

Economic burden of multiple myeloma according to treatment lines in France from 2014 to 2019, the MYLORD study

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Background and objectives

Multiple myeloma (MM) is an incurable hematologic disease. MM disease course is a succession of remissions and relapses, which define lines of treatment. In the context of a new therapeutic landscape, this study aims to describe the evolution from 2014 to 2019 of the economic burden of MM in France. For the first time, this real-life study based on secondary use of data from the nationwide French National Health Insurance (NHI) databases, called SNDS ("Système National des Données de Santé") provides information regarding the costs of MM patients in France depending on treatment lines.

Methods

Study design and data sources

This is a retrospective cohort study of MM patients identified through SNDS, the French National Health Insurance databases, from 2014 to 2019. These databases include hospital records, primary and secondary care, and deaths, for 66 million people.

Patient's identification

MM patients were identified using a published algorithm¹ refined to consider recent evolutions of MM therapeutic management.

Treatment lines reconstitution

Treatment lines were re-constructed through ATLAS, an adaptation of the Smith-Waterman alignment sequence using artificial intelligence². Retrospective treatment history was studied back to 2006 to identify previous lines received.

Statistical analysis

The economic burden was estimated per treatment lines, considering all patients who started the line during each calendar year. Costs were estimated, from the French NHI perspective, based on complete cases (i.e. patients who finished their line of treatment or died before the end of the study period) with the nonparametric method proposed by Bang and Tsiatis to address censoring of data³. Both time with active treatment and treatment free intervals (TFI) are integrated in the estimation of the line costs. Line 4+ includes L4, and all potential subsequent lines (L5, L6, ...) until death or end of follow-up.

Conclusion

The economic burden of MM varies depending on MM treatment lines.

Overall, the highest types of consumption are medications, followed closely by hospitalisation care.

Average monthly costs are higher during the first months of a line initiation and tend to decrease over time.

Results

40,747 patients treated for a MM (2014-2019)

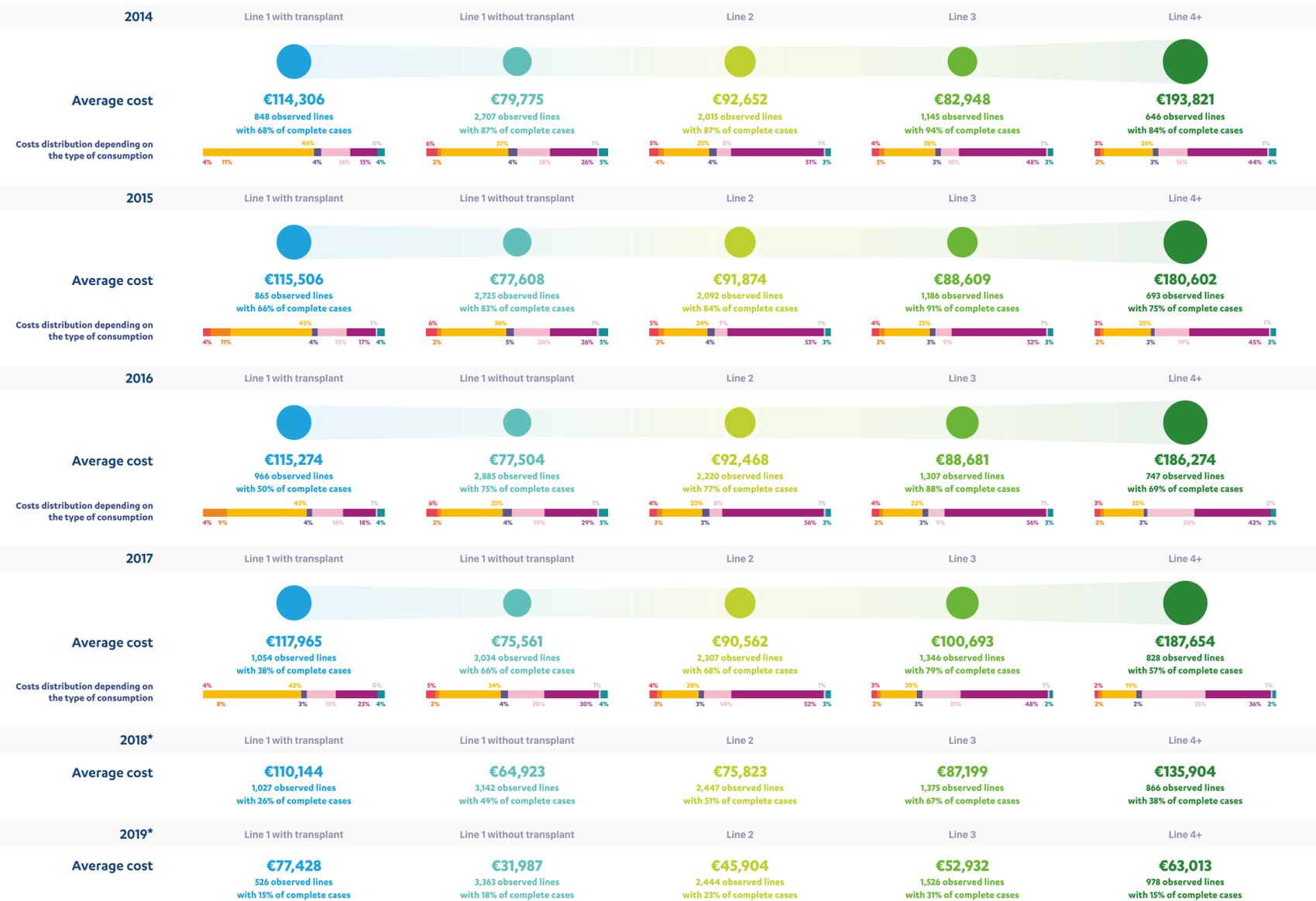
36,239 Patients with lines identified with ATLAS

Distribution of lines

49,310 different lines in total



Average total costs for patients who started a treatment line, each year, from 2014 to 2019

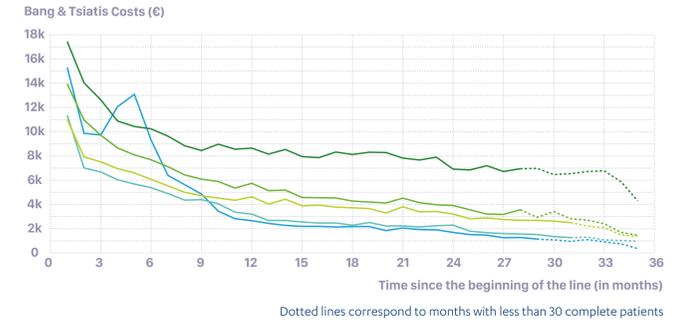


* The number of censored patients were respectively representing 14% (N=1,066) in 2014, 18.1% (N=1,368) in 2015, 25.8% (N=2,097) in 2016, 35.8% (N=3,068) in 2017, 51.3% (N=4,546) of the patients in 2018 and 78.8% (N=6,966) in 2019. As the proportion of censored patients should not exceed 50% of the number of patients included to properly interpret results obtained with the Bang & Tsiatis method, results for 2018, 2019 should be interpreted carefully.

Average monthly costs per patient and treatment lines for patients who initiated their line in 2017



Evolution of the average total monthly costs over time of follow-up since treatment line initiation presented by line for patients who initiated their line in 2017



Legend

Lines

- Line 1 with transplant
- Line 1 without transplant
- Line 2
- Line 3
- Line 4+

Type of costs

- Consultations
- Daily fees + pensions + allocations compensation revenue
- Hospital care (without medication)
- Lab tests + Medical devices + Medical procedures (out of hospital)
- Medication (in hospital)
- Medication (out hospital)
- Other out of hospital care (e.g. paramedical care, referring physician surcharge fees for patients in Long-Term Disease (ALD) status)
- Transport

Glossary

- ATLAS:** Analysis of Treatment Lines using Alignment of Sequences
- MM:** Multiple Myeloma
- MYLORD:** Multiple myeloma: an epidemiological study using SNIRAM Database
- NHI:** National Health Insurance
- SNDS:** Système National des Données de Santé
- TFI:** Treatment Free Intervals

References

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- Bang H, Tsiatis AA. Estimating Medical Costs with Censored Data. *Biometrika*. 2000;87(2):329-43