

National Programme for Diabetes

2021

CHALLENGES AND STRATEGIES



TECHNICAL DATA SHEET

Portugal. Ministry of Health. Directorate-General of Health.

NATIONAL PROGRAMME FOR DIABETES: CHALLENGES AND STRATEGIES 2021.

Lisbon: Directorate-General of Health, 2021.

ISBN: 978-972-675-333-9

KEYWORD

diabetes, chronic disease, diabetes complications, treatment, mortality, diabetes costs, National Programme for Diabetes.

EDITOR

Direção-Geral da Saúde

Alameda D. Afonso Henriques, 45 1049-005 Lisboa

Tel.: 218 430 500

Fax: 218 430 530

E-mail: geral@dgs.min-saude.pt

www.dgs.pt

AUTHOR

Programa Nacional para a Diabetes (PND) (National Program for Diabetes (NPD))

Sónia do Vale, José Dores, Eugénia Pedro, Isabel Dinis, Cristina Portugal

CONTRIBUTIONS

Isabel Alves, Sérgio Gomes (Directorate-General of Health, DGS)

Central Administration of the Health System (ACSS)

Portuguese National Authority for Medicines and Health Products (INFARMED)

Portuguese National Institute for Statistics (INE)

Shared Services of the Ministry of Health (SPMS)

Lisbon, october 2022

Table of Contents

Abbreviations and Acronyms	9
Summary in Plain Language	10
Introductory Note by the Director-General of Health	11
1. Epidemiology of Diabetes in 2020	12
1.1. Diabetes prevalence rate and intermediate hyperglycaemia	12
1.2. Primary Health Care Assistance in Mainland Portugal	15
1.3. Pre-hospital care – NHS24 Network	28
1.4. Diabetes Care at Hospital Level in the National Health Service in Mainland Portugal.....	29
1.5. Diabetes Mortality in Portugal	43
1.6. Outpatient consumption of medicines and devices.....	47
1.7. Costs of Diabetes in Portugal.....	54
1.8. Diabetes and risk factors for its development in Europe	55
1.9. Diabetes in the World Mundo.....	56
2. Monitoring Targets 2017 – 2020	57
2.1. Health Targets 2020	57
2.2. Implementation	57
2.3. Monitoring	57
3. Activities undertaken in 2021	59
3.1. Monitoring and Epidemiological Surveillance.....	59
3.2. Health Promotion and Disease Prevention.....	60
3.3. Promotion of Good Practices, Quality and Safety	61
3.4. Inter-institutional Collaboration and with Civil Society	65
3.5. Communication.....	66
3.6. Publications	66
4. Action Plan for the triennium 2022 – 2024	68
4.1. Health Goals and Targets for the triennium 2022 – 2024	68
4.2. Implementation	68
4.3. Monitoring	69
4.4. Action Plan	69
Final Notes	72
Bibliographical references	73
Annexes	75

Table of Contents for Tables

Table 1. Prevalência da Diabetes Gestacional em Portugal no SNS 2016 – 2020.....	14
Table 2. Casos de Diabetes tipo 1 registados em Portugal Continental, retirados a partir do registo DOCE	14
Table 3. Número de utentes com diagnóstico de Diabetes registados nos Cuidados de Saúde Primários	16
Table 4. Proporção de utentes com rastreio da retinopatia diabética em Portugal Continental.....	22
Table 5. Número anual de chamadas para a linha SNS24 por problemas relacionados com a Diabetes em Portugal.....	28
Table 6. Número médio de admissões em pessoas com pelo menos um diagnóstico de Diabetes (como diagnóstico principal ou associado).....	32
Table 7. Número de admissões por complicações agudas da Diabetes (utentes com Diabetes como diagnóstico principal ou associado).....	32
Table 8. Número de admissões em utentes com Diabetes (como diagnóstico principal ou associado), por manifestações oftálmicas, renais, circulatórias periféricas, neurológicas, cutâneas ou artropatia.....	33
Table 9. Causas de admissões (internamentos, incluindo day cases e episódios de ambulatório) por complicações agudas da Diabetes, em utentes com Diabetes como diagnóstico principal.....	33
Table 10. Causas de admissões (internamentos incluindo day cases e episódios de ambulatório), por manifestações oftálmicas, renais, circulatórias periféricas, neurológicas, cutâneas ou artropatia em utentes com Diabetes como diagnóstico principal.....	33
Table 11. Duração dos internamentos (com day cases) por Diabetes e totais nos hospitais do SNS	35
Table 12. Letalidade intra-hospitalar dos utentes internados com Diabetes (como diagnóstico principal) e do total de utentes internados nos Hospitais do SNS	36
Table 13. Letalidade intra-hospitalar dos utentes internados com Diabetes (como diagnóstico principal ou associado) e do total de utentes internados nos Hospitais do SNS	36
Table 14. Letalidade intra-hospitalar do total de utentes internados nos Hospitais do SNS (com qualquer diagnóstico).....	36
Table 15. Caracterização da doença renal nas pessoas com Diabetes e terapêutica de substituição renal	36
Table 16. Número de utentes internados e letalidade por enfarte agudo do miocárdio (EAM) nos hospitais do SNS.....	37
Table 17. Número de utentes internados e letalidade por acidente vascular cerebral (AVC) nos hospitais do SNS.....	37
Table 18. Admissões nos hospitais do SNS por “Pé Diabético”	38
Table 19. Número de internamentos e óbitos por COVID-19, em 2020	40
Table 20. Número de internamentos por COVID-19, em pessoas com Diabetes não controlada sem complicações e com Diabetes com complicações crónicas ou agudas, em 2020	41
Table 21. Utesentes com Diabetes tipo 1 tratados com sistemas de Perfusão Subcutânea Contínua de Insulina (PSCI)	41
Table 22. Óbitos por Diabetes de acordo com o grupo etário em Portugal	43
Table 23. Evolução da Diabetes como causa de morte (%) em Portugal.....	43

Table 24. Taxa de Mortalidade Prematura (<70 anos) Padronizada em Portugal de acordo com a região geográfica (por 100 000 habitantes)	44
Table 25. Evolução de indicadores de mortalidade total e prematura por Diabetes em Portugal	44
Table 26. Registo das Causas de Morte por Diabetes em Portugal.....	45
Table 27. Registo das Causas de Morte Prematura (<70 anos) por Diabetes em Portugal.....	46
Table 28. Discriminação do tipo de Diabetes nos casos de óbito por Cetoacidose diabética	46
Table 29. Consumo de medicamentos em ambulatório, no SNS (antidiabéticos não insulínicos, insulina e glucagon, excluindo as combinações de fármacos) em Portugal Continental – Dose Diária Definida dispensada num ano	47
Table 30. Gastos com antidiabéticos não insulínicos: valor PVP e encargos do SNS em Portugal Continental.....	49
Table 31. Gastos com insulinas: Valor PVP e encargos do SNS em Portugal Continental	50
Table 32. Consumo de Glucagon no SNS em Portugal Continental.....	52
Table 33. Gastos com Glucagon: Valor PVP e encargos do SNS Gastos	52
Table 34. Consumo de tiras teste e sensores no SNS	53
Table 35. Gastos com tiras teste e sensores: valor PVP e encargos do SNS em Portugal Continental.....	53
Table 36. Consumo e gastos com dispositivos de perfusão subcutânea contínua de insulina no SNS em Portugal Continental	53
Table 37. Fatores Risco – Dados Comparativos de Portugal e OCDE.....	56
Table 38. Implementação: metas e objetivos 2020	57
Table 39. Monitorização das metas 2017 – 2020.....	58
Table 40. Implementação: metas e objetivos 2024	68
Table 41. Indicadores para monitorização das metas 2024.....	69
Table 42. Casos de Diabetes Tipo 1 registados em Portugal (DOCE)	75
Table 43. Casos de Diabetes tipo 1 registados ao nível dos Cuidados de Saúde Primários no SNS, em Portugal Continental	75
Table 44. Prevalência e Terapêutica da Diabetes Gestacional em Portugal no SNS 2016-2020.....	76
Table 45. Proporção de utentes com avaliação de risco de Diabetes tipo 2 registada nos Cuidados de Saúde Primários, por ARS e em Portugal Continental	76
Table 46. Proporção de utentes com diagnóstico de Diabetes registados nos Cuidados de Saúde Primários, por ARS e em Portugal Continental.....	77
Table 47. Número de utentes com registo de Diabetes tipo 2 e proporção de utentes com Diabetes tipo 2 no universo de pessoas com registo de Diabetes ao nível dos Cuidados de Saúde Primários em Portugal Continental	77
Table 48. Monitorização do Rastreio da Retinopatia Diabética, por ARS e em Portugal Continental.....	78
Table 49. Total de avaliações de risco de úlcera de pé diabético por nível de risco, efetuadas nos Cuidados de Saúde Primários, por ARS e em Portugal Continental	80
Table 50. Proporção de utentes com Diabetes com úlcera de pé ativa registada nos Cuidados de Saúde Primários, por ARS e em Portugal Continental	81
Table 51. Género e faixa etária da população que recorreu ao serviço SNS24.....	82

Table 52. Número de admissões com pelo menos um diagnóstico de Diabetes (como diagnóstico principal).....	82
Table 53. Admissões por Hipoglicemia com e sem coma em utentes com Diabetes tipo 1 (DM1) e Diabetes tipo 2 (DM2)	84
Table 54. Distribuição dos utentes em utilização de dispositivo de perfusão subcutânea contínua de insulina em Portugal Continental, no SNS.....	84
Table 55. Consumo de embalagens de antidiabéticos não insulínicos no SNS em Portugal Continental .	85
Table 56. Consumo de embalagens de insulinas no SNS em Portugal Continental	85
Table 57. Custos identificados em Portugal Continental.....	86

Table of Contents for Figures

Figure 1. Prevalência de Diabetes em Portugal	12
Figure 2. Prevalência estimada de AGJ e TDG em Portugal, em 2021	13
Figure 3. Casos de Diabetes Tipo 1 registados em Portugal (DOCE).....	13
Figure 4. Proporção de partos por cesariana em mulheres com Diabetes Gestacional em Portugal	14
Figure 5. Terapêutica da Diabetes Gestacional.....	15
Figure 6. Proporção de utentes com avaliação de risco de Diabetes tipo 2 registada nos Cuidados de Saúde Primários	16
Figure 7. Proporção de utentes com diagnóstico de Diabetes registados nos Cuidados de Saúde Primários, por ARS, 2020	17
Figure 8. Taxa de novos casos de Diabetes por cada 1000 utentes e número de novos casos, registados ao nível dos Cuidados de Saúde Primários em Portugal Continental	17
Figure 9. Proporção de utentes com Diabetes tipo 2 no universo de pessoas com registo de Diabetes ao nível dos Cuidados de Saúde Primários em Portugal Continental.....	18
Figure 10. Proporção de utentes com Diabetes tipo 2 com compromisso de vigilância no SNS ao nível dos Cuidados de Saúde Primários em Portugal Continental.....	18
Figure 11. Proporção de utentes com Diabetes com consulta de enfermagem de vigilância no SNS ao nível dos Cuidados de Saúde Primários em Portugal Continental.....	19
Figure 12. Proporção de utentes com Diabetes com registo de resultado de HbA1c nos últimos 6 meses nos Cuidados de Saúde Primários por região de saúde	19
Figure 13. Proporção de utentes com Diabetes com idade inferior a 65 anos, com o último registo de de HbA1c \leq a 6.5% nos Cuidados de Saúde Primários por região de saúde.....	20
Figure 14. Proporção de utentes com Diabetes com o último registo de HbA1c \leq a 8% nos Cuidados de Saúde Primários por região de saúde	20
Figure 15. Proporção de utentes com Diabetes e último resultado de colesterol LDL < 100 mg/dl nos últimos 12 meses, nos Cuidados de Saúde Primários em Portugal Continental	21
Figure 16. Proporção de utentes com Diabetes e último registo de TA < 140/90mmHg nos últimos 12 meses, nos Cuidados de Saúde Primários em Portugal Continental.....	21
Figure 17. Proporção de utentes com Diabetes com registo de gestão de regime terapêutico (alimentação atividade física e medicação) no último ano nos últimos 12 meses, nos Cuidados de Saúde Primários em Portugal Continental.....	22

Figure 18. Taxa de cobertura e rastreio da retinopatia diabética em Portugal Continental.....	23
Figure 19. Proporção de utentes com Diabetes com registo de avaliação de microalbuminúria nos Cuidados de Saúde Primários em Portugal Continental	24
Figure 20. Proporção de utentes com Diabetes com registo de observação de pé em Portugal Continental.....	24
Figure 21. Total de avaliações de risco de pé diabético por nível de risco, efetuadas nos Cuidados de Saúde Primários em Portugal Continental.....	25
Figure 22. Proporção de utentes com Diabetes com úlcera de pé ativa registada nos Cuidados de Saúde Primários em Portugal Continental.....	25
Figure 23. Proporção de utentes com registo novo de Diabetes tipo 2 que iniciaram terapêutica com metformina em monoterapia nos Cuidados de Saúde Primários em Portugal Continental.....	26
Figure 24. Proporção de utentes com registo de Diabetes tipo 2 em terapêutica com metformina nos Cuidados de Saúde Primários em Portugal Continental	26
Figure 25. Rácio entre o somatório de Doses Diárias Definidas (DDD) prescrita em inibidores DPP4 e o somatório de DDD prescrita em antidiabéticos não insulínicos, em doentes com Diabetes tipo 2, Portugal Continental.....	27
Figure 26. Proporção de utentes com registo de Diabetes tipo 2 em terapêutica com insulina nos Cuidados de Saúde Primários em Portugal Continental	27
Figure 27. Distribuição, por faixas etárias, das chamadas para a linha SNS24 por problemas relacionados com a Diabetes	28
Figure 28. Distribuição mensal das chamadas para a linha SNS24 por problemas relacionados com a Diabetes.....	29
Figure 29. Motivo de contacto e destino das chamadas efetuadas para a linha SNS24 por problemas relacionados com a Diabetes.....	29
Figure 30. Total de admissões nos hospitais do SNS com diagnóstico de Diabetes.....	30
Figure 31. Total de admissões nos hospitais do SNS com diagnóstico Principal de Diabetes.....	31
Figure 32. Total de admissões nos hospitais do SNS com diagnóstico Principal ou Associado de Diabetes	31
Figure 33. Proporção de admissões nos hospitais do SNS com diagnóstico de Diabetes	32
Figure 34. Admissões por Hipoglicemia sem coma em utentes com Diabetes tipo 1 (DM1) e Diabetes tipo 2 (DM2) (utentes admitidos com diagnóstico principal de Diabetes)	34
Figure 35. Admissões por Hipoglicemia com coma em utentes com Diabetes tipo 1 (DM1) e Diabetes tipo 2 (DM2) (utentes admitidos com diagnóstico principal de Diabetes)	35
Figure 36. Evolução do número de amputações por pé diabético (Diabetes como diagnóstico principal)	39
Figure 37. Evolução do número de amputações totais em pessoas com Diabetes (Diabetes como diagnóstico principal e associado)	39
Figure 38. Taxa de amputação dos membros inferiores em pessoas com Diabetes, em Portugal, no ano de 2020	40
Figure 39. Taxa de utilização de sistemas de PSCI, em Portugal Continental, por ARS, em 2020	42
Figure 40. Evolução do número de utentes com Diabetes tipo 1 em tratamento com PSCI	42
Figure 41. Consumo de embalagens de antidiabéticos não insulínicos no SNS em Portugal Continental	48

Figure 42. Consumo de embalagens de insulinas humanas no SNS em Portugal Continental.....49

Figure 43. Consumo de embalagens de insulinas de análogos no SNS em Portugal Continental.....49

Figure 44. Evolução do consumo de antidiabéticos não insulínicos e insulinas no SNS em Portugal Continental | 2010 – 2020.....51

Figure 45. Evolução dos encargos com antidiabéticos não insulínicos e insulinas: valor PVP em Portugal Continental | 2010 – 2020.....51

Figure 46. Evolução dos encargos do SNS e encargos diretos dos utentes com antidiabéticos não insulínicos e insulinas em Portugal Continental | 2010 – 2020.....52

Figure 47. Custos identificados da Diabetes em Portugal Continental (M€).....54

Figure 48. Evolução dos custos identificados da Diabetes em Portugal Continental (M€).....54

Figure 49. Prevalência padronizada de Diabetes (20-79 anos) na Europa, em 202155

Figure 50. Metas de Saúde 2020 (10)57

Figure 51. Número de equipas de Saúde Escolar com pelo menos um elemento com formação sobre Diabetes tipo 1 realizada nos últimos 3 anos e número total de equipas de Saúde Escolar, por ARS, no final de 2021.....63

Abbreviations and Acronyms

ACeS – Agrupamentos de Centros de Saúde
(Healthcare Centre Group)

AMI – Acute Myocardial Infarction

ANAFRE – Associação Nacional de Freguesias
(National Parish Association)

APDP – Associação Protetora dos Diabéticos de Portugal
(Association for the Protection of Portuguese Diabetics)

BDMH – Base de Dados da Morbilidade Hospitalar
(Hospital Morbidity Database)

BMI – Body Mass Index

BP – Blood Pressure

CAHS – Administração Central do Sistema de Saúde
(Central Administration of the Health System)

CCF – Centro de Conferência de Faturas (Invoice Conference Centre)

CKD – Chronic Kidney Disease

CSII – Continuous Subcutaneous Insulin Infusion

CVA – Cerebrovascular Accident

DDD – Defined Daily Dose

DGS/DGH – Direção-Geral da Saúde
(Directorate-General of Health)

DQS – Departamento de Qualidade na Saúde da DGS
(Department of Health Quality at the DGS)

DSIA – Direção de Serviços de Informação e Análise
(Directorate of Information and Analysis Services)

FRAD – Frente Rotária Anti-Diabetes (Rotary Anti-Diabetes)

GD – Gestacional Diabetes

ICD – International Classification of Diabetes

ICPC – International Classification of Primary Care

IDF – International Diabetes Federation

IFG – Impaired Fasting Glucose

IGT – Impaired Glucose Tolerance

INE – Instituto Nacional de Estatística (National Institute of Statistics)

INFARMED – Autoridade Nacional do Medicamento e Produtos de Saúde
(Portuguese National Authority for Medicines and Health Products)

ISBE – Instituto de Saúde Baseada na Evidência
(Institute for Evidence-Based Health)

LVT – Lisboa e Vale do Tejo (Lisbon and Tagus Valley)

M€ – Millions of euros

NA – Not available

NHS – National Health Service

NHS 24 – National Health Service Contact Centre

NPD – Programa Nacional para a Diabetes
(National Program for Diabetes)

OCDE – Organisation for Economic Co-operation

OGTT – Oral Glucose Tolerance Test

OND – Observatório Nacional da Diabetes
(Portuguese National Diabetes Observatory)

PHC – Primary Health Care

RHA – Regional Health Administration

SPMS – Serviços Partilhados do Ministério da Saúde
(Shared Services of the Ministry of Health)

SPN – Sociedade Portuguesa de Nefrologia
(Portuguese Society of Nephrology)

TMRG – Tempos Máximos de Resposta Garantidos
(Guaranteed Maximum Response Times)

T1DM – Type 1 Diabetes

T2DM – Type 2 Diabetes

WHO – World Health Organisation

UCFD – Unidade Coordenadora Funcional da Diabetes
(Functional Coordinating Unit for Diabetes)

TMRG – Tempos Máximos de Resposta Garantidos

Summary in Plain Language

This document presents the panorama of Diabetes Mellitus in Portugal in 2020, with epidemiological and statistical data, a summary of the main activities developed by the National Program for Diabetes in 2021, as well as the action plan for 2022-24.

Situational Assessment

- Portugal maintains a high prevalence of Diabetes;
- There was a reduction in the rate of registration of new cases of diabetes in Primary Health Care (CSP), possibly associated with the context of the COVID-19 pandemic;
- Stabilization of the proportion of users with type 2 diabetes in medical surveillance in the Primary Health Care compared to 2019, however there was a reduction in nursing surveillance;
- Reduction of the screening rate of diabetes complications, namely diabetic retinopathy, diabetic nephropathy and diabetic foot ulcer risk assessment, which are lower than in 2019;
- The consumption and costs of diabetes medication increased in 2020, following the trend of recent years.

Activities | 2021

- Monitoring and dissemination of epidemiological data on Diabetes in Portugal;
- Articulation with the Functional Coordinating Units of Diabetes;

- Promotion of early diagnosis of Diabetes and its complications' screening;
- Management of the Treatment Program with Continuous Subcutaneous Insulin Infusion (PSCI) and articulation with the respective Treatment Centers;
- Interinstitutional collaboration and with civil society;
- Communication and support to civil society.

Objectives | 2022 – 2024

- Reduce the development of diabetes in people identified by the type 2 Diabetes risk assessment calculator;
- Reduce the number of people who are unaware of having the disease and increase the early treatment of the disease;
- Combat the stigma of diabetes;
- Promote access to new technologies in the treatment of all people with type 1 diabetes;
- Promote screening and early treatment of diabetes chronic complications;
- Reduce morbidity and mortality from diabetes.

Introductory Note by the Director-General of Health

Diabetes remains an increasingly high prevalent health issue worldwide, exceeding previous estimates. Portugal continues to have one of the highest prevalence rates in Europe. With more than 830,000 people with Diabetes enrolled in the National Health Service (NHS) in Portugal, this epidemic has major consequences for individuals, their families and society as a whole. Besides the constant daily challenges the disease represents, its complications can lead to loss of sight, kidney function, amputations, heart or brain disease and premature death. The National Programme for Diabetes (NPD) is one of the priority programmes of the Directorate-General of Health, aiming to promote health and prevent the disease, promote the quality of care and prevent or minimise its complications.

This report presents the portrait of the country in 2020, with epidemiological data on Diabetes. It details data on care in Primary Health Care, NHS 24 and NHS Hospital Care where the majority of the population with Diabetes is cared for. It also presents national data on drug consumption and mortality. It is an important management tool, allowing for an analysis of the situation and its evolution, the identification of problems and planning of solutions.

Over the past few years, due to the pandemic context, the evolution of the care provided to people with Diabetes in our country has suffered several constraints due to the various changes to the normal functioning of services imposed by the response to COVID-19. Thus, it is important to understand the true impact on the follow-up of people with Diabetes, in order to plan for the recovery and return to the positive evolution recorded in the years prior to the pandemic due to COVID-19. In this context, the work of the Diabetes Functional Coordinating Units and Health Teams providing care in this area, which maintained their focus on caring for people with Diabetes despite the difficulties, should be highlighted.

The promotion of Diabetes literacy and prevention, the integration of people with Diabetes, namely Children and Youth in schools, the access to screening and insulin pump treatment, are some of the areas in which the NPD has been working.

In the year 2020, the COVID-19 pandemic affected all areas and Diabetes was no exception. It is therefore important to remember that it is very important to strengthen care for chronic diseases in general and Diabetes in particular.

It is time to recover from the pandemic!

November 2021

Graça Freitas, Director-General of Health

1. Epidemiology of Diabetes in 2020

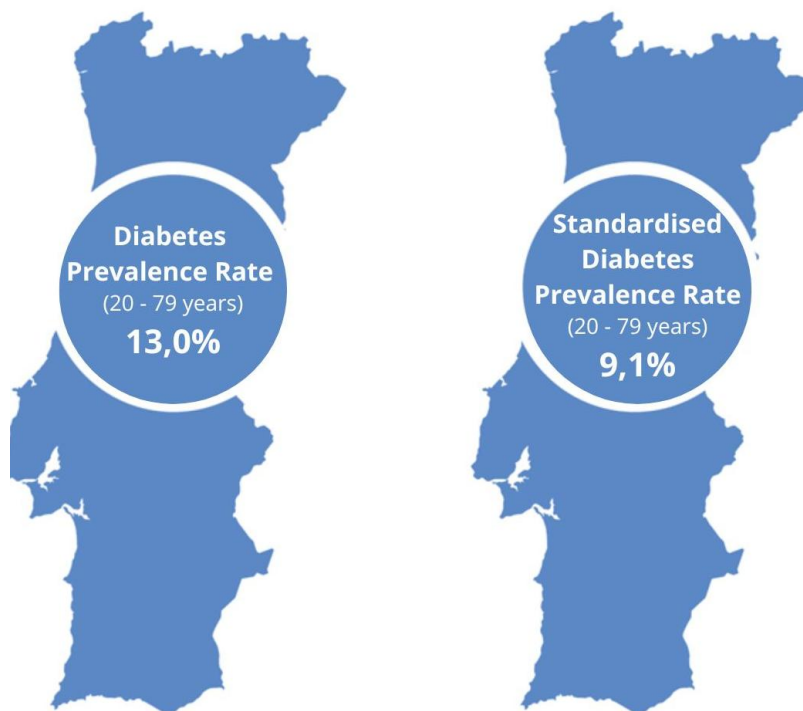
1.1. Diabetes prevalence rate and intermediate hyperglycaemia

1.1.1. Diabetes

According to the National Health Survey with Physical Examination (INSEF 2015) (1), the standardised prevalence rate of Diabetes, in 2015, in the population living in Portugal aged between 25 and 74, was 9.9%, being higher in men, who had a prevalence rate of 12.1%, compared to 7.8% in women. In this study, 12.9% of people with Diabetes were unaware of their diagnosis.

The International Diabetes Federation (IDF), in its 2021 atlas, estimated that the prevalence rate of Diabetes in the Portuguese population aged between 20 and 79 years was 13.0%, corresponding to a standardised prevalence rate of 9.1%, or around 994 thousand people (2).

Figure 1. Diabetes Prevalence Rate in Portugal

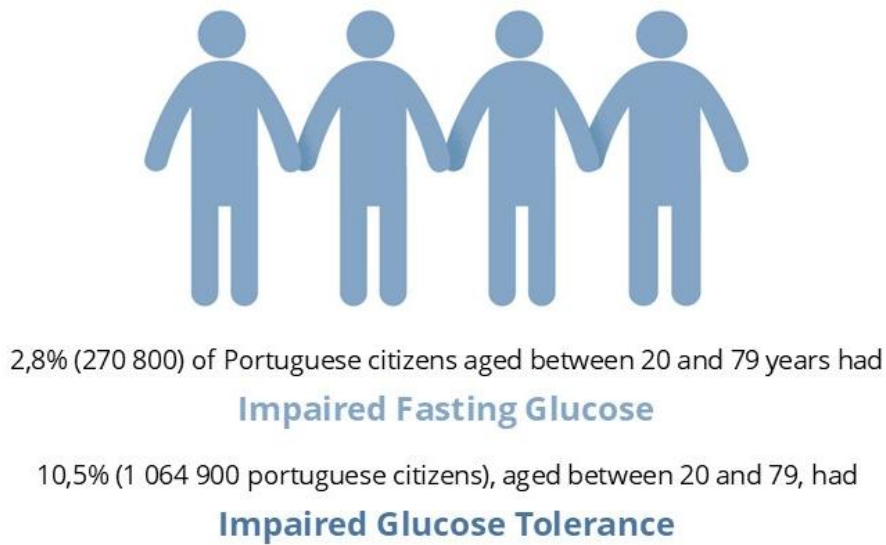


Source: IDF Diabetes Atlas 10th Ed (3)

1.1.2. Intermediate Hyperglycaemia

In 2021, the International Diabetes Federation (IDF) estimated that in the Portuguese population aged between 20 and 79 years, 2.8% (270 800 Portuguese citizens) had Impaired Fasting Glucose (IFG) and 10.5% (1 064 900 Portuguese citizens) had Impaired Glucose Tolerance (IGT) (2).

Figure 2. Estimated prevalence rate of IFG and IGT in Portugal in 2021

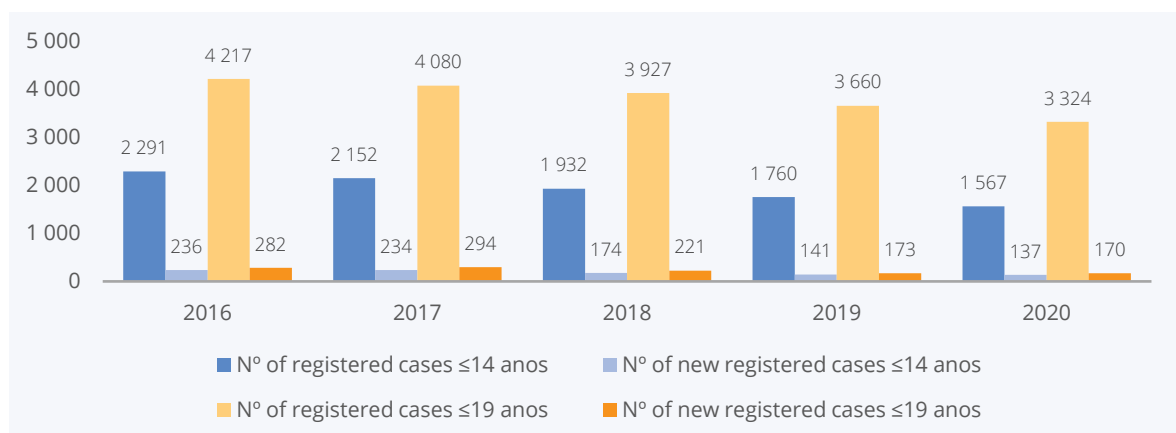


Source: IDF Diabetes Atlas 10th Ed (3)

1.1.3. Type 1 Diabetes

With regard to Type 1 Diabetes, analysis of the DOCE registry (*Diabetes - registO das Crianças e jovEns*; Diabetes - Children and Youth Registry) revealed some limitations (**Table 42**), so the National Programme for Diabetes (PND), alongside with the Directorate of Information and Analysis Services (DSIA) and the Shared Services of the Ministry of Health (SPMS), carried out an analysis of the incidence and prevalence rate of Type 1 Diabetes in the Portuguese population, of all ages, using Primary Health Care (PHC) records (**Table 43**). In 2020, 137 new cases of Type 1 Diabetes were registered in DOCE at the age of 14 or younger and 170 new cases at the age of 19 or younger (**Figure 3**). Decrease of registered and new cases of Type 1 Diabetes in recent years may be related to some lack of registration in the clinical practice support platforms.

Figure 3. Type 1 Diabetes cases registered in Portugal (DOCE)

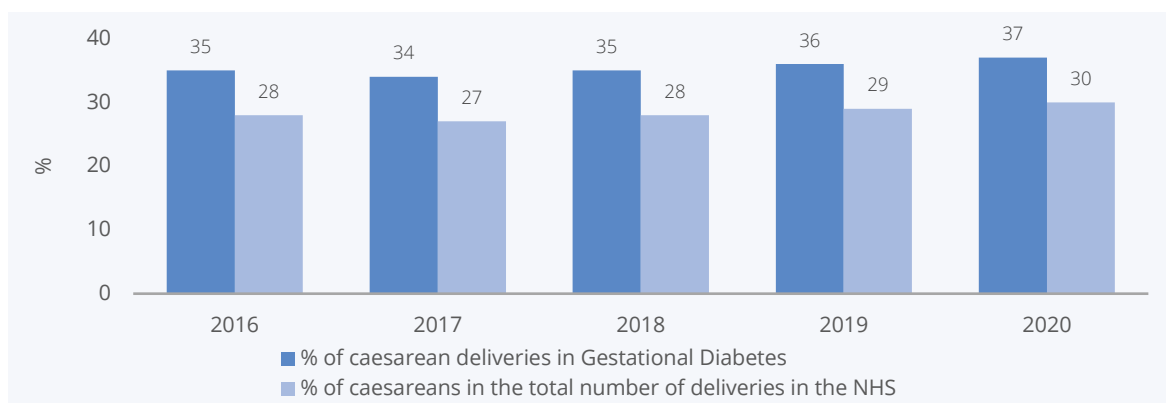


Source: Diabetes Registry – Children and Youth Registry (DOCE), DGS, 2022.

1.1.4. Gestational Diabetes and pre-pregnancy Diabetes

Em 2020, a Diabetes Gestacional esteve presente em 7,2% das gravidezes (In 2020, Gestational Diabetes was present in 7.2% of pregnancies (Table 1), showing a higher prevalence rate in women aged 40 and over (Table 44). The percentage of deliveries by caesarean section, was higher than in women without Gestational Diabetes (37% caesarean sections in women with Gestational Diabetes, 30% in total deliveries in the NHS) (Figure 4). In 2020 there were also 221 deliveries in women with Diabetes prior to pregnancy (Table 2). Most were treated with non-pharmacological therapy (Figure 5).

Figure 4. Proportion of caesarean deliveries in women with Gestational Diabetes in Portugal in the NHS | 2016-2020



Source: HMD/CAHS. Note: Main Diagnosis (MD) and Additional Diagnosis (AD) codes consulted: AD: V27.- (ICD 9 MC) and Z37.0- (ICD 10 MC); PD: 648.- (ICD 9 MC) and O24.42- (ICD 10 MC). Data prepared by DIAS/DGH, 2022

Table 1. Prevalence rate of Gestational Diabetes in Portugal in the NHS | 2016-2020

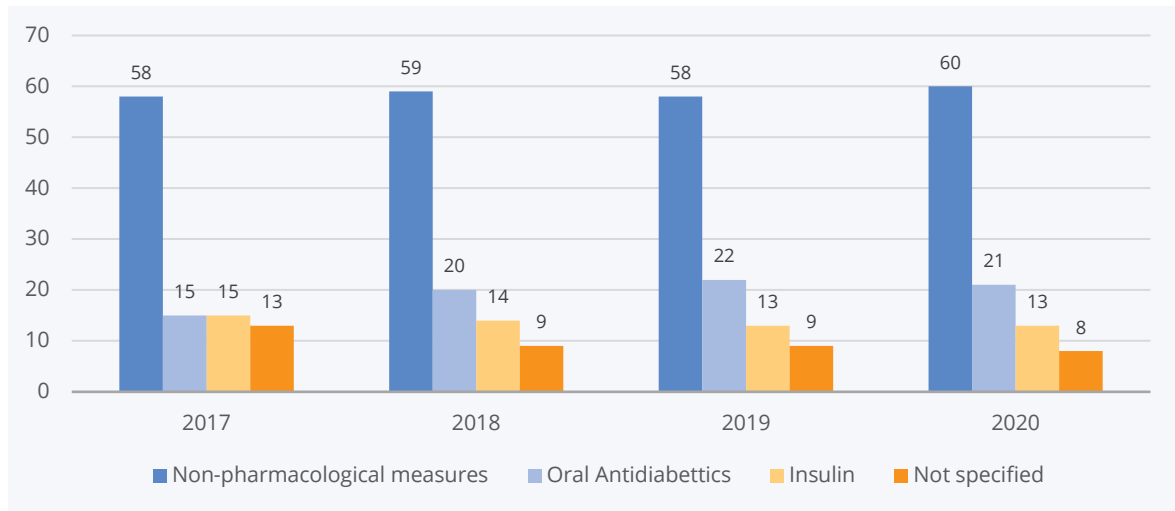
	2016	2017	2018	2019	2020
Prevalence rate of Gestational Diabetes	7,5	5,8	6,1	5,7	7,2

Source: HMD/CAHS. Note: Main Diagnosis (MD) and Additional Diagnosis (AD) codes consulted: AD: V27.- (ICD 9 MC) and Z37.0- (ICD 10 MC); PD: 648.- (ICD 9 MC) and O24.42- (ICD 10 MC). Data prepared by DIAS/DGH, 2022.

Table 2. Prevalence rate of pre-Pregnancy Diabetes in Women Delivering in NHS Hospitals in Portugal.

	2017	2018	2019	2020
Pre-pregnancy cases of T1DM	96	80	107	117
Pre-pregnancy cases of T2DM	61	68	67	92
Other cases of previous Diabetes	24	14	16	12
Total Pre-pregnancy Diabetes Cases	181	162	190	221

T1DM: Type 1 Diabetes; T2DM: Type 2 Diabetes. Source: Business Intelligence for Hospital Morbidity - BIMH, consulted on 24/06/2022. Note: Data are uploaded weekly and all episodes coded by hospitals (in ICD9CM or ICD10CM/PCS, with valid codes) from 1 January 2013 to 15 June 2022 are available on the date of appointment.

Figure 5. Gestational Diabetes Therapy

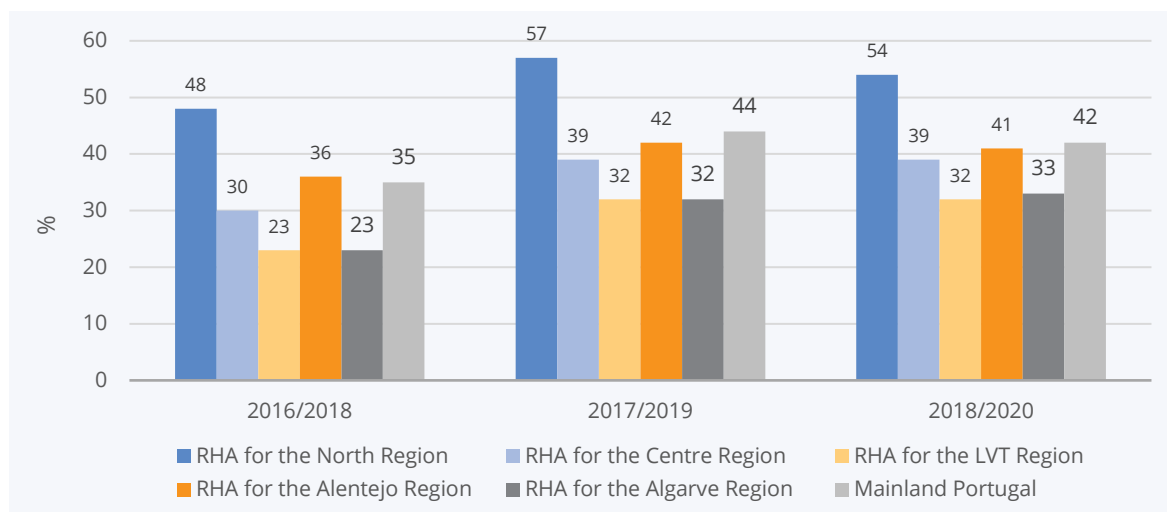
Source: Business Intelligence for Hospital Morbidity - BIMH, consulted on 27/06/2022. Note: Each patient may have more than one therapeutic option.

1.2. Primary Health Care Assistance in Mainland Portugal

Some of the monitoring indicators for Primary Health Care in Mainland Portugal and by Regional Health Administration (RHA) are presented.

1.2.1. Type 2 Diabetes Risk Assessment

Between 2018 and 2020, more than 2.48 million risk calculations for Type 2 Diabetes were registered (Table 45), at Primary Health Care level in Mainland Portugal, corresponding, globally, to 42% of the target population (Figure 6). This calculation is made in the adult population without Diabetes, and should be repeated, at least, every 3 years. Although there are great regional asymmetries, most type 2 Diabetes risk assessments are carried out at Primary Health Care level. The systematic screening of Type 2 Diabetes through this risk calculation allows risk stratification, analytical assessment for early diagnosis of Diabetes and promotion of behavioural measures in the population at risk.

Figure 6. Proportion of patients with type 2 Diabetes risk assessment recorded in Primary Health Care

Source: SSMH - SIM@SNS. Search method: SIARS code 2013.262.01

1.2.2. Diabetes Registration at Primary Health Care Level

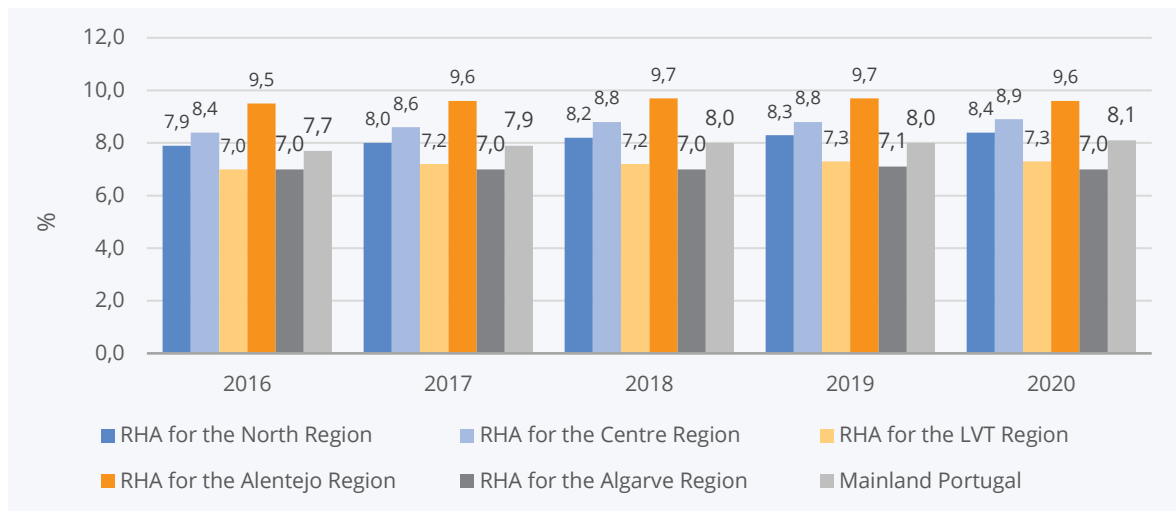
At the Primary Health Care level, 833 315 people with Diabetes were registered in 2020 (Table 3), corresponding to 8.1% of the registered patients (Figure 7). At the regional level, in 2020, the proportion of people with registered Diabetes ranged between 7.0% in the RHA for the Algarve Region and 9.6% in the RHA for the Alentejo Region.

Table 3. Number of patients diagnosed with Diabetes registered in Primary Health Care

	2016	2017	2018	2019	2020
North	290 596	297 435	304 651	311 778	314 845
Centre	146 747	152 371	155 983	157 758	159 585
Lisbon and Tagus Valley	257 973	263 512	269 095	275 116	275 386
Alentejo	46 952	47 936	48 426	48 757	48 612
Algarve	30 751	31 883	33 132	34 571	34 887
Mainland Portugal	773 019	793 137	811 287	827 980	833 315

Source: SSMH - SIM@SNS. Search method: SIARS code MORB.198.01

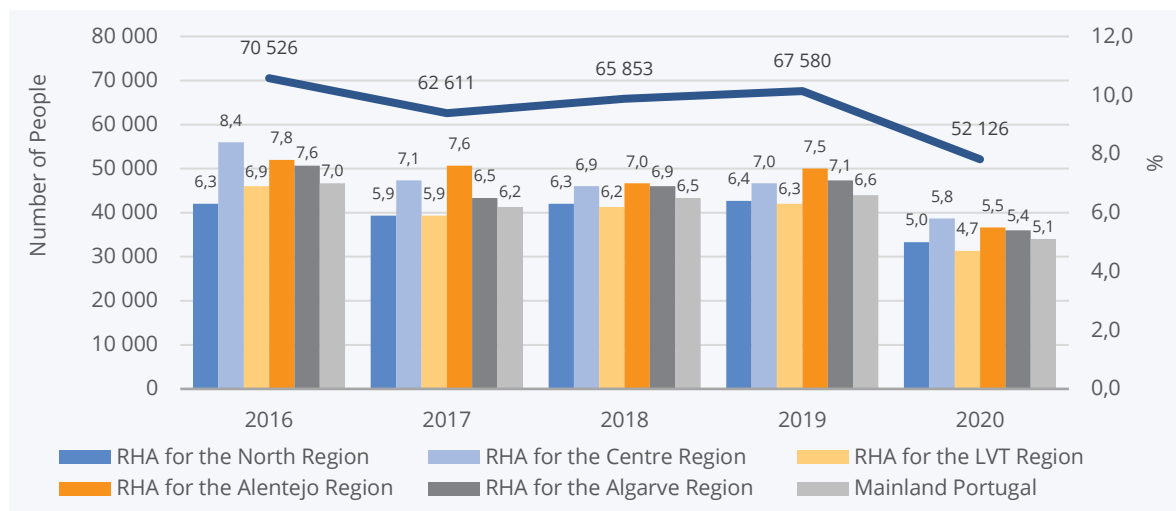
Figure 7. Proportions of patients diagnosed with Diabetes registered in Primary Health Care, by RHA, 2020



Source: SPMS – SIM@SNS

In 2020, 52 126 new cases of Diabetes were registered, with a rate in Mainland Portugal of 5.1 per 1000 enrolled patients. This rate was lower than in the previous four years, possibly associated with the constraints of the pandemic context (Figure 8).

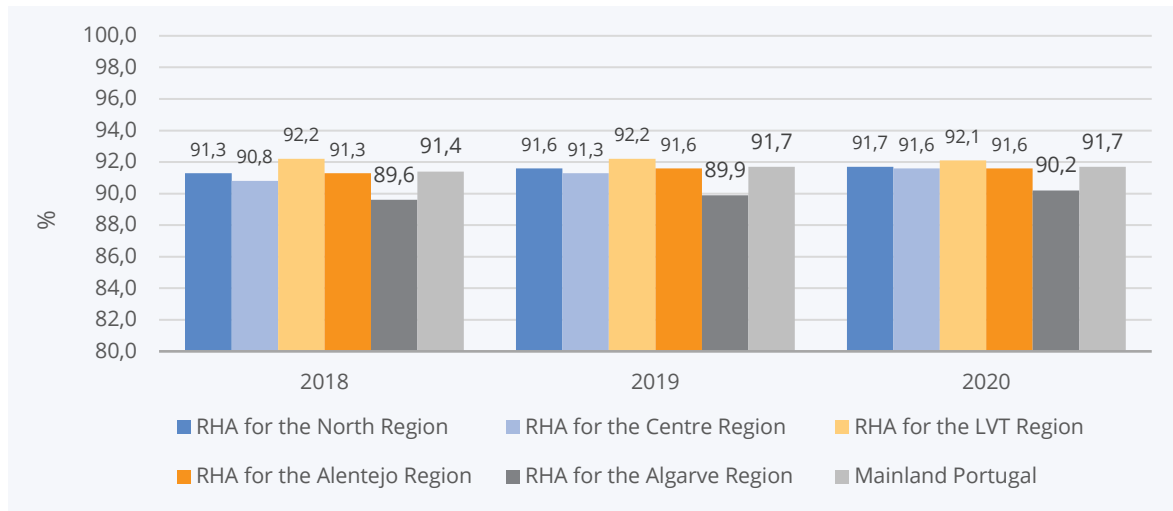
Figure 8. Rate of new cases of Diabetes per 1000 patients and number of new cases, registered at Primary Health Care level in Mainland Portugal



Source: SSMH - SIM@SNS. Search method: SIARS code MORB.236.01

In 2020, 764 556 patients with Type 2 Diabetes were registered, corresponding to approximately 92% of patients with Diabetes at Primary Health Care level (Table 47). The proportion of patients with Type 2 Diabetes was similar (90-92%) across all Regional Health Administrations (Figure 9).

Figure 9. Proportion of patients with Type 2 Diabetes in the universe of people with Primary Health Care records in Mainland Portugal

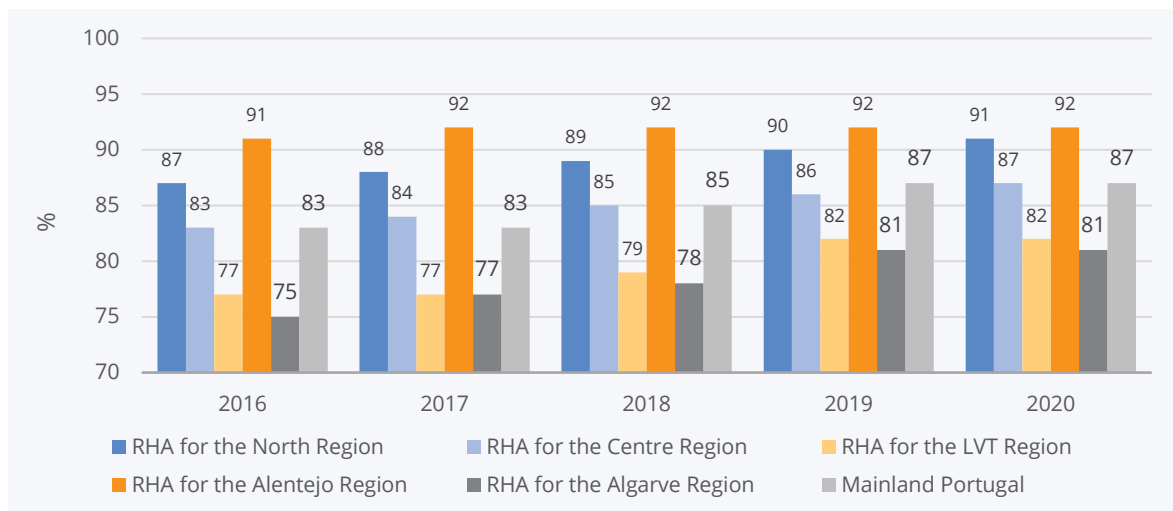


Source: SSMH - SIM@SNS. Search method: SIARS code MORB.2011.011

1.2.3. Medical and Nursing Surveillance

Regarding the surveillance of patients with Type 2 Diabetes in Primary Health Care, there is a stabilisation of the proportion of patients with medical surveillance commitment in the year 2020 compared to 2019 (87%) (Figure 10).

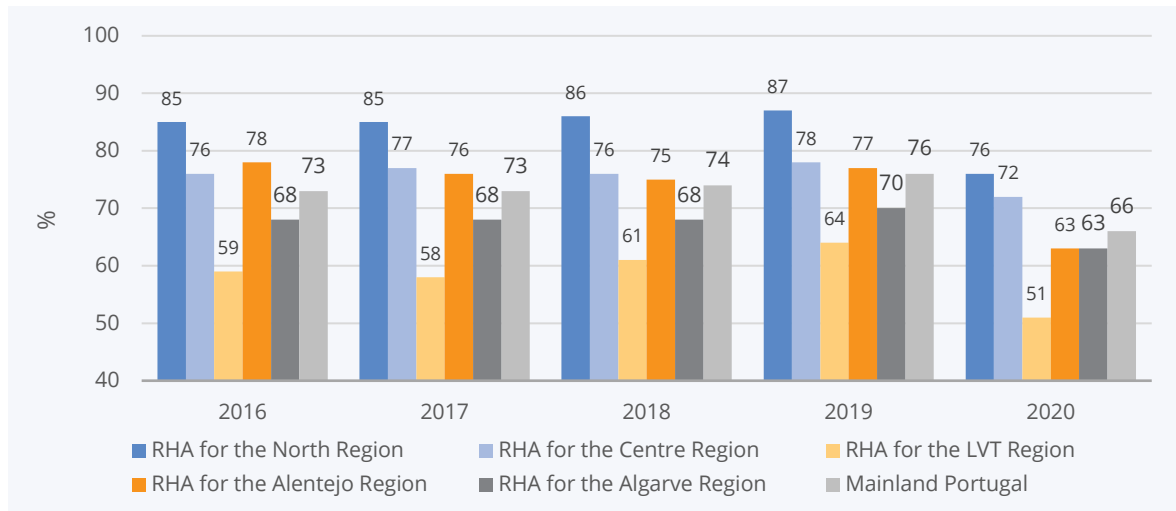
Figure 10. Proportion of patients with Type 2 Diabetes committed to NHS surveillance at Primary Health Care level in Mainland Portugal



Source: SSMH - SIM@SNS. Search method: SIARS code 2013.075.01

The number and proportion of patients with nursing surveillance also underwent a significant reduction in 2020, only 66% of patients with Diabetes followed at NHS Primary Health Care level underwent a nursing surveillance appointment (Figure 11). This situation may be related to the constraints observed due to the COVID-19 pandemic.

Figure 11. Proportion of patients with Diabetes with Surveillance nursing appointments in the NHS at Primary Health Care level in Mainland Portugal

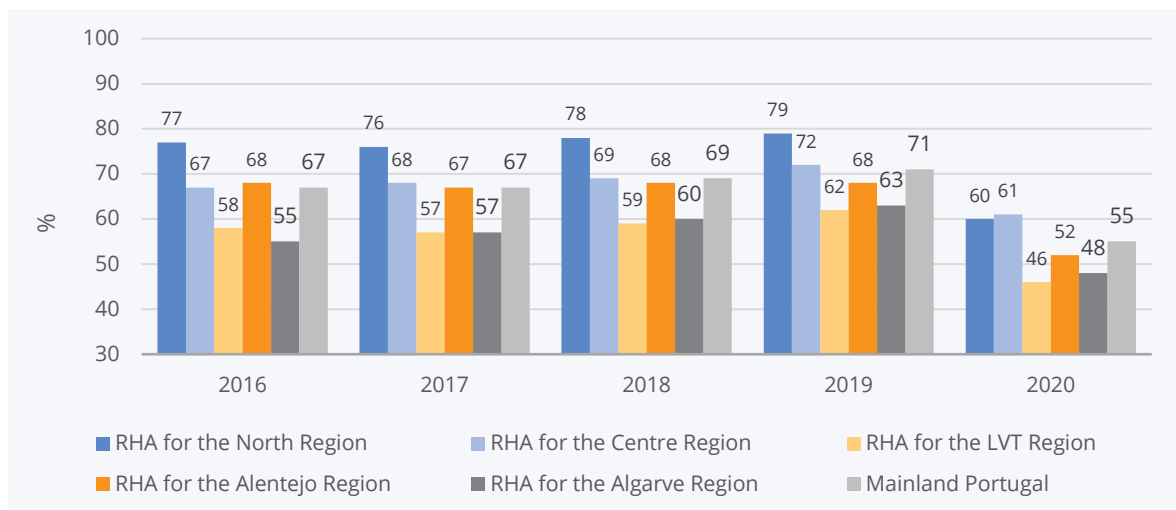


Source: SSMH - SIM@SNS. Search method: SIARS code 2013.037.01

1.2.4. Glycaemic Control and other Cardiovascular Risk Factors

By 2020, 55% of patients with a recorded diagnosis of Diabetes have at least 1 recorded an HbA1c result in the last six months (Figure 12).

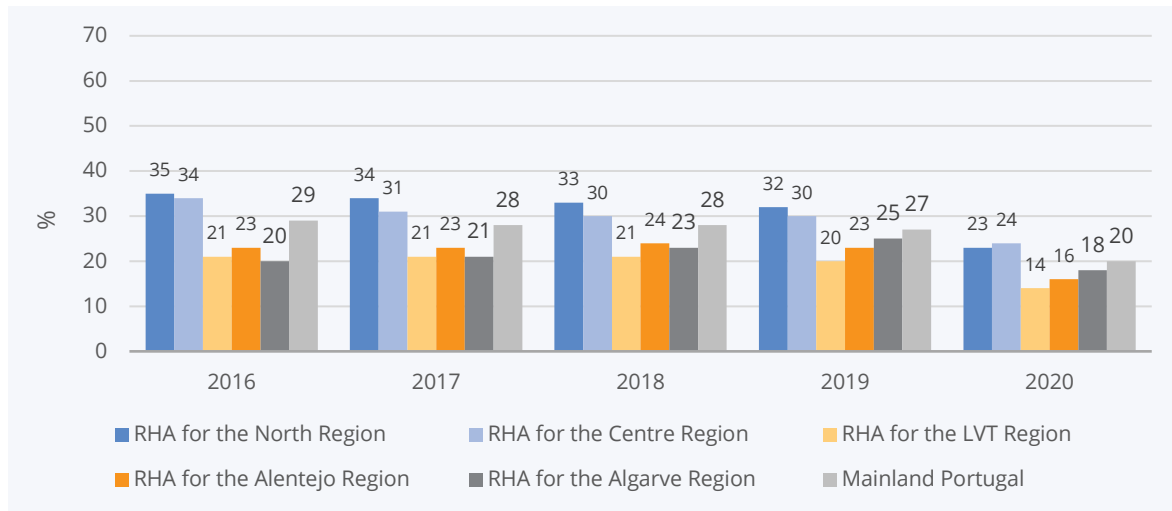
Figure 12. Proportion of patients with Diabetes with an HbA1c result registration in the last 6 months in Primary Health Care per health region



Source: SSMH - SIM@SNS. Search method: SIARS code 2013.088.01

With regard to HbA1c values in patients aged under 65, only 20% showed a result equal to or lower than 6.5%, which does not reveal an improvement in the control of the disease in this age group in relation to previous years (Figure 13).

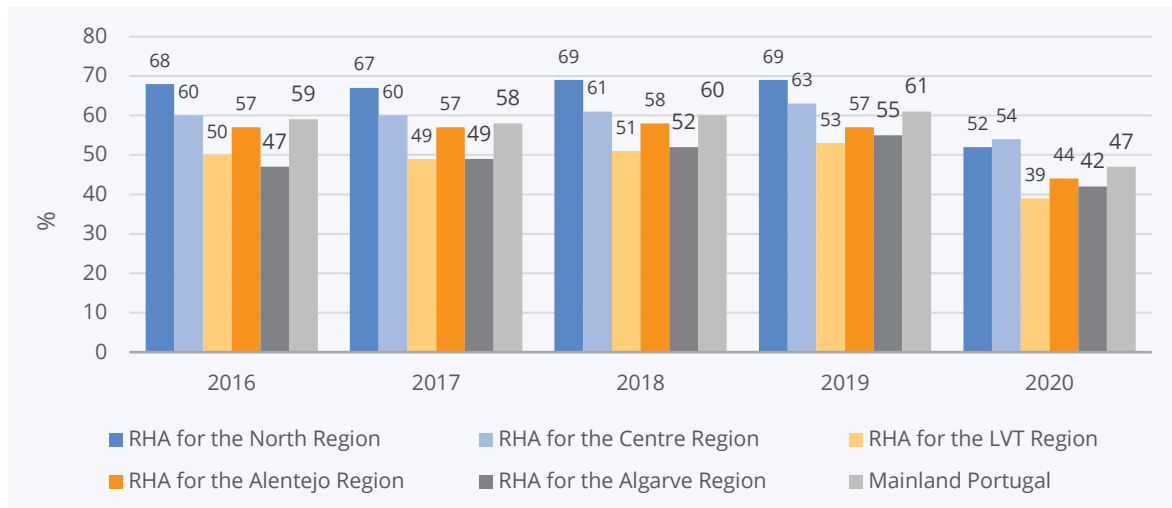
Figure 13. Proportion of patients with Diabetes under the age of 65 years, with the last record of HbA1c \leq 6.5% in Primary Health Care by health region



Source: SIM@SNS. Search method: SIARS code 2013.091.01

There was also a reduction in the proportion of people recording HbA1c \leq 8%: from 61% in 2019 to 47% in 2020, suggesting worse glycaemic control (Figure 14).

Figure 14. Proportion of patients with Diabetes with last recorded HbA1c \leq 8% in Primary Health Care by health region

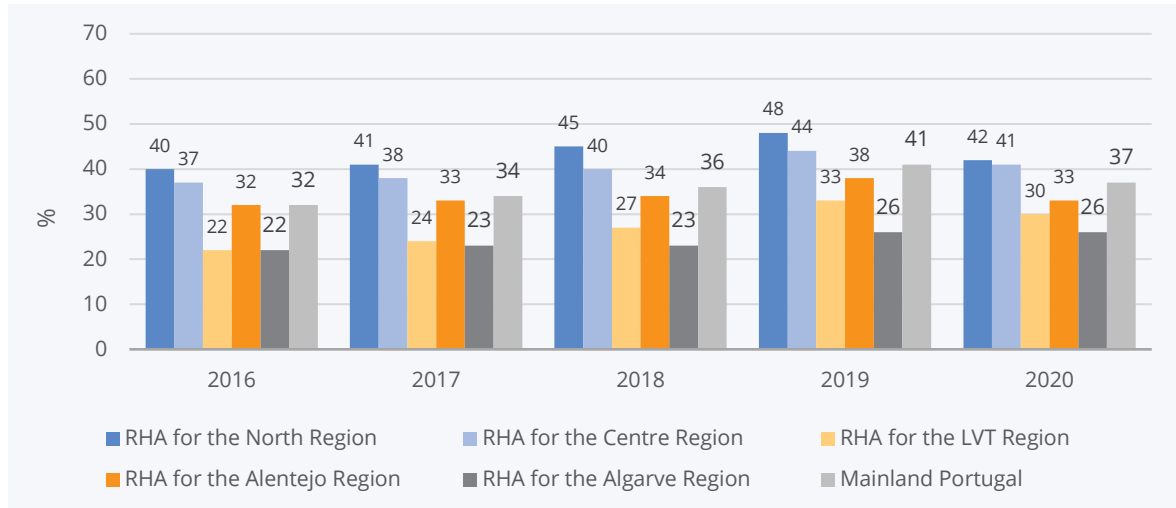


Source: SSMH - SIM@SNS. Search method: SIARS code 2013.039.01

The control of other cardiovascular risk factors is part of the correct management of Diabetes, being fundamental to prevent vascular complications. There was a decrease in the indicator for LDL cholesterol control between 2019 and 2020: only 37% of patients had LDL < 100mg/dL, with a reduction in all regions and maintaining a clear regional asymmetry (Figure 15). It should also be noted that, although the indicator we have is the proportion of patients with LDL < 100mg/dL, the current therapeutic goal for people with Diabetes is generally lower, so the proportion of patients reaching the therapeutic goal will be lower than that expressed by the same. These results reveal

the need to greatly improve the control of this important risk factor in the population with Diabetes.

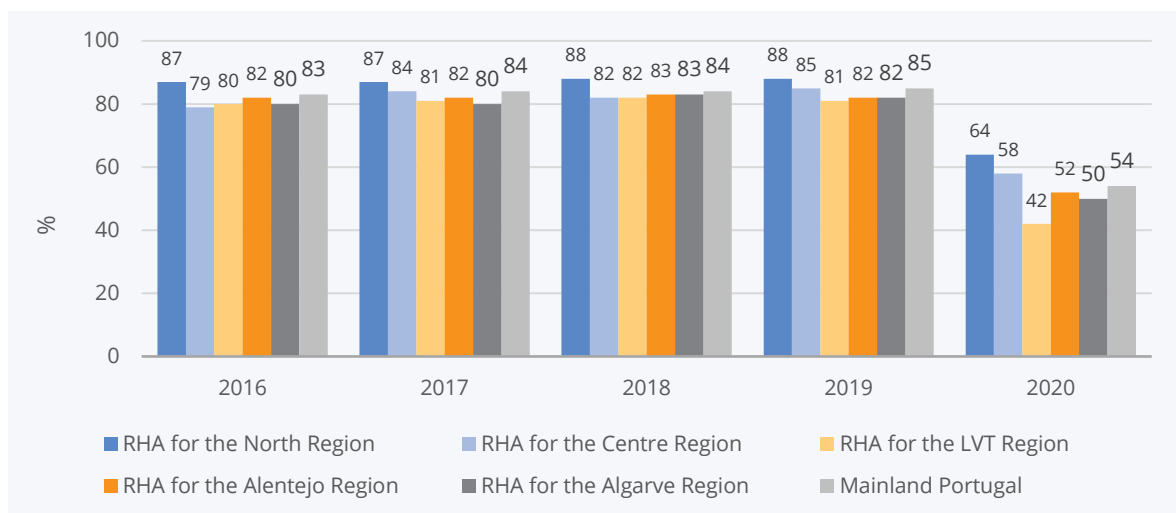
Figure 15. Proportion of patients with Diabetes and last LDL cholesterol result < 100 mg/dl in the last 12 months, in Primary Health Care in Mainland Portugal



Source: SSMH - SIM@SNS. Search method: SIARS code 2015.315.01 FL

Another important cardiovascular risk factor is Arterial Hypertension. By 2020, about half of the patients (54%) had blood pressure registered below 140/90mmHg, translating a significant reduction in the control of this cardiovascular risk factor (Figure 16).

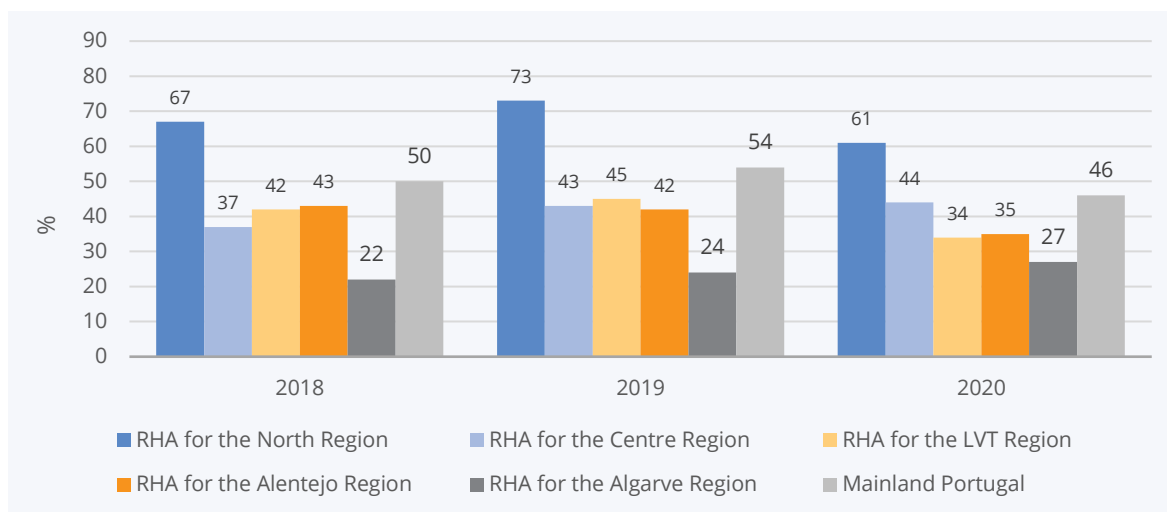
Figure 16. Proportion of patients with Diabetes and last BP < 140/90mmHg recorded in the last 12 months, in Primary Health Care in Mainland Portugal



Source: SSMH - SIM@SNS. Search method: SIARS code 2015.314.02 FL

Diet and physical activity/exercise are also key aspects in the management and control of Diabetes. Only 46% of the people with Diabetes had a record of the therapeutic regimen management in terms of eating habits, physical exercise habits and medication regimen, a value that varied between 27% in the RHA for the Algarve Region and 61% in the RHA for the North Region (Figure 17).

Figure 17. Proportion of patients with Diabetes with record of therapeutic regimen management (diet, physical activity and medication) in the last 12 months, in Primary Health Care in Mainland Portugal



Source: SSMH - SIM@SNS. Search method: SIARS code 2013.036.01

1.2.5. Monitoring the Complications of Diabetes

1.2.5.1. Screening for Diabetic Retinopathy

In the year 2020, out of 734 405 patients registered with Diabetes eligible for diabetic retinopathy screening, 192 362 were invited for screening and 102 487 were screened, corresponding to a population coverage rate of 26% and a population screening rate of 14% (

Figure 18). The test was positive in 5 118 people (Table 4), further screening data can be found in Table 48.

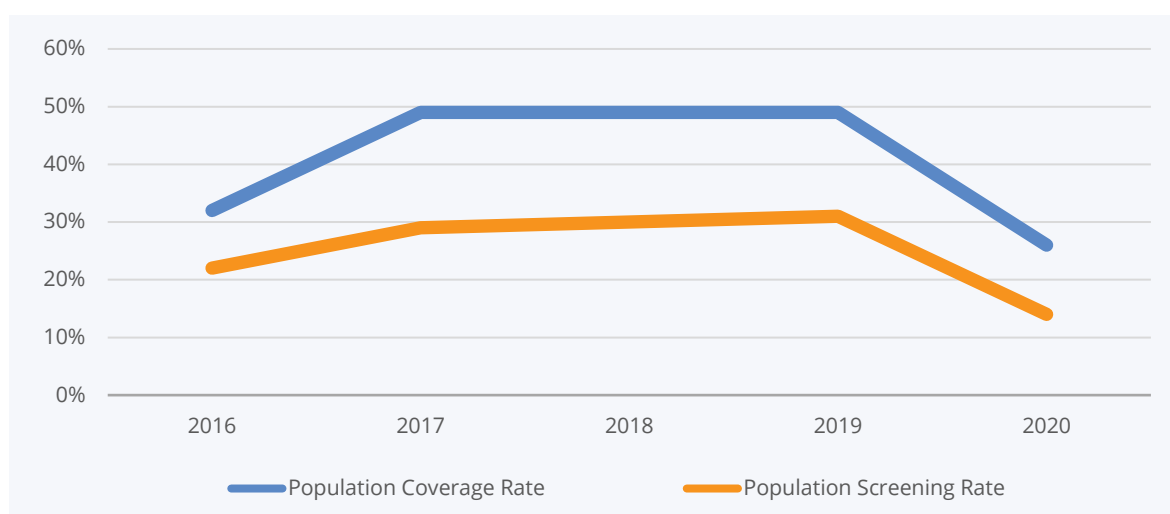
Table 4. Proportion of patients with screening for diabetic retinopathy in mainland Portugal

		2016	2017	2018	2019	2020
North	Eligible Population	262 821	249 908	285 455	312 602	281 875
	Nº of Invited Patients	106 565	175 780	184 730	186 607	106 617
	Nº of Screened Patients	68 309	105 462	121 363	124 231	67 255
	Nº of Positive Cases	2 121	4 370	4 329	6 851	3 449
Centre	Eligible Population	148 133	152 184	129 670	145 380	132 321
	Nº of Invited Patients	20 301	18 029	14 028	19 605	8667
	Nº of Screened Patients	18 845	13 803	9907	14 875	6673
	Nº of Positive Cases	600	361	156	439	841
Lisbon and Tagus Valley	Eligible Population	231 060	238 136	247 249	212 333	239 195
	Nº of Invited Patients	76 056	136 744	144 985	151 255	71 496
	Nº of Screened Patients	47 784	74 744	80 228	81 638	25 670
	Nº of Positive Cases	3 337	3 550	4 519	2 120	722

Alentejo	Eligible Population	46 795	27 649	27 829	48 687	48 669
	Nº of Invited Patients	9360	9999	10 944	7891	5582
	Nº of Screened Patients	7144	6956	6725	4999	2889
	Nº of Positive Cases	321	321	360	217	106
Algarve	Eligible Population	30 964	32 342	33 529	34 571	32 800
	Nº of Invited Patients	24 739	Na	Na	Na	Na
	Nº of Screened Patients	16 444	Na	Na	Na	Na
	Nº of Positive Cases	1 675	Na	Na	Na	Na
Mainland Portugal	Eligible Population	719 773	700 219	723 702	738 858	734 405
	Nº of Invited Patients	237 021	340 582	354 687	365 358	192 362
	Nº of Screened Patients	158 526	200 965	218 223	225 743	102 487
	Nº of Positive Cases	8 054	8 602	9 364	9 627	5 118

Source: RHA - SiIMA Screening, 2021. Note: Eligible Population: Target Population - Excluded Population; Nº of Invited Patients: Nº of patients with an invitation sent for Diabetic Retinopathy Screening; Nº of Screened Patients: Total Nº of eligible patients who underwent retinography under the screening programme in the region.

Figure 18. Coverage rate and screening for diabetic retinopathy in Mainland Portugal



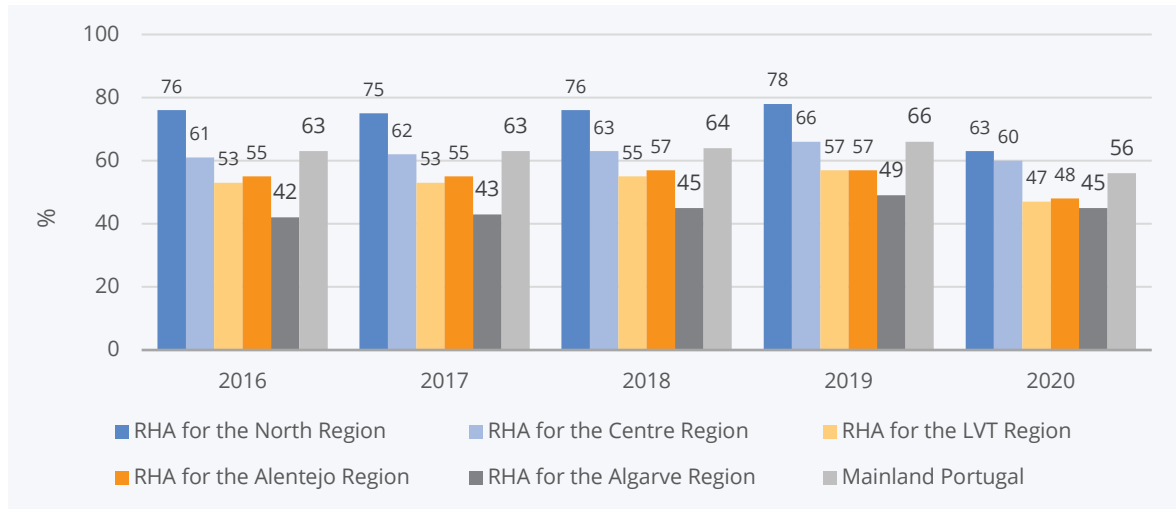
Source: RHA- SiIMA Screening, 2020 and 2021. Note: Population coverage rate: Nº of patients diagnosed with Diabetes invited for screening / Eligible population of the region; Population screening rate: Nº of patients with Diabetes screened in the region / Nº of patients diagnosed with Diabetes eligible for screening in the region.

1.2.5.2. Diabetic Nephropathy

Diabetic nephropathy is a frequent complication of Diabetes and an important cause of renal failure requiring renal replacement therapy (haemodialysis, peritoneal dialysis). Regular screening and early treatment are essential to prevent progression to the more severe forms of diabetic nephropathy. However, in 2020, there was a reduction in the proportion of patients with

microalbuminuria assessment records (56%), suggesting a reduction in the proportion of screened patients (Figure 19).

Figure 19. Proportion of patients with Diabetes with a record of microalbuminuria assessment in Primary Health Care in Mainland Portugal

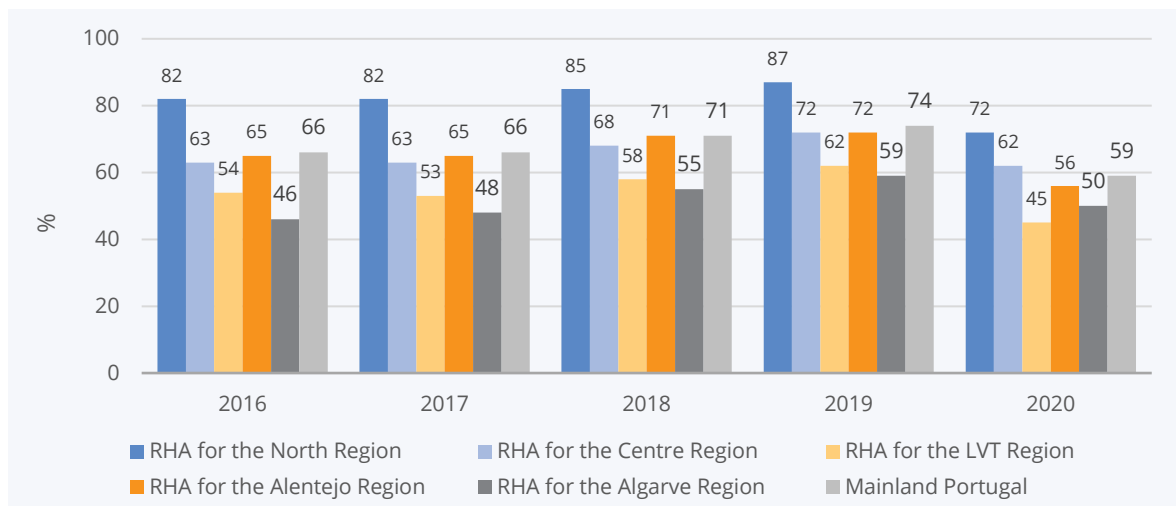


Source: SSMH - SIM@SNS. Search method: SIARS code 2013.097.01

1.2.5.3. Diabetic Foot

In the year 2020, annual foot exams were performed on 59% of patients with Diabetes records in order to assess the degree of risk of diabetic foot ulcer (Figure 20). A reduction is observed in all health regions, relative to 2019. The complete data regarding the diabetic foot ulcer risk assessment can be found in Table 49.

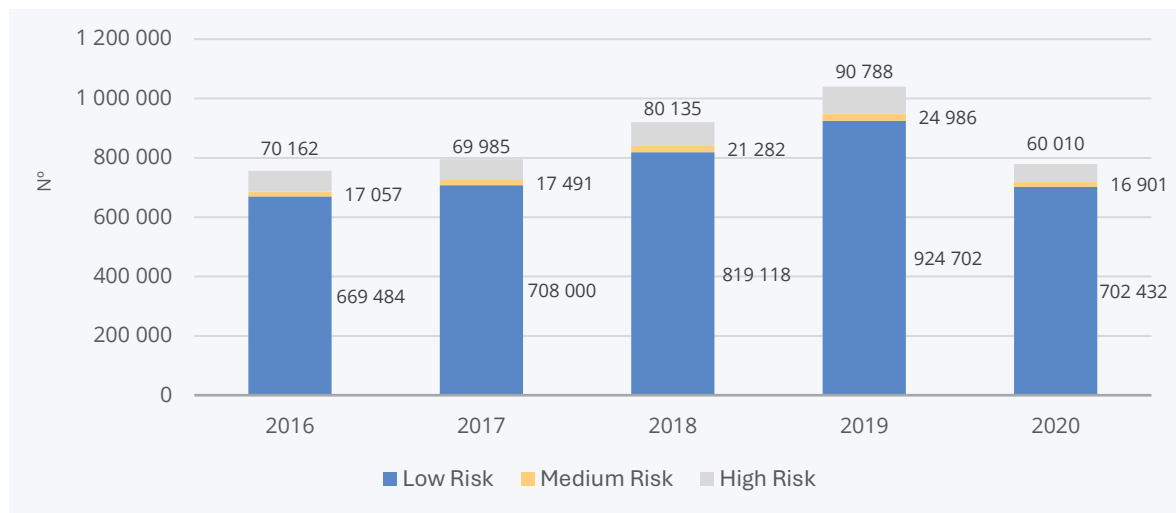
Figure 20. Proportion of patients with Diabetes with foot exams record in Mainland Portugal



Source: SSMH - SIM@SNS. Search method: SIARS code 2013.035.01

Of the total diabetic foot ulcer risk assessments performed, 702 432 (90.1%) were classified as low risk, 16 901 (2.2%) were classified as medium risk and 60 010 (7.7%) were classified as high risk (Figure 21).

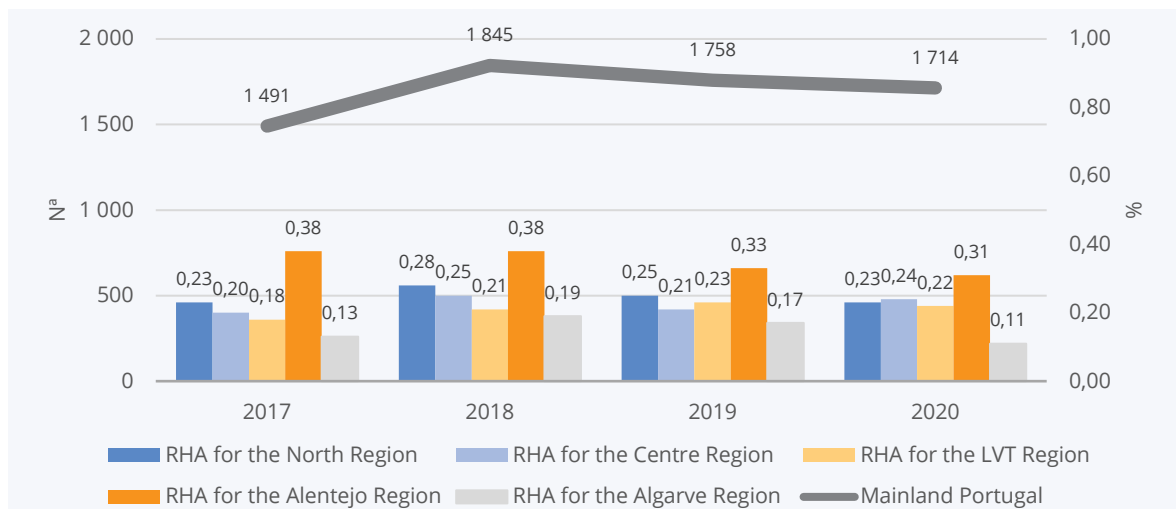
Figure 21. Total diabetic foot risk assessments by level of risk, carried out in Primary Health Care in Mainland Portugal



Source: SSMH - SIM@SNS

Overall, 1,714 (0.23%) of patients with Diabetes monitored in Primary Healthcare of the NHS in Mainland Portugal had active foot ulcers, with a higher than average prevalence rate (0.31%) in the RHA for the Alentejo Region (Figure 22). The complete data regarding patients with active foot ulcer can be found in Table 50.

Figure 22. Proportion of patients with Diabetes with active foot ulcer registered in Primary Health Care in Mainland Portugal

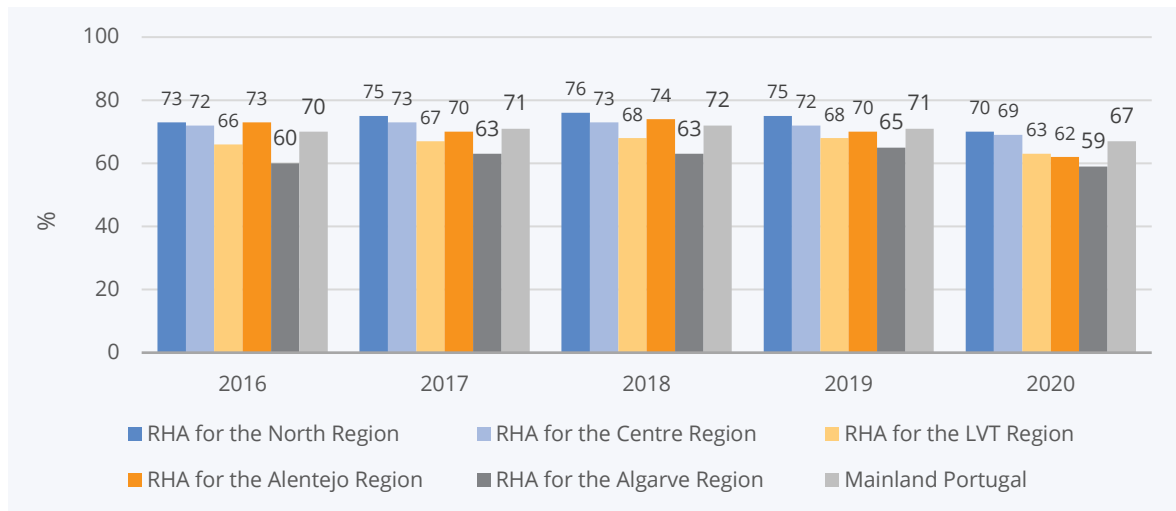


Source: SSMH - SIM@SNS. Search method: SIARS code 2011.005.02

1.2.5.4. Therapeutics

67% of users with type 2 Diabetes registered in 2020 (diagnoses made/registered in 2020), who were prescribed pharmacological therapy, started therapy with metformin in monotherapy (Figure 23).

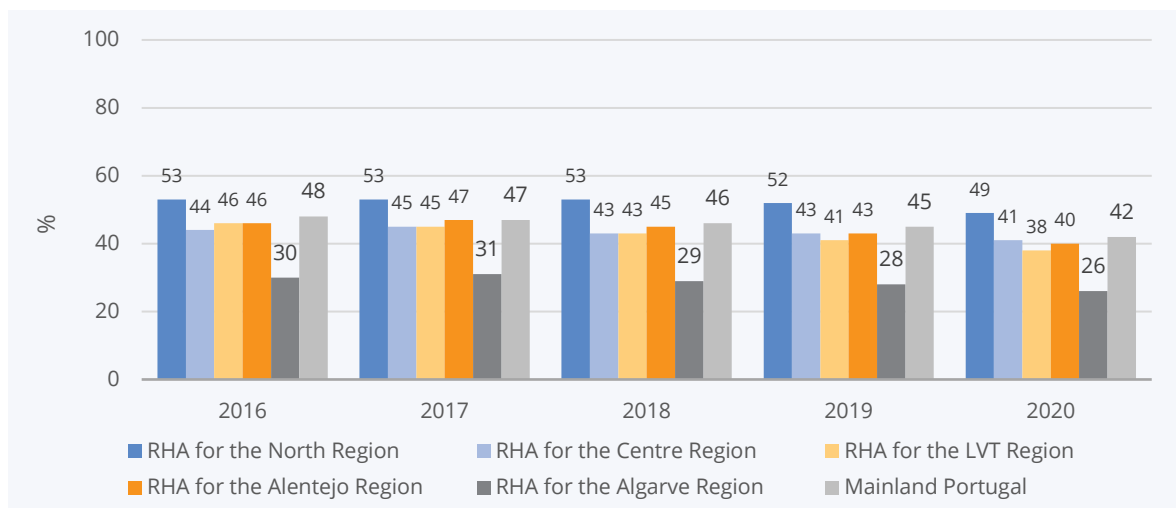
Figure 23. Proportion of newly registered Type 2 Diabetes patients who started monotherapy with metformin in Primary Health Care in Mainland Portugal



Source: SSMH - SIM@SNS. Search method: SIARS code 2013.275.01

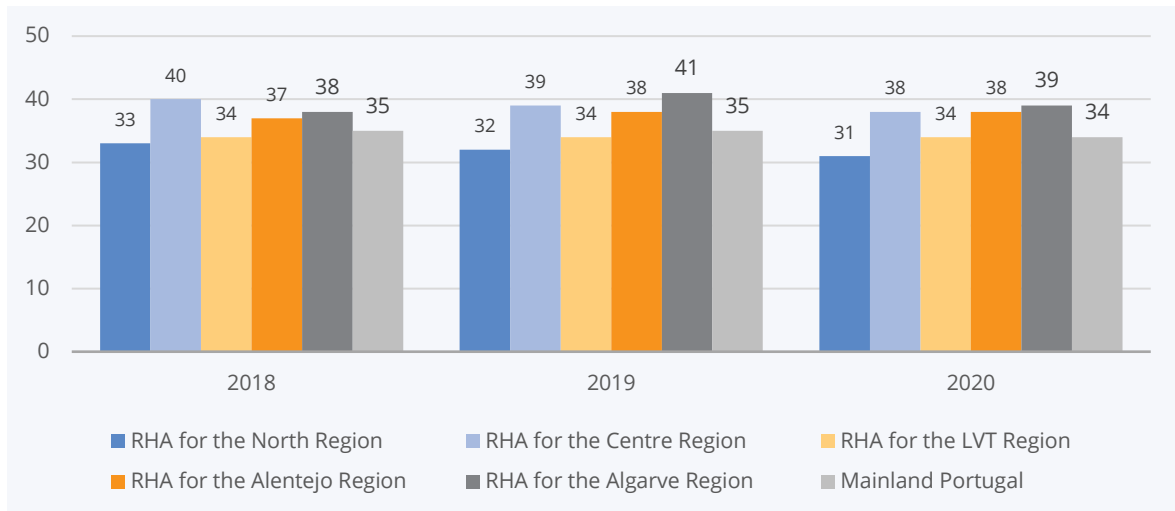
Overall, in 2020, 42% of patients with Type 2 Diabetes were medicated with metformin (Figure 24). In this type of Diabetes, DP4-inhibitors (in monotherapy or in combination) accounted for about 1/3 of the doses of non-insulin antidiabetics prescribed (Figure 25).

Figure 24. Proportion of registered Type 2 Diabetes patients on metformin therapy in Primary Health Care in Mainland Portugal



Source: SSMH - SIM@SNS. Search method: SIARS code 2013.042.01

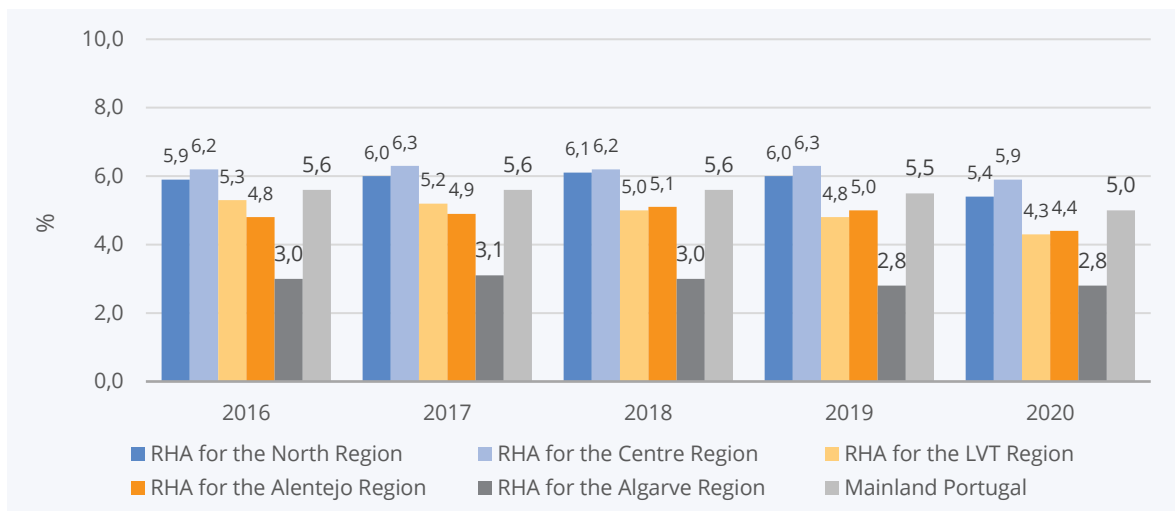
Figure 25. Ratio of the sum of the Daily Defined Doses (DDD) prescribed on DPP4 inhibitors to the sum of the DDD prescribed on non-insulin antidiabetics, in patients with Type 2 Diabetes, Mainland Portugal



Source: SSMH - SIM@SNS. Search method: SIARS code 2013.276.01

Among the patients classified as having Type 2 Diabetes, 5.0% were treated with insulin (Figure 26). However, it is still hypothesised that part of the patients classified as having Type 1 Diabetes actually correspond to patients with Type 2 Diabetes who are insulin-treated but have yet to be reclassified.

Figure 26. Proportion of registered Type 2 Diabetes patients on insulin therapy in Primary Health Care in Mainland Portugal



Source: SSMH - SIM@SNS. Search method: SIARS code 2013.041.01

1.3. Pre-hospital care – NHS24 Network

The National Health Service Contact Centre, NHS 24, is a telephone and digital service offering clinical and administrative services. This is a service that allows the immediate removal of doubts and resolution of some problems for Diabetes patients, also reducing unnecessary visits to health centres and emergency services. Between 2016 and 2020, NHS 24 accounted for about 38,000 calls related to Diabetes. In 2020, the number of calls (8 070) decreased slightly compared to the previous year (Table 5).

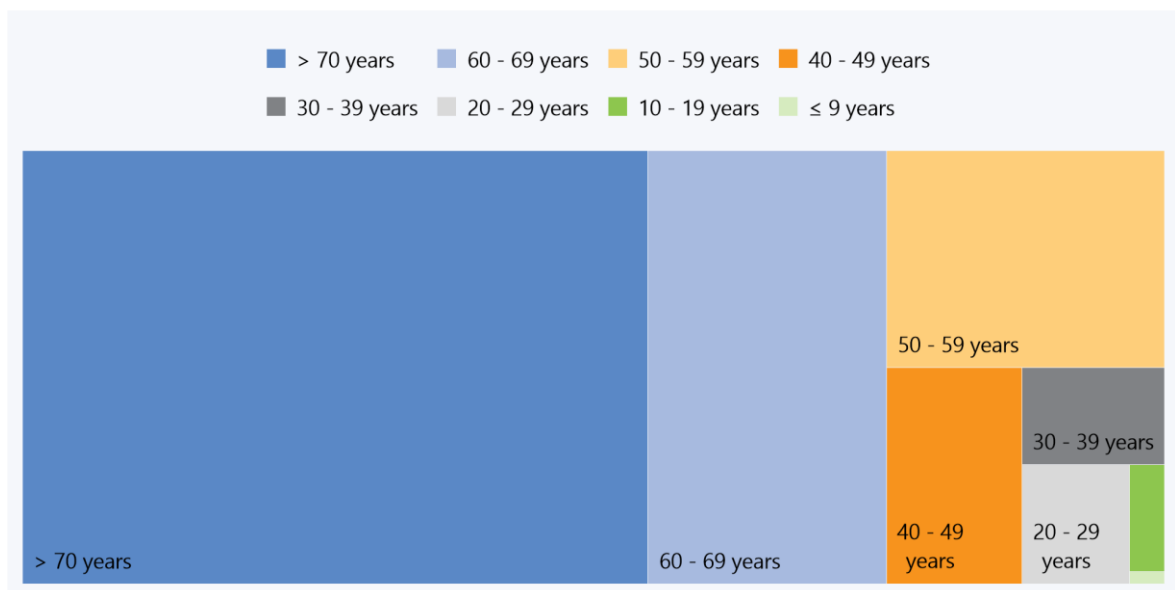
Table 5. Annual number of calls to the NHS 24 hotline for Diabetes related problems in Portugal

	2016	2017	2018	2019	2020
Nº of Calls	6 739	7 245	8 064	8 146	8 070

Source: NHS24

As in previous years, it was mainly women (around 60% of total calls) and people aged 60 or more (around 81% of total calls) (Table 51), who used this helpline the most (Figure 27.).

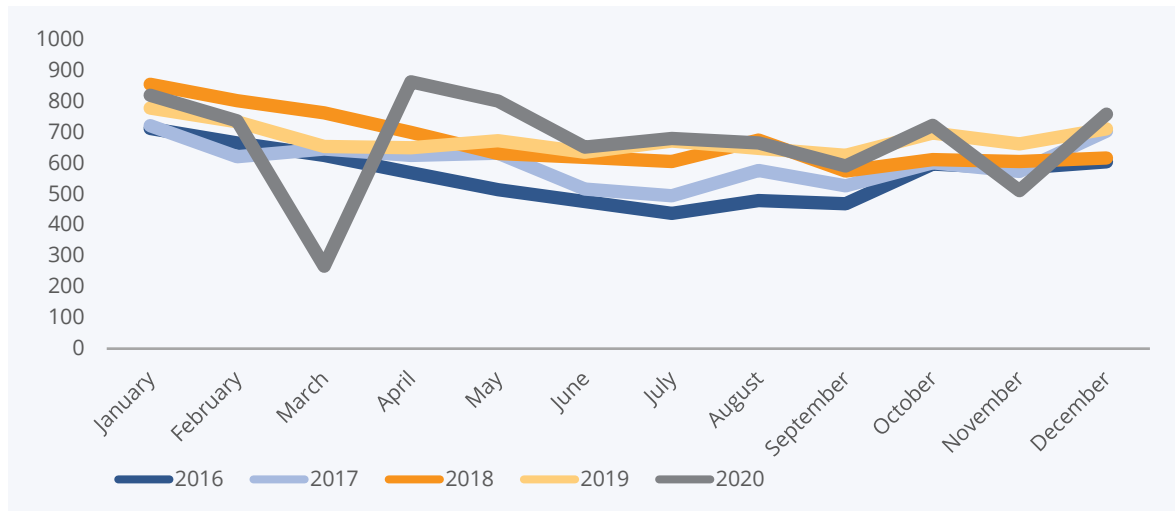
Figure 27. Distribution of calls to the NHS 24 line by age group for group for problems related to Diabetes



Source: NHS4

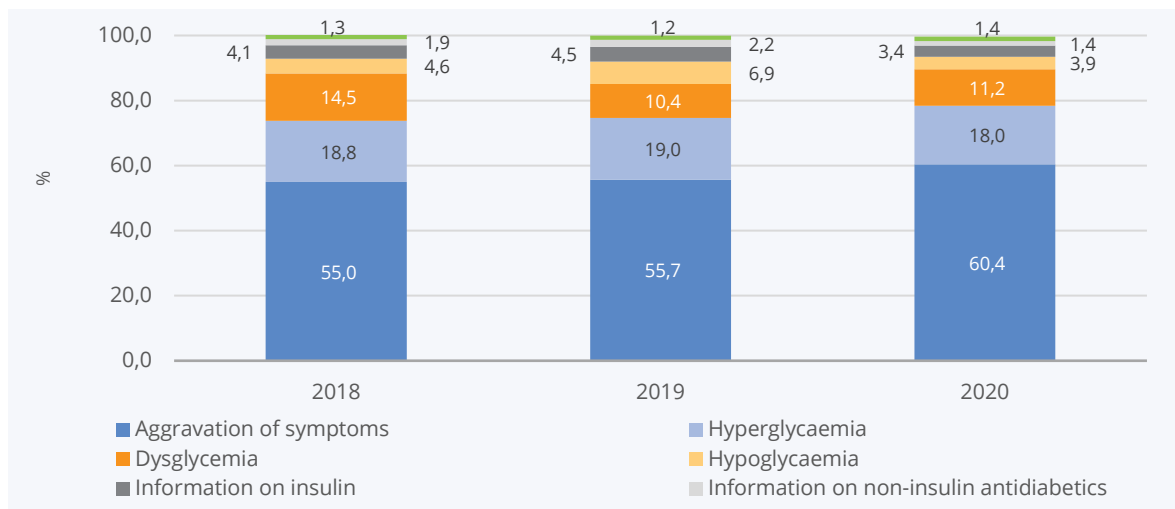
The number of calls was higher in the winter months. In 2020, the main reasons for contact were change/ worsening of symptoms (60.4%), followed by hyperglycaemia (18%). Overall, 51.8% of contacts were followed by referral for urgent medical care, in 27.2% of cases self-care was suggested and 9.9% were referred for non-urgent medical care (Figure 29.). There were some disturbances in the temporal distribution of calls throughout the year, which are related to the dynamics of the pandemic situation (Figure 28).

Figure 28. Monthly distribution of calls to the NHS 24 hotline by Diabetes related problems



Source: NHS24

Figure 29. Reason for contact and destination of calls made to the NHS 24 line for problems related to Diabetes



Source: NHS24

1.4. Diabetes Care at Hospital Level in the National Health Service in Mainland Portugal

The data presented throughout this chapter were extracted from the Hospital Morbidity Databases provided by the Central Administration of the Health System (*Administração Central do Sistema de Saúde - CAHS*). These records depend on the coding of admissions, so the most recent data may be incomplete. Data extraction was performed during the month of December 2021.

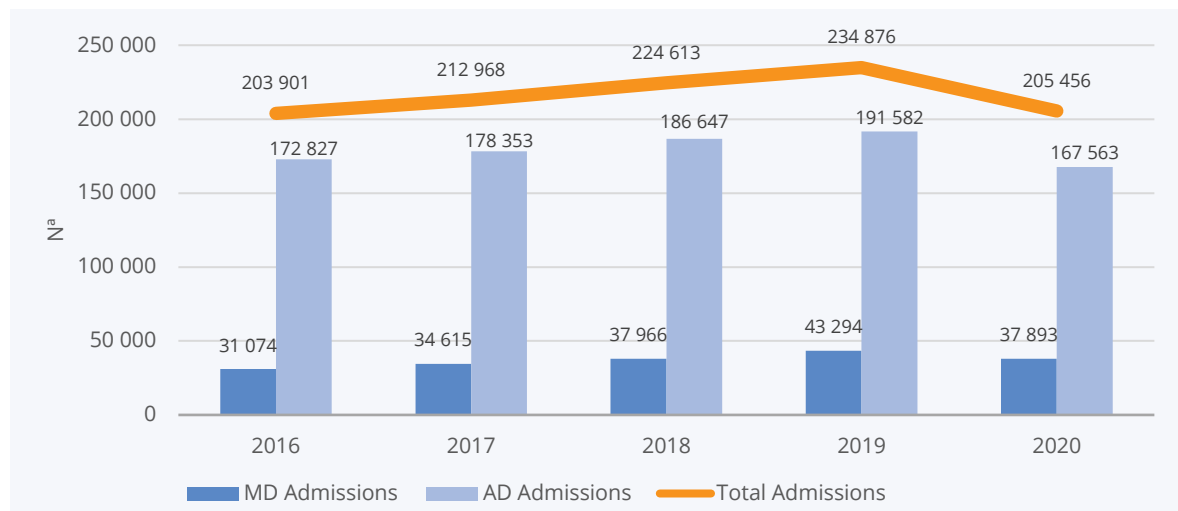
The classification used changed during the period for which data are presented, with some breaks in the series of results: from 2017 the ICD 10 (WHO International Classification of Diseases)

hospital morbidity classification was adopted, with 2016 and 2017 corresponding to transition years in the adoption of the new classification.

1.4.1. Admissions of patients with Diabetes

By 2019, there was an increase in the number of admissions to NHS hospitals with a diagnosis of Diabetes. According to data recorded up to December 2021, in 2020, there were 205,456 admissions of people with a diagnosis of Diabetes (Figure 30), among which Diabetes was the main diagnosis in 18.4%.

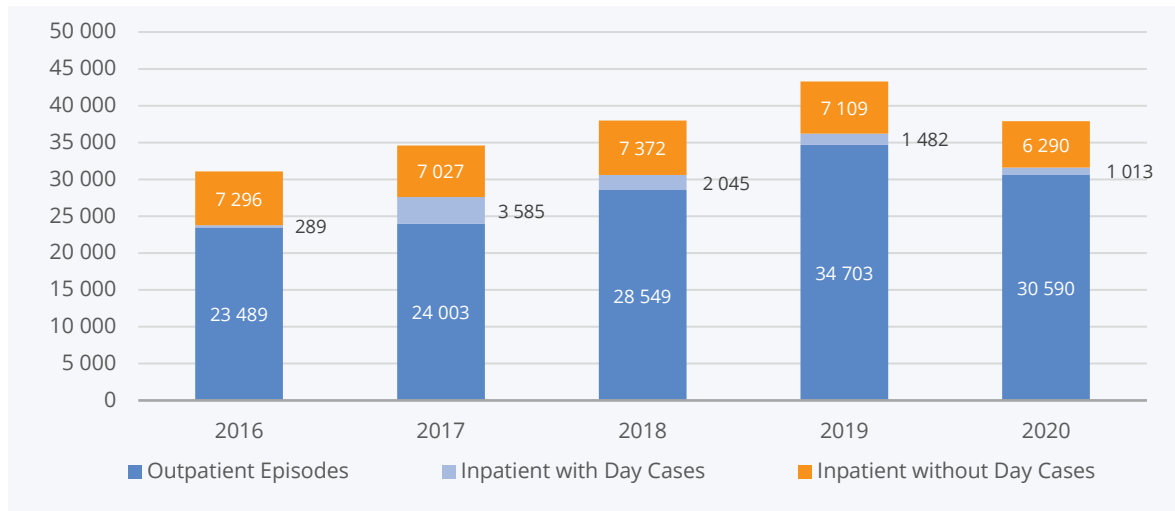
Figure 30. Total admissions in NHS hospitals with diagnosis of Diabetes



Source: HMD/CAHS Note: 2020 data are provisional (available on 03/12/2021). MD: Main Diagnosis; AD: Associated Diagnosis.

With regard to admissions with a main diagnosis of Diabetes, between 2016 and 2020, hospitalisations lasting more than 24 hours decreased and outpatient episodes increased (Figure 31). In 2020 in particular, at the date of analysis, there is a reduction in the number of outpatient episodes and hospitalisations, compared to the previous year (Table 52).

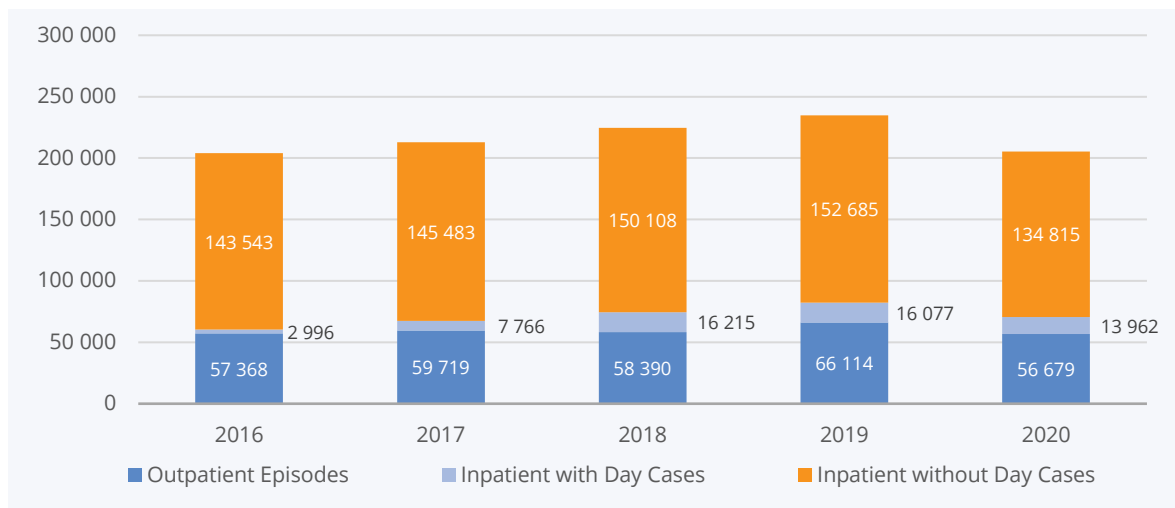
Figure 31. Total admissions in NHS hospitals with a main diagnosis of Diabetes



Source: HMD/CAHS, data available as of 03/12/2021. Note: data for 2020 are provisional. Day cases: number of inpatient episodes for a period of less than one day, excluding those who, having been admitted, died during the first day of hospitalisation.

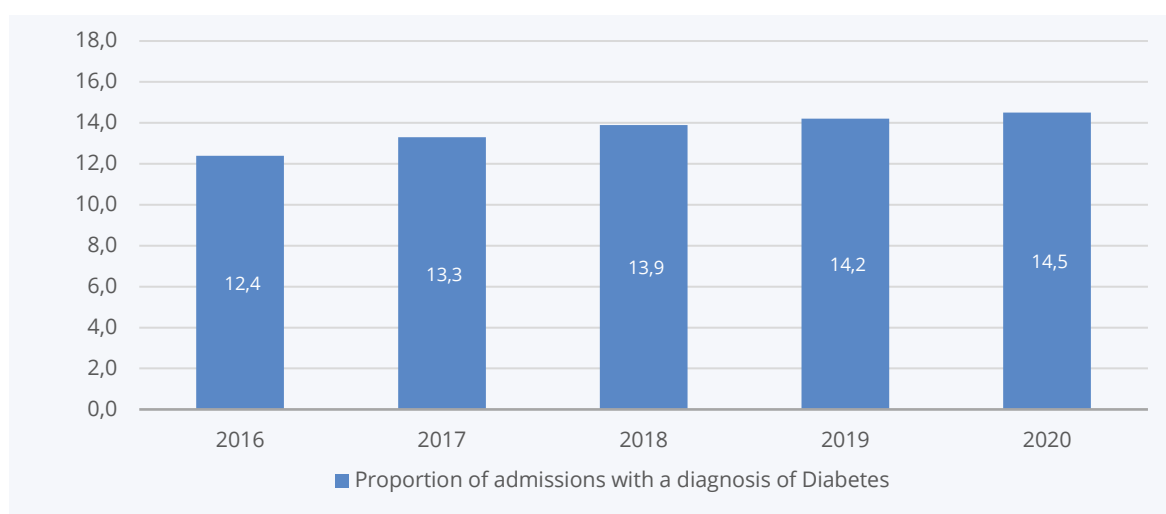
In cases where the hospitalisation is not due to Diabetes, but where Diabetes appears as an associated diagnosis, there was also a rise in the number of hospitalisations lasting more than 24 hours (Figure 32) between 2016 and 2019, and a reduction in 2020 (Table 53).

Figure 32. Total admissions in NHS hospitals with a main diagnosis of Diabetes



Source: HMD/CAHS, data available as of 03/12/2021. Note: data for 2020 are provisional. Day cases: number of inpatient episodes for a period of less than one day, excluding those who, having been admitted, died during the first day of hospitalisation.

In 2020, globally, 14.5% of admissions in NHS hospitals corresponded to patients with Diabetes (in 2016 they corresponded to 12.4% of admissions) (Figure 33). In people admitted to NHS hospitals with Diabetes, the average number of admissions in 2020 was 1.57 (Table 6.).

Figure 33. Proportion of admissions in NHS hospitals with a diagnosis of Diabetes

Source: HMD/CAHS. Note: 2020 data are provisional (available on 03/12/2021).

Table 6. Average number of admissions in people with at least one diagnosis of Diabetes (as main or associated diagnosis)

	2016	2017	2018	2019	2020
Total admissions with Diabetes diagnosis	203 901	212 968	224 613	234 876	205 456
Total patients diagnosed with Diabetes	135 321	134 236	139 496	145 051	131 206
Average number of admissions per patient	1,51	1,59	1,61	1,62	1,57

Source: HMD/CAHS. Note: 2020 data are provisional (available on 03/12/2021).

In terms of admissions for acute complications, ketoacidosis without coma was the main cause for admission, with 2026 cases (Table 7). Ophthalmic manifestations were the main cause for admission of patients with Diabetes, similar to what was previously observed. Most of these Diabetes admissions with ophthalmic manifestations were outpatient episodes (Table 8).

Table 7. Number of admissions for acute complications of Diabetes (patients with primary or associated diagnosis of Diabetes)

	2016	2017	2018	2019	2020
Ketoacidosis without coma	1 904	1 590	1 942	1 926	2 026
Hypoglycaemia without coma	NA	1 571	1 678	1 690	1 664
Hyperosmolar state without coma	NA	1 495	1 638	1 710	1 556
Ketoacidosis with coma	NA	93	103	119	116
Hypoglycaemia with coma	NA	121	126	149	132
Hyperosmolar state with coma	NA	168	160	119	162

Source: HMD/CAHS. Note: data available as of 03/12/2021. Survey method in HMD: DCI9-CM DP: 249.1, 250.1, 249.2, 250.2, 249.3, 250, 249.8, 250.8; DCI 10-CM DP: E08.10, E09.10, E10.10, E11.10, E12.10, E13.10, E08.11, E09.11, E10.11, E11.11, E12.11, E13.11, E08.00, E09.00, E10.00, E11.00, E12.00, E13.00, E08.01, E09.01, E10.01, E11.01, E12.01, E13.01, E08.641, E09.641, E10.641, E11.641, E12.641, E13.641, E08.649, E09.649, E10.649, E11.649, E12.649, E13.649.

Table 8. Number of admissions of patients with Diabetes (as main or associated diagnosis), by ophthalmic, renal, peripheral circulatory, neurological, skin or arthropathy manifestations

	2016	2017	2018	2019	2020
Ophthalmic manifestations	33 191	37 720	41 640	48 424	43 209
Renal manifestations	20 231	23 887	30 349	33 002	32 047
Peripheral circulatory alterations	5 718	4 112	5 065	5 043	5 287
Neurological manifestations	3 522	3 571	4 153	4 508	3 938
Skin complications (dermatitis, ulcer)	NA	1 669	2 133	2 387	2 206
Diabetic arthropathy	NA	145	161	179	170

Source: HMD/CAHS. Note: data available as of 03/12/2021. Survey method in HMD: DCI9-CM DP: 249.4, 250.4, 249.5, 250.5, 249.6, 250.6, 249.7, 250.7; DCI 10-CM DP: E08.2, E09.2, E10.2, E11.2, E12.2, E13.2, E08.3, E09.3, E10.3, E11.3, E12.3, E13.3, E08.4, E09.4, E10.4, E11.4, E12.4, E13.4, E08.51, E08.52, E09.51, E09.52, E10.51, E10.52, E11.51, E11.52, E12.51, E12.52, E13.51, E13.52.

Table 9 and Table 10 details the evolution of hospitalisations, with Diabetes as the main diagnosis, for acute complications of Diabetes and for ophthalmic, renal, peripheral circulatory, neurological, skin or arthropathy manifestations.

Table 9. Causes of admissions (hospitalisations, including day cases and outpatient episodes) for acute complications of Diabetes, in patients with Diabetes as a main diagnosis

	2016	2017	2018	2019	2020
Ketoacidosis without coma	1 380	1 225	1 391	1 403	1 370
Hypoglycaemia without coma	NA	520	504	447	347
Hyperosmolar state without coma	514	498	597	554	595
Ketoacidosis with coma	NA	60	71	80	70
Hypoglycaemia with coma	NA	72	81	78	71
Hyperosmolar state with coma	NA	99	98	65	95

Source: HMD/CAHS. Note: data available as of 03/12/2021. Survey method in HMD: DCI9-CM DP: 249.1, 250.1, 249.2, 250.2, 249.3, 250, 249.8, 250.8; DCI 10-CM DP: E08.10, E09.10, E10.10, E11.10, E12.10, E13.10, E08.11, E09.11, E10.11, E11.11, E12.11, E13.11, E08.00, E09.00, E10.00, E11.00, E12.00, E13.00, E08.01, E09.01, E10.01, E11.01, E12.01, E13.01, E08.641, E09.641, E10.641, E11.641, E12.641, E13.641, E08.649, E09.649, E10.649, E11.649, E12.649, E13.649.

Table 10. Causes of admissions (including day cases and outpatient episodes) for ophthalmic, renal, peripheral circulatory, neurological, skin or arthropathy manifestations in patients with Diabetes as main diagnosis

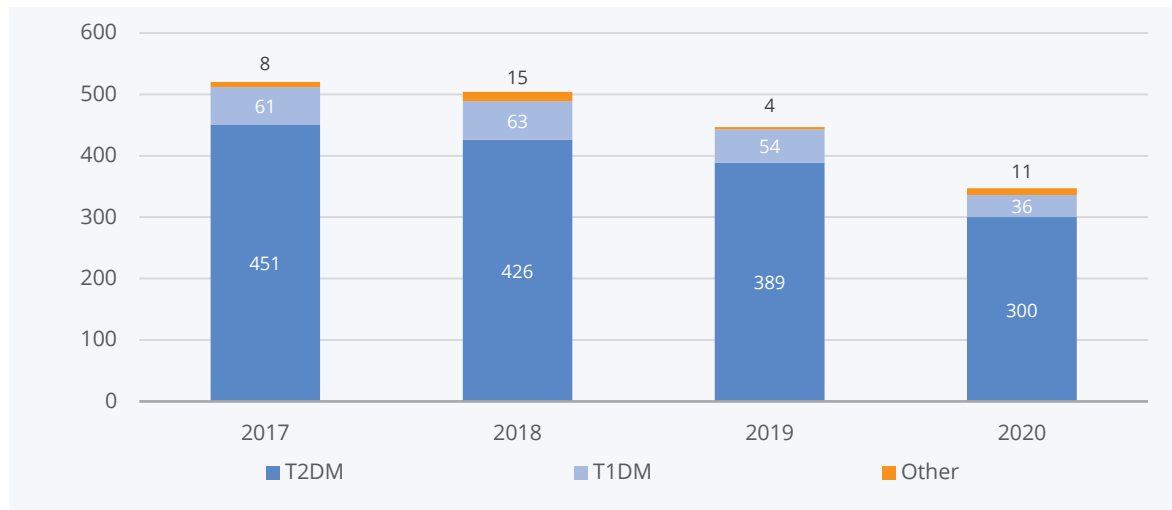
	2016	2017	2018	2019	2020
Ophthalmic manifestations	23 753	27 067	29 882	35 728	31 268
Renal manifestations	1 056	1 275	1 234	947	751
Peripheral circulatory alterations	1 523	1 099	1 250	1 276	1 338
Neurological manifestations	190	111	94	109	68
Skin complications (dermatitis, ulcer)	NA	723	961	849	709

Diabetic arthropathy	NA	27	23	24	23
----------------------	----	----	----	----	----

Source: HMD/CAHS. Note: data available as of 03/12/2021. Survey method in HMD: DCI9-CM DP: 249.4, 250.4, 249.5, 250.5, 249.6, 250.6, 249.7, 250.7; DCI 10-CM DP: E08.2, E09.2, E10.2, E11.2, E12.2, E13.2, E08.3, E09.3, E10.3, E11.3, E12.3, E13.3, E08.4, E09.4, E10.4, E11.4, E12.4, E13.4, E08.51, E08.52, E09.51, E09.52, E10.51, E10.52, E11.51, E11.52, E12.51, E12.52, E13.51, E13.52.

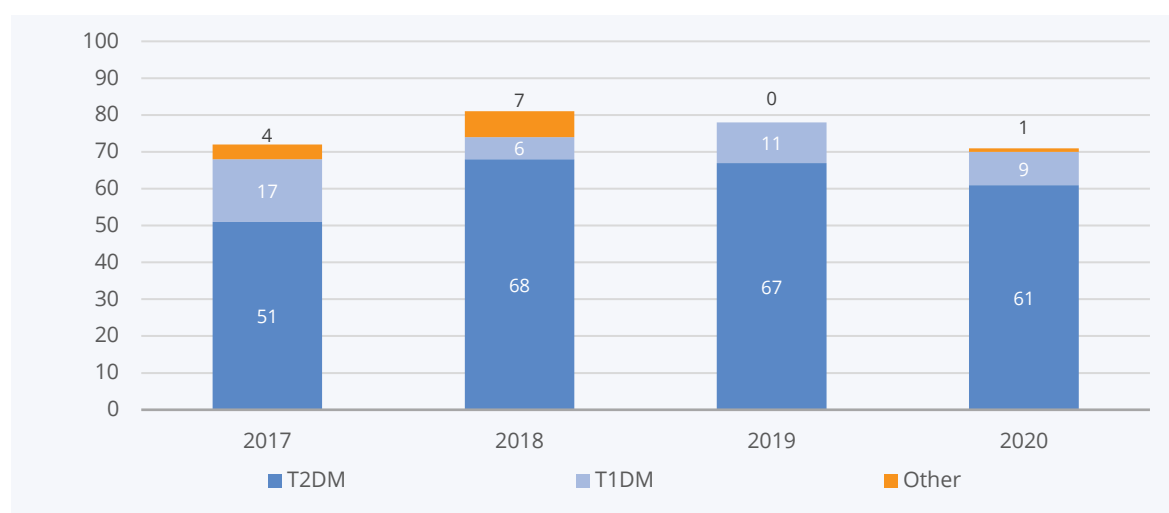
Regarding admissions for hypoglycaemia with and without coma, in absolute numbers, 418 patients were admitted to NHS hospitals with this diagnosis in 2020. There is a decreasing trend in the number of admissions for hypoglycaemia without coma (Figure 34). In line with the higher prevalence rate of Type 2 Diabetes, more patients with Type 2 Diabetes and this complication were admitted than patients with Type 1 Diabetes.

Figure 34. Admissions for Hypoglycaemia without coma in patients with Type 1 Diabetes (T1DM) and Type 2 Diabetes (T2DM) (patients admitted with a primary diagnosis of Diabetes)



Source: HMD/CAHS. Note: 2020 data are provisional (available on 03/12/2021). Survey method in HMD: DCI 10-CM SD: E08.641, E09.641, E10.641, E11.641, E12.641, E13.641, E08.649, E09.649, E10.649, E11.649, E12.649, E13.649

Figure 35. Admissions for hypoglycaemia with coma in patients with Type 1 Diabetes (T1DM) and Type 2 Diabetes (T2DM) (patients admitted with a primary diagnosis of Diabetes)



Source: HMD/CAHS. Note: 2020 data are provisional (available on 03/12/2021). Survey method in HMD: DCI 10-CM SD: E08.641, E09.641, E10.641, E11.641, E12.641, E13.641, E08.649, E09.649, E10.649, E11.649, E12.649, E13.649

1.4.2. Duration of Admissions

The duration of admissions for people with Diabetes in 2020 averaged 10.3 days, a higher figure than the average for admissions to the NHS which was 8.5 days (Table 11).

Table 11. Duration of hospitalisations (with day cases) for Diabetes and total in NHS hospitals

	2016	2017	2018	2019	2020
	Average (median)	Average (median)	Average (median)	Average (median)	Average (median)
Diabetes as a primary diagnosis	11,2 (6,0)	8,1 (3,0)	8,2 (4,0)	10,63 (5,0)	11,44 (6,0)
Diabetes as a secondary diagnosis	10,3 (7,0)	10,4 (7,0)	10,4 (7,0)	9,90 (6,0)	10,28 (6,0)
Diabetes (Primary +Secondary diagnosis)	10,3 (7,0)	10,1 (7,0)	10,2 (6,0)	9,90 (6,0)	10,28 (6,0)
Hospitalisations in the NHS (with and without Diabetes)	6,70	7,10	7,00	8,20	8,54

Source: HMD/CAHS. Note: 2020 data are provisional (available on 03/12/2021). Survey method in HMD: DCI9-CM DP, AD, DP/AD: 249.-, 250.-; DCI 10-CM DP, AD, DP/AD: E08.-, E09.-, E10.-, E11.-, E12.-, E13.

1.4.3. In-hospital Lethality

People with Diabetes have a higher in-hospital lethality rate than the general population. In 2020, the in-hospital lethality rate was 7.5% (Table 12) in people admitted with a primary diagnosis of Diabetes and 10.3% (Table 13) in people with at least one diagnosis of Diabetes (as a primary or secondary diagnosis), values higher than the 6% (Table 14) seen in all patients (with or without Diabetes) admitted to NHS hospitals.

Table 12. In-hospital lethality of inpatients with Diabetes (as primary diagnosis) and total inpatients in NHS Hospitals

	2016	2017	2018	2019	2020
No. of inpatients with Diabetes and in-hospital death	380	368	456	427	466
No. of inpatients with Diabetes	6 641	8 019	7 459	7 189	6 234
In-hospital lethality of inpatients with Diabetes	5,7%	4,6%	6,1%	5,9%	7,5%

Source: HMD/CAHS. Note: Data for 2020 are provisional (available on 03/12/2021). In-hospital lethality: number of deaths/number of patients.

Table 13. In-hospital lethality of inpatients with Diabetes (as main or associated diagnosis) and total inpatients in NHS Hospitals

	2016	2017	2018	2019	2020
No. of inpatients with Diabetes and in-hospital death	13 224	13 569	13 893	14 841	14 930
No. of inpatients with Diabetes	125 315	135 321	134 236	139 496	145 051
In-hospital lethality of inpatients with Diabetes	10,6%	10,0%	10,3%	10,6%	10,3%

Source: HMD/CAHS. Note: data for 2020 are provisional (available on 03/12/2021). In-hospital death: destination after discharge = deceased; In-hospital lethality: number of deaths/number of patients.

Table 14. In-hospital lethality rate of all patients admitted to NHS Hospitals (with any diagnosis)

	2016	2017	2018	2019	2020
No. of inpatients with Diabetes and in-hospital death	52 275	53 451	54 175	53 344	55 759
No. of inpatients	1 060 912	1 049 467	1 044 624	1 061 058	928 511
In-hospital lethality of inpatients with Diabetes	4,9%	5,1%	5,2%	5,0%	6,0%

Source: HMD/CAHS. Note: Data for 2020 are provisional (available on 03/12/2021). In-hospital lethality: number of deaths/number of patients.

1.4.4. Renal complications

In 2020, 28.6% of chronic renal failure patients on renal replacement therapy had Diabetes. Of the patients who started renal replacement therapy, more than 1/3 had Diabetes (Table 15).

Table 15. Characterisation of kidney disease in people with Diabetes and renal replacement therapy

	2016	2017	2018	2019	2020
Prevalence rate of Diabetes in people with CRF - Global (%)	28,5	28	27,8	28	27,7
Prevalence rate of Diabetes in new cases of CRF - Global (%)	31,8	32,2	31,5	33,2	33,1
Prevalence rate of Diabetes in people with CRF on haemodialysis (%)	29,1	28,7	28,1	28,6	28,6

Prevalence rate of Diabetes in new cases of CRF	33	33,4	32,5	34,6	34,6
Prevalence rate of Diabetes in people with CRF on Peritoneal Dialysis (%)	18,1	16,4	15,5	16,9	15,8
Prevalence rate of Diabetes in new cases of CRF on Peritoneal Dialysis (%)	18,9	21,3	19,2	21,8	21,3
Diabetes as an aetiology of CRF in Kidney Transplants (%)	18,9	14,9	17,6	17,0	21,7
Simultaneous kidney and pancreas transplants (n)	24	26	33	22	17
Pancreas after kidney transplants (n)	0	1	2	3	0

Source: Portuguese Society of Nephrology annual reports 2016-2021.

1.4.5. Cardiac and cerebrovascular disease

Macrovascular disease continues to account for high morbidity and mortality in the context of Diabetes. In 2020, Diabetes was present in 29% of people hospitalised for Acute Myocardial Infarction (AMI) and 29% of people hospitalised for Cerebrovascular Accident (CVA). As regards AMI, these patients had a similar in-hospital lethality rate as patients without Diabetes; as regards CVA, there was a slightly higher lethality rate in patients with Diabetes (16.4% vs. 15.9%) (Table 16 and Table 17).

Table 16. Number of inpatients and lethality due to acute myocardial infarction (AMI) in NHS hospitals

		2016	2017	2018	2019	2020
Patients admitted with AMI (main diagnosis)	With DM as an associated diagnosis	n 3 582	3 768	3 677	3 766	3 067
	With any associated diagnosis	n 11 112	12 233	12 376	12 495	10 490
	Proportion of DM in people with AMI	% 32,2%	30,8%	29,7%	30,1%	29,2%
In-hospital lethality in patients hospitalised with AMI (main diagnosis)	With DM as an associated diagnosis	n 333	318	266	267	238
		% 9,3%	8,4%	7,2%	7,1%	7,8%
	With any associated diagnosis	n 920	985	974	891	814
		% 8,3%	8,1%	7,9%	7,1%	7,8%

Source: HMD/CAHS. Note: 2020 data are provisional (available on 03/12/2021). In-hospital lethality: number of deaths/number of patients. Search method in HMD: ICD9-CM DP: 410.01, 410.11, 410.21, 410.31, 410.41, 410.51, 410.61, 410.81, 410.91, 410.71; ICD9-CM AD: 249.-, 250.-; ICD 10-CM DP: I21.01, I21.02, I21.09, I21.11, I21.19, I21.21, I21.29, I21.4; ICD10-CM AD: E08.-, E09.-, E10.-, E11.-, E12.-, E13.-.

Table 17. Number of inpatients and lethality due to CVA in NHS hospitals

		2016	2017	2018	2019	2020
CVA inpatients (main diagnosis)	With DM as an associated diagnosis	n 7 314	6 820	7 067	7 150	6 602
	With any associated diagnosis	n 24 614	24 860	24 835	24 602	22 500
	Proportion of DM in people with CVA	% 29,7%	27,4%	28,5%	29,1%	29,3%

In-hospital lethality in CVA patients (main diagnosis)	With DM as an associated diagnosis	N	1 051	1 015	1 007	1 002	1 086
		%	14,4%	14,9%	14,2%	14,0%	16,4%
	With any associated diagnosis	n	3 664	3 678	3 659	3 555	3 572
		%	14,9%	14,8%	14,7%	14,5%	15,9%

Source: HMD/CAHS. Note: 2020 data are provisional (available on 03/12/2021). In-hospital lethality: number of deaths/number of patients. HMD search method: ICD9-CM DP: 430, 431, 432, 433, 434; ICD9-CM AD: 249.-, 250.-; ICD 10CM DP: I60.-, I61.-, I62.-, I63.-; ICD10-CM AD: E08.-, E09.-, E10.-, E11.-, E12.-, E13.

1.4.6. Diabetic Foot

Diabetic foot complications, if not prevented and/or treated in a timely manner, may evolve to amputations designated as minor (part of the foot) or major (ankle, leg or thigh). In 2020 there were 2758 admissions for diabetic foot, with an in-hospital lethality of 6.9%. These are generally prolonged admissions, with an average length of stay of 17.02 days, which is longer than the average length of stay for people with Diabetes (Table 18).

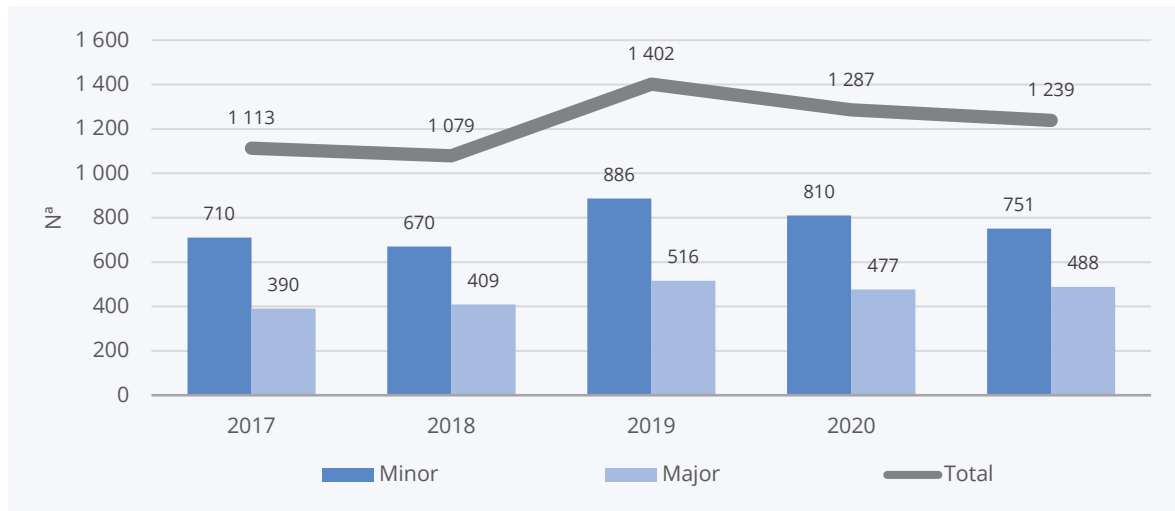
Table 18. Admissions to NHS hospitals for “Diabetic Foot”

	2016	2017	2018	2019	2020
No. of admissions	3 383	2 385	2 654	2 807	2 758
Lethality	6,4%	6,4%	7,1%	6,6%	6,9%
Average time (days)	18,59	18,62	17,99	17,78	17,02

Source: HMD/CAHS. Note: 2020 data are provisional (available 03/12/2021). Survey method in HMD: ICD9-CM DP: 440.23, 440.24, 785.4, 707.1-; ICD9-CM AD: 249.-, 250.-; ICD 10-CM DP: E08.52, E09.52, E10.52, E11.52, E12.52, E13.52, I70.233, I70.234, I70.235, I70.243, I70.244, I70.245; ICD10-AD: E08.-, E09.-, E10.-, E11.-, E12.-, E13.-

The number of lower limb amputations has remained similar in people admitted for Diabetes as a main diagnosis, despite a reduction between 2018 and 2020. In 2016-17 there was a lower number of amputations, however, these correspond to transition years in coding, so there may be a break in the series due to changes in coding parameters.

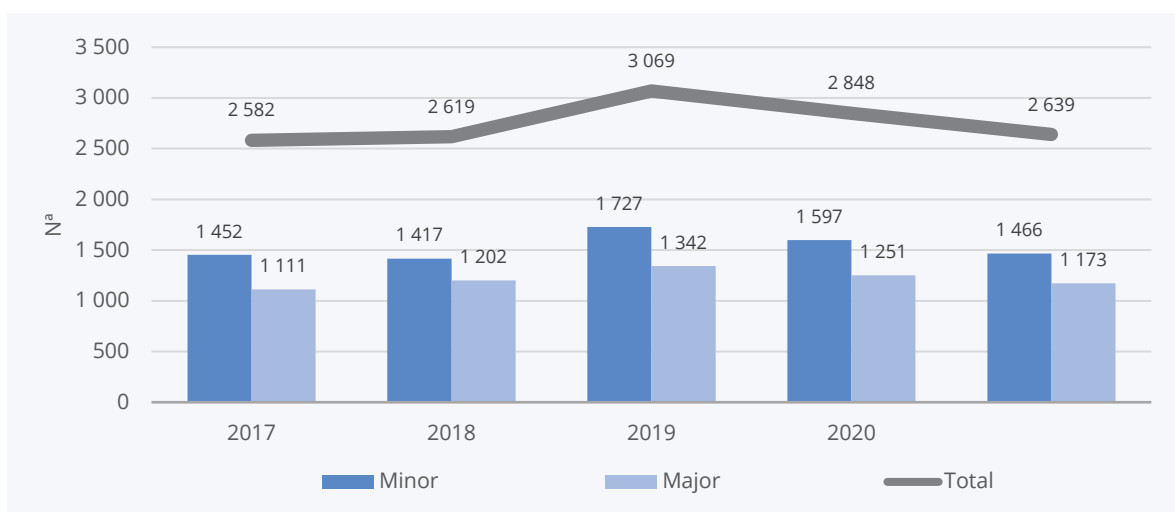
Figure 36. Evolution of the number of amputations by diabetic foot (Diabetes as main diagnosis)



Source: HMD/CAHS. Note: 2020 data are provisional (available on 03/12/2021). Survey method in HMD: ICD9-CM DP: 249.-, 250.-; ICD9-PCS: 84.1-84.19; ICD 10-CM DP: E08.-, E09.-, E10.-, E11.-, E12.-, E13.-; ICD10-PCS: 0Y6M0Z0, 0Y6M0Z4, 0Y6M0Z5, 0Y6M0Z6, 0Y6M0Z7, 0Y6M0Z8, 0Y6M0Z9, 0Y6M0ZB, 0Y6M0ZC, 0Y6M0ZD, 0Y6M0ZF, 0Y6N0Z0, 0Y6N0Z4, 0Y6N0Z5, 0Y6N0Z6, 0Y6N0Z7, 0Y6N0Z8, 0Y6N0Z9, 0Y6N0ZB, 0Y6N0ZC, 0Y6N0ZD, 0Y6N0ZF, 0Y6P0Z0, 0Y6P0Z1, 0Y6P0Z2, 0Y6P0Z3, 0Y6Q0Z0, 0Y6Q0Z1, 0Y6Q0Z2, 0Y6Q0Z3, 0Y6R0Z0, 0Y6R0Z1, 0Y6R0Z2, 0Y6R0Z3, 0Y6S0Z0, 0Y6S0Z1, 0Y6S0Z2, 0Y6S0Z3, 0Y6T0Z0, 0Y6T0Z1, 0Y6T0Z2, 0Y6T0Z3, 0Y6U0Z0, 0Y6U0Z1, 0Y6U0Z2, 0Y6U0Z3, 0Y6V0Z0, 0Y6V0Z1, 0Y6V0Z2, 0Y6V0Z3, 0Y6W0Z0, 0Y6W0Z1, 0Y6W0Z2, 0Y6W0Z3, 0Y6X0Z0, 0Y6X0Z1, 0Y6X0Z2, 0Y6X0Z3, 0Y6Y0Z0, 0Y6Y0Z1, 0Y6Y0Z2, 0Y6Y0Z3, 0Y6Z0Z0, 0Y6Z0Z1, 0Y6Z0Z2, 0Y6Z0Z3, 0Y6D0Z0, 0Y6D0Z1, 0Y6D0Z2, 0Y6D0Z3, 0Y6H0Z1, 0Y6H0Z2, 0Y6H0Z3, 0Y6J0Z1, 0Y6J0Z2, 0Y6J0Z3

When considering all patients with Diabetes (main and associated diagnosis), the total number of recorded amputations (whether or not attributed to Diabetes) remained the same between 2016 and 2020 (with the same caveat regarding coding) and with a slight decrease between 2018 and 2020. Many of these amputations will not have been attributed to Diabetes, but their number demonstrates the importance of controlling the various cardiovascular risk factors.

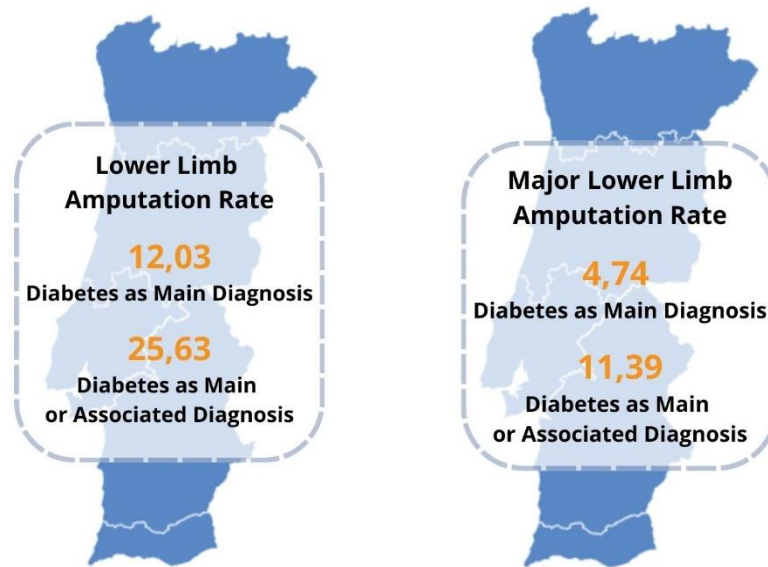
Figure 37. Evolution of the number of total amputations in people with Diabetes (Diabetes as main and associated diagnosis)



Source: HMD/CAHS. Note: 2020 data are provisional (available on 03/12/2021). Survey method in HMD: DCI9-CM DP/AD: 249.-, 250.-; DCI9-PCS: 84.10-84.19; DCI 10-CM DP/AD: E08.-, E09.-, E10.-, E11.-, E12.-, E13.-; ICD10-PCS: 0Y6M0Z0,

0Y6M0Z4, 0Y6M0Z5, 0Y6M0Z6, 0Y6M0Z7, 0Y6M0Z8, 0Y6M0Z9, 0Y6M0ZB, 0Y6M0ZC, 0Y6M0ZD, 0Y6M0ZF, 0Y6N0Z0, 0Y6N0Z4, 0Y6N0Z5, 0Y6N0Z6, 0Y6N0Z7, 0Y6N0Z8, 0Y6N0Z9, 0Y6N0ZB, 0Y6N0ZC, 0Y6N0ZD, 0Y6N0ZF, 0Y6P0Z0, 0Y6P0Z1, 0Y6P0Z2, 0Y6P0Z3, 0Y6Q0Z0, 0Y6Q0Z1, 0Y6Q0Z2, 0Y6Q0Z3, 0Y6R0Z0, 0Y6R0Z1, 0Y6R0Z2, 0Y6R0Z3, 0Y6S0Z0, 0Y6S0Z1, 0Y6S0Z2, 0Y6S0Z3, 0Y6T0Z0, 0Y6T0Z1, 0Y6T0Z2, 0Y6T0Z3, 0Y6U0Z0, 0Y6U0Z1, 0Y6U0Z2, 0Y6U0Z3, 0Y6V0Z0, 0Y6V0Z1, 0Y6V0Z2, 0Y6V0Z3, 0Y6W0Z0, 0Y6W0Z1, 0Y6W0Z2, 0Y6W0Z3, 0Y6X0Z0, 0Y6X0Z1, 0Y6X0Z2, 0Y6X0Z3, 0Y6Y0Z0, 0Y6Y0Z1, 0Y6Y0Z2, 0Y6Y0Z3, 0Y6Z0Z2, 0Y6Z0Z3, 0Y6Z0Z4, 0Y6Z0Z5, 0Y6Z0Z6, 0Y6Z0Z7, 0Y6Z0Z8, 0Y6Z0Z9, 0Y6Z0ZB, 0Y6Z0ZC, 0Y6Z0ZD, 0Y6Z0ZF, 0Y6Z0ZG, 0Y6Z0ZH, 0Y6Z0ZI, 0Y6Z0ZJ, 0Y6Z0ZK, 0Y6Z0ZL, 0Y6Z0ZM, 0Y6Z0ZN, 0Y6Z0ZO, 0Y6Z0ZP, 0Y6Z0ZQ, 0Y6Z0ZR, 0Y6Z0ZS, 0Y6Z0ZT, 0Y6Z0ZU, 0Y6Z0ZV, 0Y6Z0ZW, 0Y6Z0ZX, 0Y6Z0ZY, 0Y6Z0ZZ

Figure 38. Lower limb amputation rate in people with Diabetes, in Portugal, in the year 2020



Source: DGH (2021); NIS (2021). Note: Resident population annual estimates NIS, year 2020.

1.4.7. Hospital care in the context of hospitalisation for COVID-19

In relation to hospital care, there were 29 249 hospital admissions with a COVID-19 diagnosis, of which 6380 occurred in people diagnosed with Diabetes, and death occurred in 1515 of the people with Diabetes (Table 19).

Regarding the total number of hospitalisations for COVID-19 in people diagnosed with Diabetes, there were more cases in which DM was not controlled or was associated to chronic complications and fewer cases with acute complications. However, comparing mortality in the different situations, a higher rate (34%) was found in situations in which the hospitalisation for COVID-19 has a diagnosis of DM associated with acute complications (Table 20).

Table 19. Number of hospitalizations and deaths due to COVID-19, in 2020

	Total	Deaths (%)
No. of Hospitalisations for COVID-19	29 249	6 380 (22)
No. of Hospitalisations for COVID-19 in people with Diabetes	6 536	1 515 (23)

Source: HMD/CAHS (2022), available on 04/04/2022.

Table 20. Number of hospitalisations for COVID-19, in people with uncontrolled uncomplicated Diabetes and with Diabetes with chronic or acute complications, in 2020

	Total	Deaths (%)
No. of hospitalisations for Covid-19 + uncontrolled uncomplicated DM	1 747	354 (20)
No. of hospitalisations for Covid-19 + DM with Chronic Complications	1 397	430 (31)
No. of hospitalisations for Covid-19 + DM with Acute complications	167	57 (34)

Source: HMD/CAHS (2022), available on 04/04/2022.

1.4.8. Treatment with Continuous Subcutaneous Insulin Infusion Systems

Under the National Programme for Diabetes, until 2016, Continuous Insulin Subcutaneous Perfusion devices, CSII (“insulin pumps”) were allocated to all children up to 5 years old, 30 devices were made available for women in the preconception phase or pregnant women, and 100 devices were allocated for patients over 5 years old. Order 13 277/2016 furthermore enabled coverage of all eligible children and young people up to age 10 by the end of 2017, up to the age of 14 by the end of 2018 and up to the age of 18 by the end of 2019. From 2020, all eligible persons can access treatment with CSII devices, regardless of age.

Between 2019 and 2020, there was a 15% growth in the number of patients in CSII treatment under the NPD (3 070 patients at the end of 2019, 3 540 patients at the end of 2020).

There has been an increasing rate of patients using this type of treatment. The rate of patients treated with CSII at the end of 2020 was 81 patients per 100 000 inhabitants up to 14 years, 101 patients per 100 000 inhabitants up to 18 years and 71 patients per 100 000 inhabitants up to 39 years (

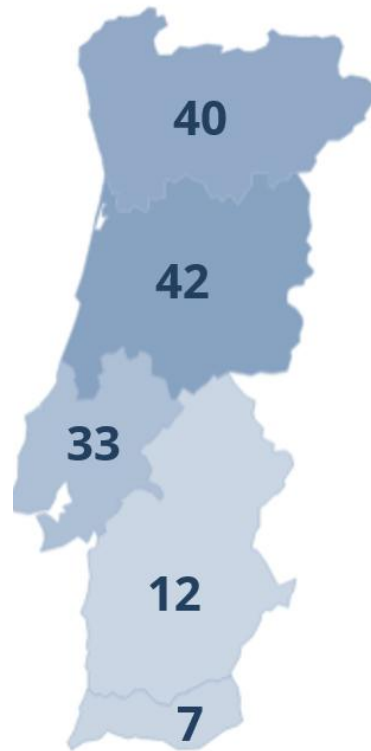
Table 21). Note that in terms of the diagnosis of Type 1 Diabetes in 2020, we had the following prevalence rates recorded in the DOCE platform: 114: 100 000 inhabitants up to 14 years and 175: 100 000 inhabitants up to 19 years.

Table 21. Type 1 Diabetes patients treated with Continuous Subcutaneous Insulin Infusion (CSII) systems

	2018	2019	2020
Patients being treated with CSII ≤14 years	954	1 087	1 072
Rate (per 100 000 inh) of patients treated with CSII ≤14 years	71	82	81
Patients in treatment with CSII <19 years old	1 319	1 671	1 731
Rate (per 100 000 inh) of patients treated with CSII ≤19 years	75	96	101
Patients being treated with CSII ≤39 years	1 976	2 574	2 863
Rate (per 100 000 inh) of patients treated with CSII ≤39 years	48	63	71

Source: DGH (2021).

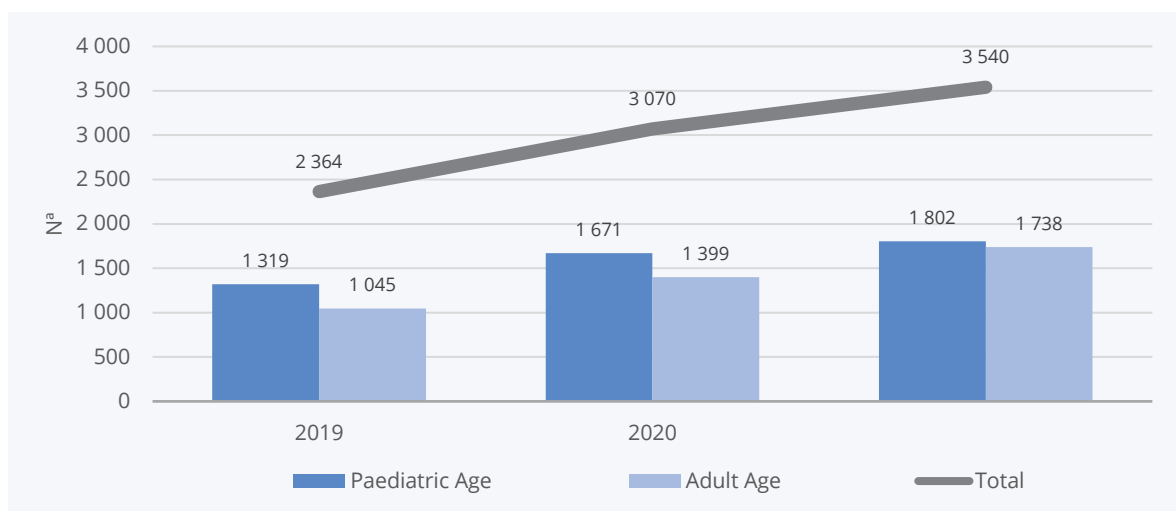
Figure 39. Rate of use of CSII per RHA, in 2020



systems, in mainland Portugal,

Source: DGH (2021). Note: Rate per 100,000 inhabitants. Patients may be followed at a Treatment Centre of a Regional Health Authority different from their place of residence.

Figure 40. Evolution of the number of patients with Type 1 Diabetes undergoing treatment with CSII



Source: DGH (2021)

Analysis of the data recorded showed an improvement in glycaemic control assessed by HbA1c ($7.7\pm 1.0\%$ vs. $8.0\pm 1.5\%$, $p<0.001$), as well as a significant reduction in severe hypoglycaemia (1.4 vs. 3.3 per 100 patient-years, $p<0.001$) and episodes of diabetic ketoacidosis (1 vs. 2.4 per 100 patient-years, $p<0.001$) in people treated with CSII under the NPD in mainland Portugal (4) (5).

1.5. Diabetes Mortality in Portugal

In 2020, Diabetes was responsible for 4110 deaths (Table 22), corresponding to 3.3% of deaths in Portugal (Table 23). About 11% of these deaths occurred in people under 70 years of age.

Table 22. Deaths from Diabetes according to age group in Portugal

	2016		2017		2018		2019		2020	
	N	%	N	%	N	%	N	%	N	%
<70 years old	558	12,8	475	11,5	504	11,7	423	11,0	459	11,2
70-74 years old	421	9,7	363	8,8	363	8,5	395	10,3	356	8,7
75-79 years old	643	14,8	656	15,8	675	15,7	515	13,4	566	13,8
≥80 years old	2 733	62,8	2 650	63,9	2 750	64,1	2 501	65,2	2 729	66,4
Total	4 355	100,0	4 144	100,0	4 292	100,0	3 834	100,0	4 110	100,0

Source: Deaths by cause of death, NIS and SICO/DGH (2022).

Table 23. Evolution of Diabetes as a cause of death (%) in Portugal

	2016	2017	2018	2019	2020
Deaths by Diabetes (%)	3,9	3,8	3,8	3,4	3,3

Source: Deaths by cause of death, NIS and SICO/DGH (2022).

The mortality rate attributed to Diabetes in people under 70 years of age was lowest in the Algarve region (3.3 per 100 000 inhabitants) and highest in the Azores region (12.3 per 100 000 inhabitants). With a national (standardised) under 70 mortality rate of 4.7 per 100 000 inhabitants. This rate decreased between 2016 and 2019, with a reversal of this trend in 2020 (

Table 24).

In 2020, Diabetes was responsible for 3488 potential years of life lost under age 70, with an average of 7.6 years of life lost for each death occurring under age 70 (Table 25).

Table 24. Standardised Premature Mortality Rate (<70 years) in Portugal according to geographical region (per 100,000 inhabitants)

	2016	2017	2018	2019	2020
North	4,6	3,8	3,8	3,9	3,9
Centre	5,2	4,8	4,7	3,1	3,5
Lisbon and Tagus Valley	6,8	5,5	5,5	4,9	5,3
Alentejo	7,1	7,6	7,0	6,3	8,0
Algarve	3,6	3,3	4,6	3,1	3,3
Wood	13,1	7,3	11,9	9,1	4,9
Azores	12,5	13,2	18,4	7,1	12,3
Portugal (Total)	6,0	5,0	5,3	4,4	4,7

Source: Deaths by cause of death, NIS and SICO/DGH (2022) Note: Rates per 100 000 inhabitants. The European standard population (2013 version) defined by EUROSTAT was used to calculate the standardised mortality rate.

Table 25. Evolution of Total and Premature Mortality Indicators for Diabetes in Portugal

	2016	2017	2018	2019	2020
Both sexes					
Deaths in all ages	4 355	4 144	4 291	3 834	4 110
Deaths aged < 70 years	558	475	504	423	459
Potential years of life lost <70 years	4 490	3 893	4 200	3 303	3 488
Potential years of life lost by death<70 years	8,0	8,2	8,3	7,8	7,6
Crude death rate for all ages	42,2	40,2	41,7	37,3	39,9
Crude death rate in age < 70 years	6,4	5,4	5,8	4,9	5,3
Standardised mortality rate at all ages	38,0	35,4	35,9	31,3	32,8
Age-standardised mortality rate <70 years	6,0	5,0	5,3	4,4	4,7
Male					
Deaths in all ages	1 877	1 725	1 828	1 655	1 796
Deaths aged < 70 years	344	286	325	271	302
Potential years of life lost <70 years	2 685	2 330	2 738	2 313	2 255
Potential years of life lost by death<70 years	7,8	8,1	8,4	8,5	7,5
Crude death rate for all ages	38,4	35,4	37,6	34,1	37,0
Crude death rate in age < 70 years	8,1	6,7	7,7	6,5	7,2
Standardised mortality rate at all ages	42,6	38,5	39,8	35,4	37,6
Age-standardised mortality rate <70 years	7,9	6,5	7,3	6,1	6,7
Female					
Deaths in all ages	2 478	2 419	2 463	2 179	2 314
Deaths aged < 70 years	214	189	179	152	157
Potential years of life lost <70 years	1 805	1 563	1 463	990	1 233
Potential years of life lost by death<70 years	8,4	8,3	8,2	6,5	7,9
Crude death rate for all ages	45,6	44,6	45,4	40,1	42,6
Crude death rate in age < 70 years	4,8	4,2	4,0	3,4	3,5
Standardised mortality rate at all ages	34,5	32,8	32,6	28,2	29,2

Age-standardised mortality rate <70 years	4,3	3,7	3,5	2,9	3,0
---	-----	-----	-----	-----	-----

Source: Deaths by cause of death, NIS and SICO/DGH (2022). Note: Rates per 100 000 inhabitants. The European standard population (2013 version) defined by EUROSTAT was used to calculate the standardised mortality rate.

In 2020, renal complications were responsible for 13.8% of deaths attributed to Diabetes and peripheral circulatory complications were responsible for 6.2% of deaths, observing a reduction in deaths attributed to these two complications in recent years. However, deaths with other specific complications and with multiple complications together represent more than 57% of all deaths attributed to Diabetes (Table 26). When it comes to deaths attributed to Diabetes under the age of 70, a similar situation is observed, where 12.1% of deaths were due to renal complications, 7% to peripheral circulatory complications and 56% to other specific or multiple complications (Table 26).

Although it is not evident from the cause of death records for Diabetes presented, Diabetes is an important cardiovascular risk factor. Note for example the 238 in-hospital deaths in people with Diabetes hospitalised for acute myocardial infarction and 1086 in-hospital deaths in people with Diabetes hospitalised for Cardiovascular Accident.

Table 26. Registry of Causes of Death by Diabetes in Portugal

	2016		2017		2018		2019		2020	
	N	%	N	%	N	%	N	%	N	%
DM with no mention of complications	1 801	41,4	1 498	36,2	1 346	31,4	551	14,4	675	16,4
DM with renal complications	975	22,4	923	22,3	897	20,9	662	17,3	568	13,8
DM with other specified complications	541	12,4	716	17,3	845	19,7	1450	37,8	1465	35,6
DM with peripheral circulatory complications	365	8,4	365	8,8	367	8,6	247	6,4	253	6,2
DM with multiple complications	375	8,6	332	8,0	520	12,1	710	18,5	896	21,8
DM with ketoacidosis	125	2,9	137	3,3	144	3,4	98	2,6	124	3,0
DM with coma	83	1,9	103	2,5	113	2,6	55	1,4	90	2,2
DM with unspecified complications	77	1,8	56	1,4	50	1,2	43	1,1	28	0,7
DM with ophthalmologic complications	11	0,3	6	0,1	7	0,2	6	0,2	3	0,1
DM with neurological complications	2	0,0	7	0,2	3	0,1	12	0,3	8	0,2
Total	4 355	100,0	4 143	100,0	4 292	100,0	3 834	100,0	4 110	100,0

Source: Deaths by cause of death, SICO/DGH (2022). Search method: Diabetes E10-E14 (ICD 10 codes, Diabetes with coma E100, E110, E120, E130, E140; with ketoacidosis E101, E111, E121, E131, E141; with renal complications E102, E112, E122, E132, E142; with ophthalmological complications E103, E113, E123, E133, E143; with neurological complications E104, E114, E124, E134, E144 with peripheral circulatory complications E105, E115, E125, E135, E145; with other specified complications E106, E116, E126, E136, E146; with multiple complications E107, E117, E127, E137, E147; with unspecified complications E108, E118, E128, E138, E148; no complications mentioned E109, E119, E129, E139, E149).

Table 27. Registry of Causes of Premature Death (<70 years) by Diabetes in Portugal

	2016		2017		2018		2019		2020	
	N	%	N	%	N	%	N	%	N	%
DM with no mention of complications	206	36,9	157	33,1	122	24,2	45	10,6	79	17,4
DM with renal complications	124	22,2	98	20,6	99	19,6	56	13,2	55	12,1
DM with other specified complications	68	12,2	81	17,1	85	16,8	134	31,6	133	29,2
DM with peripheral circulatory complications	43	7,7	42	8,8	58	11,5	35	8,3	32	7,0
DM with multiple complications	74	13,3	50	10,5	105	20,8	118	27,8	122	26,8
DM with ketoacidosis	17	3,0	19	4,0	22	4,4	19	4,5	21	4,6
DM with coma	12	2,2	17	3,6	10	2,0	7	1,7	7	1,5
DM with unspecified complications	8	1,4	6	1,3	4	0,8	5	1,2	5	1,1
DM with ophthalmologic complications	3	0,5	3	0,6	0	0,0	1	0,2	0	0,0
DM with neurological complications	3	0,5	2	0,4	0	0,0	4	0,9	1	0,2
Total	558	100,0	475	100,0	505	100,0	424	100,0	455	100,0

Source: Deaths by cause of death, SICO/DGH (2022). Search method: Diabetes E10-E14 (ICD 10 codes, Diabetes with coma E100, E110, E120, E130, E140; with ketoacidosis E101, E111, E121, E131, E141; with renal complications E102, E112, E122, E132, E142; with ophthalmological complications E103, E113, E123, E133, E143; with neurological complications E104, E114, E124, E134, E144 with peripheral circulatory complications E105, E115, E125, E135, E145; with other specified complications E106, E116, E126, E136, E146; with multiple complications E107, E117, E127, E137, E147; with unspecified complications E108, E118, E128, E138, E148; no complications mentioned E109, E119, E129, E139, E149).

In 2020 there were 124 deaths due to ketoacidosis, 21 of which under the age of 70. Once again, it is important to emphasize that the careful choice of therapy, taking into account the risk of complications and the structured therapeutic education of people with Diabetes and their caregivers and families should assume increasing importance in the care provided, in order to reduce these deaths (Table 28).

Table 28. Diabetes type breakdown in case of death by diabetic ketoacidosis

	2016		2017		2018		2019		2020	
	Total deaths	Deaths < 70 years	Total deaths	Deaths < 70 years	Total deaths	Deaths < 70 years	Total deaths	Deaths < 70 years	Total deaths	Deaths < 70 years
Type 1 Diabetes	2	2	2	0	0	0	0	0	1	1
Type 2 Diabetes	45	4	53	8	53	4	32	4	49	7
Diabetes of unspecified cause	78	11	82	11	91	18	66	15	74	13

Total	125	17	137	19	144	22	98	19	124	21
-------	-----	----	-----	----	-----	----	----	----	-----	----

Source: Deaths by cause of death, SICO/DGH (2022). Search method: Diabetes E10-E14 (ICD codes 10; E101; E111; E121; E141).

1.6. Outpatient consumption of medicines and devices

1.6.1. Outpatient consumption of medicines and devices

Diabetes medication consumption and costs increased in 2020, following the trend of recent years. This increase is mainly due to more people with diagnosed and medicated Diabetes, as well as the use of new, more expensive drugs (Table 29).

Since 2016, insulin use has increased mainly due to the increased use of long-acting analogues, which accounted for about 780 000 packs in 2020 (Figure 42), i.e., almost half the number of insulin packs consumed and more than half of insulin spending. Between 2016 and 2020, insulin consumption, as measured by the number of packs consumed, increased by about 12% and costs also increased by about 12% (Table 31).

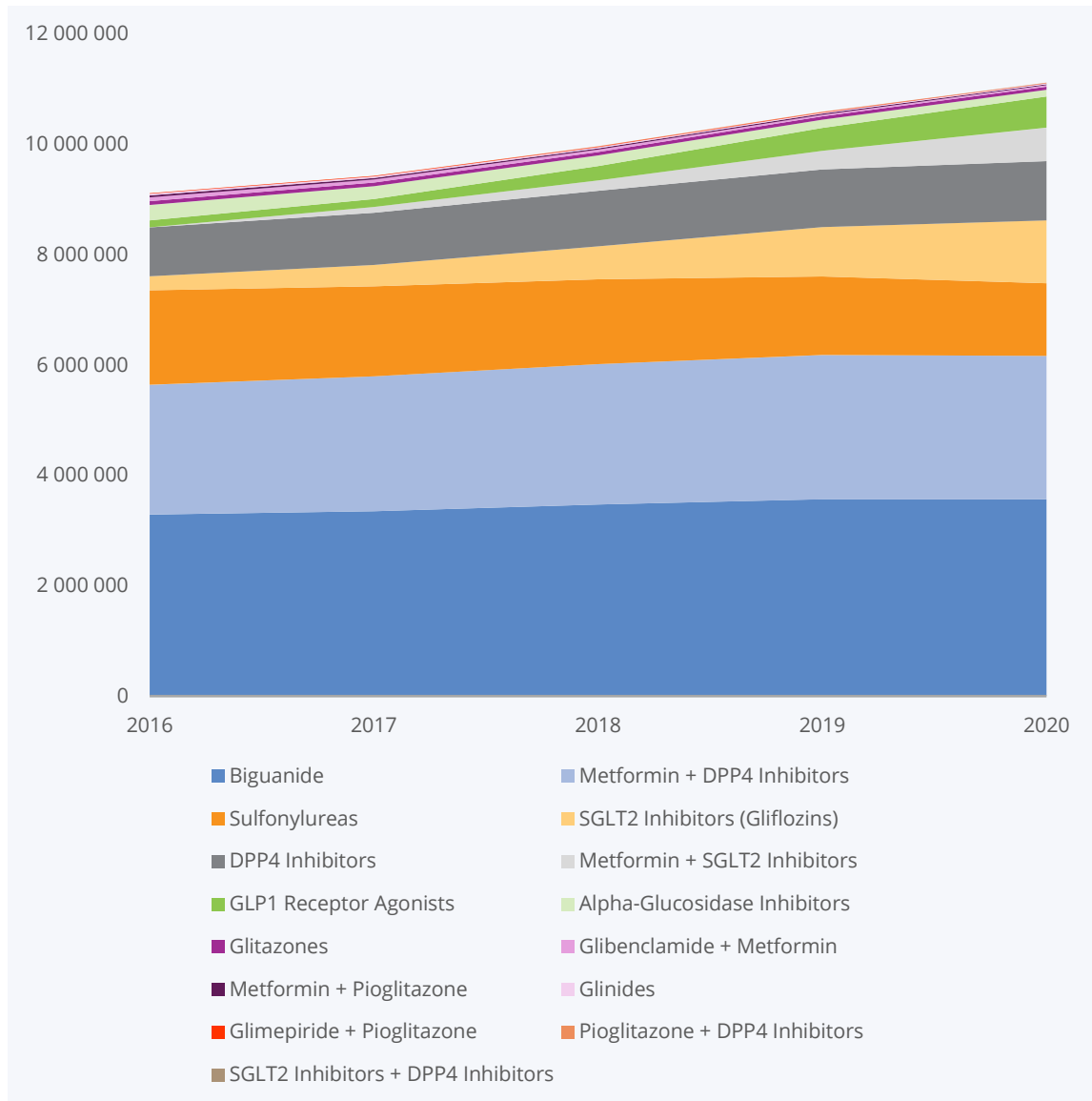
In the same period (between 2016 and 2020), the consumption of non-insulin antidiabetic drugs, grew by 22% in number of packages (Figure 41 and Table 56) and their costs grew by 30%. In this group, DPP4 inhibitors (alone or in combination) continued to be the drugs responsible for most of the burden, in 2020, corresponding to about 33% of packages consumed and 52% of non-insulin antidiabetic expenditures (Table 30).

Table 29. NHS outpatient drug consumption (non-insulin antidiabetics, insulin and glucagon, excluding drug combinations) in Mainland Portugal - Daily Prescribed Doses dispensed in one year

	2016	2017	2018	2019	2020
Defined Daily Dose	236 601 861	245 017 774	246 516 118	253 982 552	259 099 740

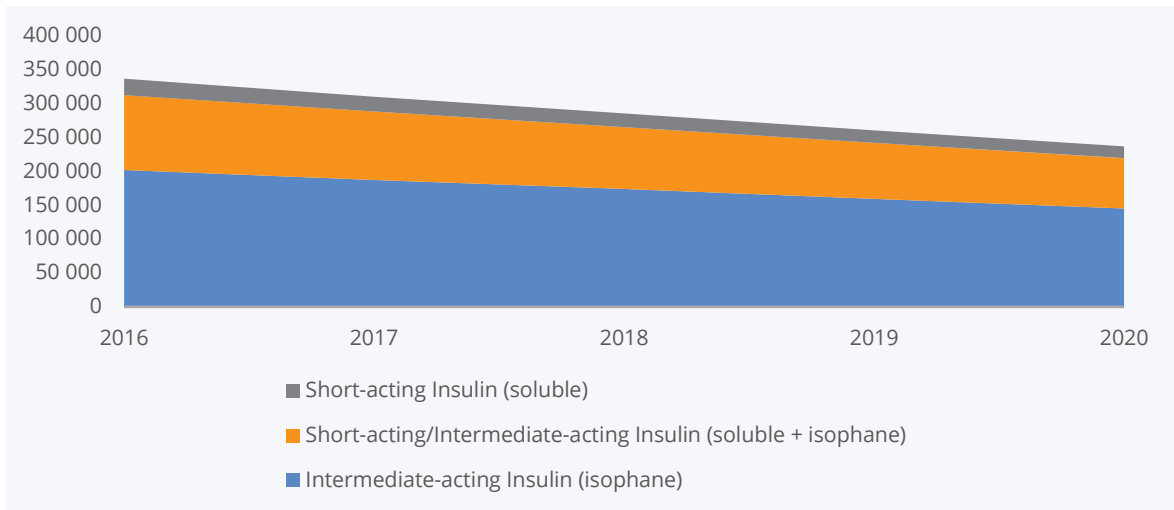
Source: INFARMED, ICC (Invoice Conference Centre). Data processed by DGH/DIAS. Note: DDD: Defined Daily Dose dispensed in one year in outpatient clinics in mainland Portugal in the NHS.

Figure 41. Consumption of non-insulin drug packages in NHS, in mainland Portugal



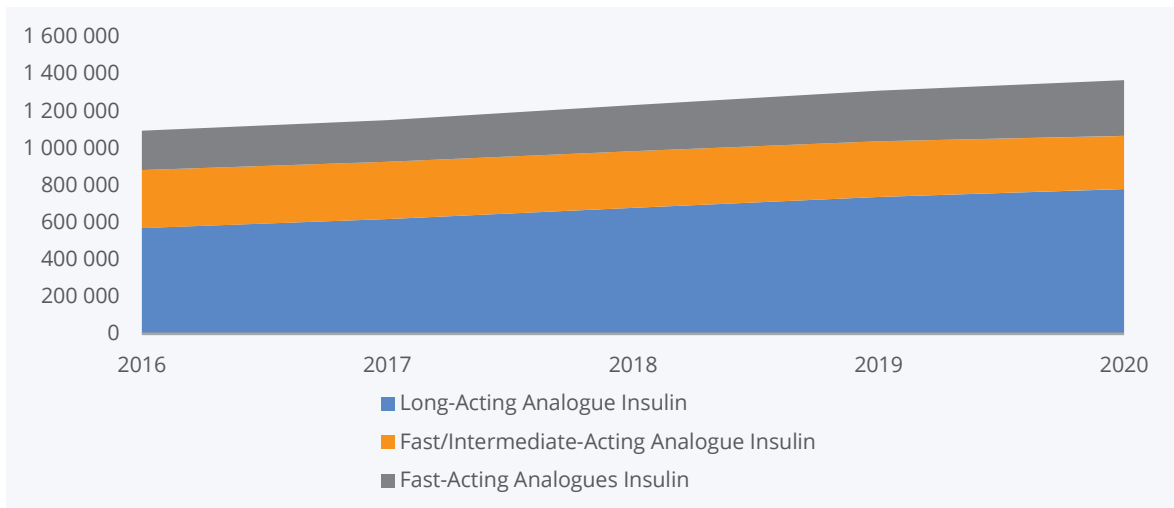
Source: INFARMED, ICC (Invoice Conference Centre). Data processed by DGH/DIAS.

Figure 42. Consumption of human insulin packs in the NHS in Mainland Portugal



Source: INFARMED, ICC (Invoice Conference Centre). Data processed by DGH/DIAS

Figure 43. Consumption of insulin analogues packs in the NHS in Mainland Portugal



Source: INFARMED, ICC (Invoice Conference Centre). Data processed by DGH/DIAS

Table 30. Gastos com antidiabéticos não insulínicos: valor PVP e encargos do SNS em Portugal Continental

	RSP value (thousand €)					NHS Expenditure (thousand €)				
	2016	2017	2018	2019	2020	2016	2017	2018	2019	2020
Non-insulin antidiabetics										

Biguanide	11 744	12 340	12 788	13 029	13 040	7789	8075	8770	9068	9210
Sulphonylureas	10 337	9593	8855	8053	7271	8306	7324	6812	6156	5645
Alpha-Glucosidase Inhibitors	1778	1484	1224	974	749	1510	1263	1044	776	624
Glinides	972	849	724	604	521	893	780	664	555	478
Glitazones	1259	1146	1075	986	933	860	822	752	677	628
DPP4 inhibitors	37 310	39 216	41 203	42 598	43 249	34 359	36 165	37 996	39 279	39 838
GLP1 receptor agonists	13 769	15 408	22 951	33 523	43 471	12 479	14 008	20 863	30 477	39 482
SGLT2 inhibitors	11 559	17 546	27 370	41 302	51 934	10 541	16 020	24 993	37 719	47 419
Total Non-insulin Antidiabetics	88 728	97 582	116 190	141 069	161 168	76 737	84 457	101 894	124 707	143 324
Combinations of non-insulin antidiabetics										
Glimepiride + Pioglitazone	489	441	411	379	751	447	404	377	347	688
Metformin + Pioglitazone	1385	1147	993	854	323	1272	1053	912	794	295
Glibenclamide + Metformin	440	347	278	150	135	404	319	255	138	124
Metformin + DPP4 Inhibitors	111 084	114 638	118 932	119 989	118 074	101 722	105 084	108 983	109 906	108 066
Metformin + SGLT2 Inhibitors	-	4809	8842	15 681	27 208	-	4382	8056	14 286	24 778
Pioglitazone + DPP4 Inhibitors	-	106	121	144	162	-	97	111	132	149
SGLT2 Inhibitors + DPP4 Inhibitors	-	-	-	-	213	-	-	-	-	196
Total of Combination	113 398	121 488	129 577	137 197	146 866	103 845	111 339	118 694	125 603	134 296
Total	202 126	219 070	245 767	278 266	308 034	180 582	195 796	220 588	250 310	277 620

Source: INFARMED, ICC (Invoice Conference Centre). Data processed by DGH/DIAS

In 2020, the costs of insulins were about 74.7 M€ (Table 31) and the costs of non-insulin antidiabetics were about 277.6 M€ (Table 30). 99.9% of the costs with insulins and 90.1% of the costs with non-insulin antidiabetics were borne by the NHS.

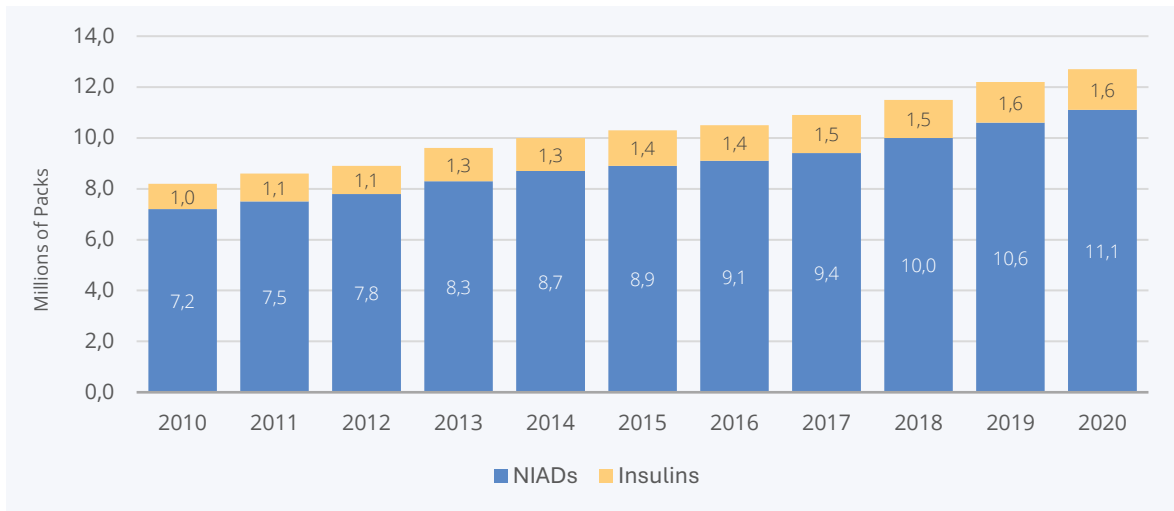
Table 31. Insulin Expenditure: RSP value and NHS charges in Mainland Portugal

	RSP value (thousand €)					NHS Expenditure (thousand €)				
	2016	2017	2018	2019	2020	2016	2017	2018	2019	2020
Insulins										
Short-acting Insulin (soluble)	789	720	673	605	558	788	719	674	605	557
Intermediate (isophane) insulin	6 686	6 092	5 746	5 261	4 802	6 676	6 190	5 743	5 260	4 794
Short-acting/intermediate-acting insulin (soluble + isophane)	3 550	3 234	2 930	2 666	2 396	3 546	3 234	2 929	2 665	2 394
Total Human Insulins	11 025	3 954	9 349	8 532	7 756	11 010	10 143	9 346	8 530	7 745
Insulin Analogues										
Fast-acting Insulin Analogues	8 529	9 065	9 960	10 905	11 944	8 515	9 061	9 956	10 901	11 930
Long-Acting Insulin Analogues	34 222	35 569	38 598	41 678	43 411	34 170	35 553	38 585	41 666	43 371

Fast-acting / Intermediate-acting Insulin Analogues	12 792	12 621	12 611	12 200	11 654	12 774	12 616	12 205	12 197	11 642
Total Insulin Analogues	55 543	57 255	61 169	64 783	67 009	55 459	57 230	60 746	64 764	66 943
Total Insulins	66 568	61 209	70 518	73 315	74 765	66 469	67 373	70 092	73 294	74 688

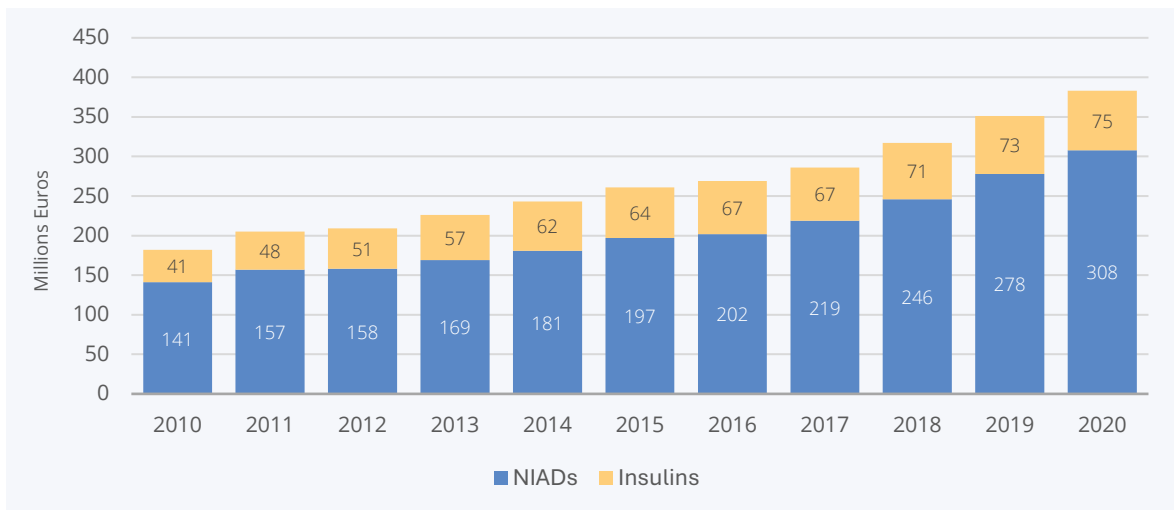
Source: INFARMED, ICC (Invoice Conference Centre). Data processed by DGH/DIAS.

Figure 44. Evolution of the consumption of non-insulin antidiabetics and insulins in the NHS in Mainland Portugal | 2010 – 2020



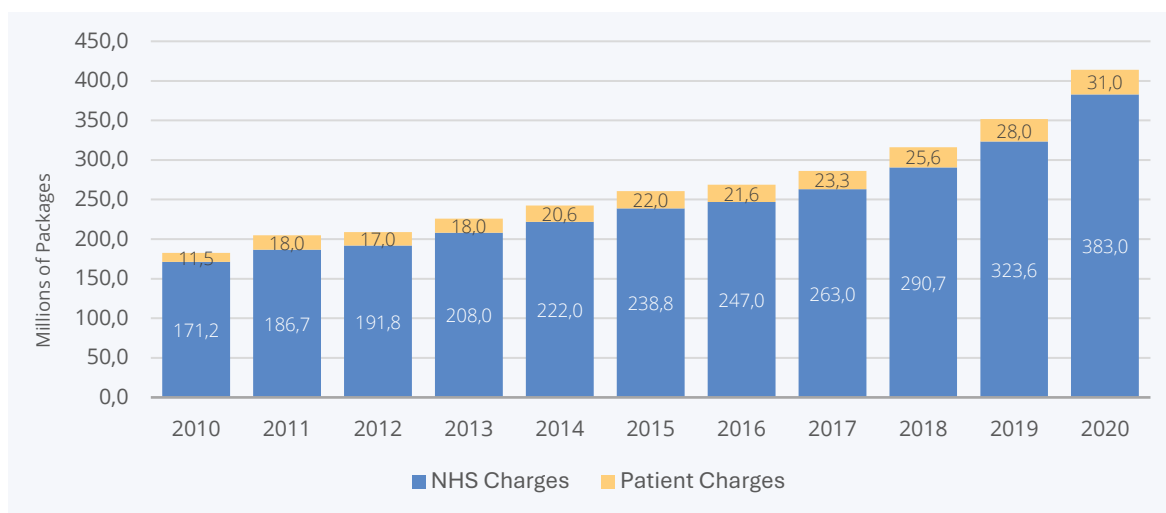
Source: NDO (2006-15) (6); INFARMED, ICC (Invoice Conference Centre). Data processed by DGH/DIAS

Figure 45. Evolution of expenditure on non-insulin antidiabetics and insulins: RSP value in Mainland Portugal | 2010 – 2020



Source: NDO (2006-15) (6); INFARMED, ICC (Invoice Conference Centre). Data processed by DGH/DIAS

Figure 46. Evolution of the costs of NHS and direct costs of patients with non-insulin antidiabetics and insulins in Mainland Portugal | 2010 – 2020



Source: NDO (2006-15) (6); INFARMED, ICC (Invoice Conference Centre). Data processed by DGH/DIAS

Consumption and spending on glucagon remained at similar levels to previous years.

Table 32. NHS Glucagon Consumption in Mainland Portugal

	2016	2017	2018	2019	2020
Quantity of Packs	5 456	5 825	6 102	6 876	5 971

Source: INFARMED, ICC (Invoice Conference Centre). Data processed by DGH/DIAS

Table 33. Glucagon Costs: RSP value and NHS charges

	RSP value (thousand €)					NHS Expenditure (thousand €)				
	2016	2017	2018	2019	2020	2016	2017	2018	2019	2020
Total Glucagon	107	115	120	135	117	42	45	46	53	46

Source: INFARMED, ICC (Invoice Conference Centre). Data processed by DGH/DIAS.

The number of packs consumed and the charges for capillary blood glucose test strips continued their downward trend between 2016 and 2020, while sales of test strips for ketone determination increased. Charges for outpatient glucose control monitoring have increased since 2018, mainly due to the increased consumption of sensors for flash glucose monitoring (reimbursed by the NHS from that year onwards).

Table 34. Consumption of test strips and sensors in the NHS

	2016	2017	2018	2019	2020
Blood glucose test strips	2 775 398	2 773 720	2 627 511	2 551 450	2 444 122
Sensors for interstitial glucose evaluation	NA	NA	242 124	406 646	541 177
Glucosuria and Ketonuria test strips	990	624	487	623	752
β -Ketone test strips	13 170	15 076	20 578	25 599	27 783
Total	2 789 558	2 789 420	2 890 700	2 984 318	3 013 834

Source: INFARMED, ICC (Invoice Conference Centre). Data processed by DGH/DIAS.

Table 35. Expenses with test strips and sensors: RSP value and NHS charges in Mainland Portugal

	RSP value (thousand €)					NHS Expenditure (thousand €)				
	2016	2017	2018	2019	2020	2016	2017	2018	2019	2020
Blood glucose test strips	50 496	50 397	47 688	45 733	43 234	42 860	42 818	40 525	38 864	36 707
Sensors for interstitial glucose evaluation	nd	nd	12 838	21 557	28 722	nd	nd	10 908	18 319	24 380
Glucosuria and Ketonuria test strips	3,8	2,4	1,9	2,4	2,9	3,2	2	1,6	2	2,4
β -Ketone test strips	174	198	270	336	365	147	168	230	286	310
Total	50 674	50 597	60 798	67 628	72 324	43 010	42 988	51 665	57 471	61 399

Source: INFARMED, ICC (Invoice Conference Centre). Data processed by DGH/DIAS.

1.6.2. Continuous subcutaneous insulin infusion systems (“Insulin pumps”)

Between 2016 and 2020, an increasing number of continuous subcutaneous insulin infusion devices and related consumables were purchased under the National Programme for Diabetes. Even though the charges have increased, the cost per unit of the devices has decreased.

Table 36. Consumption and expenditure with continuous subcutaneous insulin infusion devices in the NHS in Mainland Portugal

	Consumption (n)					NHS Expenditure (thousand €)				
	2016	2017	2018	2019	2020	2016	2017	2018	2019	2020
New devices and	278	664	852	854	626	327	790	880	726	768

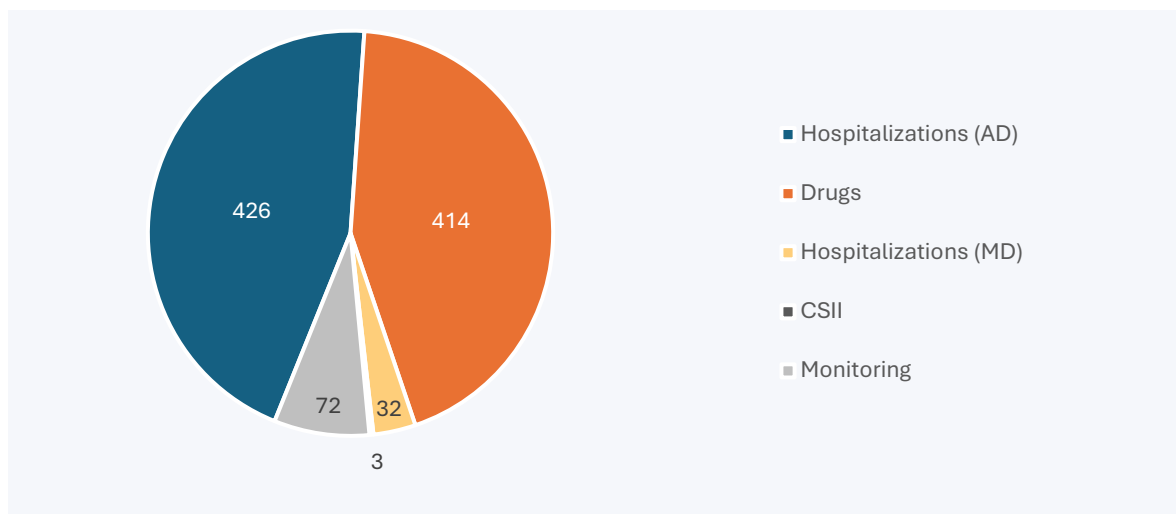
consumables for one year										
One-year consumable sets	1 287	1 442	2 165	2 634	3 116	1 254	1 281	1 840	2 239	2 535
Total	1 565	2 106	3 017	3 488	3 742	1 581	2 071	2 720	2 965	3 303

Source: DGH/PND.

1.7. Costs of Diabetes in Portugal

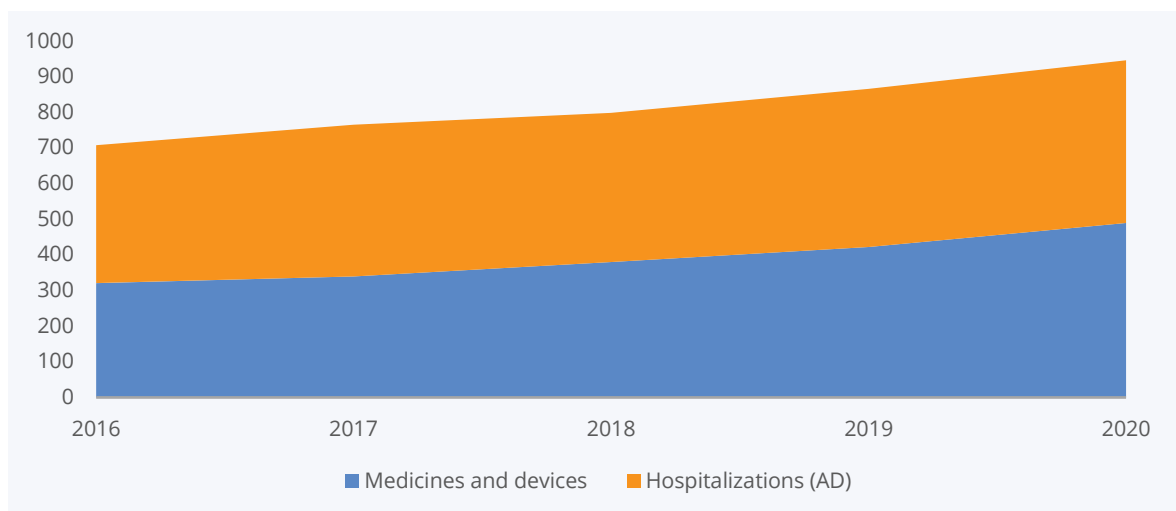
In Portugal, the cost of medication and devices for the treatment and monitoring of Diabetes and the cost of hospitalisations will reach 947M€ in 2020, with a growth in the costs identified for Diabetes over recent years.

Figure 47. Identified Costs of Diabetes in Mainland Portugal (M€)



Source: CAHS, DPS, HMD, January 2022. Note: Admissions (AD): admissions in which Diabetes is an Associated Diagnosis; Admissions (MP): admissions in which Diabetes is the Main Diagnosis; CSII: Continuous Insulin Subcutaneous Perfusion (“Insulin Pumps”); Drugs: insulins and non-insulin antidiabetics; Monitoring: test strips and glucose sensors.

Figure 48. Evolution of the identified costs of Diabetes in Mainland Portugal (M€)



Source: CAHS, DPS, HMD, January 2022.

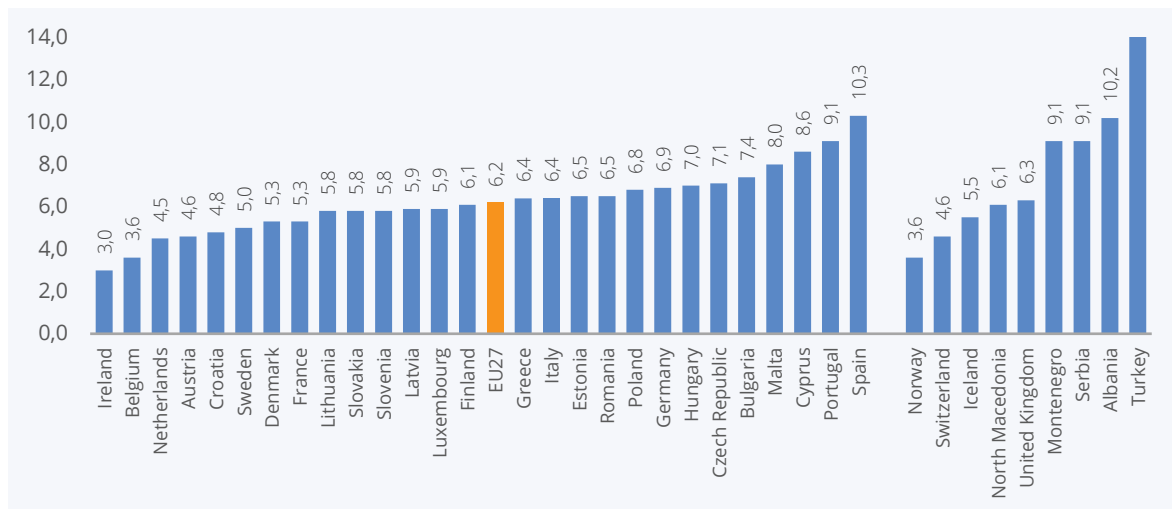
These identified charges are estimated to correspond to 50-64% of the total (7) (8), so that the costs related to Diabetes in Portugal will have reached around 1,500-1,900M€ by 2020.

According to IDF estimates, in 2019 (2), Diabetes-related costs in Portugal were about 1,800 USD, 2,777 International Dollars, ID (1,580€) per person with Diabetes and that there would be about 1.090 million people with Diabetes aged 20-79 years, corresponding to about 1,700 M€ for all people with Diabetes in this age group.

1.8. Diabetes and risk factors for its development in Europe

According to the IDF, Portugal has the second highest standardised prevalence rate of Diabetes in the 27 countries of the European Union. The same document refers to a prevalence rate of Diabetes in the European Union of 6.2% in 2021 (average of standardised prevalence rates), in the population aged between 20 and 79 years, while for Portugal that figure was 9.1%. In many European countries, the standardised prevalence rate of Diabetes has stabilised in recent years, including Portugal (3).

Figure 49. Standardised prevalence rate of Diabetes (20-79 years) in Europe in 2021



Source: IDF Diabetes Atlas 10th Ed (3).

Inadequate eating habits, physical inactivity, excessive weight and smoking represent risk factors for the development of Type 2 Diabetes. According to the OECD report, in Portugal, the 15-year-old population that does not consume fruit or vegetables daily is below the average for this group of countries. With regard to the daily consumption of vegetables in the population aged 15 or over, this is well below the average of these countries. Portugal also has an insufficient level of physical activity among adults, which is higher than the average of the countries analysed.

Portugal continues to have a higher rate of lower limb amputations in people with Diabetes than other OECD countries (9).

Table 37. Risk Factors – Comparative Data from Portugal and OECD

	Portugal	OECD Average
Proporção de adolescentes com 15 anos que não consomem frutas ou legumes diariamente (%)***	50,5	54,6
Proporção de adolescentes com 15 anos que pratica Atividade Física diária, moderada a vigorosa (%)***	8,5	13,7
Taxa de Pré-Obesidade e Obesidade auto-reportada aos 15 anos (%)***	22,0	18,3
Consumo Diário Vegetais, ≥15 anos (%)**	41,7	59,1
Prática Insuficiente de Atividade Física em Adultos (%)*	46,4	34,7
Consumo diário de bebidas com adição de açúcar, ≥15 anos (%)****	8,6	8,0
Taxa de Pré-Obesidade e Obesidade em Adultos (%)**	67,6	59,6
Hábitos Tabágicos, ≥15 anos (%)**	14,2	16,5

Source: Health at a Glance, OCDE, 2021 (9); *WHO Global Health Observatory data 2020; **OECD Health Statistics 2021; ***Inchley et al. 2020; ****Eurostat database, based on European Health Interview Survey (EHIS 3).

1.9. Diabetes in the World Mundo

The IDF reports that (3):

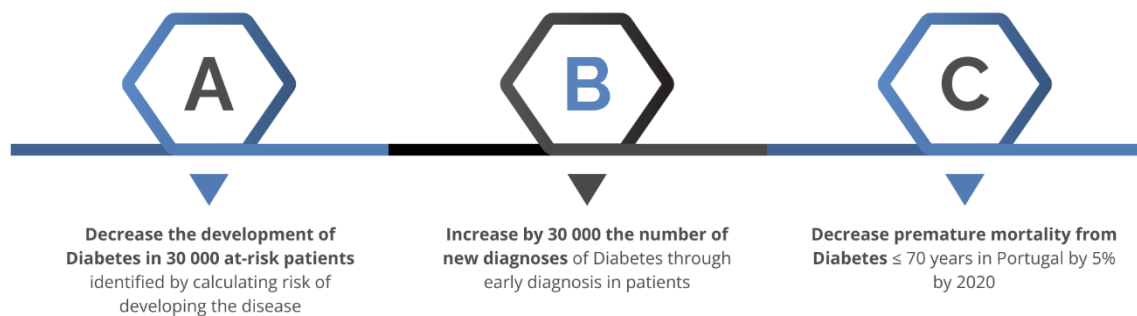
- 1 in 10 adults (aged 20-79) worldwide is living with Diabetes;
- This figure corresponded to 537 million adult people with Diabetes worldwide (20-79 years);
- 1 in 9 (541 million) adults (20-79 years) worldwide have impaired glucose tolerance;
- 1 in 18 (319 million) adults (20-79 years) worldwide has Impaired Fasting Glucose;
- 3 out of 4 adults with Diabetes live in low and middle income countries;
- 1 in 6 new-borns (21 million) are affected by hyperglycaemia in pregnancy, 80% have mothers with Gestational Diabetes;
- Diabetes was responsible for 6.7 million deaths in 2021;
- 11.5% of the world's health expenditure (USD 966 billion) is spent on Diabetes.

2. Monitoring Targets 2017 – 2020

2.1. Health Targets 2020

- A. Decrease the development of Diabetes in 30,000 at-risk patients identified by assessing the calculation of risk of developing the disease;
- B. Increase the number of new Diabetes diagnoses by 30,000 through early diagnosis in patients;
- C. Decrease premature mortality from Diabetes < 70 years in Portugal by 5% by 2020.

Figure 50. Health Goals 2020 (10)



2.2. Implementation

Table 38. Implementation: 2020 targets and goals

2020 Targets	Goals
A	<ol style="list-style-type: none"> 1. Carry out Diabetes risk assessment calculation in the national adult population and prevent progression to the disease 2. Participate in projects/programs of disease prevention and health promotion
B	<ol style="list-style-type: none"> 3. Decrease the percentage of individuals with undiagnosed Diabetes through risk assessment and early diagnosis and treatment 4. Promote good practice in the treatment of DM
C	<ol style="list-style-type: none"> 5. Reduce premature mortality from Diabetes ≤70 years 6. Reduce hospitalisations due to complications of Diabetes 7. Decrease the number of major diabetic foot amputations 8. Ensure national coverage of diabetic retinopathy screening

2.3. Monitoring

More than 50,000 new Diabetes diagnoses were recorded per year, the premature mortality rate dropped by 6% between 2017 and 2020 and International Diabetes Federation (IDF) estimates suggest a reduction in Diabetes prevalence rate in Portugal between 2019 and 2021.

Table 39. Monitoring of 2017 – 2020 targets

2020 Targets	Indicator	Value 2017	Value 2018	Value 2019	Value 2020	Value 2021	Source / Note
A	Ind.1. Adult patients with type 2 Diabetes risk assessments in PHC, in the last 3 years	NA	1.953.02	2.517.905	2.487.768	NA	SIARS (2013.262.01 FL) SClinico
	Ind.2. Standardized prevalence rate of Diabetes estimated by the IDF, 20-79 years (%)	9,8	NA	9,8	ND	9,1	IDF Diabetes Atlas/ IDF Portugal Report
B	Ind.3. Number of new cases identified at national level	62.611	65.853	67.580	52.126	NA	SIARS (MORB.2360.01 FL) SClinico
C	Ind.4. Mortality rate Standardised Premature due to Diabetes < 70 years (per 100,000 inhabitants, using the population 2013 standard)	5,0	5,3	4,4	4,7	NA	SICO/DGS/INE SICO

NA – Not Available

3. Activities undertaken in 2021

A summary of the activities undertaken by the National Programme for Diabetes (NPD) in 2021 is presented. Three main operational goals are considered: epidemiological monitoring and surveillance; health promotion and disease prevention; and promotion of good practices, quality and safety. The COVID-19 pandemic was responsible for particular constraints and challenges, with regard to the provision of healthcare and the implementation of the NPD activity plan in the three axes considered.

3.1. Monitoring and Epidemiological Surveillance

Knowing the epidemiology of Diabetes and monitoring Diabetes-related assistance is fundamental to define appropriate health strategies and improve outcomes. Several activities were developed with this purpose:

- English translation of the **“National Programme for Diabetes Report 2019 - challenges and strategies”** (11). This report includes data from the epidemiological monitoring of Diabetes in Portugal between the years 2015 and 2018 (at primary health care level, pre-hospital care, hospital care, mortality, consumption of drugs and devices, costs).
- Preparation of the Report on **“Monitoring and evaluation of diabetic retinopathy screening in 2020”** (12).
- Implementation of the **national indicators module of the Diabetic Retinopathy Screening (SSMH)**.
- Update of the **Diabetes Dashboard**, by the Information and Analysis Services Directorate (DIAS), with the participation of the NPD. This tool includes interactive tables and charts with data on Primary Health Care and Hospital Care assistance in the NHS, including Diabetic Retinopathy Screening and Treatment with Continuous Insulin Subcutaneous Perfusion, as well as consumption of Diabetes medicines and devices and data on Diabetes mortality.
- **Proposal for knowing the prevalence rate of Type 1 Diabetes**. Following the evaluation of the current information systems (Child and Juvenile Diabetes National Registry, DOCE - “Diabetes – registo das Crianças e Jovens” and Type 1 Diabetes registry at the Primary Health Care level), a proposal was prepared for developments to enable the prevalence/incidence rate of Type 1 Diabetes to be known. The SSMH prepared a first functional analysis to register the type of Diabetes/diagnosis through the PEM, awaiting its completion (PHC SClinico and Hospital SClinico), as well as the implementation and availability of the solution.
- **Analysis of the results of the Continuous Subcutaneous Insulin Infusion (CSII) devices Treatment Programme** within the scope of the National Diabetes Programme. Better glycaemic control has been found in paediatric and adult patients, with a reduction in the number of severe hypoglycaemia and the number of ketoacidosis episodes in people being treated with CSII under the CSII treatment programme (5).

3.2. Health Promotion and Disease Prevention

Portugal has a very high prevalence rate of Diabetes. Most of them are cases of Type 2 Diabetes, many of which can be prevented or their onset delayed by adopting healthy lifestyles. Thus, it is important to promote literacy and the adoption of healthy lifestyles, as well as to promote screening and early diagnosis of Diabetes.

- At the end of 2021, 2,431,050 people, corresponding to 40.9% of adult patients registered at the NHS PHC level, had their **risk assessment of developing Diabetes** in the next 10 years updated and recorded. By the end of 2019, this number was 2,517,905 patients (43.6%) and by the end of 2020 it was 2,487,884 patients (42.5%). The identification of people at higher risk of developing Diabetes should promote the adoption of preventive measures as well as the early diagnosis of Diabetes cases.
- In 2019 and 2020, 67,580 and 52,126 **new cases of Diabetes** were registered respectively at the NHS PHC level. The decrease in 2020, reflects the constraints associated with the pandemic by COVID-19. The lockdown, relevant postponement of non-urgent appointments and exams and the reallocation of health resources will have contributed to this decrease. Although it was still a year marked by the COVID-19 pandemic, 2021 saw an increased number of new Diabetes registrations (74,396 new cases). The **total number of people identified with Diabetes** at the NHS PHC level has remained increasing, as has the percentage of people registered who have Diabetes records. By the end of 2021 **857,272 people with Diabetes** were registered, corresponding to 8.2% of registered patients (this percentage was 8% in 2019 and 8.1% in 2020).
- **Films and Infographics** were produced and disseminated to promote Diabetes prevention and control. In addition to dissemination through the DGH's social networks, these materials are made available for use by health professionals of the FCUDs and/or the general public. The film released on Youtube on 28/10/2021 with the same purpose (<https://www.youtube.com/watch?v=g0X8DYAw6E>), reached 300,000 views in January 2022.
- In 2021, the 2nd edition of the **National Competition "Diabetes 2021"** was held for the making of a film by schools, with the aim of stimulating creativity in order to promote knowledge on Diabetes, prevention of Type 2 Diabetes and the full integration and well-being of young students with Type 1 Diabetes. Organised by the National Programme for Diabetes of the Directorate-General of Health, in conjunction with the Functional Diabetes Coordinating Units, the National School Health Programme and the Directorate-General of Education, the theme of this second edition was "Diabetes and Insulin", linking the competition to the commemorations of the Centenary of the Discovery of Insulin. The competition had 3 levels of participation (1st level; 2nd and 3rd level; and secondary), with the awarding of 1st prize and an honourable mention for each level. More than 30 films from 27 schools competed, with the participation of around 320 students and 55 teachers.
- **Diabetes diagnosis and prevention programme "More Health, Less Diabetes"**. This project, promoted by the National Programme for Diabetes, has the collaboration of the National Programme for the Promotion of Healthy Eating, the National Programme for the Promotion of Physical Activity and the Division of Literacy of the Directorate-General of Health. The programme provides for a screening component by calculating the risk of Type 2 Diabetes and a prevention programme for people identified at increased risk

(moderate, high and very high). The National management of the Programme will be centralised in the NPD/DGH while the local management will be the responsibility of the FCUDs that implement it. In 2021 the materials for the educational sessions of the prevention programme were prepared, in its face-to-face version (to be promoted by the FCUD) and online version (with the use of the “NAU - Teaching and Training for Large Audiences” platform planned).

3.3. Promotion of Good Practices, Quality and Safety

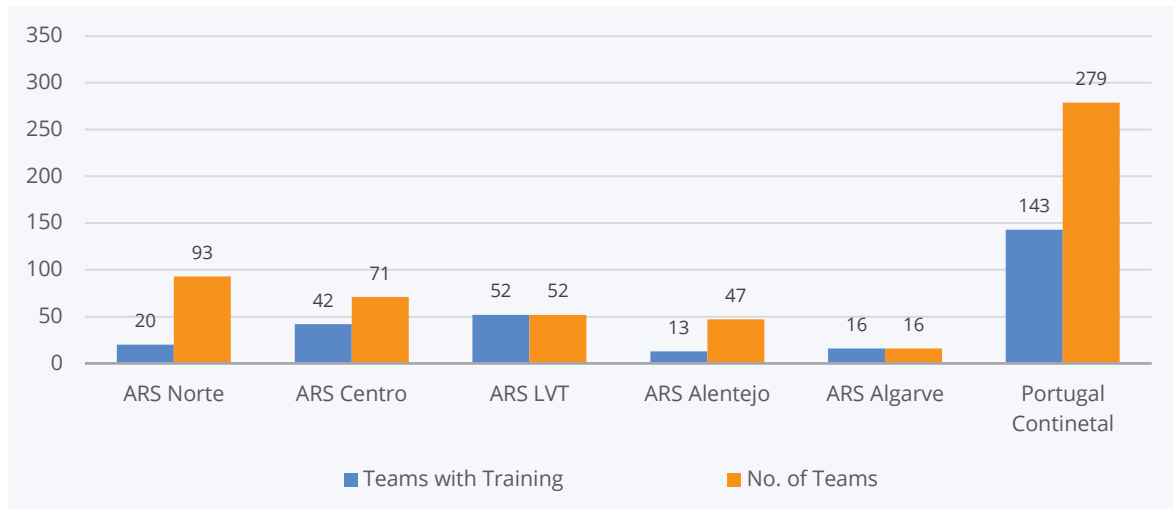
In recent years, we have witnessed a rapid evolution in monitoring methods, pharmacological treatment and technologies in the area of Diabetes. These developments allow for improved disease control, reduced complications and improved quality of life for people with Diabetes. Alongside these developments, the constraints caused by the COVID-19 pandemic have brought new challenges to the implementation of good practice in the field of Diabetes: mainly difficulties but also opportunities for innovation and developments that may contribute to the improvement of care in the future.

- **Continuous Subcutaneous Insulin Infusion (CSII) Treatment Programme.** This type of treatment for Type 1 Diabetes allows for better glycaemic control, with fewer complications and better quality of life. In 2021, the management of the CSII treatment programme involved several activities of the National Programme for Diabetes:
 - Liaison with the Treatment Centres and structures of the Ministry of Health;
 - Management of the CSII Platform;
 - At the end of each year, the needs for the acquisition of CSII devices and relevant consumables for the following year are accounted for. The 2020 State Budget foresaw the availability of CSII devices for all eligible Type 1 Diabetes patients, regardless of age. Thus, in accounting the purchasing needs for 2021 and 2022, all eligible people were considered, taking into account the placement capacity of new CSII devices of each Treatment Centre;
 - **Three new Treatment Centres** were created (two in the RHA for the LTV Region - Beatriz Ângelo Hospital, Setúbal Hospital; one in the RHA for the Alentejo Region - Beja HC, thus, mainland Portugal now has 24 Treatment Centres spread across the 5 RHA;
 - There is an increasing number of people in treatment with CSII under this Programme: 1,313 by the end of 2015, 3,540 by the end of 2020 and 3,859 by the end of 2021;
 - Due to the clinical benefits for selected patients, the NPD considered it important to promote the introduction of new types of devices (**integrated devices with Real-Time Continuous Glucose Monitoring/hybrid devices and adhesive devices**), which would thus be reimbursed by the NHS under this CSII treatment programme. These new types of devices have advantages in controlling the disease, reducing complications and improving satisfaction and quality of life. In addition to the NPD and a working group with experts on CSII, the working group to achieve this goal includes CAHS, INFARMED and SSMH. This work has been ongoing since the beginning of 2019. In this context, in 2021 a new Framework Agreement was published that includes the new types of devices; the burden of this programme

was estimated and a joint proposal was prepared that was accepted by the Health Ministry; and at the end of the year, the prior evaluation of the new devices was still ongoing. The introduction of new devices came to occur during 2022 (337 integrated/hybrid devices and 150 patch/micro pump devices), according to the distribution by Treatment Centres planned at the end of 2021;

- Information No. 002/2017 dated 6/2/2017, on **Protocol of Care for Patients with Continuous Insulin Subcutaneous Perfusion Devices and Related Consumables**, was updated on 9/11/2021.
- Promotion of appropriate treatment and integration of **Children and Young People with Type 1 Diabetes Mellitus at school**. These Children and Young People need proper management of insulin administration, diet and physical activity throughout the day, so school involvement in treatment is essential (13). In 2019, training support materials on Type 1 Diabetes in schools have been developed and the relevant support for Children and Young People with Diabetes in schools was regulated by the Ministry of Health and Ministry of Education (14):
 - In the context of COVID-19 pandemic in 2021, the training of School Health Teams remained limited (periods of lockdown of students, redistribution of tasks of health professionals). At the end of 2021, 51% of School Health Teams considered to have at least one person trained in Type 1 Diabetes.
 - With the aim of improving the knowledge of the population and promoting the integration of people with Type 1 Diabetes, NPD organised the Webinar "Experiencing Diabetes at School - Young People with Type 1 Diabetes: perspectives of improvement in daily life". Following questions about the disease asked to the public and recorded in different contexts (school/gymnasium, rural setting/city), a group of Young People with Type 1 Diabetes commented on the answers, shared experiences and prepared proposals for improvement. The Webinar was also attended by a diverse panel of people (namely from the Directorate-General of Education, Parents, Teachers, School Health teams, Associations), who made enriching comments and suggestions.

Figure 51. Number of School Health Teams with at least one member trained in Type 1 Diabetes in the last 3 years and total number of School Health Teams, by RHA, by the end of 2021



Source: RHA

- **Diabetic Retinopathy** Screening is essential for the early diagnosis and treatment of Diabetic Retinopathy, which can prevent over 90% of cases of severe vision loss and blindness.
 - In 2019, 2020 and 2021, 225,743, 102,487 and 185,356 people with Diabetes were screened respectively, corresponding to coverage rates of 49%, 26% and 35% and population screening rates of 31%, 14% and 23%. The drop in the results obtained in 2020 and 2021 reflects the constraints associated with the COVID-19 pandemic, making it important to increase population coverage and screening as soon as possible;
 - A survey of the needs to expand the coverage of screening in all the RHA was carried out and a project proposal was prepared for inclusion in the **Recovery and Resilience Plan**. The Recovery and Resilience Plan approved for Portugal included screening for Diabetic Retinopathy, to be executed by the various RHA, starting in 2022.
- Portugal has a high rate of lower limb amputations due to Diabetes, particularly major amputations. It is essential to prevent, detect and treat **diabetic foot** lesions early.
 - Systematic foot observation in the person with Diabetes allows to assess the degree of risk, guide prevention and early treatment of diabetic foot lesions. In 2019, foot observation was performed in 74% of people with Diabetes monitored at Primary Health Care level, a percentage that decreased to 59% in 2020 and 62% in 2021, following the constraints caused by the COVID-19 pandemic;
 - The needs identified by the ARSs were collected and signalled and proposals were made to improve diabetic foot screening and care within the scope of the Recovery and Resilience Plan and the “Recovering Health” plan. **The Recovery and Resilience Plan** approved for Portugal, whose implementation is the responsibility of the ARSs, foresees the extension of level 1 diabetic foot appointments to all the HCEG.

- Distance appointment in large numbers was a necessity imposed by the pandemic. In the area of Diabetes their use beyond the pandemic, in selected situations, can bring advantages. It is important, however, to ensure the quality of the consultation . Therefore, NPD:
 - Facilitated contact between the Functional Diabetes Coordinating Units (FDCUs) and the SSMH for training and use of the RSE Live tool;
 - Discussed quality criteria for Diabetes Online Appointments within its Scientific Board and produced a document with its conclusions, which was made available to the DQH.

- The National Programme for Diabetes joins forces with the National Programme for the Promotion of Physical Activity, as part of the coordination of the Diabetes in Movement Programme. This is a community physical exercise programme for people with Type 2 Diabetes, implemented in 32 municipalities and that in the 2018/2019 season. The Programme has been suspended since the start of the pandemic by COVID-19 and was interrupted throughout the year 2021.

- The production of standards and normative circulars aims to improve the quality of care and reinforce patient safety:
 - The following standards are still under revision/preparation, under the care of the Department of Quality in Health (DQH) of the DGH:
 - “Prevention, Diagnosis, Treatment, Follow-up and Referral of Diabetic Foot in the Adult and Elderly”;
 - “Prevention, Diagnosis and Treatment of Diabetic Kidney Disease in Adults”;
 - “Diagnosis, Therapy, Follow-up and Referral of Type 2 Diabetes”.
 - Aiming to improve the quality of care provided to people with Type 1 Diabetes, the NPD proposed the revision of the normative circular 15/DSCS/DGID of 2008 on “Integrated Management of Diabetes - Application to Treatment Centres for Continuous Insulin Subcutaneous Infusion”. The issue was discussed in NPD working meetings with a group of experts and in the Programme Scientific Board with a view to drafting a new proposal on **Integrated Management of Type 1 Diabetes** for patients on treatment with and without CSII.

- The Directorate-General of Health periodically promotes tenders for the attribution of financial support to non-profit private collective entities, under Decree-Law No. 186/2006, of 12 September, and Ordinance No. 418/2007, of 13 April. In September 2020, the opening of an application process for public funding of a project under the National Programme for Diabetes was published (notice No. 26/2020 of the Financial Support Programme Management Centre). This project aims to promote the improvement of healthcare for adults with Diabetes and the empowerment of formal and informal caregivers. The project includes the creation of an **interactive digital platform for people with Diabetes and their formal and informal caregivers**. 4 projects were admitted to the competition, and the APPD project for people with type 2 Diabetes and their carers (eDiabetes) was selected and is underway. The institution is in the project implementation phase. A postponement of its completion was requested, and the project is expected to be completed in the first half of 2023. At the end, the platform will be available for use by

the Directorate General of Health, with the intention of integrating it into the NHS tools, so that it can enhance its future use by people with Type 2 Diabetes and their caregivers.

- Transversal to the three major operational targets of the NPD is the participation in the monitoring committee of the National Health Plan 2021-30. In this context, specific contributions were made during its construction, especially in the area of Diabetes.

3.4. Inter-institutional Collaboration and with Civil Society

The NPD participated in the following initiatives promoted by other entities:

- **Central Administration of the Health System.** “Annual Report. Access to healthcare in NHS facilities and procured entities 2020.” As in previous years, in 2021, the SNP contributed to the relevant chapter of the access report.
- **Rotary Anti-Diabetes Front (RADF),** Collaboration on dissemination materials, presentations and preparation of film to be used in virtual sessions promoted in collaboration with NAAPA and with the participation of health professionals, namely from the FCUD.
- **Institute of Health Sciences of the Portuguese Catholic University.** Participation in the Think Tank (2018-2019), which resulted in the publication and public launch (2021) of the “National Strategic Consensus for Type 1 Diabetes”.
- **Institute for Evidence-Based Health (IEBH), Faculty of Medicine, University of Lisbon.** “D-Way Initiative - a new pathway for Diabetes”. Participation with conference presentation, interview, document review and panel discussion.
- **Portuguese Association of Hospital Administrators.** “A Recovery and Resilience Plan for Diabetes”. Integration of the steering committee of the initiative.
- **GIROhc Association - caring for the person with Diabetes.** Rethink Carbohydrate Options Influence Group, whose project includes the preparation of a set of interactive computer games to promote healthy lifestyles and knowledge about Diabetes. Collaboration in content review and scientific sponsorship of the project.
- As part of the centenary celebrations of the discovery of Insulin, collaboration with:
 - **Ernesto Roma Foundation** (participation with Diabetes 2021, “Diabetes and Insulin” contest);
 - **Faculty of Science and Technology of the University of Algarve.** Creation of a “Time Capsule” to be opened after 100 years (NPD's participation with the winning films of the competition “Diabetes and Insulin”, which were sent for inclusion in the time capsule).
- Opinions on proposals from parliamentary groups and petitions to Parliament, on Treatment with CSII, Diabetic Foot Care, National Register of Type 1 Diabetes.
- The Assembly of the Republic published **law 75/2021** of 18 November, which “Strengthens access to credit and insurance contracts by people who have overcome or mitigated situations of aggravated health risk or disability, prohibiting discriminatory practices and enshrining the right to be forgotten”. NPD's prior opinion of the importance of people with Diabetes being included. Not only people who no longer have Diabetes, but also those who have the disease adequately controlled will benefit from the new law.

- **National Youth Plan 2022.** In 2021, proposals for the National Youth Plan for Diabetes were developed.

3.5. Communication

Within the scope of information dissemination, organised events and collaboration with the media, the following are mentioned:

- Preparation of **infographics** published on the DGH website and social networks.
- Publication of a **film** on Diabetes Prevention and Control on the DGH website and social networks in April 2021. A 30" version was also produced and posted on YouTube on 28/04/2021 and reached 300,000 views in January 2021 ([Prevent Diabetes - YouTube](#))
- **Events and initiatives** organised by NPD:
 - **5th National Meeting of the FCUD**, virtual format, 06/10/2021;
 - *"The symbol of World Diabetes Day has been a blue circle since 2007, the year it became a United Nations Day. The circle represents the universal union of life and health. Blue represents the colour of the sky that unites all Nations on Earth and is also the colour of the United Nations flag."* In this context, the NPD promoted the **lighting of monuments in blue** as a way to raise awareness of the importance of Diabetes prevention and control. In addition to the lighting of the DGH and Ministry of Health buildings on the nights of 13 and 14 November, the UDFUs and municipalities were invited to participate in this initiative, and several municipalities and UDFUs in mainland Portugal joined in.
 - Experiencing Diabetes at School. Webinar **"Young people with type 1 Diabetes: perspectives for improvement in everyday life"**, 24/11/2021;
 - Award ceremony for the winning schools of the competition for making a film **"Diabetes 2021 - Diabetes and Insulin"**, virtual format 24/11/2021.
- Participation/representation in various events: congresses, meetings, scientific meetings, master's degrees and others organised by the Civil Society.
- Participation in interviews, television programmes, magazine/newspaper articles and other media collaborations.

3.6. Publications

Documents published in 2021 or being edited for publication:

- Documents originating from the NPD/DGH:
 - DGH Order 10/2021 of 20/4/2021, "[Appointment of the members of the Scientific Council of the Priority Health Programme for Diabetes](#)" (15);
 - Update of Information 2/2017 on "[Update on Protocol of Care for Patients with Continuous Insulin Subcutaneous Perfusion Devices and Related Consumables](#)", 09/11/2021 (16);
 - "National Programme for Diabetes 2019. Challenges and Strategies." Sónia do Vale, Ana Filipa Martins, Diogo Cruz, Graça Freitas. Portugal. Ministry of Health. Directorate-General of Health. Lisbon, Directorate-General of Health 2020. ISBN:

- 978-972-675-302-5. By the end of 2021, revised Portuguese version and English version (11) (17);
- “Monitoring and evaluation of diabetic retinopathy screening in 2017/2018” (18);
 - “Monitoring and evaluation of diabetic retinopathy screening in 2019. 2020 report” (19);
 - “Monitoring and evaluation of diabetic retinopathy screening in 2020. Report 2021” (20).
- Participation in documents published by other entities:
 - Chapter on the National Programme for Diabetes on the [“Annual report – access to healthcare in NHS facilities and contracted entities 2020”](#). Ministry of Health (21);
 - [A RRP for Diabetes – a rebuilding plan for Diabetes. Portuguese Association of Hospital Administrators](#) (22).

4. Action Plan for the triennium 2022 – 2024

4.1. Health Goals and Targets for the triennium 2022 – 2024

- A. Reducing the development of Diabetes in at-risk NHS users identified through the Type 2 Diabetes risk assessment:
- Achieve $\geq 2,500,000$ patients on average with updated Type 2 Diabetes risk calculation annually;
 - Achieve $\geq 5,000$ patients involved in Type 2 Diabetes prevention programmes by the end of 2024.
- B. Increase the number of diabetes diagnoses through early diagnosis to reduce the number of people who are unaware they have the disease:
- $\geq 150,000$ new diagnostic records in 3 years;
 - Increase by $\geq 30,000$ the total number of people with registered Diabetes by the end of 2024.
- C. Reduce diabetes morbidity and mortality:
- Increase by $\geq 66\%$ the proportion of patients with $HbA1c \leq 8\%$ by end 2024;
 - Increase by $\geq 50\%$ the proportion of patients with $c\text{-LDL} < 100\text{mg/dL}$ by the end of 2024;
 - Increase by ≥ 6000 the number of patients in treatment with CSII by the end of 2024;
 - Increase by $\geq 85\%$ the population coverage rate of diabetic retinopathy screening by the end of 2024;
 - Increase by $\geq 50\%$ the population screening rate for diabetic retinopathy by the end of 2024;
 - Reduce the number of major diabetic foot amputations by 15% by the end of 2024;
 - Decrease premature mortality from diabetes < 70 years in Portugal by 5% by the end of 2024.

4.2. Implementation

Table 40. Implementation: goals and targets 2024

2024 Targets	Goals
A	1. Carry out risk assessment for Type 2 Diabetes in the adult population
	2. Promote prevention programme(s) for the population at risk of developing Type 2 Diabetes
B	3. Increase the number of new diagnoses of Diabetes through early diagnosis of those identified at increased risk of developing Type 2 Diabetes
	4. Promote Good Practice in Diabetes Care
C	5. Increase access to treatment with SCII and integrated CSII and Continuous Glucose Monitoring Systems
	6. Increase coverage of Diabetic Retinopathy screening and promote early treatment of positive cases
	7. Increase coverage of early screening and treatment of diabetic foot lesions and

reduce the number of major diabetic foot amputations

8. Reduce premature mortality <70 years by Diabetes

4.3. Monitoring

Table 41. Indicators for monitoring the 2024 targets

2024 Targets	Indicator	2020 Value	2021 Value	Source / Note
A	Ind.1 Adult non Diabetes patients with recorded PHC Type 2 Diabetes risk assessment in the last 3 years	2.487.768	2.431.050	SIARS (numerator of indicator 2013.262.01 FL)
	Ind. 2 Patients involved in Type 2 Diabetes prevention programmes	NA	NA	NAU Platform and SCLinico (prevention module)*/FCUD
B	Ind. 3 Number of service patients newly diagnosed with Diabetes Mellitus	52.126	74.396	SIARS / SIM@SNS (numerator of indicator MORB.236.01 FL)
	Ind. 4 Number of service patients diagnosed with Diabetes Mellitus	833.315	857.272	SIM@SNS (numerator of indicator MORB.198.01 FL)
C	Ind. 5 Proportion (%) of patients with Diabetes with last HbA1c≤8%	47 (a)	54	SIM@SNS (2013.039.01 FL)
	Ind. 6 Proportion (%) of Diabetes patients with c-LDL <100mg/dL	37	43	SIM@SNS (2015.315.01 FL)
	Ind. 7 No. of patients receiving treatment with Continuous Subcutaneous Insulin Infusion (CISI)	3.540	3.859	CSII Platform/Register
	Ind. 8 Population coverage rate of diabetic retinopathy screening	26 (b)	36	SiiMA Reports/ DRR Monitoring Platform
	Ind. 9 Population screening rate for diabetic retinopathy (%)**	14	23	SiiMA Reports/ DRR Monitoring Platform
	Ind. 10 Proportion of patients with foot examination in the last year (%)	59	62	SIM@SNS (2013.035.01 FL)
	Ind. 11 Number of major amputations with primary or secondary diagnosis of Diabetes	1.173 (c)	NA	Diabetes/HMD/CAHS Dashboard
	Ind. 12 Rate of major amputations	12,5	NA	OECD - Health at a Glance
	Ind. 13 Standardised Premature Mortality Rate from Diabetes < 70 years (per 100,000 population, using 2013 standard population)	4,7	NA	SICO/DGH/NIS SICO/Diabetes dashboard

NA* - not applicable; * dependent on developments by SSMH; ** pre-pandemic COVID-19 value of 30.6% in 2019; (a): 62% in 2019; (b): 49% in 2019; (c) coding may still be incomplete;1,251 in 2019 (source HMD/CAHS/extraction from Diabetes Dashboard on 7/3/2022).

4.4. Action Plan

4.4.1. Monitoring and Epidemiological Surveillance

Knowing the epidemiology of Diabetes and its evolution is fundamental to adopting adequate health policies.

Proposed activities:

- Prepare annual reports on the NPD;
- Prepare annual Diabetic Retinopathy Screening (DRS) reports;
- Promote the Diabetes Dashboard update;
- Promote registration of type 1/type 1 Diabetes diagnosis;
- Request improvements/new system for recording treatment with CSII;

- f. Promote the availability of the Diabetes Prevention Module in the SClinico PHC and monitor the results of the MSMD prevention programme
- g. Propose the revision of the Diabetes Module in the Hospital SClinic;
- h. Prepare a proposal for the creation of Diabetes indicators for Hospital Care;
- i. Propose a study on the prevalence rate of Diabetes in Portugal;
- j. Evaluate the results of treatment with CSII;
- k. Assess the epidemiology of diabetic foot in mainland Portugal.

4.4.2. Health Promotion and Disease Prevention – Prevention and diagnosis

The prevalence rate of Diabetes has been increasing worldwide and the IDF (2) estimate for Portugal is growing, estimating that in 2030 the country will have a standardised prevalence rate of Diabetes in the population aged between 20 and 79 years of 10.3%. The adoption of measures to promote healthy lifestyles is essential for the prevention and control of Diabetes. The knowledge of risk facilitates diagnosis, population selection for the implementation of intervention programmes and early treatment, with a potential positive impact on disease prevention, early diagnosis, decreased morbidity and mortality.

Activity plan:

- a. Promote assessment of the risk of Type 2 Diabetes in the adult population:
 - i. At PHC level;
 - ii. In the community, through publicity campaigns and partnerships with municipalities and civil society;
- b. To prepare and implement the “More Health, Less Diabetes Project” to promote the diagnosis and prevention of Type 2 Diabetes, online and face-to-face versions;
- c. Hold the annual competition for students in schools in Portugal to make a film about Diabetes;
- d. Promote Diabetes literacy, namely on its prevention, diagnosis and fighting the stigma;
- e. Promote the establishment of partnerships (namely of FCUDs) with municipalities and civil society in the promotion of healthy lifestyles;
- f. Promote therapeutic education for people at risk;
- g. Promote early diagnosis by assessing the calculation of risk of developing Type 2 Diabetes.

4.4.3. Promoting Good Practice, Quality and Safety – Reducing Diabetes Morbidity and Mortality

Diabetes complications lead to significant morbidity, with high costs to self and society. Good control of Diabetes and other cardiovascular risk factors reduces the incidence and progression of Diabetes-related complications and mortality, particularly premature mortality from Diabetes.

Activity plan:

- a. Management of treatment with CSII, promote access to this type of treatment and to new technologies in this field (namely integrated devices with continuous glucose monitoring, closer to the “artificial pancreas”; adhesive devices; real-time continuous glucose monitoring; and applications to support Diabetes management);
- b. Review the organisation of healthcare for patients with Type 1 Diabetes (including the revision of the normative circular 15/2008 on Integrated Management of Type 1 Diabetes);
- c. Promote training of School Health and School Community teams on Type 1 Diabetes;

- d. Promote the publication by the DQH, of the standards on:
 - i. “Prevention, Diagnosis, Treatment, Follow-up and Referral of Diabetic Foot in the Adult and Elderly”;
 - ii. “Prevention, Diagnosis and Treatment of Diabetic Kidney Disease in the Adult”;
 - iii. “Diagnosis, Therapy, Follow-up and Referral of Type 2 Diabetes”;
- e. Promote therapeutic education of people with Diabetes:
 - i. Promote the systematisation of therapeutic education and the monitoring of its implementation;
 - ii. Monitor the creation of the Type 2 Diabetes management platform for people with the disease and their formal and informal carers (eDiabetes) and promote its availability within the NHS tools;
- f. Promote the reversal of Type 2 Diabetes:
 - i. Participation in the Joint Action “Reverse Diabetes2 Now/Care4Diabetes” to implement a project to reverse/improve the control of Type 2 Diabetes;
- g. Promote the expansion of the coverage of the Diabetes on the Move Programme and the inclusion of training content in the relevant sessions;
- h. Promote the implementation of telemonitoring programme for Diabetes;
- i. Promote population-based screening for diabetic retinopathy screening (DRS) and its treatment
 - i. Monitor and promote the execution of the DRS recovery and resilience plan by the RHA;
 - ii. Promote the implementation of the DRS standard;
 - iii. Propose the inclusion of TMRG for diabetic retinopathy appointment;
 - iv. Propose a review of the funding/contractualisation of diabetic retinopathy treatment;
- j. Promote early screening and treatment of diabetic foot:
 - i. Promote observation and assessment of the degree of diabetic foot risk;
 - ii. Promote the execution of the Recovery and Resilience Plan by the Regional Health Authorities, which includes the expansion of level 1 diabetic foot appointments in all the Regional Health Authorities;
 - iii. Propose the inclusion of TMRG for diabetic foot appointment at hospital level;
 - iv. Propose the creation of own funding/contractualisation for multidisciplinary diabetic foot appointment;
 - v. Promote the treatment and rehabilitation of people with amputations and other diabetic foot injuries;
- k. Participate in the Healthier Together - EU Non-Communicable Diseases Initiative (EU4Health Programme), in particular the Joint Action on Cardiovascular Diseases and Diabetes;
- l. Promote the quality of care for people with Diabetes using social support facilities.

4.4.4. Other – transversal to the various purposes

Actions to be taken:

- a. Participate in the commission to monitor the National Health Plan 2021-2030;
- b. Promote the appointment of the FCUD for the triennium 2023-2025;
- c. Review of the NPD website;
- d. Partnerships with other priority programmes;
- e. Intra- and inter-institutional collaboration;
- f. Collaboration with civil society and the media.

Final Notes

Portugal has a high prevalence rate of Diabetes, which is associated with acute and chronic complications, with high costs, both personal and for family and society in general.

Promoting prevention programmes, early diagnosis of Diabetes, with the aim of reducing the growth of the disease and providing all people equitably with access to the best healthcare, are the major challenges of the NPD.

In 2021, the context of the COVID-19 pandemic conditioned both the activity of the teams in providing care to the person with Diabetes and the implementation of some activities planned by the NPD.

At this time, it is essential to continue to know the epidemiology of Diabetes and monitor Diabetes-related assistance in order to define appropriate health strategies and improve outcomes.

It is important to continue to promote literacy and the adoption of healthy lifestyles as well as to promote screening and early diagnosis of Diabetes.

It is absolutely necessary to continue to provide access to new methods of monitoring, pharmacological treatment and new technologies that will improve the control of the disease, reduce complications and improve the quality of life of people with Diabetes.

It is urgent not only to recover post pandemic COVID-19, but to increase, the coverage of early screening and treatment of diabetic retinopathy and diabetic foot to the entire population with Diabetes.

Thus, the NPD commits to continue working with the aim of promoting health and preventing Diabetes, promoting quality of care and preventing or minimising its complications.

Bibliographical references

1. *Prevalence, awareness, treatment and control of diabetes in Portugal: Results from the first National Health examination Survey* (INSEF 2015). Barreto M, Kislaya I, Gaio V et al, INSEF Research Group. 2018, Diabetes Research and Clinical Practice., Vol. 140, pp. 271-8.
2. International Diabetes Federation. IDF Diabetes Atlas 9th edition. 2019.
3. International Diabetes Federation. Diabetes Atlas 10th edition 2021. 2021.
4. Matos T, Figueiredo R, Portugal C, do Vale S. Monitorização do tratamento com perfusão subcutânea contínua de insulina em Portugal. *Rev Port Endocrinol Diabetes Metab.* 2022, 17(1): 98-99.
5. Figueiredo AR, Matos T, do Vale S. *Monitoring of continuous subcutaneous insulin infusion treatment in Portugal and its implications for diabetes management.* Hormes (aceite para publicação).
6. Observatório Nacional da Diabetes. Diabetes: Factos e Números - O Ano de 2015. 2016.
7. Massi-Benedetti M, CODE-2 Advisory Board. *The cost of diabetes Type II in Europe: the CODE-2 Study.* *Diabetologia.* 2002, Vol. 45 (7), pp. S1-4.
8. *The global economic burden of diabetes in adults aged 20-79 years: a cost-of-illness study.* Bommer C, Heesemann E, Sagalova V, Manne-Goehler J, Atun R, Bärnighausen T, et al. 6, s.l.: Lancet Diabetes, 2017, Vol. 5, pp. 423-30.
9. OECD. Health at a Glance 2021: OECD Indicators. OECD Publishing, Paris, 2021.
10. Programa Nacional para a Diabetes. Programa Nacional para a Diabetes 2017. Lisboa : Direção-Geral da Saúde., 2017.
11. Programa Nacional para a Diabetes (PND) (*National Program for Diabetes (NPD)*), do Vale S, Martins AF, Cruz D, Freitas G. *National Program for Diabetes 2019. Challenges and Strategies.* s.l. : Direção-Geral da Saúde, 2020. ISBN: 978-972-675-302-5.
12. Programa Nacional para a Diabetes. Monitorização e Avaliação do Rastreamento da Retinopatia Diabética em 2019. Relatório 2020. s.l. : Direção-Geral da Saúde Ministério da Saúde, 2020. 978-972-675-330-8.
13. Crianças e Jovens com Diabetes Mellitus tipo 1. Manual de Formação para Apoio aos Profissionais de Saúde e de Educação. Lisboa : Direção-Geral da Saúde. Ministério da Saúde, 2019. 978-972-675-291-2..
14. Educação e Saúde - Gabinetes do Ministro da Educação e da Ministra da Saúde. Despacho n.º 8297-C/2019. Aprovação do regulamento de enquadramento do apoio às crianças e jovens com Diabetes Mellitus tipo 1 na Escola. Diário da República n.º 179/2019, 1º Suplemento, Série II. 2019-09-18.
15. Direção-Geral da Saúde. Designação dos membros que integram o Conselho Científico do Programa Nacional de Saúde Prioritário para a área da Diabetes. Despacho 10/2021. 2021.

16. Atualização Sobre Protocolo de Cuidados a Utentes com Dispositivos de Perfusão Subcutânea Contínua de Insulina e Respetivos Consumíveis. Informação 2/2017 de 06/02/2017 atualizada a 09/11/2021. 2021.
17. do Vale S, Martins AF, Cruz D, Freitas G. Programa Nacional para a Diabetes. Programa Nacional para a Diabetes 2019. Desafios e Estratégias. Lisboa : Direção-Geral da Saúde, Ministério da Saúde., 2020. ISBN: 978-972-675-302-5.
18. do Vale S, Portugal C, Programa Nacional para a Diabetes,. Monitorização e avaliação do rastreio da retinopatia diabética. Relatório 2017-2018. Lisboa : Direção-Geral da Saúde, 2019. ISBN: 978-972-675-299-8.
19. Programa Nacional para a Diabetes, Direção-Geral da Saúde. Monitorização e Avaliação do Rastreio da Retinopatia Diabética em 2019. Relatório 2020. s.l. : Ministério da Saúde, 2020. ISBN: 978-972-675-330-8.
20. do Vale S, Portugal C, Programa Nacional para a Diabetes. Monitorização e avaliação do Rastreio da Retinopatia Diabética em 2020. Relatório 2021. Portugal : Direção-Geral da Saúde, 2021. ISBN: 978-972-675-329-2.
21. Ministério da Saúde. Relatório Anual. Acesso a cuidados de saúde nos estabelecimentos do SNS e entidades convencionadas em 2020. 2021.
22. Um PRR para a Diabetes. Um Plano de Reconstrução para a Diabetes. Iniciativa da Administração Portuguesa de Administradores Hospitalares. 2021.

Annexes

Type 1 Diabetes

Table 42. Type 1 Diabetes cases registered in Portugal (DOCE)

	2016	2017	2018	2019	2020
No. of registered cases ≤14 years old	2 291	2 152	1 932	1 760	1 567
Prevalence Rate ≤14 years	167	158	144	132	119
Female (No.)	1 068	1 008	914	815	710
Male (No.)	1 223	1 144	1 018	945	857
No. of new cases of T1DM registered, ≤14 years	236	234	174	141	137
Incidence rate ≤14 years	17	17	13	11	10
Female (No.)	99	110	66	54	58
Male (No.)	137	125	108	87	79
No. of registered cases ≤19 years old	4 217	4 080	3 927	3 660	3 324
Prevalence Rate ≤19 years	222	217	211	198	182
Female (No.)	1 933	1 885	1 789	1 676	1 518
Male (No.)	2 284	2 195	2 138	1 984	1 806
No. of new cases of T1DM registered, ≤19 years	282	294	221	173	170
Incidence rate ≤19 years	15	16	12	9	9
Female (No.)	120	139	85	66	70
Male (No.)	162	155	136	107	100

Source: Diabetes Registry - Children and Youth Registry (DOCE), DGH, 2022. Note: Incidence and prevalence are underestimated due to incomplete records. Rates calculated based on DOCE records; Prevalence and incidence rates per 100 000 inhabitants.

Table 43. Type 1 Diabetes cases registered at Primary Health Care level in the NHS in Mainland Portugal

	2018	2019	2020
No. of registered cases ≤14 years old	1 373	1 407	1 405
Prevalence Rate ≤14 years	102	106	106
Female (No.)	642	661	653
Male (No.)	731	746	752
No. of registered cases ≤19 years old	2 811	2 875	2 867
Prevalence Rate ≤19 years	151	156	157
Female (No.)	1 275	1 314	1 332
Male (No.)	1 536	1 561	1 535
No. of registered cases ≤29 years old	6 071	6 225	6 365
Prevalence Rate ≤29 years	210	216	222
Female (No.)	2 747	2 813	2 909
Male (No.)	3 324	3 412	3 456

Source: SIM@SNS, 2022.

Gestational Diabetes

Table 44. Prevalence and Therapeutics of Gestational Diabetes in Portugal in the NHS | 2016-2020

	2016	2017	2018	2019	2020
No. of deliveries of women with Gestational Diabetes	5 156	4 085	4 385	4 065	4 932
Total No. of deliveries	68 846	70 013	71 437	71 494	68 069
No. (%) of deliveries by Caesarean section in Gestational Diabetes	1 799 (35%)	1 389 (34%)	1 549 (35%)	1 461 (36%)	1 830 (37%)
No. (%) of caesarean sections in the total number of deliveries in the NHS	19 847 (28%)	18 824 (27%)	20 030 (28%)	20 954 (29%)	20 257 (30%)
Prevalence of Gestational Diabetes (GD)	7,5%	5,8%	6,1%	5,7%	7,2%
No. of deliveries with GD in clients < 20 years old	39	30	35	37	31
No. of deliveries with GD in clients aged 20-29	1 134	948	1 060	1 006	1 222
No. of deliveries with GD in clients aged 30-39	3 324	2 622	2 717	2 470	3 051
No. of deliveries with GD in clients aged ≥40 years	657	483	573	552	628
Prevalence of GD in patients < 20 years	1,8%	1,4%	1,8%	1,8%	1,8%
Prevalence of GD in patients aged 20-29	4,5%	3,8%	4,2%	4,0%	5,0%
Prevalence of GD in patients aged 30-39	8,4%	6,7%	6,9%	6,3%	8,2%
Prevalence of GD in patients aged ≥40 years	16,2%	11,2%	12,4%	11,3%	13,1%

GD: Gestational Diabetes. Sources: Diabetes Dashboard, consulted on 24/06/2022 (The hospital morbidity data presented in the Diabetes Dashboard at the date of appointment were obtained from the version of the HMD made available by the CAHS on 03/12/2021). Business Intelligence for Hospital Morbidity - BIMH, consulted on 24/06/2022 (Data are loaded weekly, and all episodes coded by hospitals (in ICD9CM or ICD10CM/PCS, with valid codes) from 1 January 2013 to 15 June 2022 are available on the date of appointment).

Type 2 Diabetes Risk Assessment

Table 45. Proportion of patients with risk assessment for Type 2 Diabetes recorded in Primary Health Care, by RHA and in Mainland Portugal

		2016/2018	2017/2019	2018/2020
RHA for the North Region	N°	1 056 620	1 290 736	1 239 197
	% of target population	48	57	54
RHA for the Centre Region	N°	309 660	408 389	416 464
	% of target population	30	39	39
RHA for the LTV Region	N°	430 042	616 683	629 413
	% of target population	23	32	32
RHA for the Alentejo Region	N°	102 634	123 016	120 587
	% of target population	36	42	41
RHA for the Algarve Region	N°	54 069	79 081	82 223
	% of target population	23	32	33
Mainland Portugal	N°	1 953 025	2 517 905	2 487 884
	% of target population	35	44	42

Source: SIM@SNS, 2022.

Diabetes Diagnosis Record

Table 46. Proportion of patients diagnosed with Diabetes registered in Primary Health Care, by RHA and in Mainland Portugal

		2016	2017	2018	2019	2020
RHA for the North Region	Nº	290 596	297 435	304 651	311 778	314 845
	% of registrations	7,9	8,0	8,2	8,3	8,4
RHA for the Centre Region	Nº	146 747	152 371	155 983	157 758	159 585
	% of registrations	8,4	8,6	8,8	8,8	8,9
RHA for the LTV Region	Nº	257 973	263 512	269 095	275 116	275 386
	% of registrations	7,0	7,2	7,2	7,3	7,3
RHA for the Alentejo Region	Nº	46 952	47 936	48 426	48 757	48 612
	% of registrations	9,5	9,6	9,7	9,7	9,6
RHA for the Algarve Region	Nº	30 751	31 883	33 132	34 571	34 887
	% of registrations	7,0	7,0	7,0	7,1	7,0
Mainland Portugal	Nº	773 019	793 137	811 287	827 980	833 315
	% of registrations	7,7	7,9	8,0	8,0	8,1

Source: SIM@SNS, 2022.

Table 47. Number of service patients with Type 2 Diabetes and proportion of service patients with Type 2 Diabetes in the universe of people with primary health care records in Mainland Portugal

		2016	2017	2018	2019	2020
RHA for the North Region	NA	NA	278 110 (91%)	285 682 (92%)	288 823 (92%)	
RHA for the Centre Region	NA	NA	141 695 (91%)	144 082 (91%)	146 203 (92%)	
RHA for the LVT Region	NA	NA	247 978 (92%)	253 524 (92%)	253 526 (92%)	
RHA for the Alentejo Region	NA	NA	44 232 (91%)	44 651 (92%)	45 52 (92%)	
RHA for the Algarve Region	NA	NA	29 691 (90%)	31 096 (90%)	31 452 (90%)	
Mainland Portugal	NA	NA	741 697 (91%)	759 035 (92%)	764 556 (92%)	

Source: SIM@SNS, 2022.

Diabetic Retinopathy Screening

Table 48. Monitoring of Diabetic Retinopathy Screening, by Regional Health Administration and in Mainland Portugal

		2016 (%)	2017 (%)	2018 (%)	2019 (%)	2020 (%)
RHA for the North Region	No. HCEG/ULS with Screening	17	21	21	21	21
	Total HCEG/ULS	24	24	24	24	24
	Geographic Coverage / HCEG/USI	71%	88%	88%	88%	88%
	Eligible Population (n)	262 821	249 908	285 455	312 602	281 875
	No. of Invited Patients (n)	106 565	175 780	184 730	186 607	106 617
	No. Screened Patients (n)	68 309	105 462	121 363	124 231	67 255
	Screening Adherence Fee	64%	60%	66%	67%	63%
	Population Coverage Rate	41%	70%	65%	63%	38%
	Population Screening Rate	26%	42%	43%	42%	24%
	No. of Positive Cases (n)	2 121	4 370	4 329	6 851	3 449
	% Positive Cases	3,0%	4,1%	3,6%	5,5%	5,1%
	RHA for the Centre Region	No. HCEG/ULS with Screening	7	6	6	6
Total HCEG/ULS		8	8	8	8	8
Geographic Coverage / HCEG/USI		88%	75%	75%	75%	75%
Eligible Population (n)		148 133	152 184	129 670	145 380	132 321
No. of Invited Patients (n)		20 301	18 029	14 028	19 605	8 667
No. Screened Patients (n)		18 845	13 803	9 907	14 875	6 673
Screening Adherence Fee		93%	77%	71%	76%	36%
Population Coverage Rate		14%	12%	11%	14%	30%
Population Screening Rate		13%	9%	8%	10%	11%
No. of Positive Cases (n)		600	361	156	439	841
% Positive Cases		3,0%	2,6%	1,6%	3,0%	13,0%
RHA for the LVT Region		No. HCEG/ULS with Screening	11	15	15	15
	Total HCEG/ULS	15	15	15	15	15

RHA for the LVT Region	Geographic Coverage / HCEG/USI	73%	100%	100%	100%	100%
	Eligible Population (n)	231 060	238 136	247 249	212 333	239 195
	No. of Invited Patients (n)	76 056	136 744	144 985	151 255	71 496
	No. Screened Patients (n)	47 784	74 744	80 228	81 638	25 670
	Screening Adherence Fee	63%	55%	55%	54%	36%
	Population Coverage Rate	33%	57%	59%	71%	30%
	Population Screening Rate	21%	-31%	32	38	11
	No. of Positive Cases (n)	3 337	3 550	4 519	2 120	722
	% Positive Cases	7,0%	4,7%	5,6%	2,6%	2,8%
RHA for the Alentejo Region	No. HCEG/ULS with Screening	4	2	2	2	3
	Total HCEG/ULS	4	4	4	4	4
	Geographic Coverage / HCEG/USI	100%	50%	50%	50%	75%
	Eligible Population (n)	46 795	27 649	27 829	48 687	48 669
	No. of Invited Patients (n)	9 360	9 999	10 944	7 891	5 582
	No. Screened Patients (n)	7 144	6 956	6 725	4 999	2 889
	Screening Adherence Fee	76%	70%	61%	63%	52%
	Population Coverage Rate	14%	36%	39%	29%	12%
	Population Screening Rate	13%	25%	24%	18%	6%
RHA for the Algarve Region	No. of Positive Cases (n)	321	321	360	217	106
	% Positive Cases	5,0%	4,6%	5,4%	4,3%	3,7%
	No. HCEG/ULS with Screening	3	3	3	3	3
	Total HCEG/ULS	3	3	3	3	3
	Geographic Coverage / HCEG/USI	100%	100%	100%	100%	100%
	Eligible Population (n)	30 964	32 342	33 529	34 571	32 800
	No. of Invited Patients (n)	24 739	NA	NA	NA	NA
	No. Screened Patients (n)	16 444	NA	NA	NA	NA
	Screening Adherence Fee	66%	NA	NA	NA	NA
Mainland Portugal	Population Coverage Rate	80%	NA	NA	NA	NA
	Population Screening Rate	53%	NA	NA	NA	NA
	No. of Positive Cases (n)	1675	NA	NA	NA	NA
	Positive Cases	10%	NA	NA	NA	NA
	No. HCEG/ULS with Screening	42	47	47	47	48
	Total HCEG/ULS	54	54	54	54	54
	Geographic Coverage / HCEG/USI	78%	87%	87%	87%	89%
	Eligible Population (n)	719 773	700 219	723 702	738 858	734 405
	No. of Invited Patients (n)	237 021	340 582	354 687	365 358	192 362

No. Screened Patients (n)	158 526	200 965	218 223	225 743	102 487
Screening Adherence Fee	67%	59%	62%	62%	53%
Population Coverage Rate	32%	49%	49%	49%	26%
Population Screening Rate	22%	29%	30%	31%	14%
No. of Positive Cases (n)	8 054	8 602	9 364	9 627	5 118
% Positive Cases	5,0%	4,3%	4,3%	4,3%	5,0%

Source: RHA - SIIMA Screening, 2020 and 2021. Note: Geographic Coverage Rate: No. of HCEG with Screening / Total No. of HCEG in the Region; Eligible Population: Target Population - Excluded Population; No. of Invited Patients: No. of patients with invitation sent for Diabetic Retinopathy Screening; No. of Screened Patients: Total No. of eligible patients who underwent retinography (2 eyes) under the screening programme in the region; Screening adherence rate: No. of patients screened/No. of patients diagnosed with diabetes invited for screening; Population coverage rate: No. Patients diagnosed with diabetes invited for screening / Eligible Population in the region; Population screening rate: No. of Patients with Diabetes Screened in the region / No. of Patients diagnosed with diabetes eligible for screening in the region.

Diabetic foot

Table 49. Total risk assessments for diabetic foot ulcers per level of risk, carried out in Primary Health Care, by RHA and in Mainland Portugal

		2016	2017	2018	2019	2020
RHA for the North Region	N	NA	429 954	479 606	521 343	389 231
	Low [n (%)]	NA	392 333 (91%)	438 165 (91%)	477 554 (92%)	359 542 (92%)
	Average [n (%)]	NA	7974 (2%)	9132 (2%)	9705 (2%)	6652 (2%)
	High [n (%)]	NA	29 647 (7%)	32 309 (7%)	34 084 (6%)	23 037 (6%)
RHA for the Centre Region	N	130 257	133 966	152 230	175 347	139 278
	Low [n (%)]	114 516 (88%)	118 265 (89%)	138 674 (88%)	154 994 (88%)	125 303 (90%)
	Average [n (%)]	2991 (2%)	3226 (2%)	4035 (3%)	4566 (3%)	3185 (2%)
	High [n (%)]	12 750 (10%)	12 475 (9%)	14 521 (9%)	15 807 (9%)	10 790 (8%)
RHA for the LVT Region	N	151 079	152 677	190 921	239 408	174 675
	Low [n (%)]	128 678 (85%)	130 622 (85%)	162 357 (85%)	204 279 (85%)	151 909 (87%)
	Average [n (%)]	4331 (3%)	4227 (3%)	5691 (3%)	7530 (3%)	4896 (3%)
	High [n (%)]	18 070 (12%)	17 828 (12%)	22 873 (12%)	27 599 (12%)	17 870 (10%)
RHA for the Alentejo Region	N	59 905	58 388	65 847	70 624	48 917
	Low [n (%)]	50 366 (84%)	49 411 (85%)	57 326 (87%)	59 381 (84%)	42 490 (87%)
	Average [n (%)]	1478 (2%)	1297 (2%)	1346 (2%)	1887 (3%)	1156 (2%)
	High [n (%)]	8061 (14%)	7680 (13%)	7175 (11%)	9356 (13%)	5271 (11%)
RHA for the Algarve Region	N	17 855	20 491	26 931	33 754	27 242
	Low [n (%)]	15 616 (87%)	17 369 (85%)	22 596 (84%)	28 494 (84%)	23 188 (85%)
	Average [n (%)]	466 (3%)	767 (4%)	1078 (4%)	1318 (4%)	1012 (4%)

	High [n (%)]	1773 (10%)	2355 (11%)	3257 (12%)	3942 (12%)	3042 (11%)
	N	756 703	795 476	920 535	1 040 476	779 343
Mainland Portugal	Low [n (%)]	669 484 (89%)	708 000 (89%)	819 118 (89%)	924 702 (89%)	702 432 (90%)
	Average [n (%)]	17 057 (2%)	17 491 (2%)	21 282 (2%)	24 986 (2%)	16 901 (2%)
	High [n (%)]	70 162 (9%)	69 985 (9%)	80 135 (9%)	90 788 (9%)	60 010 (8%)

Source: SIM@SNS, 2022.

Table 50. Proportion of patients with Diabetes with active foot ulcer registered in Primary Health Care, by RHA and in Mainland Portugal

		2017	2018	2019	2020
RHA for the North Region	Nº	632	803	734	679
	%	0,23	0,28	0,25	0,23
RHA for the Centre Region	Nº	263	341	293	341
	%	0,2	0,25	0,21	0,24
RHA for the LVT Region	Nº	386	470	539	515
	%	0,18	0,21	0,23	0,22
RHA for the Alentejo Region	Nº	177	179	155	147
	%	0,38	0,38	0,33	0,31
RHA for the Algarve Region	Nº	33	52	37	32
	%	0,13	0,19	0,17	0,11
Mainland Portugal	Nº	1 491	1 845	1 758	1 714
	%	0,22	0,26	0,25	0,23

Source: SIM@SNS, 2022.

Pre-hospital assistance

Table 51. Gender and age group of the population using the NHS 24 service

		2016	2017	2018	2019	2020
Women	Nº	4 098	4 356	4 797	4 742	4 705
	%	60,81%	60,13%	59,49%	58,21%	58,30%
Men	Nº	2 641	2 888	3 267	3 404	3 372
	%	39,19%	39,87%	40,51%	41,79%	41,75%
≤29 years	Nº	122	185	235	263	269
	%	1,81%	2,55%	2,91%	3,23%	3,33%
30-59 years	Nº	1 022	1 333	1 553	1 579	1 690
	%	15,17%	18,40%	19,26%	19,38%	20,94%
≥60 years	Nº	4 495	5 726	6 276	6 034	6 111
	%	66,70%	79,04%	77,83%	74,07%	75,72%
Total	Nº	6 739	7 244	8 064	8 146	8 070

Source: SNS24

NHS hospital care in Mainland Portugal

Table 52. Number of admissions with at least one diagnosis of Diabetes (as main or associated diagnosis)

		2016	2017	2018	2019	2020
DM with ketoacidosis without coma	Hospitalisations (n)	1 380	1 225	1 390	1 402	1 370
	Outpatient (n)	0	0	1	1	0
	Subtotal (%)	4,44%	3,54%	3,66%	3,24%	3,62%
DM with ketoacidosis with coma	Hospitalisations (n)	ND	54	66	78	69
	Outpatient (n)	ND	6	5	2	1
	Subtotal (%)	ND	0,17%	0,19%	0,18%	0,18%
DM with hyperosmolarity without coma	Hospitalisations (n)	512	489	573	535	589
	Outpatient (n)	2	9	24	19	6
	Subtotal (%)	1,65%	1,44%	1,57%	1,28%	1,57%
DM with hyperosmolarity with coma	Hospitalisations (n)	ND	99	98	65	95
	Outpatient (n)	ND	0	0	0	0
	Subtotal (%)	ND	0,29%	0,26%	0,15%	0,25%
Hypoglycaemia without coma	Hospitalisations (n)	ND	520	504	447	347
	Outpatient (n)	ND	0	0	0	0
	Subtotal (%)	ND	1,50%	1,33%	1,03%	0,92%

Hypoglycaemia with coma	Hospitalisations (n)	ND	72	81	78	71
	Outpatient (n)	ND	0	0	0	0
	Subtotal (%)	ND	0,21%	0,21%	0,18%	0,19%
DM with coma (cause unspecified)	Hospitalisations (n)	95	ND	ND	ND	ND
	Outpatient (n)	0	ND	ND	ND	ND
	Subtotal (%)	0,31%	ND	ND	ND	ND
DM with renal manifestations	Hospitalisations (n)	879	703	503	550	466
	Outpatient (n)	177	572	731	397	285
	Subtotal (%)	3,40%	3,68%	3,25%	2,19%	1,98%
DM with ophthalmic manifestations	Hospitalisations (n)	498	3669	2123	1488	996
	Outpatient (n)	23 255	23 398	27 759	34 240	30 272
	Subtotal (%)	76,44%	78,19%	78,71%	82,52%	82,52%
DM with neurological manifestations	Hospitalisations (n)	190	111	93	108	66
	Outpatient (n)	0	0	1	1	2
	Subtotal (%)	0,61%	0,32%	0,25%	0,25%	0,18%
DM with peripheral circulatory alterations	Hospitalisations (n)	1506	1093	1236	1246	1328
	Outpatient (n)	17	3	14	30	10
	Subtotal (%)	4,90%	3,17%	3,29%	2,95%	3,53%
DM with diabetic arthropathy	Hospitalisations (n)	ND	26	22	23	23
	Outpatient (n)	ND	1	1	1	0
	Subtotal (%)	ND	0,08%	0,06%	0,06%	0,06%
DM with skin complications (dermatitis, ulcer)	Hospitalisations (n)	ND	718	952	843	703
	Outpatient (n)	ND	5	9	6	6
	Subtotal (%)	ND	2,09%	2,53%	1,96%	1,87%
DM with oral complications	Hospitalisations (n)	ND	1	1	1	0
	Outpatient (n)	ND	0	1	0	0
	Subtotal (%)	ND	0,00%	0,01%	0,00%	0,00%
DM with hyperglycaemia	Hospitalisations (n)	ND	1458	1436	1410	951
	Outpatient (n)	ND	0	0	1	0
	Subtotal (%)	ND	4,21%	3,78%	3,26%	2,51%
DM with other specified manifestations	Hospitalisations (n)	832	100	81	80	57
	Outpatient (n)	2	2	0	0	1
	Subtotal (%)	2,68%	0,29%	0,21%	0,18%	0,15%
DM with unspecified	Hospitalisations (n)	64	41	43	29	19

complications	Outpatient (n)	1	1	1	0	0
	Subtotal (%)	0,21%	0,12%	0,12%	0,07%	0,05%
DM with no mention of complications	Hospitalisations (n)	1376	145	112	114	94
	Outpatient (n)	32	5	1	5	4
	Subtotal (%)	4,53%	0,43%	0,30%	0,27%	0,26%
Total		31 074	34 615	37 966	43 294	37 893

Source: HMD/CAHS, data available as of 03/12/2021. Note: Data for 2020 is provisional.

Table 53. Admissions for hypoglycaemia with and without coma in Type 1 Diabetes (T1DM) and Type 2 Diabetes (T2DM) patients

		2017	2018	2019	2020
Diabetes with Hypoglycaemia without coma	T1DM	61 (12%)	63 (13%)	54 (12%)	36 (10%)
	T2DM	451 (87%)	426 (85%)	389 (87%)	300 (86%)
	Other	8 (2%)	15 (3%)	4 (1%)	11 (3%)
	Subtotal	520	504	447	347
Diabetes with Hypoglycaemia with coma	T1DM	17 (24%)	6 (7%)	11 (14%)	9 (13%)
	T2DM	51 (71%)	68 (84%)	67 (86%)	61 (86%)
	Other	4 (6%)	7 (9%)	0	1 (1%)
	Subtotal	72	81	78	71

Source: HMD/CAHS, data available as of 03/12/2021. Note: Data for 2020 is provisional.

Table 54. Distribution of patients using continuous subcutaneous insulin infusion devices in mainland Portugal, in the NHS

		2018	2019	2020
RHA for the North Region	Nº	939	1249	1446
	Rate	26,29	34,95	40,47
RHA for the Centre Region	Nº	418	586	713
	Rate	25,32	35,64	42,91
RHA for the LVT Region	Nº	946	1157	1294
	Rate	25,91	31,57	33,21
RHA for the Alentejo Region	Nº	35	51	55
	Rate	7,44	10,91	11,84
RHA for the Algarve Region	Nº	25	31	32
	Rate	5,69	7,07	7,30
Mainland Portugal	Nº	2364	3070	3540
	Rate	24,16	31,36	35,31

Source: DGH, CSII treatment register (2022). Note: Note that many patients living in Alentejo and Algarve were accompanied in other regions. Rate per 100 000 inhabitants.

Oupatient drug consumption

Table 55. Package consumption of non-insulin antidiabetics in the NHS in Mainland Portugal

	2016	2017	2018	2019	2020
Non-insulin antidiabetics					
Biguanide	3 293 288	3 350 961	3 471 890	3 570 566	3 568 616
Sulphonylureas	1 711 332	1 633 295	1 539 476	1 426 223	1 313 768
Alpha Glucosidase Inhibitors	279 085	232 865	192 640	153 524	122 478
Glinides	29 903	26 045	22 246	18 548	15 976
Glitazones	69 681	64 772	61 751	58 480	55 012
DPP4 inhibitors	887 353	947 410	1 004 512	1 048 972	1 073 798
GLP1 agonists	126 292	147 597	257 390	412 452	567 184
Glifozins	255 833	387 442	599 407	891 752	1 144 534
Total Non-insulin Antidiabetics	6 652 767	6 790 387	7 149 312	7 580 517	7 861 366
Non-insulin combinations of antidiabetics					
Glimepiride + Pioglitazone	10 598	9677	9057	8345	7143
Metformin + Pioglitazone	34 581	28 783	24 930	21 447	18 847
Glibenclamide + Metformin	68 763	55 168	44 267	29 410	24 544
Metformin + DPP4 inhibitors	2 352 784	2 447 060	2 547 273	2 613 895	2 601 804
Metformin + Glifozins		102 127	190 393	337 086	603 821
Pioglitazone + DPP4 inhibitors		3017	3393	3980	4517
Glifozins + DPP4 inhibitors					2706
Total Combinations	2 466 726	2 645 832	2 819 313	3 014 163	3 263 382
Total	9 119 493	9 436 219	9 968 625	10 594 680	11 124 748

Source: INFARMED, ICC (Invoice Conference Centre). Data processed by DGH/DIAS.

Table 56. Consumption of insulin packs in the NHS in Mainland Portugal

	2016	2017	2018	2019	2020
Human Insulins					
Fast Insulin (soluble)	24 151	22 051	20 662	18 580	17 117
Intermediate (isophane) insulin	202 162	187 452	173 911	159 303	145 256
Fast / Intermediate (soluble + isophane) insulin	110 729	100 932	91 298	82 984	74 456
Total Human Insulins	337 042	310 435	285 871	260 867	236 829
Insulin Analogues					
Fast Insulin Analogues	212 178	224 524	247 635	272 899	455 075
Long-Acting Insulin Analogues	569 528	618 377	678 430	737 790	780 024
Fast-acting / intermediate-acting Insulin Analogues	313 214	308 419	306 412	299 823	132 157
Total Insulin Analogues	1 094 920	1 151 320	1 232 477	1 310 512	1 367 256
Total Insulins	1 431 962	1 461 755	1 518 348	1 571 379	1 604 085

Source: INFARMED, ICC (Invoice Conference Centre). Data processed by DGH/DIAS.

Costs of Diabetes in Portugal

Table 57. Costs identified in mainland Portugal

	Costs (million €)				
	2016	2017	2018	2019	2020
Medicines and devices					
1. Non-insulin antidiabetics and insulins - total patient + NHS	268,6	286,4	316,3	351,6	413,9
2. Glucagon	0,1	0,1	0,1	0,1	0,1
3. Glucose test strips and sensors - total patient + NHS	50,7	50,6	60,8	67,6	72,3
4. Continuous Insulin Subcutaneous Perfusion Systems	1,6	2,1	2,7	3,0	3,3
Subtotal	321,0	339,2	379,9	422,3	489,6
Hospitalisations					
5. Hospitalisations with Diabetes as Main Diagnosis	25,8	26,4	29,0	28,0	31,8
5.1 Decompensated uncomplicated Diabetes	1,5	3,0	3,4	3,3	3,6
5.2 Acute complications	3,6	4,6	4,6	4,1	4,9
5.3 Chronic complications	12,8	11,3	12,0	11,5	13,5
5.4 Lower limb amputation	7,9	7,5	9,0	9,1	9,8
6. Hospitalisations with Diabetes as associated diagnosis*.	361,2	371,0	376,2	384,2	425,9
Subtotal	387,0	397,4	405,2	412,2	457,7
Total	708,0	736,6	785,1	834,5	947,3

Source: CAHS, DPS, HMD, 19/01/2022. Note: * Costs of hospitalisations in which Diabetes is an associated diagnosis, the total estimate of costs of these hospitalisations is presented. Search method: Indicator specifications according to doc 2019.03.18_IncD-10-CM/PCS_Diabetes Indicator Specification (except the indicator No. of hospitalisations with additional diagnosis of Diabetes which has been calculated for this purpose. This indicator corresponds to all episodes with registration of any of the Diabetes codes considered in the other indicators, as additional diagnosis) and inclusion, in all indicators, of patients under 18 years of age and diagnoses E08xxx and E09xxxx (E12 does not exist in CD10CM/PCS)



Alameda D. Afonso Henriques, 45
1049-005 Lisboa – Portugal
Tel.: +351 218 430 500
Fax: +351 218 430 530
E-mail: geral@dgs.min-saude.pt

www.dgs.pt