Healthcare resource utilization and associated economic burden of metastatic urothelial cancer in France using the French National Health Data System (SNDS): a retrospective cohort study

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CONCLUSIONS

- In this large study using the French National Health Data System (SNDS), total reimbursed healthcare expenditure for 27,762 patients diagnosed with metastatic urothelial cancer (mUC) in France between 1 January 2017 and 31 December 2023 reached €1.41 billion during their follow-up period
- Hospitalizations and medications were the principal cost drivers, accounting for 47.2% (€663.7 million) and 37.6% (€529.1 million) of total expenditure, respectively
- Approximately 69% of total expenditure occurred during the first year after the mUC index date, with first-year costs of €968 million (€6,677 per patient-month [PPM])
- These findings provide a nationwide benchmark of all-cause reimbursed healthcare use and costs among patients with mUC in France, supporting future assessments of changes in care pathways and resource needs

PLAIN LANGUAGE SUMMARY

- Metastatic urothelial cancer is a serious form of urinary tract cancer that has spread to other parts of the body and often affects older people
- Using the large nationwide French National Health Data System (SNDS), this study described several types of healthcare use among people with metastatic urothelial cancer, including hospital care, visits with physicians and other healthcare professionals, laboratory tests, imaging, medicines, and medical transportation
- The study also estimated healthcare spending for these people:
  - Healthcare spending was high, particularly during the first year after metastatic disease was identified
  - Hospital care and medicines were the 2 largest sources of healthcare spending
- These results show that care for people with metastatic urothelial cancer requires many healthcare resources beyond cancer medicines alone

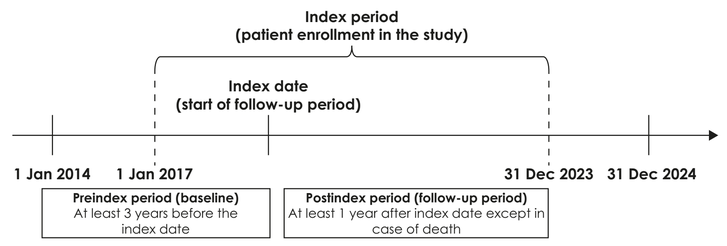
BACKGROUND

- Bladder cancer represents an important clinical and economic burden
  - A European cost-of-illness study estimated total bladder cancer costs of €4.9 billion in 2012, including €2.9 billion in direct healthcare costs[1]
- Patients with mUC are generally older and frequently have comorbidities, increasing the need for medical, supportive, and hospital care[2,3]
- Treatment options for advanced UC have evolved over the past decade, including immune checkpoint inhibitors, avelumab first-line maintenance therapy, and antibody-drug conjugate–based combinations[4-7]
- French real-world evidence on advanced UC has mainly focused on hospital care; a nationwide assessment incorporating both inpatient and outpatient reimbursed healthcare is therefore relevant[3]
- The present study quantifies healthcare resource utilization (HCRU) and associated healthcare expenditure in routine clinical practice, with costs reported both as total expenditure and PPM

METHODS

- This was a retrospective longitudinal cohort study using the SNDS
- Adults with mUC* were identified between 1 January 2017 and 31 December 2023 (**Figure 1**)
  - The index date was defined as diagnosis via first recorded *International Statistical Classification of Diseases and Related Health Problems, 10th Revision* (*ICD-10*) code for metastasis or the first systemic therapy for mUC in the absence of the former
  - Preindex: 36-month period to identify previous diagnoses and comorbidities
  - Follow-up: from the index date until death or 31 December 2024, whichever occurred first
- HCRU covered inpatient care, outpatient visits, medications, procedures, imaging, laboratory tests, medical devices, transportation, sick leave, and disability benefits
- Costs were evaluated from the French national health insurance payer perspective (expressed in 2025 euros) and summarized as total costs and costs PPM

Figure 1. Study schematic



*Urothelial cancer *ICD-10* codes: renal pelvis (C65), ureter (C66), bladder (C67), and other unspecified urinary organs (C68) and metastasis *ICD-10* diagnosis codes for respiratory and digestive organs (C78) and for other and unspecified sites (C79) except for kidney and renal pelvis (C79.0) and bladder and other and unspecified urinary organs (C79.1) within the enrollment period (1 January 2017 to 31 December 2023)

RESULTS

Study population

- 68,516 individuals had a recorded metastasis diagnosis during the enrollment period; after application of eligibility criteria, 27,762 patients were included in the overall mUC cohort
- The cohort was predominantly male (77.9%) and of older age (mean age, 74.7 years) (**Table 1**)
- Median follow-up was 3 months
- Mortality during follow-up was 88.1%
- Median Charlson Comorbidity Index score at baseline was 4

Table 1. Baseline characteristics

Characteristic	Overall mUC cohort (N=27,762)
Male, n (%)	21,616 (77.9)
Age	
Mean (SD), years	74.7 (11.0)
Median (IQR), years	75 (67.5-83.1)
Age groups, n (%)	
<65 years	5,143 (18.5)
65-69 years	3,876 (14.0)
70-74 years	4,723 (17.0)
75-79 years	4,448 (16.0)
80-84 years	4,184 (15.0)
≥85 years	5,388 (19.4)
Charlson Comorbidity Index score, median (IQR)	4 (3-5)
Charlson Comorbidity Index category, n (%)	
0	380 (1.3)
1-2	5,559 (20.0)
3-4	13,309 (48.0)
≥5	8,514 (30.7)
Follow-up, median (IQR), months	3 (1-12.3)
Mortality during follow-up, n (%)	24,470 (88.1)

mUC, metastatic urothelial cancer.

Inpatient HCRU

- 381,873 all-cause hospitalizations were recorded during follow-up (1.4 hospitalizations PPM)
- Medicine, surgery, and obstetric care (MCO) accounted for most hospital activity: 367,152 hospitalizations (96.1% of admissions)
  - 98.9% of patients had at least 1 MCO hospitalization, with a median (IQR) of 4 (2-17) hospitalizations per patient
  - Of MCO hospitalizations, 75.4% were ambulatory and 24.6% involved an overnight stay
  - 26,559 patients (95.7%) had at least 1 overnight stay, with a median (IQR) of 11 (7-17) days
- Hospital-at-home services and postacute and rehabilitative care were used by 13.7% and 19.4% of patients, respectively

Outpatient HCRU

- Outpatient healthcare use was frequent, reflecting the broad care needs of patients with mUC beyond hospital admissions
- Outpatient physician visits were recorded for 73.2% of patients, with an overall rate of 1.2 visits PPM; visits with other healthcare professionals were also common, reaching 6.6 visits PPM (**Table 2**)
- Medication use was substantial, with 71.8% of patients receiving at least 1 dispensed medication and an overall rate of 6.8 dispensations PPM
- Diagnostic and monitoring activities were frequent: 56.3% of patients had outpatient imaging, 65.7% had outpatient laboratory testing, and 81.5% had at least 1 computed tomography scan in any setting
- Medical transportation was used by 81.9% of patients, corresponding to 2.8 transportation services PPM

Table 2. HCRU during follow-up in the overall mUC cohort

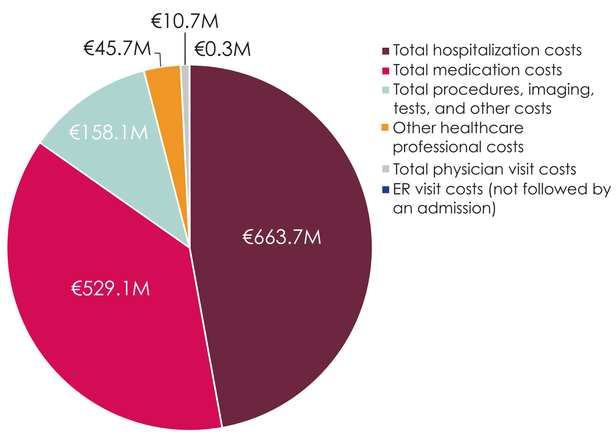
HCRU category	Patients with ≥1 use, n (%)	Rate PPM
Any hospitalization	27,756 (99.9)	1.38
MCO hospitalization	27,468 (98.9)	1.33
MCO overnight hospitalization	26,559 (95.7)	0.33
Outpatient physician visits	20,324 (73.2)	1.23
Other healthcare professional visits	19,354 (69.7)	6.56
Medication dispensations	19,938 (71.8)	6.82
High-cost hospital drugs	9,087 (32.7)	0.51
All outpatient procedures*	13,656 (49.2)	0.28
Outpatient imaging	15,636 (56.3)	0.43
Outpatient laboratory tests	18,248 (65.7)	1.50
CT scans, any setting	22,617 (81.5)	0.35
Medical transportation	22,736 (81.9)	2.76

CT, computed tomography; **HCRU**, healthcare resource utilization; **MCO**, medicine, surgery, and obstetric care; **PPM**, per patient-month.
*"All" procedures, imaging, and laboratory tests were each counted by service date. If a patient had more than 1 on the same day, it was counted once; events on different dates were counted separately.

Economic burden

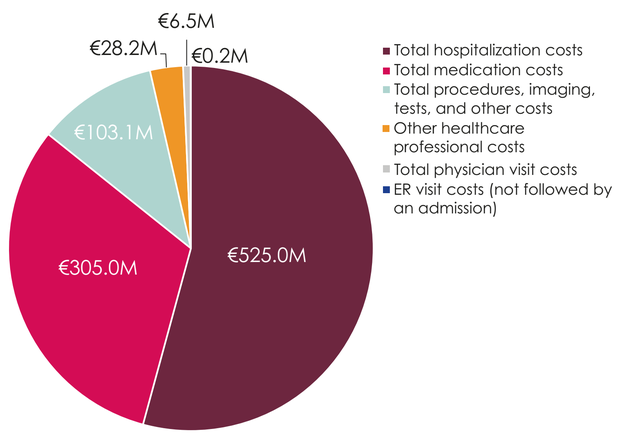
- Total reimbursed healthcare expenditure among patients with mUC was €1.41 billion during follow-up, corresponding to €5,088 PPM
- Hospitalization and medication costs were the main contributors, accounting for €663.7 million and €529.1 million, respectively, and together representing approximately 85% of total expenditure (**Figure 2**)
- Hospitalization costs were mainly driven by MCO hospitalizations, especially overnight MCO stays, while medication costs were mainly driven by high-cost hospital drugs
- Other healthcare costs, including procedures, imaging, laboratory tests, transportation, medical devices, sick leave, and disability benefits, accounted for €158.1 million
- Costs were concentrated early after the mUC index date, with €968.0 million incurred during the first year (**Figure 3**), representing approximately 68.8% of total follow-up expenditure
- Healthcare costs by type of setting PPM, are shown in **Table 3**

Figure 2. Total healthcare costs: total follow-up



ER, emergency room.

Figure 3. Total healthcare costs: first year



ER, emergency room.

Table 3. Healthcare costs by type of setting, PPM

Cost component	Cost, €/PPM	Cost, first year, €/PPM
Total healthcare expenditure	5,088.0	6,677.3
Hospitalization, all settings	2,399.0	3,621.1
Medication costs	1,912.7	2,103.9
Procedures, imaging, tests, and other costs	571.4	711.5
Other healthcare professional costs	165.1	196.3
Outpatient physician visit costs	38.6	44.5

Other healthcare resources include procedures, imaging, laboratory tests, medical transportation, LPP (*Liste des Produits et Prestations*)–reimbursed products/services, sick leave, and disability benefits. First-year other healthcare professional costs were calculated as the residual of first-year total costs after hospitalization, medication, other healthcare resources, and outpatient physician visit costs.
PPM, per patient-month.

LIMITATIONS

- Administrative data do not provide detailed clinical information such as performance status, tumor burden, radiological progression, or the clinical rationale for treatment decisions
- mUC identification and some treatment exposures relied on diagnosis/procedure algorithms; chemotherapy agents were inferred using session-based proxies
- The analysis captured reimbursed healthcare expenditure from the French national health insurance payer perspective and did not include broader societal costs such as informal care or patient out-of-pocket expenditure
- Reported costs were all-cause healthcare costs incurred by patients with mUC and therefore should not be interpreted as costs directly attributable to mUC

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