† Costs by LOT\*



**Abbreviations - LOT:** Line of therapy; Note that this axis is shorter than panels A and B.

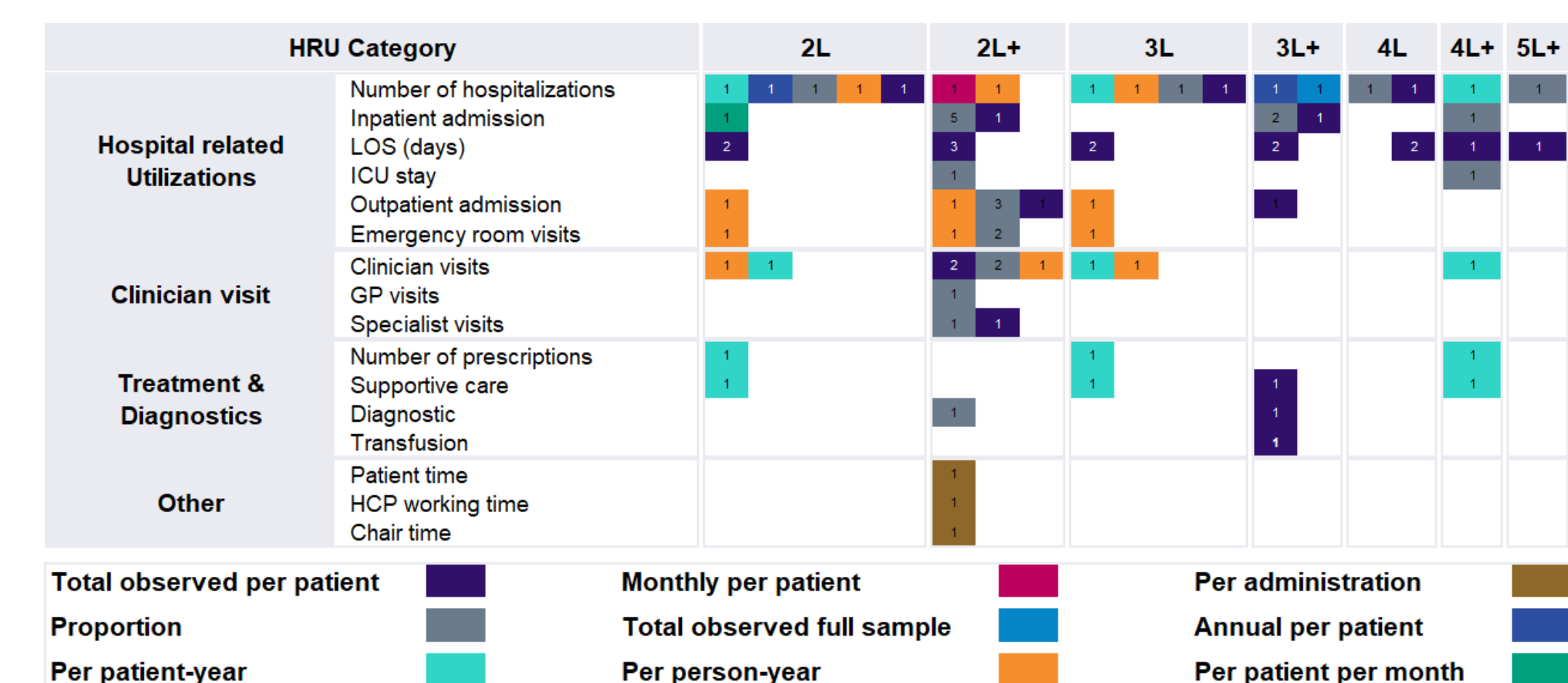
\* Note the change in x-axis relative to panels A and B; † clinicians were not restricted to hematological oncologists or specialists more broadly.

### HRU in Europe

- The HRU evidence was highly dispersed, making it challenging to identify clear trends or patterns within any single resource utilization category (**Figure 5**).
- While HRU reporting was inconsistent, a significant proportion of patients across regions required visits to general practitioners (22-31%), outpatient visits (≥60%), or hospitalizations (30-59%).
- Within-study comparisons showed increasing hospitalization rates across LOT.<sup>4</sup>

- Highest hospitalization rates occurred during active treatment. In the 5L+ setting, at least one hospitalization during active treatment was observed in UK (64%), France (73%), and Italy (50%), with UK reporting the lowest cost.

**Figure 5. HRU reporting by outcomes**



## Limitations

- Most studies were retrospective in design, using claims databases as their sources of patient data. This introduced heterogeneity in the evidence base due to differences in study methodologies – including analytical techniques, data collection approaches, and outcome definitions – and geography.
- The heterogeneity in the evidence limits the ability to compare results across studies or draw conclusions regarding trends between different studies.
- Most summary measures of costing data used means as opposed to medians, which are generally preferred given they are more resistant to outliers.
- Sparse data made it challenging to determine if observed patterns would hold with more evidence.

## CONCLUSIONS

- This study provides a comprehensive and up-to-date summary of published cost and HRU estimates for RRMM across Europe.
- Managing RRMM is resource-intensive and costly, with medications being the primary cost driver; where trends in overall healthcare costs closely align with medication cost trends. Hospitalization costs were the next most significant component.
- There was a general trend towards increased costs with increasing LOTs that appeared to peak at 4L.
- The findings of this study highlight the unmet need for novel and effective treatments that can reduce prolonged HRU and associated costs, especially in the more expensive later-line settings.

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### Disclosures

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### Contact

Ken Hasegawa, [ken.hasegawa1@gilead.com](mailto:ken.hasegawa1@gilead.com)

