

# Analysis of Venous Thromboembolism (VTE) among patients with cancer from Real-World French Administrative Database

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## Introduction

Venous thromboembolism (VTE) is caused by the formation of a thrombus in the venous bloodstream. VTE includes deep vein thrombosis, which can evolve to embolism if the thrombus breaks off. VTE is a frequent pathology, with an annual incidence of 1 to 2 per 1,000 inhabitants in France and a severe pathology, with a 3-month mortality between 10 and 15%<sup>1</sup>.

Cancer is recognized as an independent and major risk factor for venous thromboembolism (VTE)<sup>2</sup> with a high potential of morbidity and mortality<sup>3</sup>.

However very few real-world data are available in France on those patients and their hospital management.

## Objectives

### Primary objective

To describe the venous thrombosis and embolism (VTE) rate for each cancer of interest, in France.

### Secondary objectives

- To describe VTE patients characteristics.
- To describe VTE inhospital management and associated costs.

## Methods

A retrospective cross-sectional study was conducted using the French exhaustive National hospital discharge database (PMSI).

### Study period

VTE patients were included on a 1-year period in 2016 and followed for two years, up until to December 31, 2018 at most. A retrospective follow-up over the 5 years prior to inclusion was performed to study comorbidities.

### Inclusion criteria

Adult patients (≥18 years old) with at least one stay with an ICD-10 code as Main Diagnosis (DP), Related Diagnosis (DR) or Significant Associated Diagnosis (DAS) corresponding to 14 cancers of interest.

For these cancer patients, VTE hospital stays were identified through ICD-10 codes as a whole and separately for:

- patients with venous thrombosis (I80\*, I820 I821, I636, I676, O222, O223, O225, O870, O871 and O873)
- patients with embolism (I26\*, I822, I823, I828, I829 and O882).

## Conclusion

This study included more than 607,000 cancer patients among which more than 40,000 patients were hospitalized for a VTE over a 2-year follow-up period

During the observation period, VTE event for cancer patients rated ranged from 3.1 to 14.6%, from one cancer to another.

The mean cost of a VTE hospitalization ranged from 5,143€ to 12,620€, from one type of cancer to another.

The study has been done through PMSI analysis, a medico-administrative database collecting all reimbursed hospital patient cares in France. It is thus exhaustive.

### References :

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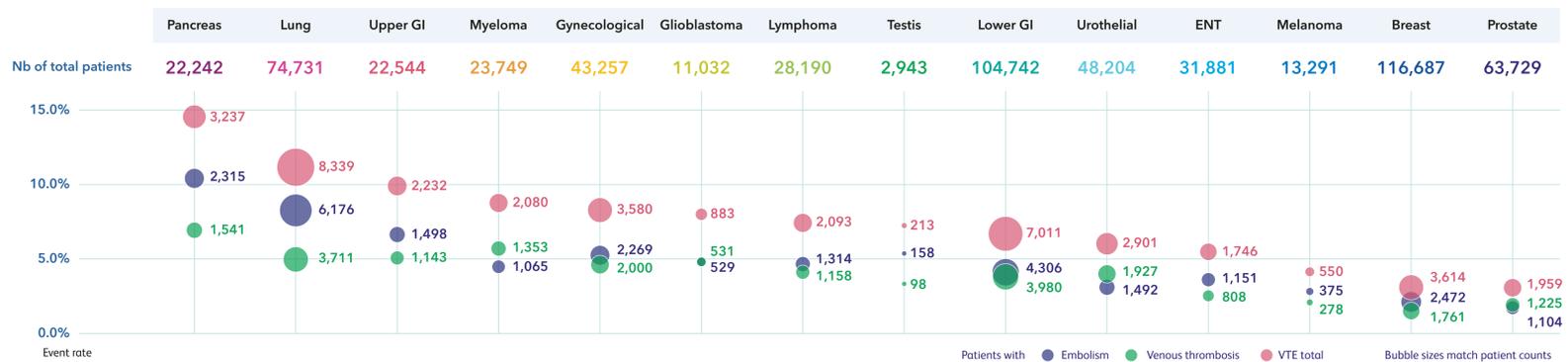
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## Results

### Description of venous thrombosis and embolism (VTE) rate for each cancer of interest, in France



607,222 patients have been hospitalized for the 14 cancers of interest in France in 2016. Among them, 6.7% (N= 40,438) had a VTE in the following two years. Pancreatic cancer presented the highest VTE event rate per patient (14.5%) Lung cancer presented the highest number of patients having a VTE (8,339)

### Description of cancer patients experiencing VTE

Age and sex	Pancreas	Lung	Upper GI	Myeloma	Gynecological	Glioblastoma	Lymphoma	Testis	Lower GI	Urothelial	ENT	Melanoma	Breast	Prostate
Age, mean ± SD (y)	70.4 ± 12.1	68.2 ± 12.3	62.5 ± 13.1	67.0 ± 13.0	67.9 ± 15.4	68.2 ± 13.9	67.8 ± 13.6	64.3 ± 11.2	68.7 ± 11.2	65.5 ± 10.9	72.9 ± 9.5	65.6 ± 13.8	40.9 ± 13.0	73.1 ± 10.9
Male, n (%)	3,897 (55.6%)	1,582 (70.9%)	569 (64.4%)	3 (0.1%)	1,190 (56.9%)	303 (55.1%)	1,117 (53.7%)	1,364 (78.1%)	1,645 (50.8%)	5,491 (65.8%)	1,959 (100%)	69 (1.9%)	213 (100%)	2,282 (78.7%)
Risk factors	Pancreas	Lung	Upper GI	Myeloma	Gynecological	Glioblastoma	Lymphoma	Testis	Lower GI	Urothelial	ENT	Melanoma	Breast	Prostate
Surgery	8.6%	10.8%	13.8%	7.7%	22.3%	16.6%	16.3%	34.7%	17.3%	37.5%	14.5%	14.2%	15.4%	19.0%
Trauma	1.7%	2.4%	1.6%	3.3%	2.4%	3.2%	2.4%	0.9%	2.2%	3.0%	3.6%	2.7%	2.1%	2.2%
Stroke	0.4%	0.8%	0.3%	0.6%	0.4%	1.0%	0.8%	0.0%	0.2%	0.6%	0.4%	0.7%	0.2%	0.6%
Heart failure	0.4%	0.7%	0.3%	0.7%	0.3%	0.0%	1.0%	0.9%	0.4%	1.0%	0.3%	1.1%	0.4%	0.9%
Respiratory failure	1.5%	4.3%	3.2%	2.3%	1.2%	1.0%	2.2%	0.5%	1.2%	1.6%	3.4%	1.3%	1.4%	1.0%
Infection	13.3%	14.6%	14.9%	24.9%	11.8%	7.7%	21.6%	10.3%	9.9%	13.6%	15.9%	9.5%	8.8%	8.5%
Pregnancy	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.2%	0.0%	0.1%	0.0%	0.0%	0.2%	0.1%	0.0%
Chemotherapy	67.6%	59.2%	65.0%	64.5%	62.8%	36.7%	63.3%	84.5%	48.5%	39.4%	53.4%	50.7%	55.0%	26.4%
Active cancer	62.6%	71.1%	65.0%	59.2%	75.4%	34.4%	64.7%	84.5%	63.4%	47.3%	67.3%	78.2%	71.5%	36.0%

### Hospital management

VTE Length of stay	Pancreas	Lung	Upper GI	Myeloma	Gynecological	Glioblastoma	Lymphoma	Testis	Lower GI	Urothelial	ENT	Melanoma	Breast	Prostate
LOS, mean ± SD (days)	12.0 ± 13.3	11.8 ± 13.8	15.2 ± 18.9	14.3 ± 18.2	12.1 ± 14.3	15.6 ± 18.3	14.2 ± 17.9	9.6 ± 13.4	13.1 ± 16.1	13.7 ± 14.4	14.3 ± 18.9	9.8 ± 14.3	10.1 ± 12.9	11.7 ± 13.3
Admission through ER, n (%)	1,495 (32.3%)	4,207 (34.5%)	974 (31.6%)	881 (27.7%)	1,631 (31.4%)	471 (39.9%)	865 (28.0%)	76 (20.5%)	3,166 (33.6%)	1,408 (35.8%)	681 (28.7%)	245 (28.3%)	1,666 (34.7%)	1,059 (42.2%)

Mean duration ranged from 9.6 days for testicular cancer patients to 15.6 days for glioblastoma patients.

Critical care units	Pancreas	Lung	Upper GI	Myeloma	Gynecological	Glioblastoma	Lymphoma	Testis	Lower GI	Urothelial	ENT	Melanoma	Breast	Prostate
Resuscitation unit	0.3%	0.6%	0.6%	1.1%	0.8%	0.5%	1.1%	0.9%	0.7%	0.6%	1.1%	0.2%	0.3%	0.5%
ICU	1.7%	2.7%	2.6%	2.5%	2.1%	6.0%	3.1%	2.3%	2.5%	2.2%	2.3%	2.9%	2.8%	2.9%
Continuous monitoring	1.5%	1.9%	2.3%	2.0%	1.8%	4.8%	2.0%	4.2%	2.5%	1.7%	2.5%	2.4%	1.3%	1.5%

Share of critical care units didn't exceed 6.0% of patients per type of cancer. ICU and continuous monitoring units were the two main units concerned ranging from 1.3 to 6.0% of patients.

Procedure of interest	Pancreas	Lung	Upper GI	Myeloma	Gynecological	Glioblastoma	Lymphoma	Testis	Lower GI	Urothelial	ENT	Melanoma	Breast	Prostate
Thrombectomy	0.1%	0.1%	0.2%	0.0%	0.0%	0.6%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%
Thromboaspiration	0.2%	0.4%	0.4%	0.3%	0.4%	1.2%	0.1%	1.4%	0.1%	0.7%	0.1%	0.0%	0.3%	0.7%
Fibrinolysis	0.2%	0.5%	0.5%	0.7%	0.9%	0.9%	0.3%	0.9%	0.6%	0.7%	0.4%	1.8%	0.2%	0.3%
Cava filter placement	3.7%	3.0%	5.4%	2.8%	5.6%	7.0%	2.3%	3.8%	3.7%	7.0%	1.0%	6.2%	1.5%	3.4%

The most performed procedure was cava filter placement ranging from 1.0% to 7.0%.

### Mean cost of VTE stays

Mean cost of VTE stay	Pancreas	Lung	Upper GI	Myeloma	Gynecological	Glioblastoma	Lymphoma	Testis	Lower GI	Urothelial	ENT	Melanoma	Breast	Prostate
Mean cost of VTE stay	€5,945	€6,122	€8,559	€12,620	€6,001	€7,689	€9,413	€5,837	€7,079	€6,743	€7,984	€5,598	€5,143	€5,724

VTE mean costs of stays costs ranged from 5,143€ for breast cancer patients to 12,620€ for myeloma patients.

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