

Burden of disease and cost of illness of neovascular Age-Related Macular Degeneration and Diabetic Macular Edema in Portugal

EPH37

Gouveia M¹, Cabral D², Silva R³, Carneiro A⁴, Joana Alarcão J⁵, Café A⁵, Rodrigues A², Sousa RD², Canhão H²

¹Católica Lisbon School of Business and Economics, Portugal, ²Nova Medical School, Lisbon, Portugal ³University of Coimbra Medical School, Portugal ⁴University of Porto Medical School, Portugal, ⁵Roche Farmacêutica, Portugal

ISPOR Europe 2023

BACKGROUND AND OBJECTIVES

BACKGROUND

- Neovascular Age-Related Macular Degeneration (nAMD) and Diabetic Macular Edema (DME) are vision-related health problems with significant implications for population health and for social and economic well-being.
- nAMD is considered the most common cause of vision loss in people over 55 years of age. It has potentially very serious consequences, including blindness. The incidence and prevalence of nAMD have been increasing due to the general aging of the population and the increase in risk factors.
- DME is a potential complication of diabetic retinopathy. It is one of the leading causes of vision loss and blindness in people aged between 20 and 65.

OBJECTIVES

- To assess the impact of these ophthalmological diseases on population health and to quantify the economic implications for the healthcare system and for society as a whole.
- To estimate the burden of disease (BoD) due to nAMD and DME in Portugal for 2018. Estimates of the BoD use Disability Ajusted Life Years (DALYs), a measure introduced by the World Bank and the WHO (Murray and Lopez, 1997) [1].
- To quantify society's cost of illness (CoI) associated with nAMD and DME, including both direct (medical and non-medical) and indirect costs for 2018, the latest year for which public data is available.
- To raise awareness for nAMD and DME in Portugal and to provide information relevant for health policy makers.

METHODS

- Burden of disease was assessed considering the impact in terms of DALY (disability adjusted life years, the number of years patients lose while living with disability due to the disease). Mortality and the loss of life years were not attributed to nAMD and DME as in the Global Burden of Disease studies. The burden of disease estimates were based solely on the resulting Years Lived with Disabilities (YLD).
- Costs for the health care system and indirect costs were estimated for 2018 using a prevalence perspective, with indirect costs resulting from reductions in employment and productivity of the labor force. Cost estimates were based on multiple sources of information, including microdata from the Hospital Morbidity Database and the 2019 National Health Survey, population data from Statistics Portugal, official data on wages, the Coimbra Eye study[2] and expert opinions. Disability level distribution estimates were based on data from the national registry Retina.pt.

MAIN LIMITATIONS

- There is very little epidemiological direct data on Portugal for the prevalence of DME. The present analysis relied on the PREVABIAB study for the prevalence of diabetes [3, 4], supplemented by the 2019 National Health Survey for the case of patients 80 and over, and on the prevalence rate estimates in [5].
- The information on treated prevalence, resource use and costs was extracted from databases that only include National Health Service hospitals.

REFERENCES

[1] Murray, Christopher J. L., Lopez, Alan D., World Health Organization, World Bank & Harvard School of Public Health. (1996). The Global burden of disease: a comprehensive assessment of mortality and disability from diseases, injuries, and risk factors in 1990 and projected to 2020. [2] Cachulo M da L, Lains I, Lobo C, Figueira J, Ribeiro L, Marques JP, Costa J, Vieira A, Rodrigues J, Alves D, Nunes S, Costa M, Rodrigues V, Cunha-Vaz J, Delcourt C, Silva R. Age-related macular degeneration in Portugal: prevalence and risk factors in a coastal and an inland town. The Coimbra Eye Study - Report 2. Acta Ophthalmol. 2016 Sep;94(6):e442-53. doi: 10.1111/aos.12950. Epub 2016 Jan 25. PMID: 26806024; [3] Gardete-Correia L, Boavida JM, Raposo JF, Mesquita AC, Fona C, Carvalho R, Massano-Cardoso S. First diabetes prevalence study in Portugal: PREVADIAB study. Diabet Med. 2010 Aug;27(8):879-81. doi: 10.1111/j.1464-5491.2010.03017.x. PMID: 20653744. [4] Observatório Nacional da Diabetes (2019), Diabetes: Factos e Números – Os Anos de 2016, 2017 e 2018, https://www.spd.pt/images/uploads/20210304-200808/DF&N-2019_Final.pdf; [5] Li, J.Q., Welchowski, T., Schmid, M. et al. Prevalence, incidence and future projection of diabetic eye disease in Europe: a systematic review and meta-analysis. Eur J Epidemiol 35, 11–23 (2020). <https://doi.org/10.1007/s10654-019-00560-z>; [6]. Global Burden of Disease Collaborative Network. Global Burden of Disease Study 2019 (GBD 2019) Disability Weights. Seattle, United States of America: Institute for Health Metrics and Evaluation (IHME), 2020. <https://doi.org/10.6069/1W19-VX76>

FUNDING AND DISCLOSURES

This project benefited from an unrestricted grant from Roche, Portugal.

RESULTS

BURDEN OF DISEASE

- The estimated prevalences of nAMD and DME were 18 068 and 44 109, respectively, and are represented in Table 1. The prevalence is higher in women for both types of vision problems.

	Prevalence n and (%)	Women	Men	Population
nAMD – (55 and over population)		11 026 (0.56%)	7 042 (0.65%)	18 068 (0.52%)
DME – (20 and over population)		28 745 (0.64%)	15 364 (0.40%)	44 109 (0.53%)

Table 1. Prevalence of neovascular Age-Related Macular Degeneration and Diabetic Macular Edema

- Mean disability coefficients estimates used coefficients in [6] applied to distributions by level of disability taken from the national registry Retina.pt. The mean disability coefficient estimated for nAMD was 0.0528. For DME it was 0.0432
- The DALY (YLD) estimates were obtained putting together the prevalence data and the mean disability coefficients. The results are displayed in Table 2.

	DALY (YLD)	Women	Men	Population
nAMD		582	372	954
DME		1242	664	1906

Table 2. Years of Life Lost due Disability (YLD) for nAMD and DME

- The estimated total disease burden for nAMD was 954 DALY, with women representing 61% of total. In the case of DME, women had 65% of the total 1906 DALY. Figures 1 and 2 show the distribution of the DALY by age groups.

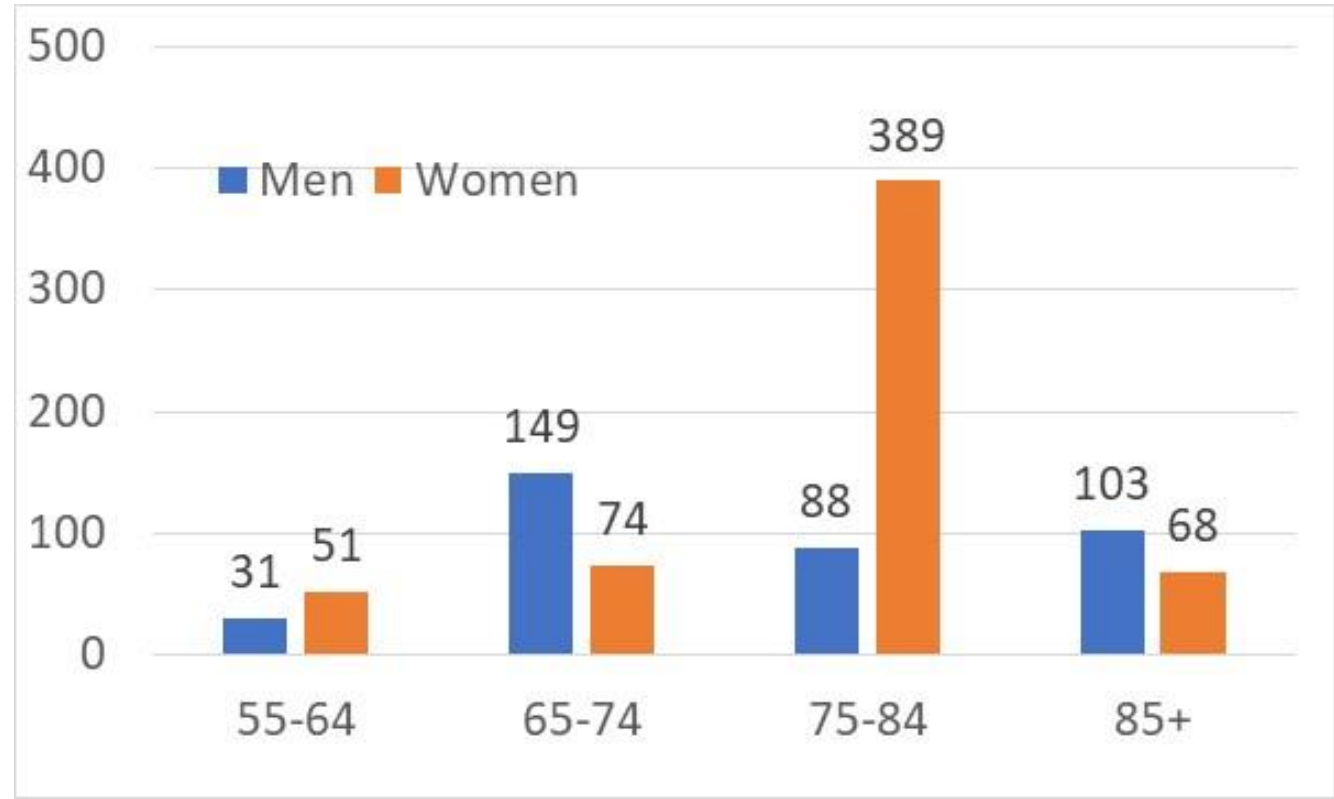


Figure 1. Disease burden age distribution for nAMD

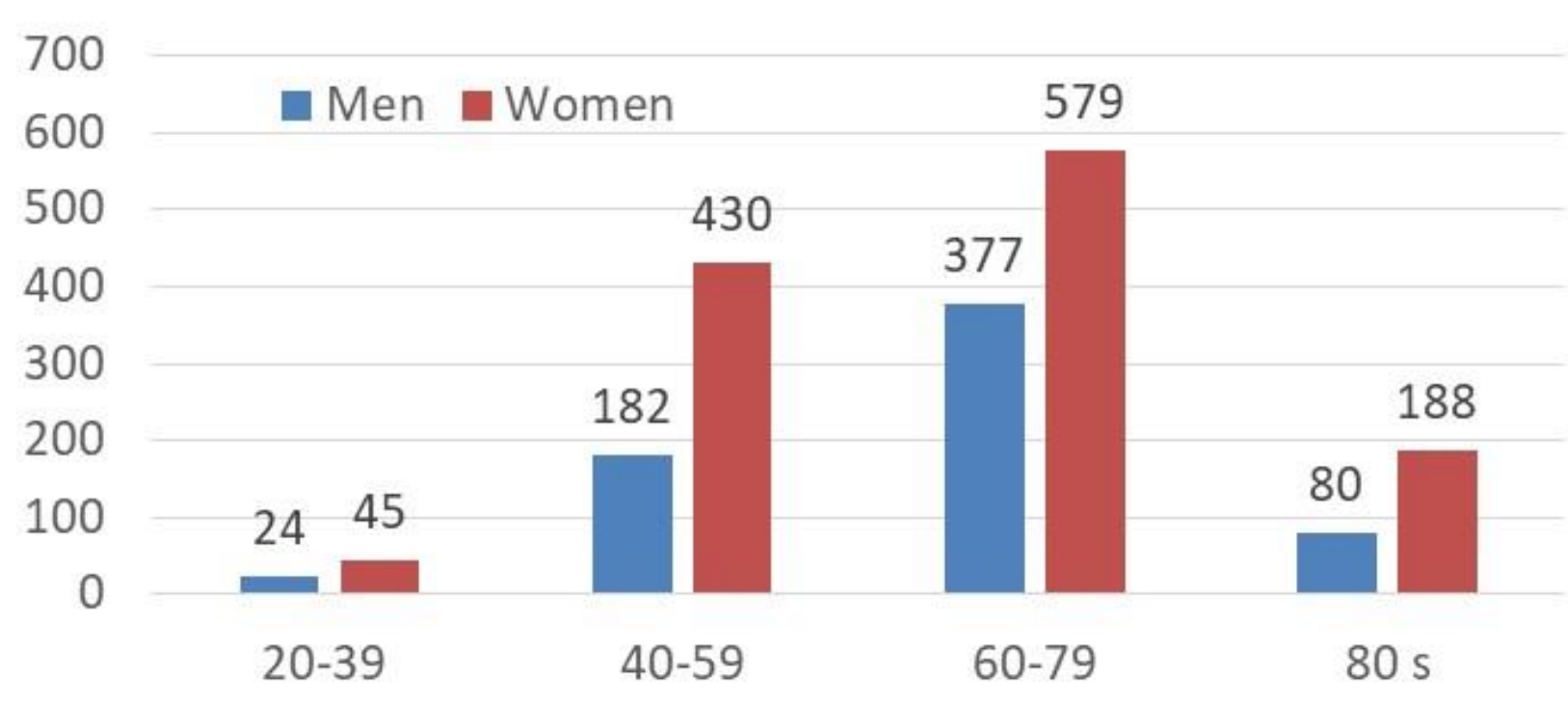


Figure 2. Disease burden age distribution for DME

COST OF ILLNESS

- Analysis used NHS hospitals DRG microdata for 2018. Episodes (and patients) of interest were identified using a list for nAMD ICD 10 CM codes and a long list of ICD 10 CM codes for DME.
- For nAMD the total DRG costs estimated were € 30 133 083.
- There were 23 262 episodes with nAMD in 7 195 patients. The average number of episodes per patient was 3.2 (SD=2.3) and the median was 3. Mean cost per episode was € 1 295.24 and € 4 188 per patient/year.
- Cost with consultations and exams was estimated based on opinion of experts at € 654 292. Total costs added to € 30 787 375.
- Indirect costs for the nAMD patients were assumed to be negligible.
- For DME the total DRG costs estimated were € 28 157 979
- There were 21 843 episodes with DME in 7 854 patients. The average number of episodes per patient was 2.8 (SD=2.1) and the median was 2. Mean cost per episode was € 1 289 and per patient/year was € 3 585.
- Cost with consultations and exams was estimated at €599 245, so total costs were € 28 757 224
- For DME, the indirect costs were estimated € 39 053 719 including both absenteeism and early exit from the labor market
- For both nAMD and DME, we could not find information to estimate the indirect costs for companions/caregivers.

DISCUSSION AND CONCLUSIONS

- The DALY due to nAMD are projected to increase by approximately 36.6% over the next 20 years. For the same period, DME DALYs are expected to rise by 10.1%.
- For nAMD, the treated prevalence is 44.7% of the total estimated prevalence of the disease in men and 36.7% in women. For DME, the treated prevalence is 17.7% of the total estimated prevalence of the disease in men and 12.5% in women. These figures show that there are severe problems of access and disparity in access to nAMD and DME treatments. Even for those with access there is undertreatment since the means of 3.2 procedures/year in AMD and 2.7 in DME are too low.
- This study provides insights into the consequences of nAMD and DME, emphasizing the need to prioritize and define healthcare policies based on these findings. Policies should address the gaps and disparities in access, the levels of undertreatment and prepare the health care system for the increased prevalence of these vision problems due to the aging of the population.