

Obesity Impact in the Economic Burden of Invasive Pneumococcal Disease in Hospitalized Adults in Portugal – the SPHERE study

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Background

- Invasive pneumococcal disease (IPD) caused by *Streptococcus pneumoniae* is associated with significant morbidity and mortality, posing a considerable burden for healthcare systems^{1,2}.
- Vaccines are the primary and most cost-effective primary prevention intervention³.
- Obesity has been associated with increased risk of IPD, leading to a worse prognosis and greater healthcare burden⁴. Obese individuals are more susceptible to infections due to compromised immune responses, making them more vulnerable to severe forms of IPD⁵.

Objective

- To estimate healthcare resource utilization (HCRU) and associated costs related to adult patients with IPD hospitalisations in mainland Portugal⁶, particularly the impact of obesity on outcomes.

Results

Sociodemographic and clinical characterization

- The study included **395 adults** hospitalized for IPD, of which **44 (11.1%)** were obese (BMI ≥30). The demographic and clinical data are shown in **Figure 1** and **Figure 2**, comparing all IPD patients with obese patients.

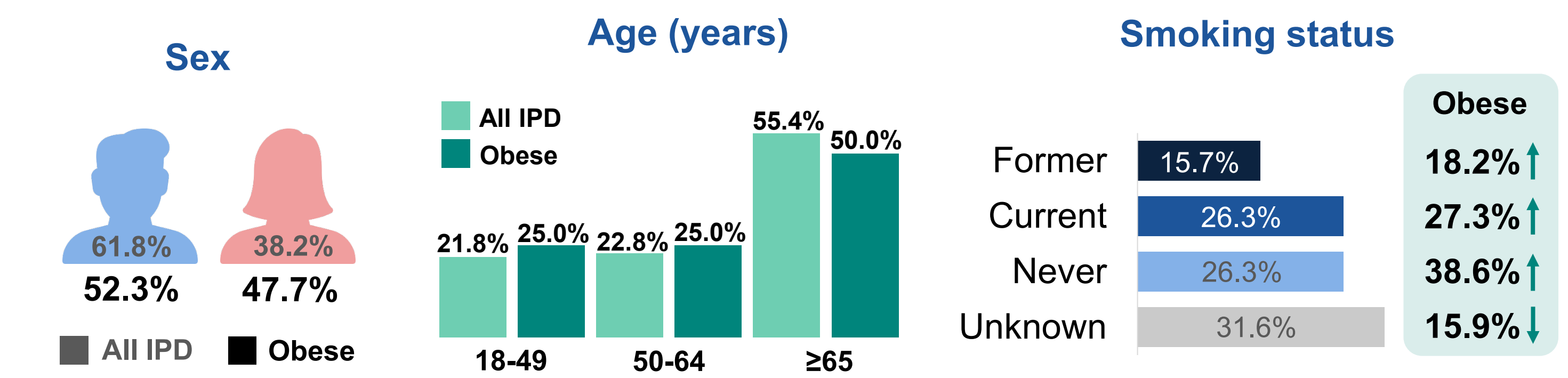


Figure 1. Demographic characteristics.

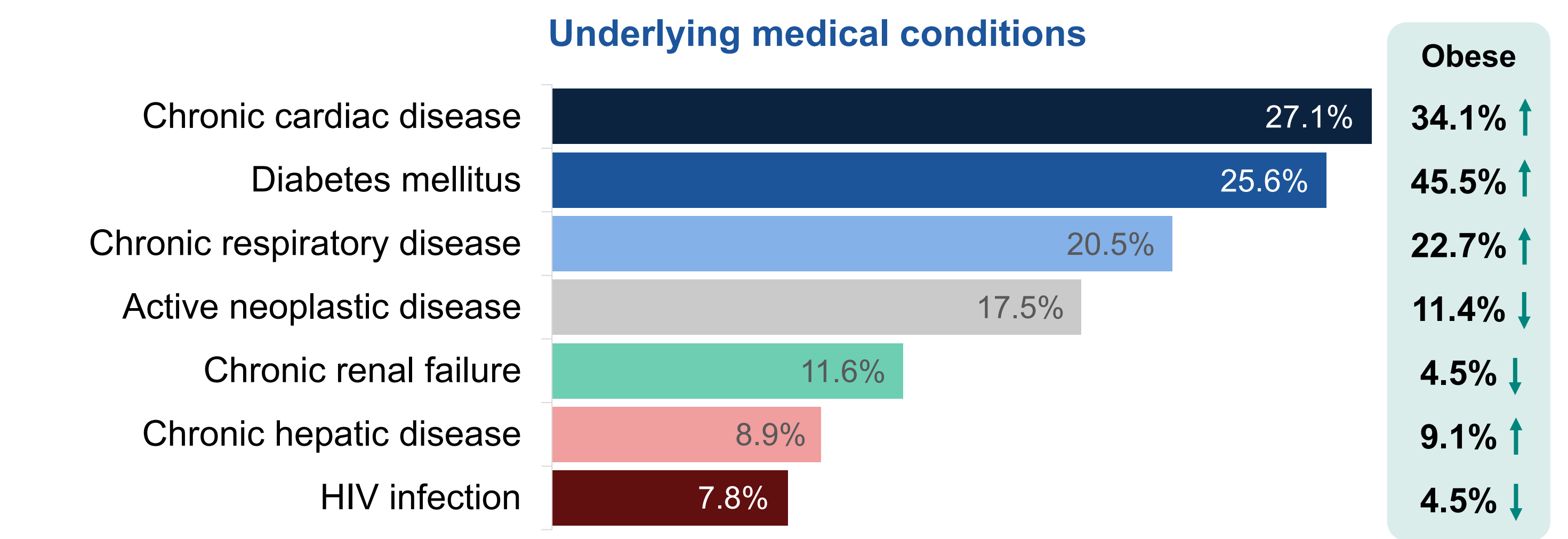


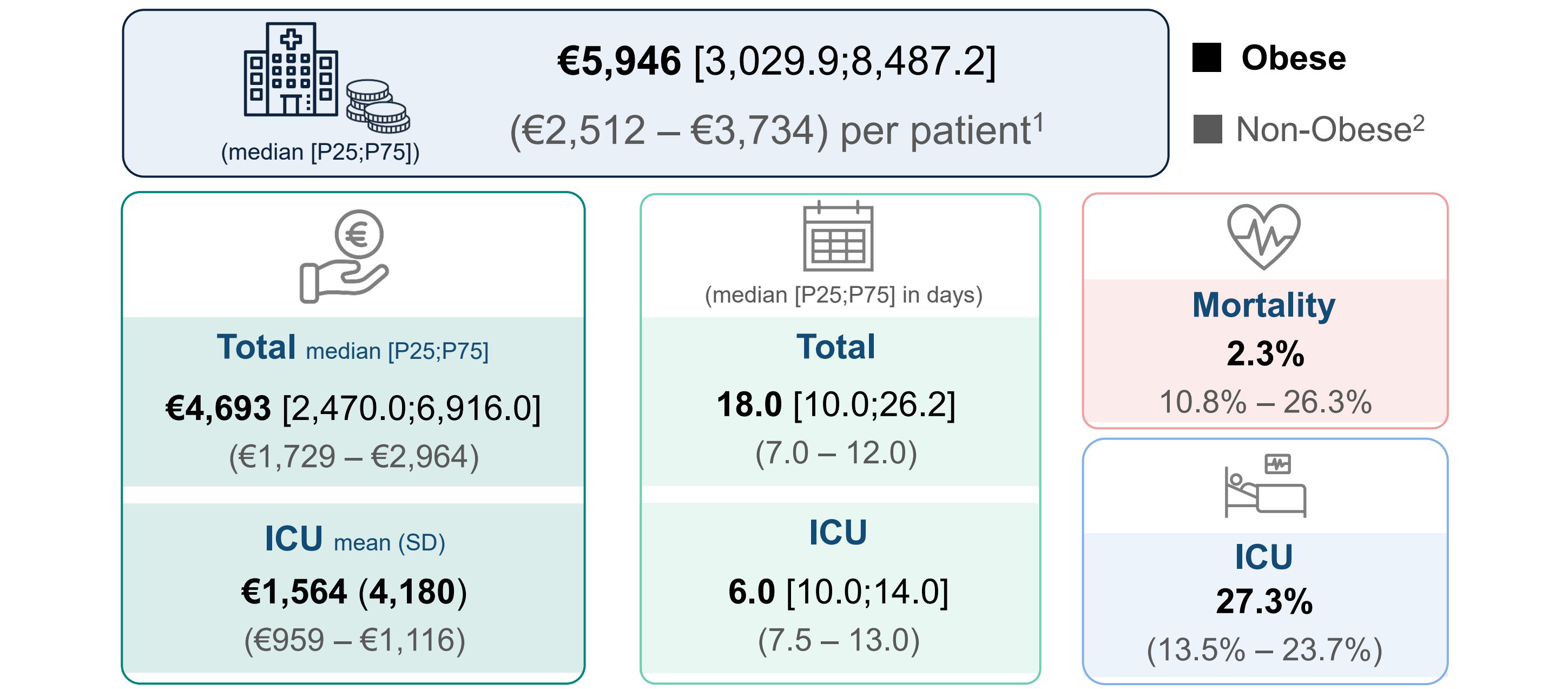
Figure 2. Clinical characteristics.

Methods

- Study Design**
 - Retrospective and multicentric study based on secondary data from seven mainland Portuguese hospitals.
 - Cost data was derived from the Portuguese diagnosis-related groups database.
- Study Population**
 - Adults (≥18 years old) with IPD hospitalized between 2017-2018 based on *S. pneumoniae* isolation/DNA detection from sterile body sites.
 - Patients were stratified into four classes according to their baseline BMI: Underweight (<18.5); Normal (18.5-24.9); Preobese (25.0-29.9); **Obese (≥30)**.

Economic Data

- Figure 3** compares hospitalization-related costs between obese and non-obese patients. It comprises overall costs per patient, hospitalization and intensive care units (ICU) costs, length of stay, mortality rate and frequency of ICU admissions.
- Obese patients incurred higher overall and hospitalization costs (wards and ICU). They also experienced longer total hospital stays and a higher frequency of ICU admission, despite having shorter ICU stays and mortality.



¹The cost estimate included the cost per patient for each type of healthcare resource used during hospitalization.
²Includes underweight (<18.5), normal (18.5-24.9) and preobese (25.0-29.9)

Figure 3. Hospitalization for IPD in obese patients.

- Figure 4** presents healthcare procedures use and cost for obese and non-obese patients
- Obese patients hospitalized with IPD faced higher costs for imaging assessments and laboratory tests, and required more medical procedures, compared to non-obese patients.

	Obese	Non-Obese ³
Imaging Assessments		
HCRU	100%	100%
€	170.3	25.1 – 110.1
Laboratory Tests		
HCRU	100%	100%
€	487.0	321.4 – 351.3
Complementary Exams		
HCRU	77.3%	73.0% - 81.4%
€	298.0	298.0
Medical procedures		
HCRU	34.1%	16.9% – 21.1%
€	0.0	0.0

³Includes underweight (<18.5), normal (18.5-24.9) and preobese (25.0-29.9)

Figure 4. Use and cost of healthcare procedures

Conclusion

- This real-world study highlights the substantial clinical and economic impact of IPD on healthcare systems. Obese patients had higher overall costs and HCRU, along with longer hospital stays. Their clinical profile was also different, with a higher prevalence of diabetes and meningitis, compared to non-obese, both of which place a known burden on the healthcare system.
- Understanding the impact of obesity on the severity of disease and economic burden of IPD can assist health policymakers to prioritize this group as a target for prevention, namely through vaccination.
- Given the small sample size, further studies are needed to validate these findings across broader populations.

References

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Acknowledgements

To the Investigators and Sites: Centro Hospitalar Universitário Lisboa Norte (Dr. Luís Rodrigues, Dr.ª Maria João Palma Santos, Dr.ª Diana Organista), Hospital Prof. Doutor Fernando Fonseca (Dr. Rudi Fernandes, Dr.ª Margarida Pereira, Dr. Carlos Alves, Dr.ª Mariana Silva), Centro Hospitalar Universitário de Coimbra (Dr.ª Ana Isabel Santos, Dr.ª Adriana Dias), Centro Hospitalar Vila Nova de Gaia e Espinho (Dr. Pedro Viegas, Dr. Jorge Menezes), Centro Hospitalar Universitário do Algarve (Dr.ª Rita Neves), Centro Hospitalar Entre Douro e Vouga (Dr.ª Rita Gomes, Dr.ª Cristiana Cruz, Dr.ª Francisca Lopes), Centro Hospitalar Universitário de São João.
To W4R, namely à Nélia Lima (Gestão Projeto), Mariana Laranjeiro, Cristina Mota e Ana Rita Marques (Monitorização do Estudo), Carla Gomes e Joana Melo (Medical Writing) e Adriana Belo (Análise Estatística).
To Carolina Moura (Project Management, MSD Portugal).