MONASH University

AUSTRALIAN NATIONAL DIABETES AUDIT

ANNUAL REPORT 2022

ads Australian Diabetes Society

nadc National Association of Diabetes Centres

This report was produced by the Australian National Diabetes Audit.

Suggested citation:

Australian National Diabetes Audit Annual Report 2022.
Monash University, School of Public Health and Preventive Medicine,
January 2023, Report No 15, 91 pages.

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FOREWORD

FROM THE ANDA PROJECT LEAD

We are proud to present the Australian National Diabetes Audit (ANDA) 2022 Annual Report, the fifteenth diabetes data collection facilitated by the National Association of Diabetes Centres (NADC).

In Australia, there are an estimated 1.3 million people living with diabetes, affecting individuals and communities, and placing a major disease burden on the healthcare system. Identifying and understanding variations in quality of care is integral to improve service delivery and health outcomes for people with diabetes.

ANDA is an important quality improvement activity that provides an overview of the clinical status, quality of life and well-being of people with diabetes who attend services for diabetes care. It gives participating diabetes centres, endocrinologists, general practitioners and other diabetes health care professionals the opportunity to evaluate their data against their peers, enabling them to identify variations and implement initiatives to improve care and health outcomes for those with diabetes.

Despite the continued challenges associated with the COVID-19 pandemic in 2022, 64 diabetes centres participated in ANDA collecting de-identified process and outcomes data on 5244 patients during the months of May through July 2022.

This report provides:

i) a unique snapshot of the current health status and outcomes of people with diabetes attending services for diabetes care in 2022 and

ii) a comparison with past collections.

The ANDA Project Executive and Scientific Advisory Committee would like to express our sincere gratitude to all the multidisciplinary teams for their participation in ANDA and commitment to improving diabetes care in Australia. We also acknowledge the generous support of The Australian Government Department of Health and Aged Care. I would like to personally thank the ANDA Project Executive Team for their ongoing commitment and dedication to the ANDA activity. This annual report would not be possible without their hard work.

Professor Sophia Zoungas
Project Lead on behalf of the ANDA Project Executive and Scientific Advisory Committees

FROM THE PRESIDENT OF THE ADS

On behalf of the Australian Diabetes Society (ADS) and indeed the wider diabetes community I am delighted to write this foreword for the 2022 ANDA report. The Australian National Diabetes Audit is a core activity of the National Association of Diabetes Centres (NADC, a division of ADS) as we continue to improve diabetes services across primary, secondary and tertiary level diabetes services in Australia.

This national audit and data collection process is an important activity that can inform participating services of areas for quality improvement and better care for people living with diabetes. It is particularly significant as we emerge from the pandemic lockdown that saw disruption to services and changes in the way that diabetes care was delivered. I am sure that you will find this report insightful and useful in your pursuit of continued improvements in care for people living with diabetes.

I would like to congratulate, thank, and acknowledge the enormous efforts of the ANDA project lead Prof Sophia Zoungas and her team, NADC CEO Natalie Wischer and her team, all participating centres and services for completing the audit forms and all the participants for making themselves available. I am proud that during these difficult times we have been able to conduct the national audit and produce this report.

Professor Anthony Russell
President, Australian Diabetes Society

ACKNOWLEDGEMENTS

ANDA 2022 has been supported by funding from The Australian Government Department of Health and Aged Care.

ANDA is operated by the Project Executive Team at the School of Public Health and Preventive Medicine (SPHPM), Monash University.

We are grateful for the contributions made by the ANDA Scientific Advisory Committee. We acknowledge the leadership of the chair of the Scientific Advisory Committee, who is also the project lead and data custodian, Professor Sophia Zoungas. We also acknowledge the Project Executive at SPHPM and their contributions.

We would like to thank the participating diabetes services and their patients for their generous contribution to this work. ANDA would not be possible without the ongoing efforts of the many clinicians, nurses, and other relevant staff at the services who collect data and manage the ANDA-related activities.

We gratefully acknowledge the significant support and championing of this project over many years by the NADC, a division of the ADS.

In the spirit of reconciliation, we acknowledge the Traditional Custodians of country throughout Australia and their connections to land, sea and community. We pay our respect to their Elders past and present and extend that respect to all Aboriginal and Torres Strait Islander peoples today.

ANDA Project Executive

Professor Sophia Zoungas - Project Lead

Ms Dimitra Giannopoulos - Project Manager/ Secretariat

Professor Susannah Ahern - Technical Advisor

A/Professor Arul Earnest - Senior Biostatistician

Dr Ella Zomer - Research Lead

Dr Ahmad Reza Pourghaderi - Senior Data Analyst

Dr Lavanya Gupta - Clinical Research Fellow

Dr Anthony Pease - Clinical Researcher

Ms Trieu-Anh Truong - Data Manager

Mrs Claudia Lassetter - Communications Manager

Ms Mahima Choudhary - Research Support Officer

Ms Kara Kotsovolos - Administrative Officer

Mr Matthew Quigley - PhD Candidate

ANDA Scientific Advisory Committee

Professor Sophia Zoungas - Project Lead

A/Professor Sofianos Andrikopoulos - Australian Diabetes Society (ADS) Representative

Ms Taryn Black - Diabetes Australia Representative

A/Professor Wendy Davis - Data/Science Expert

Professor Barbora de Courten - Clinical Representative

Dr Gary Deed - Primary Health Sector Representative

Professor Jeff Flack - Clinical Representative

Professor Jenny Gunton - Clinical Representative

Mr Trevor Jones - Consumer Representative

Dr Konrad Kangru - Primary Health Sector Representative

Ms Faith Margrie - Australian Government Department of Health and Aged Care Representative

Dr Odette Pearson - Aboriginal and Torres Strait Islander Representative and Data/Science Expert

Ms Megan Phelan - Australian Government Department of Health and Aged Care Representative

Ms Sally Rayner - Australian Government Department of Health and Aged Care Representative

Professor Jane Speight - Data/Science Expert

Ms Natalie Wischer - National Association of Diabetes Centres (NADC) Representative

LIST OF TABLES

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ABBREVIATIONS AND ACRONYMS

ACE	Angiotensin Converting Enzyme
ACR	Albumin-to-Creatinine Ratio
ADS	Australian Diabetes Society
AER	Albumin Excretion Rate
ANDA	Australian National Diabetes Audit
ANDA-EFFECT	Evaluating Facilitated Feedback Enhancement – a Cluster randomised Trial
AQCA	Australian Quality Clinical Audit
AQSMA	Australian Quality Self-Management Audit
ARB	Angiotensin II Receptor Blockers
BMI	Body Mass Index
BP	Blood Pressure
CABG	Coronary Artery Bypass Graft
CoE	Centre of Excellence
COVID-19	Coronavirus Disease-2019
CSII	Continuous Subcutaneous Insulin Infusion
CVD	Cardiovascular Disease
DCQR	Diabetes Clinical Quality Registry
DKA	Diabetic Ketoacidosis
DPP4	Dipeptidyl Peptidase-4
DVA	Department of Veterans Affairs
eGFR	Estimated Glomerular Filtration Rate
GDM	Gestational Diabetes Mellitus
GLP1	Glucagon Like Peptide-1
HbA_{1c}	Glycated Haemoglobin
HDL	High-Density Lipoprotein
HHS	Hyperosmolar Hyperglycaemic State
IQR	Interquartile Range
KDIGO	Kidney Disease Improving Global Outcomes
LDL	Low-Density Lipoprotein
NADC	National Association of Diabetes Centres
NDOQRIN	National Diabetes Outcomes Quality Review Initiative
NDSS	National Diabetes Services Scheme
NICE	National Institute for Health and Care Excellence
Non-HDL	Non-High-Density Lipoprotein
PCR	Protein-to-Creatinine Ratio
PER	Protein Excretion Rate
REDCap	Research Electronic Data Capture
SD	Standard Deviation
SFTP	Secure File Transfer Protocol
SGLT2	Sodium-Glucose Co-Transporter 2
SPHPM	School of Public Health and Preventive Medicine
T1DM	Type 1 Diabetes Mellitus
T2DM	Type 2 Diabetes Mellitus

EXECUTIVE SUMMARY

The Australian National Diabetes Audit (ANDA) is an important quality improvement activity delivering individualised site reports to participating diabetes services to highlight their care process and patient outcome data in comparison to their peers (benchmarking), as well as a national pooled report on the clinical status and outcomes of people with diabetes attending primary, secondary and tertiary diabetes services across Australia.

The ANDA activity can identify site-specific and nationwide variations in clinical performance, which can inform the implementation of targeted, evidence-based quality improvement activities. This serves to promote best practice and high-quality diabetes care, thus reducing the occurrence of diabetes related complications and improving quality of life among people living with diabetes.

The first half of 2022 was dominated by the COVID-19 pandemic with the arrival of the Omicron variant, which sent many states and territories back into restrictions while COVID-19 vaccines continued to be rolled out.[1] Since then, we have entered the era of "living with COVID", encouraging national and international free movement. This new era has been supported by and reliant on community vaccination, safe workplaces and an increase in working from home, as well as mask wearing and social distancing.[1] With the arrival of new COVID-19 variants and ongoing waves of infection, the pandemic continues to affect Australians, however the majority of those affected have mild disease. Delivery of health care has continued to be affected throughout the year, with staff shortages and staff sick leave a recurring theme. Despite the ongoing challenges associated with the pandemic, the ANDA activity was able to proceed, with site and patient participation similar to ANDA 2021.

ANDA 2022 included 64 participating diabetes centres from all eight states and territories, collecting data from 5244 patients between May and July 2022. Of these, 4641 were adult patients (excluding gestational diabetes), 415 were paediatric patients and 188 were patients with gestational diabetes. This would not have been possible without the dedication and determination of clinicians, staff and patients at participating diabetes services to maintain and continue to improve the quality of diabetes care across the country.

In previous years, ANDA delivered two audits that alternated every year capturing clinical indicators (ANDA-Australian Quality Clinical Audit, ANDA-AQCA) and self-management data (ANDA- Australian Quality Self-Management Audit, ANDA-AQSMA). In 2022, ANDA was updated to capture the best elements of both audits collected in one cycle.

The analysis of data from all participating centres forms the basis of this report. Every effort was made to ensure data were complete and correct prior to pooling and analysis. Specifically, centres were given an opportunity to supply any missing data and to validate any data that appeared incorrect. This reduced the amount of missing data and ensured high quality data was maintained.

Unless otherwise indicated, outcomes are reported as the percentage of patients who answered the question, not the percentage of the total patient group. Pooled data have been grouped according to the various aspects of a patient's health status and clinical characteristics.

This report provides a unique snapshot of key clinical care indicators and patient reported outcomes for Australians living with diabetes in 2022. Of note:

1. Regular blood glucose monitoring and following of recommended diet, both integral to optimal self-management of diabetes, were reported by most patients.

2. Uptake of newer, non-insulin oral and injectable therapies with cardio- and reno-protective effects had increased.

3. COVID-19 and influenza vaccination levels were very high.

The report also highlights the need for ongoing focus on management of glycaemic control, weight and cardiovascular risk factors especially lipids and smoking.

"ANDA aims to improve health outcomes and quality of life for Australians living with diabetes. This report provides a unique snapshot of the health and well-being of patients attending diabetes services across Australia."

KEY FINDINGS FOR ADULT PATIENTS*

DEMOGRAPHICS

64
PARTICIPATING CENTRES

4641
PATIENTS

MEAN AGE

T1DM	T2DM
44.2 YEARS	63.8 YEARS

MEDIAN DURATION OF DIABETES

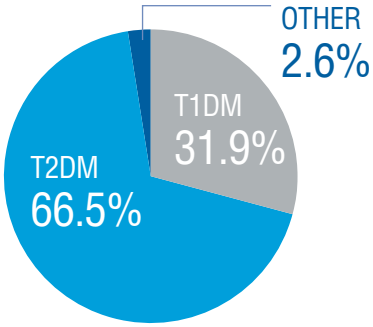
T1DM	T2DM
17.4 YEARS	12.4 YEARS

SEX DISTRIBUTION

FEMALE 45.5%

MALE 54.5%

TYPES OF DIABETES†



†excluding unknown or unstated diabetes type

BLOOD GLUCOSE MONITORING

T1DM

CAPILLARY GLUCOSE SELF MONITORING
52.0%

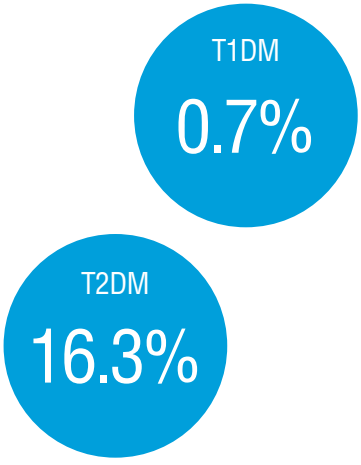
CONTINUOUS GLUCOSE/ FLASH MONITORING
58.7%

T2DM

CAPILLARY GLUCOSE SELF MONITORING
81.3%

CONTINUOUS GLUCOSE/ FLASH MONITORING
3.5%

NO REGULAR BLOOD GLUCOSE MONITORING



*excluding gestational diabetes

MANAGEMENT

MEAN HbA_{1c} (%)

T1DM 8.4%

T2DM 8.3%

PROPORTION OF PATIENTS WITH T2DM ON GLUCOSE LOWERING THERAPIES

18.3% ON 1 THERAPY

29.7% ON 2 THERAPIES

47.0% ON ≥3 THERAPIES

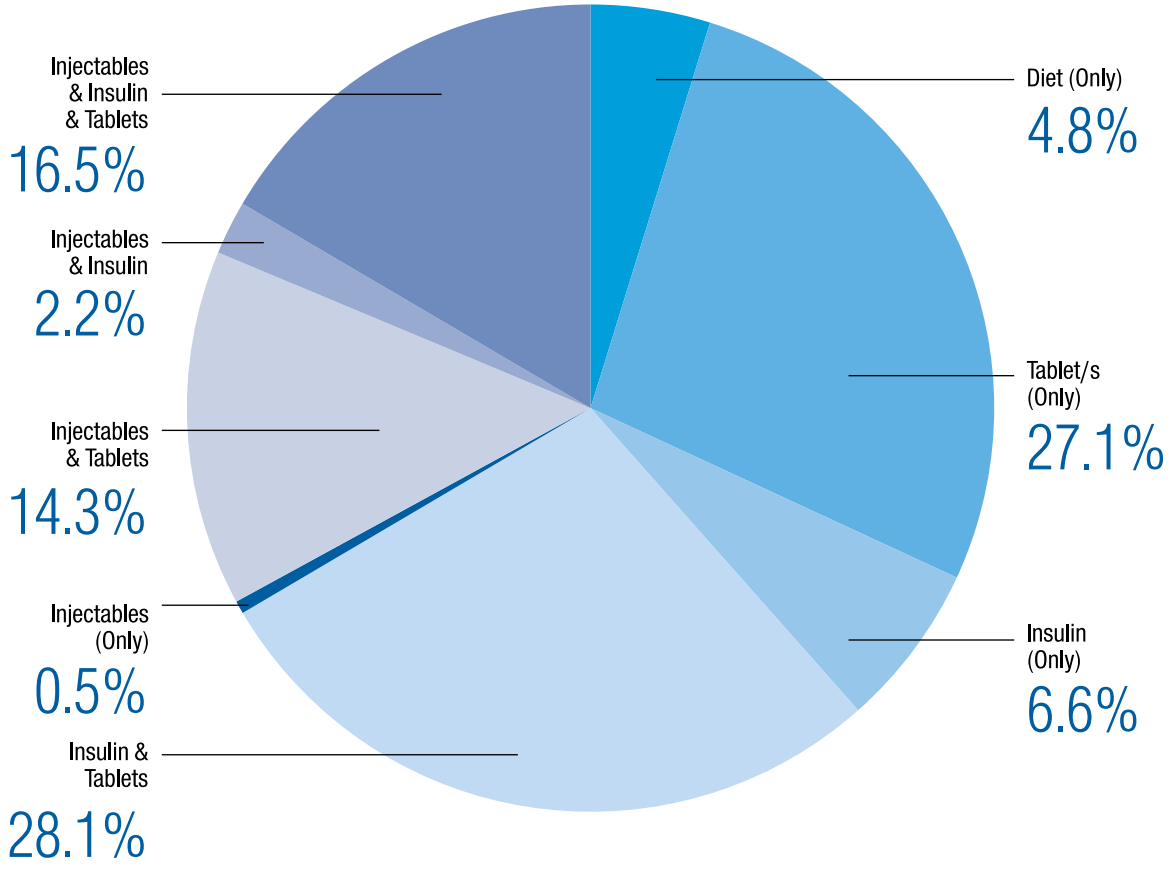
T1DM INSULIN REGIMENS

75.7% MULTIPLE DAILY INJECTIONS

24.3% CONTINUOUS SUBCUTANEOUS INSULIN

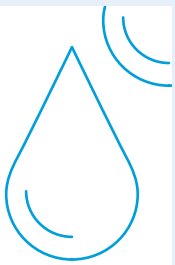
2.1% ON ADDITIONAL NON-INSULIN THERAPY

TYPES OF GLUCOSE LOWERING THERAPIES (T2DM ONLY)



RISK FACTORS

CHOLESTEROL

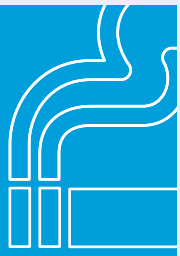


- 43.7% Total Cholesterol <4.0 mmol/L
- 60.0% On Lipid Modifying Therapy

BLOOD PRESSURE

- 44.9% Blood Pressure <130/80 mmHg
- 70.8% Blood Pressure <140/90 mmHg
- 59.9% On Anti-Hypertensive Therapy

SMOKING



- 31.0% Past Smokers
- 15.1% Current Smokers

WEIGHT

- 31.3 kg/m² Mean BMI
- 79.5% Overweight/ Obese

COMPLICATIONS (LAST 12 MONTHS)

FOOT COMPLICATIONS

- 5.3% Foot Ulceration
- 21.0% Peripheral Neuropathy
- 1.8% Amputation

KIDNEY AND EYE DISEASE

- 4.3% End-Stage Kidney Disease
- 2.0% Blindness
- 16.0% Retinopathy

CARDIOVASCULAR DISEASE

- 3.8% Myocardial Infarction/ CABG
- 8.5% Peripheral Vascular Disease
- 1.5% Stroke

OVERALL COMPLICATIONS

- 61.6% No Complications
- 35.4% 1-2 Complications
- 2.9% ≥3 Complications

EXPERIENCED SEVERE HYPOGLYCAEMIA

- T1DM 9.3%
- T2DM 1.8%

EXPERIENCED DKA OR HHS

- T1DM 7.8% DKA
- T2DM 1.1% DKA 1.1% HHS

BACKGROUND

DIABETES CARE IN AUSTRALIA

Diabetes is a chronic disease that has become one of the largest challenges facing Australia's health care system. There are an estimated 1 in 20 Australians living with diabetes and approximately 280 people developing diabetes every day.[2,3] The increasing prevalence, and multisystem complications associated with diabetes, is imposing a substantial burden on the health care system with almost 1.2 million hospitalisations in 2019-2020 associated with diabetes (11% of all hospitalisations).[2]

The Australian Government Department of Health and Aged Care has identified diabetes as a major health priority. The national strategy to tackle the holistic challenges of diabetes has been condensed into the Australian National Diabetes Strategy 2021-2030.[4]

The vision of the Strategy is to "strengthen, integrate and coordinate all sectors to improve health outcomes and reduce the social and economic impacts of diabetes in Australia". This ten-year vision has been broken down into five key principles and seven key goals, which are summarised in Table 1.

TABLE 1. PRINCIPLES AND GOALS OF THE AUSTRALIAN NATIONAL DIABETES STRATEGY, 2021-2030

Principles

1. Facilitation of person-centred care and self-management throughout life
2. Reduction of health inequities
3. Collaboration and cooperation to improve health outcomes
4. Coordination and integration of diabetes care across services, settings, technology and sectors
5. Measurement of health behaviours and outcomes

Goals

1. Prevent people developing type 2 diabetes
2. Promote awareness and earlier detection of type 1 and type 2 diabetes
3. Reduce the burden of diabetes and its complications and improve quality of life
4. Reduce the impact of pre-existing diabetes and gestational diabetes in pregnancy
5. Reduce the impact of diabetes among Aboriginal and Torres Strait Islander peoples
6. Reduce the impact of diabetes among other priority groups
7. Strengthen prevention and care through research, evidence and data

ANDA, which is supported by the Australian Government, is a key contributor towards the goals of reducing the burden of diabetes and its complications and improving quality of life, and strengthening prevention and care through research, evidence and data.

NATIONAL ASSOCIATION OF DIABETES CENTRES

The National Association of Diabetes Centres (NADC) established in 1994 is a national collective of diabetes centres brought together by a common desire to see improvement in the standard of diabetes care in Australia. With a focus on proactive maintenance of good health and prevention of complications, NADC diabetes centres aim to provide integrated care and to bridge the gap between the acute care hospital system, and the long-term chronic care provided by primary care and community-based services.

Supported by the Australian Diabetes Society (ADS), the NADC facilitates the ANDA initiative as part of monitoring and improving quality of care.

The NADC was created to establish and promote effective health care practice and, ultimately, to achieve better outcomes for people with diabetes. In particular, key strategies were identified including the development of standards of care and quality review initiatives, information provision, and training and support for health professionals in specialist multidisciplinary settings.

OVERVIEW OF NADC MEMBER CENTRES

The NADC promotes mechanisms for improving the standard of care available to people with or at risk of diabetes through services providing diabetes care.

In 2022, there were 190 NADC member diabetes centres across Australia; these operated in a range of locations and facilities from major metropolitan adult and children's hospitals to community-based services including general practices and pharmacies. The number of NADC centres has expanded by 26 since 2019.

TYPES OF NADC MEMBER CENTRES

There are six membership levels of NADC:

1. Centres of Excellence
Recognised diabetes centres that have demonstrated excellence in education, research, service delivery, practice/policy development and national influence. These centres must be tertiary level facilities.

2. Tertiary Care Diabetes Services
These centres have the full range of diabetes service providers including endocrinologists, credentialed diabetes educators, dietitians and podiatrists on staff (full-time) and have demonstrated a high standard of care through service delivery and organisational capacity and have been accredited by the NADC.

3. Secondary Care Diabetes Services
These centres have a range of full and/or part-time diabetes staff but often do not have an endocrinologist as part of their usual team. They may be working toward accreditation as a Tertiary Care Diabetes Service.

4. Primary Care Diabetes Services
These centres have part-time staff and work closely with the local general practitioners to provide care for people with diabetes.

5. Pharmacy Diabetes Services
These centres have staff that have received training and/or have expertise in diabetes and work closely with the local general practitioners and allied health staff to provide additional care and services for people with diabetes. NADC Pharmacy Diabetes Service membership is offered to groups of professional healthcare workers who have an active involvement in diabetes care provided in the pharmacy context and are committed to the goals and objectives of the NADC and to monitoring the outcomes of their service, but do not have the full complement of services or resources of a larger diabetes service.

6. Network Members
The NADC Network membership is offered to Primary Health Networks (PHNs) and Primary Care Partnerships (PCPs) around Australia. PHNs and PCPs work directly with general practitioners, other primary health care providers, secondary care providers and hospitals, to facilitate improved outcomes for patients. PHNs and PCPs are committed to providing efficient and effective primary health care, with objectives that align closely with those of the NADC.

TABLE 2. NADC MEMBERSHIP DISTRIBUTION IN 2022

Centre types	Registrations
Centres of Excellence	6
Tertiary Care Diabetes Services	60
Secondary Care Diabetes Services	38
Primary Care Diabetes Services	67
Pharmacy Diabetes Services	13
Network Members	6

WHO ACCESSES THE VARIOUS DIABETES CENTRES?

Most patients referred to Tertiary Care Diabetes Services, including Centres of Excellence, are referred by their general practitioners so that they may receive specialist assessment and treatment. Given this role of Tertiary Care Diabetes Services, it is probable that people attending these services will be those with more complex care needs including an increased number of comorbidities and diabetic complications. In considering the outcomes of this data collection, it is important to remember that whilst Tertiary Care Diabetes Services will provide assessment and treatment, ongoing responsibility for management of diabetes remains with the person with diabetes and their general practitioner.

HOW CAN ANDA IMPROVE THE CARE OF PATIENTS WITH DIABETES?

The results of ANDA are expected to provide an indication of processes of care and patient health outcomes among participating diabetes services throughout Australia. There will likely be wide variation in these findings which may reflect the need for service development or revision.

Sharing this information in a pooled report will assist in identifying processes that may be adopted to improve education and clinical care at a national and jurisdictional level which (once implemented) should result in improved outcomes for people attending services.

The individual site reports provide data for each participating site as well as comparisons to all other sites. Participating sites are encouraged to interrogate their own practice findings for use for local quality improvement.

HOW WILL EFFICIENCY OF ANDA BE ASSESSED?

Efficiency of ANDA 2022 will be assessed in two ways:

- Participation rates in ANDA
- Assessment of responses to the questionnaires

1. METHODOLOGY

1.1 ETHICS APPROVAL

This is a quality audit exercise utilising de-identified patient data from de-identified sites transmitted through a trusted third party (the ANDA Secretariat). There is no disclosure of individual patient data. Site participation is voluntary.

ANDA has been approved by the Monash Health Human Research Ethics Committee.

1.2 GOVERNANCE

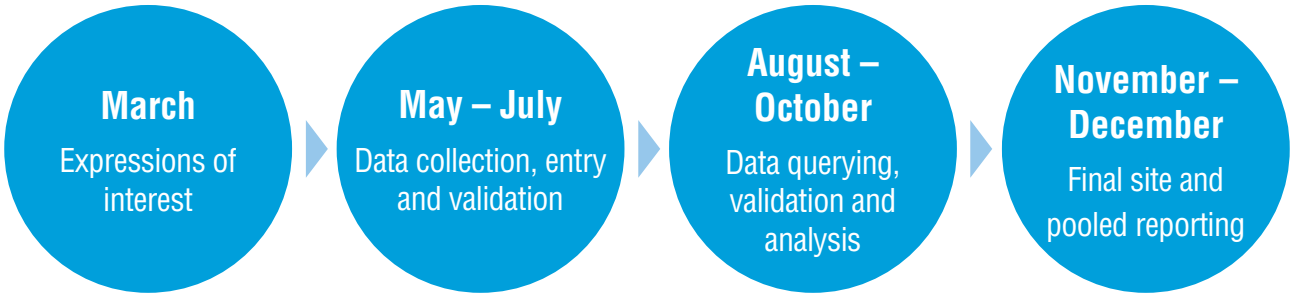
Established in 2015, the ANDA Scientific Advisory Committee provides strategic guidance to ensure the objectives, outcomes and deliverables of ANDA, as specified by the Australian Government Department of Health and Aged Care are achieved. This committee consists of representatives of key stakeholder organisations including endocrinologists, general practitioners, diabetes nurse educators, consumer representatives and the NADC CEO, and is working to agreed Terms of Reference with the ultimate vision of assisting ANDA to maintain high visibility, appropriate engagement and relevance for diabetes service delivery.

1.3 KEY PROJECT MILESTONES

ANDA coordination and conduct is overseen by the ANDA Project Executive based at the School of Public Health and Preventive Medicine (SPHPM), Monash University.

The major Project Milestones are summarised in Figure 1.

FIGURE 1. ANDA KEY PROJECT MILESTONES



1.4 THE DATASET

The National Diabetes Outcomes Quality Review Initiative (NDOQRIN) dataset was enhanced and used as the basis of this national initiative, aimed at improving diabetes care through a structured approach to patient management.[5] This was achieved by linking the minimum dataset to the NSW Clinical Management Guidelines for Diabetes, with subsequent updates to the dataset over the years.[6] This minimum dataset is suitable for use in primary care (where it is known as the 'Recommended GP Subset of the NDOQRIN Dataset'), specialist practice and diabetes centre settings. Enhancements and deletion/addition of data fields have occurred over the years to reflect feedback from participating centres, as well as the latest research in diabetes quality improvement. Enhancements were made to ensure comprehensive capture of the variables necessary to analyse and convey quality in diabetes care, in accordance with the latest evidence.

The ANDA dataset has considerable concordance with similar international datasets throughout the United States of America and Europe.[7-10] Areas of discordance include benchmarking of structural measures, smoking counselling, conception/pregnancy counselling and contraceptive counselling. However, ANDA benchmarking is more comprehensive than international standards with regards to reporting on multidisciplinary care, diabetes complications and psychological factors.[8] The overall high rates of agreement with international practice, supports the validity of the ANDA report in the benchmarking of key quality indicators regarding diabetes care within Australia.

The ANDA 2022 dataset was updated to capture the best elements from the ANDA-AQCA 2021 and ANDA-AQSMA 2018 datasets collecting data on clinical indicators as well as patient self-management and well-being outcomes. The data collection fields were merged and refined with the following changes/additions to the ANDA-AQCA 2021 data collection form.

Added:

- How was the consultation conducted?: In person, video, or telephone
- Interpreter required?: No/Yes
- (Finger prick blood glucose monitoring) Does the patient check as often as recommended?: No/Yes/Unsure of recommended testing
- (Finger prick blood glucose monitoring) How many times a day?:
- Weight: Self-reported?: No/Yes
- Height: Self-reported?: No/Yes
- Lipid modifying therapy: Evolocumab: No/Yes/Contraindicated
- Lipid modifying therapy: Other: No/Yes/Contraindicated
- HbA_{1c} test date (month/year)
- eGFR
- Previous retinopathy, treatment for retinopathy and right or left cataract: No/Yes
- Depression (last 12 months and previous): No/Yes
- Has the patient tested positive to COVID-19? (last 12 months and previous): No/Yes
- (Tested COVID-19 positive) Was hospital admission required? (last 12 months and previous): No/Yes
- Screened for depression, anxiety and diabetes distress?: No/Yes/Unsure
- COVID-19 vaccination in the last 12 months?: No/Yes
  - » Number of doses in total, date of last dose
- Do you have difficulties following your recommended diet?: No/Yes
  - » (Difficulties following diet) Why?
- How many minutes per week of moderate/vigorous intensity physical activity do you usually do?: 150 mins/week or more/ Less than 150 mins/week/ Rarely/never
- Muscle strengthening exercise?: No/Yes

Changed:

- Urinary albumin/protein was split into two questions to capture urinary albumin and urinary protein separately
- Individual malignancies were merged to capture any type of malignancy in one question (last 12 months and previous): No/Yes

Smoking status, vaccination status, health professional attendances, medication use, patient self-care practices and physical activity questions were included on a one-page questionnaire for patients to either complete directly or with a health professional at their diabetes health service. Completion of the questionnaire directly by patients was intended to reduce the burden of data collection on participating sites.

The data collection forms captured most fields using no/yes responses or other choice options to reduce the amount of written data required. The data collection forms are included in Appendix 1.

The 'Data Definitions' document was updated and made available to all sites, including the ADS Algorithm to assist in collection of data on treatments (Appendix 2).

1.5 DATA COLLECTION

Participating sites had the option to choose from three methods of data collection:

Web-based data collection – Research electronic data capture (REDCap)

The web-based electronic data capture application, REDCap[11] has been used in the clinical audit since 2019. Study data were collected and managed using REDCap electronic data capture tools hosted and managed by Helix (Monash University). REDCap is a secure, web-based application designed to support data capture for research studies,[12,13] providing:

1) An intuitive interface for validated data entry
2) Audit trails for tracking data manipulation and export procedures
3) Automated export procedures for seamless data downloads to common statistical packages
4) Procedures for importing data from external sources

Branching logic coding was used to skip irrelevant questions. Data validations were put in place to help prevent data entry errors and reduce data queries. Staff were granted access to patients from their sites only.

Paper-based data collection

The Teleform© software was utilised for the design of paper data collection forms. Once completed by sites and sent to the ANDA coordinating centre through secure file transfer protocol, the forms were entered directly into REDCap. Any printed data collection forms are stored in a locked room at SPHPM, Monash University.

Data Extraction

Sites were provided with the ANDA data dictionary, to facilitate the data extraction directly from their in-house software. Data was securely transferred to the coordinating centre via a secure file transfer protocol (SFTP) for collation and analysis.

1.6 DATA VERIFICATION AND VALIDATION

Data quality procedures were followed to ensure data were as complete and accurate as possible. Specific validation reports were generated for each site, querying missing data, potential duplicate records and invalid or out-of-range values. Sites were encouraged to address data queries prior to resubmission to the data management centre. Where duplicate records were identified (multiple case record entries for the same patient), only the first entry was retained. Data assumptions and manipulations were made according to a pre-defined list of criteria (see Supplement). Corrected data items were updated in the database prior to final analysis.

1.7 STATISTICAL ANALYSES

Descriptive statistics

Results are presented descriptively as frequencies and percentages for categorical variables, and mean and standard deviation (SD) for continuous variables. Variables that were not normally distributed are presented as median and interquartile range (IQR). Percentages were calculated from total respondents (and did not include missing data in the denominator). Percentages may not always add to 100% due to rounding. Where n is reported, it refers to the number of patients who responded 'Yes' to categorical variables or the number of patients with data for continuous variables.

All results presented are analyses for the pooled data. The primary analysis included adults only, with secondary analyses including the sub-groups of gestational diabetes mellitus (GDM) and paediatrics (aged <18 years).

Subgroup analyses: Centre type, gestational and paediatric diabetes

Given the different patient populations attending primary, secondary and tertiary health care settings, results by centre type (centres of excellence/tertiary care services versus secondary/primary care services) are presented.

Based on the demographic and clinical differences of those with gestational and paediatric diabetes compared to those with chronic forms of diabetes, data for these patients are presented as separate subgroups. Some outcomes where missing data was high are not presented.

Risk-adjusted funnel plots

Risk-adjusted funnel plots of performance indicators were generated to enable identification of variation in clinical performance across participating sites. It is acknowledged that patients attending tertiary diabetes services for management are often more challenging with poorer glycaemic control and an increased complexity of care. This may skew clinical outcomes further away from target levels than may be seen in patients attending primary and secondary diabetes services. Risk-adjusted performance indicators were used to compare across differing sites using adjusted analysis, in order to highlight where sites may be able to achieve improved outcomes with more intensive management. Performance indicators were calculated as site-specific average values or rates of the following diabetes health outcomes: HbA_{1c}, LDL cholesterol, systolic blood pressure and severe hypoglycaemia (defined as an episode of hypoglycaemia associated with neuroglycopaenia and requiring third-party assistance).

Performance indicators were adjusted for statistically significant, non-care related patient risk factors. Selection of non-care related patient risk factors was informed by a literature review on risk-adjustment of diabetes health outcomes, and by clinical reasoning with expert input. Non-care related patient factors considered for the risk-adjustment exercise were: age, sex, duration of disease, severity of disease, body mass index (BMI), country of birth and smoking history. Severity of disease was defined using a modified version of the Diabetes Complications Severity Index. Statistically significant risk factors ($p<0.05$) were identified for each outcome measure using multiple stepwise regression. HbA_{1c}, systolic blood pressure and severe hypoglycaemia were adjusted for statistically significant risk factors only. LDL cholesterol was adjusted for fasting status in addition to statistically significant risk factors.

'Action' control limits were set at 99.8% (approximately three SDs from the mean) and 'alert' control limits set at 95.0% (approximately two SDs from the mean). Sites positioned above the 'action' limit are considered outliers and should work towards implementing strategies to improve in this outcome measure. Sites positioned above the 'alert' limit (but below the 'action' limit) may be at risk of outlier performance.

FIGURE 2. RISK ADJUSTMENT PROCESS

Diabetes health outcomes:
HbA_{1c}, LDL cholesterol, systolic blood pressure, severe hypoglycaemia

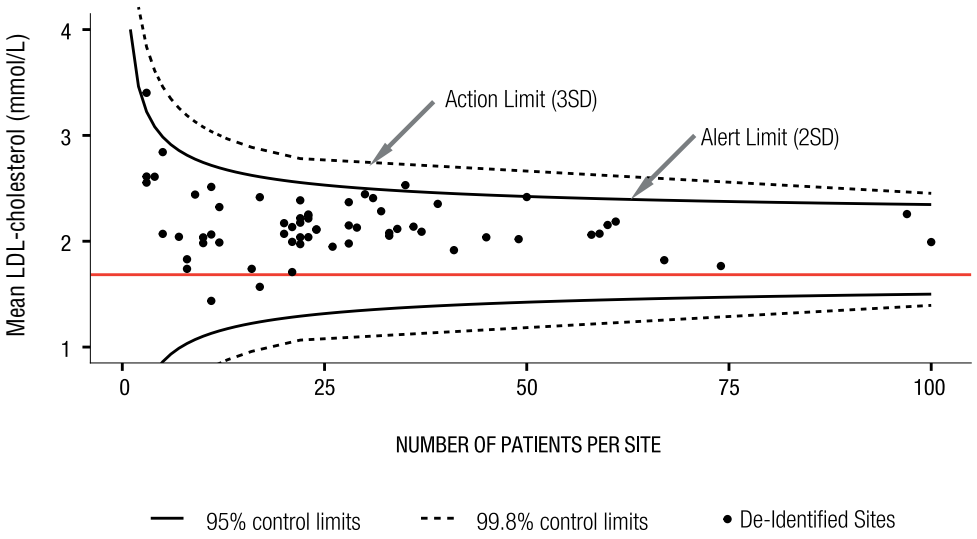
Non-care and patient factors:
age, sex, duration of diabetes, severity of diabetes,
BMI, country of birth, smoking history

Multivariate stepwise regression to identify statistically significant ($p<0.05$) patient risk factors for diabetes health outcomes

Risk-adjustment of diabetes health outcomes

Development of funnel plots for risk-adjusted diabetes health outcomes (control limits set at 99.8%, ~3SD from the mean)

FIGURE 3. EXAMPLE OF A FUNNEL PLOT

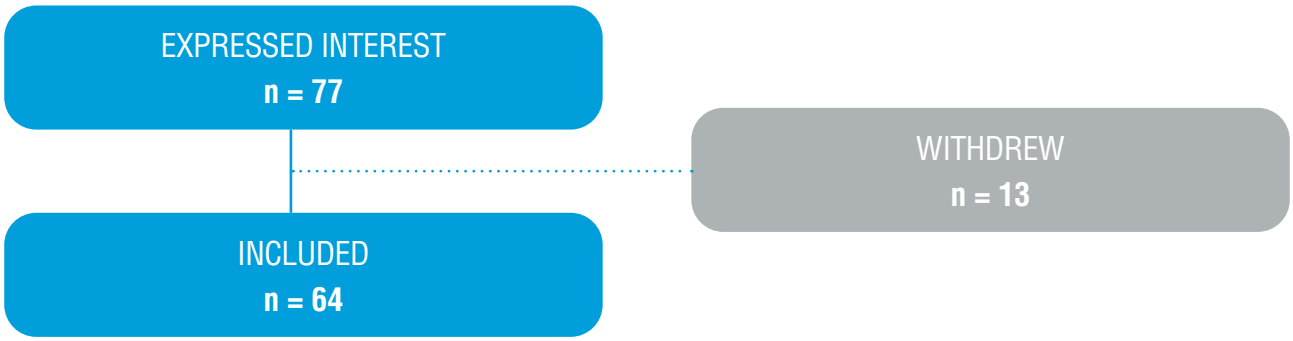


1.8 PARTICIPATING SITES

In 2022, 77 diabetes centres expressed an interest in participating (Figure 4). Of those expressing interest, 13 sites withdrew from the data collection after registering. The most cited reasons for withdrawal related to staffing pressures due to staff changes and illness which were exacerbated by the COVID-19 pandemic. In addition, lengthy ethics and governance requirements were a barrier.

Data were received, processed, analysed and reported from 64 sites, 83.1% of those who initially expressed interest (Table 3).

FIGURE 4. FLOWCHART OF PARTICIPATION OF DIABETES CENTRES IN ANDA 2022



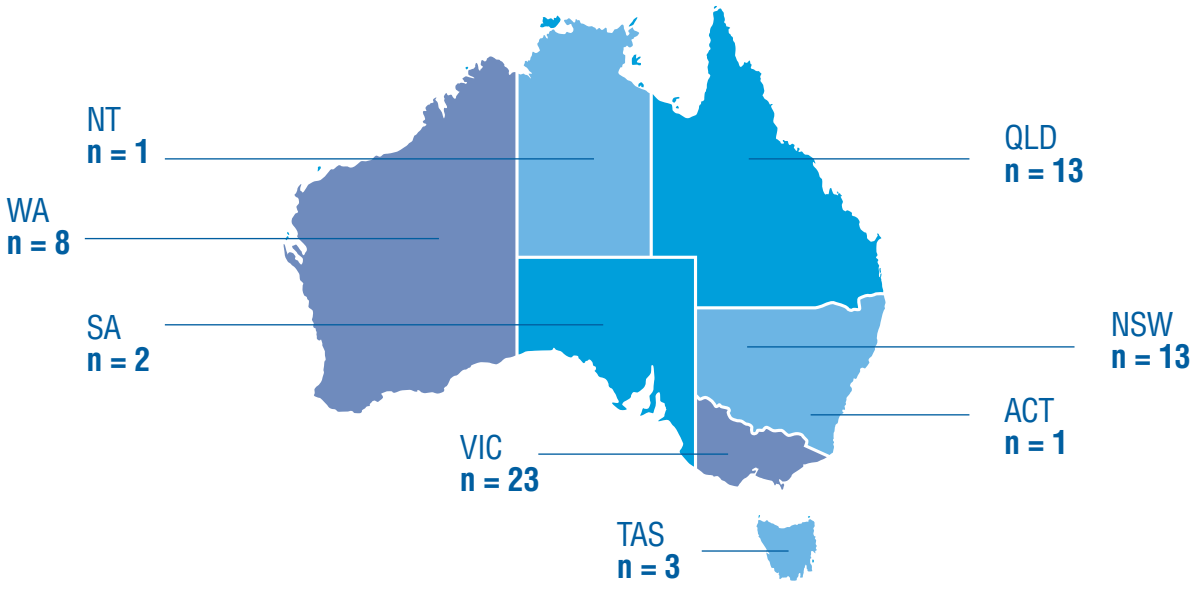
Of the 64 sites participating in ANDA 2022, 50.0% were centres of excellence or tertiary care services and 50.0% were primary or secondary care services (Table 3). A list of participating sites is included in Appendix 3.

TABLE 3. PARTICIPATING SITES BY CENTRE TYPE

Centre types	Participating sites
Centres of Excellence and Tertiary Care Diabetes Services	32
Secondary Care Diabetes Services and Primary Care Diabetes Services	32

The majority of participating sites were on the Australian eastern seaboard, with 35.9% of sites in Victoria, and 20.3% in both New South Wales and Queensland, but increasing participation in other states. The broad geographical distribution of participating sites is shown in Figure 5:

FIGURE 5. PARTICIPATING SITES BY STATE AND TERRITORY



2. RESULTS

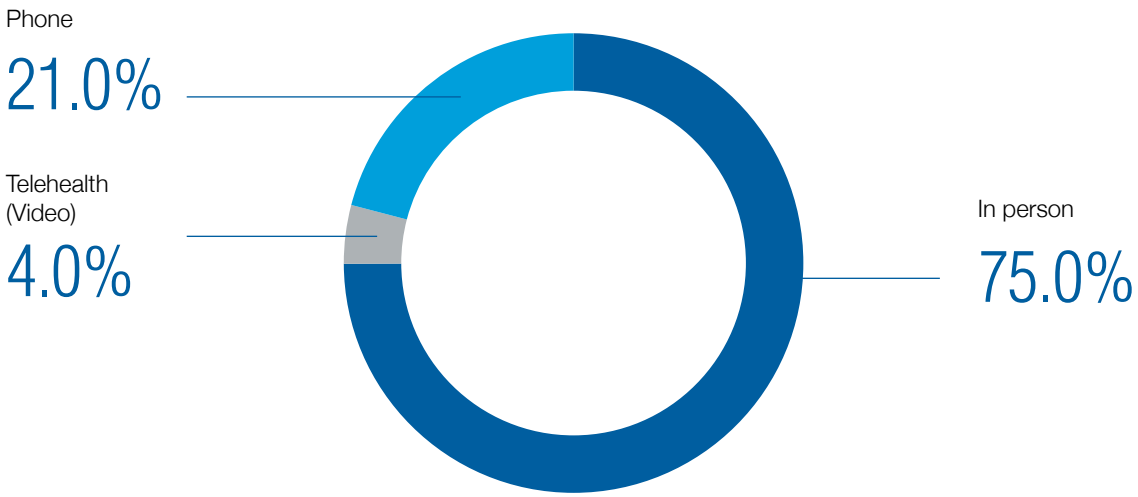
Data were collected on a total of 5244 patients. Of these, 4641 were adult patients (excluding GDM), 415 were paediatric patients and 188 were patients with GDM.

Results in this section of the report (the primary analysis) represent the pooled analyses of adult patients only. These analyses are also reported for patients with type 1 diabetes (T1DM) and type 2 diabetes (T2DM) separately. Analyses of data for GDM are presented in section 2.13.2, and data for paediatric diabetes are presented in section 2.13.3.

2.1 TYPE OF CLINICAL CONSULTATION - ADULTS

Despite the restrictions imposed in some state and territories, and changes in the delivery of care since the COVID-19 pandemic, 3 in 4 patients had in person consultations, and 1 in 5 patients had phone consultations (Figure 6).

FIGURE 6. TYPE OF CLINICAL CONSULTATION FOR PATIENTS PARTICIPATING IN ANDA 2022 (n = 4104)



2.2 DEMOGRAPHIC DATA - ADULTS

The demographic data are included in Table 4. Overall, the mean age of patients was 57.2 years, and males represented slightly more of the cohort than females, similar to previous years. The majority of patients included in the analysis identified as being born in Australia and almost 1 in 10 patients identified as Aboriginal/Torres Strait Islander which was more than double compared to previous years. Most patients were registered with the National Diabetes Services Scheme (NDSS). Around 2 in 3 patients had T2DM with a median duration of diabetes of 12.1 years (Table 5), and about 1 in 3 patients had T1DM with a median duration of 17.4 years. Overall, the median duration of diabetes reported in 2022 was almost 2 years shorter than the median duration reported in previous years. Table 4 highlights that patient registrant numbers remained stable over the course of the pandemic (i.e. 2021 – 2022).

TABLE 4. DEMOGRAPHIC DATA

Category	2019	2021	2022
Number of patients	6116	4484	4641
Age (years), mean ± SD	57.2 ± 17.3	57.6 ± 17.3	57.2 ± 17.7
Female, %	47.4	45.5	45.5
Pregnant, %	6.8	5.7	5.3
Diabetes duration (years), median (IQR)	14.0 (6 - 21)	14.0 (7 - 22)	12.5 (5 - 22)
Diabetes type, %			
T1DM	28.3	29.0	30.3
T2DM	67.7	67.5	63.2
Don't know	1.5	0.6	2.9
Other	2.1	2.5	2.5
Unstated	0.4	0.4	1.0
Initial visit, %	20.8	14.0	17.8
Interpreter required, %	NA	NA	2.9
Aboriginal/Torres Strait Islander, %	4.7	3.5	7.6
Australian-born, %	70.4	71.1	73.5
DVA patient, %	1.1	1.3	1.8
NDSS member, %	94.2	94.0	88.5

Patients with T1DM were approximately 20 years younger than patients with T2DM (Table 5).

TABLE 5. AGE AT VISIT AND DURATION OF DIABETES, BY DIABETES TYPE

Category	n	T1DM	n	T2DM
Age (years), mean + SD	1406	44.2 ± 17.9	2935	63.8 ± 13.5
Duration (years), median (IQR)	1384	17.4 (7.4 - 30.5)	1426	12.1 (5.3 - 20.5)

2.3 DIABETES MONITORING AND MANAGEMENT – ADULTS

Table 6 outlines the methods of blood glucose monitoring undertaken by patients with T1DM and T2DM.

Almost all patients with T1DM performed regular blood glucose monitoring with over 1 in 2 using contemporary glucose monitoring technologies (either flash or continuous). Over 4 in 5 patients with T2DM performed regular blood glucose monitoring with the vast majority using the finger prick method.

TABLE 6. BLOOD GLUCOSE MONITORING BY DIABETES TYPE

Method	T1DM		T2DM	
	n	%	n	%
Any	1279	99.3	2370	83.7
None	9	0.7	461	16.3
Finger pricking*	670	52.0	2301	81.3
Continuous glucose monitoring*	407	31.6	29	1.0
Flash glucose monitoring*	352	27.3	70	2.5

**Some patients indicated multiple methods, so total is greater than 100%*

The majority of patients who performed regular blood glucose monitoring using the finger prick method performed testing as often as recommended by their health care professional, with a small proportion unsure of the frequency of testing recommended (Table 7). Patients with T1DM performed slightly better than patients with T2DM.

TABLE 7. BLOOD GLUCOSE MONITORING BY FINGER PRICK PERFORMED AS OFTEN AS RECOMMENDED BY THE HEALTH CARE PROFESSIONAL, BY DIABETES TYPE

Finger prick testing	T1DM		T2DM	
	n	%	n	%
No	164	24.5	731	31.8
Yes	465	69.4	1387	60.3
Unsure of recommended testing	22	3.3	133	5.8
Unstated	19	2.8	50	2.1
Number of times per day, mean ± SD	657	3.7 ± 2.1	2259	2.1 ± 1.3

Of those that used flash or continuous glucose monitoring (CGMs), the majority of patients used sensors between 75 and 100% of the time (Table 8). Specifically, almost 3 in 4 patients with T1DM and 3 in 5 patients with T2DM used sensors more than 75% of the time.

TABLE 8. BLOOD GLUCOSE MONITORING BY FLASH/CONTINUOUS GLUCOSE MONITORING AND PROPORTION OF TIME USING SENSORS, BY DIABETES TYPE

Proportion of time using sensors	T1DM		T2DM	
	n	%	n	%
<50%	84	11.1	23	23.2
50-75%	85	11.3	8	8.1
>75-100%	558	73.9	60	60.6
Unstated	28	3.7	8	8.1

Table 9 details the classes of glucose lowering drugs patients were treated with. All patients with T1DM were treated with insulin, and the most commonly co-prescribed adjuvant glucose lowering agent was metformin. Of those patients with T2DM, almost 3 in 4 patients were treated with metformin, 1 in 2 were treated with insulin, 1 in 3 were treated with SGLT2 inhibitors and 1 in 3 were treated with GLP1 receptor agonists.

TABLE 9. CLASSES OF GLUCOSE LOWERING DRUGS BY DIABETES TYPE

Treatment*	T1DM		T2DM	
	n	%	n	%
Metformin	120	8.5	2150	73.3
SGLT2 Inhibitor	30	2.1	914	31.1
GLP1 Receptor Agonist	30	2.1	979	33.4
DPP4 Inhibitor	9	0.6	598	20.4
Sulphonylurea	5	0.4	609	20.7
Thiazolidinedione	1	0.1	19	0.6
Acarbose	0	0.0	12	0.4
Insulin	1407	100.0	1560	53.2
Unstated	0	0.0	10	0.3

**Monotherapy or in combination with other treatments*

Over the past ten years, there has been a continuing trend towards patients with T2DM being treated with newer, non-insulin oral and injectable therapies (Table 10). In addition, an increase in the use of multiple glucose lowering classes of drug was evident (Figure 7), with a shift towards agents with pleiotropic cardio- and reno-protective effects such as SGLT2 inhibitors and GLP1 receptor agonists (Table 11).

TABLE 10. TREATMENT FOR T2DM COMPARED BY YEAR

Treatment for T2DM, %	2015	2017	2019	2021	2022
Diet only	4.1	3.7	5.0	3.8	**4.8**
Tablet/s (only)	31.4	32.9	32.2	31.2	**27.1**
Insulin (only)	18.1	13.9	11.0	8.4	**6.6**
Insulin & tablet/s	40.9	39.0	39.4	33.7	**28.1**
Injectables* (only)	0.1	0.2	0.1	0.3	**0.5**
Injectables* & tablet/s	3.3	4.7	6.5	11.4	**14.3**
Injectables* & insulin	0.3	0.6	0.9	1.4	**2.2**
Injectables* & insulin & tablet/s	1.8	4.9	4.8	9.8	**16.5**

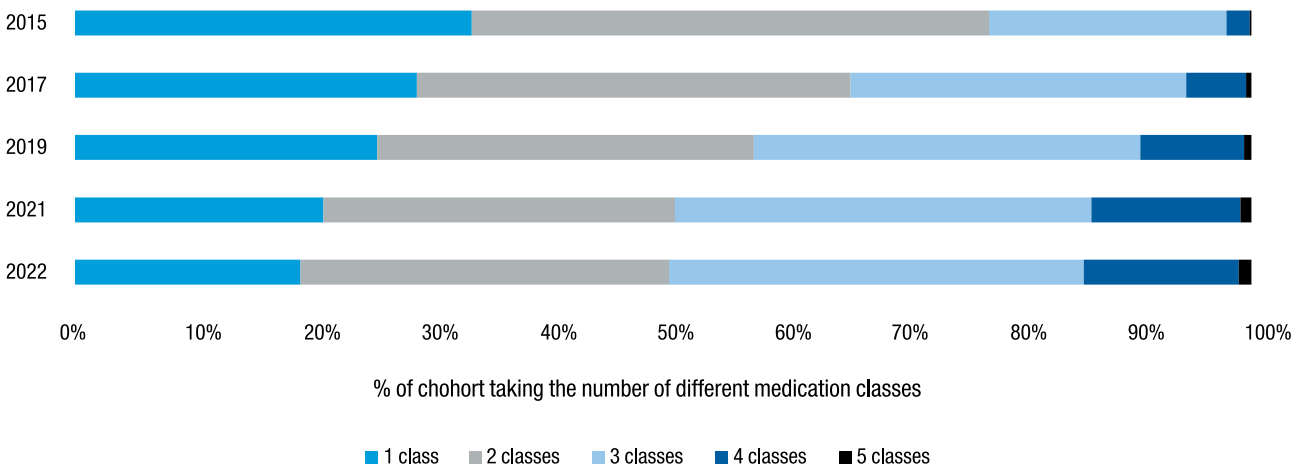
**Injectables are GLP1 receptor agonists*

TABLE 11. NON-INSULIN TREATMENT FOR T2DM COMPARED BY YEAR

Treatment for T2DM, %	2015	2017	2019	2021	2022
Metformin	67.4	71.8	71.2	74.6	**73.3**
SGLT2 Inhibitor	4.5	18.5	26.7	33.6	**31.1**
GLP1 Receptor Agonist	5.5	10.3	12.4	22.9	**33.4**
DPP4 Inhibitor	14.2	17.5	25.8	25.9	**20.4**
Sulphonylurea	26.5	24.3	22.1	21.7	**20.7**
Acarbose	1.1	0.9	0.6	0.5	**0.4**
Thiazolidinedione	1.8	0.6	0.3	0.4	**0.6**

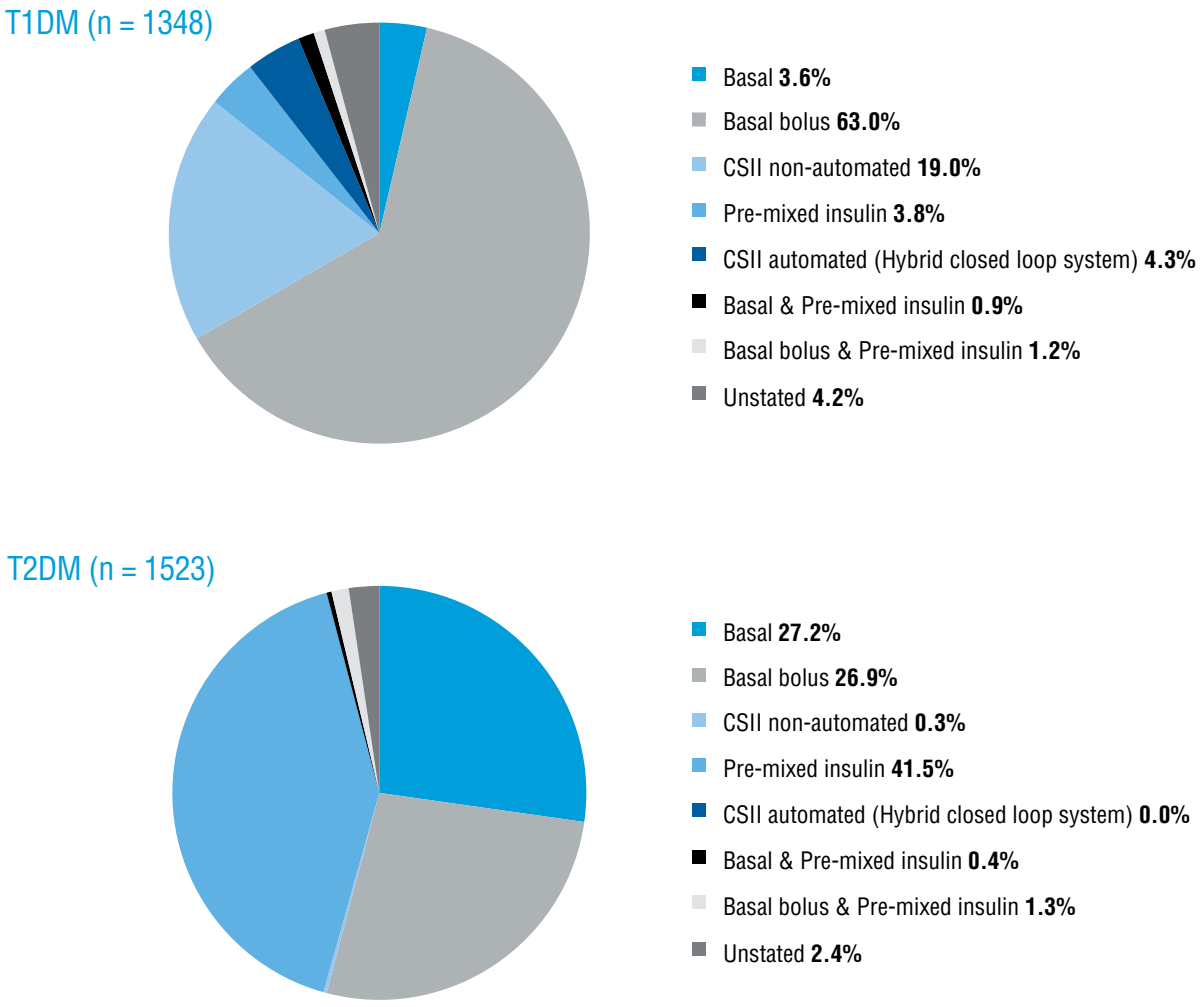
Total greater than 100% due to patients being on multiple agents

FIGURE 7. STACKED BAR CHART DEPICTING THE PROPORTION OF PATIENTS WITH T2DM TREATED WITH MULTIPLE CLASSES OF MEDICATIONS OVER TIME



The majority of patients with T1DM were treated with a basal-bolus insulin regimen (Figure 8). Almost 1 in 4 patients were using CSII (automated or non-automated) systems. Of those patients with T2DM treated with insulin, the largest proportion used a pre-mixed regimen, with the remainder mostly using either a basal-bolus or basal-only regimen (Figure 8).

FIGURE 8. MODALITIES OF INSULIN USE BY DIABETES TYPE



2.4 CLINICAL PARAMETERS, COMPLICATIONS AND COMORBIDITY DATA - ADULTS

Table 12 presents clinical parameters for adult patients with diabetes (excluding GDM). Normally distributed data are presented as mean ± SD, and non-normally distributed data are presented as median and IQR. Tables 13-20 detail risk factors, complications and comorbidities of the pooled cohort. These data are reported as number of people (n) responding 'Yes' and percent (%) of 'Yes' of the patients who responded to the question, unless otherwise indicated.

2.4.1 CLINICAL PARAMETERS

Overall, the average values for clinical parameters/cardiovascular risk factors were above targets with a mean HbA_{1c} of 8.4%, mean systolic and diastolic blood pressure of 132 and 77 mmHg, respectively, and mean total cholesterol of 4.3 mmol/L, LDL cholesterol of 2.2 mmol/L and non-HDL cholesterol of 3.1 mmol/L. HDL cholesterol was the only parameter meeting recommended target levels. Mean BMI was in the obese range (31.3 kg/m^2).

TABLE 12. CLINICAL PARAMETERS

Metabolic data	n	Mean + SD
HbA_{1c} (%)	3758	8.4 ± 1.9
HbA_{1c} (mmol/mol)	3758	67.8 ± 20.7
Systolic BP (mmHg)	3747	132 ± 17
Diastolic BP (mmHg)	3747	77 ± 11
Total cholesterol (mmol/L)	2814	4.3 ± 1.5
HDL cholesterol (mmol/L)	2442	1.2 ± 0.4
LDL cholesterol (mmol/L)	2396	2.2 ± 1.0
Non-HDL cholesterol	2430	3.1 ± 1.5
Triglyceride (mmol/L)*, median (IQR)	2768	1.6 (1.1 – 2.4)
BMI (kg/m^2)	4017	31.3 ± 7.7

**Reported as median (IQR) as data were not normally distributed*

2.4.2 CARDIOVASCULAR RISK FACTORS

A high prevalence of cardiovascular risk factors was observed across the cohort (Table 13). Indeed, 4 in 5 patients were overweight or obese, over 1 in 2 had total cholesterol, LDL cholesterol and blood pressure above target and more than 1 in 10 reported current smoking.

TABLE 13. RISK FACTORS FOR CARDIOVASCULAR DISEASE

Risk factors	n	%
Current smokers	614	15.1
Past smokers	1259	31.0
Never smoked	2187	53.9
On anti-hypertensive therapy	2560	59.9
On lipid modifying therapy	2582	60.0
Blood pressure ≥130/80 (mmHg)	2555	55.1
Blood pressure ≥140/90 (mmHg)	1356	29.2
Raised total cholesterol ≥4.0 (mmol/L)	1583	56.3
Raised LDL cholesterol ≥2.0 (mmol/L)	1312	54.8
Reduced HDL cholesterol <1.0 (mmol/L)	689	28.2
Raised triglycerides ≥2.0 (mmol/L)	1030	37.2
Raised non-HDL cholesterol ≥2.5 (mmol/L)	1614	66.4
Overweight/obese ≥25 (kg/m^2)	3194	79.5

2.4.3 SERUM CREATININE AND ESTIMATED GLOMERULAR FILTRATION RATE (eGFR) – ADULTS

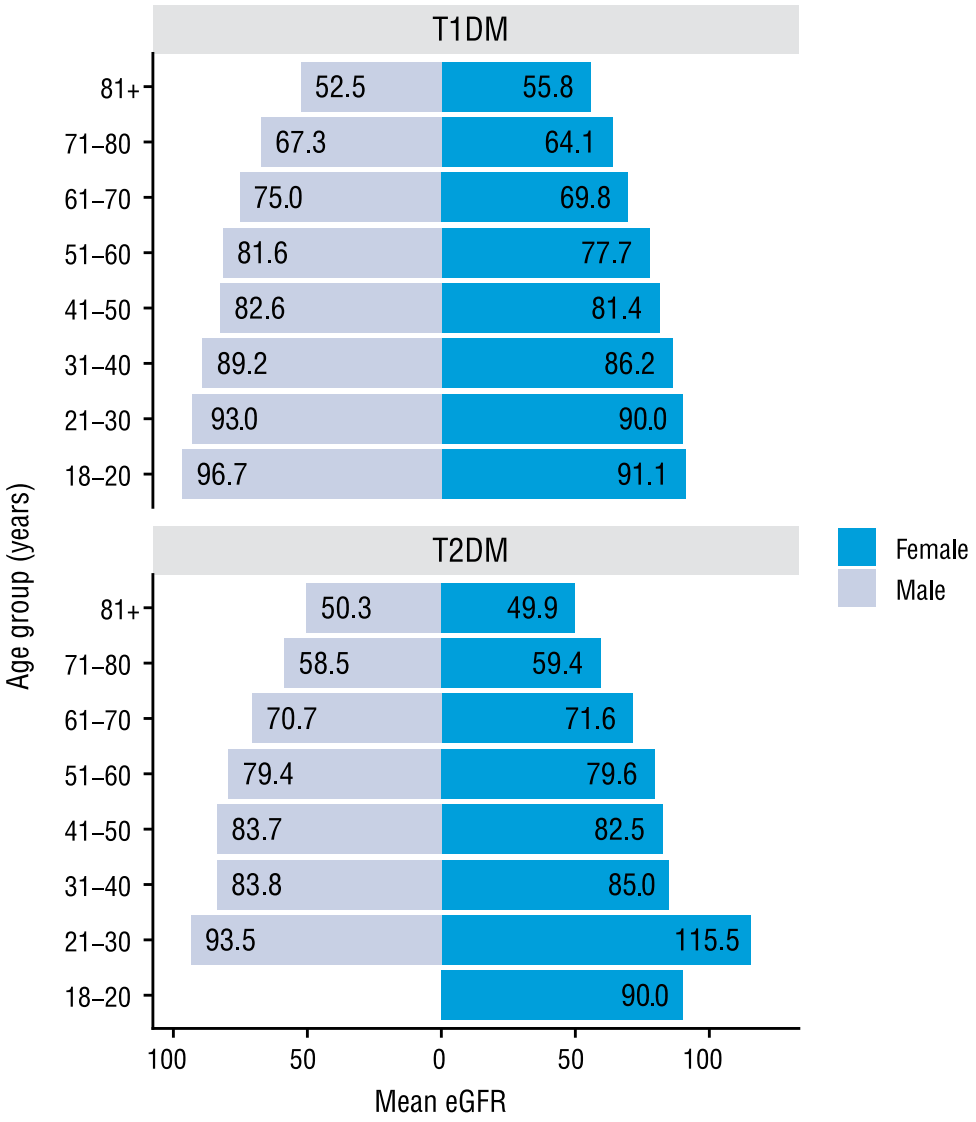
Table 14 demonstrates data on serum creatinine of patients. Over 1 in 10 patients had a serum creatinine greater than 120 µmol/L.

TABLE 14 SERUM CREATININE

Serum creatinine	n	%
<120 µmol/L	2912	84.5
120 - 500 µmol/L	507	14.7
>500 µmol/L	29	0.8

Figure 9 represents the mean values of eGFR by sex, age-group and diabetes type. The overall mean ± SD eGFR in T1DM was 82.9 ± 18.0 in males and 80.7 ± 18.7 mL/min/1.73m^2 in females. The overall mean eGFR in T2DM was 69.9 ± 22.9 in males and 71.6 ± 30.7 mL/min/1.73m^2 in females. Increasing age above 60 years was concurrently associated with a progressive trend towards declining mean eGFR in both male and female patients with T1DM and T2DM. Of note, there were no males with T2DM in the 18-20 years age-group with eGFR reported.

FIGURE 9. MEAN eGFR BY AGE, SEX AND DIABETES TYPE



2.4.4 ACUTE METABOLIC COMPLICATIONS

Both hyperglycaemic and hypoglycaemic emergencies in the last 12 months were more common in patients with T1DM compared with T2DM (Table 15). Just under 1 in 10 patients with T1DM reported diabetic ketoacidosis and 1 in 10 reported severe hypoglycaemia.

TABLE 15. GLYCAEMIC EMERGENCIES IN THE LAST 12 MONTHS BY DIABETES TYPE

Complication/event	T1DM		T2DM	
	n	%	n	%
Diabetic ketoacidosis	99	7.8	30	1.1
Hyperosmolar hyperglycaemic state	3	0.2	30	1.1
Severe hypoglycaemia	118	9.3	52	1.8
1-2 episodes	73	5.7	30	1.0
3-5 episodes	21	1.7	14	0.5
>5 episodes	16	1.3	8	0.3
Unstated	8	0.6	0	0.0

2.4.5 EYE COMPLICATIONS

The majority of patients attended an optometrist or ophthalmologist in the last 12 months (Table 16). Eye complications were common, with over 1 in 10 patients reporting retinopathy in the last 12 months, and a similar proportion reporting cataract. A minority of patients reported blindness.

TABLE 16. EYE COMPLICATIONS

Eye testing and complications	Last 12 months		Prior to last 12 months	
	n	%	n	%
Attended optometrist/ophthalmologist*	2983	75.3	N/A	N/A
Retinopathy	684	16.0	769	18.4
Treatment for retinopathy	275	6.4	474	11.4
Cataract	502	11.7	686	16.4
Blindness	84	2.0	74	1.8

**Historical data on attendances to optometrists/ophthalmologists were not collected*

2.4.6 FOOT COMPLICATIONS

Foot complications were common, with over 1 in 5 patients reporting peripheral neuropathy, and 1 in 20 reporting foot ulcerations in the last 12 months (Table 17). A minority of patients reported lower limb amputation.

TABLE 17. FOOT COMPLICATIONS

Foot complications	Last 12 months		Prior to last 12 months	
	n	%	n	%
Foot ulceration	228	5.3	274	6.5
Peripheral neuropathy	904	21.0	762	18.2
Lower limb amputation	76	1.8	110	2.6
Minor	52*	1.2	79*	1.9
Major	22*	0.5	29*	0.7

**A small number of patients did not specify whether amputation was major and/or minor*

2.4.7 KIDNEY COMPLICATIONS

Kidney complications were common (Table 18). Almost 1 in 3 patients had moderately increased albuminuria and over 1 in 10 patients had severely increased albuminuria. About 1 in 3 patients were classified as having stage 3-5 chronic kidney disease (CKD) with most having stage 3 CKD. A minority were classified as having end-stage kidney disease.

TABLE 18. KIDNEY COMPLICATIONS

Albuminuria*	n	%
Normal to mildly increased albuminuria	1370	58.4
Moderately increased albuminuria	696	29.6
Severely increased albuminuria	281	12.0
Chronic Kidney Disease†		
Stage 1	328	14.0
Stage 2	249	10.6
Stage 3	678	28.9
Stage 4	130	5.5
Stage 5	55	2.3
End stage kidney disease††	186	4.3

**Albuminuria was determined using the Kidney Disease: Improving Global Outcomes (KDIGO) guidelines.[14] Where albumin measurement was missing, and proteinuria measurement was available, patients were categorised into albuminuria using the relevant thresholds outlined by KDIGO. Albuminuria was defined as:*

Normal to mildly increased: AER <30 mg/24 hours, ACR <3 mg/mmol, PER <150 mg/24 hours, or PCR <15 mg/mmol
Moderately increased: AER 30-300 mg/24 hours, ACR 3-30 mg/mmol, PER 150-500 mg/24 hours, or PCR 15-50 mg/mmol
Severely increased: AER >300 mg/24 hours, ACR >30 mg/mmol, PER >500 mg/24 hours, or PCR >50 mg/mmol

† KDIGO guidelines define chronic kidney disease as any abnormality of kidney structure or function that is present for >3 months, with implications for health.[14]

Stage 1: eGFR ≥90 ml/min/1.73m² and evidence of kidney damage (albuminuria, urine sediment abnormalities, electrolyte and other abnormalities due to tubular disorders, structural abnormalities on histology or imaging and history of kidney transplantation)
Stage 2: eGFR 60-89 ml/min/1.73m² and evidence of kidney damage
Stage 3: eGFR 30-59 ml/min/1.73m²
Stage 4: eGFR 15-29 ml/min/1.73m²
Stage 5: eGFR <15 ml/min/1.73m²

†† End stage kidney disease was defined as Stage 5 chronic kidney disease (eGFR <15 ml/min/1.73m²) and/or dialysis dependent (haemodialysis or peritoneal dialysis) and/or renal transplant recipient reported in the last 12 months

2.4.8 CARDIOVASCULAR COMPLICATIONS

About 1 in 4 patients reported cardiovascular complications (including myocardial infarction, CABG/angioplasty, stroke, congestive cardiac failure or peripheral vascular disease) in the last 12 months. Almost 1 in 10 patients reported peripheral vascular disease, 1 in 20 congestive cardiac failure and a smaller number reported other cardiovascular complications. Prior to the last 12 months, myocardial infarction, CABG/Angioplasty and stroke were commonly reported.

TABLE 19. CARDIOVASCULAR COMPLICATIONS

Complication/event	Last 12 months		Prior to last 12 months	
	n	%	n	%
Myocardial infarction	119	2.7	417	9.9
CABG/Angioplasty	122	2.8	431	10.2
Cerebral stroke	67	1.5	226	5.4
Congestive cardiac failure	177	4.2	187	4.5
Peripheral vascular disease	365	8.5	319	7.7

2.4.9 OTHER COMPLICATIONS AND COMORBIDITIES

Other complications and comorbidities are shown in Table 20.

In the last 12 months, the most commonly reported complication/event was depression affecting 1 in 5 patients. The presence of depression was defined as a formal diagnosis of depression from a clinician or prescribed pharmacotherapy for depression. Sexual dysfunction was reported by 1 in 10 patients. Liver disease was also common with 1 in 10 patients reporting mild liver disease and 1 in 20 reporting moderate/severe disease. Dementia and malignancy were uncommonly reported among the cohort. About 1 in 5 patients reported COVID-19 in the last 12 months, with almost 1 in 10 of those being hospitalised for COVID-19.

TABLE 20. OTHER COMPLICATIONS AND COMORBIDITIES

Complication/event	Last 12 months		Prior to last 12 months	
	n	%	n	%
Depression	841	20.0	908	21.8
Sexual dysfunction	504	12.1	472	11.6
Malignancy	152	3.6	305	7.3
Dementia	127	3.0	89	2.1
COVID-19	829	20.3	62	1.5
Hospitalisation for COVID-19	70	8.4	5	8.1
Liver disease				
Mild	418	10.1		
Moderate/Severe	181	4.3		

2.5 CLINICAL PERFORMANCE INDICATORS - ADULTS

2.5.1 BENCHMARKING AND TREATMENT TARGETS

The data collected for ANDA 2022 as compared to the National Vascular Disease Prevention Alliance evidence-based guidelines for the management of cardiovascular risk[15] and the Australian Diabetes Society (ADS) position statement on glycaemic targets[16] are summarised in Table 21.

These data provide a snapshot of the overall performance of participating centres with respect to key treatment targets and clinical indicators.

Table 21 demonstrates key data against benchmarking and treatment targets for patients with diabetes. For simplicity, data in this table are presented without SD and IQR.

Glycaemic control targets were poorly met, with the mean HbA_{1c} for both T1DM and T2DM being above target, and only 2 in 5 patients and almost 1 in 3 patients meeting target, respectively. The attainment of lipid targets was fair, with almost 1 in 2 patients meeting total cholesterol target, 1 in 2 patients meeting the LDL cholesterol target, 3 in 5 patients meeting the HDL cholesterol target, and 3 in 5 patients meeting the triglyceride target. The target for non-HDL, which has been shown to be an important predictor of cardiovascular disease[17], was only met by 1 in 3 patients. In regards to blood pressure and weight management, almost 1 in 2 patients met the blood pressure target of <130/80 mmHg, and only 1 in 5 met the BMI target, with patients with T2DM having a higher mean BMI.

TABLE 21. BENCHMARKING AND TREATMENT TARGETS

Data collected	Mean	Target	% Meeting Target
HbA_{1c} (%) overall	8.4	≤7.0*	26.0
HbA_{1c} (%) T1DM	8.4	≤7.0*	19.6
HbA_{1c} (%) T2DM	8.3	≤7.0*	28.7
Systolic BP (mmHg)	132.0	<130	43.6
Diastolic BP (mmHg)	77.0	<80	55.0
Total cholesterol (mmol/L)	4.3	<4.0	43.7
HDL cholesterol (mmol/L)	1.2	≥1.0	71.8
LDL cholesterol (mmol/L)	2.2	<2.0	45.2
Non-HDL cholesterol (mmol/L)	3.1	<2.5	33.6
Triglycerides (mmol/L)†, median	1.6	<2.0	62.8
BMI (kg/m^2) overall	31.3	<25	20.5
BMI (kg/m^2) T1DM	27.9	<25	35.5
BMI (kg/m^2) T2DM	33.2	<25	12.2

**In 2009, the Australian Diabetes Society published a position statement describing the need for individualisation of glycaemic targets.[16] The key conclusions were that for most people with diabetes the general HbA_{1c} target is 7.0% (53 mmol/mol), however:*

- *In people without known cardiovascular disease, a long duration of diabetes, severe hypoglycaemia or another contraindication, the HbA_{1c} target is ≤6.5% (48 mmol/mol)*
- *In people with reduced hypoglycaemia awareness or major comorbidities, the target may increase to 8.0% (64 mmol/mol)*
- *In people with limited life expectancy, aim for symptom control*
- *In women planning a pregnancy, aim for the tightest achievable control without severe hypoglycaemia before and during pregnancy; preferably ≤6.0% (42 mmol/mol)*

For this analysis, a HbA_{1c} target of 7.0% or less was applied to all patients.

†Reported as median (IQR) as data were not normally distributed.

2.5.2 CLINICAL MANAGEMENT GUIDELINES FOR DIABETES

National evidence-based guidelines for the clinical management of diabetes[18] emphasise the importance of patient assessment and management with regards to blood glucose control, blood pressure, lipids, BMI, eyes, foot and kidney function. The data below indicate process and outcome indicators based on these clinical management guidelines.

BLOOD GLUCOSE CONTROL:

Process: HbA_{1c} (%) – overall 82.7% of patients had an HbA_{1c} measurement recorded

Outcome:

All patients Overall HbA_{1c} (%) was 8.4 ± 1.9

T1DM Overall HbA_{1c} (%) was 8.4 ± 1.8

Initial visit: HbA_{1c} (%) was 9.1 ± 2.1

Follow-up visit: HbA_{1c} (%) was 8.3 ± 1.7

T2DM Overall HbA_{1c} is (%) was 8.3 ± 1.9

Initial visit: HbA_{1c} (%) was 9.1 ± 2.3

Follow-up visit: HbA_{1c} (%) was 8.1 ± 1.8

BLOOD PRESSURE:

Process: Blood pressure was recorded for 80.7% of patients.

Anti-hypertensive therapy was prescribed for 59.9%. Of these patients, 44.3% were on an ACE inhibitor, 38.4% on an ARB, 30.5% on a calcium antagonist, 29.5% on a beta blocker, 12.2% on a thiazide and 12.2% on an alternative anti-hypertensive therapy.

Outcome: Overall 44.9% achieved a blood pressure of <130/80 mmHg and 70.8% achieved a blood pressure <140/90 mmHg.

Overall blood pressure

<130/80 mmHg - 44.9% ≥130/80 mmHg - 55.1%

<140/90 mmHg - 70.8% ≥140/90 mmHg - 29.2%

Aged ≤60 years

<130/80 mmHg - 50.5% ≥130/80 mmHg - 49.5%

<140/90 mmHg - 77.0% ≥140/90 mmHg - 23.0%

Aged >60 years

<130/80 mmHg - 39.5% ≥130/80 mmHg - 60.5%

<140/90 mmHg - 64.8% ≥140/90 mmHg - 35.2%

BODY MASS INDEX (KG/M2):

Process: 92.4% of patients had a weight measurement recorded and 86.9% of patients had a height measurement recorded so that BMI could be calculated for 86.6% of patients overall.

Outcome:	**Normal Weight**	**Overweight**	**Obese**
	<25 kg/m^2 - 20.5%	25-30 kg/m^2 - 28.5%	≥30 kg/m^2 - 51.0%

LIPIDS:

Process: 60.7% of patients had a total cholesterol level recorded, 51.6% a LDL cholesterol level, 52.6% an HDL cholesterol level and 59.6% a triglyceride level. 84.3% of lipid measurements were taken while fasting.

Outcome:

Total cholesterol

<4.0 mmol/L - 43.7% ≥4.0 mmol/L - 56.3%

LDL cholesterol

<2.0 mmol/L - 45.2% ≥2.0 mmol/L - 54.8%

HDL cholesterol

≥1.0 mmol/L - 71.8% <1.0 mmol/L - 28.2%

Triglyceride

<2.0 mmol/L - 62.8% ≥2.0 mmol/L - 37.2%

Non-HDL cholesterol

<2.5 mmol/L - 33.6% ≥2.5 mmol/L - 66.4%

EYES:

Process: 75.3% had an eye review by an ophthalmologist, an optometrist or both.

Outcome: 16.0% of patients had retinopathy and 6.4% had treatment for retinopathy.

FEET:

Process: 93.0% recorded a response for foot ulceration, peripheral neuropathy and lower limb amputation in the last 12 months.

Outcome: In the last 12 months, 5.3% of patients had foot ulceration, 21.0% peripheral neuropathy and 1.8% recorded lower limb amputation.

KIDNEYS (ALBUMINURIA):

Process: Urinary protein/albumin was recorded for 50.6% of patients.

Outcome:

Albuminuria

Normal to mildly increased - 58.4%

Moderately increased - 29.7%

Severely increased - 12.0%

Chronic Kidney Disease

Stage 1 - 14.0%

Stage 2 - 10.6%

Stage 3 - 28.9%

Stage 4 - 5.5%

Stage 5 - 2.3%

2.6 HEALTH OUTCOMES BY DIABETES TYPE - ADULTS

Tables 22-31 demonstrate data relating to glucose control, clinical indicators and foot, eye and kidney related complications, categorised by diabetes type.

2.6.1 BLOOD GLUCOSE CONTROL

Mean HbA_{1c} was 0.1% higher in T1DM compared with T2DM and was above target for all diabetes types (Table 22).

TABLE 22. BLOOD GLUCOSE CONTROL: HbA_{1c} BY DIABETES TYPE

Diabetes type		Mean ± SD	
	n	HbA_{1c} (%)	HbA_{1c} (mmol/mol)
Overall	3838	8.4 ± 1.9	67.8 ± 20.7
T1DM	1156	8.4 ± 1.8	68.4 ± 19.2
T2DM	2567	8.3 ± 1.9	67.4 ± 21.1
Don't know	10	10.4 ± 2.7	90.0 ± 29.7
Other	98	8.4 ± 2.3	68.1 ± 25.3
Unstated	7	7.9 ± 1.4	63.1 ± 15.2

2.6.2 BODY MASS INDEX

Of all patients with a weight and height collected, 26.3% self-reported weight, and 30.2% self-reported height.

Table 23 shows the mean BMI of patients with T1DM and T2DM. The mean BMI of patients with T1DM was in the overweight range (25-<30 kg/m^2), while the mean BMI of patients with T2DM was in the obese range (≥30 kg/m^2).

TABLE 23. BODY MASS INDEX BY DIABETES TYPE

Diabetes type	BMI (kg/m^2)	
	n	Mean ± SD
Overall	4001	31.3 ± 7.7
T1DM	1252	27.9 ± 6.0
T2DM	2596	33.2 ± 7.9
Don't know	55	29.4 ± 7.5
Other	98	27.2 ± 7.3
Unstated	16	30.0 ± 6.7

2.6.3 BLOOD PRESSURE

Table 24 presents the mean blood pressure for patients with T1DM and T2DM, as well as those on anti-hypertensive therapy. The mean blood pressure of patients with T1DM was 129/77 mmHg and therefore met the blood pressure target of <130/80 mmHg. The mean blood pressure of patients with T2DM was 134/77 mmHg and therefore was higher than the blood pressure target of <130/80 mmHg but was less than the more modest target of <140/90 mmHg.

Mean blood pressure was typically higher in those patients taking anti-hypertensive medication, likely reflecting a treatment gap.

TABLE 24. BLOOD PRESSURE AND ANTI-HYPERTENSIVE THERAPY BY DIABETES TYPE

Anti-hypertensive therapy	T1DM (Mean ± SD)			T2DM (Mean ± SD)		
	n	Systolic BP	Diastolic BP	n	Systolic BP	Diastolic BP
Overall	1100	129 ± 17	77 ± 10	2535	134 ± 17	77 ± 11
On anti-hypertensive therapy	383	137 ± 18	77 ± 11	1820	135 ± 17	77 ± 11
Not on anti-hypertensive therapy	705	125 ± 14	76 ± 9	696	130 ± 17	79 ± 10
Anti-hypertensive therapy unstated	12	132 ± 18	77 ± 8	19	127 ± 17	79 ± 8

2.6.4 LIPIDS

Mean total cholesterol, HDL and LDL cholesterol were higher in patients with T1DM compared with T2DM, but no differences were observed for non-HDL (Table 25). In contrast, median triglycerides were higher in patients with T2DM compared with T1DM.

TABLE 25. LIPIDS BY FASTING STATUS AND DIABETES TYPE

Anti-hypertensive therapy	T1DM (Mean ± SD)		T2DM (Mean ± SD)	
	Pooled	Fasting	Pooled	Fasting
Total cholesterol	4.6 ± 1.2	4.6 ± 1.2	4.2 ± 1.6	4.2 ± 1.7
HDL cholesterol	1.5 ± 0.5	1.5 ± 0.4	1.1 ± 0.4	1.1 ± 0.4
LDL cholesterol	2.5 ± 1.0	2.5 ± 1.1	2.1 ± 1.0	2.1 ± 1.0
Non-HDL cholesterol	3.1 ± 1.1	3.1 ± 1.1	3.1 ± 1.6	3.0 ± 1.7
Triglyceride*, median (IQR)	1.1 (0.8 – 1.6)	1.5 (0.8 – 2.6)	1.8 (1.3 – 2.7)	1.8 (1.3 – 2.6)

**Reported as median (IQR) as data are not normally distributed*

Table 26 shows that the average patient with T1DM on lipid modifying therapy met HDL (>1.0 mmol/L) and triglyceride (<2.0 mmol/L) targets but did not meet the LDL (<2.0 mmol/L) or non-HDL (<2.5 mmol/L) targets. The average patient with T2DM on lipid modifying therapy met HDL, LDL and triglyceride targets, but did not meet the non-HDL target.

TABLE 26. FASTING LIPIDS AND LIPID MODIFYING THERAPY USE BY DIABETES TYPE

Fasting Lipids (mmol/L)	T1DM (Mean ± SD)		T2DM (Mean ± SD)	
	On lipid modifying therapy	Not on lipid modifying therapy	On lipid modifying therapy	Not on lipid modifying therapy
Total cholesterol	4.3 ± 1.2	4.8 ± 1.0	4.0 ± 1.7	4.7 ± 1.5
HDL cholesterol	1.4 ± 0.4	1.5 ± 0.5	1.1 ± 0.4	1.2 ± 0.4
LDL cholesterol	2.3 ± 1.2	2.7 ± 0.9	1.9 ± 0.9	2.6 ± 1.0
Non-HDL cholesterol	2.9 ± 1.2	3.3 ± 1.0	2.9 ± 1.7	3.6 ± 1.5
Triglyceride*, median (IQR)	1.1 (0.8 – 1.7)	1.0 (0.7 – 1.5)	1.8 (1.3 – 2.6)	1.8 (1.3 – 2.7)

**Reported as median (IQR) as data are not normally distributed*

2.6.5 EYE COMPLICATIONS

Tables 27 and 28 show recent (in the last 12 months) and historical (prior to the last 12 months) eye testing and complications data among patients with T1DM and T2DM. Most eye complications were more common in patients with T1DM, except for cataract which was more common in patients with T2DM, however similar proportions of patients with T1DM and T2DM reported attendances at an eye specialist in the last 12 months. A minority of patients with T1DM and T2DM reported blindness.

TABLE 27. EYE COMPLICATIONS IN THE LAST 12 MONTHS BY DIABETES TYPE

Eye testing and complications	T1DM		T2DM	
	n	%	n	%
Attended optometrist/ophthalmologist	924	77.4	1975	74.6
Retinopathy	233	18.1	442	15.5
Treatment for retinopathy	99	7.7	172	6.0
Cataract	86	6.7	400	14.0
Blindness	24	1.9	58	2.1

TABLE 28. EYE COMPLICATIONS PRIOR TO THE LAST 12 MONTHS BY DIABETES TYPE

Eye testing and complications	T1DM		T2DM	
	n	%	n	%
Retinopathy	294	23.5	466	16.7
Treatment for retinopathy	192	15.3	276	9.9
Cataract	146	11.7	529	18.9
Blindness	18	1.5	54	1.9

2.6.6 FOOT COMPLICATIONS

Tables 29 and 30 highlight recent (in the last 12 months) and historical (prior to the last 12 months) foot complications among patients with T1DM and T2DM. Recent foot complications including amputation were more common in patients with T2DM compared with T1DM. Almost 1 in 4 patients with T2DM reported peripheral neuropathy in the past 12 months, and 1 in 20 reported foot ulceration. Historical foot complications were more common in patients with T2DM.

TABLE 29. FOOT COMPLICATIONS IN THE LAST 12 MONTHS BY DIABETES TYPE

Foot complications	T1DM		T2DM	
	n	%	n	%
Foot ulceration	27	2.1	197	6.8
Peripheral vascular disease	65	5.1	296	10.3
Peripheral neuropathy	200	15.5	678	23.6
Lower limb amputation*	13	1.0	62	2.2
Minor	12	0.9	40	1.4
Major	1	0.1	20	0.7

**A small number of patients did not specify whether amputation was major and/or minor*

TABLE 30. FOOT COMPLICATIONS PRIOR TO THE LAST 12 MONTHS BY DIABETES TYPE

Foot complications	T1DM		T2DM	
	n	%	n	%
Foot ulceration	43	3.4	227	7.9
Peripheral vascular disease	61	4.9	254	9.1
Peripheral neuropathy	174	13.9	570	20.4
Lower limb amputation*	15	1.2	94	3.4
Minor	8	0.6	70	2.5
Major	7	0.6	22	0.8

**A small number of patients did not specify whether amputation was major and/or minor*

2.6.7 KIDNEY COMPLICATIONS

Kidney complications were more common in patients with T2DM compared to T1DM (Table 31). Around 1 in 2 patients with T2DM reported stage 3-5 CKD compared to almost 1 in 5 patients with T1DM. While a minority of patients recorded end-stage kidney disease, it was more than twice as common in patients with T2DM compared to T1DM.

TABLE 31. KIDNEY COMPLICATIONS BY DIABETES TYPE

Albuminuria	T1DM		T2DM	
	n	%	n	%
Normal to mildly increased	493	70.9	836	52.5
Moderately increased	157	22.6	528	33.1
Severely increased	45	6.5	230	14.4
Chronic Kidney Disease				
Stage 1	94	13.5	228	14.3
Stage 2	58	8.3	189	11.9
Stage 3	99	14.2	568	35.6
Stage 4	15	2.2	114	7.2
Stage 5	5	0.7	46	2.9
End stage kidney disease	26	2.0	146	5.1

2.7 IMPACT OF DIABETES DURATION ON CLINICAL PARAMETERS - ADULTS

Tables 32 and 33, as well as Figures 10 and 11 provide a breakdown (by diabetes type) of age and duration of diabetes (where all three data items were available for analysis).

2.7.1 AGE AND DIABETES DURATION

Among patients with T1DM, more than 1 in 10 were recently diagnosed (<5 years duration), while almost 3 in 4 had relatively long-standing diabetes (>10 years) (Table 32).

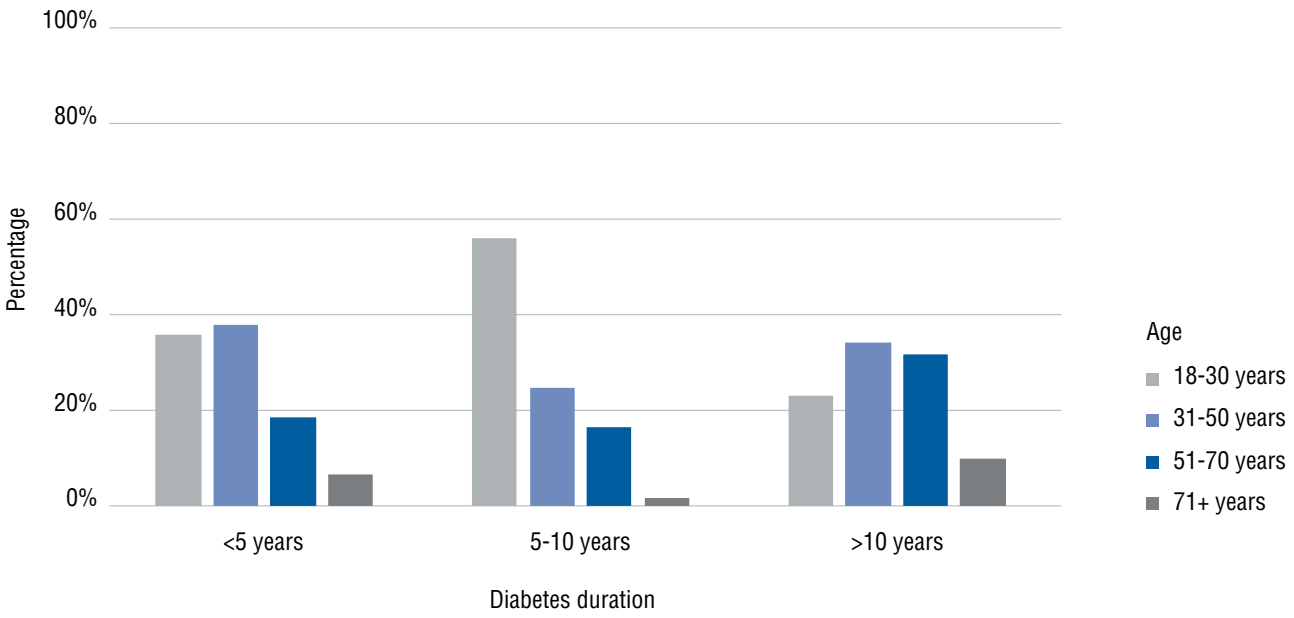
TABLE 32. PATIENTS WITH T1DM BY DURATION OF DIABETES AND VISIT TYPE

Visit type	Duration of diabetes			
	n	<5 years	5-10 years	>10 years
All patients*	1369	16.7%	14.1%	69.2%
Initial visit	137	19.7%	16.1%	64.2%
Follow-up visit	1232	16.3%	13.9%	69.8%

**This captures only patients with T1DM who have available data in initial visit and diabetes duration*

Figure 10 highlights that among patients with recently diagnosed or shorter duration of T1DM (<10 years), most were aged 18 to 50 years of age. Patients with longstanding (>10 years) T1DM were typically older, with a greater proportion over 50 years of age than seen in more recently diagnosed disease.

FIGURE 10. COMPARISON OF AGE AND DURATION OF DIABETES IN PATIENTS WITH T1DM



Among patients with T2DM, about 1 in 4 were recently diagnosed (<5 years duration), while 3 in 5 had relatively long-standing diabetes of >10 years (Table 33). This was similar to patients with T1DM.

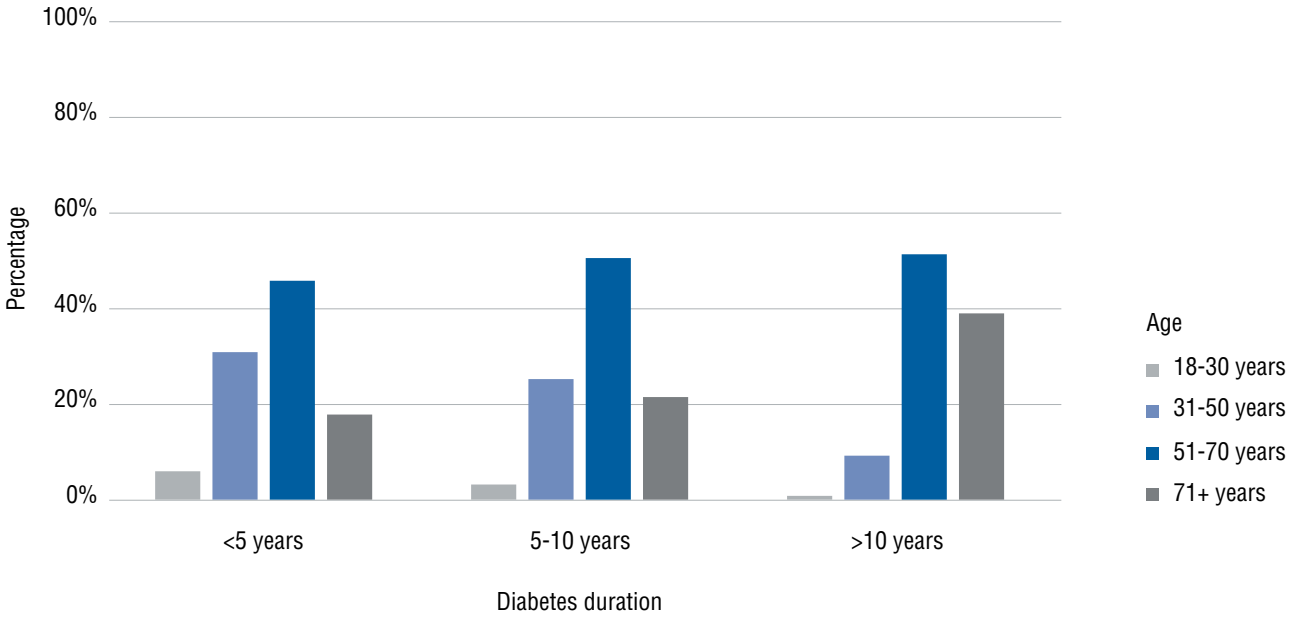
TABLE 33. PATIENTS WITH T2DM BY DURATION OF DIABETES AND VISIT TYPE

Visit type	Duration of diabetes			
	n	<5 years	5-10 years	>10 years
All patients*	2869	24.5%	16.4%	59.1%
Initial visit	646	45.8%	16.4%	37.8%
Follow-up visit	2223	18.3%	16.4%	65.3%

**This captures only patients with T2DM who have available data in initial visit and diabetes duration*

Figure 11 highlights that among patients with recently diagnosed (<5 years) T2DM, most patients were 51-70 years of age. With increasing duration of diabetes, the proportion of the older population (71+ years) increased.

FIGURE 11. COMPARISON OF AGE AND DURATION OF DIABETES IN PATIENTS WITH T2DM



2.7.2 HbA_{1c} BY AGE AND DIABETES DURATION

Tables 34 and 35, as well as Figures 12 and 13 provide a breakdown (by diabetes type) of age, duration of diabetes and the proportion of patients meeting an HbA_{1c} target of ≤7.0% (where all four data items were available for analysis).

Among patients with T1DM, 1 in 5 of those recently diagnosed (<5 years duration) were meeting the HbA_{1c} target of ≤7.0%, compared with just over 3 in 5 of those with long-standing diabetes (>10 years).

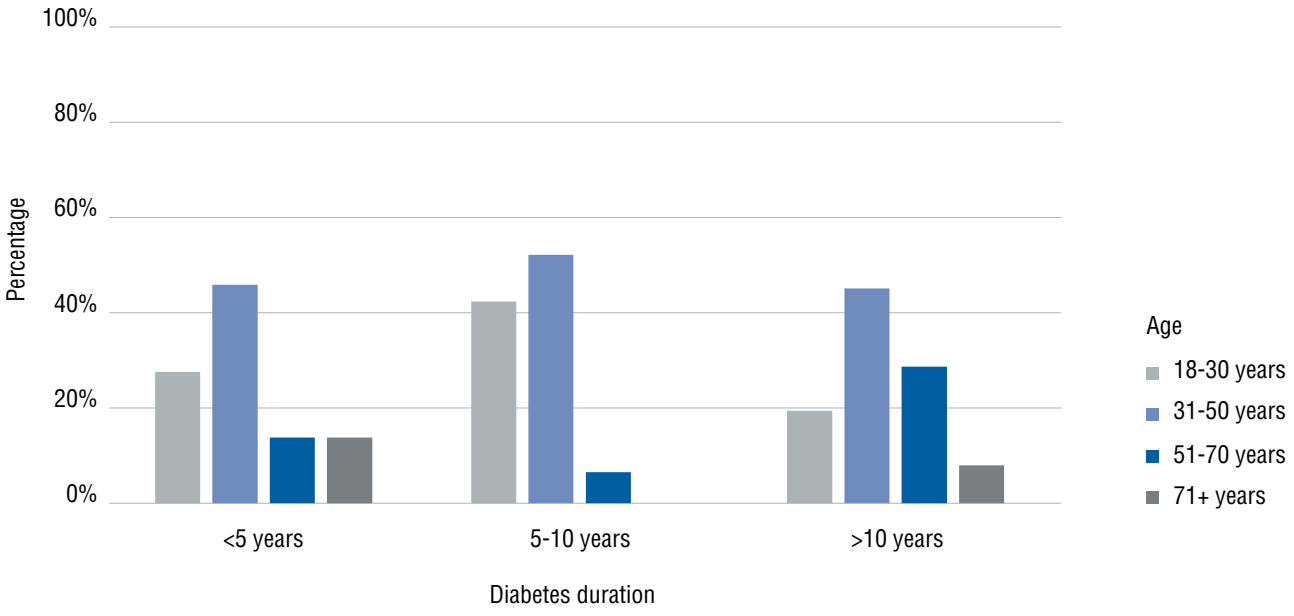
TABLE 34. PATIENTS WITH T1DM AND HbA_{1c} ≤7.0% BY DURATION OF DIABETES AND VISIT TYPE

Patients with T1DM and HbA_{1c} ≤7.0%	Duration of diabetes			
	n	<5 years	5-10 years	>10 years
All patients*	222	20.3%	14.9%	64.9%
Initial visit	16	18.8%	18.8%	62.5%
Follow-up visit	206	20.4%	14.6%	65.0%

**This captures only patients with T1DM who have available data in initial visit, diabetes duration and HbA_{1c}*

Figure 12 highlights that most patients with T1DM meeting HbA_{1c} targets were 18 to 50 years of age, irrespective of duration of diabetes.

FIGURE 12. PATIENTS WITH T1DM AND HbA_{1c} ≤7.0% BY AGE AND DURATION OF DIABETES



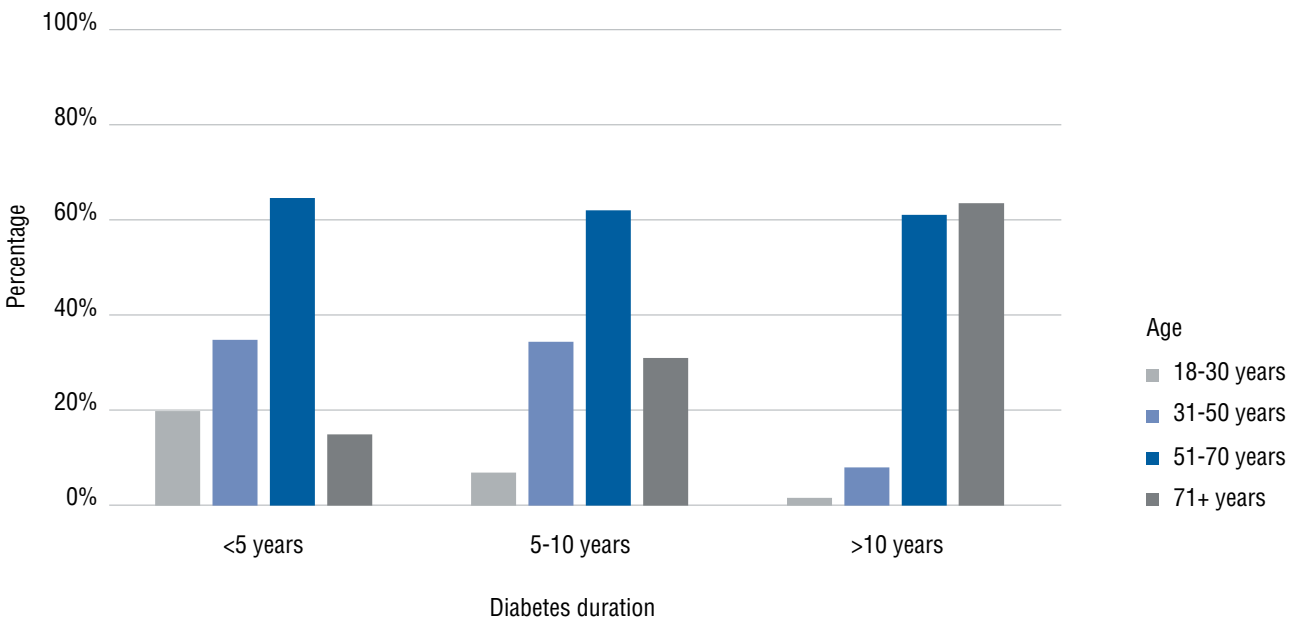
Among patients with T2DM, only 1 in 3 of those who were recently diagnosed (<5 years duration) were meeting an HbA_{1c} target of ≤7.0%, compared with almost 1 in 2 of those with long-standing diabetes (>10 years). Among patients with T2DM, younger patients (≤50 years) were less likely to meet HbA_{1c} targets than older patients (>50 years) (Figure 13).

TABLE 35. PATIENTS WITH T2DM AND HbA_{1c} ≤7.0% BY DURATION OF DIABETES AND VISIT TYPE

Patients with T2DM and HbA_{1c} ≤7.0%	Duration of diabetes			
	n	<5 years	5-10 years	>10 years
All patients*	724	32.3%	19.3%	48.3%
Initial visit	104	57.7%	17.3%	25.0%
Follow-up visit	620	28.1%	19.7%	52.3%

**This captures only patients with T2DM who have available data in initial visit, diabetes duration and HbA_{1c}*

FIGURE 13. PATIENTS WITH T2DM AND HbA_{1c} ≤7.0% BY AGE AND DURATION OF DIABETES



2.7.3 COMPLICATIONS IN THE LAST 12 MONTHS

Among adult patients with diabetes (excluding GDM) with complications data (n = 4380), 3 in 5 patients reported no complications in the last 12 months, 1 in 3 patients reported 1-2 complications and a minority reported ≥3 complications.

Tables 36 and 37 demonstrate the incidence of diabetes related complications in the last 12 months categorised by the duration of diabetes for patients with T1DM and T2DM, respectively. Only patients who have available data in complications and diabetes duration are included.

The first column in both tables calculates the percentage of patients from the pooled cohort with T1DM and T2DM, who were found to have each complication. The subsequent columns separate each complication by duration of diabetes, expressed as a percentage for each complication.

As expected, the occurrence of all complications is associated with increased duration of diabetes.

For both patients with T1DM and T2DM, an increased burden of complications was associated with a duration of diabetes that exceeded 10 years, followed by those with recently diagnosed diabetes (<5 years).

TABLE 36. COMPLICATIONS AMONG PATIENTS WITH T1DM IN THE LAST 12 MONTHS BY DIABETES DURATION (n = 1296)

Complications	% of T1DM	Duration of diabetes (%)		
		<5 years	5-10 years	>10 years
Cerebral stroke	1.1	13.3	6.7	80.0
Myocardial infarction	1.2	11.8	0.0	88.2
CABG/Angioplasty	0.9	25.0	0.0	75.0
Peripheral vascular disease	4.6	1.5	3.1	95.4
Peripheral neuropathy	14.2	5.1	7.6	87.4
Foot ulceration	1.9	0.0	0.0	100.0
Lower limb amputation	0.9	0.0	0.0	100.0
End stage kidney disease	1.8	3.8	3.8	92.3
Blindness	1.7	0.0	4.2	95.8
Retinopathy	16.6	1.3	1.7	97.0
Sexual dysfunction	7.9	6.4	7.3	86.2

TABLE 37. COMPLICATIONS AMONG PATIENTS WITH T2DM IN THE LAST 12 MONTHS BY DIABETES DURATION (n = 2867)

Complications	% of T2DM	Duration of diabetes (%)		
		<5 years	5-10 years	>10 years
Cerebral stroke	1.6	14.9	12.8	72.3
Myocardial infarction	3.3	21.6	11.3	67.0
CABG/Angioplasty	3.6	16.2	11.4	72.4
Peripheral vascular disease	10.1	6.5	11.9	81.6
Peripheral neuropathy	23.1	8.5	14.1	77.4
Foot ulceration	6.7	7.1	14.8	78.1
Lower limb amputation	2.1	11.3	8.1	80.6
End stage kidney disease	5.0	14.4	6.8	78.8
Blindness	2.0	22.4	25.9	51.7
Retinopathy	15.1	8.2	8.4	83.3
Sexual dysfunction	12.6	13.6	13.4	73.0

2.8 IMPACT OF SMOKING – ADULTS

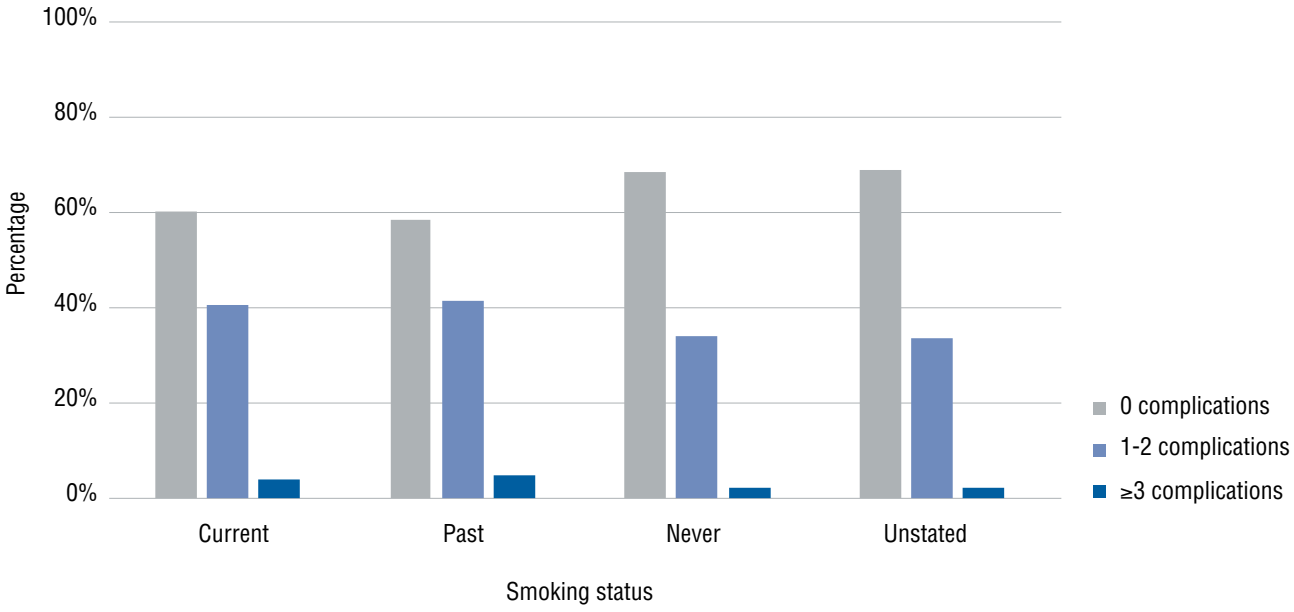
Table 38 shows that current smokers were younger compared with past smokers or never-smokers.

TABLE 38. MEAN AGE BY SMOKING STATUS

Smoking status	Age (years)	
	n	Mean ± SD
Current	614	54.9 ± 15.2
Past	1259	62.5 ± 14.5
Never	2187	56.3 ± 18.5

Past smokers recorded the highest proportion of complications in the last 12 months, with 2 in 5 patients recording 1-2 complications and almost 1 in 20 recording ≥3 complications (Figure 14). Never-smokers had the highest proportion of patients that were complication-free with 2 in 3 patients reporting no complications.

FIGURE 14. DIABETES RELATED COMPLICATIONS BY SMOKING STATUS (n = 4380)



2.9 MANAGEMENT OF CARDIOVASCULAR DISEASE – ADULTS

Table 39 demonstrates the analysis of cholesterol levels, according to those meeting total cholesterol target levels (<4 mmol/L) and lipid modifying therapy status in patients with cardiovascular disease (including myocardial infarction, CABG/ angioplasty, stroke, congestive cardiac failure or peripheral vascular disease in the last 12 months or previously). Irrespective of whether total cholesterol targets were met, higher cholesterol levels were seen in patients not on lipid modifying therapy, with the exception of triglycerides which were higher in in patients on lipid modifying therapy compared to those who were not on lipid modifying therapy.

TABLE 39. MEAN TOTAL CHOLESTEROL LEVELS AND LIPID MODIFYING THERAPY IN PATIENTS WITH CARDIOVASCULAR DISEASE

Total cholesterol (mmol/L)	Lipid modifying therapy	Mean ± SD (mmol/L)				Median (IQR) (mmol/L)
		Total cholesterol	LDL	HDL	Non-HDL	Triglyceride
Cholesterol ≥4	No	5.3 ± 1.2	2.9 ± 1.1	1.2 ± 0.3	4.1 ± 1.3	1.9 (1.4 – 2.4)
Cholesterol ≥4	Yes	4.9 ± 0.9	2.6 ± 0.9	1.2 ± 0.5	3.6 ± 1.1	2.3 (1.6 – 3.4)
Cholesterol <4	No	3.3 ± 0.5	1.5 ± 0.5	1.1 ± 0.4	2.2 ± 0.5	1.3 (1.0 – 1.8)
Cholesterol <4	Yes	3.1 ± 0.5	1.4 ± 0.5	1.0 ± 0.3	2.2 ± 0.5	1.6 (1.2 – 2.2)

Of 715 patients with cardiovascular disease, 2 in 5 patients had total cholesterol levels above target. Over 1 in 10 patients with a total cholesterol level above target were not receiving lipid modifying therapy, reflecting a prescribing gap, which may include either provider non-prescription, patient non-adherence, or medication intolerance (Figure 15).

Of the 632 patients with cardiovascular disease on lipid modifying therapy, around 2 in 5 patients had total cholesterol levels above target, reflecting a treatment gap (Figure 15). Compared with 2021, the lipid modifying therapy prescribing gap (p = 0.52) and the treatment gap (p = 0.62) has not changed significantly.

FIGURE 15. PRESCRIBING AND TREATMENT GAPS OF CHOLESTEROL AND LIPID MODIFYING THERAPY IN PATIENTS WITH CARDIOVASCULAR DISEASE

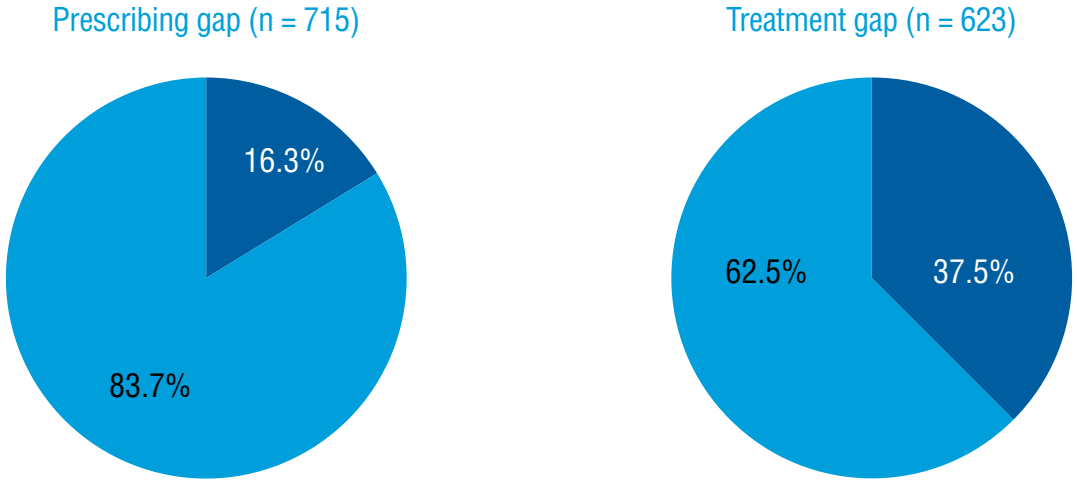


Table 40 demonstrates the analysis of blood pressure levels according to those meeting blood pressure target (<130/80mmHg) and anti-hypertensive therapy status in patients with cardiovascular disease (including myocardial infarction, CABG/angioplasty, chronic cardiac failure, stroke or peripheral vascular disease in the last 12 months or previously). Patients on anti-hypertensive therapy had higher mean blood pressure than patients not on anti-hypertensive therapy, irrespective of whether blood pressure targets were met.

TABLE 40. BLOOD PRESSURE AND ANTI-HYPERTENSIVE THERAPY IN PATIENTS WITH CARDIOVASCULAR DISEASE

Blood pressure target (mmHg)	Anti-hypertensive therapy	n	Blood pressure (Mean ± SD)	
			Systolic BP	Diastolic BP
BP ≥130/80	No	110	139 ± 14	81 ± 8
BP ≥130/80	Yes	532	143 ± 15	78 ± 11
BP <130/80	No	59	115 ± 10	68 ± 7
BP <130/80	Yes	263	116 ± 9	67 ± 7

Among 964 patients with cardiovascular disease, 3 in 5 patients were above target blood pressure, and of those above target, less than 1 in 5 patients were not receiving anti-hypertensive therapy, reflecting a prescribing gap (Figure 16).

Among the 795 patients receiving anti-hypertensive therapy, almost 3 in 5 patients were above target blood pressure, reflecting a large treatment gap (Figure 16). Compared with 2021, there was no significant change in either the anti-hypertensive therapy prescribing gap (p = 0.22) or treatment (p = 0.68) gap.

FIGURE 16. PRESCRIBING AND TREATMENT GAPS OF BLOOD PRESSURE AND ANTI-HYPERTENSIVE THERAPY IN PATIENTS WITH CARDIOVASCULAR DISEASE

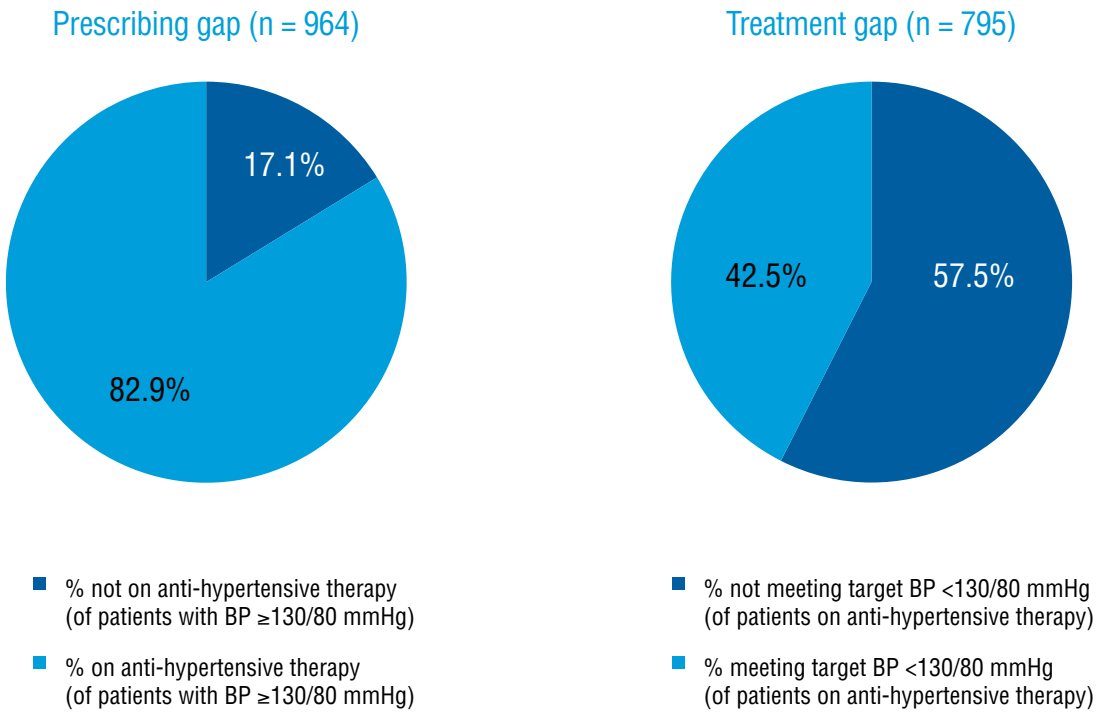
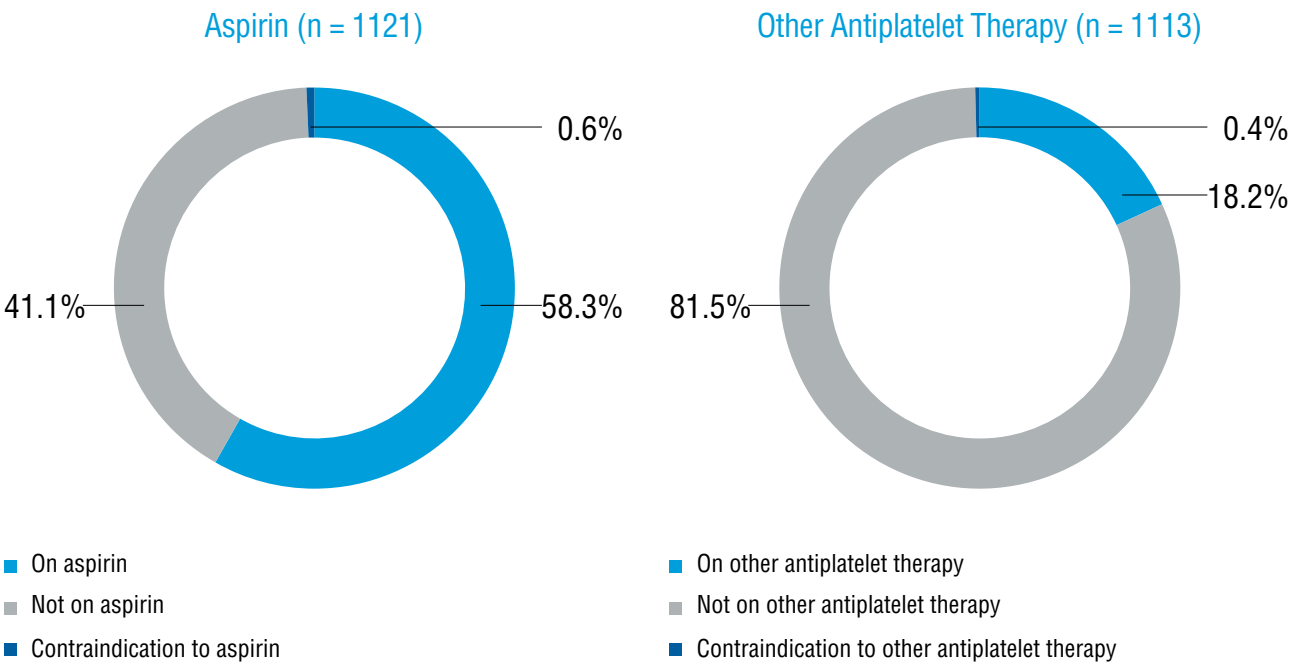


Figure 17 demonstrates antiplatelet use in patients with cardiovascular disease (including myocardial infarction, CABG/ angioplasty, stroke, congestive cardiac failure or peripheral vascular disease in the last 12 months or previously).

Among those on antiplatelet therapies, almost 3 in 5 patients reported use of aspirin and 1 in 5 reported use of other antiplatelet agents. Compared with 2021, there was no significant change (p = 0.60) in anti-platelet therapy prescription among patients with cardiovascular disease.

FIGURE 17. ANTIPLATELET THERAPY USE IN PATIENTS WITH CARDIOVASCULAR DISEASE



2.10 MENTAL HEALTH SCREENING – ADULTS

Mental health screening was defined as screening of patients using a validated questionnaire such as the Patient Health Questionnaire (PHQ-9) screening tool for depression, Generalised Anxiety Disorder scale (GAD-7) screening tool for anxiety and the Problem Areas In Diabetes (PAID) screening tool for diabetes distress. This section highlights if a diabetes centre has screened their patients for depression, anxiety, and/or diabetes distress. Each condition was considered separately, therefore patients who reported 'yes' to being screened to one condition (e.g. depression) may not have been screened for another condition (e.g. anxiety).

Of those who answered the questions regarding mental health screening, around 1 in 4 patients were reported as being screened for depression and 1 in 5 patients were reported as being screened for anxiety, while only 1 in 10 patients were reported as being screened for diabetes distress (Table 41).

TABLE 41. MENTAL HEALTH SCREENING

Mental health screening	Yes		No		Unsure	
	n	%	n	%	n	%
Depression	931	22.1	2652	62.9	632	15.0
Anxiety	749	17.8	2808	66.6	657	15.6
Diabetes Distress	383	9.1	3145	74.6	685	16.3

2.11 PATIENT REPORTED OUTCOMES – ADULTS

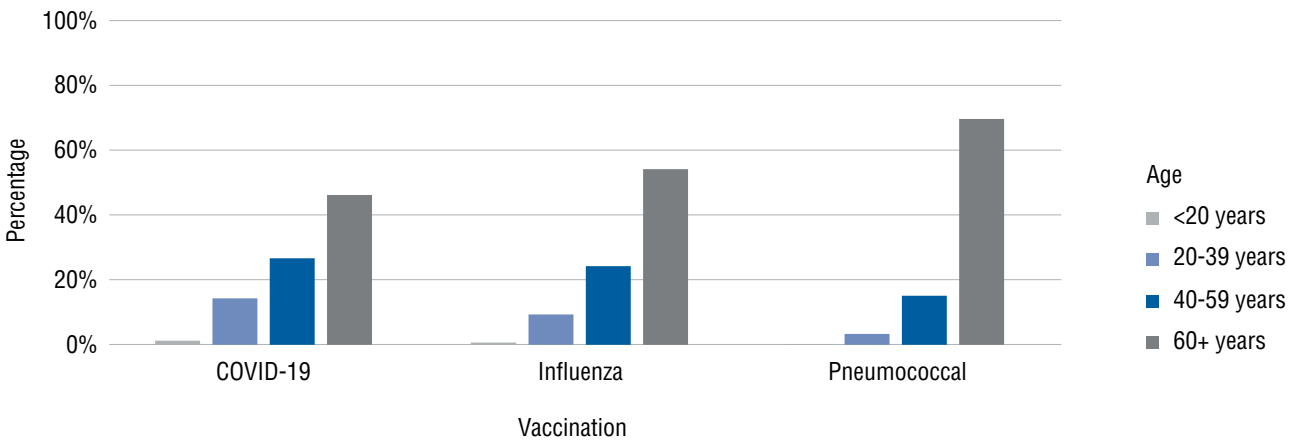
2.11.1 VACCINATIONS

In the last 12 months, almost all patients self-reported vaccination against COVID-19, around 2 in 3 self-reported vaccination against influenza and 1 in 10 self-reported vaccination against pneumococcal (Table 42). Those aged 40 years and over were more likely to be vaccinated against COVID-19, influenza and pneumococcal, with vaccination rates highest in those aged 60 years and over (Figure 18).

TABLE 42. VACCINATIONS IN THE LAST 12 MONTHS

Vaccination	n	%
COVID-19	3725	93.3
Flu (Influenza)	2570	64.8
Pneumococcal	426	10.8

FIGURE 18. DISTRIBUTION OF PATIENTS VACCINATED IN THE LAST 12 MONTHS BY AGE



Patients with T2DM were more likely to be vaccinated against influenza and pneumococcal compared to patients with T1DM (Figure 19). The proportion of patients with T1DM and T2DM vaccinated against COVID-19 were comparable, with the majority of patients having three vaccination doses (Figure 20).

FIGURE 19. VACCINATIONS IN THE LAST 12 MONTHS BY DIABETES TYPE

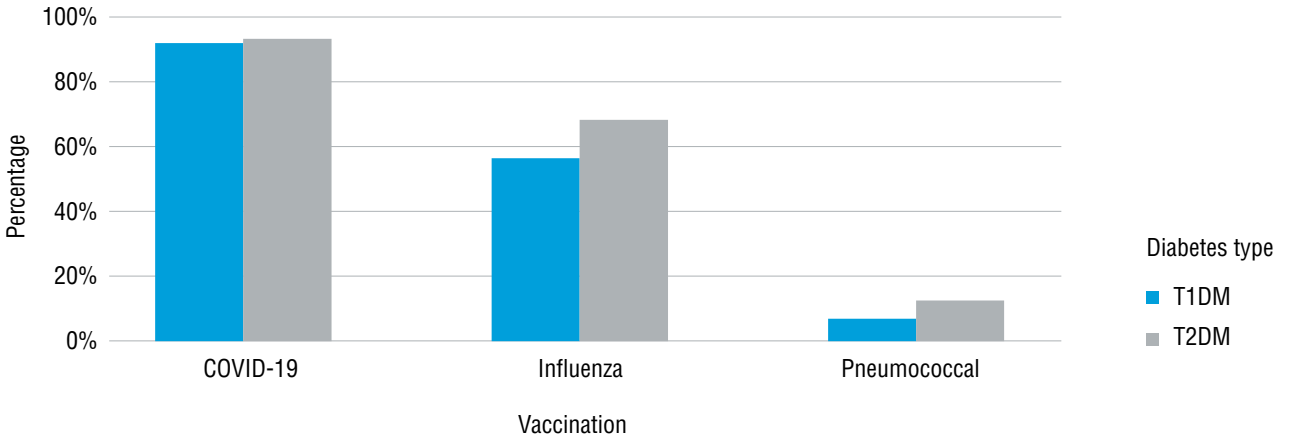
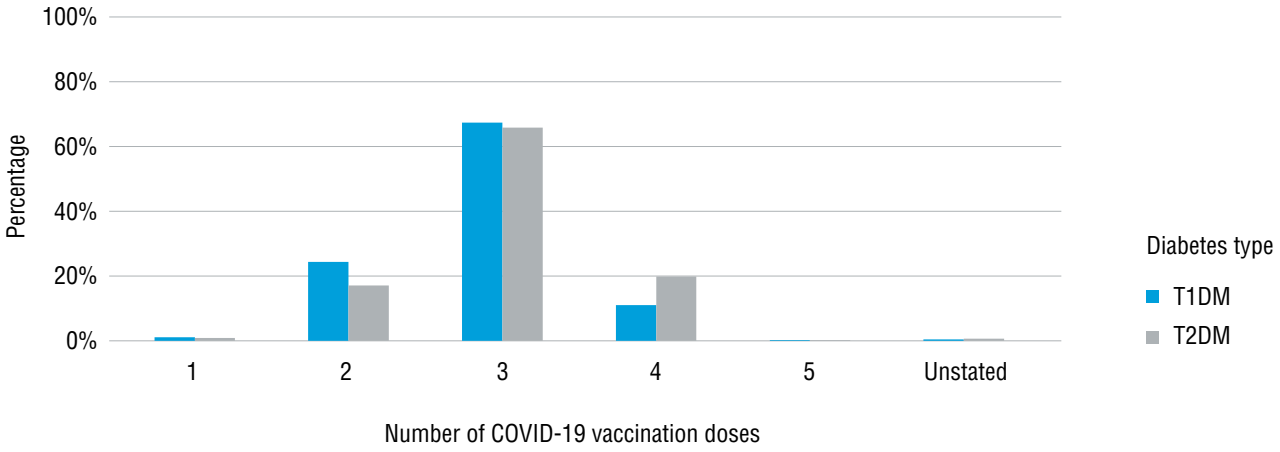


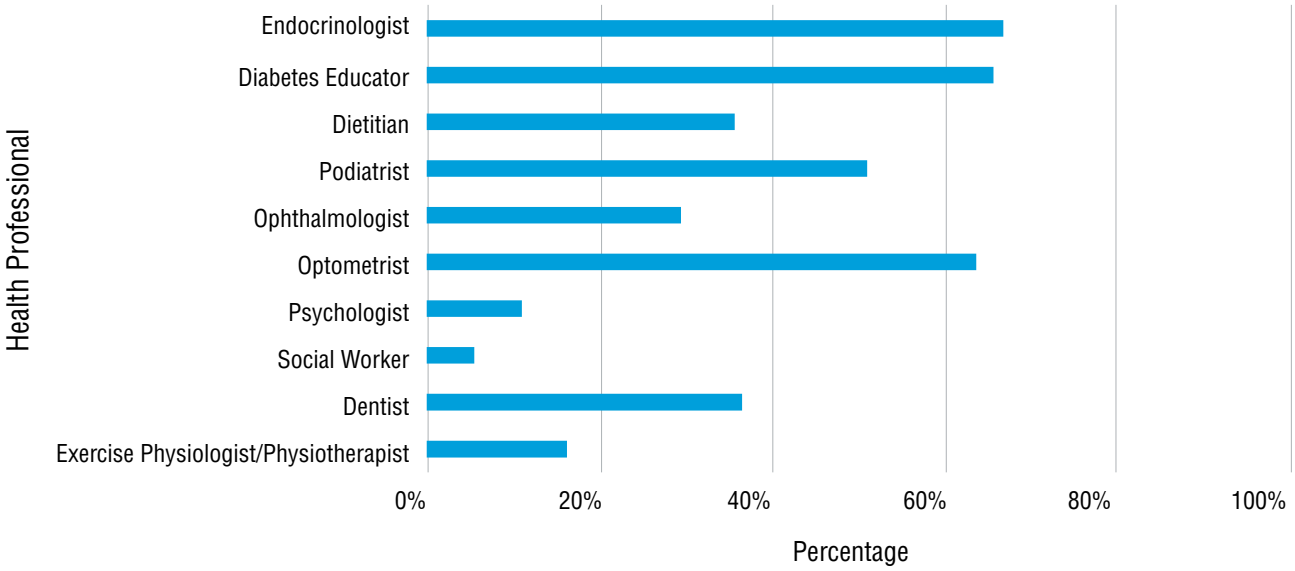
FIGURE 20. NUMBER OF COVID-19 VACCINATION DOSES BY DIABETES TYPE



2.11.2 HEALTH PROFESSIONAL ATTENDANCES

Figure 21 presents health professional attendances in the last 12 months. Most patients self-reported consultations with endocrinologists (2 in 3 patients), and a similar proportion self-reported consultations with a diabetes educator. Around 1 in 3 patients self-reported consultations with an ophthalmologist, a dentist and/or a dietitian. Despite 1 in 5 patients reporting depression, only 1 in 10 patients self-reported seeing a psychologist.

FIGURE 21. HEALTH PROFESSIONAL ATTENDANCES IN THE LAST 12 MONTHS



2.11.3 MEDICATION USE

The majority of patients self-reported that they usually take all of their medications (3 in 4 patients) (Table 43). Among those patients who forget to take their medications, the average number of times this occurred was 1.9 times per week.

TABLE 43. MEDICATION USE

Category	n	%
Ever forget to take medications	931	23.9
Number of times per week, mean ± SD	1.9 ± 1.7	

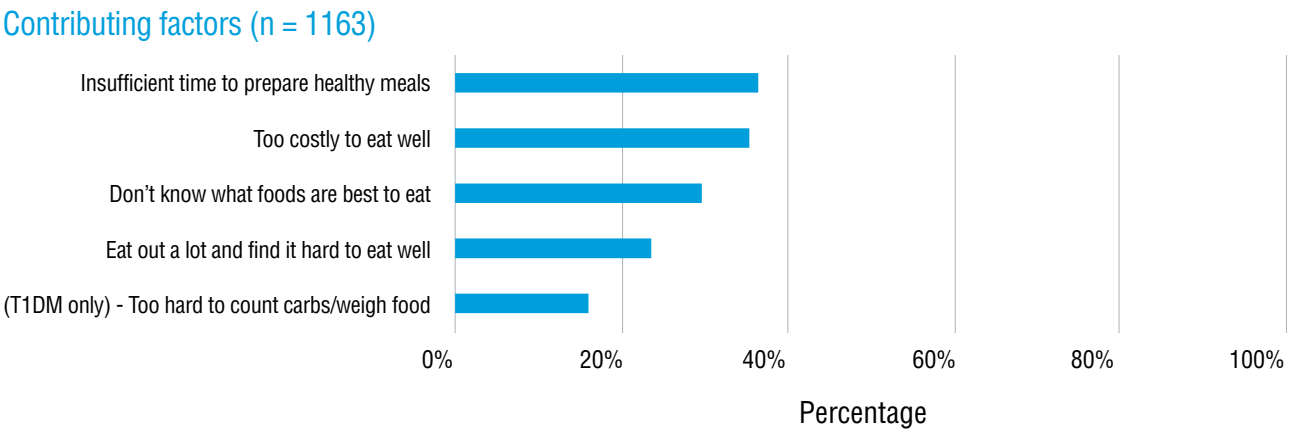
2.11.4 PATIENT SELF-CARE PRACTICES

Patient self-care practices were collected on approximately 86.5% of patients.

About 1 in 3 patients reported having difficulties following their recommended diet, with the most common reason in all patients being 'I don't have enough time to prepare healthy meals' and 'It costs too much to eat well' (Figure 22).

Over 1 in 10 patients with T1DM who reported difficulties in following their recommended diet, stated that it is too hard to count carbohydrates and weigh food (Figure 22).

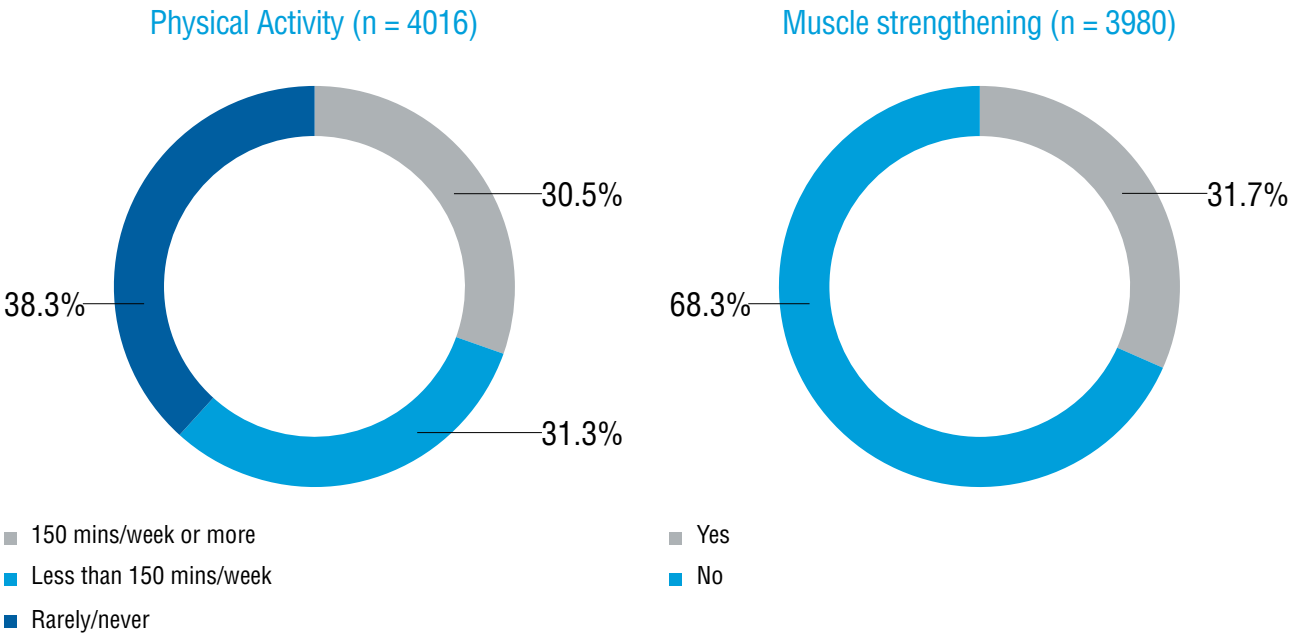
FIGURE 22. PATIENT DIETARY PRACTICES



2.11.5 PHYSICAL ACTIVITY

About 1 in 3 patients self-reported that they engaged in sufficient physical activity (150 total minutes per week) (Figure 23). A similar proportion of patients reported that they do muscle strengthening exercises in a usual week, including lifting weights or household tasks that involve lifting, carrying or digging.

FIGURE 23. PHYSICAL ACTIVITY



2.12 RISK-ADJUSTED PERFORMANCE INDICATORS (FUNNEL PLOTS) - ADULTS

Figures 24-31 depict the risk-adjusted performance of de-identified sites participating in ANDA 2022 with regards to mean HbA_{1c}, LDL cholesterol, systolic blood pressure and rates of severe hypoglycaemia for patients with T1DM and T2DM.

The red line on each funnel plot represents the mean of the relevant cohort, and the green line represents the national benchmarking target.

To ensure accuracy, any outliers identified need to be further compared with those from additional years to determine if they are persistent. The risk adjustment model also requires review to ensure it contains all relevant and potential non-modifiable variables impacting outcomes.

Among patients with T1DM (Figure 24), there were no outliers identified for mean HbA_{1c} (mean of T1DM cohort = 8.3%) however, a few sites were close to the 99.8% control limit. Among patients with T2DM (Figure 25), five outliers were present above the 99.8% action control limit for mean HbA_{1c} (mean of T2DM cohort = 8.4%). The green line represents the HbA_{1c} treatment target (≤7.0%).

FIGURE 24. MEAN HbA_{1c} (%) IN PATIENTS WITH T1DM BY SITE

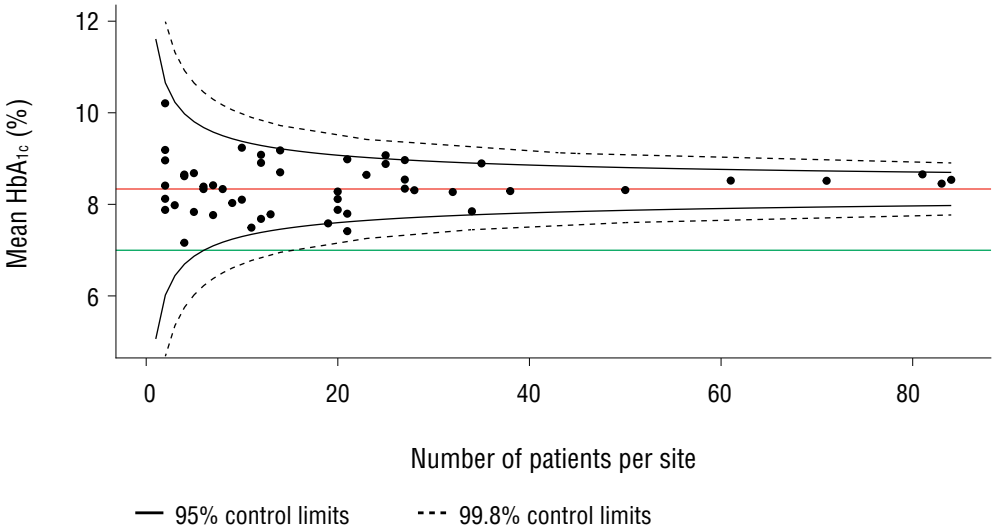
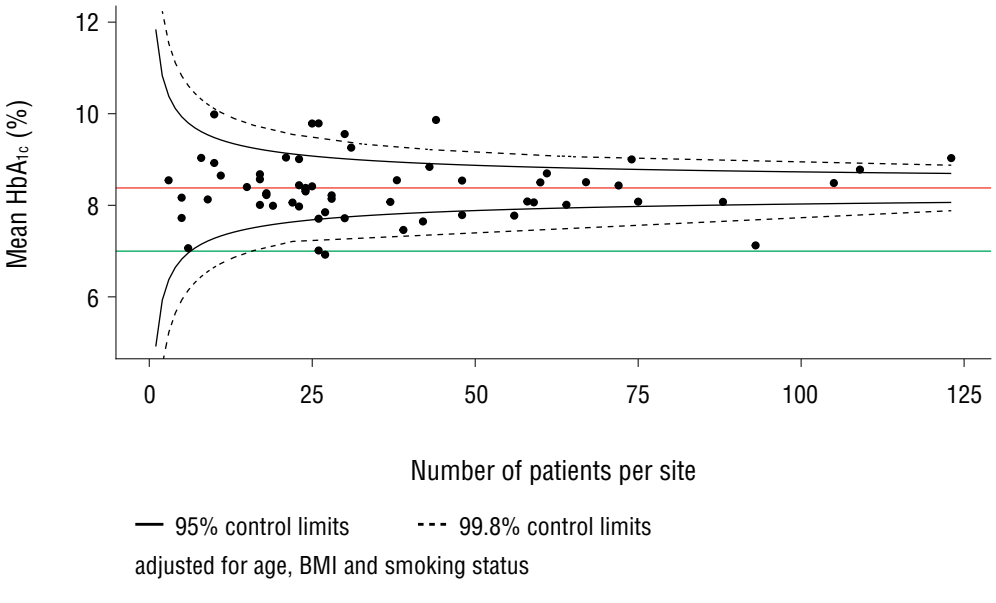
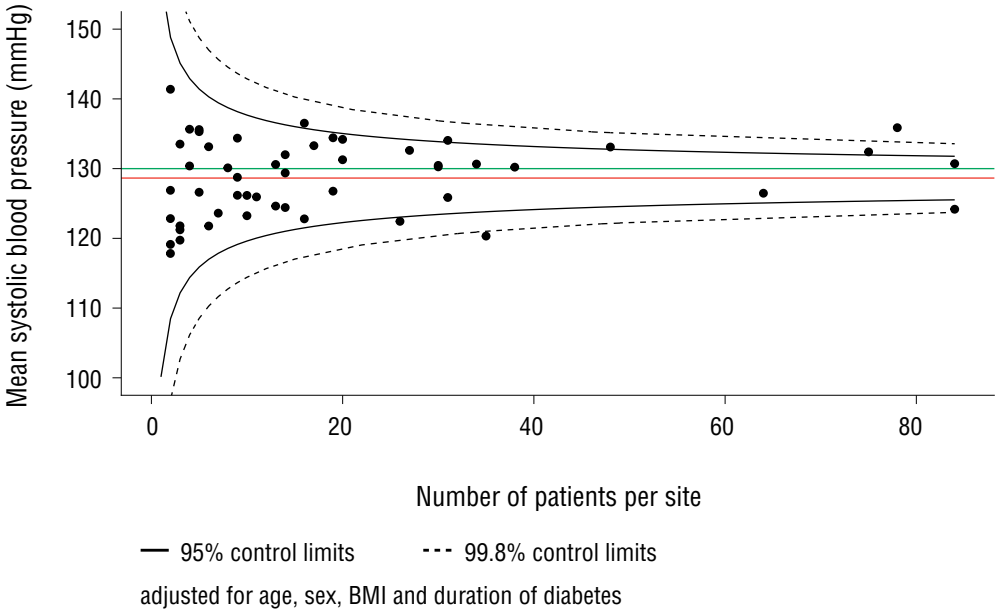


FIGURE 25. MEAN HbA_{1c} (%) IN PATIENTS WITH T2DM BY SITE



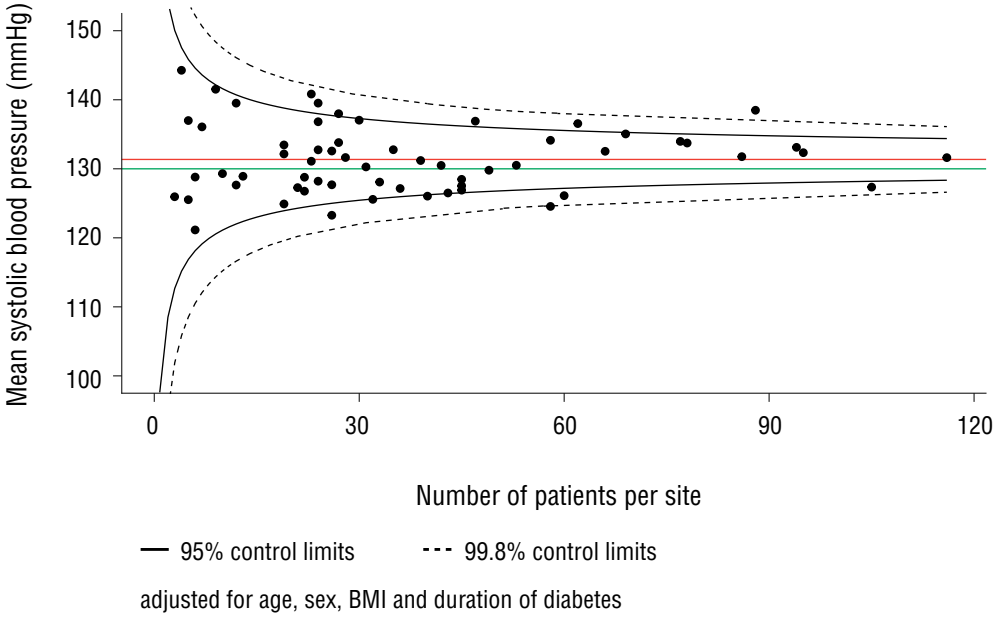
Among patients with T1DM (Figure 26) and T2DM (Figure 27), there was one outlier present above the 99.8% control limit for mean systolic blood pressure (mean of T1DM cohort = 128 mmHg and mean of T2DM cohort = 131 mmHg). The green line represents the systolic blood pressure treatment target (<130 mmHg).

FIGURE 26. MEAN SYSTOLIC BLOOD PRESSURE (mmHg) IN PATIENTS WITH T1DM BY SITE



adjusted for age, sex, BMI and duration of diabetes

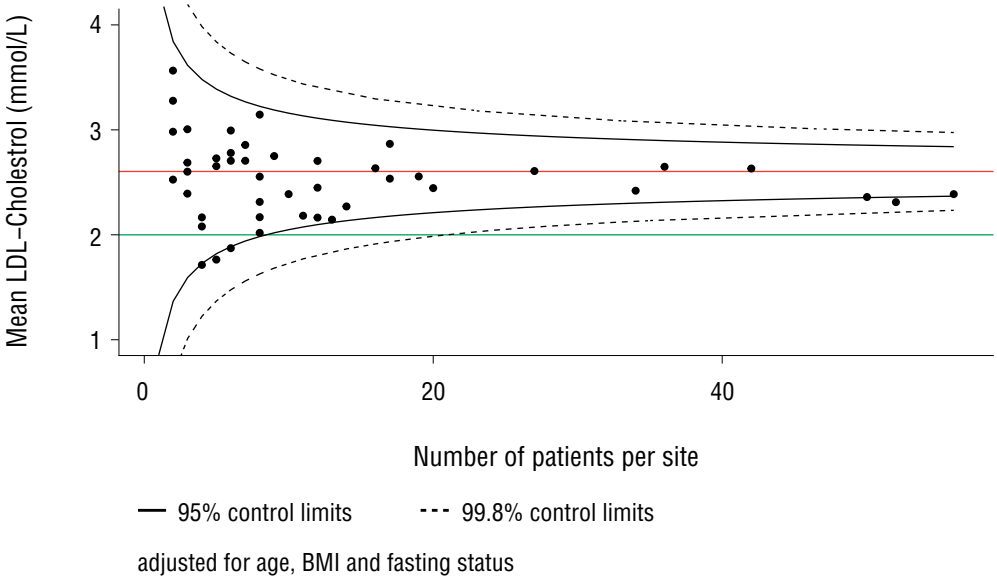
FIGURE 27. MEAN SYSTOLIC BLOOD PRESSURE (mmHg) IN PATIENTS WITH T2DM BY SITE



adjusted for age, sex, BMI and duration of diabetes

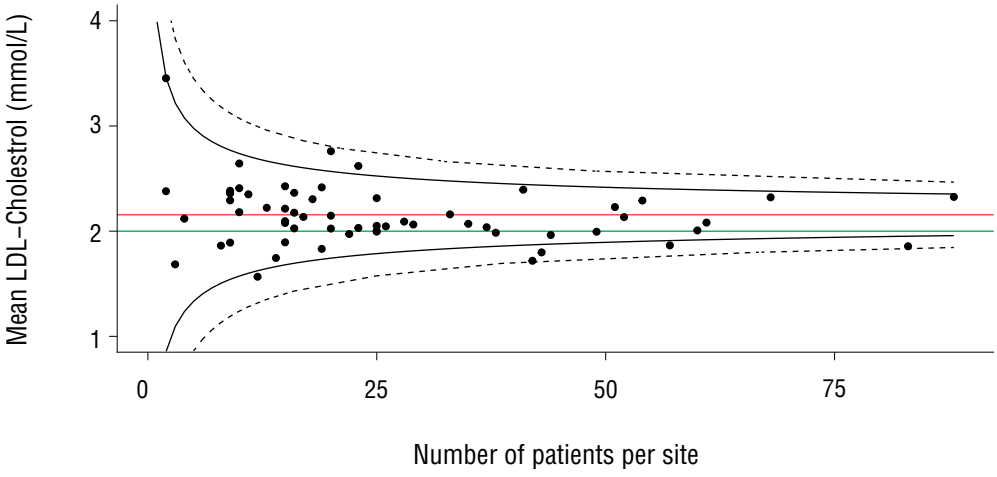
Among patients with T1DM (Figure 28), there were no outliers identified for mean LDL cholesterol (mean of T1DM cohort = 2.6 mmol/L). This was also the case among patients with T2DM (Figure 29; mean of T2DM cohort = 2.2 mmol/L). The green line represents the LDL treatment target (<2.0 mmol/L).

FIGURE 28. MEAN LDL CHOLESTEROL (mmol/L) IN PATIENTS WITH T1DM BY SITE



adjusted for age, BMI and fasting status

FIGURE 29. MEAN LDL CHOLESTEROL (mmol/L) IN PATIENTS WITH T2DM BY SITE



adjusted for age, sex, duration of diabetes, fasting status and severity of diabetes

Among patients with T1DM, there was one outlier identified for severe hypoglycaemia (mean of T1DM cohort = 9.1%) (Figure 30). The green line represents the target severe hypoglycaemia event rate (0%).

Among patients with T2DM, there were 3 outliers identified above the 99.8% action control limit for severe hypoglycaemia (mean of T2DM cohort = 3.0%), where one outlier is significantly higher and the other two are marginally higher (Figure 31). The green line represents the target severe hypoglycaemia event rate (0%).

FIGURE 30. RATES OF SEVERE HYPOGLYCAEMIA IN PATIENTS WITH T1DM IN THE LAST 12 MONTHS BY SITE

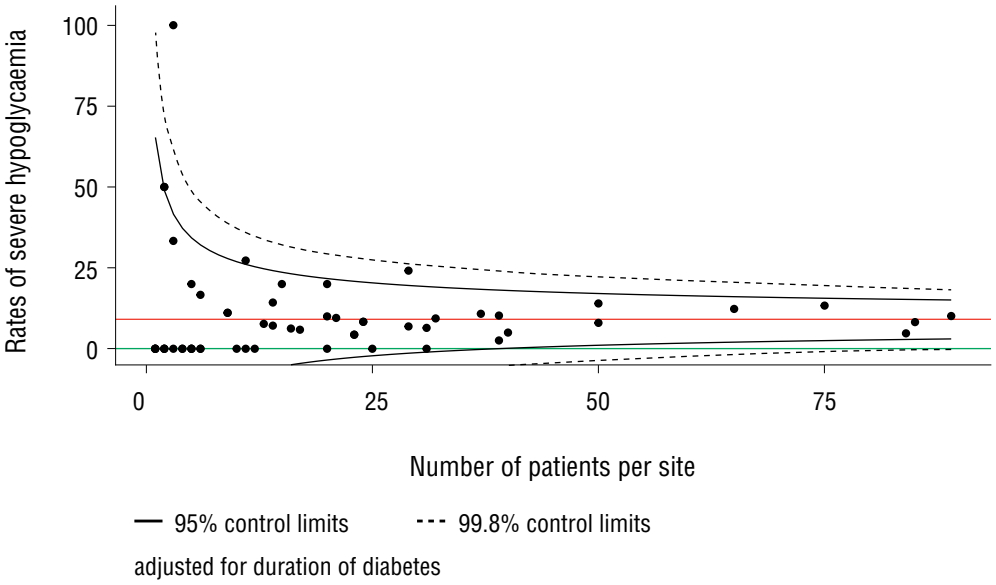
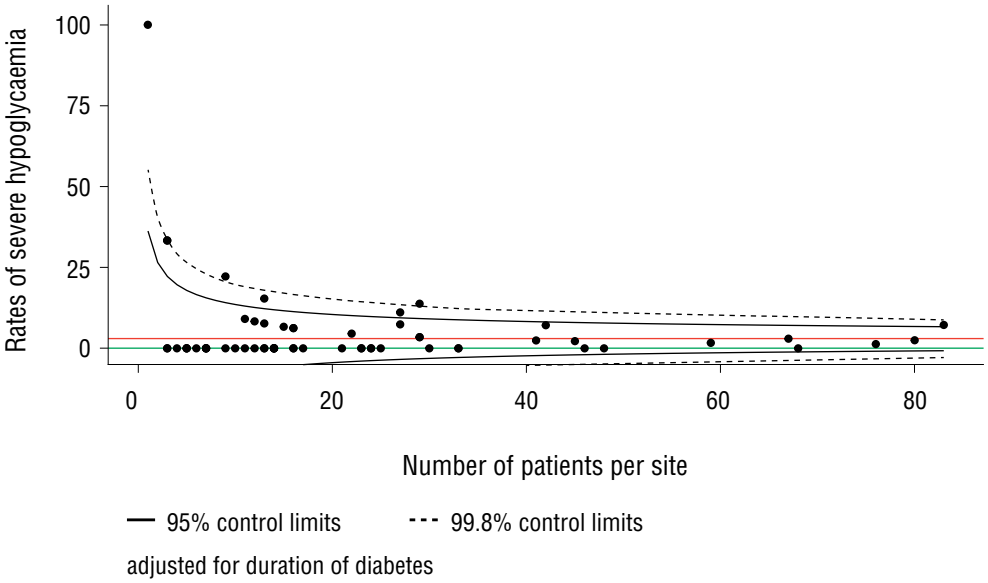


FIGURE 31. RATES OF SEVERE HYPOGLYCAEMIA IN PATIENTS WITH T2DM IN THE LAST 12 MONTHS BY SITE



2.13 SUB-ANALYSES

2.13.1 CENTRE TYPE AT A GLANCE – ADULTS

Table 44 details the 64 centres that participated in ANDA 2022. Thirty-two sites were comprised of Centres of Excellence or Tertiary Care Centres (CoE/Tertiary), with the contribution from each individual site ranging from 2 to 341 patients. Thirty-two sites were comprised of Secondary or Primary Care Centres (Secondary/Primary), with the contribution from each individual site ranging from 11 to 177 patients. There were 39.6% more patients from Centres of Excellence or Tertiary centres than Primary or Secondary care centres.

Patients from CoE/Tertiary centres were typically younger than those from Secondary/Primary centres (54.0 vs 62.4 years), however duration of diabetes was shorter in CoE/Tertiary settings (13.4 vs 12.4 years). A greater proportion of patients from CoE/Tertiary centres were using CGM, with comparable rates of flash glucose monitoring among patients from CoE/Tertiary centres and Secondary/Primary centres.

There was minimal difference in diabetes management methods in T1DM between CoE/Tertiary and Secondary/Primary centres. Among patients with T2DM, a marginally greater proportion from CoE/Tertiary centres were taking DPP4 inhibitors/SGLT2 inhibitors and GLP-1 receptor agonists than patients from Secondary/Primary centres; and a greater proportion of patients from CoE/Tertiary centres were treated with insulin.

Patients managed at CoE/Tertiary centres had greater prevalence of complications, including acute glycaemic complications (hypoglycaemia, DKA and HHS), than patients managed at Secondary/Primary centres. The only exception was peripheral vascular disease in the last 12 months, which was higher in patients attending Secondary/Primary centres.

Patients from CoE/Tertiary centres had a higher mean HbA_{1c} than patients from Secondary/Primary centres. These findings likely reflect the fact that patients who are referred to CoE/Tertiary centres typically have more complex and difficult to manage diabetes.

Patients attending Secondary/Primary centres were more likely to be screened for depression, anxiety and diabetes distress compared to patients attending CoE/Tertiary centres.

TABLE 44. DEMOGRAPHIC, MANAGEMENT AND CLINICAL OUTCOMES BY CENTRE TYPE

Item no.	Clinical Parameters	Centres of Excellence & Tertiary Care	Secondary & Primary Care
	Number of sites (n)	32	32
	Number of patients (n)	2894	1747
Demographics			
	Age (calculated; years), mean ± SD	54.0 ± 18.1	62.4 ± 15.7
1.2	Sex - Females, %	44.6	47.1
1.4	Initial Visit, %	15.4	21.9
1.5	Aboriginal/Torres Strait Islander, %	3.8	13.0
1.6	Interpreter required, %	4.0	1.5
1.7	NDSS, %	90.6	85.5
1.8	DVA, %	0.8	3.3
Diabetes type and management			
2.2	**Type of diabetes**		
	T1DM, %	36.4	20.3
	T2DM, %	54.8	77.2
	Don't know, %	4.7	0.1
	Other, %	3.0	1.7
	Unstated, %	1.2	0.7
	Duration of diabetes (calculated;years), median (IQR)	13.4 (5.4 – 22.4)	12.4 (5.0 – 22.2)
2.3	**Blood glucose monitoring**		
	None, %	6.0	19.6
	Finger pricking, %	75.0	67.3
2.3.1	Check as often as recommended, %	24.2	29.9
2.3.2	Finger pricking - number of times per day, mean ± SD	2.6 ± 1.8	2.1 ± 1.5
	Continuous glucose monitoring, %	13.3	6.7
	Flash glucose monitoring, %	10.8	9.8

2.3.3	Proportion of time using sensors <50%, %	11.6		15.0	
	Proportion of time using sensors 50-75%, %	11.1		10.5	
	Proportion of time using sensors >75-100%, %	74.1		66.8	
	Unstated, %	3.2		7.7	
2.4	**Management method**	T1DM	T2DM	T1DM	T2DM
	Diet only, %	0.0	1.6	0.0	8.5
	Metformin, %	8.4	73.7	9.0	72.7
	Sulphonylurea, %	0.4	21.7	0.3	19.6
	Glitazone, %	0.1	0.8	0.0	0.5
	Acarbose, %	0.0	0.4	0.0	1.4
	GLP1 Receptor Agonist, %	1.9	34.3	2.8	32.3
	DPP4 Inhibitor, %	0.4	21.4	1.4	19.2
	SGLT2 Inhibitor, %	1.8	32.3	3.1	29.8
	Insulin, %	100	61.6	100	43.2
	Unstated, %	0.0	0.5	0.0	0.5
2.4.1	Years on insulin (only patients using insulin), median (IQR)	10.0 (2.8 - 19.6)		9.8 (3.4 - 19.0)	
2.4.2	If on insulin: mode	T1DM	T2DM	T1DM	T2DM
	Basal, %	13.6	29.7	12.7	30.1
	Basal bolus, %	64.6	28.1	63.9	28.4
	Pump, %	20.4	0.2	21.4	0.3
	Pre-mixed insulin, %	6.1	43.9	5.4	42.3
	Hybrid closed loop system, %	4.4	0.0	3.9	0.0
Lifestyle risk factors					
	Body mass index (kg/m^2), mean ± SD	30.8 ± 7.7		32.1 ± 7.7	
Blood pressure					
3.3	Systolic BP (mmHg), mean ± SD	131.6 ± 17.3		133.2 ± 16.8	
	Diastolic BP (mmHg), mean ± SD	77.3 ± 10.3		76.8 ± 10.9	
3.4	Systolic BP - on anti-hypertensive treatment (mmHg), mean ± SD	135.7 ± 17.7		135.3 ± 17.3	
	Diastolic BP - on anti-hypertensive treatment (mmHg), mean ± SD	77.3 ± 10.8		76.2 ± 11.2	
Medications					
4.1	Aspirin therapy, %	24.8		27.6	
4.2	Other antiplatelet therapy, %	6.5		6.1	
4.3	Anticoagulant therapy, %	7.1		8.6	
4.4	On lipid modifying therapy, %	57.8		63.3	
4.4.1	Statin, %	93.1		93.9	
4.4.2	Fibrate, %	13.2		10.1	
4.4.3	Ezetimibe, %	12.6		13.5	
4.4.4	Fish oil, %	5.2		4.7	
4.4.5	Evolocumab, %	0.5		0.4	
4.4.6	Other, %	1.7		0.9	
Lipids					
4.5	Lipids, %	57.4		67.4	
4.5.1	Total cholesterol (mmol/L), mean ± SD	4.4 ± 1.7		4.2 ± 1.1	
4.5.2	LDL cholesterol (mmol/L), mean ± SD	2.3 ± 1.1		2.2 ± 1.0	
4.5.3	HDL cholesterol (mmol/L), mean ± SD	1.3 ± 0.5		1.2 ± 0.4	
	Non-HDL cholesterol (mmol/L), mean ± SD	3.1 ± 1.8		3.0 ± 1.1	
4.5.4	Triglyceride, (mmol/L), median (IQR)	1.6 (1.0 - 2.3)		1.7 (1.6 - 2.6)	
4.5.5	Fasting lipids, %	41.1		57.2	
Renal function and blood glucose control					
5.1	HbA_{1c} (%), mean ± SD	8.5 ± 1.9		8.1 ± 1.8	
	HbA_{1c} (mmol/mol), mean ± SD	69.7 ± 20.9		65.0 ± 20.1	
5.2	eGFR (mL/min per 1.73m^2), mean ± SD	75.6 ± 26.9		71.6 ± 21.5	
5.3	Serum creatinine (µmol/L), mean ± SD	95.9 ± 81.5		98.9 ± 82.1	
5.4	Normal to mildly increased albuminuria, %	56.6		61.2	
	Moderately increased albuminuria, %	31.2		27.3	
	Severely increased albuminuria, %	12.2		11.6	
Diabetes related eye and foot diseases					
6.1	Retinopathy – last 12 months, %	18.4		12.4	
	Retinopathy – previous, %	20.9		14.8	
6.2	Treatment for retinopathy – last 12 months, %	7.0		5.6	
	Treatment for retinopathy – previous, %	12.9		9.1	
6.3	Right or left cataract – last 12 months, %	12.1		11.2	
	Right or left cataract – previous, %	16.1		16.8	
6.4	Peripheral neuropathy – last 12 months, %	21.9		19.7	
	Peripheral neuropathy – previous, %	18.9		17.3	
6.5	Foot ulceration – last 12 months, %	5.4		5.1	
	Foot ulceration – previous, %	6.9		5.7	

6.6	Peripheral vascular disease – last 12 months, %	7.9	9.4
	Peripheral vascular disease – previous, %	7.6	7.7
6.7	Lower limb amputation – last 12 months, %	2.0	1.4
	Minor, %	1.5	0.8
	Major, %	0.5	0.5
	Lower limb amputation – previous, %	3.0	2.2
	Minor, %	0.6	0.4
	Major, %	0.3	0.5
Complications/events/comorbidities			
7.1	Stroke – last 12 months, %	1.5	1.7
	Stroke – previous, %	4.8	6.2
7.2	Myocardial infarction – last 12 months, %	3.0	2.4
	Myocardial infarction – previous, %	9.8	10.1
7.3	CABG/Angioplasty – last 12 months, %	2.7	2.9
	CABG/Angioplasty – previous, %	2.7	2.9
7.4	Congestive cardiac failure – last 12 months, %	2.7	2.9
	Congestive cardiac failure – previous, %	2.7	2.9
7.5	End stage kidney disease – last 12 months, %	4.2	4.4
	End stage kidney disease – previous, %	4.9	4.8
7.6	Blindness – last 12 months, %	1.2	3.1
	Blindness – previous, %	1.2	2.6
7.7	Sexual dysfunction – last 12 months, %	10.3	15.0
	Sexual dysfunction – previous, %	9.9	14.2
7.8	Dementia – last 12 months, %	1.7	5.0
	Dementia – previous, %	1.2	3.5
7.9	Depression – last 12 months, %	19.6	20.6
	Depression – previous, %	21.5	22.2
7.10	Malignancy – last 12 months, %	6.8	8.1
	Malignancy – previous, %	3.8	3.4
7.11	Diabetic ketoacidosis – last 12 months, %	3.9	2.7
	Diabetic ketoacidosis – previous, %	11.2	5.7
7.12	Hyperosmolar hyperglycaemic state – last 12 months, %	0.8	0.9
	Hyperosmolar hyperglycaemic state – previous, %	1.4	0.9
7.13	Severe hypoglycaemia – last 12 months, %	4.8	3.5
	Severe hypoglycaemia – previous, %	9.5	6.0
7.14	COVID-19 positive – last 12 months, %	22.2	17.6
	COVID-19 positive hospital admission – last 12 months, %	9.1	7.3
	COVID-19 positive – previous, %	1.8	1.1
	COVID-19 positive hospital admission – previous, %	11.6	0.0
7.15	**Liver disease**		
	Mild, %	9.8	10.5
	Moderate/severe, %	4.0	4.9
	Nil, %	86.3	84.6
Mental health screening			
8.1	**Screened for depression, %**		
	Yes	18.8	26.7
	No	66.8	57.4
	Unsure	14.4	15.9
8.2	**Screened for anxiety, %**		
	Yes	15.9	20.4
	No	69.3	62.9
	Unsure	14.8	16.7
8.3	**Screened for diabetes distress, %**		
	Yes	9.0	9.3
	No	74.4	75.0
	Unsure	16.6	15.8

Table 45 outlines patient health and well-being outcomes. Patients managed at Secondary/Primary centres were more likely to be current or past smokers. These patients were also more likely to be vaccinated against influenza and pneumococcal, compared to patients managed at CoE/Tertiary centres. Similar rates of COVID-19 vaccination were reported by patients managed at Secondary/Primary and CoE/Tertiary centres.

Health professional attendances varied by centre type. As expected, patients from CoE/Tertiary centres were more likely to have consultations with an endocrinologist, which reflects the more complex diabetes typically managed at these types of centres.

In terms of self-management of diabetes, around 1 in 3 patients attending diabetes centres self-reported difficulties following their recommended diet. The cost of food was the main barrier self-reported by patients attending Secondary/Primary Centres, while adequate time to prepare healthy measures was the main barrier reported by patients attending CoE/Tertiary centres. Among patients with T1DM, two times as many patients (1 in 5) managed at CoE/Tertiary centres self-reported that it was too hard to count carbs/weigh food than patients (1 in 10) managed at Secondary/Primary centres. Patients from CoE/Tertiary centres were more likely to engage in moderate/vigorous physical activity, while muscle strengthening exercise was comparable across centre types.

TABLE 45. PATIENT REPORTED OUTCOMES BY CENTRE TYPE

Item no.	Health and well-being outcomes	Centres of Excellence & Tertiary Care	Secondary & Primary Care
Smoking & vaccination status			
1.1	Currently smoke tobacco, %	14.3	15.6
1.1.1	Previously smoked tobacco (of patients who don't currently smoke), %	34.8	37.3
1.2	COVID-19 vaccination - last 12 months, %	93.3	93.3
1.2.1	Number of COVID-19 vaccination doses, mean ± SD	2.9 ± 0.6	3.0 ± 0.6
1.3	Flu (influenza) vaccination - last 12 months, %	61.0	70.1
1.4	Pneumococcal vaccination - last 12 months, %	8.8	13.6
Health professional attendances			
2.1	Endocrinologist, %	80.1	47.8
2.2	Diabetes Educator, %	64.4	68.3
2.3	Dietitian, %	35.8	36.0
2.4	Podiatrist, %	46.3	58.6
2.5	Ophthalmologist, %	30.8	27.7
2.6	Optometrist, %	62.9	65.6
2.7	Psychologist, %	11.8	9.9
2.8	Social Worker, %	5.7	5.3
2.9	Dentist, %	38.1	34.7
2.10	Exercise Physiologist/Physiotherapist, %	15.8	17.1
Medication use			
3.1	Ever forget to take medications, %	25.1	20.4
3.1.1	Forget medications - number of times per week, mean ± SD	1.9 ± 1.7	2.1 ± 1.7
Patient self-care practices			
4.1	Difficulties following recommended diet, %	29.2	28.6
4.1.1	Don't have enough time to prepare healthy meals, %	37.3	36.5
4.1.2	Costs too much to eat well, %	32.1	41.4
4.1.3	Don't know what foods are best to eat, %	31.8	27.6
4.1.4	Eat out a lot and find it hard to eat well, %	24.3	23.4
4.1.5	(T1DM) Too hard to count carbs/weigh food, %	20.1	10.6
Physical activity			
5.1	Moderate/vigorous intensity physical activity, %	34.0	25.4
5.2	Muscle strengthening exercise, %	31.7	31.6

2.13.2 GESTATIONAL DIABETES AT A GLANCE

Seventeen centres provided data for the GDM sub-analysis of ANDA 2022, with the contribution from each individual site ranging from 1 to 71 patients.

Among the 188 females with GDM, 3 in 4 had in person consultations (Table 46). The mean age was 32.7 years. Most patients were born in Australia and 1 in 10 patients identified as Aboriginal/Torres Strait Islander (Table 47).

TABLE 46. CONSULTATION CONDUCTED (GDM)

Consultation conducted	n	%
In person	147	78.2
Telehealth (video)	5	2.7
Phone	31	16.5
Not stated	5	2.7

TABLE 47. DEMOGRAPHIC DATA (GDM)

Category	2015	2017	2019	2021	2022
Number of patients, n	226	287	320	163	188
Age (years), mean ± SD	32.0 ± 5.9	31.4 ± 5.5	32.3 ± 5.4	32.8 ± 4.8	32.7 ± 6.2
Initial visit, %	34.9	50.5	40.9	36.9	53.2
Aboriginal/Torres Strait Islander, %	3.3	4.9	12.9	6.2	10.2
NDSS member, %	87.3	89.4	83.0	77.4	58.3

The average BMI of patients with GDM was in the obese range, similar to previous years (Table 48).

TABLE 48. BODY MASS INDEX (GDM)

Category	2015	2017	2019	2021	2022
BMI (kg/m^2), mean ± SD	31.6 ± 7.3	33.3 ± 7.2	31.5 ± 6.9	32.4 ± 6.8	33.5 ± 7.3

Around 3 in 5 patients with GDM managed their diabetes with diet-control only (Table 49) and almost 1 in 3 patients were managed with insulin, of which the majority were using a basal regimen, and most of the remainder managed with a basal-bolus regimen.

TABLE 49. TREATMENT (GDM)

Treatment	n	%
Diet only	112	59.6
Metformin	21	11.2
Insulin	55	29.3
Insulin & Metformin	15	8.0
Insulin modalities*		
Basal	38	54.3
Basal bolus	29	41.4
Pump	0	0.0
Pre-mixed insulin	2	2.9
Hybrid closed loop system	0	0.0
Unstated	2	2.9

**Multiple modes of insulin reported in some patients*

Tables 50 and 51 highlight diabetes related clinical parameters among patients with GDM. Mean blood pressure was below target levels, and less than 1 in 10 were current smokers.

TABLE 50. BLOOD PRESSURE (GDM)

Blood pressure (mmHg)	n	Mean ± SD
Systolic	156	115 ± 12
Diastolic	156	70 ± 9

TABLE 51. SMOKING STATUS (GDM)

Smoking status	n	%
Current	13	7.3
Past	34	19.1
Never	131	73.6
Not stated	5	3

About 2 in 5 patients with GDM were reported as being screened for depression, and 1 in 3 patients were reported as being screened for anxiety. A minority reported as being screened for diabetes distress.

TABLE 52. MENTAL HEALTH SCREENING (GDM)

Mental Health Screening	Yes		No		Unsure	
	n	%	n	%	n	%
Depression	74	39.8	108	58.1	4	2.2
Anxiety	63	33.9	117	62.9	6	3.2
Diabetes Distress	2	1.1	176	94.6	8	4.3

Most patients with GDM self-reported vaccination status (95.7%). Of those, most self-reported vaccination against COVID-19 (Table 53) with the majority of patients having 2 or 3 doses (Table 54). About 1 in 2 patients self-reported vaccination against influenza, and a minority self-reported vaccination against pneumococcal (Table 53).

TABLE 53. VACCINATIONS (GDM)

Vaccinations	n	%
COVID-19	165	91.7
Influenza	97	53.9
Pneumococcal	7	3.9
Not stated	5	3

TABLE 54. NUMBER OF COVID-19 VACCINATION DOSES (GDM)

Number of COVID-19 vaccination doses	n	%
1	0	0.0
2	73	44.2
3	90	54.5
4	1	0.6
5	0	0.0
Unstated	1	0.6

Almost 3 in 5 patients with GDM self-reported consultations with a diabetes educator, 1 in 2 patients self-reported consultations with a dietician, and 2 in 5 patients self-reported consultations with an endocrinologist. Other health professional attendances were less common (Table 55).

TABLE 55. HEALTH PROFESSIONAL ATTENDANCES (GDM)

Health professional attendances	n	%
Endocrinologist	70	38.9
Diabetes Educator	106	58.6
Dietitian	89	49.4
Podiatrist	2	1.1
Ophthalmologist	1	0.6
Optometrist	24	13.3
Psychologist	17	9.4
Social Worker	8	4.4
Dentist	61	33.9
Exercise Physiologist/Physiotherapist	9	5.0

Almost 1 in 4 patients with GDM self-reported difficulties following their recommended diet, with the most common reason in all patients being 'I don't have enough time to prepare healthy meals' followed by 'I don't know what foods are best to eat'.

TABLE 56. PATIENT DIETARY PRACTICES (GDM)

Patient dietary practices	n	%
Difficulties following recommended diet	44	24.4
Insufficient time to prepare healthy meals	24	54.5
Too costly to eat well	11	25.0
Don't know what foods are best to eat	16	36.4
Eat out a lot and find it hard to eat well	8	18.2

The majority of patients with GDM self-reported physical activity levels that were not meeting physical activity targets of 150 mins/week or more of moderate/vigorous activity (Table 57). In addition, most patients self-reported that they were not undertaking muscle strengthening exercises (Table 58).

TABLE 57. PHYSICAL ACTIVITY (GDM)

Physical activity	n	%
150 mins/week or more	47	25.0
Less than 150 mins/week	87	46.3
Rarely/never	46	24.5
Unstated	8	4.3

TABLE 58. MUSCLE STRENGHTENING EXERCISES (GDM)

Muscle strengthening	n	%
Yes	41	21.8
No	138	73.4
Unstated	9	4.8

2.13.3 PAEDIATRIC DIABETES AT A GLANCE

Fifteen centres provided data for the paediatric sub-analysis of ANDA 2022, with the contribution from each individual site ranging from 1 to 365 patients.

Overall there were 415 patients with paediatric diabetes captured in ANDA 2022, the majority attending in person consultations (Table 59). Most patients were born in Australia, and about 1 in 20 patients were Aboriginal/Torres Strait Islander (Table 60).

The majority (9 in 10) of paediatric patients had T1DM. Patients with T1DM were younger than those with T2DM, with the average age for each diabetes type being 13.1 and 15.3 years, respectively.

TABLE 59. CONSULTATION CONDUCTED (PAEDIATRICS)

Consultation conducted	n	%
In person	252	60.7
Telehealth (video)	151	36.4
Phone	3	0.7
Not stated	9	2.2

TABLE 60. DEMOGRAPHIC DATA (PAEDIATRICS)

Category	
Number of sites, n	15
Number of patients, n	415
Diabetes type	
T1DM, %	92.3
T2DM, %	6.0
Don't know, %	0.0
Other, %	1.0
Unstated, %	0.7
Age (years)	
All patients, mean ± SD	13.2 ± 3.3
T1DM, mean ± SD	13.1 ± 3.3
T2DM, mean ± SD	15.3 ± 2.1
Initial visit, %	4.1
Aboriginal/Torres Strait Islander, %	5.8
Australian-born, %	97.1
NDSS member, %	99.8

Tables 61 to 64 highlight diabetes related clinical parameters among paediatric patients with diabetes. The mean HbA_{1c} was 0.2% higher in paediatric patients with T2DM compared with T1DM. Mean blood pressure was 110/69 mmHg. No paediatric patients reported being past or current smokers. About 1 in 10 paediatric patients had moderately/severely increased albuminuria.

TABLE 61. HbA_{1c} (PAEDIATRICS)

Type of diabetes	Mean ± SD		
	n	HbA1c (%)	HbA1c (mmol/mol)
Overall	135	8.3 ± 1.7	66.7 ± 18.8
T1DM	115	8.3 ± 1.6	66.8 ± 17.4
T2DM	17	8.5 ± 2.4	69.8 ± 26.9
Other	2	6.1 ± 1.2	42.5 ± 13.4

TABLE 62. BLOOD PRESSURE (PAEDIATRICS)

Blood Pressure (mmHg)	n	Mean ± SD
Systolic	64	110 ± 14
Diastolic	64	69 ± 9

TABLE 63. SMOKING STATUS (PAEDIATRICS)

Smoking status	n	%
Current	0	0.0
Past	0	0.0
Never	401	100.0

TABLE 64. ALBUMINURIA (PAEDIATRICS)

Albuminuria	n	%
Normal to mildly increased	90	89.1
Moderately increased	9	8.9
Severely increased	2	2.0

The majority (9 in 10) of paediatric patients were treated with insulin monotherapy, and almost 1 in 2 insulin-treated paediatric patients had insulin administered via pump (Table 65).

TABLE 65. TREATMENT (PAEDIATRICS)

Treatment	n	%
Diet only	0	0.0
Tablets (only)	7	1.7
Insulin (only)	388	93.5
Insulin & tablets	9	2.2
Injectables & tablets*	2	0.5
Injectables & tablets & insulin*	5	1.2
Insulin modalities †		
Basal	175	43.5
Basal bolus	175	43.5
Pump	179	44.5
Pre-mixed insulin	0	0.0
Hybrid closed loop system	46	11.4
Unstated	51	12.7

**Injectables are GLP1 receptor agonists*
†Multiple modes of insulin reported in some patients

The most commonly reported complications in paediatric patients were glycaemic in nature, with 1 in 20 patients having had a severe hypoglycaemic episode in the last 12 months, and a similar proportion reporting diabetic ketoacidosis in the last 12 months. Around 1 in 5 patients reported past severe hypoglycaemic events and almost 1 in 10 patients recorded a prior episode of diabetic ketoacidosis (Table 66).

TABLE 66. ACUTE METABOLIC AND OTHER DIABETES RELATED COMPLICATIONS (PAEDIATRICS)

Complications	n	%
Retinopathy	2	0.5
Treatment for retinopathy	0	0.0
Cataract	0	0.0
Peripheral neuropathy	0	0.0
Diabetic ketoacidosis - last 12 months	21	5.1
Diabetic ketoacidosis - previous	30	7.3
Severe hypoglycaemia - last 12 months	18	4.4
1-2 episodes	17	4.1
3-5 episodes	0	0.0
>5 episodes	0	0.0
Unstated	1	0.2
Severe hypoglycaemia - previous	86	21.0

About 1 in 3 paediatric patients self-reported vaccination against COVID-19 (Table 67), the majority having two doses (Table 68). A similar proportion of patients self-reported vaccination against influenza, and a minority self-reported vaccination against pneumococcal (Table 67).

TABLE 67. VACCINATIONS (PAEDIATRICS)

Vaccinations	n	%
COVID-19	135	32.9
Influenza	14	31.1
Pneumococcal	1	2.5

TABLE 68. NUMBER OF COVID-19 VACCINATION DOSES (PAEDIATRICS)

Number of COVID-19 vaccination doses	n	%
1	10	7.4
2	110	81.5
3	15	11.1
4	0	0.0
5	0	0.0
Unstated	0	0.0

Almost all paediatric patients self-reported consultations with an endocrinologist and diabetes educator (Table 69). Just over 1 in 2 patients also self-reported consultations with a dietician. Almost 2 in 5 paediatric patients self-reported consultations with a social worker, and 1 in 10 patients saw a psychologist. Other health professionals were less frequently consulted.

TABLE 69. HEALTH PROFESSIONAL ATTENDANCES (PAEDIATRICS)

Health professional attendances	n	%
Endocrinologist	412	99.8
Diabetes Educator	410	99.3
Dietitian	232	56.2
Podiatrist	8	1.9
Ophthalmologist	45	10.9
Optometrist	31	7.5
Psychologist	40	9.7
Social Worker	152	36.8
Dentist	26	6.3
Exercise Physiologist/Physiotherapist	9	2.2

3. FUTURE DEVELOPMENTS

The aim of the Australian National Diabetes Audit (ANDA) is to provide a high-quality cross-sectional 'snapshot' of the health of patients being cared for in Australian diabetes centres. In 2022, ANDA merged the best elements from the ANDA-AQCA and ANDA-AQSMA audits to capture and report on clinical diabetes data as well as patient self-management and well-being outcomes. The underlying objectives of ANDA have remained:

- to provide an individual audit report for each participating site
- to generate a pooled data collection report of standardised data
- to provide nationwide diabetes data against which to benchmark clinical indicators against endorsed guidelines, in order to gauge the effectiveness of diabetes management and intervention strategies

ANDA 2022 is the final year of this activity as it transitions into a Diabetes Clinical Quality Registry (DCQR) in 2023 as a pilot activity under the National Clinical Quality Registry and Virtual Registry Strategy 2020-2030. The DCQR aims to build on the visions, principles and goals of the Australian National Diabetes Strategy 2021-2030[4] and further implement, broaden and reinvigorate the concept of ANDA. The registry will collect comprehensive cross-sectional and longitudinal data related to key diabetes care quality indicators, informed by data collected in ANDA 2022, incorporating both patient self-management and well-being data and diabetes centre care quality in a single registry. The DCQR will aim to drive continuous improvement in the quality and value of diabetes healthcare data beyond that of other similar international registries, to achieve better health outcomes for all Australians living with diabetes. This registry will prospectively facilitate the monitoring of the quality of health care for patients with diabetes by routinely collecting and analysing clinical performance data and providing clinicians, health service managers, patients and other stakeholders with ongoing, risk-adjusted, benchmarked feedback on these outcomes. Linkage of the DCQR to external key data sources will provide the ability to see how patients' diabetes care and health and well-being changes over time.

As per our formative work with stakeholders, the site-specific reports have been redesigned to better meet the needs of end users, in accordance with current audit and feedback theory. This redesign provides an overall visual summary of clinical outcomes at participating sites, with further detail for each major outcome. We provide information in simple tabular and graphic formats, with the use of infographics where appropriate. This new design is much shorter than previous reports. To help provide data that is useful for sites, we also provide the full dataset as an appendix.

To help aid in dissemination, we provide a PowerPoint template that may be used to present the report data to clinical teams. Other resources that ease the interpretation and use of data for sites are also in development and will be implemented in the DCQR in future.

The redesigned site reports are being tested and evaluated as part of a current Cluster Randomised Trial, ANDA-Evaluating Facilitated Feedback Enhancement – a Cluster randomised Trial (ANDA-EFFECT). Following evaluation, these reports will be incorporated into the future DCQR project.

4. PUBLICATIONS, PRESENTATIONS & AWARDS

Publications

Quigley M, Earnest A, Szwarcbard N, Wischer N, Andrikopoulos S, Green S, Zoungas S. Exploring HbA_{1c} variation between Australian diabetes centres: The impact of centre-level and patient-level factors. PLoS One. 2022 Feb 4;17(2):e0263511. doi: 10.1371/journal.pone.0263511.

Quigley M, Zoungas S, Zimbudzi E, Wischer N, Andrikopoulos S, Green SE. Making the most of audit and feedback to improve diabetes care: a qualitative study of the perspectives of Australian Diabetes Centres. BMC Health Serv Res. 2022 Feb 24;22(1):255. doi: 10.1186/s12913-022-07652-9.

Presentations

Gupta L, Gasevic D, Xiang A, Szwarcbard N, Earnest A, Zoungas S. The association of weight status with hypertension, blood pressure control, and use of antihypertensive agents with type 2 diabetes mellitus: the results of the Australian National Diabetes Audit (ANDA). Australasian Diabetes Congress, Brisbane Australia, 10-12 August 2022.

Reza T, Quigley M, Zoungas S, Gasevic D. The association between physical activity and self-rated health status in patients with type 1 and type 2 diabetes, ESA (Endocrine Society of Australia)/SRB (Society for Reproductive Biology)/ APEG (Australian Paediatric Endocrine Group)/NZSE (New Zealand Society of Endocrinology) Annual Scientific Meeting, Christchurch New Zealand, 13-16 November 2022.

Xiang A, Szwarcbard N, Gasevic D, Jones A, Quigley M, Earnest A, Zoungas S. The association of weight status with glycaemic control, diabetes-related complications and anti-hyperglycaemic medication use in patients with type 2 diabetes mellitus: the Australian National Diabetes Audit (ANDA) 2013-2019. Australasian Diabetes Congress, Brisbane Australia, 10-12 August 2022.

Zoungas S, Quigley M, Zomer E. Taking diabetes care to new heights: Highlights from ANDA and the transition to the Diabetes Clinical Quality Registry (DCQR). Australasian Diabetes Congress, Brisbane Australia, 10-12 August 2022.

Zoungas S. Kellion Plenary Lecture. Australasian Diabetes Congress, Brisbane Australia, 10-12 August 2022.

Zoungas S. Award Lecture. International Diabetes Federation, Lisbon Portugal, 5-8 December 2022.

Zomer E. Existing databases and registries for type 2 diabetes: What do we have nationally and internationally? Best Practice in Diabetes Care, Gold Coast Australia, 22 October 2022.

Zomer E, Quigley M, Giannopoulos D, Zoungas S. Transitioning from a national diabetes audit to a clinical quality registry during the COVID-19 pandemic. Australian Registry Annual Scientific Meeting, Adelaide Australia, 7 November 2022.

Awards

Zoungas S. Winner of the Kellion Award 2022. Provided by the Kellion Foundation and Australian Diabetes Society for an Australian who has made an outstanding contribution in diabetes research, clinical or service areas in Australia.

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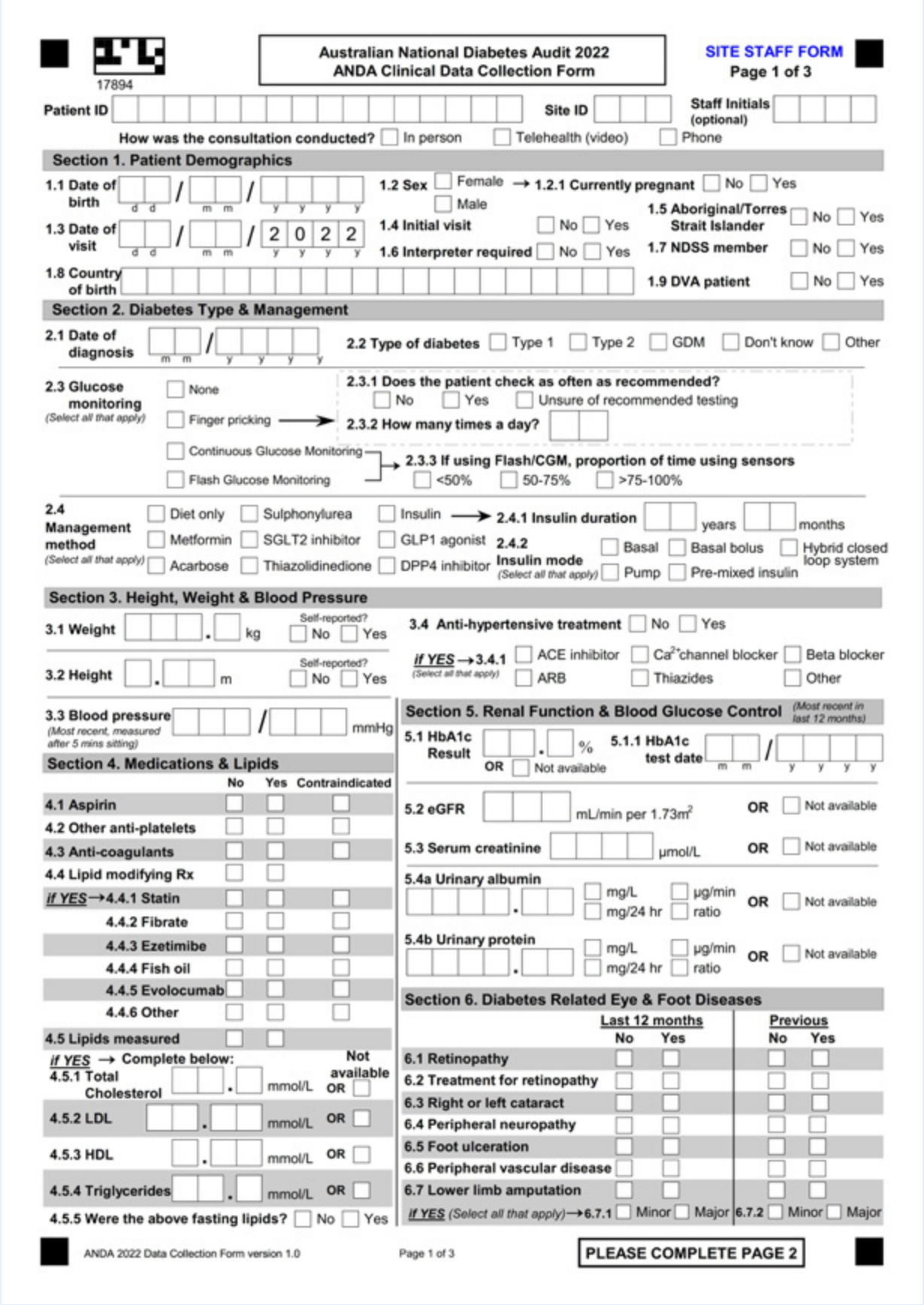
APPENDIX 1

ANDA 2022 Data Collection Form



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Australian National Diabetes Audit 2022
ANDA Clinical Data Collection Form

SITE STAFF FORM
Page 1 of 3

Patient ID | Site ID | Staff Initials (optional)

How was the consultation conducted? ☐ In person ☐ Telehealth (video) ☐ Phone

Section 1. Patient Demographics

1.1 Date of birth (d d / m m / y y y y)
1.2 Sex ☐ Female → 1.2.1 Currently pregnant ☐ No ☐ Yes ☐ Male
1.3 Date of visit (d d / m m / 2 0 2 2)
1.4 Initial visit ☐ No ☐ Yes
1.5 Aboriginal/Torres Strait Islander ☐ No ☐ Yes
1.6 Interpreter required ☐ No ☐ Yes
1.7 NDSS member ☐ No ☐ Yes
1.8 Country of birth
1.9 DVA patient ☐ No ☐ Yes

Section 2. Diabetes Type & Management

2.1 Date of diagnosis (m m / y y y y)
2.2 Type of diabetes ☐ Type 1 ☐ Type 2 ☐ GDM ☐ Don't know ☐ Other

2.3 Glucose monitoring (Select all that apply)
☐ None
☐ Finger pricking → 2.3.1 Does the patient check as often as recommended? ☐ No ☐ Yes ☐ Unsure of recommended testing; 2.3.2 How many times a day?
☐ Continuous Glucose Monitoring
☐ Flash Glucose Monitoring → 2.3.3 If using Flash/CGM, proportion of time using sensors ☐ <50% ☐ 50-75% ☐ >75-100%

2.4 Management method (Select all that apply)
☐ Diet only ☐ Sulphonylurea ☐ Insulin → 2.4.1 Insulin duration ____ years ____ months
☐ Metformin ☐ SGLT2 inhibitor ☐ GLP1 agonist
☐ Acarbose ☐ Thiazolidinedione ☐ DPP4 inhibitor
2.4.2 Insulin mode (Select all that apply) ☐ Basal ☐ Basal bolus ☐ Hybrid closed loop system ☐ Pump ☐ Pre-mixed insulin

Section 3. Height, Weight & Blood Pressure

3.1 Weight ____.____ kg Self-reported? ☐ No ☐ Yes
3.2 Height ____.____ m Self-reported? ☐ No ☐ Yes
3.3 Blood pressure (Most recent, measured after 5 mins sitting) ____ / ____ mmHg
3.4 Anti-hypertensive treatment ☐ No ☐ Yes
if YES → 3.4.1 (Select all that apply) ☐ ACE inhibitor ☐ Ca^{2+} channel blocker ☐ Beta blocker ☐ ARB ☐ Thiazides ☐ Other

Section 4. Medications & Lipids

	No	Yes	Contraindicated
4.1 Aspirin	☐	☐	☐
4.2 Other anti-platelets	☐	☐	☐
4.3 Anti-coagulants	☐	☐	☐
4.4 Lipid modifying Rx	☐	☐	
if YES → 4.4.1 Statin	☐	☐	☐
4.4.2 Fibrate	☐	☐	☐
4.4.3 Ezetimibe	☐	☐	☐
4.4.4 Fish oil	☐	☐	☐
4.4.5 Evolocumab	☐	☐	☐
4.4.6 Other	☐	☐	☐
4.5 Lipids measured	☐	☐	

if YES → Complete below:

		Not available
4.5.1 Total Cholesterol	____.____ mmol/L	OR ☐
4.5.2 LDL	____.____ mmol/L	OR ☐
4.5.3 HDL	____.____ mmol/L	OR ☐
4.5.4 Triglycerides	____.____ mmol/L	OR ☐

4.5.5 Were the above fasting lipids? ☐ No ☐ Yes

Section 5. Renal Function & Blood Glucose Control (Most recent in last 12 months)

5.1 HbA1c Result ____.____ % OR ☐ Not available
5.1.1 HbA1c test date (m m / y y y y)
5.2 eGFR ____ mL/min per 1.73m² OR ☐ Not available
5.3 Serum creatinine ____ µmol/L OR ☐ Not available
5.4a Urinary albumin ____.____ ☐ mg/L ☐ µg/min ☐ mg/24 hr ☐ ratio OR ☐ Not available
5.4b Urinary protein ____.____ ☐ mg/L ☐ µg/min ☐ mg/24 hr ☐ ratio OR ☐ Not available

Section 6. Diabetes Related Eye & Foot Diseases

	Last 12 months No	Last 12 months Yes	Previous No	Previous Yes
6.1 Retinopathy	☐	☐	☐	☐
6.2 Treatment for retinopathy	☐	☐	☐	☐
6.3 Right or left cataract	☐	☐	☐	☐
6.4 Peripheral neuropathy	☐	☐	☐	☐
6.5 Foot ulceration	☐	☐	☐	☐
6.6 Peripheral vascular disease	☐	☐	☐	☐
6.7 Lower limb amputation	☐	☐	☐	☐

if YES (Select all that apply) → 6.7.1 ☐ Minor ☐ Major 6.7.2 ☐ Minor ☐ Major

ANDA 2022 Data Collection Form version 1.0 Page 1 of 3 **PLEASE COMPLETE PAGE 2**

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Australian National Diabetes Audit 2022
ANDA Clinical Data Collection Form

SITE STAFF FORM
Page 2 of 3

Patient ID | | | | | | | | | | | | | | | | Site ID | | | |

Section 7. Other Complications/Events/Comorbidities

	Last 12 months		Previous	
	No	Yes	No	Yes
7.1 Cerebral stroke	☐	☐	☐	☐
7.2 Myocardial infarction	☐	☐	☐	☐
7.3 CABG/Angioplasty	☐	☐	☐	☐
7.4 Congestive cardiac failure	☐	☐	☐	☐
7.5 End stage kidney disease	☐	☐	☐	☐
7.6 Blindness	☐	☐	☐	☐
7.7 Sexual dysfunction	☐	☐	☐	☐
7.8 Dementia	☐	☐	☐	☐
7.9 Depression	☐	☐	☐	☐
7.10 Malignancy (exclude non-melanotic skin cancers)	☐	☐	☐	☐
7.11 Diabetic ketoacidosis	☐	☐	☐	☐
7.12 Hyperosmolar hyperglycaemic state	☐	☐	☐	☐
7.13 Severe hypoglycaemia	☐	☐	☐	☐
if YES → 7.13.1 No. of episodes	☐ 1-2 ☐ 3-5 ☐ >5			
7.14 Has the patient tested positive to COVID-19?	☐	☐	☐	☐
if YES → 7.14.1 Was hospital admission required?	☐	☐	☐	☐
7.15 Liver disease	☐ Mild	☐ Moderate/Severe	☐ Not applicable	

Section 8. Mental Health Screening

8.1 Has the patient been screened for depression? *(e.g. PHQ-9)*	☐ No	☐ Yes	☐ Unsure
8.2 Has the patient been screened for anxiety? *(e.g. GAD-7)*	☐ No	☐ Yes	☐ Unsure
8.3 Has the patient been screened for diabetes distress? *(e.g. PAID)*	☐ No	☐ Yes	☐ Unsure

PLEASE ENSURE THE PATIENT HEALTH & WELL-BEING QUESTIONNAIRE (PAGE 3) IS ALSO COMPLETED.

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PATIENT HEALTH & WELL-BEING QUESTIONNAIRE
Australian National Diabetes Audit 2022

PATIENT FORM
Page 3 of 3

Patient ID | | | | | | | | | | | | | | | | | **Site ID** | | | |
(OFFICE USE ONLY - Site staff to complete Patient ID)

Please answer all questions by marking the appropriate box **Cross box like this: X**

Section 1. Smoking & Vaccination Status

1.1 Do you currently smoke tobacco? ☐ No → **1.1.1 *If NO*, did you previously smoke tobacco?** ☐ No
[i.e. cigarettes/cigars/e-cigarettes(vaping)] ☐ Yes ☐ Yes

1.2 Have you had a COVID-19 vaccination in the last 12 months? ☐ No ☐ Yes

1.2.1 *If YES*, how many doses have you had in total? ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

1.2.2 *If YES*, what was the date of your last dose? d d / m m / y y y y ☐ I do not remember

1.3 Have you had a flu (influenza) vaccination in the last 12 months? ☐ No ☐ Yes

1.4 Have you had a pneumococcal vaccination in the last 12 months? ☐ No ☐ Yes

Section 2. Health Professional Attendances

Have you attended any of the following health professionals in the last 12 months?

2.1 Endocrinologist	☐ No	☐ Yes	☐ Unsure
2.2 Diabetes Educator	☐ No	☐ Yes	☐ Unsure
2.3 Dietitian	☐ No	☐ Yes	☐ Unsure
2.4 Podiatrist	☐ No	☐ Yes	☐ Unsure
2.5 Ophthalmologist	☐ No	☐ Yes	☐ Unsure
2.6 Optometrist	☐ No	☐ Yes	☐ Unsure
2.7 Psychologist	☐ No	☐ Yes	☐ Unsure
2.8 Social Worker	☐ No	☐ Yes	☐ Unsure
2.9 Dentist	☐ No	☐ Yes	☐ Unsure
2.10 Exercise Physiologist/Physiotherapist	☐ No	☐ Yes	☐ Unsure

Section 3. Medication Use

3.1 Do you ever forget to take your medications? ☐ No ☐ Yes → ***if YES*** **3.1.1 How many times per week?** ☐☐
☐ Not applicable

Section 4. Patient Self Care

4.1 Do you have difficulties following your recommended diet? ☐ No ☐ Yes

If YES → **Do the following apply?**

4.1.1 I don't have enough time to prepare healthy meals	☐ No	☐ Yes
4.1.2 It costs too much to eat well	☐ No	☐ Yes
4.1.3 I don't know what foods are best to eat	☐ No	☐ Yes
4.1.4 I eat out a lot and find it hard to eat well	☐ No	☐ Yes
4.1.5 If you have type 1 diabetes - it is too hard to count carbs/weigh food	☐ No	☐ Yes ☐ Not applicable

Section 5. Physical Activity

5.1 How many minutes per week of moderate or vigorous intensity physical activity do you usually do?
(e.g. brisk walking, lawnmowing, swimming, or more vigorous activity such as jogging)
☐ 150 mins/week or more
☐ Less than 150 mins/week
☐ I rarely/never do moderate or vigorous physical activity

5.2 Do you do any muscle strengthening exercise in a usual week? ☐ No ☐ Yes
(e.g. lifting weights or household tasks that involve lifting, carrying or digging)

THANK YOU FOR COMPLETING THE QUESTIONNAIRE.
PLEASE RETURN TO STAFF.

APPENDIX 2

ANDA 2022 – Data Definitions

Identifiers	
Patient ID	Compulsory field. Enter identifier such as record number or the first 2 letters of the first name, surname, month and year of birth (e.g. FFSSMMYY) to enable you to check your records if there is a query from ANDA regarding the data.
Site ID	Unique site identifier (assigned by ANDA Secretariat).
Staff initials (optional)	Site staff initials.
Visit conduct	Record if the consultation was conducted **in person**, by **telehealth (video)** or by **phone**.
Section 1. Patient Demographics	
Date of birth	Record as **DD/MM/YYYY**.
Sex	Mark **Male** or **Female** indicating phenotypic (physical) sex at birth.
Currently pregnant	If sex is female, mark **No** or **Yes** if the patient is currently pregnant.
Date of visit	Record the date the patient attended as **DD/MM/2022**.
Initial visit	Mark **No** or **Yes** indicating if this is an initial visit assessment.
Aboriginal/Torres Strait Islander	Mark **No** or **Yes** indicating Aboriginal/Torres Strait Islander background.
Interpreter required	Mark **No** or **Yes** for the requirement for interpreter services as perceived by the patient
NDSS member	Mark **No** or **Yes** if a member of the National Diabetes Services Scheme (NDSS).
Country of birth	Record the patient's country of birth.
DVA patient	Mark **No** or **Yes** if medical care charges are met by the Department of Veterans' Affairs (DVA).
Section 2. Diabetes Type & Management	
Date of diagnosis	Record as **MM/YYYY** of first diagnostic blood glucose estimation. [If date unknown other than year, record as 01/YYYY].
Type of diabetes	Mark **Type 1** or **Type 2** or **Gestational Diabetes Mellitus (GDM)** or **Don't know**, or **Other** to indicate the clinical classification of diabetes.
Glucose monitoring	Mark how blood glucose levels are monitored. If multiple, **tick all that apply** within the last 12 months. **None:** No regular blood glucose monitoring is performed. **Finger pricking:** A blood sample is obtained via a finger-prick and is analysed using testing strips and a glucometer. **Continuous Glucose Monitoring (CGM):** Subcutaneous/interstitial glucose monitoring systems that automatically provide the user (and/or carer) with real-time glucose data via a receiver or compatible phone running an application. To indicate that people use CGM, this system should have been used for at least 1 month over the last year. **Flash Glucose Monitoring:** A factory calibrated subcutaneous/interstitial glucose monitoring system that requires the user (and/or carer) to scan the attached sensor with a reader or compatible phone running an application in order to view recent glucose data. To indicate that people use Flash Glucose Monitoring, this system should have been used for at least 1 month over the last year.
Finger pricking - Does the patient check their blood glucose level as often as recommended?	If monitoring glucose by finger pricking, mark the option that describes the patient's usual practice (**No/Yes/Unsure of recommended testing**).
Finger pricking - How many times a day?	If monitoring glucose by finger pricking, indicate the number of times the patient does finger pricking per day.

If using Flash/CGM, proportion of time using sensors	To indicate that people use Flash/CGM, these systems should have been used for at least 1 month over the last year. The proportion of time spent using sensors refers to the overall **average time since sensors were commenced** in the last 12 months, and should also encompass any breaks from using sensors since commencement.
Management method	If multiple, tick all that apply. See the 'Australian Blood Glucose Treatment Algorithm For Type 2 Diabetes' and the 'Table of Evidence and Properties of Glucose-Lowering Agents' for information on each drug class. These resources are found on the Australian Diabetes Society website, or with the direct link https://t2d.diabetessociety.com.au/documents/h2PgsPGv.pdf
Insulin duration	If the patient is on insulin, record the number of years/months the patient has been on insulin.
Insulin mode	If the patient is on insulin, mark mode of administration(s). If multiple, **tick all that apply**. **Basal:** Intermediate-acting or long-acting insulin injection(s). **Basal bolus:** Insulin regime that utilises any type of basal insulin as well as any type of bolus insulin. Pre-mixed insulins are excluded from this category. **Pre-mixed:** Injection of any pre-mixed combination of intermediate or long-acting insulin with either short-acting or very short-acting insulin. **Pump:** Mode of insulin delivery being via continuous subcutaneous insulin infusion. **Hybrid closed loop system:** The simultaneous and integrated use of continuous glucose monitoring and an insulin pump with a control algorithm that may increase and decrease basal insulin delivery based on real-time interstitial glucose results.
Section 3. Height, Weight & Blood Pressure	
Weight	Record in **kilograms** the weight measurement without shoes or jacket. Mark **No** or **Yes** if the weight measurement was self-reported.
Height	Record in **metres** the height measurement without shoes. Mark **No** or **Yes** if the height measurement was self-reported.
Blood pressure	Record systolic / diastolic (mmHg) measured after 5 minutes sitting, **[1st and 5th phases].**
Anti-hypertensive treatment	Mark **No** or **Yes** to indicate if the patient is on treatment for hypertension.
Anti-hypertensive medications	Select the anti-hypertensive medication(s) the patient is currently taking. ACE – angiotensin converting enzyme, ARB – angiotensin II receptor blocker. Thiazides also include thiazide-like diuretics. **If on combination tablet, tick all that apply.**
Section 4. Current Medications & Lipids in last 12 months	
Aspirin	Mark **No** or **Yes** to indicate whether the patient is on aspirin. Indicate if contraindicated.
Other anti-platelets	Mark **No** or **Yes** to indicate whether the patient is on any other anti-platelet treatment (e.g. clopidogrel, ticagrelor or prasugrel). Indicate if contraindicated.
Anti-coagulants	Mark **No** or **Yes** to indicate whether the patient is on anti-coagulants (e.g. warfarin or non-vitamin K antagonist oral anticoagulants (NOAC)). Indicate if contraindicated.
Lipid modifying treatment	Mark **No** or **Yes** to indicate whether the patient is on lipid lowering treatment. If Yes, indicate whether they are on statin, fibrate, ezetimibe, fish oil, evolocumab and/or other. Indicate if contraindicated. If on combination tablet, tick all that apply.
Lipids measured	Mark **No** or **Yes** to indicate if lipids have been measured in the past 12 months.
Total Cholesterol, LDL, HDL, Triglycerides	Record the most recent result(s) for *total, LDL & HDL cholesterol and triglycerides* in the last 12 months or tick 'Not available'.
Above measured in fasting specimen	Mark No or Yes to indicate if the lipids reported in 4.5.1 to 4.5.4 were measured in a fasting state.
Section 5. Renal Function & Blood Glucose Control – Most recent in last 12 months	

HbA_{1c} result	Record the most recent Haemoglobin A1c (HbA_{1c}) result [%]in the last 12 months, or tick 'Not available'.
HbA_{1c} test date	If Haemoglobin A1c (HbA_{1c}) result was collected, record the date as **MM/YYYY** for the most recent Haemoglobin A1c (HbA_{1c}) result in the last 12 months.
eGFR	Record the result for the most recent eGFR **[mL/min per 1.73m2]** in the last 12 months, or tick 'Not available'.
Serum creatinine	Record result measurement of serum creatinine **[µmol/L]** in the last 12 months, or tick 'Not available'.
Urinary albumin	Record amount of albumin **[mg/L]** or as albumin excretion rate [AER: **µg/min** or **mg/24hr**] or **ratio**. If the result is less than the lower limit of detection provided by the pathology service, please record the lower limit of detection. Example: If reported as <0.05 please record as 0.05. Tick 'Not available' if a result is not available from the last 12 months.
Urinary protein	Record amount of albumin **[mg/L]** or as albumin excretion rate [AER: **µg/min** or **mg/24hr**] or **ratio**. If the result is less than the lower limit of detection provided by the pathology service, please record the lower limit of detection. Example: If reported as <0.05 please record as 0.05. Tick 'Not available' if a result is not available from the last 12 months.

Section 6. Diabetes Related Eye & Foot Diseases

Mark **No** or **Yes** to indicate diabetes related foot problems in the last 12 months **AND/OR** previously (prior to the last 12 months). Answer all questions.

Retinopathy	Mark **No** or **Yes** to indicate if the ophthalmological assessment revealed any diabetic retinopathy or maculopathy in the last 12 months.
Treatment for retinopathy	Mark **No** or **Yes** to indicate if the patient has had any diabetic eye related treatment in the last 12 months. Includes any of the following: laser photocoagulation treatment, intravitreal VEGF inhibitor injection, or vitrectomy.
Right or left cataract	Mark **No** or **Yes** to indicate if the patient currently has a cataract or has had one removed in the last 12 months.
Peripheral neuropathy	Mark **No** or **Yes** to indicate clinical judgement following assessment using pin prick and vibration or monofilament. Also includes presence of Charcot foot.
Foot ulceration	Mark **No** or **Yes** to indicate past history of foot ulceration.
Peripheral vascular disease	Mark **No** or **Yes** to indicate peripheral vascular disease. **Yes**: Absence of **both** dorsalis pedis and posterior tibial pulses in either foot **and/or** symptoms of peripheral vascular disease (e.g. intermittent claudication, rest pain, tissue loss/gangrene) **and/or** Ankle-Brachial Pressure Index <0.9 and/or confirmatory arterial ultrasound or angiography **and/or** previous revascularisation procedure (incl. angioplasty, stent insertion or surgical bypass).
Lower limb amputation	Mark **No** or **Yes** to indicate lower limb amputation. Amputation of toe, forefoot or leg [above or below knee], not due to trauma or causes other than vascular disease.
Minor/Major Lower Limb Amputation	If the patient has had an amputation in either lower limb, indicate if minor and/or major. **Minor** = Amputation of the toe(s) or foot (below the ankle) **Major** = Amputation above the ankle.

Section 7. Other Complications/Events/Comorbidities

Mark **No** or **Yes** to indicate a history of complication or an event in the last 12 months **AND/OR** previously (prior to the last 12 months). Answer all questions.

Cerebral stroke	Diagnosis of ischaemic stroke (Does not include transient ischaemic attack or haemorrhagic stroke).
Myocardial infarction	Evidenced by ECG changes, plasma enzyme changes or medical documentation.
CABG/Angioplasty	Coronary Artery Bypass Graft (CABG) surgery, coronary angioplasty or stent.

Congestive cardiac failure	Symptomatic congestive cardiac failure with response to specific therapy.
End stage kidney disease	Any of the following: stage 5 chronic kidney disease (eGFR <15mL/min/1.73m2) **and/or** dialysis-dependent (haemodialysis or peritoneal dialysis) **and/or** renal transplant recipient.
Blindness	Patient became legally blind (>6/60) in either eye.
Sexual dysfunction	If **male**: History or treatment of failure to achieve or maintain erection sufficient for satisfactory sexual intercourse. If **female**: History of persistent and recurrent problems with sexual response, desire, orgasm or pain that cause distress or relationship strain.
Dementia	A formal diagnosis of dementia from a clinician **or** prescribed dementia-specific pharmacotherapy.
Depression	A formal diagnosis of depression from a clinician **or** prescribed pharmacotherapy for depression.
Malignancy	Any type of malignancy. *Exclude non-melanoma skin cancers*.
Diabetic Ketoacidosis (DKA)	Any hospital admission involving diabetic ketoacidosis as evidenced by blood results (glucose, ketones, pH) or medical documentation.
Hyperosmolar Hyperglycaemic State (HHS)	Any hospital admission involving hyperosmolar hyperglycaemic state as evidenced by blood results (glucose, osmolality) or medical documentation.
Severe hypoglycaemia	Severe hypoglycaemia requiring assistance of another person to actively administer carbohydrates, glucagon, or other corrective actions.
Number of episodes	If **Yes** to 'Severe hypoglycaemia', mark the number of episodes.
COVID-19 positive	Confirmed by a positive Rapid Antigen Test (RAT) or Polymerase Chain Reaction (PCR) test.
COVID-19 hospitalisation	If **Yes** to 'COVID-19', mark if the patient was admitted to hospital. Any hospital admission, including to a general medical ward or intensive care unit (ICU).
Liver disease	Indicate severity of liver disease **or** if **not applicable**. **Mild**: cirrhosis without portal hypertension, chronic hepatitis. **Moderate to severe**: cirrhosis with portal hypertension.
Section 8. Mental Health Screening	
Depression	Mark if the patient has been screened for depression using a validated questionnaire (**No/Yes/Unsure**). Example: Patient Health Questionnaire (PHQ-9) screening tool.
Anxiety	Mark if the patient has been screened for anxiety using a validated questionnaire (**No/Yes/Unsure**). Example: Generalized Anxiety Disorder scale (GAD- 7) screening tool.
Diabetes distress	Mark if the patient has been screened for diabetes distress using a validated questionnaire (**No/Yes/Unsure**). Example: Problem Areas In Diabetes questionnaire (PAID) screening tool.

Patient Health & Well-Being Questionnaire

Section 1. Smoking & Vaccination Status	
Currently smoke tobacco	Mark if the patient currently smokes any tobacco material (**No/Yes**).
[i.e. cigarettes/cigars/ e-cigarettes(vaping)]	Unique site identifier (assigned by ANDA Secretariat).
Previously smoked tobacco	Mark if the patient previously smoked any tobacco material (**No/Yes**).
COVID-19 vaccination	Mark if the patient had a COVID-19 vaccination in the last 12 months (**No/Yes**).
COVID-19 vaccination – Number of doses	If the patient has had a COVID-19 vaccination in the last 12 months, mark the total number of doses the patient has received.
COVID-19 vaccination – Date of last dose	If the patient has had a COVID-19 vaccination in the last 12 months, record the date [**DD/MM/YYYY**] of the last (most recent) dose or tick **'I do not remember'**.
Flu/Influenza vaccination	Mark if the patient had a flu (influenza) vaccination in the last 12 months (**No/Yes**).
Pneumococcal vaccination	Mark if the patient had a pneumococcal vaccination in the last 12 months (**No/Yes**).
Section 2. Health Professional Attendances	
Endocrinologist	Mark if the patient attended in the last 12 months (**No/Yes/Unsure**).
Diabetes Educator	Mark if the patient attended in the last 12 months (**No/Yes/Unsure**).
Dietitian	Mark if the patient attended in the last 12 months (**No/Yes/Unsure**).
Podiatrist	Mark if the patient attended in the last 12 months (**No/Yes/Unsure**).
Psychologist	Mark if the patient attended in the last 12 months (**No/Yes/Unsure**).
Ophthalmologist	Mark if the patient attended in the last 12 months (**No/Yes/Unsure**).
Optometrist	Mark if the patient attended in the last 12 months (**No/Yes/Unsure**).
Social Worker	Mark if the patient attended in the last 12 months (**No/Yes/Unsure**).
Dentist	Mark if the patient attended in the last 12 months (**No/Yes/Unsure**).
Exercise Physiologist/ Physiotherapist	Mark if the patient attended in the last 12 months (**No/Yes/Unsure**).
Section 3. Medication Use	
Medication use practices	Indicate whether the patient every forgets to take their medications (**No/Yes**) or mark **Not applicable** if the patient is not prescribed tablets. If the patient ever forgets to take their medication, record how many times per week. If the patient does not forget to take their medication weekly (e.g. fortnightly), record 0.
Section 4. Patient Self Care Practices	
Do you have difficulties following your recommended diet?	Mark whether the patient has difficulties following recommended diet (**No/Yes**). If **Yes**, ask the patient whether the listed options apply to them. Mark **No/Yes** to each of the options.
Section 5. Physical Activity	
Physical activity	Mark the usual weekly duration of time (**150 mins/week or more, less than 150 mins/week, or rarely/never**) spent performing moderate or vigorous intensity physical activity. Physical activity is calculated in '**total minutes per week**' by summing the total minutes of walking, moderate and/or vigorous physical activity in a usual 7-day period. Vigorous physical activity is weighted by a factor of two to account for its greater intensity. Intensity of physical activity is defined by The National Physical Activity Guidelines for Australians: **Moderate** physical activity causes a slight but noticeable increase in breathing and heart rate, the person can comfortably talk but not sing. **Vigorous** physical activity causes the person to 'huff and puff,' talking in full sentences between breaths is difficult.
Muscle strengthening exercise	Mark whether the patient does any muscle strengthening exercise in a usual week. (**No/Yes**). Muscle strengthening activities are physical activities that maintain or improve the strength, power, endurance and size of skeletal muscles. This can be physical activity with free weights, body weight or resistance machines/bands, or house/garden activities that involve muscular effort, such as, lifting, carrying or digging.

APPENDIX 3

ANDA 2022 Participating sites

State	Site Name
ACT	Canberra Hospital - Canberra Health Service (CHS) Diabetes Service
NSW	Prince of Wales Hospital Diabetes Centre
NSW	Royal Prince Alfred (RPA) Diabetes Centre
NSW	Macarthur Diabetes and Endocrine Metabolic Services
NSW	Royal North Shore Hospital - Diabetes Centre
NSW	St Vincents Hospital Diabetes Centre, Darlinghurst, Sydney
NSW	Liverpool Diabetes and Endocrine Service
NSW	Greater Newcastle Sector Diabetes Service
NSW	Murrumbidgee Local Health District
NSW	Harry Grunstein
NSW	Endocrinology East
NSW	Corowa Medical Centre
NSW	Albury Wodonga Health
NSW	Sydney Endocrinology
NT	Australian Regional and Remote Community Services (ARRCS)
QLD	Townsville University Hospital
QLD	Cairns Diabetes Centre
QLD	Queensland Diabetes & Endocrine Centre, Mater Health
QLD	Chronic Disease Logan Diabetes
QLD	Princess Alexandra Hospital
QLD	Sunshine Coast Diabetes Centre
QLD	Ipswich Diabetes Service
QLD	Brisbane South Complex Diabetes Service
QLD	Whitsunday Doctors Service - Prosperine
QLD	Metro North Health Diabetes Service- North Lakes Health Precinct
QLD	Metro North Heath Diabetes Service - Caboolture Community Health Centre
QLD	Metro North Health Diabetes Service - Chermside Community Health Centre
QLD	Mareeba Community Health - Mareeba District Hospital
SA	Lyell McEwin Hospital -Northern Adelaide Local Health Network
SA	SADES Southern Adelaide Diabetes and Endocrine Services (GP Plus Noarlunga)

State	Site Name
TAS	Royal Hobart Hospital
TAS	NW Diabetes Centre
TAS	John Morris Diabetes Centre, NICS
VIC	Western Health
VIC	Alfred Health
VIC	GV Diabetes Centre
VIC	Monash Health - Clayton
VIC	Royal Melbourne Hospital
VIC	Diabetes Referral Centre
VIC	Baker Heart & Diabetes Institute
VIC	Monash Health - Dandenong
VIC	St Vincent's Public Hospital Melbourne
VIC	Bendigo Health
VIC	Gateway Health, Wangaratta
VIC	Beechworth Health Service
VIC	NCN Health Cobram
VIC	Northern Health
VIC	Gateway Health, Wodonga
VIC	Seymour Health and Yea District Memorial Hospital
VIC	Delkaya Health (formerly CHIRP Community Health)
VIC	Eastern Health - Box Hill, Maroondah, Angliss, Yarra Ranges, Healesville, IDEAS
VIC	Tallangatta Health Service
VIC	Kyabram District Health Service
VIC	Green Street Specialists
VIC	Kensington Hill Medical Centre
VIC	Yarrawonga Denis Medical Group
WA	Royal Perth Hospital
WA	Perth Children's Hospital
WA	Fiona Stanley Hospital
WA	Perth Diabetes Care
WA	Prof. Tim Davis
WA	Boab Health Service -East Kimberley region, Western Australia
WA	Boab Health Service - West Kimberley region (Fitzroy Valley), Western Australia
WA	Boab Health Service - West Kimberley, Broome based, Western Australia


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