



Health & Social Care
Information Centre

National Diabetes Audit

Methodology Document, 2014-2015



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This report is of particular interest to healthcare providers and commissioners to monitor the quality and effectiveness of services, researchers and charities working on this subject and to members of the public.

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Introduction

The National Diabetes Audit is commissioned by the Healthcare Quality Improvement Partnership (HQIP) and delivered by the Health and Social Care Information Centre (HSCIC), working in collaboration with Diabetes UK and Public Health England (PHE).

The National Diabetes Audit (NDA) is a major national clinical audit, which measures the effectiveness of diabetes healthcare against NICE Clinical Guidelines and NICE Quality Standards, in England and Wales. The NDA collects and analyses data for use by a range of stakeholders to drive changes and improvements in the quality of services and health outcomes for people with diabetes.

The National Diabetes Audit (NDA) answers four key questions based on the diabetes National Service Framework (NSF):

1. Is everyone with diabetes diagnosed and recorded on a practice diabetes register?
2. What percentage of people registered with diabetes received the nine NICE key processes of diabetes care?
3. What percentage of people registered with diabetes achieved NICE defined treatment targets for glucose control, blood pressure and blood cholesterol?
4. For people with registered diabetes what are the rates of acute and long term complications (disease outcomes)?

The NDA aims to improve the quality of patient care by enabling NHS organisations to:

- compare their outcomes of care with similar NHS organisations
- identify and share best practice
- identify gaps or shortfalls in commissioning services
- assess local practice against NSF for diabetes and NICE guidelines and drive service improvement
- provide a more comprehensive picture of diabetes care and outcomes in England and Wales

Through participation in the audit, local services are able to benchmark their performance and identify where they are performing well, and improve the quality of treatment and care they provide. On a national level, wide participation in the audit also provides an overview of the quality of care being provided in England and Wales.

This document provides you with the information and links you need to understand how the audit data is collected and analysed.

How the data is collected

Information is collected from GP practice administrative data via pre-agreed extracts of their computer system. Data is collected via automated and manual extraction from General Practice Clinical Systems and Secondary Care Hospitals.

The audit is a voluntary audit and GP practices have to opt in to be included. The participation rate was 57.1 per cent and 57.3 per cent of all GP practices in England and Wales for 2013-14 and 2014-15 respectively. Ninety nine Secondary Care Units participated in 2014-15 in England.

Full guidance on how to submit data to the audit for GP practices and secondary care units is provided [here](#)

The information collected from GP practices for the audit are individual level data and so contain demographic information such as age, sex, ethnicity, diabetes duration and some geographic variables such as IMD centiles and ward code.

A full list of the information collected from GP systems can be found [here](#) and a list of variables which feed the analysis database can be found in Appendix A.

A data flow diagram can be found in Appendix B.

What is done with the data after submission

Data Cleaning

Cleaning rules are applied to the data on submission to ensure correct information is being received as part of the audit. The following cleaning rules are applied to these variables.

These ensure that the data received as part of the audit are within certain acceptable limits. Data outside of these limits is deemed to be invalid and therefore set to unknown or null.

Rule statement	Valid codes and values	Invalid codes and values set to unknown values
SEX	0,1,2,9	0
ETHNICITY	A, B, C, D, E, F, G, H, J, K, L, M, N, P, R, S, Z	Z
DIABETES_TYPE	01, 02, 06, 08, 99	99
ALBUMIN_TEST	01, 02, 03, 04, 99	99
ALBUMIN_STAGE	01, 02, 03, 99	99
EYE_EXAM_VALUE	01, 02, 03, 99	99
FOOT_EXAM_VALUE	01, 02, 03, 99	99
SMOKING_VALUE	1, 2, 3, 4, 9	9
ED_REVIEW_VALUE	01, 02, 99	99
ED_REVIEW_DATE	>= audit start date (01/01/20xx) and <= audit end date (<31/03/20xx)	NULL
ED_OFFER_VALUE	01, 02, 99	99
ED_OFFER_DATE	>= audit start date (01/01/20xx) and <= audit end date (<31/03/20xx)	NULL
ED_ATTEND_VALUE	01, 02, 99, NULL	99
ED_ATTEND_DATE	>= audit start date (01/01/20xx) and <= audit end date (<31/03/20xx)	NULL
ANGINA_VALUE	01, 02, 99	99
DIAGNOSIS_DATE	>=01/01/1907 and <= audit end date (<31/03/20xx) and >= BIRTH_DATE	NULL
BIRTH_DATE	>=01/01/1907 and <= audit end date (<31/03/20xx) and <=DIAGNOSIS_DATE	NULL
SYSTOLIC_DATE & DIASTOLIC_DATE	SYSTOLIC_DATE = DIASTOLIC_DATE and >= audit start date (01/01/20xx) and <= audit end date (<31/03/20xx)	NULL
HBA1C value - no conversion	<3.979993595 or >195.082525407	NULL
HBA1C value - conversion	>= 3.979993595 and < 20 1) Convert HBA1C_VALUE to MMOL_HBA1C_VALUE 2) Copy MMOL_HBA1C_VALUE to CLEAN_MMOL_HBA1C_VALUE 3) Copy HBA1C_VALUE to PERCENTAGE_HBA1C_VALUE and CLEAN_PERCENTAGE_HBA1C_VALUE	NULL
BMI_VALUE	>=12 and <=90	NULL
SYSTOLIC_VALUE	>=70 and <= 300	NULL
DIASTOLIC_VALUE	>= 20 and <= 150	NULL
CREATININE_VALUE	>=20 and <=1200	NULL
CHOLESTEROL_VALUE	>=1 and <=40	NULL

Certain records are excluded completely from the extracts submitted by the GP practices and secondary care units.

Records are rejected for the following reasons:

- A primary care record does not come from a patient's current GP practice
- A primary care record does not come from a GP practice which is eligible for the NDA

(A list of eligible GP practices is obtained from the HSCIC corporate reference library, which is updated weekly using data from the Organisation Data Service (ODS))

- A secondary care record submitted with only NHS number and no corresponding primary care record.

Validation

Validation of the records extracted from GP systems is completed by matching to the National Health Applications and Infrastructure services (NHAIS). This ensures that the person's NHS number is valid and is correct, it also provides the current GP practice that the person is registered to. This ensures that we have up to date information on the individuals from the GP practices that have submitted to the audit.

A provisional report is produced for each CCG which provides a comparison to the Quality Outcomes Framework (QOF) data on people registered as having diabetes and an overall figure on the care process completion and the treatment target achievement. This provides an opportunity for CCGs to address any data quality issues with the GP practices and re-submit the data.

Internal validation is completed on receipt of the automated extracts to ensure that there are no systematic issues with the data, and these are resolved where possible within the collection window.

Any data quality issues with the data are highlighted alongside analysis to ensure readers are made aware and further details are provided in the data quality statement accompanying the report.

For example, "Albumin Care Process" - there is a known issue with the recording of this element of the collection.

"There is a 'health warning regarding the screening test for early kidney disease (Urine Albumin Creatinine Ratio, UACR). An issue with data supplied to the HSCIC for the 2012-13 audit was brought to our attention prior to publication, which is believed to be restricted to Urine Albumin data extraction across a number of practices. Caution should be borne in mind when looking at the variation across CCGs for this care process."

The 2013-14 and 2014-15 data was extracted in a consistent way across all service providers. This resulted in a better performance for the albumin care process completion in 2013-14. However, due to the retirement of the QOF indicator and the potential for the focus of GP practices to shift, the performance in recording this care process fell in 2014-15.

Production of Analysis database

Most individuals within the NDA will have one record only which can be used to determine demographic and diagnostic information. The majority of records will come from primary care (GP extracts), if an individual is only submitted by a participating secondary care unit, then the mandatory demographics data needs to be included in the submission in order for the record to be included in the NDA.

The demographic fields include:

- Age
- Sex
- Ethnicity
- LSOA
- GP practice code
- Diagnosis year
- Diabetes type

Diagnostic information includes dates and values for each of the care processes.

If a primary care patient does not have a secondary care record then demographic and diagnostic information is taken from this single record. Similarly, if a patient is recorded at a secondary care organisation, with no primary care record, demographic and diagnostic information is taken from this single record.

However, if a person has multiple records, i.e. one primary care record plus one or more secondary care records, or no primary care record and only multiple secondary care records, an algorithm is applied to determine a single set of demographic and diagnostic data for the individual. This is known as the 'golden record'.

A patient with one primary care record and one or more secondary care

Demographics are taken from the primary care record. The only exception would be for diabetes type. If this is unknown in the primary care record but known in the secondary care record, the diabetes type will be taken from the secondary care record.

Diagnostic information is taken from whichever record includes the latest recorded date, regardless of whether the record is from primary or secondary care. For example:

Record 1 (Primary Care): blood pressure date= 23/06/2013; cholesterol date=16/07/2013
Record 2 (Secondary Care): blood pressure date= 01/03/2013; cholesterol date=14/12/2013

Blood pressure date and values will be taken from Record 1 and cholesterol date and value will be taken from Record 2.

A patient with no primary care record and multiple secondary care records

If a patient has more than one secondary care record, demographic information will be taken from the record with the most completed number of demographic fields. If there is more than one record with the highest count of completed demographic fields, one record will be selected at random (this will be the first record for this individual in the loaded data, the data is not loaded in any specific order).

Diagnostic information is taken from whichever record includes the latest recorded date.

Analysis

Coverage

The NDA provides a detailed picture of the clinical processes and care pathway for those diagnosed with diabetes. Some of the information collected as part of the audit is collected and published via the Quality and Outcomes Framework (QOF). QOF is an aggregated return which provides information for nearly all GP practices in England. The QOF information is used within the report when discussing coverage.

Clinical Commissioning Groups (CCGs), Local Health Boards (LHBs), GP practices and adult outpatient secondary care units submit data about the care that is being delivered for people with diabetes in their organisation. This will include children that have been treated in an adult care setting. For the full picture on the paediatric care for children with diabetes please refer to the National Paediatric Diabetes Audit (NPDA) which is conducted by the Royal College of Paediatrics and Child Health (RCPCH)¹.

The suite of NDA reports uses three separate cohorts of patients from England and Wales:

- Primary Care Patients – These are patients who are registered with a participating GP practice.
- Secondary Care Patients – These are patients that have a secondary care record, however they may or may not be registered with a participating GP practice. Information is collected from hospitals and trusts via a bespoke data collection system
- All patients – Any patient from participating GP practices and secondary care units

The audit is voluntary and is reliant on GP practices opting in from 2013-14 and therefore has seen a slight drop in participation at a National level (Wales has seen an increase in participation). Therefore caution should be taken when looking at local level analysis (Clinical Commissioning Groups and Local Health Boards).

Prior to 2013-14 the approach to the audit was opt out, this meant that GP practices had to tell the HSCIC that they did not wish to participate; this was normally a small number of practices.

The drop in participation in 2012-13 was expected due to the restructuring of the NHS since April 2013. This organisational transition disrupted many well established people and systems.

Audit year	Total number of practices	Number of participating practices	National participation rate
2011-2012	8,549	7,515	87.9%
2012-2013	8,476	5,991	70.7%
2013-2014	8,232	4,699	57.1%
2014-2015	8,198	4,696	57.3%

¹National Paediatric Diabetes Audit, Royal College of Paediatrics and Child Health <http://www.rcpch.ac.uk/npdat>

Registrations

This relates to the number of people registered with a GP or with a secondary care unit and covers the all patients cohort. It is expected that the majority of patients should be registered with a GP, however there are instances where this is not the case. This may be because their registered GP practice has failed to participate.

Definition of the Care Processes

It is vital that people with diabetes receive all nine of the NICE recommended key health tests and measures. These tests help to monitor and manage the condition, as well as to reduce the risk of complications such as stroke, heart disease and amputations.

For each of the care processes the date fields are used to determine if the care process has been performed. The most recent date is used in each audit year and these are matched back on to the relevant cohort of patients. The denominator for the care processes are the total number of people aged 12 or over within the relevant cohort with the exception of HbA1c (where all patients are used).

A care process can take place in any setting for example the blood test or the smoking review can be done in hospital or in the registered GP practice and it will still count towards the GP practice, Clinical Commissioning Group (CCG), Local Health Board (LHB) and the secondary care unit.

The nine annual health checks for people with diabetes are:

1. **Blood Pressure** is a measurement of the force of blood flow inside your arteries. Your blood pressure is stated as two figures, e.g.130/80. The first figure is known as the systolic pressure and relates to the pressure as the heart contracts and pushes blood through the arteries. The other figure is the diastolic pressure measured when the heart relaxes to refill with blood.

A blood pressure measurement should be taken for all registered patients at least once a year this information is collected as part of the audit. Records are only used within the care process completion indicator if there is a diastolic and systolic date and these are the same. Where a patient aged 12 or over has a diastolic and systolic date in the audit year at any organisation participating in the audit the care process is considered complete.

2. **Weight and BMI measurement** – Body Mass Index this should be recorded for all diabetes patients. This should be measured and recorded annually by the GP or secondary care unit.

The date of this record is used to determine if the care process has been completed in the audit period. Where a patient aged 12 or over has a BMI date in the audit year at any organisation the care process is considered complete.

3. **Serum creatinine test** (creatinine is an indicator for renal function)
This should be measured and recorded annually by the GP or secondary care unit. The date of this record is used to determine if the care process has been completed in the

audit period. Where a patient aged 12 or over has a creatinine date in the audit year at any organisation the care process is considered complete.

4. **Urinary albumin** test (or protein test to measure the kidney function)

This should be measured and recorded annually by the GP or secondary care unit. The date of this record is used to determine if the care process has been completed in the audit period. Where a patient aged 12 or over has an albumin date in the audit year at any organisation the care process is considered complete.

5. **Cholesterol** (Triglycerides are another type of fat in the blood)

If you have raised cholesterol and raised triglycerides you have an increased risk of Cardio Vascular Disease (CVD).

This should be measured and recorded annually by the GP or secondary care unit. The date of this record is used to determine if the care process has been completed in the audit period. Where a patient aged 12 or over has a cholesterol date in the audit year at any organisation the care process is considered complete.

6. **Eye check** (retinopathy screening)

Diabetic retinopathy is a common complication of diabetes. It occurs when high blood sugar levels damage the cells at the back of the eye, known as the retina. Patients with diabetes should be offered screening on an annual basis.

Unfortunately, the variation in the use of terminology and its impact on the consistency of data extraction from electronic clinical records rendered this element of the data unreliable as a measure of this care process. The NHS Diabetic Eye Screening Programme (NHS DESP) records every digital eye screening and we believe that its records should now be used as the preferred measure for this annual care process. Presently this is reported only nationally. The NHS DESP data are available on the NHS England website.

7. **Foot check**

Patients with diabetes should have an annual foot check, as diabetes can limit the blood supply to your feet and cause a loss of feeling. This can mean foot injuries do not heal well. A patient is more likely to have a limb amputated when they have diabetes. Where a patient aged 12 or over has a foot exam date in the audit year at any organisation the care process is considered complete.

8. **Smoking Status**

Where a patient aged 12 or over has a smoking status date in the audit year at any organisation the care process is considered complete.

9. **Blood test (HbA1c – blood glucose levels)**

This indicates your blood glucose levels for the previous two to three months. The HbA1c measures the amount of glucose that is being carried by the red blood cells in the body. This care process is appropriate for all ages where a patient of any age has an HbA1c date in the audit period at any organisation the care process is considered complete.

All 8 Care Processes – this is where the person has to have received all eight care processes (excluding eye screening) where appropriate. The requirement is that everyone has their HbA_{1c} measured annually, and everyone aged 12 or over should have all eight care processes annually. So, an 11 year old will only be required to have their HbA_{1c} value tested and so if this has been done they will have achieved the all care process element, However, an adult aged 25 will have to have received all eight different care processes to have achieved the all eight care processes.

Definition of the Treatment Targets

There are targets relating to three of the care processes; “blood tests” (HbA_{1c}), cholesterol and blood pressure. For a patient to appear in the denominator group for each of the targets section they need to have the date that the measurement was taken and a result recorded.

The most recent date is used in each audit year and the best result for the test is taken if two tests were completed on the same day. These are matched back on to the relevant cohort of patients. A care process and therefore the target result are taken from any setting and it will count towards the GP practice/CCG and secondary care unit targets.

The seven targets for the three care processes for people with diabetes are:

Blood test (HbA_{1c} – blood glucose levels). This is vital to measuring the long term glucose levels within the patients’ blood; the aim should be to keep these at normal levels. The most recent result is taken for use within the calculation and if there were two tests completed on the same day the lowest value is used.

There are three cumulative levels of the target:

- a. The HbA_{1c} value is less than 6.5
- b. The HbA_{1c} value is less than or equal to 7.5
- c. The HbA_{1c} value is less than or equal to 10

Cholesterol - If you have raised cholesterol and raised triglycerides you have an increased risk of CVD. This target measures the cholesterol levels of diabetes patients. The most recent result is taken for use within the calculation and if there were two tests completed on the same day the lowest value is used.

There are two cumulative levels of the target:

- d. The cholesterol value is less than or equal to 4 mmol/l
- e. The cholesterol value is less than or equal to 5 mmol/l

Blood Pressure – This is a flat target that the patient’s blood pressure (BP) should be less than or equal to 140/80. The most recent result is taken for use within the calculation and if there were two tests completed on the same day the lowest value is used

All Targets – this is where the person has achieved HbA_{1c} ≤7.5%, cholesterol < 5mmol/l and blood pressure ≤140/80.

Standardisation

For the first time in the NDA audit indirect standardisation has been used to compare the actual number of people completing care processes with the number expected to.

Logistic regression models have been derived to calculate for care providers and commissioners the expected numbers of people completing care processes. The model is derived for each year in question from the audit data for that year. So the assessment is against what is seen for the whole of England and Wales.

The expected number is assessed against the number of people that are observed to complete the processes or achieve the targets to establish whether this is above, below or in line with that expected. A 'banding' score is then provided based on this. This measure should be used along with other information to inform the decision making of GPs and commissioning organisations. The banding is not a measure of quality of care. A higher/lower than expected number of people completing care processes, or achieving treatment targets, should not immediately be interpreted as indicating poor/good performance. The banding should not be treated as an absolute assessment of performance, but rather as a tool to aid local investigation. The banding cannot be used to directly compare performance between GP practices and CCGs/LHBs; it is inappropriate to rank organisations according to their score.

When looking at modelling the outcomes, demographic variables are used; this is to determine if a younger male Asian is more likely to have had the outcome compared to an older female of white ethnicity.

The models allow each variable to be considered independently by controlling for the effects of other, sometimes related factors. The model allows an evaluation of the strength of the relationship between each of the variables.

When modelling data in this way the aim is to produce a model which both satisfies certain statistical criteria and maintains a connection with the real-world understanding of the behaviours we are trying to explain. The ability of the model to explain the variation seen in our data has been presented as the 'c-statistic'. This statistic is the probability that predicting the outcome is better than chance. The values for this measure range from 0.5 to 1.0.

A value of 0.5 indicates that the model is no better than chance at predicting care process completion and a value of 1.0 indicates that the model perfectly identifies those who will and those who will not complete a care process. Models are typically considered reasonable when the c-statistic is higher than 0.7 and strong when the c-statistic exceeds 0.8.

The choice of explanatory variables came from consultation with our clinical lead and advisory group. However not all variables were found to make significant improvements to the ability of the model to explain observed variation and where this was the case these were removed.

Variables included in the care process models were:

- Age in years
- Ethnic group
- IMD quintile group (a measure of deprivation based on a patients postcode)
- Sex

- Smoking status
- BMI group
- Duration of diagnosed diabetes

The outputs from the logistic regression models presented in the supporting tables to allow users to review the quality of the models derived. This includes the c-statistic for each model, as described above.

Banding has been investigated for treatment target achievement results but was judged not to be appropriate. This is because the statistical models did not predict with sufficient certainty whether an individual was likely to achieve the treatment target. Accordingly it is likely that achievement of treatment targets is largely driven by factors other than the patient characteristics captured in the NDA.

For each care provider or commissioner, for each care process or all eight care processes, a banding is shown of 'Lower than expected', 'As expected' or 'Higher than expected'. The exception to this is when the expected number of people with diabetes completing a care process is small. In this instance a banding of 'Insufficient data' is shown.

Disclosure Control

Disclosure control has been applied to the GP level data to mitigate the risk of patient identification. We have removed the data for practices from the publication where the practice list size is less than 1,000. This is in line with the requirements of the *Anonymisation Standard for Publishing Health and Social Care Data* and has been approved by the HSCIC Disclosure Control Panel. Data for additional practices has been removed where differencing would reveal suppressed data.

Appendix A: Database Variable List

Field no.	Field Name	Field Description	Permitted Values	Validation Rules
1	NHS_Number	NHS number of the patient.	10n	If null, invalid or not matched on NHAIS then reject record.
2	Record_Type	Indicates patient demographic and observation data record.	1an 1 = Demographic	
3	Organisation_Code	National GP practice code/Organisation code for the practice/secondary care unit submitting the data.	6an	
4	Source_Unit	Defines whether the data is from primary or secondary care.	1an G Primary Care Unit S Secondary Care Unit	
5	Date_of_Birth	Date of birth of the patient.	YYYY-MM-DD	
6	Ward_Code	Derived from patient's postcode via look up file.	7an	
7	GP_Practice_Code	Registered GP practice code of the patient.	6an Format: X99999, where X can be A-H, J-N, P, W or Y	
8	CCG_Code	Derived from registered GP practice code.	3an	
9	Sex	Sex of the patient.	1an 0 Unknown 1 Male 2 Female 9 Unspecified	
10	Ethnicity	The latest ethnic group code recorded.	1an A British B Irish C Any other White background D White and Black Caribbean E White and Black African F White and Asian G Any other mixed background H Indian J Pakistani K Bangladeshi L Any other Asian background M Caribbean N African P Any other Black background	

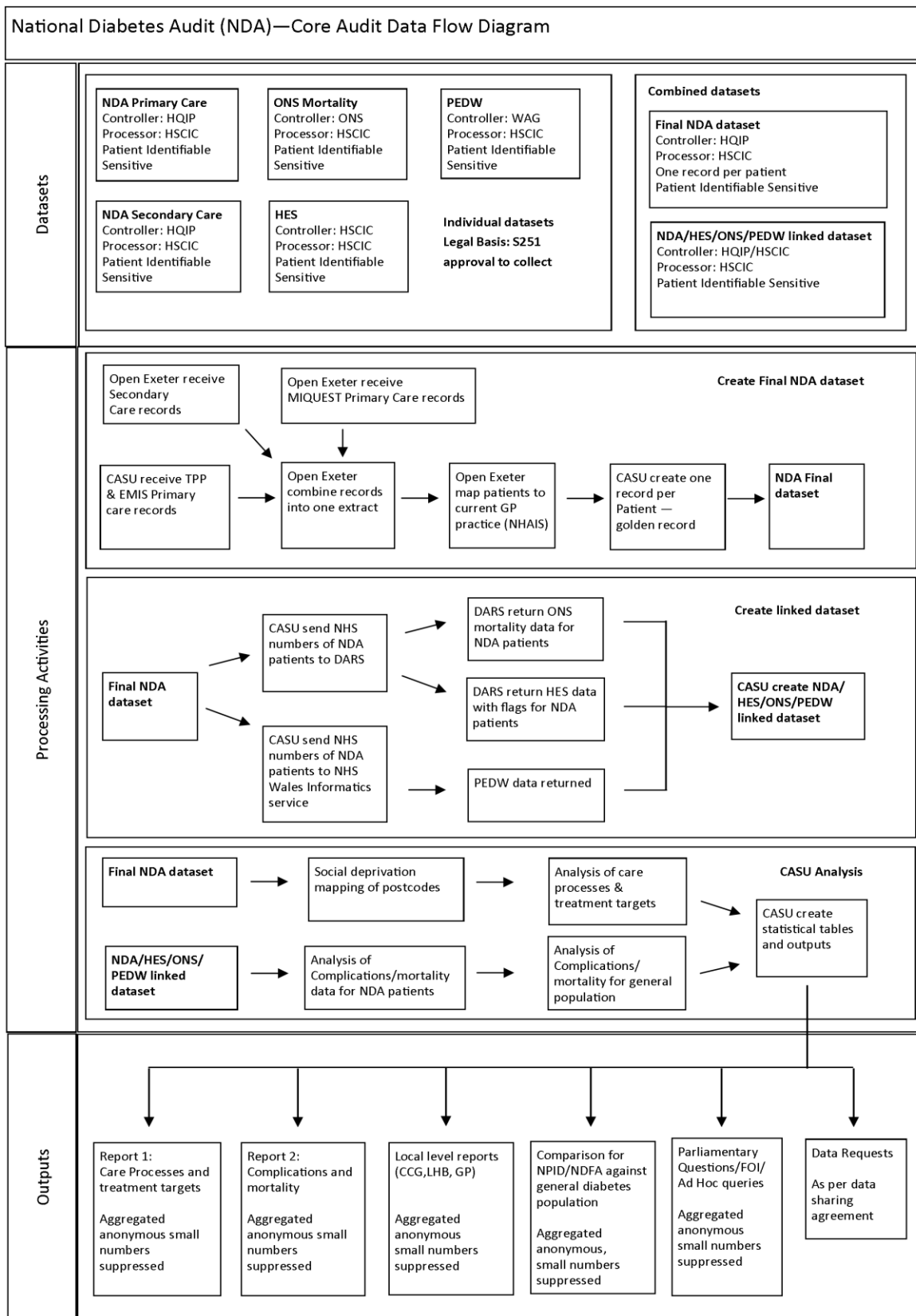
Field no.	Field Name	Field Description	Permitted Values	Validation Rules
			R Chinese S Any other ethnic group Z Not stated	
11	Dissent_Code	The code of the latest "Dissent from disclosure of personal confidential data by Health and Social Care Information Centre" recorded at any time up until the run date that has not been superseded by an appropriate withdrawn dissent code.	5an	
12	Dissent_Date	The date of the latest "Dissent from disclosure of personal confidential data by Health and Social Care Information Centre" recorded at any time up until the run date that has not been superseded by an appropriate withdrawn dissent code	YYYY-MM-DD	
13	Diagnosis_Date	The earliest diagnosis date of Diabetes Mellitus recorded against the patient (where diagnosis before 1st April 2015).	YYYY-MM-DD	
14	Diabetes_Type	The latest diagnosis code of Diabetes Mellitus, where this has been specified as Type I, Type II, MODY or Other recorded against the patient (where diagnosis before 1st April 2015).	2an 01 Type 1 02 Type 2 06 MODY 08 Other specified 99 Not Specified	
15	BMI_Value	The value of the latest entry of body mass index within the audit period.	Format 99.9	Expected range = 16 - 70
16	BMI_Date	The date of the latest entry of body mass index within the audit period.	YYYY-MM-DD	Must be within audit year. Mandatory if an observation value is provided.
17	Systolic_Value	The value of the latest entry of systolic blood pressure within the audit period.	3n	Expected range = 80 – 250
18	Systolic_Date	The date of the latest entry of systolic blood pressure within the audit	YYYY-MM-DD	Must be within audit year. Mandatory if an observation value is

Field no.	Field Name	Field Description	Permitted Values	Validation Rules
		period.		provided.
19	Diastolic_Value	The value of the latest entry of diastolic blood pressure within the audit period.	3n	Expected range = 30 – 150
20	Diastolic_Date	The date of the latest entry of diastolic blood pressure within the audit period.	YYYY-MM-DD	Must be within audit year. Mandatory if an observation value is provided.
21	HbA1c_Value	The value of the latest HbA1 or HbA1c result within the audit period.	Format 99.9	Expected range = 1 – 300
22	HbA1c_Date	The date of the latest HbA1 or HbA1c result within the audit period.	YYYY-MM-DD	Must be within audit year. Mandatory if an observation value is provided.
23	Creatinine_Value	The value of the latest serum creatinine result within the audit period.	4n	Expected range = 20 – 1000
24	Creatinine_Date	The date of the latest serum creatinine result within the audit period.	YYYY-MM-DD	Must be within audit year. Mandatory if an observation value is provided.
25	Albumin_Value	The value of the latest urine albumin result within the audit.	Format 9999.9	
26	Albumin_Test		2an 01 Albumin concentration (mg/L) 02 Albumin creatinine ratio (mg/mmol) 03 Timed overnight albumin (ug/min) 04 24hr albumin excretion (mg/24hr)	
27	Albumin_Stage	The code of the latest microalbuminuria within the audit period.	2an 01 Normoalbuminuria 02 Microalbuminuria 03 Macroalbuminuria	
28	Albumin_Date	The date of the latest urine albumin result within the audit.	YYYY-MM-DD	Must be within audit year. Mandatory if an observation value is provided.

Field no.	Field Name	Field Description	Permitted Values	Validation Rules
29	Cholesterol_Value	The value of the latest serum cholesterol result within the audit period.	Format 99.9	Expected range = 1 – 20
30	Cholesterol_Date	The date of the latest serum cholesterol result within the audit period.	YYYY-MM-DD	Must be within audit year. Mandatory if an observation value is provided.
31	Eye_Exam_Value	The code of the latest retinopathy screening record within the audit period.	2an 01 Carried out 02 Not done 03 Not necessary	
32	Eye_Exam_Date	The date of the latest retinopathy screening record within the audit period.	YYYY-MM-DD	Must be within audit year. Mandatory if an observation value is provided.
33	Foot_Exam_Value	The code of the latest feet examination (neuropathy testing or peripheral pulses) recorded within the audit period.	2an 01 Carried out 02 Not done 03 Not necessary	
34	Foot_Exam_Date	The date of the latest feet examination (neuropathy testing or peripheral pulses) recorded within the audit period.	YYYY-MM-DD	Must be within audit year. Mandatory if an observation value is provided.
35	Smoking_Value	The code of the latest smoking status recorded within the audit period.	1an 1 Current smoker 2 Ex-smoker 3 Non-smoker history unknown 4 Never smoked 9 Unknown	
36	Smoking_Date	The date of the latest smoking status recorded within the audit period.	YYYY-MM-DD	Must be within audit year. Mandatory if an observation value is provided.
37	Current_GP_Practice	Is the person currently registered to this GP practice.	1an Y Yes N No	
38	Ed_Review_Value	The code of the latest diabetic education review recorded within the audit period.	2an 01 Carried out 02 Not done	
39	Ed_Review_Date	The date of the latest diabetic education review recorded within the audit period.	YYYY-MM-DD	Must be within audit year. Mandatory if an observation value is provided.
40	Ed_Offer_Value	The code of the latest referral to a diabetes structured education	2an 01 Carried out 02 Not done	

Field no.	Field Name	Field Description	Permitted Values	Validation Rules
		programme recorded within the audit period.		
41	Ed_Offer_Date	The date of the latest referral to a diabetes structured education programme recorded within the audit period.	YYYY-MM-DD	Must be within audit year. Mandatory if an observation value is provided.
42	Ed_Attend_Value	The code of the latest attendance or completion of a diabetes structured education programme recorded within the audit period.	2an 01 Carried out 02 Not done	
43	Ed_Attend_Date	The date of the latest attendance or completion of a diabetes structured education programme recorded within the audit period.	YYYY-MM-DD	Must be within audit year. Mandatory if an observation value is provided.
44	LSOA		9an	
45	Angina_Value	The code of the earliest angina diagnosis recorded against the patient (where diagnosis before 1st April 2015).	2an 01 Has angina 02 No angina	
46	Angina_Date	The date of the earliest angina diagnosis recorded against the patient (where diagnosis before 1st April 2015).	YYYY-MM-DD	Must be within audit year. Mandatory if an observation value is provided.

Appendix B: Data Flow Diagram



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