National Diabetes Transition Audit, 2003-2014

England and Wales

23 June 2017

Prepared in collaboration with:

The Healthcare Quality Improvement Partnership (HQIP). The National Diabetes Audit is commissioned by the Healthcare Quality Improvement Partnership (HQIP) as part of the National Clinical Audit Programme (NCA). HQIP is led by a consortium of the Academy of Medical Royal Colleges, the Royal College of Nursing and National Voices. Its aim is to promote quality improvement, and in particular to increase the impact that clinical audit has on healthcare quality in England and Wales. HQIP holds the contract to manage and develop the NCA Programme, comprising more than 30 clinical audits that cover care provided to people with a wide range of medical, surgical and mental health conditions. The programme is funded by NHS England, the Welsh Government and, with some individual audits, also funded by the Health Department of the Scottish Government, DHSSPS Northern Ireland and the Channel Islands.

NHS Digital is the new name for the Health and Social Care Information Centre. NHS Digital managed the publication of the 2003 -2014 National Diabetes Transition Audit Report and also manage the adult National Diabetes Audit.

Diabetes UK is the largest organisation in the UK working for people with diabetes, funding research, campaigning and helping people live with the condition.

Royal College of Paediatrics and Child Health manage the National Paediatric Diabetes Audit and support the development and production of the National Diabetes Transition Audit (NDTA) report.

Why is Transition Important

- Type 1 Diabetes is a very difficult condition to manage. From the point of diagnosis onwards diabetes can have a significant impact on the life of a young person, placing an enormous 24/7 burden on them and also their family or carers. Promoting lifelong management of the condition is essential in achieving the most positive outcomes for the individual.
- The transition from childhood to adulthood is particularly sensitive to disruption with both short and long-term health effects. It is therefore especially important that the handover of care from paediatric to adult services defends against this and does not intensify the risk.
- Transition will need collaborative support through medical, educational and psychological services, with crucial engagement needed between paediatric and young adult services to provide continuity of care, and give young adults confidence to continue to manage their diabetes. Falling short of this can lead to serious and lasting consequences, resulting in increased morbidity and mortality.

Introduction

- The National Diabetes Transition Audit (NDTA) links datasets from the adult and paediatric national diabetes audits. The NDTA has been designed to audit care provision during the period when young people with Type 1 diabetes move from paediatric to adult based clinical care.
- A working group was formed consisting of the clinical leads and audit managers for both the National Diabetes Audit - Adults (NDA) and the National Paediatric Diabetes Audit (NPDA), and analysts from NHS Digital along with Diabetes UK. The working group has designed, developed and delivered the NDTA according to the requirements and methodology set out overleaf.
- The NDTA measures changes in glycaemic control and care provision so that priorities for improvement are identified, and a framework is established for monitoring the impact of improvement action plans.

Introduction

- This is the first published report for the NDTA. This report has linked data from the NPDA and NDA for the audit period 2003-04 to 2013-14. The NDTA focusses on young people with Type 1 diabetes, the report does not include those with Type 2 diabetes.

- The report aims to answer the following audit questions:-
  1. Is the transition from paediatric to adult care associated with changes in care process completion rates?
  2. Is the transition from paediatric to adult care associated with a change in treatment target achievements?
  3. Is the transition from paediatric to adult care associated with changes in episodes of diabetic ketoacidosis (DKA)?

Key Findings

Annual Care Processes

- KF1: Annual measurement of HbA1c decreases after transition.
- KF2: Annual measurements of blood pressure and cholesterol remain similar, whereas kidney, foot, retinopathy and smoking check completion rates increase after transition.
- KF3: The differences in care process completion pre and post transition do not appear to be influenced by gender, ethnicity, or living in a deprived area.
- KF4: Pre-transition annual care process completion rates fall as age at transition increases, while post-transition completion rates increase as age at transition increases. A similar pattern is seen for duration of diabetes.
- KF5: The least variation in care process completion rates was found where transition occurred between the age of 16 and 19 years. This may be because planned transition usually occurs during this time window. Planned movement from paediatric to adult care is less likely at younger and older ages.

Key Findings

Treatment Targets (HbA1c)

- KF6: The HbA1c target is more likely to be reached pre-transition compared to post-transition; the difference is greatest at younger ages.
- KF7: The decrease in meeting the HbA1c target is not influenced by gender, ethnicity, or living in a deprived area.

Risk Factors

- KF8: For both cholesterol and blood pressure, the percentage of children achieving the targets are higher pre-transition compared to post-transition.

Diabetic Ketoacidosis (DKA)

- KF9: There are a higher number of DKA admissions post-transition. However, this maybe due to the fact that DKA rates increase with increasing duration of diabetes.

Recommendations

Clinical Commissioning Groups and Local Health Boards:-

- Must understand that transition from paediatric to adult care is a vulnerable period
- Should specifically contract Paediatric and Adult Multi disciplinary teams services to deliver appropriate, joined-up services during this period, so essential key healthcare checks are not missed, and DKA admissions do not increase.

Specialist Services:-

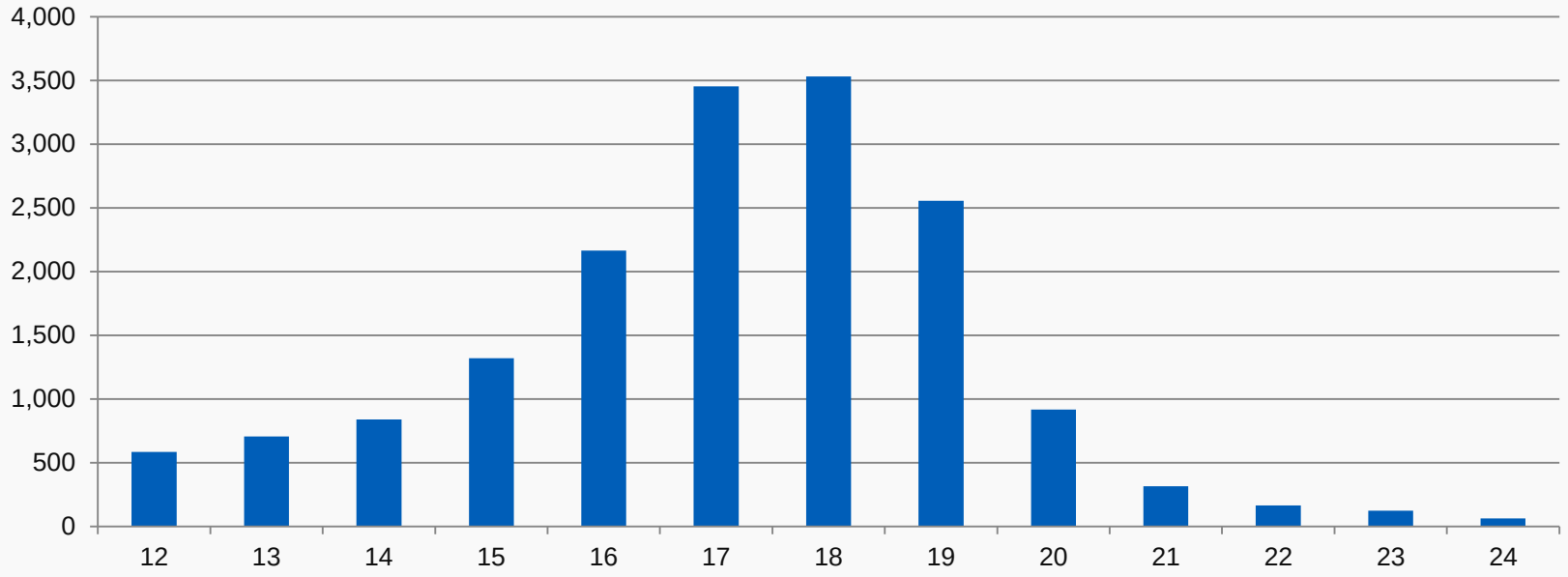
- **Adult and Paediatric Services** should have clear transition pathways designed to make the process user-friendly but focussed on sustaining stable HbA1c and minimising DKA.
- **Paediatric Services** should ensure that children and young people with Type 1 diabetes remain in their care until at least 16 years of age before transition.
- **Adult Services** should ensure that young people with diabetes have transitioned into their service by 19 years at the latest.

Identifying Young People with continuous records through Transition

Definition of “Transition”

- The NDTA has linked data for the NPDA from 2003-04 to 2013-14 with NDA data from 2004-05 to 2014-15.
- Children have been followed from the NPDA dataset into the NDA dataset.
- For the purpose of this report transition[1] has been defined as the last audit year a young person appears in the NPDA and the following year they have a record in the NDA.
- Applying the above rule we were able to establish a cohort of 16,370 individuals.

Figure 1: Number of people at age of transition[1], 2003-2014, England and Wales



1. Please see methodology and data quality section

National Diabetes Transition Audit 2003-2014

What percentage of young people registered with Type 1 diabetes received the NICE key processes of diabetes care?

Care Processes

All people with diabetes aged 12 years and over should receive all of the nine, NICE recommended care processes[2,3,4] and attend a structured education program when diagnosed.

Nine Annual Care Processes for all people with diabetes aged 12 and over	
Responsibility of Diabetes Care providers (included in the NDA 8 Care Processes, for NPDA 7 care processes are used as smoking and creatinine are not included)	
1 - HbA1c (blood test for glucose control)	**5 - Urine Albumin/Creatinine Ratio** (urine test for kidney function)
2 - Blood Pressure (measurement for cardiovascular risk)	**6 - Foot Risk Surveillance** (foot examination for foot ulcer risk)
3 - Serum Cholesterol (blood test for cardiovascular risk)	**7 - Body Mass Index** (measurement for cardiovascular risk) *Not included in this report due to differences in measurement over time. For future inclusion.*
4 - Serum Creatinine (blood test for kidney function) *Not recorded in NPDA from 2011, so not included in this report.*	**8 - Smoking History** (measurement for cardiovascular risk) *Only recorded in NPDA from 2011, so not included in this report.*
Responsibility of NHS Diabetes Eye Screening (reliant on the data being passed back to the specialist service)	
9 - Digital Retinal Screening Photographic eye test for eye risk	

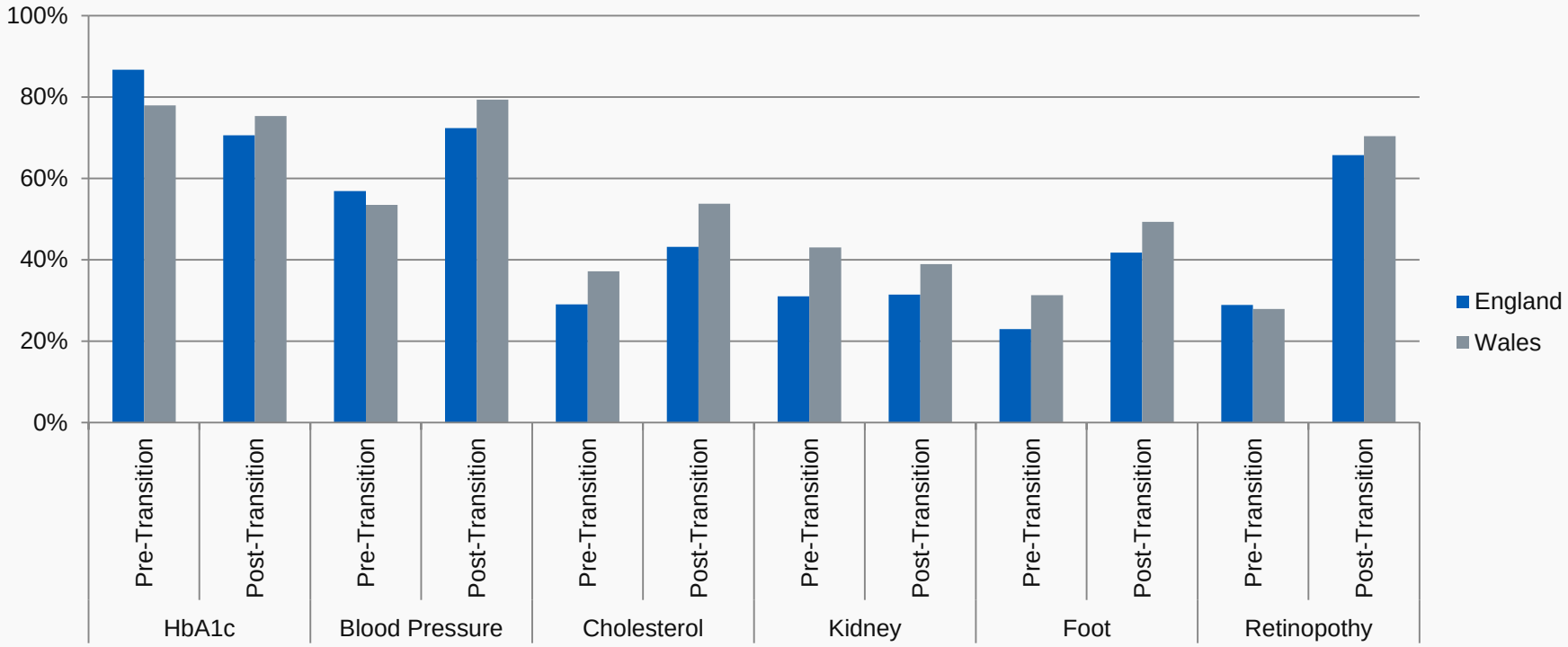
2,3, 4. Please see full list of footnotes in the definitions and footnote section

Care Processes – by country

Key Findings

Wales completion rates are generally higher than for England, although patterns are similar.

Figure 2: Ratios of care process completion pre- and post-transition[1], by country, 2003-2014



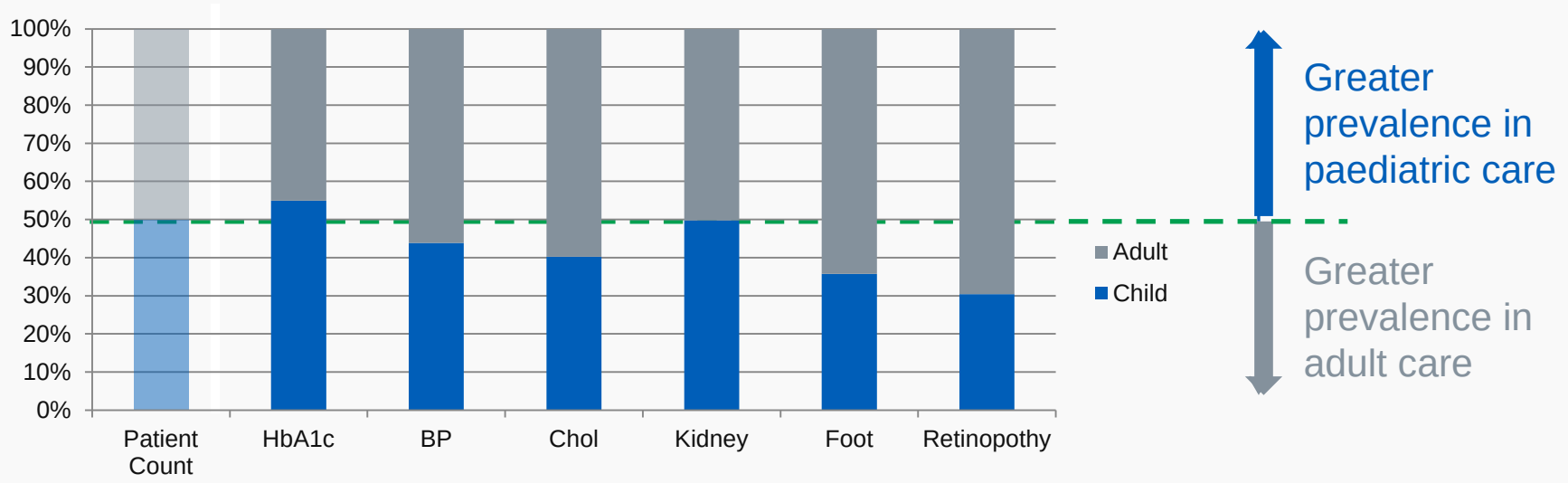
1. Please see methodology and data quality section of this report

Care Processes – England & Wales

Key Findings

- Annual care check completion rate for HbA1c decreases after transition.
- Kidney remains similar.
- Blood Pressure, cholesterol, foot checks and retinopathy completion rates increase after transition.

Figure 3: Ratios of care process completion pre- & post-transition[1], 2003-2014, England and Wales



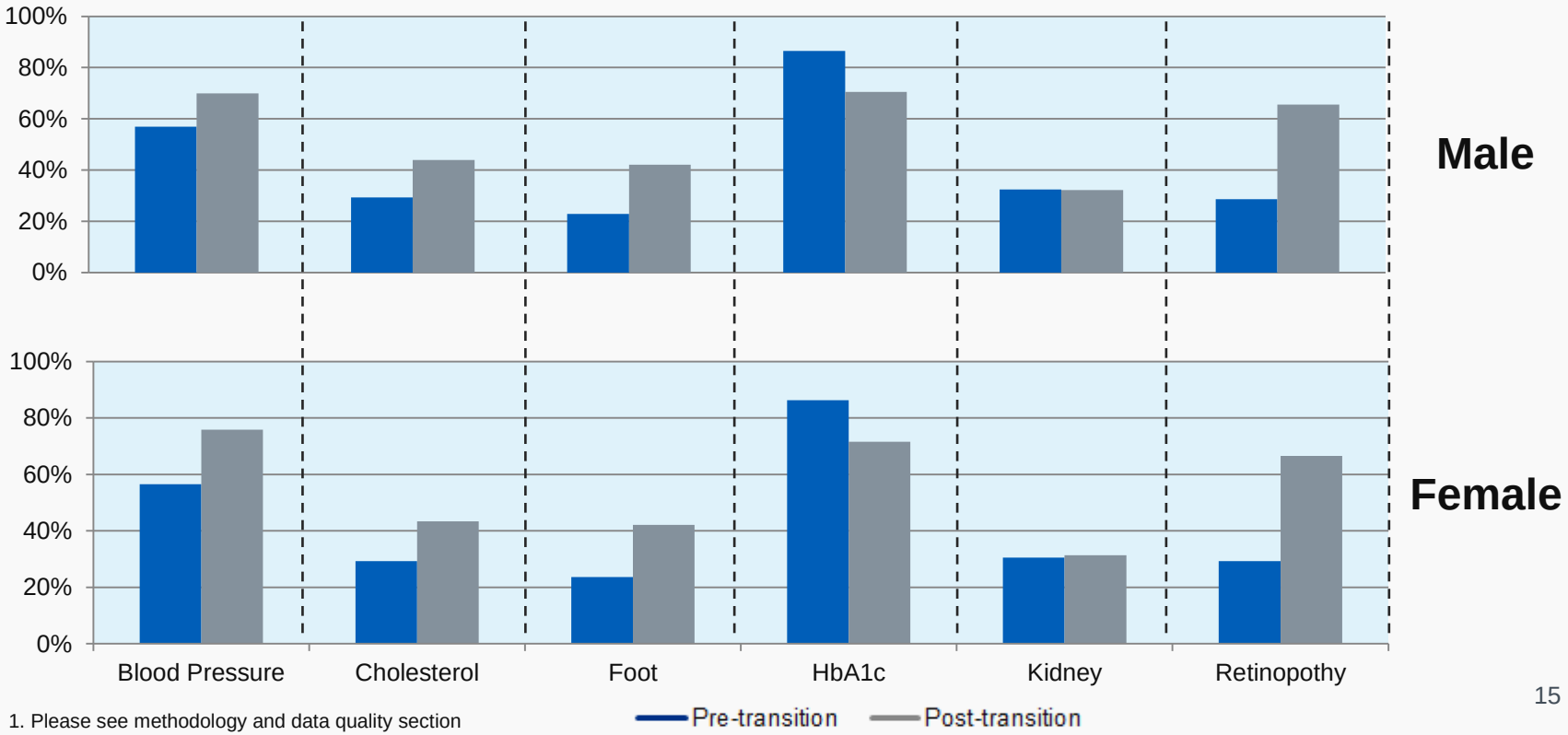
1. Please see methodology and data quality section of this report

Care Processes – by gender

Key Finding

Care process completion rates pre and post-transition are similar for both males and females.

Figure 4: Ratios of care process completion pre- and post-transition[1], by gender, 2003-2014, England and Wales



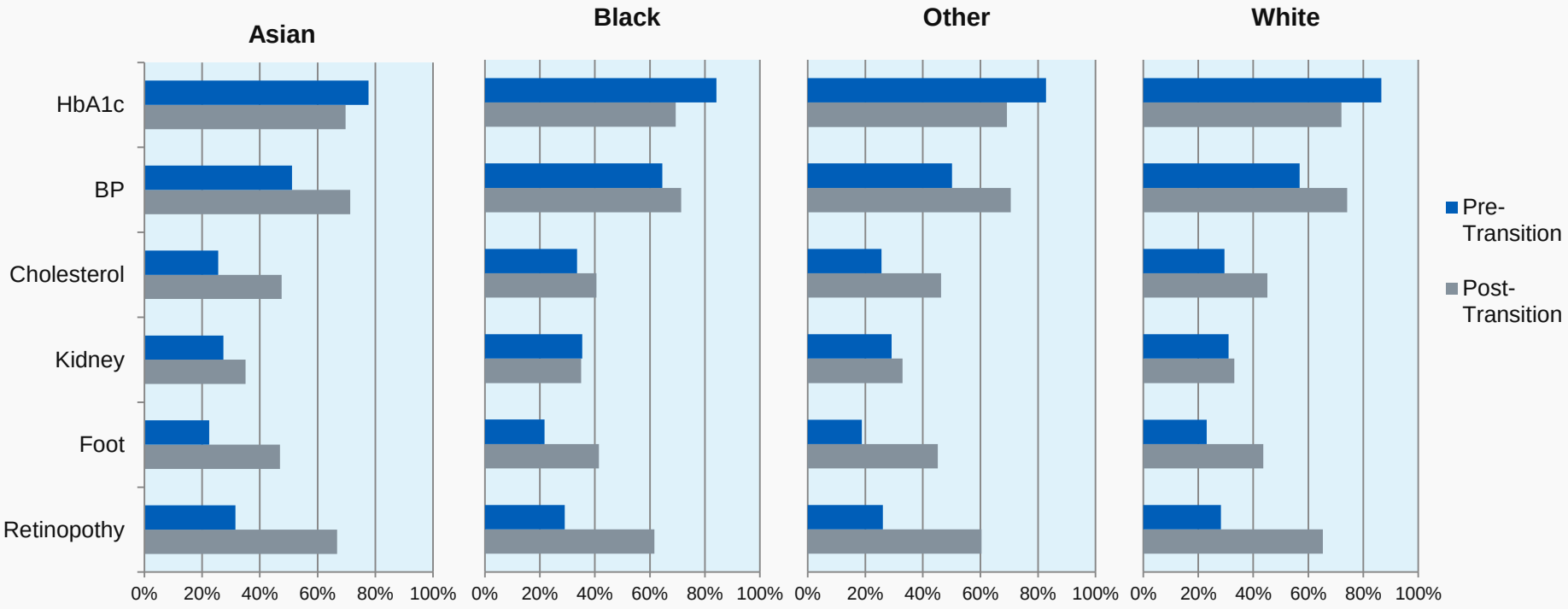
1. Please see methodology and data quality section

Care Processes – by ethnicity

Key Findings

There is a lack of distinguishing patterns between the different ethnicities and care processes. The different ethnic groups have near identical distributions. For reasons of statistical integrity users should be wary of making comparisons between the groups due to the differences in their sizes; the White group being in the thousands whilst the Asian, Black and Other groups are in the hundreds.

Figure 5: Ratios of care process completion pre- & post-transition[1], by ethnicity[5], 2003-2014, England & Wales



1. Please see methodology and data quality section

5. Please see footnotes and definitions section. 22% of records have ethnicity of 'not stated'.

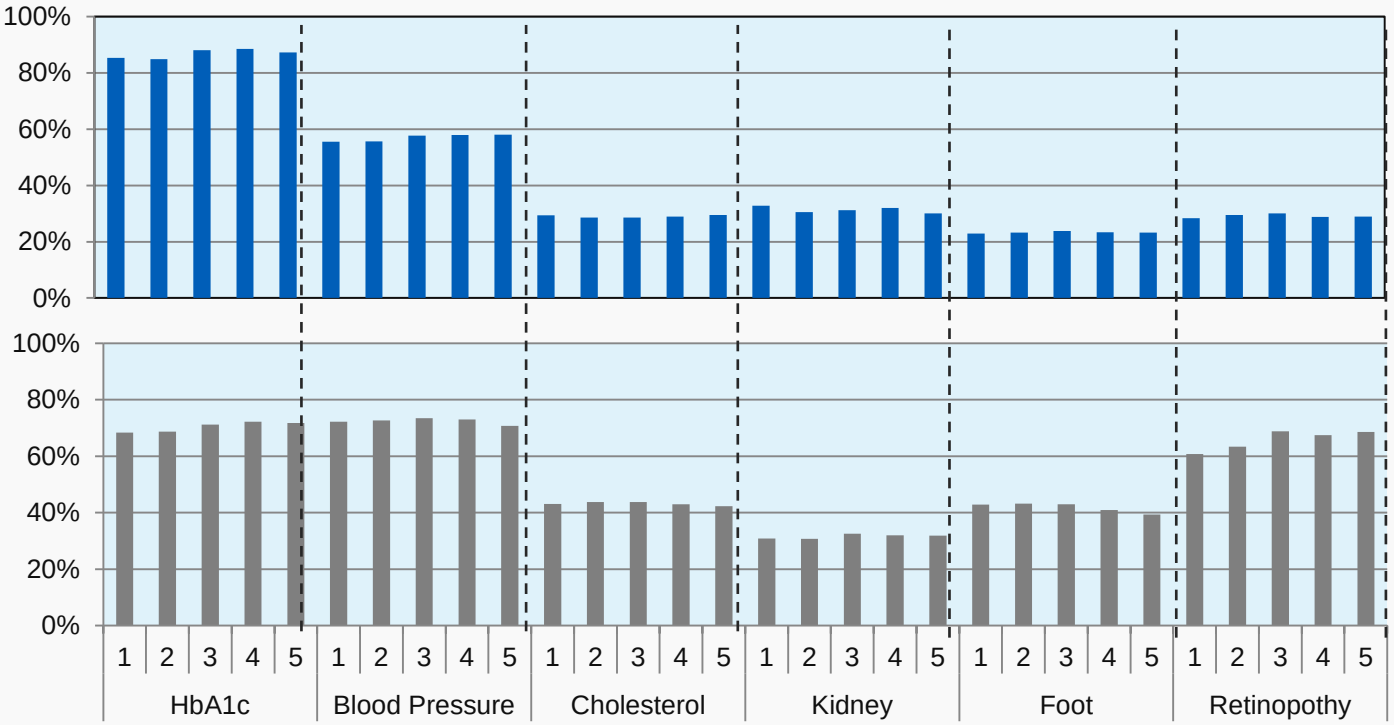
Care Processes – by social deprivation

Key Finding

Pre-transition there is no general trend for care process completion rates to vary with IMD quintile.

Post-transition there is also no general trend for care process completion rates to vary with IMD quintile.

Figure 6: Ratios of care process completion pre- and post-transition[1], by IMD quintile, 2003-2014, England and Wales



1. Please see methodology and data quality section

*IMD Quintile: 1 = most deprived, 5 = least deprived

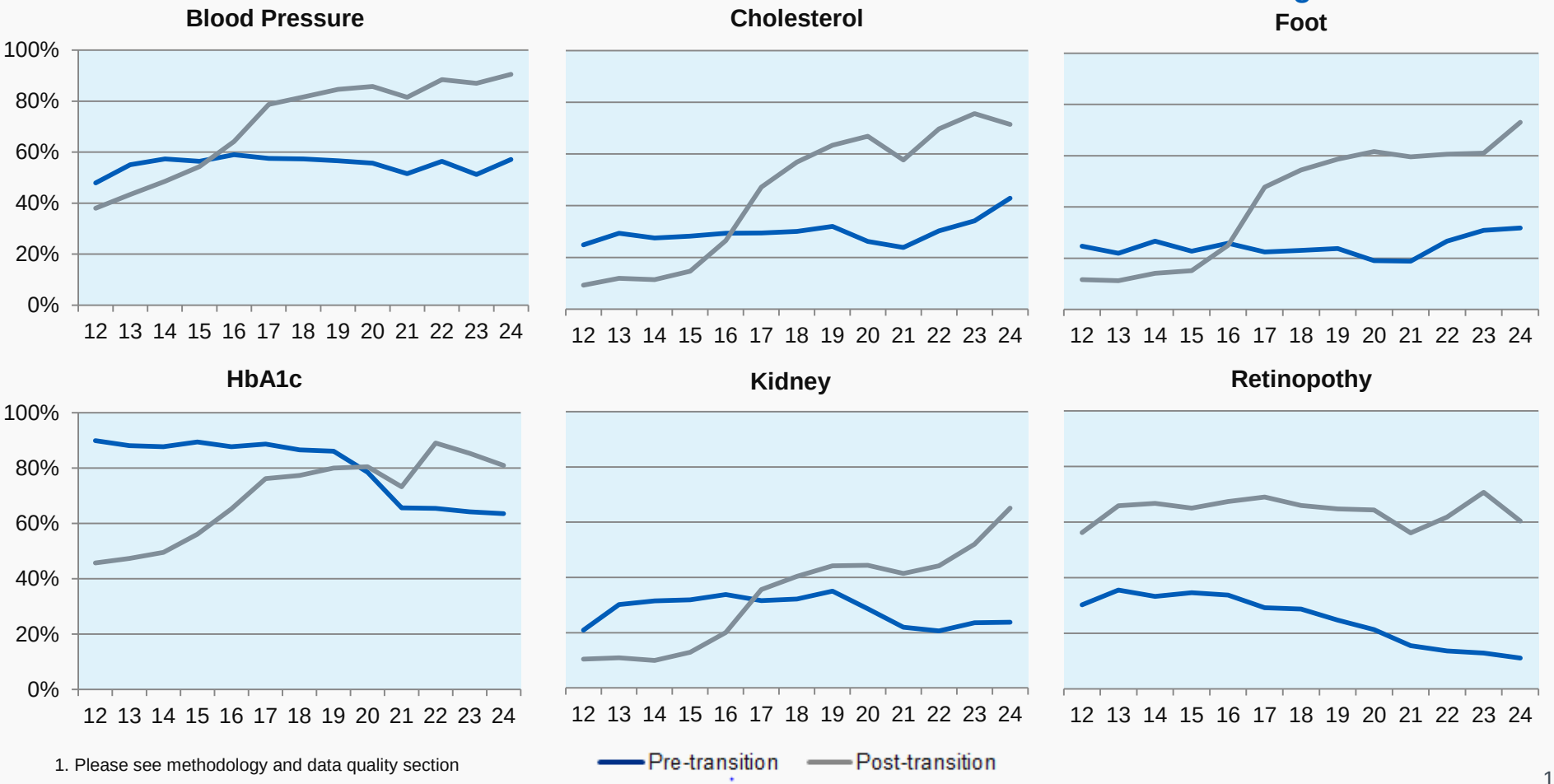
Care Processes – by age at transition

Key Finding

Pre-transition care process completion rates often fall as age at transition increases, whereas post-transition care process completion rates rise as age at transition increases.

The least variation in care process completion rates are where transition occurs between the age of 16 and 19 years.

Figure 7: Ratios of care process completion pre- & post-transition[1], by age at transition, 2003-2014, England and Wales



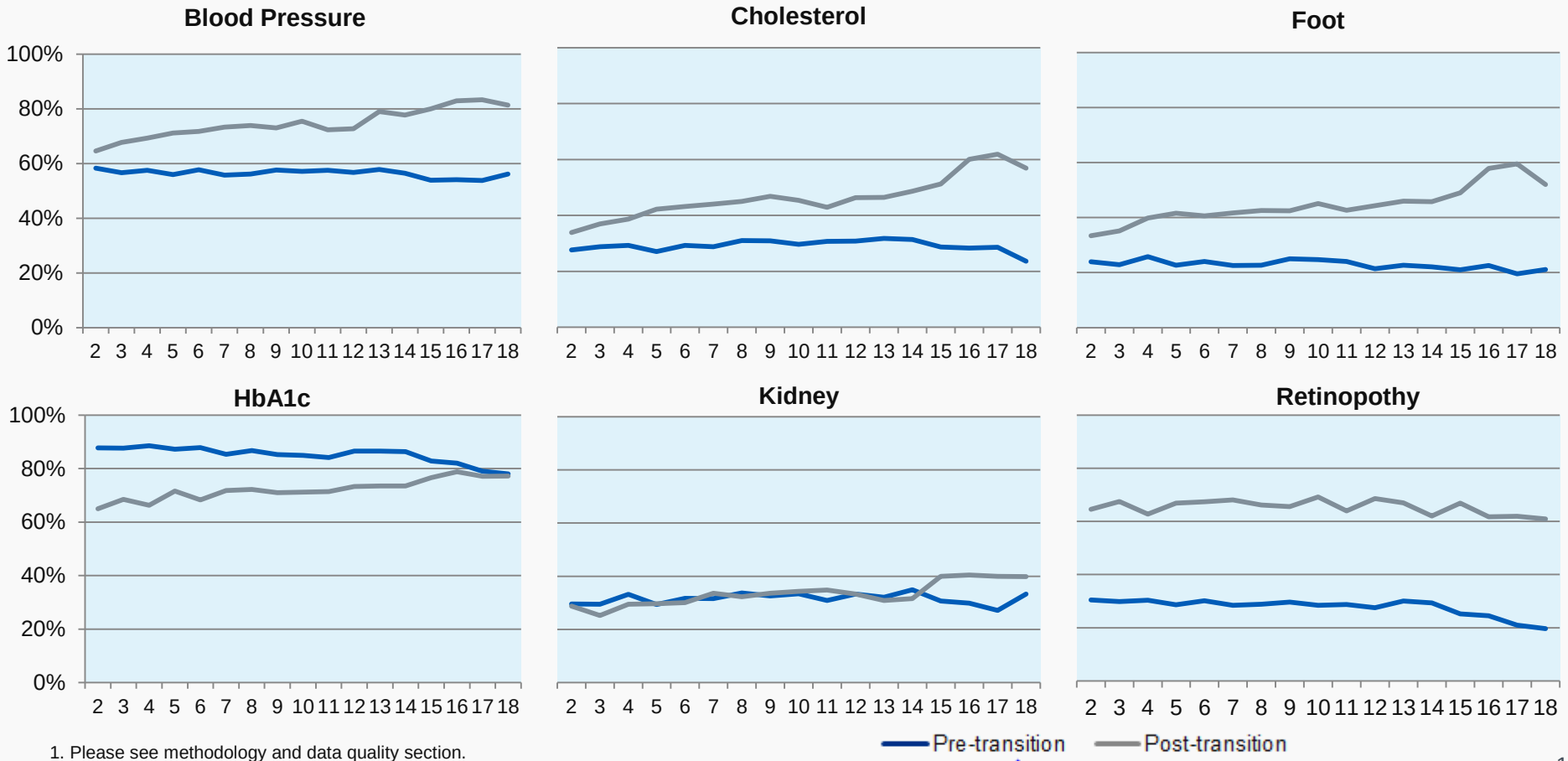
1. Please see methodology and data quality section

Care Processes – by duration of diabetes

Key Finding

Pre-transition care process completion rates generally fall as duration increases.
Post-transition care process completion rates generally rise as duration increases.

Figure 8: Ratios of care process completion pre & post-transition[1], by duration[2] of diabetes, 2003-2014, England and Wales



1. Please see methodology and data quality section.
2. due to small numbers durations of > 18 years have been excluded.

Care Processes – Comment

- This audit does not have data about planned transition because it is not routinely recorded. Therefore it deduces the year of transition from the proxy measure of the last year that a patient appeared in the NPDA. This does not allow distinction between planned and unplanned transition but it does identify the point of moving from paediatric to adult based diabetes services.
- The least variation in care process completion was seen when transition occurred between the ages of 16 and 19 years. This may reflect the probability that planned transition is most likely in this age group and therefore the impact on care process completion is more successfully managed.
- For young people moving to adult services before 16 years of age there is a decrease in care process completion post-transition. This may reflect the fact that it is unlikely to have been a planned transition. A similar deduction might apply to those moving after the age of 19 years.
- This audit does not report on children with Type 1 diabetes who have never attended specialist care though these are thought to be small in number.

National Diabetes Transition Audit 2003-2014

What percentage of young people registered with Type 1 diabetes met the NICE treatment targets for diabetes care?

Treatment Target

NICE recommends a treatment target for HbA1c (glucose control):

Having a target HbA1c reduces the risk of all diabetic complications

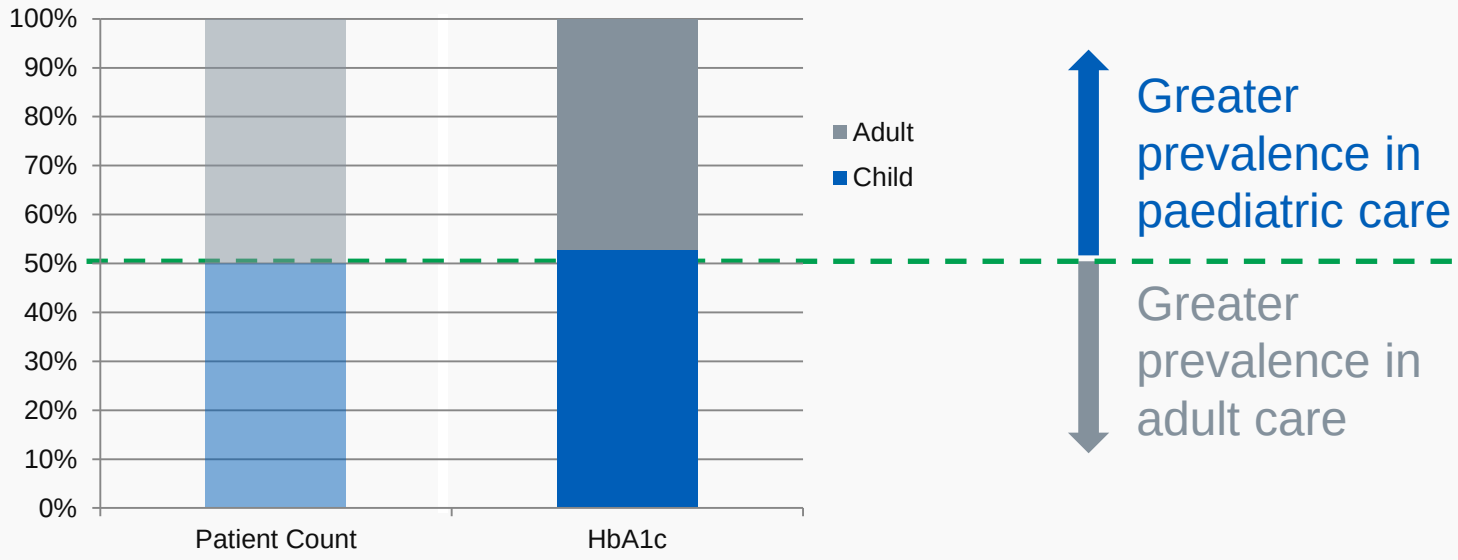
The target for HbA1c for adults and paediatrics is set as <=58 mmol/mol

Treatment Target – England & Wales

Key Finding

Children are more likely to reach the treatment target for HbA1c before transition compared to after transition.

Figure 9: Ratios of HbA1c target met pre- and post-transition[1], England and Wales



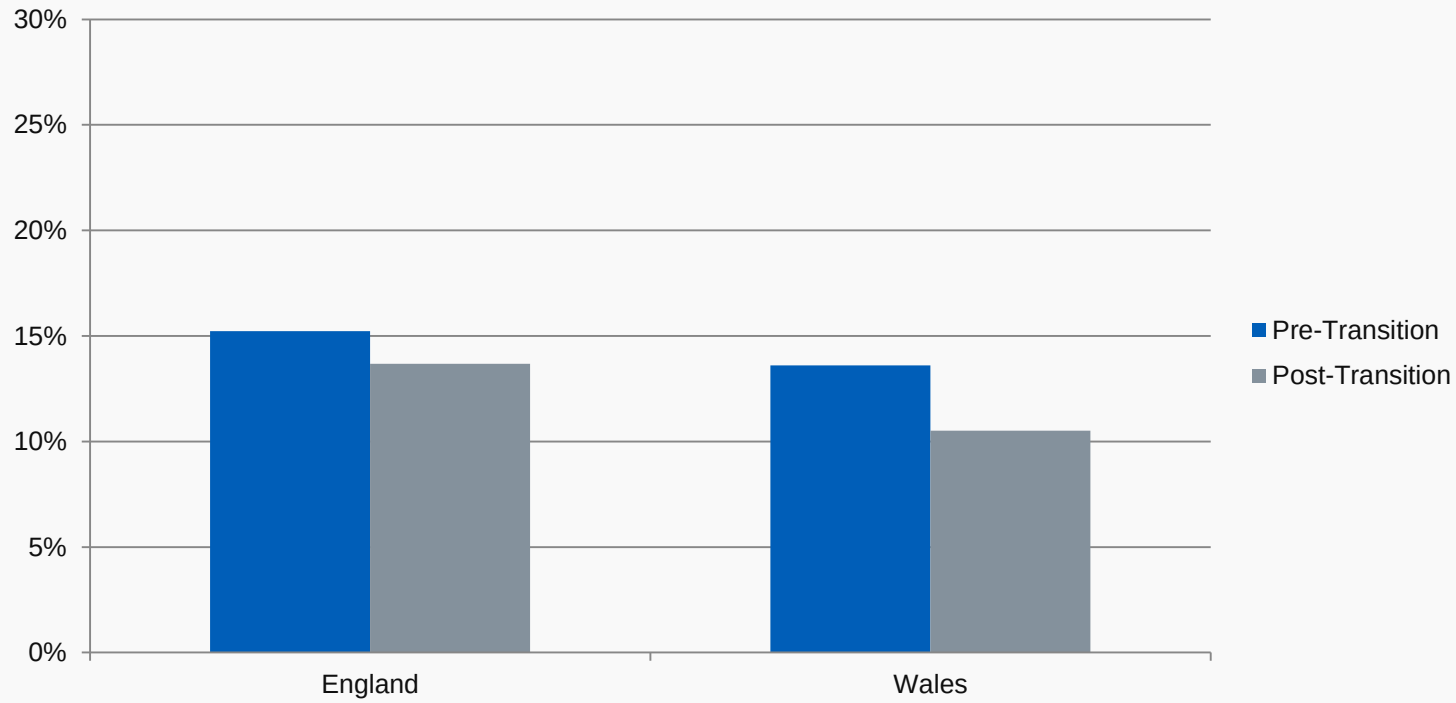
1. Please see methodology and data quality section

Treatment Target – by country

Key Findings

The proportion of children who meet the HbA1c target decreases after transition for both England and Wales.

Figure 10: Ratios of HbA1c target met pre- and post-transition[1], by country, 2003-2014



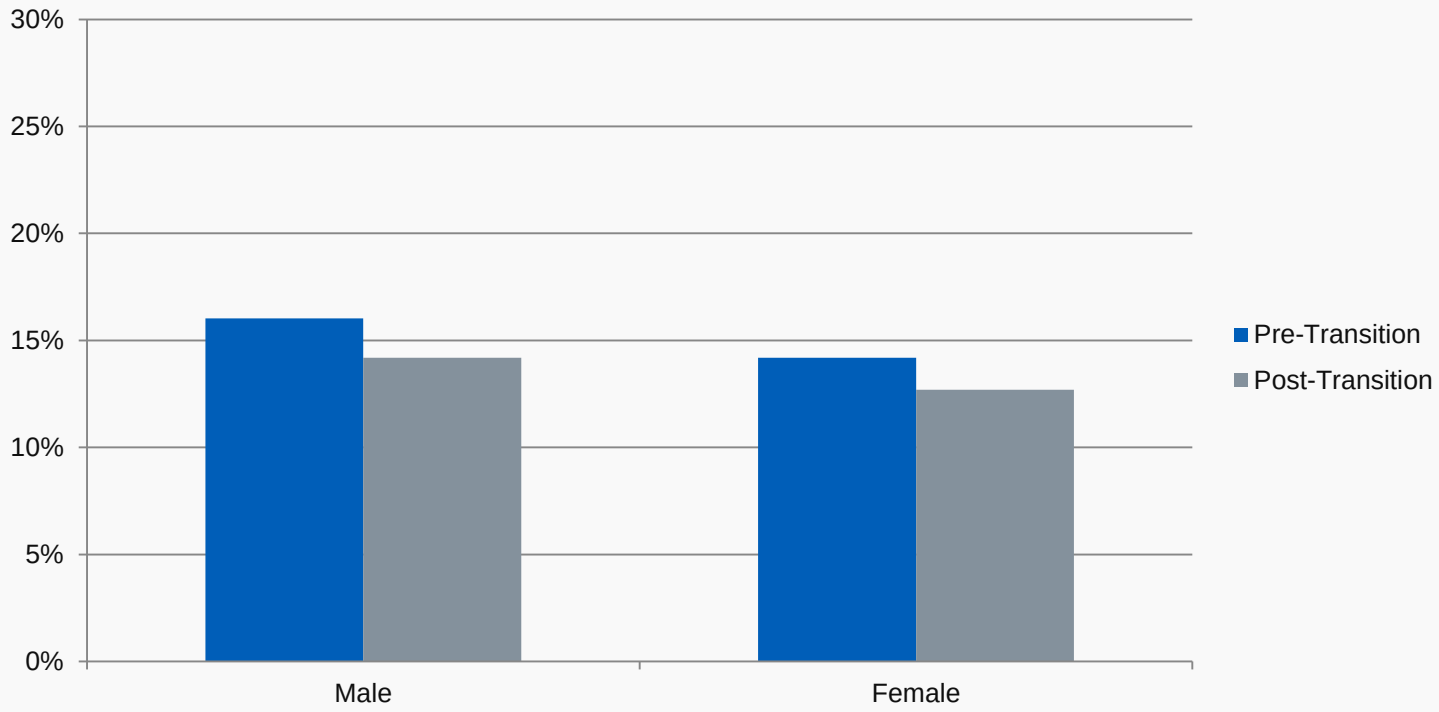
1. Please see methodology and data quality section

Treatment Target – by gender

Key Findings

There is no evidence of a gender split in the meeting of the HbA1c treatment target over the period of transition.

Figure 11: Ratios of HbA1c target met pre- and post-transition[1], by gender, 2003-2014, England and Wales



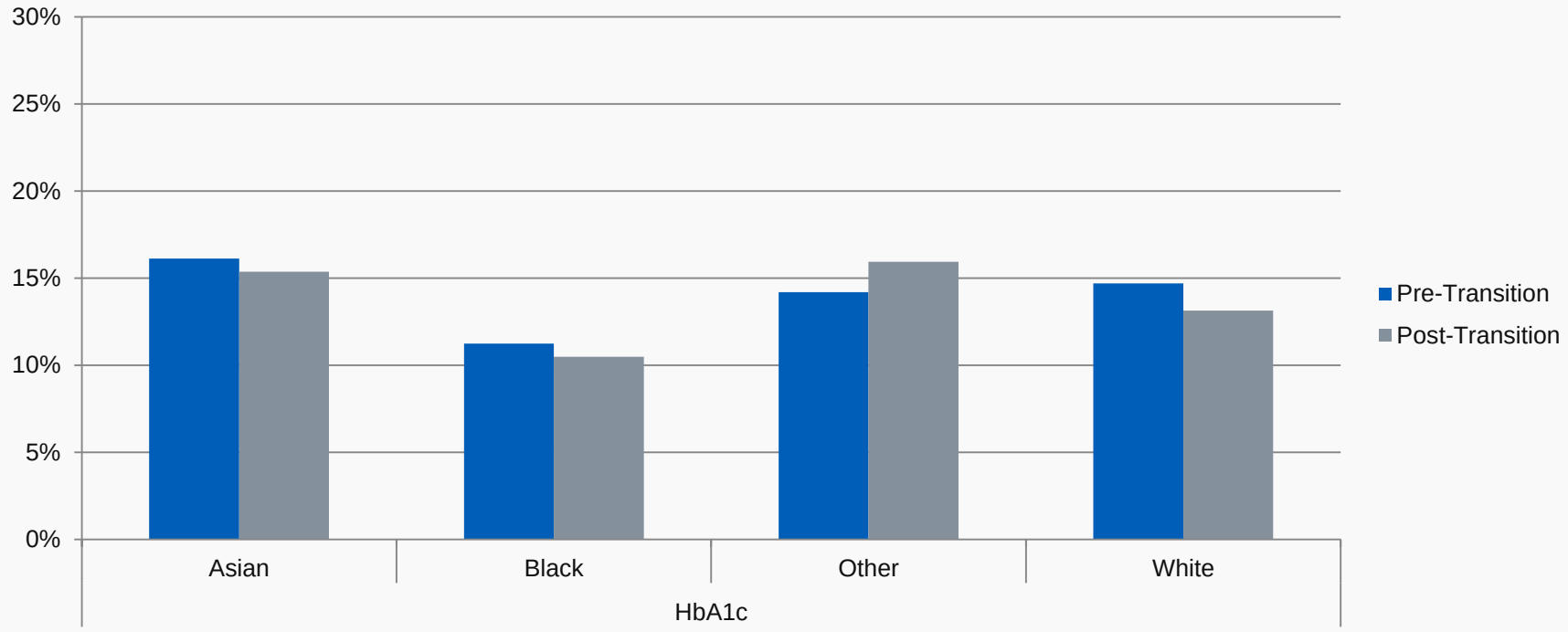
1. Please see methodology and data quality section

Treatment Target – by ethnicity

Key Findings

For most ethnic groups the meeting of the HbA1c treatment target falls post-transition.

Figure 12: Ratios of HbA1c target pre- and post-transition[1], by ethnic group[5], 2003-2014, England and Wales



1. Please see methodology and data quality section

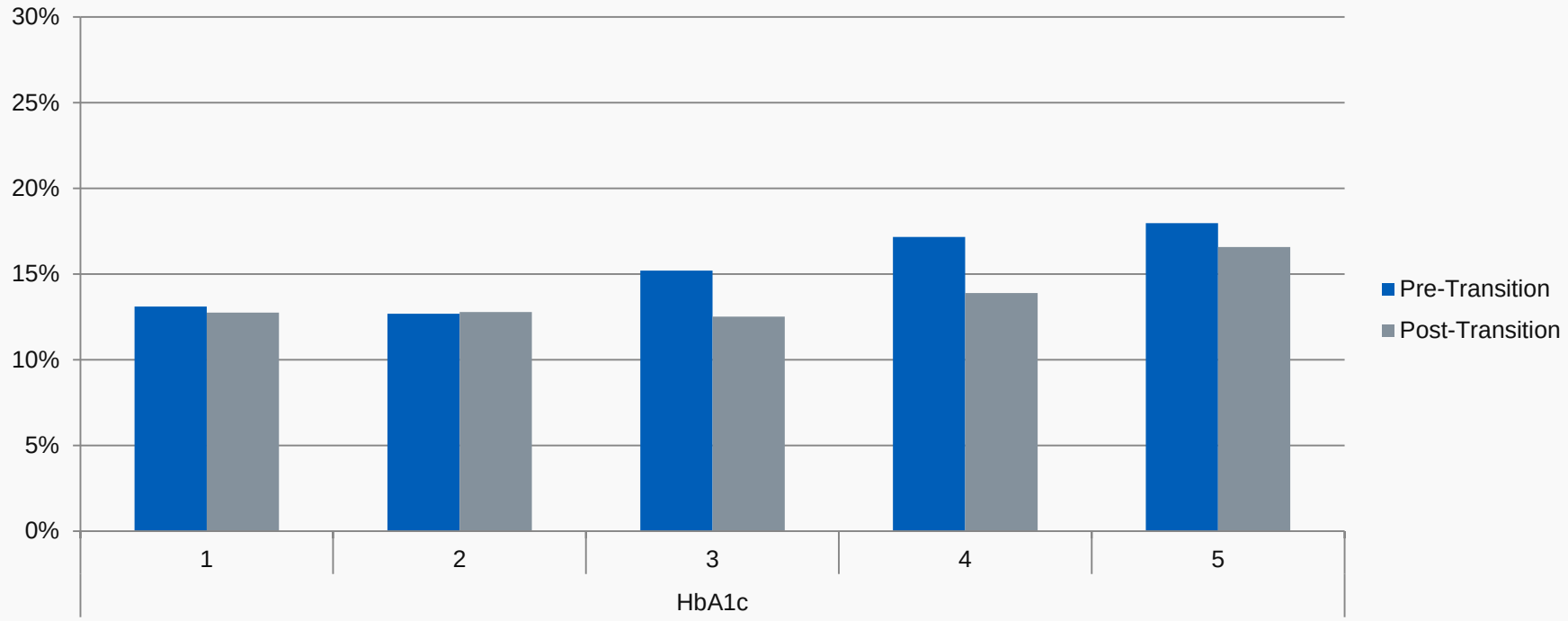
5. Please see footnotes and definitions section

Treatment Target – by social deprivation

Key Finding

There is a trend that children living in a less deprived area will have a higher rate for achieving HbA1c treatment. This is more marked pre-transition.

Figure 13: Ratios of HbA1c target pre- and post-transition[1], by IMD quintile and process, 2003-2014, England and Wales



1. Please see methodology and data quality section

*IMD Quintile: 1 = most deprived, 5 = least deprived

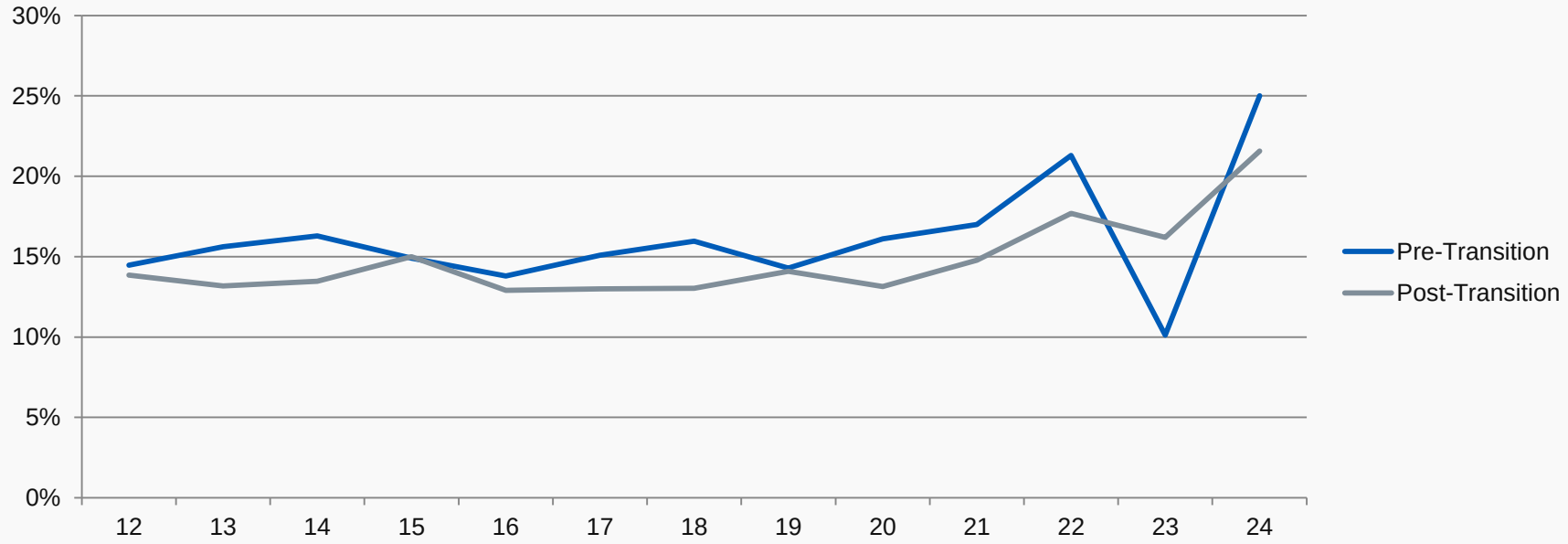
Treatment Target – by age at transition

Key Finding

Children are more likely to reach the HbA1c target pre-transition compared to post-transition across most ages.

Care should be taken when interpreting the figures for people over the age of 22 due to small numbers.

Figure 14: Ratios of HbA1c treatment target pre- and post-transition[1], by age at transition, 2003-2014, England and Wales



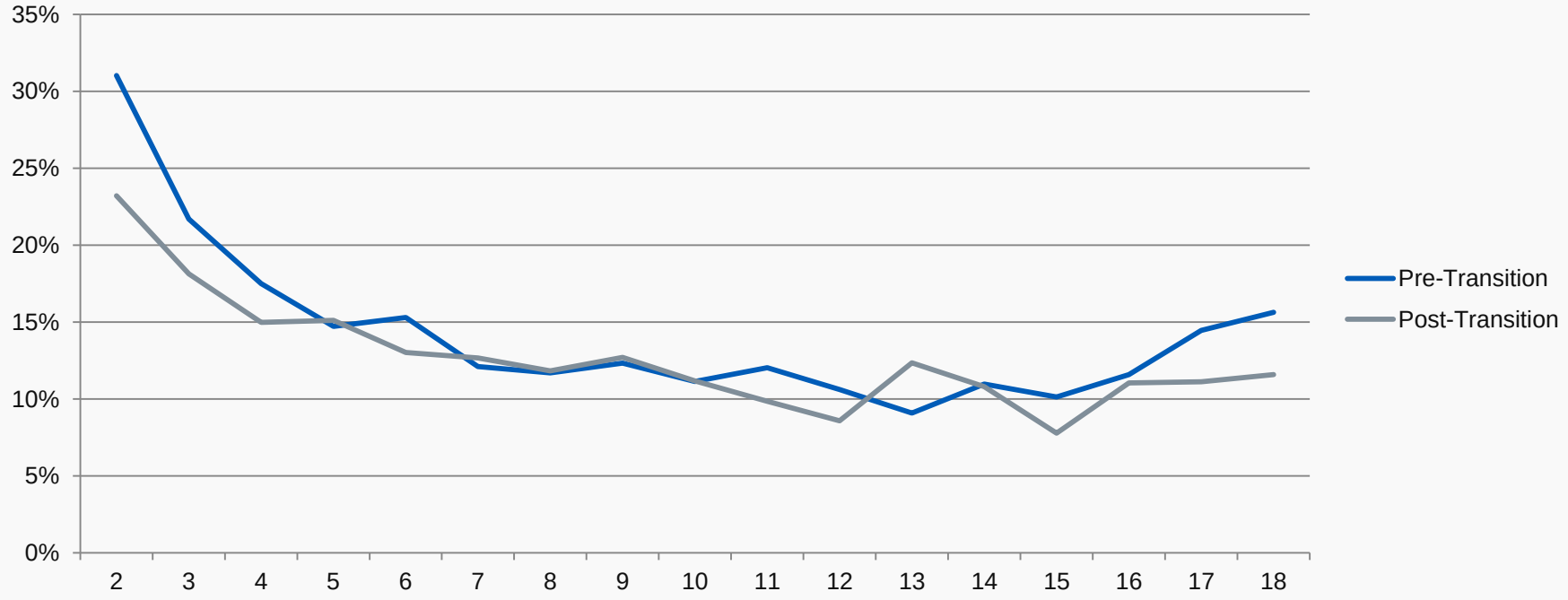
1. Please see methodology and data quality section

Treatment Target – by duration of diabetes

Key Finding

Both pre- and post-transition the overall trend is for a decrease in the proportion of children reaching the treatment target for HbA1c where children have been diagnosed with diabetes for between 2 to 6 years, after this point the rates for achieving the target remains broadly constant.

Figure 15: Ratios of HbA1c treatment target pre- and post-transition[1], by duration of diabetes, 2003-2014, England and Wales



1. Please see methodology and data quality section
due to small numbers durations of > 18 years have been excluded

Treatment Target – Comment

- What is apparent from these findings is that the proportion of young people meeting the treatment target for HbA1c pre-transition is higher than post-transition.
- This finding can be seen across age at transition, gender, whether they live in a deprived area and across most ethnic groups and for children diagnosed in the few years prior to transition.
- It is notable that for children living in the least deprived areas, there is still a difference in the achievement of the HbA1c target pre and post-transition, emphasising the fact that transition is a very vulnerable time for everyone.

National Diabetes Transition Audit 2003-2014

How did young people registered with type 1 diabetes measure against the risk factors for diabetes care?

Risk Factors

Blood pressure and serum cholesterol, along with checking for early evidence of kidney damage, should all be monitored as they identify people at increased risk of complications:-

- Monitoring of blood pressure allows early detection of hypertension amenable to treatment that can reduce the risk of vascular complications and reduce the progression of eye disease and kidney failure.
  - Blood pressure threshold for adult and paediatrics is <140/80 mmHg

- Monitoring of cholesterol allows early detection of those at greater risk of vascular complications.
  - Applied to both paediatric and adults: total cholesterol: <4.0 mmol/l

Risk Factors

- Monitoring for early evidence of kidney damage with the aim of maintaining healthy renal function:
  - Kidney threshold for paediatric:
    - *Albumin/creatinine ratio:*
      - Less than or equal to 2.5 mg/mmol (male)
      - Less than or equal to 3.5 mg/mmol (female)
  - Kidney thresholds for adult:
    - *Albumin/creatinine ratio:*
      - Less than or equal to 2.5 mg/mmol (male) or 3.5 mg/mmol (female)
    - *Albumin concentration:*
      - Less than or equal to 20mg/L
    - *Albumin excretion (overnight):*
      - Less than or equal to 20µg/min
    - *Albumin excretion (24 hours):*
      - Less than or equal to 30mg/24hr

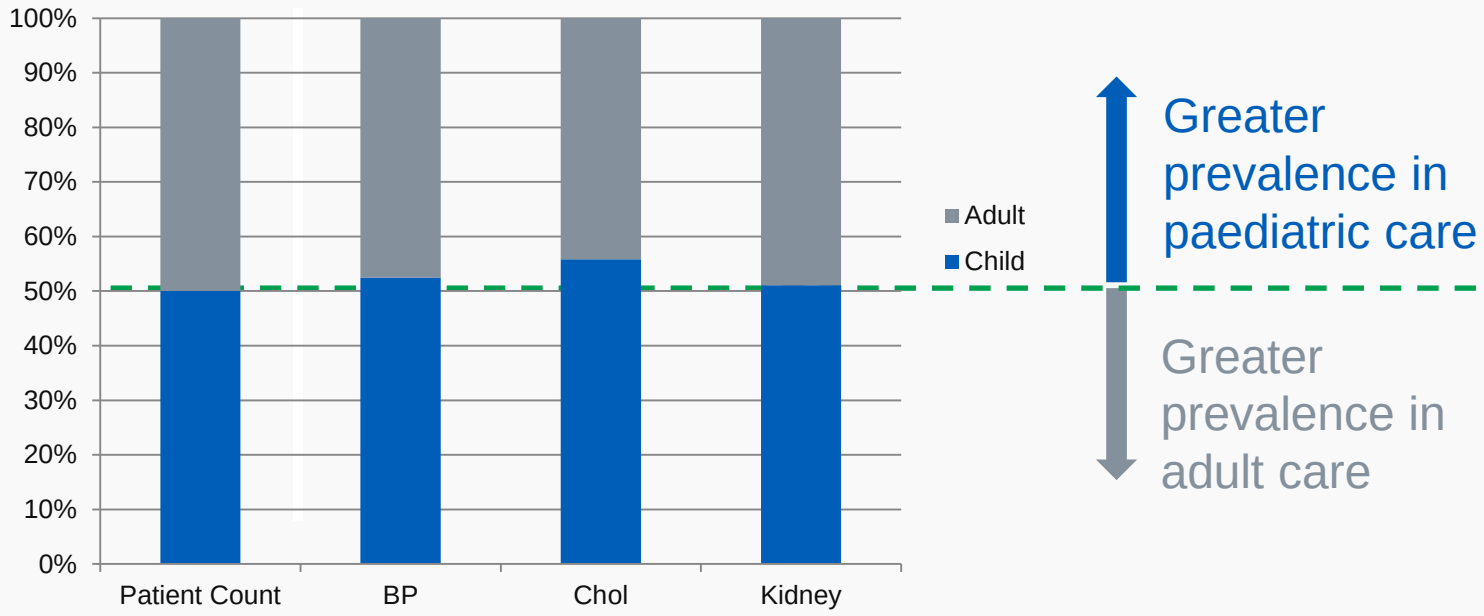
Risk Factors – England & Wales

Key Finding

Threshold ratios for E&W:

- Thresholds more often met pre-transition, particularly for Cholesterol and Blood Pressure.

Figure 16: Ratios of thresholds met, pre- and post-transition[1], England and Wales



* There is a 'health warning' regarding the screening test for early kidney disease (Urine Albumin Creatinine Ratio, UACR) prior to 2013-14; please see the NDA Data Quality statement

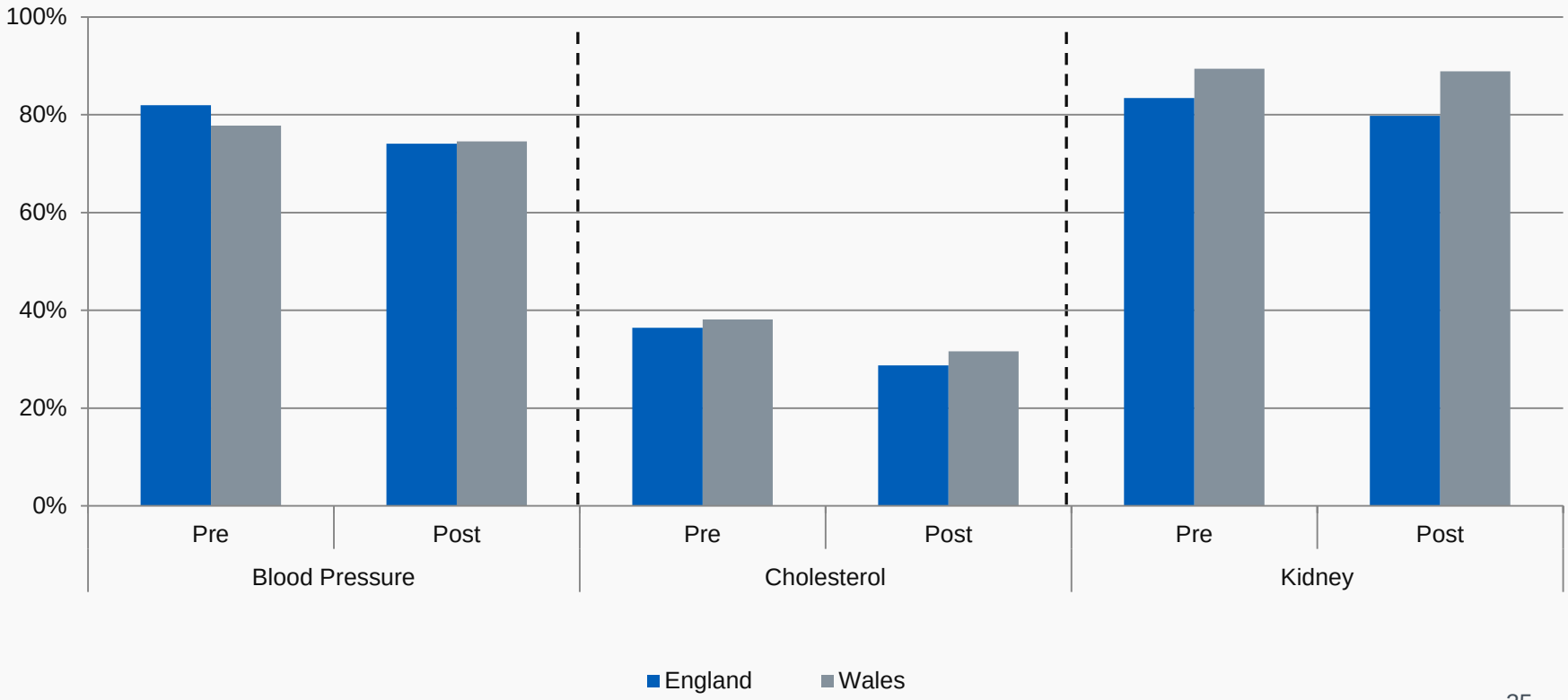
1. Please see methodology and data quality section

Risk Factors – by country

Key Findings

Rates fall post-transition, with Wales generally achieving slightly better results post-transition than England.

Figure 17: Ratios of thresholds met pre- & post-transition[1], by country, 2003-2014



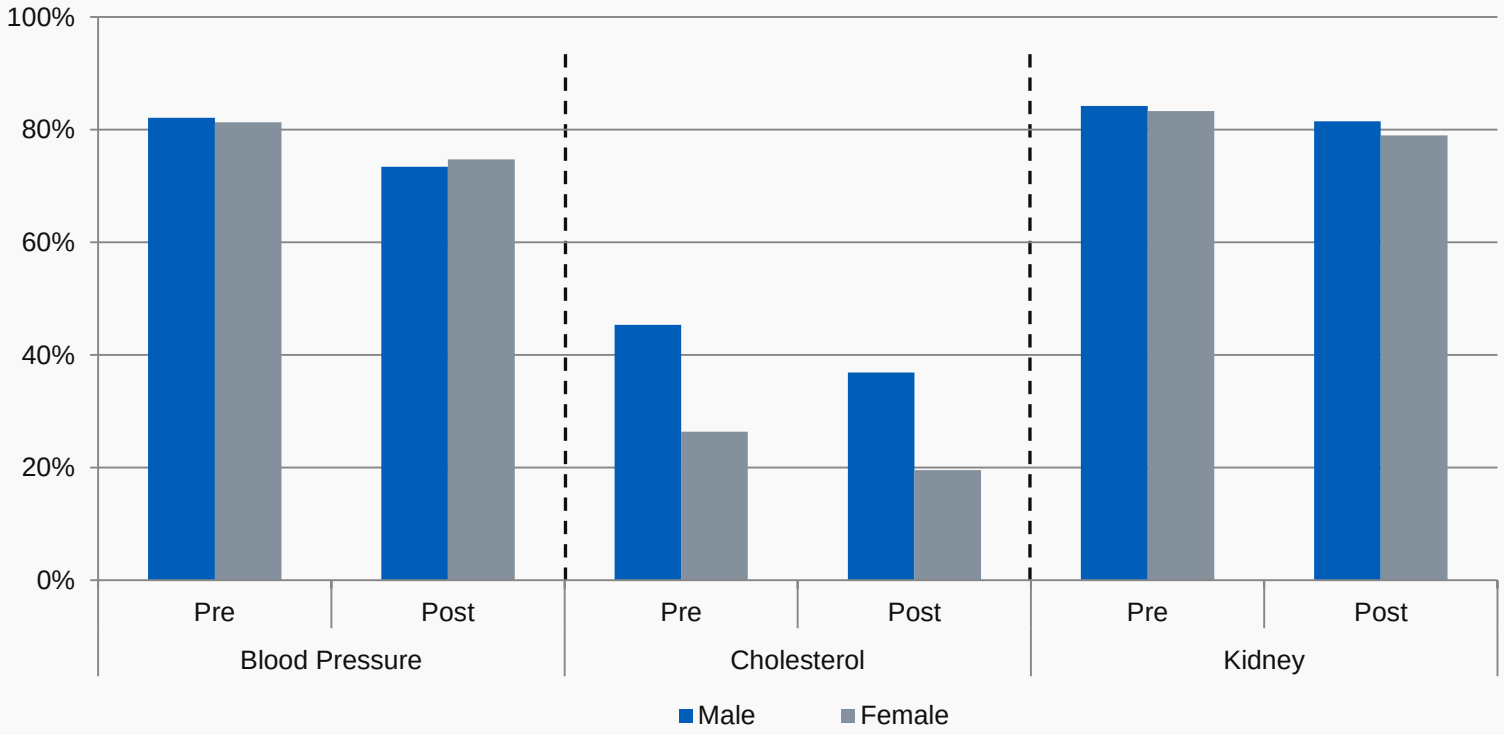
1. Please see methodology and data quality section

Risk Factors – by gender

Key Findings

For both males and females there is a decrease in the achievement of targets post-transition compared to pre-transition. For cholesterol a higher proportion of males achieve the target both pre and post-transition.

Figure 18: Ratios of thresholds met pre- & post-transition[1], by gender, 2003-2014, England and Wales



1. Please see methodology and data quality section

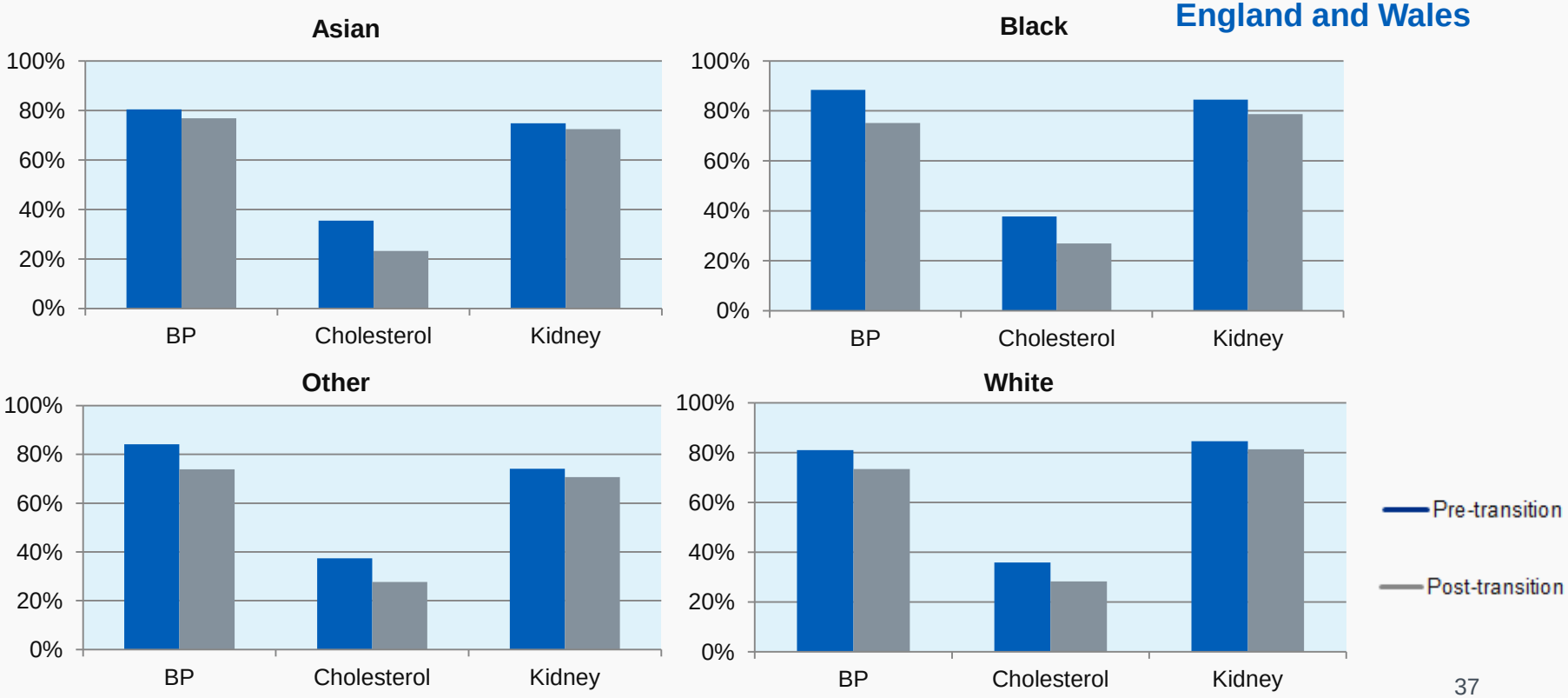
Risk Factors – by ethnicity

Key Findings

For the three risk factors with defined thresholds there is a lack of a clear pattern across the different ethnicities in terms of their relative positions.

Pre-transition threshold met ratios are higher than post-transition for all risk factors and ethnicities.

Figure 19: Ratios of treatment targets pre- and post-transition[1], by ethnicity[5] and process, 2003-2014, England and Wales



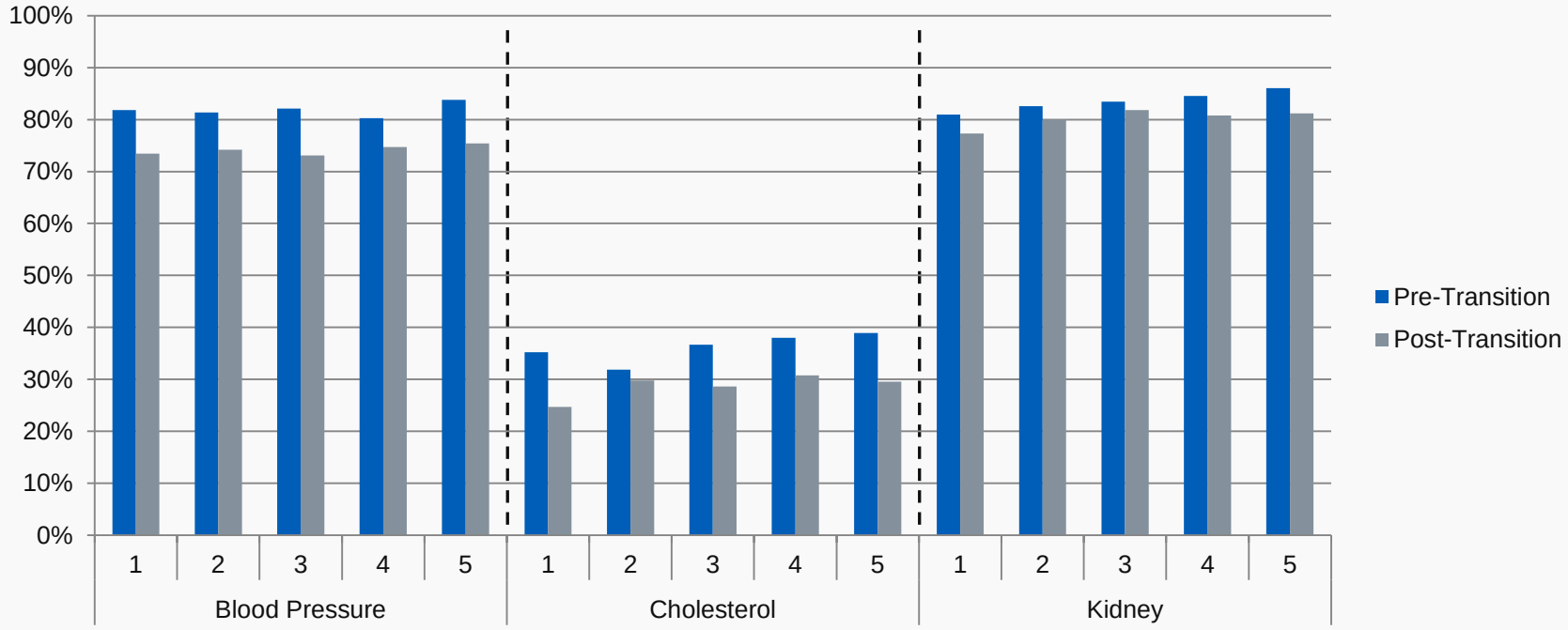
1. Please see methodology and data quality section 5. Please see footnotes and definitions section.

Risk Factors – by social deprivation

Key Finding

Trends are seen for Cholesterol and Kidney threshold achievement, with higher achievement observed pre and post-transition for less deprived areas. A similar pattern is not observed for Blood Pressure.

Figure 20: Ratios of thresholds met pre- & post-transition[1], by IMD quintile, 2003-2014, England and Wales



*IMD Quintile: 1 = most deprived, 5 = least deprived

1. Please see methodology and data quality section

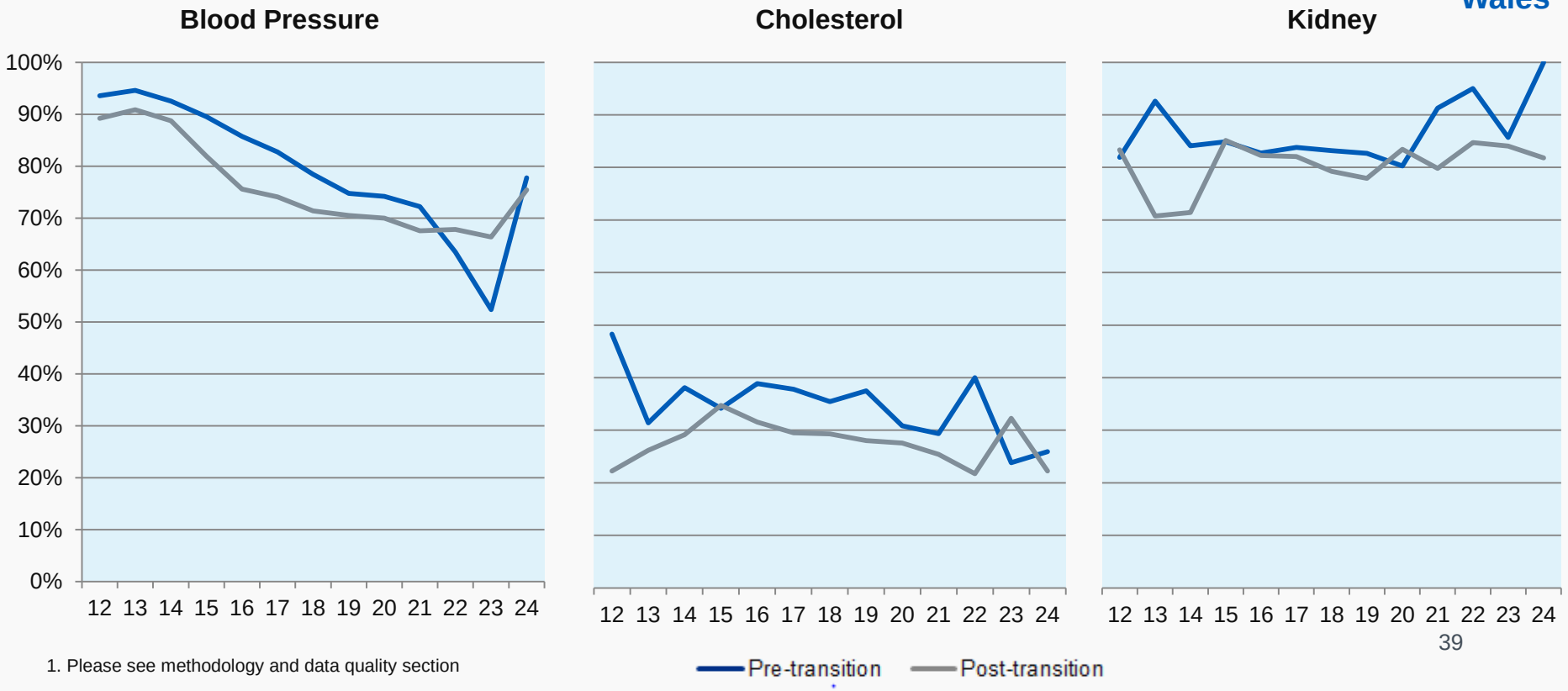
Risk Factors – by age at transition

Key Finding

Pre-transition for the Blood Pressure and Cholesterol risk factors the general trend is for ratios to fall as age at transition increases.

Post-transition the general trend is for ratios to fall for Blood Pressure, but to exhibit a less obvious pattern for Cholesterol.

Figure 21: Ratios of thresholds met pre- & post-transition[1], by age & process, 2003-2014, England and Wales



1. Please see methodology and data quality section

Risk Factors – Comment

- Achievement of the pre-defined targets for blood pressure, cholesterol and kidney function are important for all people over the age of 12 years of age as these are potential risk factors for complications in later life.

- The trend is that young people are more likely to achieve risk factor targets before transition than they are after transition, in particular for blood pressure and cholesterol.

- This trend is irrespective of age at transition, gender and whether they live in a deprived area. The trend can be seen across different ethnic groups and for children diagnosed in the few years prior to transition.

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Diabetic ketoacidosis (DKA) Hospital Inpatient Admissions

DKA Hospital Inpatient Admissions

- Diabetic ketoacidosis (DKA) is a potentially life-threatening complication of diabetes caused by a lack of insulin in the body.

- As a result of the lack of insulin the body is unable to use blood sugar (glucose). It instead breaks down fat as an alternative energy source. This causes a build-up of potentially harmful ketones.

- The number of DKA admissions[1] was investigated in the 3 years prior to transition compared to the number of DKA admissions in the 3 years post transition.

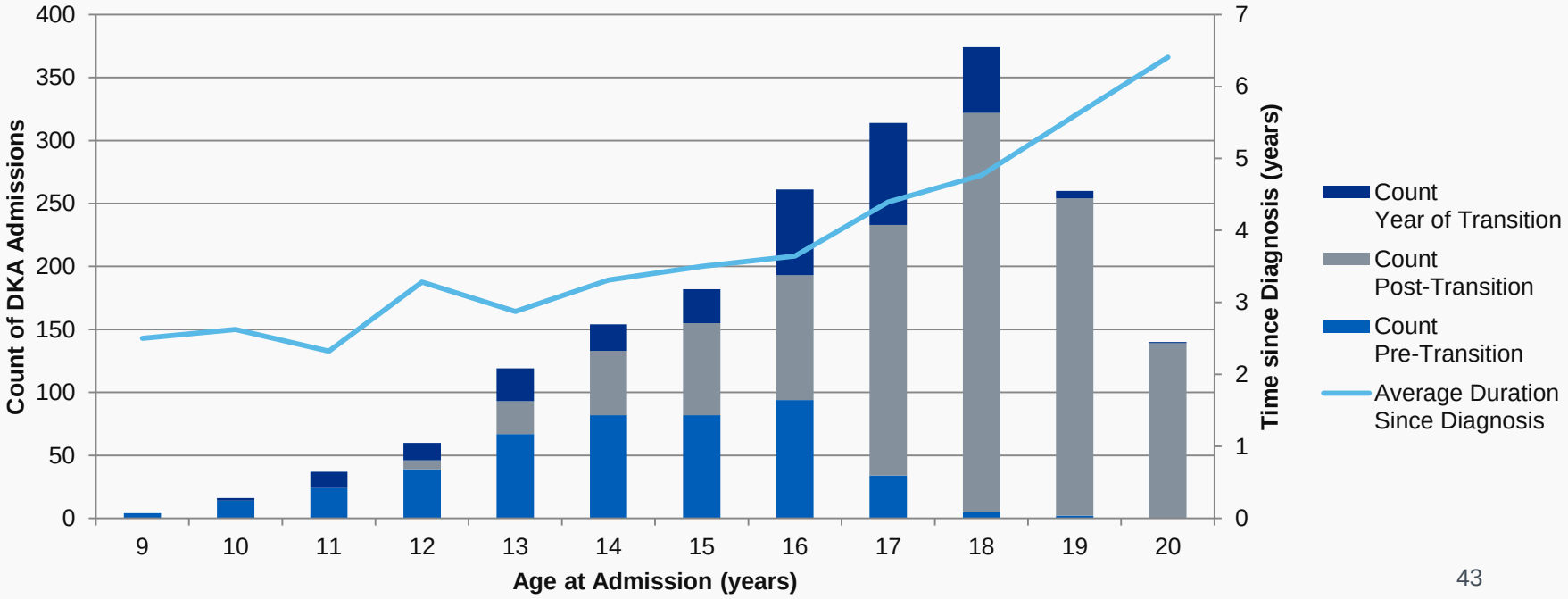
1. See the methodology and data quality section

DKA Hospital Inpatient Admissions

Key Finding

There is a higher number of hospital inpatient admissions due to DKA post-transition than pre-transition. However, DKA admission is also related to the duration of diabetes. It has not been possible to establish a statistically significant relationship between DKA episodes and transition, however services should make note of the increase in DKA admissions when planning services for young people undergoing the transition to adult care.

Figure 22: Count of hospital inpatient admissions with a diagnosis of DKA, by age at admission, 2003-'04 to 2014-'15, England and Wales



Methodology and data quality

Methodology

Time period covered.

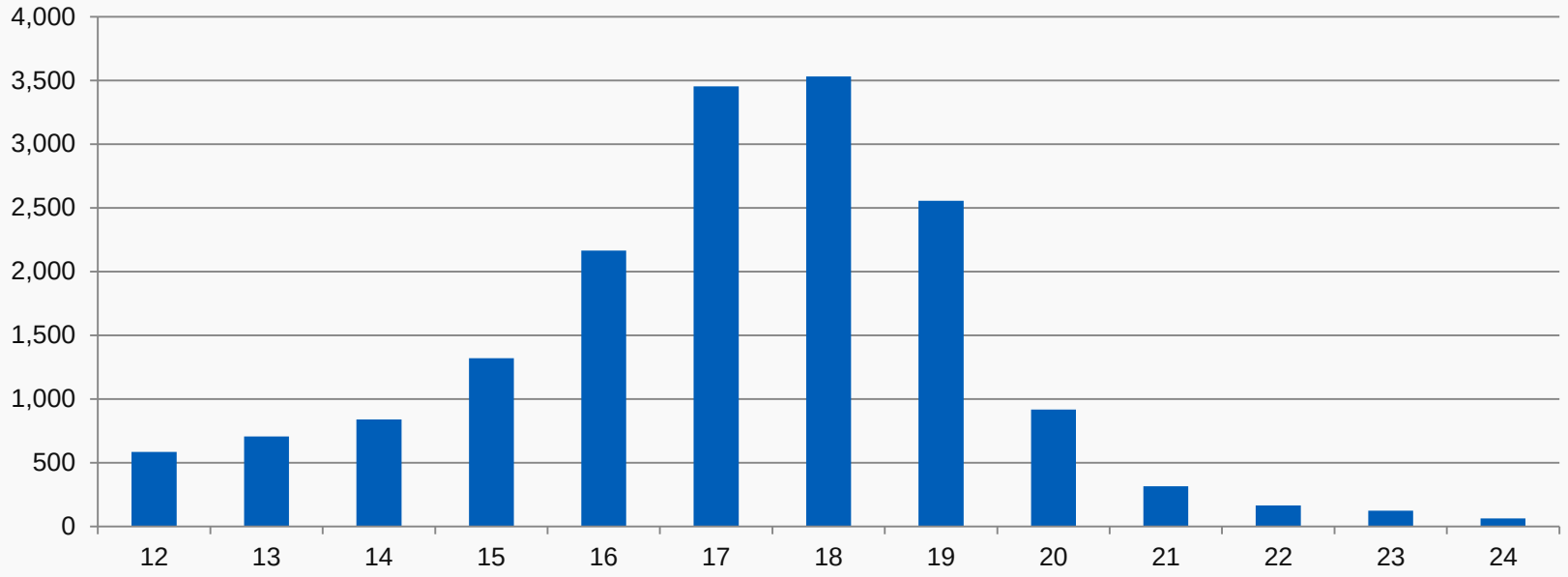
- The NPDA audit years covered are 2003-04 to 2013-14.
  - For 2003-04 to 2010-11 the audit year for NPDA was 1 January to 31 March of the following year.
  - For 2011-12 onwards the audit year runs 1 April to 31 March the following year.
  - Therefore data covered in the NPDA is 1 January 03 to 31 March 14.

- The NDA audit years covered are 2003-04 to 2014-15.
  - For the NDA the audit year is 1 January to 31 March the following year.
  - Due to the method used to identify subjects who have transitioned between services NDA Data covers the period 1 January 03 to 31 March 15.

Methodology – Definition of "Transition"

- The NDTA has linked data for the NPDA from 2003-04 to 2013-14 with NDA data from 2003-04 to 2014-15.
- Children have been followed from the NPDA dataset into the NDA dataset.
- For the purpose of this report transition has been defined as the last audit year a young person appears in the NPDA and the following year they have a record in the NDA.
- Applying the above rule we were able to establish a cohort of 16,730 individuals.

Figure 1: Number of people at age of transition, 2003-2014, England and Wales



Methodology - limitations of the data

- **There are some considerations that you need to be aware of when reviewing this report:-**
- For this report we are using the point at which a person “disappears” from the NPDA as a definition that they have transitioned, however it does not necessarily mean that they have undergone a planned transition move to adult services, but it is the best proxy that we have and defines the process of patients moving from paediatric to young adult based care.
- We do not know the exact date a person transitions during the defined year that they move out of paediatric care. Therefore, they may not have received a complete year of care prior to transition and care process rates may not be complete.
- The data used spans over 10 years of diabetes care. For both the NPDA and NDA national figures for care process and treatment target achievements have improved over that time, therefore the results reported for overall care process and treatment target achievement may not reflect current national figures, and this should be borne in mind when comparing to recently published national reports.

Methodology

Load, filter and join records.

- Load data from the NDA analysis database for each audit year.
- Load NPDA data for each audit year.
- Select the latest record for each NPDA record (by audit year).
- Join the NDA and NPDA data using the NHS_NUMBER field where:
  - NPDA audit year = [NDA audit year – 1] … (thereby identifying the point of transition)
- At this point records are filtered so that either:
  - Subjects (identified by their NHS number) with only a single transition record are retained or...
  - Only the latest record is retained in cases where a subject had multiple records in an audit year.
- Restrict to:
  - People aged ≥12years old and < 25 years old.
  - Type 1

Methodology

Target: HbA1c

- Applied to both paediatric and adults:
  HbA1c values ≤ 7.5% (equivalent to 58 mmol/mol)
  - Values presented in mmol/mol have been converted to percentages using the following formula:
    HbA1c (%) = [HbA1c (mmol/mol) / 10.929] + 2.15
  - The need to convert some values reflects the change in how HbA1c was reported post June 1st 2009. The change was from reporting HbA1c as a percentage to reporting it in units of mmol per mol of unglycated haemoglobin.

Risk Factor: Blood Pressure

- Blood pressure threshold for adults and paediatrics:
  Below 140/80 mmHg
  In children blood pressure is related to age and growth, however it is expected that all children have a blood pressure below this threshold.

Risk Factor: Cholesterol

- Applied to both paediatric and adults:
  Total cholesterol: under 4.0 mmol/l

Methodology

Risk factor: Kidney

Kidney:

Kidney threshold for paediatric:

- *Albumin/creatinine ratio:*
  - Less than or equal to 2.5 mg/mmol (male)
  - Less than or equal to 3.5 mg/mmol (female)

Kidney thresholds for adult:

- *Albumin/creatinine ratio:*
  - Less than or equal to 2.5 mg/mmol (male) or 3.5 mg/mmol (female)
- *Albumin concentration:*
  - Less than or equal to 20mg/L
- *Albumin excretion (overnight):*
  - Less than or equal to 20µg/min
- *Albumin excretion (24 hours):*
  - Less than or equal to 30mg/24h

Methodology

Null values.

Null values occur where there is an absent field value in the loaded data. In the tables presented the nulls refer to null entries in the demographic fields by which the data has been grouped.

The exceptions are as follows:

- For '*By Duration*', where data has been grouped by duration of diabetes, a number of records had a duration of diabetes value of -1. These values have been recoded as nulls.
- In cases (such as sex or ethnicity) where the field is common to both the NDA and the NPDA and the field value in, for example, the NDA is a null and the corresponding field in the NPDA has a valid value then the valid value has been used to group the record. This has had the effect of reducing the number of records grouped under null in the tables.

Methodology

DKA Hospital Inpatient Admissions.

Selected hospital inpatient data from the HES system was linked to the data on transition:

- Inpatient data was available from 2003/04.
- The data from HES was filtered on:
  - Episodes with either a primary or secondary diagnosis of DKA.
  - Finished episodes of inpatient care.
  - The final episode in a spell of care (a spell being a series of related episodes).
  - Episodes of the general type (i.e. other than maternity or mental health episodes).
  - Age at admission of 27 years or less.
- The transition data was truncated by three years at it's beginning and end. The resultant time series covered the period 2006/07 to 2011/12.
- HES episodes that occurred prior to, or during, the year of diagnosis were excluded.
- The remaining HES episodes were then restricted to those that occurred within +/- 3 years of the year of transition.

National Diabetes Transition Audit 2003-2014

Definitions, footnotes, data sources and further reading

Definitions

Diabetes

Is a condition where the amount of glucose in the blood is too high because the pancreas doesn't produce enough insulin. Insulin is a hormone produced by the pancreas that allows glucose to be used as a body fuel and other nutrients to be used as building blocks. There are two main types of diabetes: Type 1 diabetes (no insulin); Type 2 diabetes (insufficient insulin).

Care Processes (NICE recommends all of these at least once a year)

Blood Pressure – a measurement of the force driving the blood through the arteries. Blood pressure readings contain two figures, e.g.130/80. The first is known as the systolic pressure which is produced when the heart contracts. The second is the diastolic pressure which is when the heart relaxes to refill with blood.
BMI measurement – Body Mass Index calculated from weight and height to classify under, normal and over-weight.
Serum creatinine – this blood test is used as measure kidney function.
Urinary albumin – this urine test detects the earliest stages of kidney disease.
Cholesterol – this blood test measures a type of fat that can damage blood vessels.
Foot check – this examination checks the blood supply and sensation (feeling) in the feet. Loss of either is an indicator of risk of foot disease.
Smoking Status – this records whether the person is a smoker. Smoking increases the diabetic risk for heart attacks and stroke.
HbA1c – this is a blood test of average blood glucose levels during the previous two to three months.

Definitions

Ethnicity categories

- Asian = Indian (Asian or Asian British), Pakistani (Asian or Asian British), Bangladeshi (Asian or Asian British), & any other Asian background.
- Black = Caribbean (Black or Black British), African (Black or Black British), & any other Black background.
- Other =Arab, Chinese, any other ethnic group, White & Black Caribbean (Mixed), White & Black African (Mixed), White & Asian (Mixed) & any other Mixed background.
- White = British (White), Irish (White), Gypsy/Irish Traveller, & any other White background.

Specialist Service

This is a service (often hospital based but sometimes delivered in a community setting) which includes diabetes specialists working in multidisciplinary teams. These teams usually comprise physicians (Diabetologists), Diabetes Specialist nurses and dieticians; it may also include clinical psychologists.

Treatment Targets (NICE defines target levels to reduce risks of complications for people with diabetes)

HbA1c - the closer this is to normal (less than 42mmol/mol) the lower is the risk of all long term complications of diabetes

Cholesterol – reducing cholesterol levels lowers the risk of heart attacks and strokes

Blood Pressure – high levels are a risk for heart attacks and strokes; they also drive progression of eye and kidney disease

Footnotes

1. See methodology and data quality section in this report for information regarding point of transition and DKA admissions

2. NICE recommended care processes http://www.nice.org.uk/guidance/conditions-and-diseases/diabetes-and-other-endocrinal--nutritional-and-metabolic-conditions/diabetes

3. National Service Framework (NSF) for Diabetes
   https://www.gov.uk/government/publications/national-service-framework-diabetes
   NICE Clinical Guidelines – GN17: Type 1 diabetes in adults: diagnosis and management
   http://www.nice.org.uk/guidance/ng17
   NICE Clinical Guidelines – NG28: Type 2 diabetes in adults: management
   http://www.nice.org.uk/guidance/ng28
   NICE – Diabetes in Adults Quality Standard http://guidance.nice.org.uk/QS6

4. NICE Clinical Guidance – NG18: Diabetes in children and young people
   https://www.nice.org.uk/guidance/indevelopment/gid-cgwaver118

5. See the ethnicity categories under definitions

Additional information

The following documents are available from http://www.digital.nhs.uk/pubs/ndatrans

- Supporting data in Excel
- Powerpoint version of this report
- One Page Summary highlighting key findings and recommendations

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