NPDA Quality Improvement Plan

1. Introduction

The NPDA has been delivered by the Royal College of Paediatrics and Child Health (RCPCH) since 2011 and has been reporting for 15 years. Data is submitted by healthcare professionals in all Paediatric Diabetes Units (PDUs) in England and Wales about the care received by the children and young people with diabetes using their service. The effectiveness of diabetes care is measured against NICE guidelines and includes HbA1c targets, health checks, patient education, psychological wellbeing, and assessment of diabetes related complications including acute hospital admissions, all of which are vital to monitoring and improving the long-term health and wellbeing of children and young people with diabetes.

The audit aims to establish:

- How many children and young people with diabetes are receiving care within paediatric diabetes units in England and Wales?
- What proportion of children and young people with diabetes are reported to be receiving key age-specific processes of diabetes care, as recommended by NICE?
- How many achieve outcomes within specified treatment targets?
- Are children and young people with diabetes demonstrating evidence of small vessel disease (microvascular) and/or abnormal risk factors associated with large vessel disease (macrovascular) prior to transition into adult services?

2. Improvement goals

The NPDA was designed to stimulate national improvements in the completion rates of health checks recommended by NICE, and in diabetes control as indicated by glycated haemoglobin (HbA1c). Since 2012, there have been year on year improvements in completion rates of the '7 key health checks' for Type 1 diabetes, and a downward trend (improvement) in national median HbA1c, which currently stands at 64.5 mmol/mol (RCPCH, 2019). NICE (2015) recommends an HbA1c of 48 mmol/mol in order to reduce the risk of micro and macrovascular complications of diabetes, including blindness, amputations, and cardiovascular events, however only a small proportion of children and young children with Type 1 diabetes per PDU and nationally are currently meeting this target:

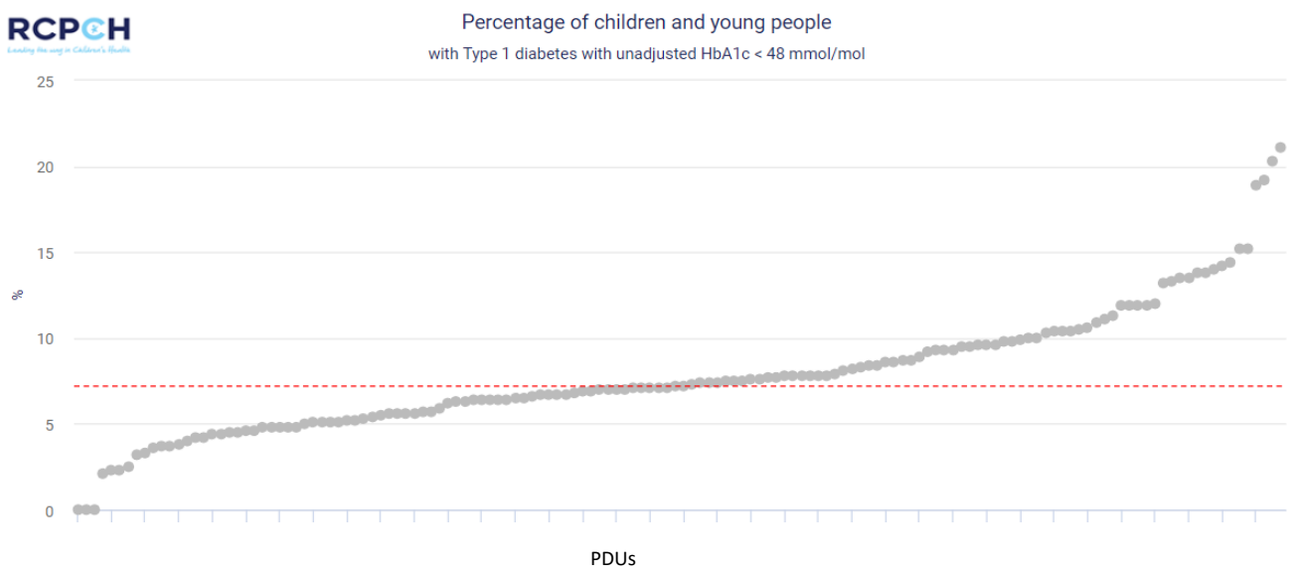


Figure 1: Percentage of children and young people with Type 1 diabetes with an HbA1c < 48 mmol/mol, 2017/18

Similarly, whilst there have been improvements in completion of the seven key annual health checks recommended by NICE (Figure 2), only 50% of children and young people with Type 1 diabetes received all seven in 2017/18 (Figure 3), and only around 25% of those with Type 2 diabetes received all seven.

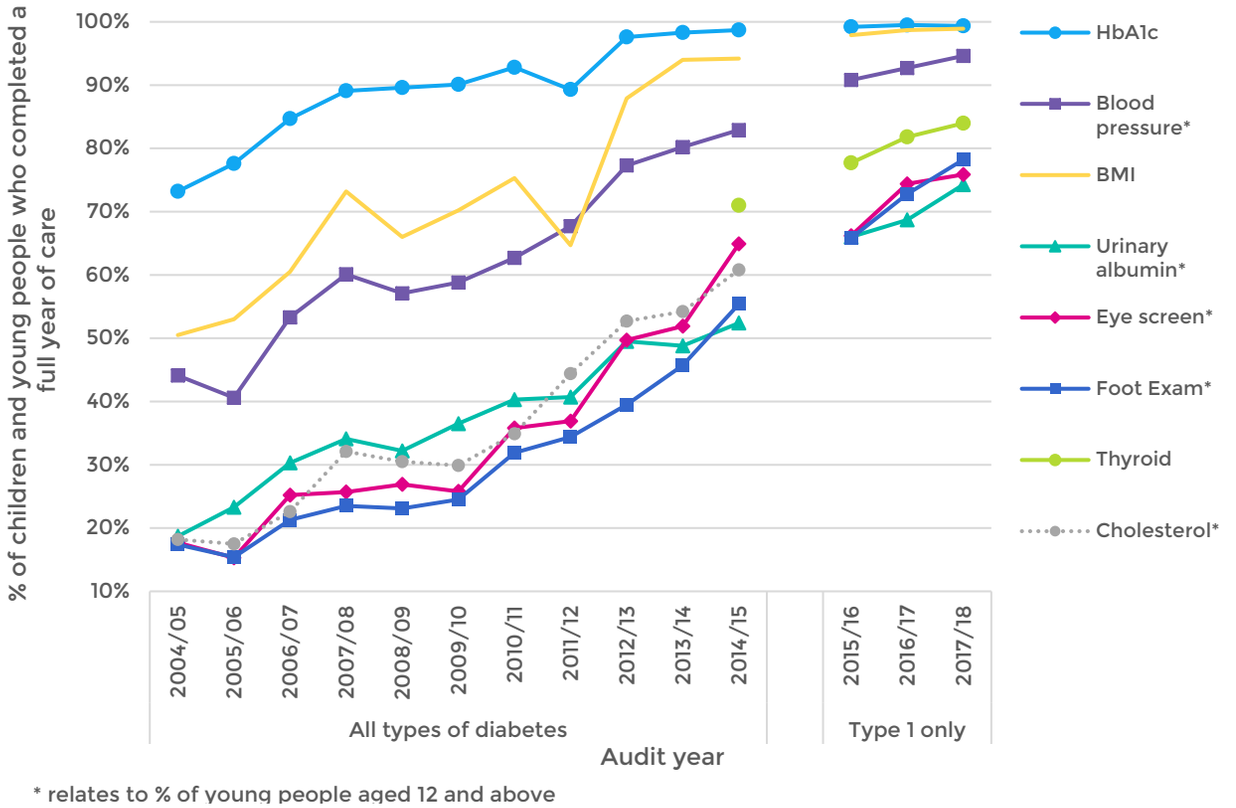


Figure 2: Percentage of children and young people with diabetes with a complete year of care receiving each key health check, 2004/5- 2017/18

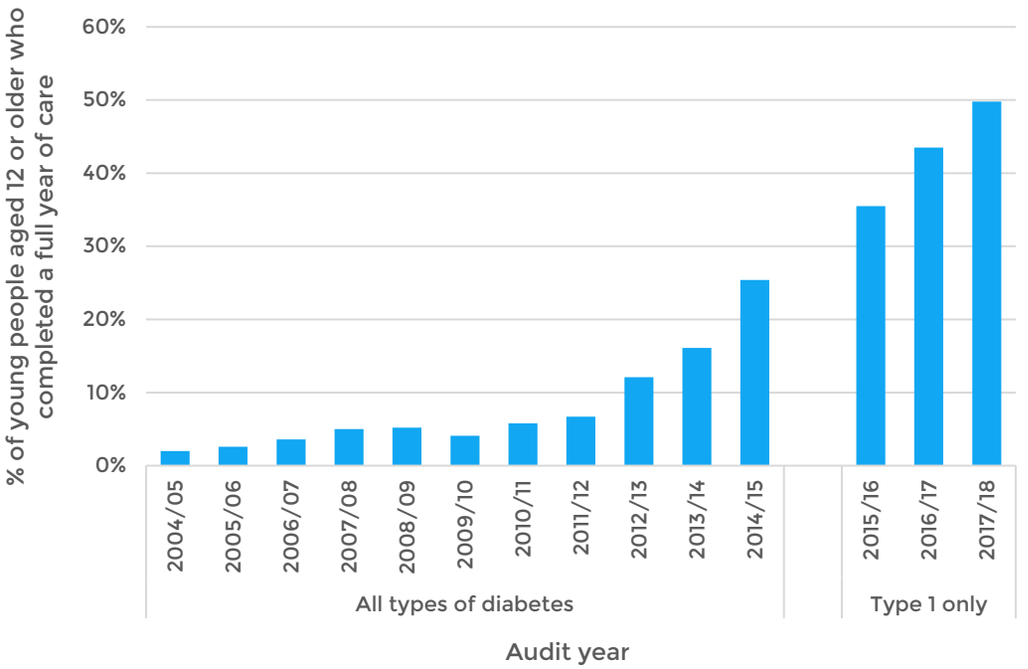


Figure 3: Percentage of children and young people with diabetes with a complete year of care receiving all seven key health checks, 2004/5- 2017/18

Improvement goals for the audit are therefore year on year increases in the percentage of children and young people with diabetes receiving all key recommended health checks, reduction in the national median HbA1c, and increase in the percentage of children and young people with an HbA1c <48mmol/mol.

3. Improvement methods

a. National

With support from HQIP, the RCPCH recently used underspend from the previous contract to deliver the NPDA to test the feasibility of a sustainable, subscription based National Children and Young People's Diabetes Quality Programme. This has now been successfully established, and 90% of all PDUs in England and Wales are participating in the programme, which includes a quality improvement collaborative and a self- and peer-review process. Based on the experience of Sweden (Samuelsson et al, 2016), and preliminary findings from PDUs taking part, the collaborative has the potential to make a huge impact on HbA1c outcomes nationally.

The NPDA feeds into this programme by providing unit level reports which are used to inform discussions around service strengths and weaknesses at peer-review, and by providing summary performance statistics upon each upload of data to the data capture system enabling benchmarking within PDSA cycles within the quality improvement collaboratives.

A best practice tariff (BPT) was introduced in England in 2012 to fund the provision of good quality multidisciplinary care for all children and young people receiving care at PDUs meeting certain care quality criteria. The NPDA supports PDUs to evidence these criteria by aligning its dataset and reporting where appropriate. In the workforce and structures spotlight audit undertaken in 2018, we found that the majority of PDUs receiving BPT did not know the percentage of these funds being diverted by their Trusts into their service, and estimates varied from 0% to 100%. The audit has recommended that clinical leads of services not receiving BPT funding due should negotiate with their Trusts to ensure adequate provision of MDT support and optimal service design.

NPDA data also feeds into national quality assurance visits undertaken by the Care Quality Commission (CQC) in England and Health Inspectorate Wales (HIW). Both organisations are informed of negative outlier status of PDUs in their respective countries, and data from key NPDA metrics is supplied to the CQC to enable them to assess unit performance.

Additionally, the NPDA collaborates with the National Diabetes Audit (NDA) to track patient outcomes pre-, post- and during transition to adult diabetes services, highlighting variation in care quality at this vulnerable time and supporting focus on transition practices for QI initiatives.

Finally, the NPDA supports the National Children and Young People's diabetes network; a network included in the NHS Long Term Plan, which brings all PDUs in England and Wales together nationally and within regions to share good practice and maintain high quality standards. The NPDA, in collaboration with Diabetes UK, fund the national meetings of this network to ensure their sustainability and to ensure we have a slot on the agenda, enabling the NPDA team to provide updates from the audit and solicit feedback on audit outputs and plans.

b. Regional

The NPDA produces regional data in addition to PDU, CCG/LHB, STP and national level data. The NPDA team work closely with regional network managers to ensure that audit outputs enable detection of high and poor performance on audit measures within their region, and host regional manager meetings at the RCPCH offices to ensure their sustainability. All regional networks are expected to collectively share their NPDA results and planned responses annually.

c. Local

The NPDA data capture system supports services to monitor and improve completion rates of health checks and HbA1c outcomes by providing patient-level and overall summary results each time data is uploaded

during the audit year within an automatically generated data completeness report (DCR). Table 1 provides an excerpt from the DCR showing which key health checks have been received by the first three patients within a dummy PDU's submission. This display can be used to identify and follow up patients who are in danger of missing all recommended checks by the end of the audit year:

Table 1: Example excerpt from the 'individual values' display for key health check completion rates within the NPDA DCR

NHS	12+	HbA1c	BMI	Thyroid Screen	Blood Pressure	Urinary Albumin	Eye Screen	Foot Exam	Total
7777777777	N	✗	✓	✗	N/A	N/A	N/A	N/A	1/3 ✗
7777779999	N	✗	✗	✗	N/A	N/A	N/A	N/A	0/3 ✗
9500000028	Y	✗	✗	✗	✗	✗	✓	✗	1/7 ✗

Table 2 shows summary HbA1c results generated by the system upon upload, which can feed into run charts if used regularly:

Table 2: 'Site values' outcomes display within the NPDA DCR

Site Values - Outcomes

Note: The data presented below on HbA1c relates to the results for the children and young people with Type 1 diabetes and one or more valid HbA1c measurements in the audit period:

Mean HbA1c	Median HbA1c	Number of admissions	Number of DKA admissions	Required additional psych support
65.7 (from 94 records)	68.0 (from 94 records)	8	3	2 (from 109 records)
0.0 (from 0 records [0-4])	0.0 (from 0 records [0-4])			
66.7 (from 7 records [5-9])	68.0 (from 7 records [5-9])			
65.5 (from 72 records [10-14])	68.0 (from 72 records [10-14])			
66.2 (from 12 records [15-19+])	66.5 (from 12 records [15-19+])			

NPDA unit reports support units to benchmark their own performance against their previous years' results and against regional and national data. Radar plots within PDF summaries sent directly to PDUs give an 'at a glance' view of performance, and highlight where improvement focus could be directed:

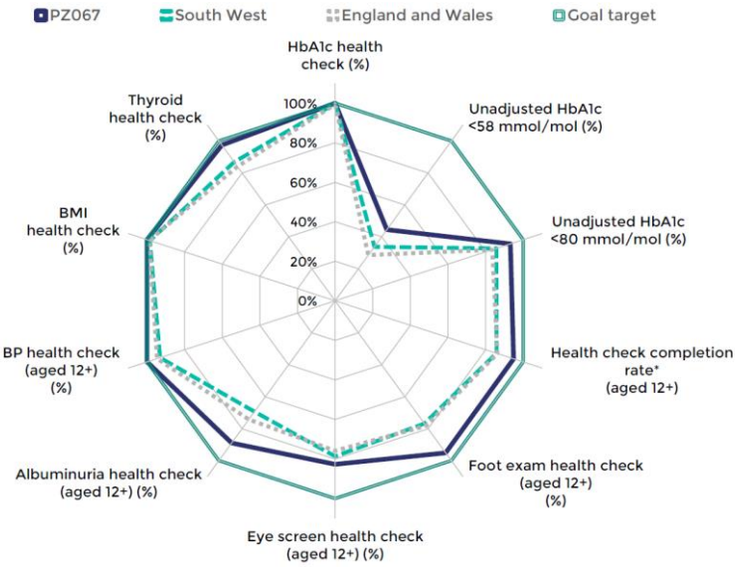


Figure 4: Example of a radar plot within PDU-level results summary showing unit, regional, national and target results

Case mix adjustment of mean HbA1c at unit level enables fairer benchmarking of PDU level HbA1c outcomes, and the production of funnel plots for key audit metrics including adjusted mean HbA1c provides an effective visualisation of relative performance.

Funnel plots also enable detection of positive and negative outlier status:

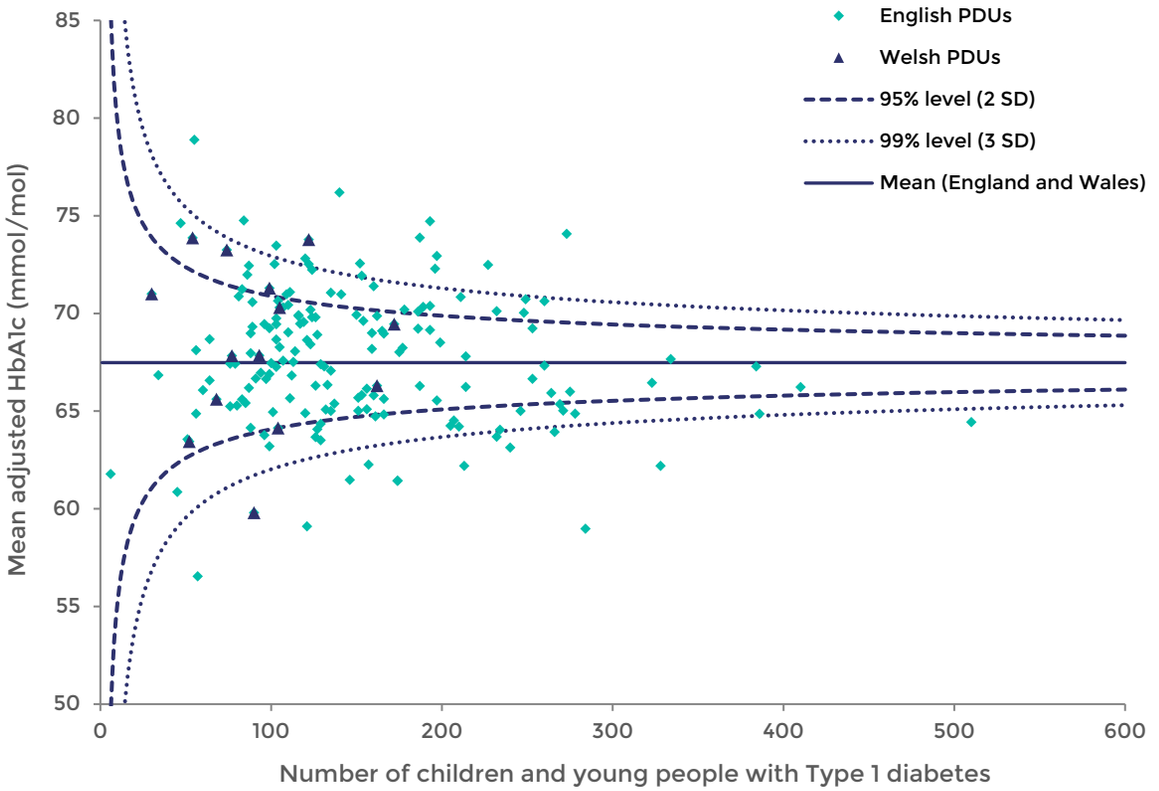


Figure 5: Funnel plot within PDU-level results summary showing PDU performance on the case mix-adjusted mean HbA1c metric.

Alerting the clinical leads, Chief Executives and Medical Directors of the negative outlier status of their PDU ensures organisational awareness of challenges to good paediatric diabetes care locally and stimulates improvement activity via the production of an action plan, which must then be submitted to the CQC or Welsh government depending on the location of the PDU.

4. Improvement tools

The majority of the PDUs participating in the NPDA are also participating in the National Children and Young People's Diabetes Quality Programme, which teaches and encourages use of improvement tools including run charts, PDSA cycles, and driver diagrams as part of its intensive, residential quality improvement collaborative. In order to avoid duplication, the improvement tools promoted by the NPDA are largely created by the NPDA team and are based around NPDA results.

These include a slide deck for PDU staff to use in the context of a team meeting to help them identify necessary improvements, find relevant improvement resources, and collectively plan actions.

The slide deck presents a selection of QI ideas generated through the national quality programme, and directs staff towards QI Central, the repository for QI projects being developed by RCPCH including a selection from PDUs, and the large repository of presentations from our annual conference.

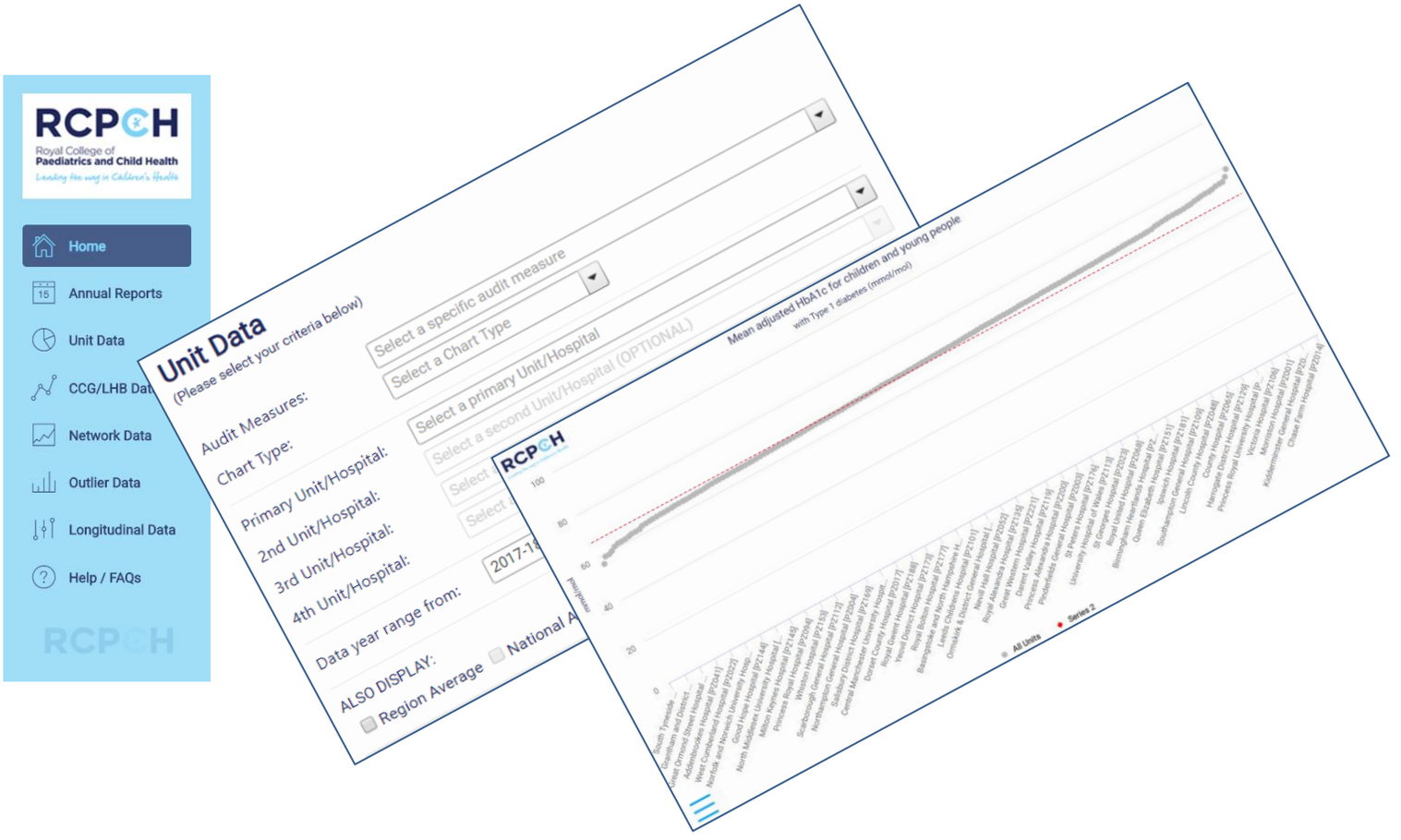
The annual NPDA conference brings together up to 200 MDT members of staff working in PDUs to receive updates on the findings of the audit, national QI priorities for improvement revealed by the audit, and to learn about successful practice trialled in other PDUs.

Feedback surveys consistently show nearly all attendees leave the conference with at least one idea to trial in their PDU.

In addition to the national conference, the NPDA supports improvement-based workshops where possible, including hosting the British Society for Paediatric Diabetes (BSPED) meeting to discuss new DKA guidelines and the National Network Working Group for Type 2 diabetes.

This autumn, we will host our first workshop to develop unit level and regional recommendations based on findings from the 2018/19 national core audit report. The recommendations generated will then be audited by the NPDA, as a driver to support implementation.

Finally, the NPDA has produced an interactive online reporting tool, NPDA Results Online, which enables comparison of units, regions, and CCGs/LHBs on key audit measures, enabling trend identification and motivating QI through public benchmarking of named PDUs:



5. Patient and public involvement

The NPDA has rolled out two previous national patient and parent reported experience measures (PREMS) and is coming towards the end of data collection for the third. The PREMs give children and young people attending PDUs and their families the opportunity to provide structured feedback on the care they receive and make suggestions for improvements. They also provide quantitative data enabling benchmarking at unit level on key domains of care prioritised by children and young people with diabetes and their families at a workshop held at the beginning of the PREM production process. Unit level results will be displayed publicly, and we plan to hold a workshop with parents to make recommendations for units based on the results of the 2018/19 PREMs.

A previous workshop commissioned from Diabetes UK involved review of NPDA outputs for parents by a group of parents of children with diabetes. Further to this, we updated our lay summary of the national core audit report to include sections on what care should be received, and how parents can work with their clinic to support better outcomes. We plan to hold a similar workshop this year for parents to review the core and spotlight audit reports and make recommendations for our parent facing outputs from them.

Finally, parent representation on our Board and Dataset and Methodology groups ensures that parents can influence QI plans and initiatives on an equal footing as MDT diabetes professionals.

6. Communications

Regular email updates to participating PDUs and regional network managers enable the NPDA team to communicate QI activities and raise awareness of available QI tools. We also use Twitter to promote the use of our tools, and the use of NPDA data in QI planning.

Bi-annual presentations to the National Children and Young People's Diabetes Network enable us to directly promote use of audit QI tools and audit data, as does our annual conference. Quarterly Board, Dataset and Methodology Meetings and contract review meetings ensure that QI plans are guided and monitored by key stakeholders.

Our main communications for parents are via Twitter or printed materials sent for display in patient waiting areas within PDUs, including lay summary reports in English and Welsh containing information on what high quality care looks like and how to support services to provide it. We plan to create a clinic poster pdf generator for PDUs to use to display their 2018/19 NPDA data to help raise awareness of the audit amongst families with diabetes and to support them to understand their clinic's performance.

There are a wide range of resources on the NPDA website to support PDU staff to get the most out of available audit tools, including a recent webinar demonstrating how to submit data and review the summary results in the data completeness report. We plan to upload our own driver diagram to the website and share it via email update and via Twitter in order to promote the use of driver diagrams and to promote wider understanding of the functions and methodologies of the audit.

7. Evaluation

The total impact of the NPDA and other national and local QI initiatives is demonstrated within the annual core NPDA national report, which presents each year's results against those of previous years. Our planned audit of recommendations arising from the 2018/19 core audit will measure the impact of this exercise.

Quarterly Board, Dataset and Methodology Group and contract review meetings with HQIP ensure regular review of progress towards implementation of QI initiatives by the team and our stakeholders and stimulate ideas for new ones.

The annual feedback survey for PDU staff enables benchmarking of user satisfaction and enables us to monitor the uptake and impact of our communications and support tools each year. In addition to collecting quantitative satisfaction data, comments are also sought on communication from the team, resources produced to support submission of data, data completeness/data quality reporting and our publications. These are considered by the team and at Board meetings, before implementation of appropriate and feasible actions, which are then fed back in a 'you said we did' document.

8. Conclusion

A culture of continual quality improvement (CQI) underpins all NPDA team processes and outputs, and is promoted to all PDUs participating in the audit.

The NPDA, the national children and young people's diabetes quality improvement programme and the national children and young people's diabetes network work together to provide a unique, comprehensive, and strategic approach to improving the care and outcomes for children and young people with diabetes, with support from NHS England, the Welsh Government, HQIP, the best practice tariff, and the NHS long term plan. We look forward to evidencing the impact of these initiatives in upcoming rounds of audit and are proud to operate within an exemplar model for improving care for long term conditions nationally.