

# Burden of Hospitalized Viral Respiratory Infections in France: Insights from the 2022–2023 season

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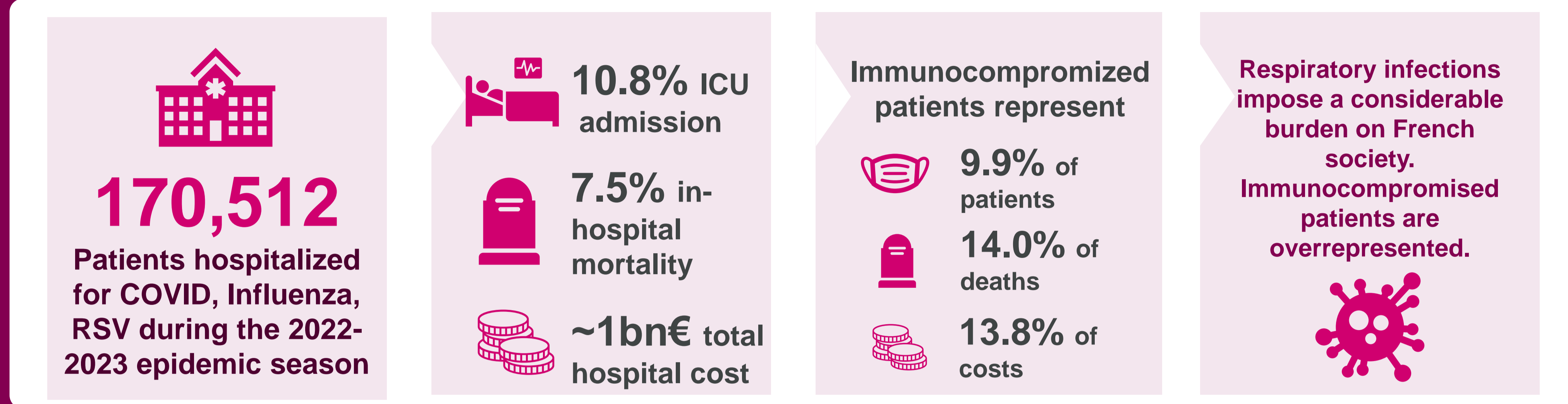
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## Introduction

- COVID-19, Influenza and Respiratory Syncytial Virus (RSV) are significant causes of respiratory infections.
- Their exact burden is not completely established in France.
- Immunocompromised (IC) patients are particularly susceptible to adverse outcomes.
- **Objective: Quantify the clinical and economical hospital burden of viral respiratory infections in France during the 2022-2023 epidemic season**



## Summary



## Key takeaway

Hospitalized viral respiratory infections are associated with considerable healthcare resources utilization, especially among immunocompromised patients

## What did we find?



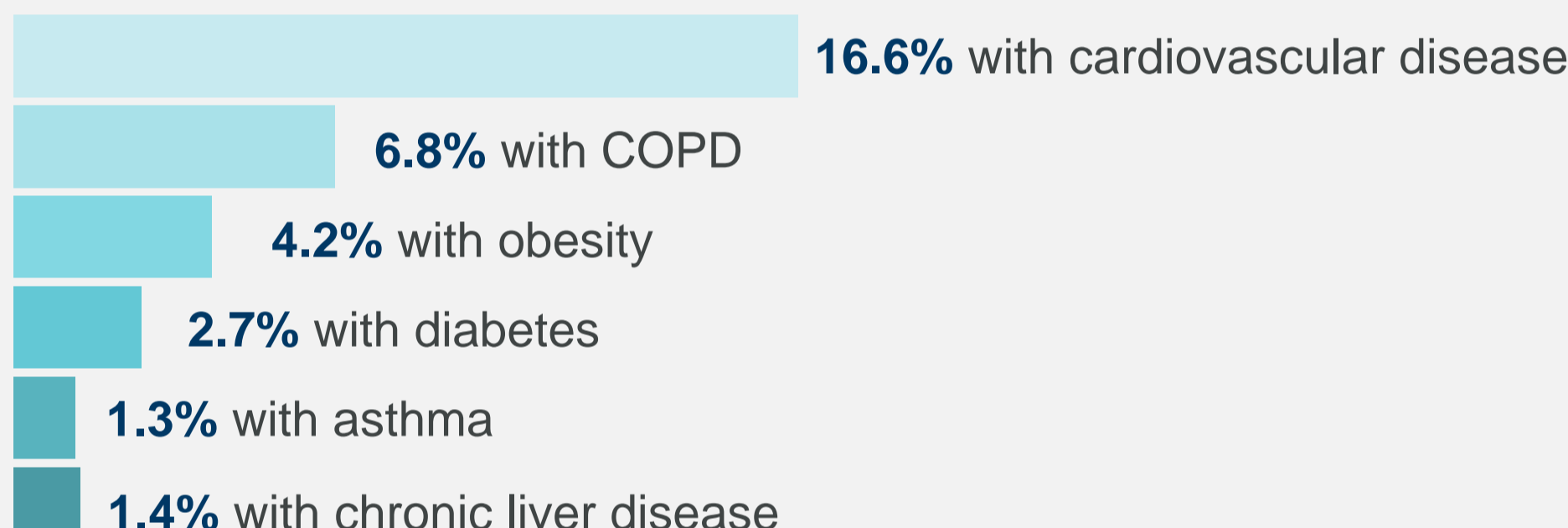
### COVID-19

102,631 hospitalized patients, 2022-2023 epidemic season

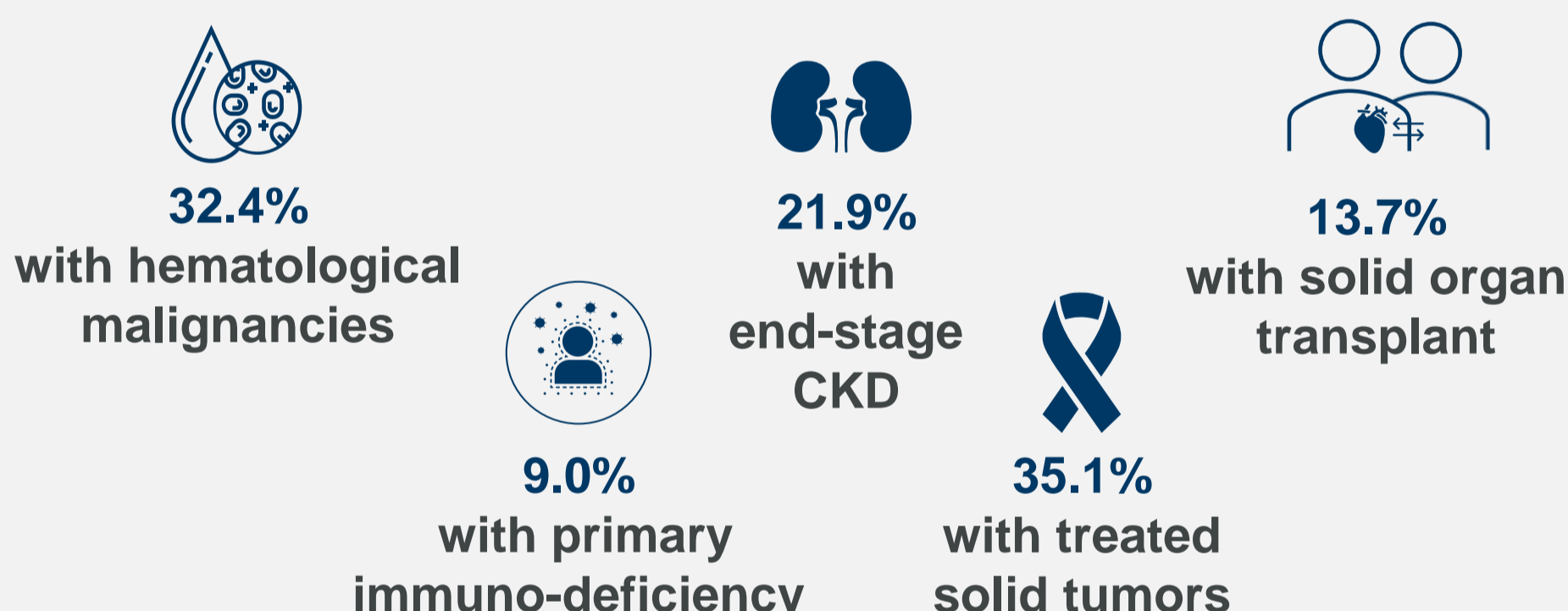
Male 51.6% Female 48.4%

Mean age (SD) 71.1 (17.8)  
 1.7% 2-17 y.o.  
 15.7% 18-64 y.o.  
 82.6% >65 y.o.

24,571 patients (23.9%) had ≥ 1 comorbidity\* reported



11,035 immunocompromised patients (10.8%)



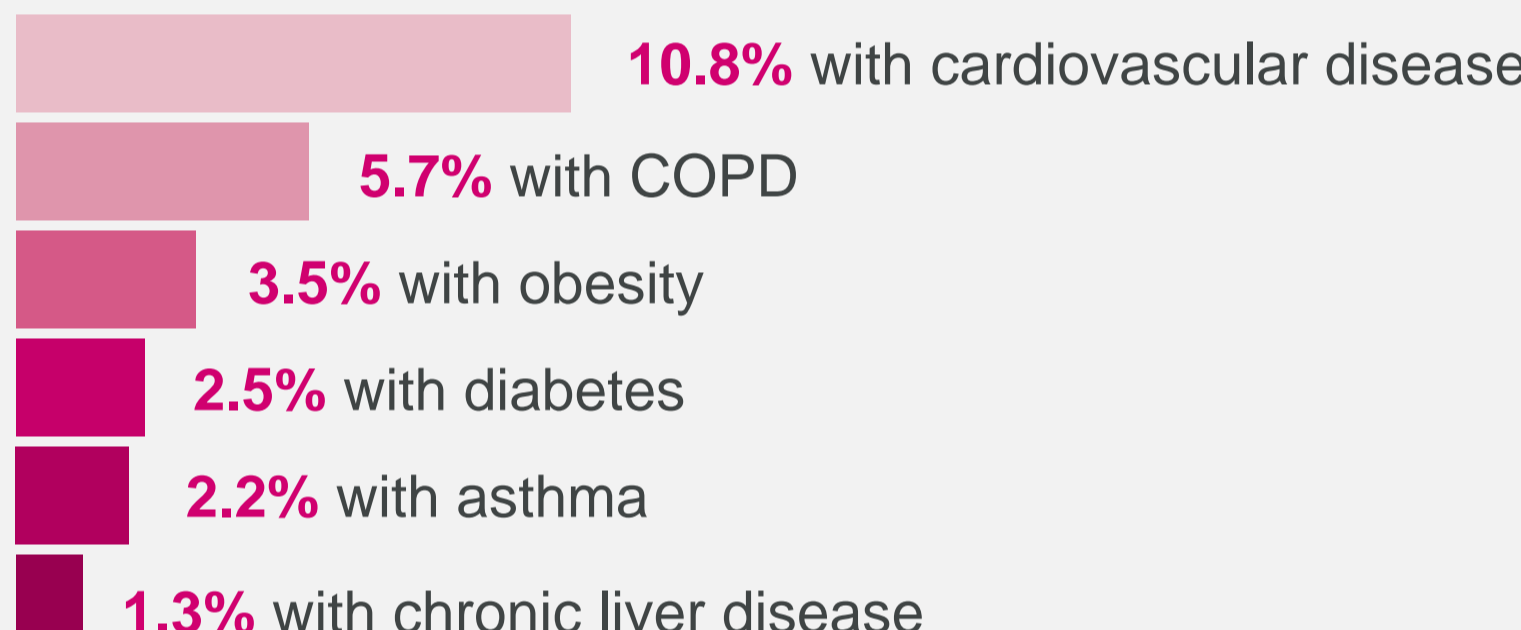
### Influenza

51,573 hospitalized patients, 2022-2023 epidemic season

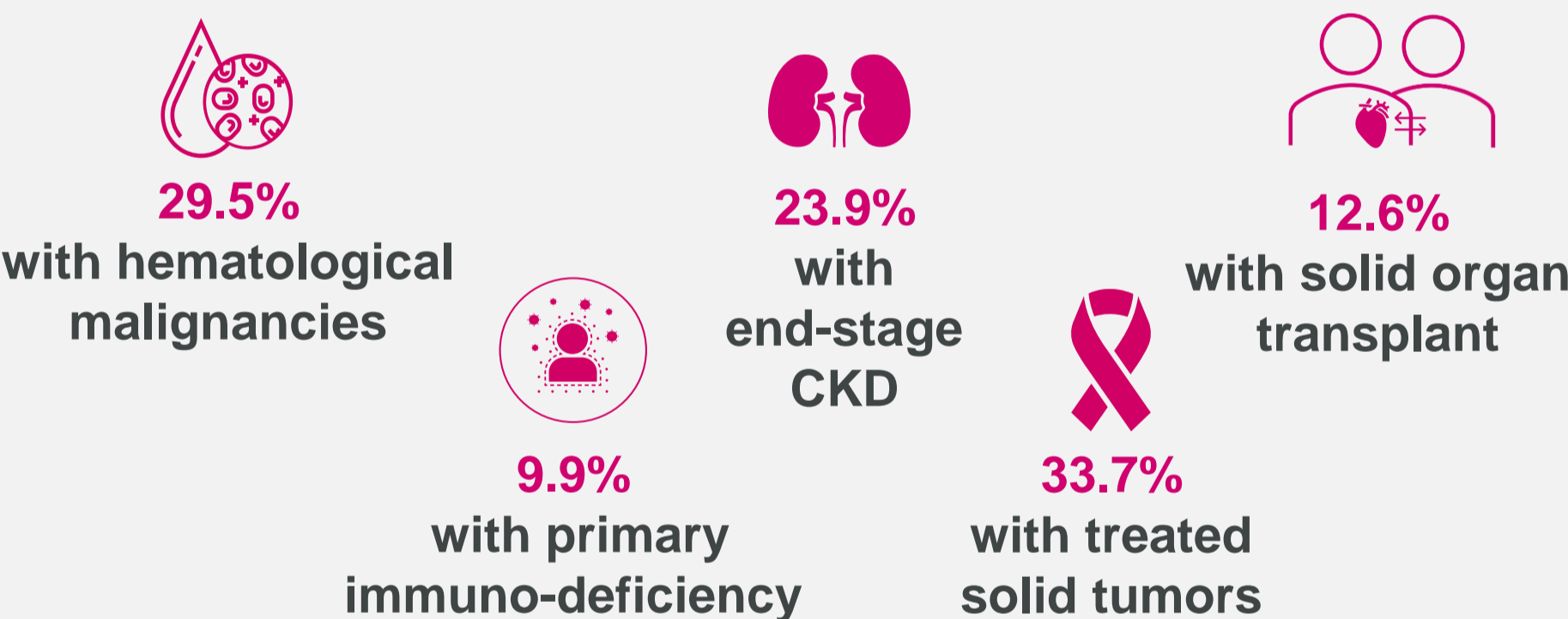
Male 47.5% Female 52.5%

Mean age (SD) 55.4 (30.3)  
 19.0% 2-17 y.o.  
 30.1% 18-64 y.o.  
 50.9% >65 y.o.

9,644 patients (18.7%) had ≥ 1 comorbidity\* reported



3,965 immunocompromised patients (7.7%)



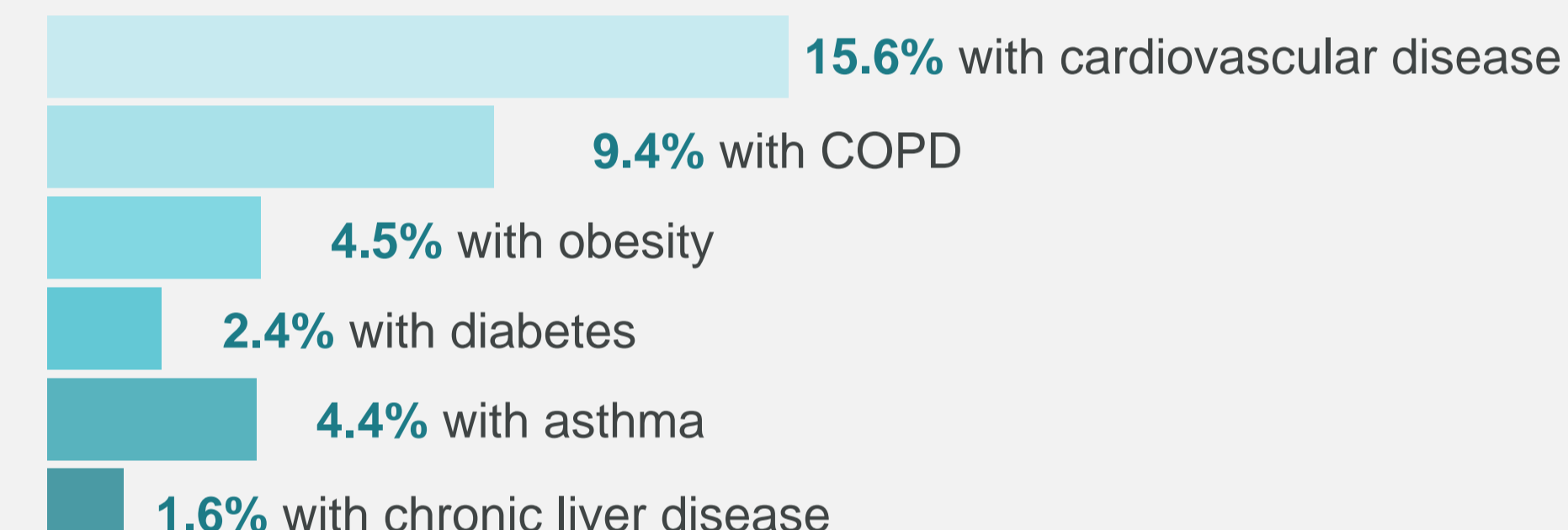
### RSV

19,653 hospitalized patients, 2022-2023 epidemic season

Male 47.4% Female 52.6%

Mean age (SD) 60.0 (31.2)  
 19.3% 2-17 y.o.  
 20.0% 18-64 y.o.  
 60.7% >65 y.o.

5,310 patients (27.0%) had ≥ 1 comorbidity\* reported



2,369 immunocompromised patients (12.1%)

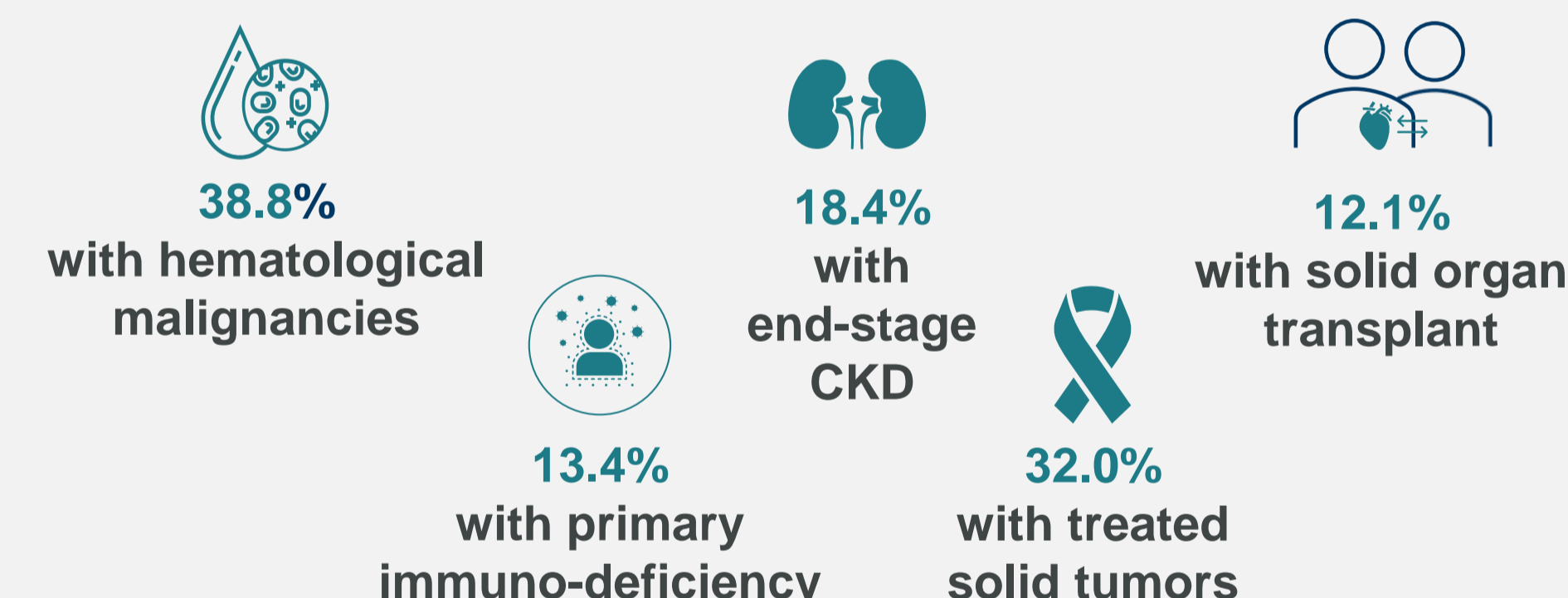


Table 2. Hospitalization characteristics of patients hospitalized depending on IC status, 2022-2023 season

Outcome	COVID-19		Influenza		RSV	
	Non-IC	IC	Non-IC	IC	Non-IC	IC
Length of hospital stay (median, in days) (IQR)	6.0 (2.0; 12.0)	7.0 (2.0; 12.0)	4.0 (1.0; 9.0)	6.0 (2.0; 12.0)	6.0 (2.0; 11.0)	7.0 (3.0; 14.0)
ICU admission, %	8.4%	15.6%	12.4%	18.0%	14.0%	19.3%
Length of stay in ICU (median, in days) (IQR)	5.0 (2.0; 10.0)	6.0 (3.0; 12.0)	4.0 (2.0; 8.0)	5.0 (2.0; 10.0)	5.0 (2.0; 9.0)	5.0 (2.0; 9.0)
In-hospital mortality rate, %	8.8%	11.6%	4.5%	8.2%	5.6%	8.1%
Mean index hospitalization cost, € (SD)	5,026 € (5,710)	6,185 € (8,024)	4,210 € (5,828)	6,145 € (8,912)	4,923 € (6,771)	7,726 € (12,735)
Total cost across cohort for index hospitalizations, million €	461.5 M€	68.7 M€	200.4 M€	24.3 M€	85.1 M€	18.3 M€
Total cost including rehospitalisation for the pathogen during follow-up, million €	527.3 M€	86.1 M€	225.2 M€	27.5 M€	90.5 M€	19.9 M€

\*CKD: Chronic Kidney Disease

## Limitations

- Based on claims databases and not virological results nor clinical data. Sensitive to coding practices.
- Use of hospital data only to detect immunodepressions and comorbidities (little treatment information for immunosuppressive treatment detection and no outpatient information).

## Interpretation

During the epidemic season 2022-2023 in France, hospitalized viral respiratory infections were associated with high healthcare resource utilization.

IC patients (estimated 0.5-1.5% of the French population) are overrepresented among hospitalized patients, deaths, costs and are responsible for longer hospitalisations higher ICU usage.

→ Measures are needed to reduce the burden of respiratory viruses especially in IC populations.

→ Need for systematic testing to accurately assess the burden of respiratory viruses

## How did we perform this research?

- Retrospective study using French Hospital Claims database (Programme de Médicalisation des Systèmes d'Information, PMSI), a universal exhaustive hospital claim dataset in France.
- Inclusion of all patients aged ≥ 2 years hospitalized between July 1, 2022, and June 30, 2023 (called epidemic season 2022-2023), with a primary diagnosis for COVID-19 and with a primary or secondary diagnosis for Influenza and RSV infections.
- The demographic factors of the hospitalized patients, presence of a comorbidity of interest identified in hospital in the previous year, the length of initial hospital stay, admission to intensive care unit (ICU), in-hospital mortality over the period and the cost of the index hospitalization and rehospitalization within 6 months (RSV, Influenza) or 12 months (COVID-19) were characterized.

- Immunocompromised (IC) patients were defined as having the following comorbidities and immunosuppressive conditions used as primary or secondary diagnosis in a previous hospitalisation in previous year : patients with history of primary immunodeficiency disease, hematologic malignancies, hematopoietic stem cell transplantation (HSCT), end-stage chronic kidney disease (CKD), treated within the year solid tumor, or solid organ transplantation, patients with HIV, patients receiving captured (*liste en sus*) immunosuppressive therapies, patients with an autoimmune or inflammatory disease were identified through the medical codes associated with hospital diagnoses and procedures the year preceding the index date.

## Disclosures

- Luong Nguyen LB.: Sanofi, GSK, Pfizer, Valneva, AstraZeneca
- Capit N., Majed L., Degand E., Anchim A., Artaud C.: AstraZeneca employees
- Bignon-Favary C., Larrieu S.: Horiana employees
- Marant-Micallef C.: PELyon employee
- Caillé Y.: no conflict of interest
- Lachâtre M.: AstraZeneca, GSK, Sanofi, Moderna, MSD, Pfizer ;
- Fourati S.: GlaxoSmithKline, AstraZeneca, MSD, Pfizer, Cepheid, Moderna ;