

Flash Glucose Monitoring Prescribing outcomes in people with Type 1 diabetes mellitus (T1DM)

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The National Diabetes Audit (NDA) (17/18) states that one quarter to one third of the hospital admissions for cardiovascular (CV) disease are for people with diabetes, despite the actual prevalence of diabetes being much smaller (~1 in 20 people).¹ Specifically, in T1DM, Heart failure (HF) is the most common CV complication; four times more frequent than diabetes admissions for Myocardial Infarction (MI) or Stroke. Angina is the second most common. Diabetic Ketoacidosis (DKA) is the most prevalent diabetic complication.² It is also the only outcome directly related to short-term control of blood glucose.

A Medtech Innovation Briefing (MIB) was published by NICE in 2017 for the Flash Glucose Monitoring (Flash GM) product 'Freestyle Libre' (FL).³ Additionally, Diabetes UK published a consensus guideline for Flash GM (2017), highlighting that FL should be available to all Type 1 diabetics and people with other types of diabetes who require intensive insulin therapy.⁴

The use of Flash GM is reported to lower HbA1c and improve blood glucose control.⁵

AIM & OBJECTIVES

- Aim:**
- To highlight variation and outcomes across the Integrated Care System (ICS) for Flash GM prescribing, specifically FL, in Type 1 diabetes mellitus patients.
- Objectives:**
- Analyse volume and age distribution of FL prescribing across the ICS.
 - Estimate Hospital admissions avoidance attributable to FL prescribing.
 - Estimate reduction in blood glucose test strip prescribing associated with FL sensor prescribing.

METHOD

- ePACT2 searches were constructed to determine the number of FL items prescribed by Clinical Commissioning Group (CCG) in the North East and North Cumbria (NENC) ICS footprint.
- The number of people with Type 1 diabetes, taken from the NDA 18/19, was used to weight the prescribing volume.
- The age distribution of the people prescribed FL was also extracted from ePACT2.

- Hospital episode statistics data for diabetic patients presenting with hypoglycaemia, hyperglycaemia and DKA/coma was used to estimate the impact on admissions rate correlated to the uptake of FL for an ICS (Greater Manchester) with a 2.5 year history of FL prescribing (Oct 2017 - Mar 2020).
- ePACT2 prescribing volume of all blood glucose test strips (BGTS) was correlated against the uptake of FL prescribing in order to estimate the potential reduction in test strip prescribing (Greater Manchester ICS, Oct 2017-Mar 2020).

RESULTS

Freestyle Libre prescribing volume and trend

The threshold reimbursable through NHSE funding arrangements in 2020/21 was equivalent to the number of sensors needed for 20% of the T1DM patient list size. The actual number of sensors prescribed is shown below (Figure 1).

A target threshold of 1.3 sensors/T1DM patient is equivalent to the number of sensors reimbursable for 20% T1DM patient list size receiving a continuous supply of sensors over 12 months.

This method enables monitoring of total sensor prescribing irrespective of variables such as patient drop out and irregular ordering. This graph assumes that all FL prescribing was within the criteria for NHSE reimbursement.

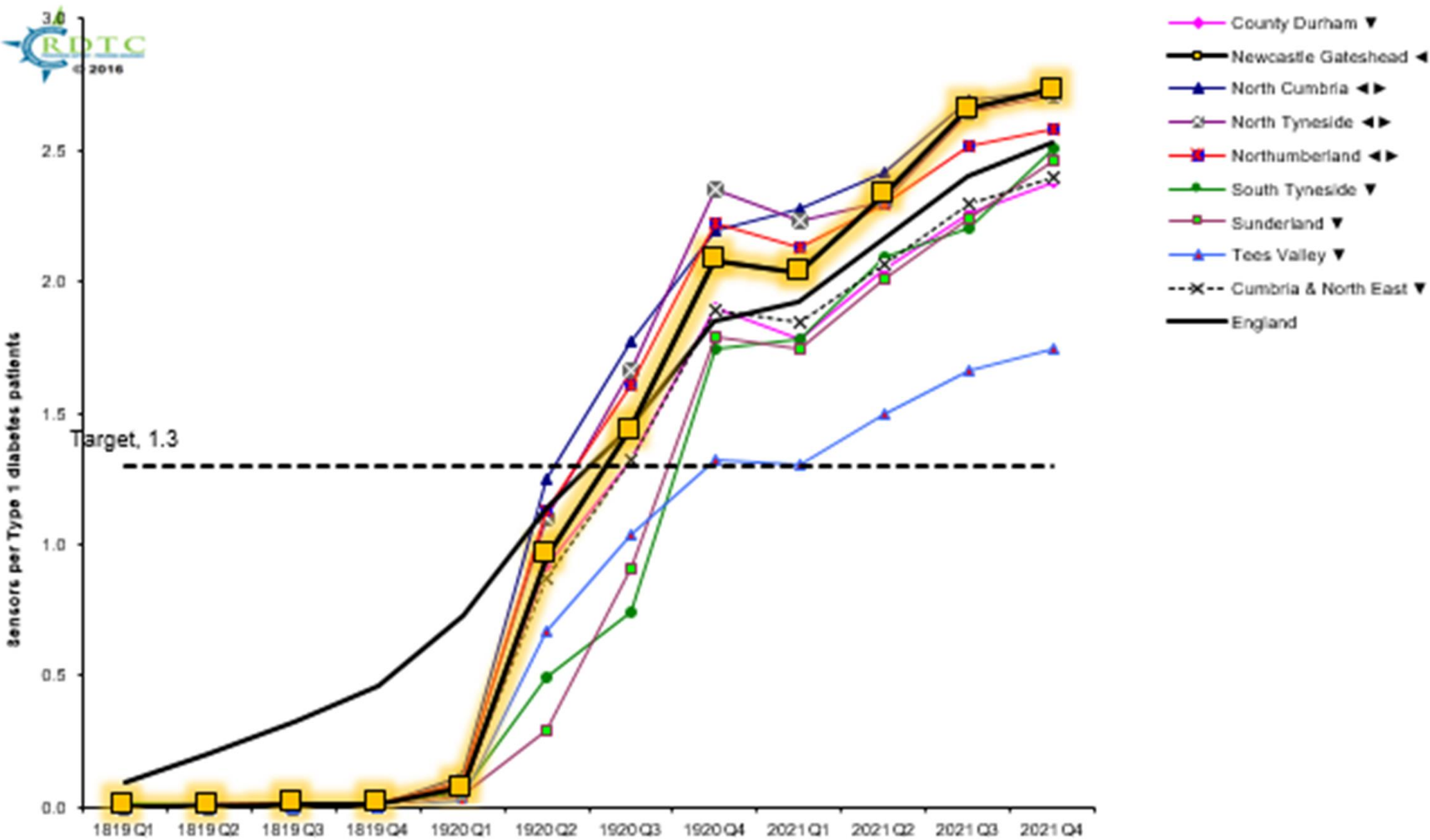
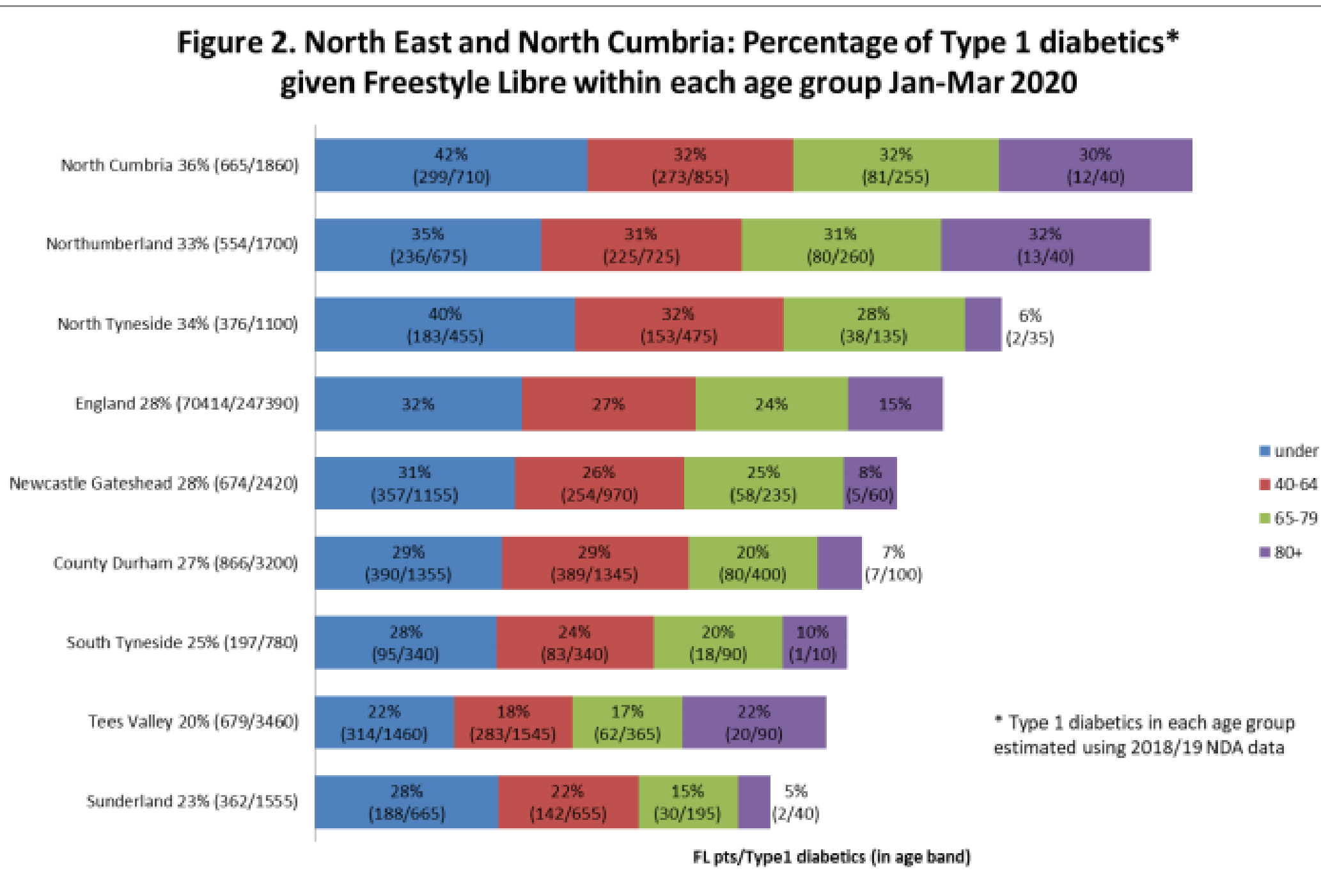


Figure 1. North East & North Cumbria: Uptake of freestyle libre sensor prescribing over time, weighted for the number of T1DM (Apr 18-Mar 21)

Age distribution

- DKA is the most prevalent diabetic complication of T1DM.² It is also the only outcome directly related to short-term control of blood glucose.
- The incidence of DKA is highest in 20-24 year olds (8.11%) with over 3% occurring in each 5 year age band below 40 years and above 80 years.²

- Between 22 and 42% of the Under 40 T1DM patients (contains age band with highest incidence of DKA; 20-24 year olds (8.11%)²) were prescribed FL in the NENC ICS (Jan-Mar 20). This was reduced to 5-32% of the T1DM population over 80 years (Figure 2).



Hospital admissions

- A significant reduction in hospital admissions ($p < 0.005$) for diabetic patients admitted with hypoglycaemia, hyperglycaemia and ketoacidosis was identified.
- On average an increase of 100 unique patients using FL was shown to correlate with 2.5 fewer admissions related to blood glucose control.
- The average cost of admission for diabetic patients presenting with hypoglycaemia, hyperglycaemia and DKA/coma was estimated as £1108. (2019/20 Greater Manchester hospital admissions).
- No correlation was found between FL sensor prescribing and the number of diabetic patient hospital admissions for HF, MI, Stroke and RRT (longer term complications) (Oct 2017 - Mar 2020).

Blood glucose test strips

- A significant correlation was identified, quantifiable as 'For every sensor prescribed (£35) an 'average' CCG can expect to save £7.87 in BGTS costs'.
- This is a recurrent saving and may increase with improved patient confidence and familiarity with the Flash GM method.
- The savings calculated reflect the number and make of BGTS used prior to switching to a FL Flash GM system.

CONCLUSION

- The uptake of FL is still increasing but there is variation in uptake across the ICS footprint (Figure 1).
- Consideration of the age bands prescribed FL and likelihood of DKA may be useful to address inequality and targeted outcomes.
- The variation in values for the impact of FL on hospital admissions discernible between the RDTc analysis and the national ABCD dataset⁵ could potentially be attributable to regional variation and the different methodologies applied (impact of total FL prescribing versus optional reporting of prescribing and inclusion of patients with baseline and follow up data only).
- As more prescribing data becomes available over time, it will be possible to better understand the realised reduction in hospital admissions and test strip prescribing.

REFERENCES

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