Hospital Clinical Data Network and Research Organization Collaboration for Analysis of Infection Burden in Immunocompromised Patients in France using Real-World Electronic Medical Record Data

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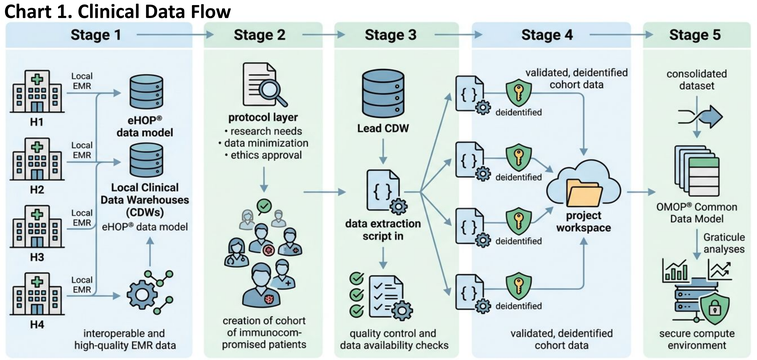
Introduction

For immunocompromised patients, infection is not an incidental risk but a defining one - a compromised immune system brings markedly higher infection rates and a steeper toll of morbidity and mortality than in immunocompetent individuals. This population spans several distinct conditions - hematologic malignancy, solid organ transplantation, immunosuppressive therapy, and primary immunodeficiency - each bearing a disproportionate infection burden that complicates clinical management, yet one that remains strikingly underquantified in real-world practice.

Objective: To study real-world infection burden among immunocompromised (IC) patients.

Primary: Describe viral respiratory infection rates in IC patients by subgroup
Secondary: Demonstrate feasibility of a multi-site EMR data collaboration model for real-world research in Europe

Chart 1. Clinical Data Flow



Methods and Materials

The HUGO network deployed CDWs using the eHOP® data model to provide interoperable and quality EMR data across hospitals. A protocol that met research needs, data minimization policies, and ethics requirements was developed for creating a cohort of IC patients from four hospitals. The lead CDW developed a data extraction script, including quality controls and data availability checks, and distributed this script to the network. Following validation, the deidentified cohort from each hospital was securely transferred to the project workspace on the Ouest Data Hub, where the consolidated dataset was converted to the OMOP® Common Data Model for Graticule access and analyses within a secure compute environment.
The study period extended from December 2021 to October 2023, spanning multiple waves of the COVID-19 pandemic. Patients aged ≥12 years were included and indexed at their first visit during this period at which an IC condition was documented (prior or current). Rates of viral respiratory infections during follow-up were described.

Results

A total of 30,150 IC patients qualified for the study, including those with immunosuppressive therapy (56%), hematologic malignancy (27%), organ transplantation (21%), solid tumor (17%), and primary immunodeficiency (6%).

Rates of infection per 1,000 person-years were 107.8 (95% CI 103.8–111.8) for SARS-CoV-2, 12.4 (11.1–13.8) for influenza, 9.3 (8.1–10.4) for RSV, and 5.4 (4.5–6.2) for hMPV, over a median follow-up of approximately 12 months.

Table 1. Summary Table

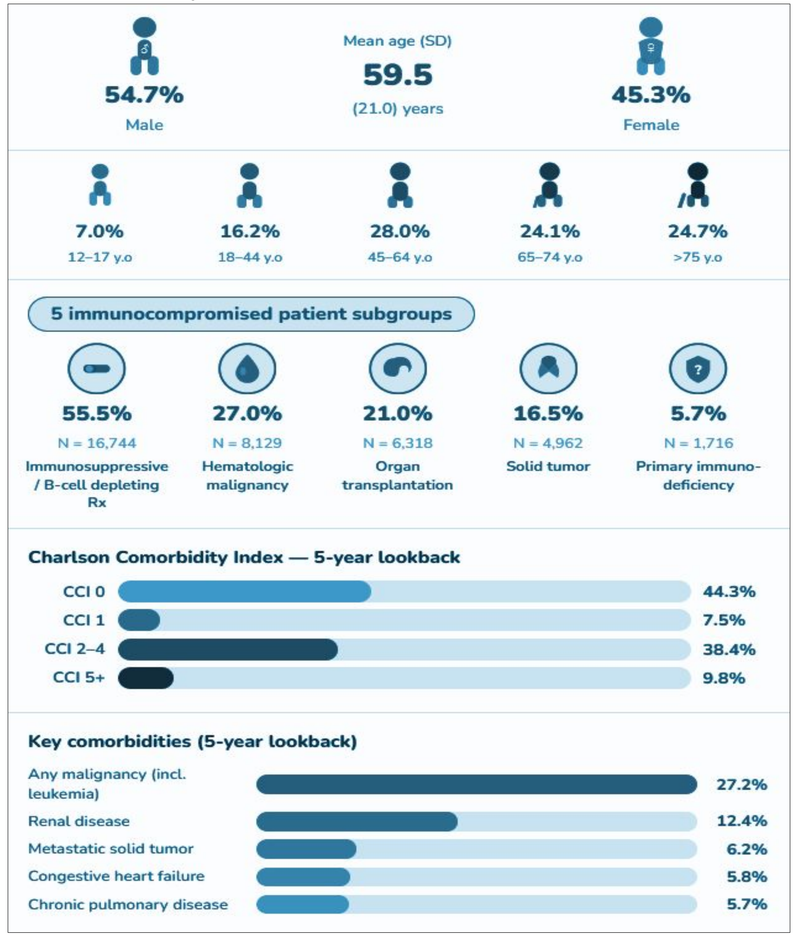
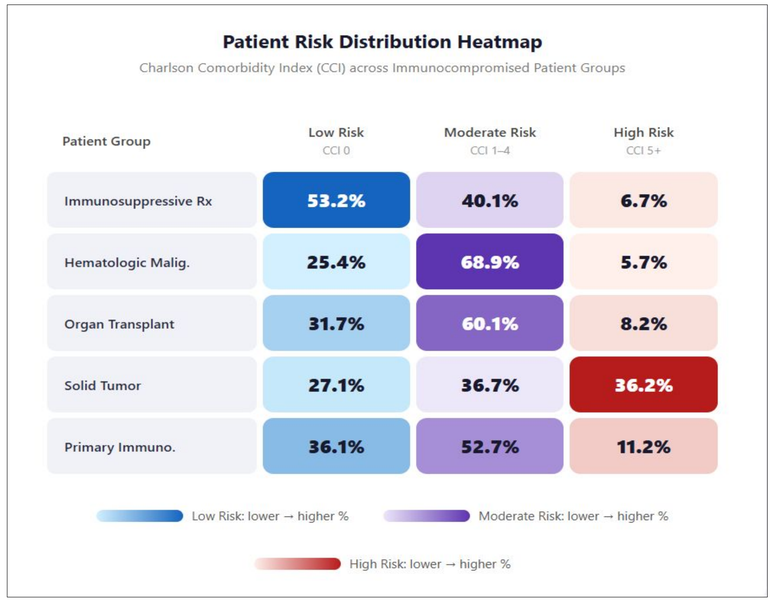


Chart 2. Patient Risk Distribution



Discussion

This study demonstrates a high burden of respiratory viral infections among IC patients, with SARS-CoV-2 rates substantially exceeding those of influenza, RSV, and hMPV. These findings align with prior reports of elevated COVID-19 morbidity in immunocompromised populations.

The HUGO network and OMOP CDM standardization enabled multi-site analysis across four French university hospitals, confirming the feasibility of federated real-world data approaches for infectious disease surveillance in IC cohorts.

Limitations include potential under-detection of infections diagnosed outside the participating hospitals and the retrospective observational design. Future work should evaluate temporal trends and the impact of vaccination on infection rates in IC subgroups.

Conclusions

This study of 30,150 patients demonstrates that collaborative and flexible partnerships allow for inclusion of EMR data in medical research at a large scale, providing an innovative framework for real-world studies.

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Acknowledgements

The Authors are grateful to the selected hospitals for the data access that was granted

References

1. Kamboj M, et al. COVID-19 infection and vaccination in immunocompromised patients. Adv Ther. 2024;41:4651-4672. doi:10.1007/s12325-024-02998-w
2. Pinana JL, et al. SARS-CoV-2 infection in patients with B-cell malignancies. Clin Microbiol Infect. 2023;29(4):459-467. doi:10.1016/j.cmi.2022.10.030
3. Papadimitriou K, et al. HONEUR: a pan-European network for observational studies in haematology. Eur J Haematol. 2022;109(5):569-575. doi:10.1111/ejh.13841
4. Chemaly RF, et al. Respiratory viruses in immunocompromised patients: epidemiology and outcomes. Clin Infect Dis. 2014;59(6):756-765. doi:10.1093/cid/ciu396
5. Gomes L, et al. Ct dynamics of non-SARS-CoV-2 respiratory viruses. Infect Control Hosp Epidemiol. 2024;45(5):586-593. doi:10.1017/ice.2024.10
6. Surie D, et al. RSV vaccine effectiveness among adults 60 years and older. JAMA. 2024;332(24):1972-1981. doi:10.1001/jama.2024.21228
7. Ogonek J, et al. Human metapneumovirus in immunocompromised patients. Transpl Infect Dis. 2025;27(1):e14416. doi:10.1111/tid.14416

Disclosures

The authors declare that this study received funding from AstraZeneca.
The authors declare no financial or personal relationships with other people or organizations that could inappropriately influence the work reported in this study

Presented at the ISPOR 2026 congress | May 17-20, 2026 | Philadelphia, PA | USA