

# HEALTHCARE RESOURCE UTILIZATION AND COSTS BY CARDIOVASCULAR RISK LEVEL: RESULTS FROM THE LATINO STUDY

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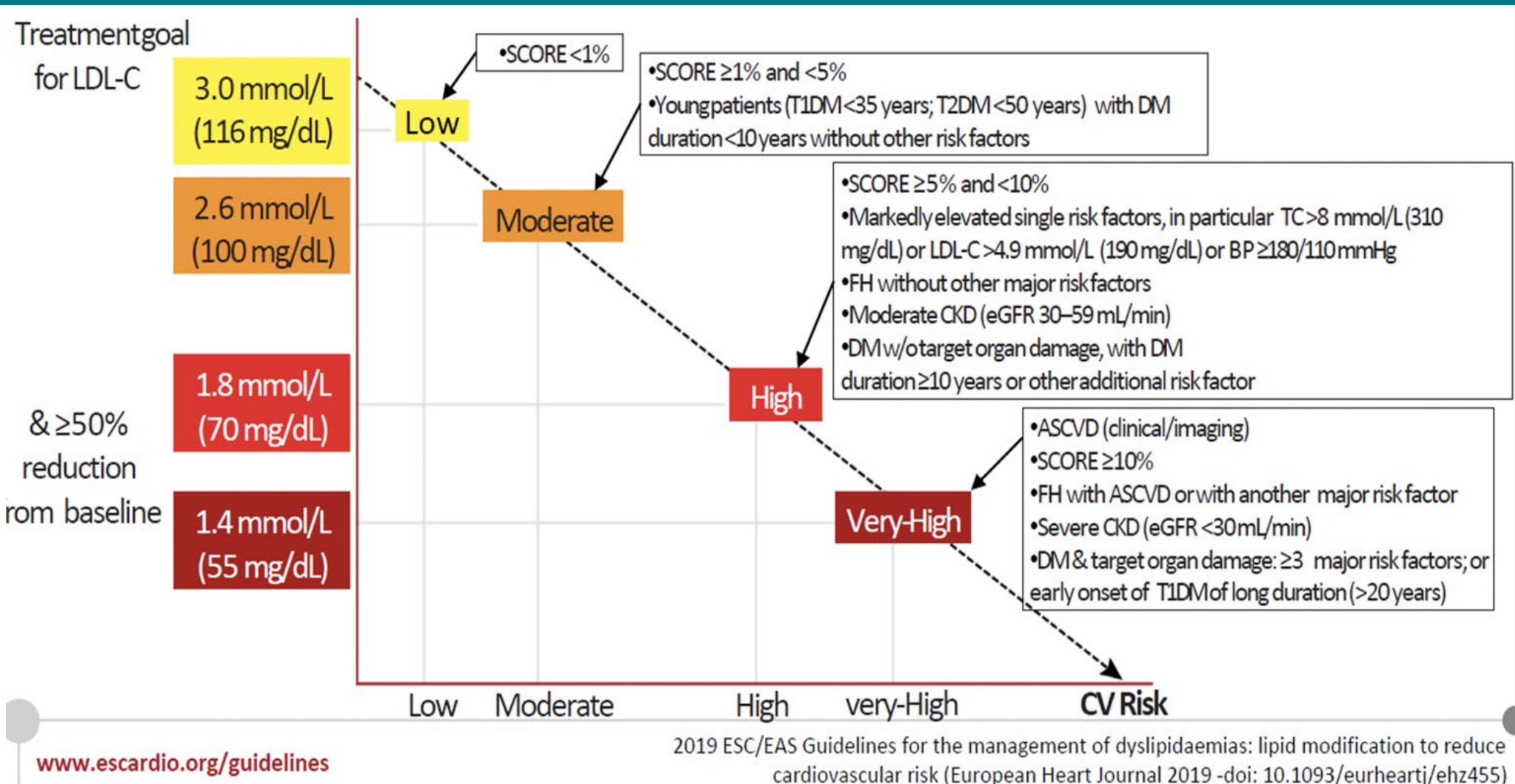
## BACKGROUND/OBJECTIVES

- Cardiovascular diseases (CVD) are the main cause of mortality in Portugal, with stroke and ischemic heart disease as the leading causes of death among CVD (1,2).
- Atherosclerosis entails a high burden and costs in the Portuguese population, accounting for 260,943 disability-adjusted life years and 11% of all health expenditures in 2016 (3,4).
- This analysis aimed to assess cardiovascular (CV) related healthcare resource utilization (HRU) and respective costs by CV risk level in patients followed at a Portuguese local health unit.

## METHODS

- Multicenter cohort study (LATINO) using data from a local health unit (Unidade Local de Saúde de Matosinhos [ULSM]) composed by 14 primary care centers and one central hospital.
- ULSM represents ~90% of the adult population of the geographic region of Matosinhos (the eight most inhabited municipality in the country and the fourth in the northern region) (5).
- Patients aged 40-80 years-old, alive at 31/12/2019 (index date), and with ≥1 general practitioner (GP) appointment in the 3 years prior to index date were included.
- Data sources used were all electronic health records available since health unit inception (2000-2019), including ICD-9/ICD-10 and ICPC-2 data, laboratory exams, clinical measurements, medication, family structure and echocardiography.
- HRU analyzed included CV-related lifetime hospital episodes (hospitalizations, outpatient visits, and emergency room [ER] visits) and GP appointments.
- CV-related was defined as any episode with an ICD-10 diagnosis under the I chapter on any position, or matched ICD-9 codes.
- Median length-of-stay per patient was also assessed.
- Lifetime costs (2000-2019) were calculated based on the reference cost for each episode (excluding therapy and test and diagnostic procedures costs).
- CV risk categories (low, intermediate, high and very-high risk) were defined and fully implemented according to the 2019 ESC/EAS Guidelines (except imaging, surgical procedures and biomarkers not used in routine practice) (Figure 1) (6).

**Figure 1. Cardiovascular risk categories defined as per 2019 ESC/EAS guidelines (6)**



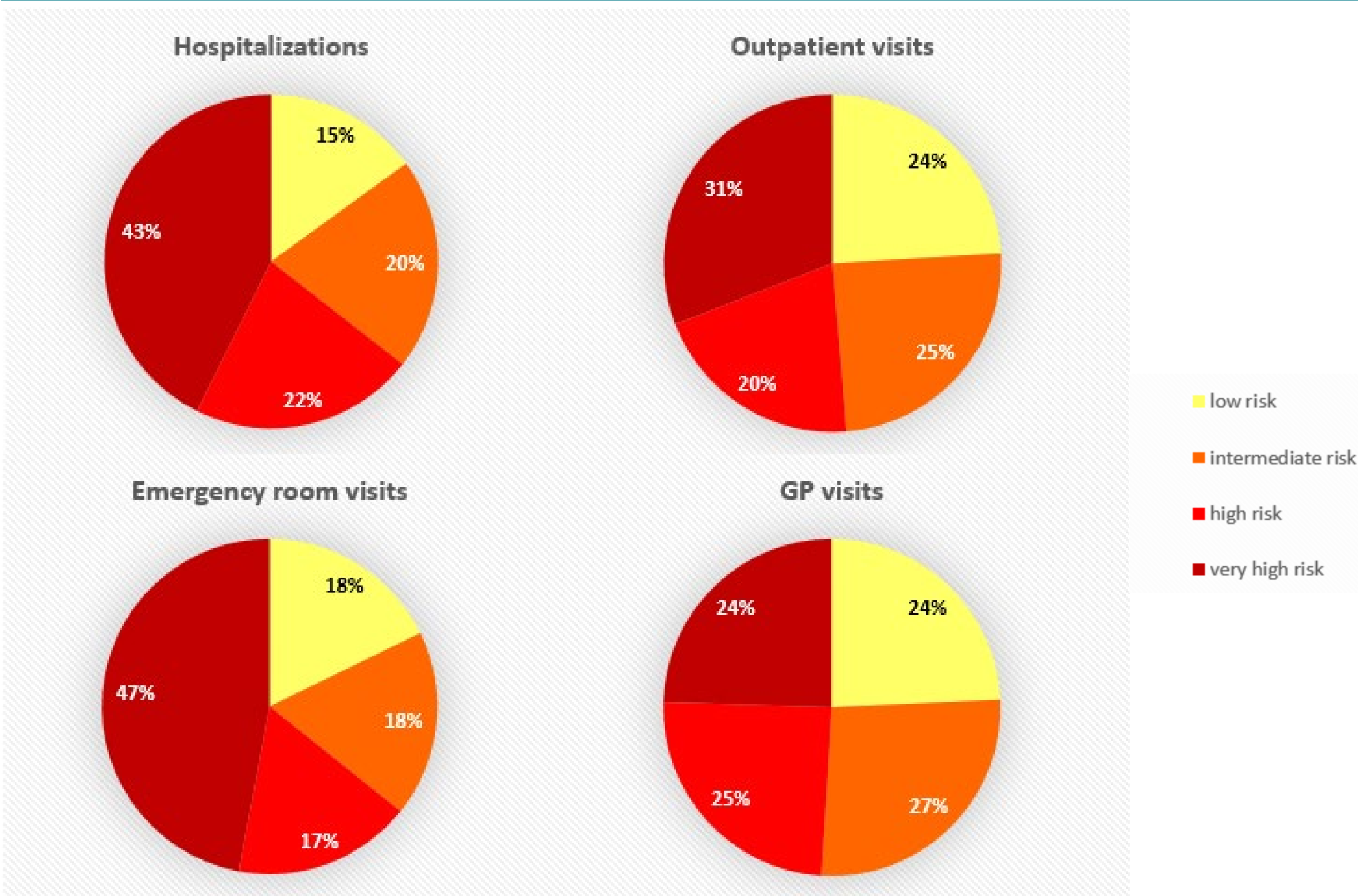
## RESULTS

- A total of 81,731 patients (31% low, 28% intermediate, 21% high and 16% very high CV risk) corresponding to 5M lifetime episodes (24%, 27%, 24% and 25% in each CV risk category, respectively) were analyzed.

## RESULTS (cont.)

- Very high-risk patients were responsible for 43% of the CV-related lifetime hospitalizations, 47% of ER visits, 31% of outpatient visits and 24% of GP visits (Figure 2).
- Whereas high-risk patients were responsible for 22%, 17%, 20% and 25% of the CV-related lifetime hospitalizations, ER, outpatient and GP visits, respectively (Figure 2).

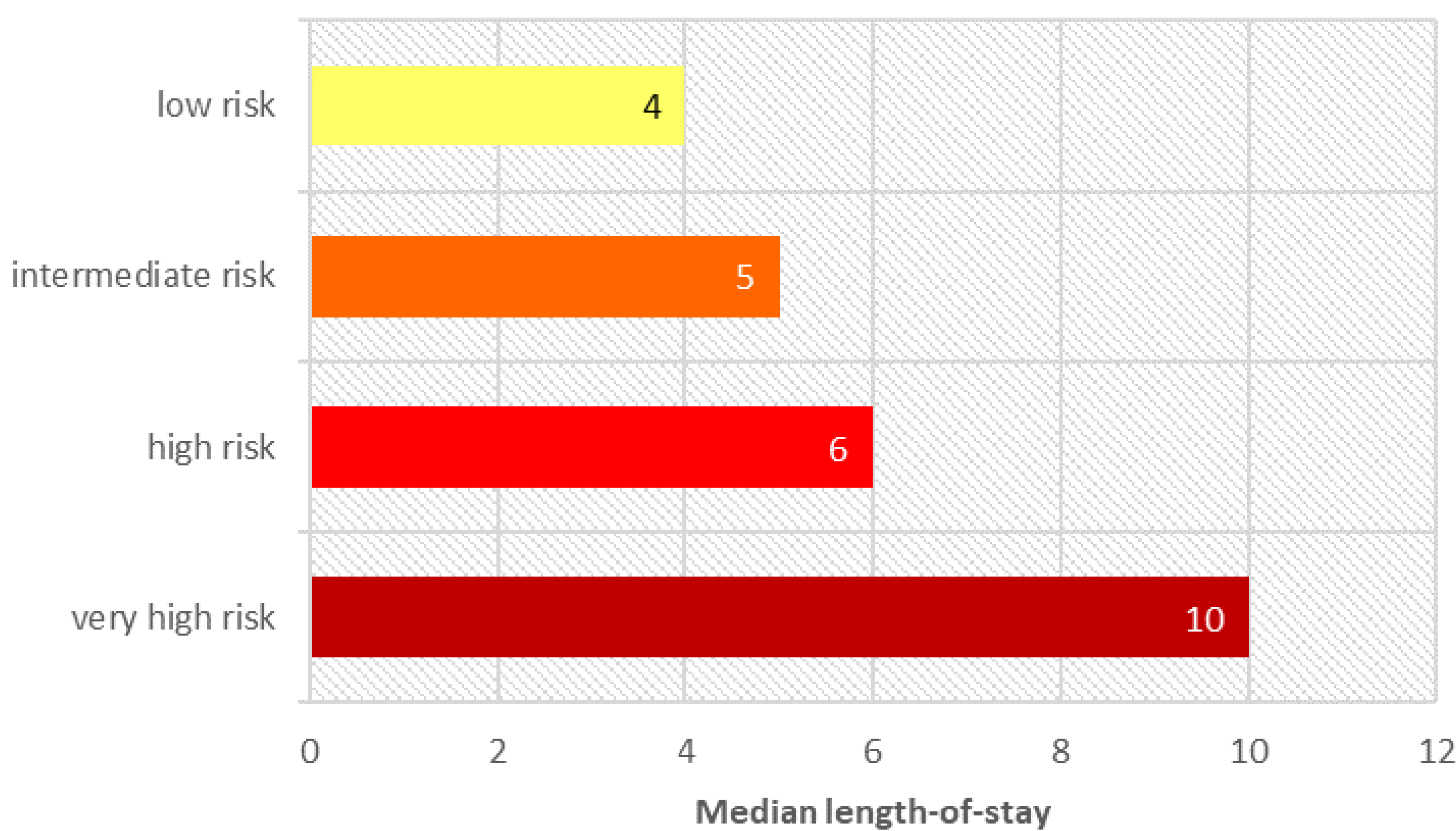
**Figure 2. Distribution of HRU among all cardiovascular risk categories**



GP, general practitioner; HRU, healthcare resource utilization .

- Very high-risk patients were accounted for 52% of all CV-related hospitalization days.
- The median length-of-stay per patient almost doubles in very high-risk patients versus the other CV risk categories (Figure 3).

**Figure 3. Median length-of-stay per patient in CV-related hospitalizations in each cardiovascular risk category**



- Despite being 37% of the total population, very high and high-risk patients represented 65% of total costs.
- The lifetime CV-related cost was 4,281€ per very high-risk patient and 1,699€ per high-risk.

## CONCLUSIONS

- There is a steep healthcare resource utilization in the highest CV risk patients.
- These data may help inform the development of impact assessment strategies to optimize disease management in the highest CV risk patients, reducing HRU and respective economic burden.

## REFERENCES

1. Statistics Portugal [Instituto Nacional de Estatística]. Causes of Death 2017 [Causas de Morte: 2017]. Lisboa: INE, 2019; 2. DGS Programa nacional para as doenças cérebro-cardiovasculares. 2017. Ministério da Saúde. Retrato da Saúde, Portugal. 2018; 3. Costa J, et al. The burden of atherosclerosis in Portugal. European Heart Journal – Quality of Care and Clinical Outcomes. 2020;0:1-9; 4. Costa J, Alarcão J, Amaral-Silva A, et al. Os custos da aterosclerose em Portugal. Rev Port Cardiol. 2021. 5. Portuguese Census 2021. 6. Mach et al. 2019 ESC/EAS Guidelines for the management of dyslipidaemias: lipid modification to reduce cardiovascular risk. European Heart Journal, 2020; 41(1):111–188.