Economic Impact of Lenalidomide-Refractory Multiple Myeloma in Finland: Insights from Real-World Data

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Background

Multiple myeloma (MM) is an aggressive hematologic malignancy characterized by malignant plasma cell proliferation in the bone marrow. Patients who have received 1-3 prior lines of therapy, are exposed to proteasome inhibitors (PIs), immunomodulatory drugs (IMIDs), refractory to lenalidomide, and are treated with modern triplet or quadruplet treatments, continue to experience poor outcomes despite advances in MM care (Figure 2). This retrospective registry-based study aims to understand current healthcare resource use (HCRU) and indirect costs of this patient group in Finland.

Results:

Patient, treatment, outcomes

- Out of 1 733 MM patients, altogether 101 filled the criteria at one or more index dates (Figure 1)
- Median age of the cohort was 69 years, and median time from diagnosis was 3 years (Table 1). For more detailed patient treatment and outcomes see Partanen et al. 2025a

Healthcare resource use (HCRU):

- Total HCRU was €25,331 in the first year and €29,529 in the second year after index. Of these costs, 69% and 81% were MM-specific (Figure 3).
- The cost distribution was: emergency room (ER) 3% (year 1) and 5% (year 2), inpatient care 32% and 26%, outpatient contacts 53% and 66%, and primary care 12% and 20%. (Figure 3)
- 75% of outpatient contacts were within the hematological specialty (Figure 4A)
- In year 1 and year 2, patients had on average: 10 and 11 hematology IV visits, 2 and 3 radiotherapy visits, 0.4 and 0.5 palliative care visits, 6 and 9 outpatient clinic visits, 12 and 15 remote contacts, and 5 and 6 other outpatient contacts (e.g., dialysis, procedures, imaging), respectively. (Figure 4B)
- Patients lost 185, 221, 223, and 242 working days in years 1–4 after index—nearly a full working year annually in Finland (~256 days)—corresponding to indirect costs of €27,525, €32,976, €33,173, and €36,091, respectively. Cost drivers shifted from sick leaves in Year 1 to premature mortality in Years 2–4 (Figure 5).

Table 1. Characteristics of MM patients at index

n		101
Age at index, years, median [IQR]		69 [61, 74]
Follow-up, months, median [IQR]		8 [4, 17]
Time from diagnosis, months, median [IQR]		36 [21, 55]
Sex, female, N (%)		44 (44)
Index year, N (%)	2013-2017	5 (5)
	2018-2022	96 (95)
Prior SCT, N (%)		59 (58)
Number of prior treatment lines, median [IQR]		2.0 [2.0, 3.0]
Index treatment, N (%)	DPd/p	21 (21)
	KDd	10 (10)
	KPd	8 (8)
	PCd	26 (26)
	other	36 (35)
Median OS, months (95% CI)		16.3 (12.1-22.9)
Median TTNT, months (95% CI)		7.7 (5.4-10.8)

SCT, stem cell transplant; D, daratumumab; P, pomalidomide; K, karfilzomib; C, cyclophosphamide; d, dexamethasone; p, prednisone; OS, overall survival; TTNT, time to next treatment

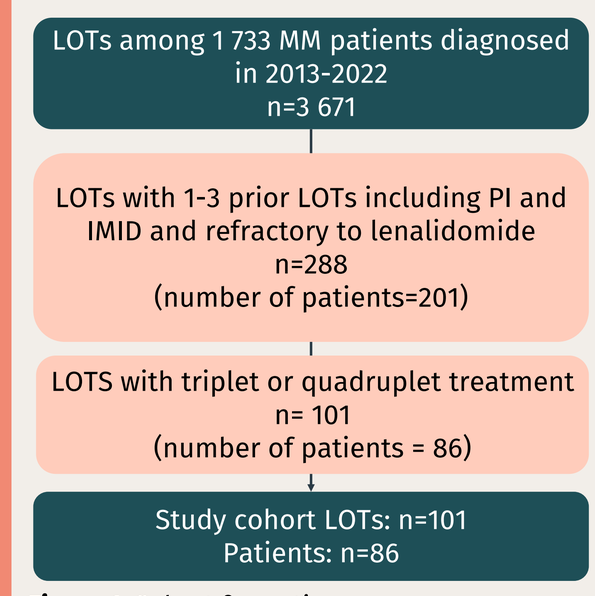

Figure 1. *Cohort formation*

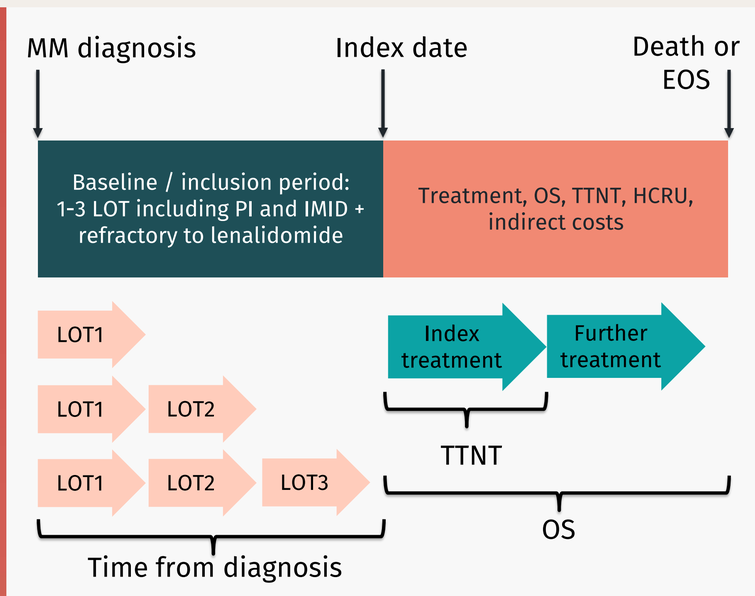

Figure 2. *Study outline. Patients were followed from MM diagnosis onwards. Index was set at the beginning of next treatment line after filling inclusion criteria. LOT: line of treatment. (Partanen et al. 2025a)*

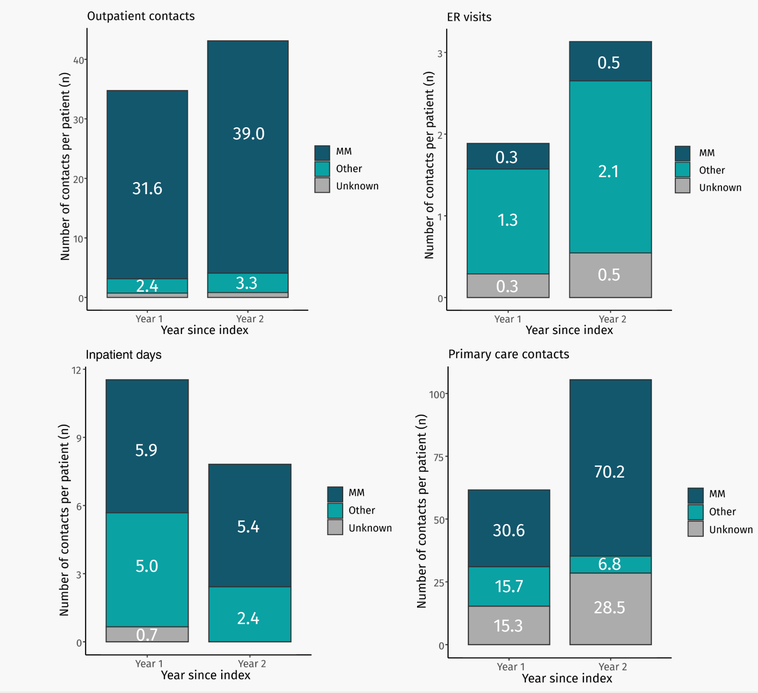

Figure 3. *Healthcare resource use by type for A) specialized care outpatient contacts, B) specialized care ER visits, C) specialized care inpatient days and D) primary care contacts by diagnosis. Other= non-MM contact.*

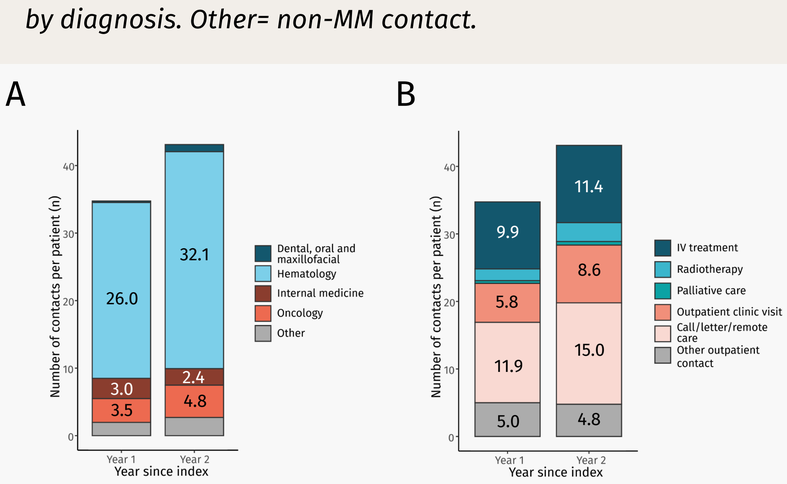

Figure 4. *Outpatient contacts stratified by specialty of contact (A) and type of visit (B). IV treatment: sequential therapy at hematological specialty*

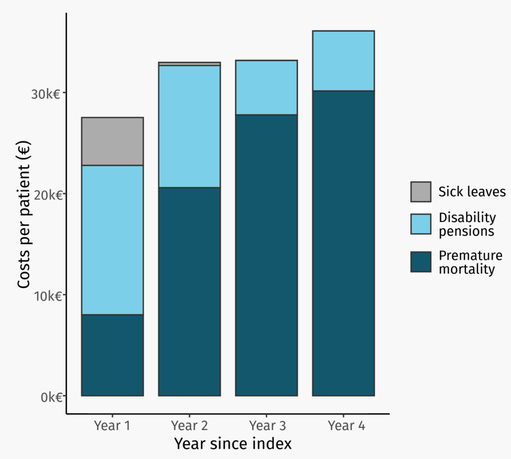

Figure 5. *Indirect costs as missed working days due to sick leaves, disability pensions and premature mortality.*

Conclusions

- Lenalidomide-refractory patients have a high burden of care, with frequent outpatient specialized contacts, including IV treatments administered in hematology units and remote contacts.
- Indirect costs were consistently high throughout the observed four-year follow-up, reflecting a substantial societal burden.
- With current standard of care, lenalidomide is used in early treatment lines, increasing the number of lenalidomide-refractory patients.
- These patients represent a vulnerable group with limited treatment options, underlining the need for more effective therapies.

Methods

- **Data source**: MM patients were identified during 2013-2022 from four hospital district data sources of Helsinki and Uusimaa (HUS), Southwest Finland, Pirkanmaa, and North Savo, covering 54% of the Finnish background population. Data were collected from hospital electronic health records, Finnish Institute for Health and Welfare, Social Insurance Institution, and Finnish Centre for Pensions linked using Finnish social security IDs. For results of the overall MM cohort, see Partanen et al. 2025b.
- **Inclusion Criteria (Figure 2)**: 1) MM patients with 1-3 prior treatment lines. 2) Previous exposure to PI and IMID. 3) Refractory to lenalidomide (treatment duration ≤60 days or next treatment started within 60 days, excluding lenalidomide). 4) Received anti-CD38, carfilzomib or pomalidomide containing index treatment 5) For indirect costs, only patients <65 years old were included
- **Study Design**: Patients were included at each qualifying treatment line. Index date set at initiation of the next treatment line after filling inclusion criteria. End of follow-up (EOF) defined as death or end of the study (EOS; Dec 31, 2022) for HCRU and as patient's 65th birthday or EOS for indirect costs
- **Statistical analyses**: All-cause HCRU and indirect costs were analyzed from index to EOF using a mean cumulative function (MCF). The direct healthcare costs were estimated using publicly available unit costs of healthcare in Finland in 2017 with index correction to 2022. The unit costs include the average cost of procedures, laboratory examinations, inpatient medications, and overheads related to the visit and are estimated separately for each specialty field and contact type. Cost of outpatient medication is not included. MM specificity was determined by the use of the diagnosis code (ICD-10: C90) during the contact. The indirect costs of missed workdays were defined using a median salary of 3130 €/month in Finland in 2022. When estimating the missed workdays, it was assumed that a year comprises of approximately 256 workdays.

References:
Partanen et al. HemaSphere, 2025a;9:(S1):3076-3077
Partanen et al. Acta Oncol. 2025b May 5:64:598-606.

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