Prevalence of Metabolic and Micro-Vascular Complications Among English Adult Patients With Type 1 Diabetes Initiated on Basal Insulin Analogues Between 2014 and 2019: A Population-Based Retrospective Cohort Study

EPH105

Onyinye Diribe[1], Neil Holden[1], Karen Palmer[1], Amar Puttana[1], Aymeric Mahieu[2], Charlie Nicholls[1], Xiaocong Li Marston[3], Nick Denholm[3], Idris Iskander[4]

[1]Sanofi, Reading, United Kingdom; [2]Sanofi, Paris, France; [3]OPEN Health, London, United Kingdom; [4]University of Nottingham, Nottingham, United Kingdom

BACKGROUND

Individuals with Type 1 diabetes (T1DM) have been reported to require up to five times more secondary care support than those without diabetes.[1] Basal insulin analogues (BIA) are used in people with T1DM to facilitate insulin dose titration while reducing the risks of nocturnal hypoglycaemia. This study describes the prevalence of metabolic and microvascular complications among a cohort of patients on a first-generation (Gen 1) BIA who were switched to either an alternative Gen 1 or a second generation (Gen 2) BIA.

METHODS

This is a population-based retrospective cohort study using CPRD-HES linked data. Adult English patients with T1DM who switched from a Gen 1 to an alternative Gen 1 or a Gen 2 BIA were analysed. Patient characteristics and the prevalence of metabolic and microvascular complications were assessed.

- **Index event** was defined as the first recorded instance in CPRD, between 1 July 2014 and 31 March 2021, when a person with T1DM treated with a Gen 1 BIA switched to an alternate Gen 1 BIA or a Gen 2 BIA (Gla-300 or IDeg).
- **Observation period** was defined as the time between 1 July 2014 and 31 March 2021.
- **Follow-up period** was defined as the time from the index date until the end of the observation period, data availability (i.e., deregistration in CPRD), or date of death (whichever occurred earliest).

RESULTS

STUDY SAMPLE
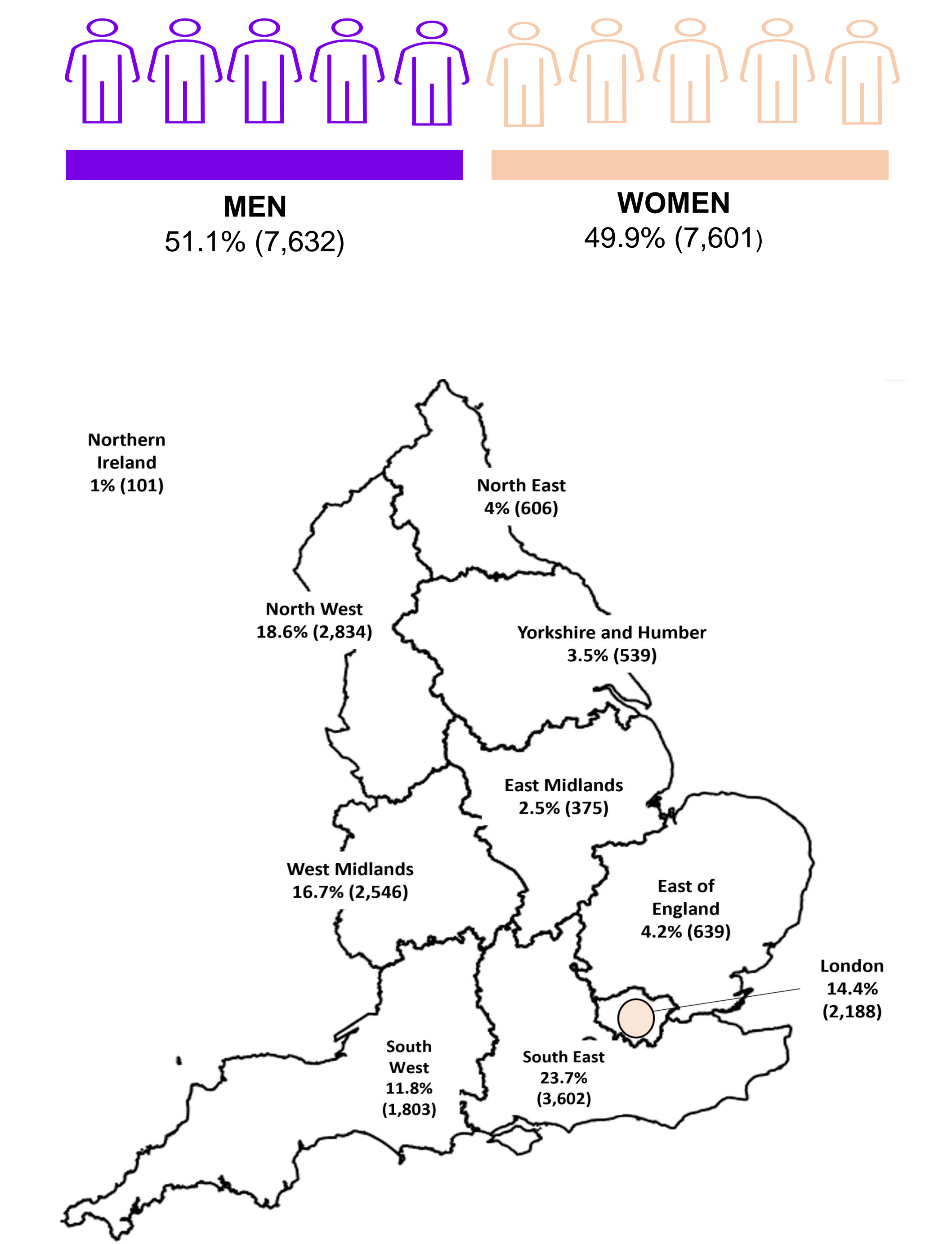
- **15,233** met the inclusion criteria

MEN
51.1% (7,632)

WOMEN
49.9% (7,601)

Figure 1. Geographical distribution of patients with T1DM included in the analysis

Northern Ireland 1% (101)
North East 4% (606)
North West 18.6% (2,834)
Yorkshire and Humber 3.5% (539)
East Midlands 2.5% (375)
West Midlands 16.7% (2,546)
East of England 4.2% (639)
London 14.4% (2,188)
South West 11.8% (1,803)
South East 23.7% (3,602)

RESULTS

DEMOGRAPHIC CHARACTERISTICS

- Mean (SD) age at index was 40.5 (15.9) years.
- Mean (SD) weight was 75.81 kg (16.89), (n=14,983).

Table 1. Other baseline demographic characteristics of patients with T1DM included in the analysis

Demographic	N (%)
Ethnicity	
White	8,702 (57.13%)
Black	229 (1.5%)
Asian	395 (2.59%)
Mixed	5,291 (34.73%)
Other	180 (1.18%)
Unknown	436 (2.86%)
Index of Multiple Deprivation	
1 (Most deprived quintile)	2,653 (17.4%)
2	2,937 (19.8%)
3	2,881 (18.9%)
4	3,096 (20.3%)
5 (Least deprived quintile)	3,012 (19.8%)
Unknown	654 (4.3%)

CLINICAL CHARACTERISTICS

- The mean (SD) duration from T1DM diagnosis to index date was 18.7 (13.7) years.
- The mean (SD) baseline HbA1c was 8.94% (1.85), n=11,167.
- Among the cohort, 34.7% switched to an alternative Gen 1 BIA, whilst 65.3% switched to a Gen 2 BIA.

GEN1
34.7% (5,287)

GEN2
65.3% (9,946)
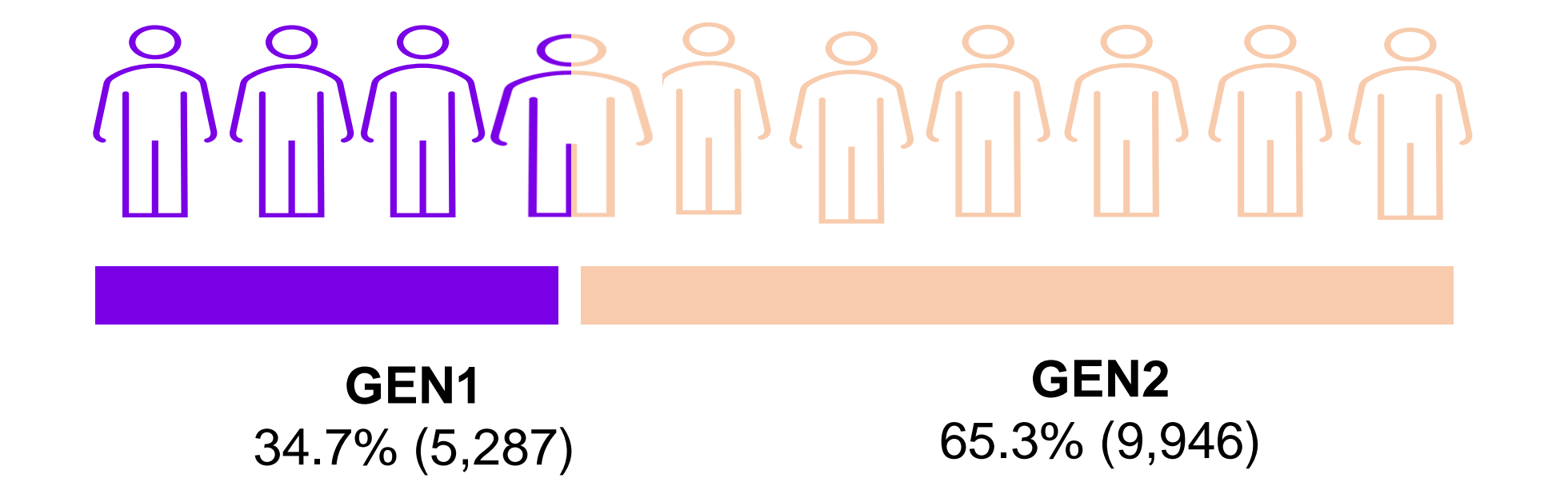
HISTORY OF HOSPITALISATIONS

- History of **TIDM-related admission**?

No
23.2% (3,538)

Yes
76.8% (11,695)

- History of admission for **hypoglycaemia**?

No
65.4% (9,968)

Yes
34.6% (5,265)

- History of admission for **diabetic ketoacidosis**?

No
67.6% (10,299)

Yes
32.4% (4,934)

RESULTS

MICRO-VASCULAR COMPLICATIONS

- History of **retinopathy**?

No
15.1% (2,308)

Yes
84.9% (12,925)

- History of **neuropathy**?

No
88.0% (13,402)

Yes
12.0% (1,831)

- History of **nephropathy**?

No
91.9% (13,994)

Yes
8.1% (1,239)

DISCUSSION

- Over three-quarters of the cohort (76.8%) had been previously hospitalised with a T1DM-related complication.
- Despite a mean duration from T1DM diagnosis to index of 18.7 years, at least 4 in 5 patients included in the study had a history of microvascular complications, with retinopathy being the most common (84.9%).
- Approximately 1 in 3 individuals with T1DM included in the analyses had experienced either diabetic ketoacidosis (DKA) or hypoglycaemia. Whilst DKA and hypoglycaemia are both serious but distinct acute complications of T1DM, they share common risk factors, one of which is poor glycemic control.
- The results suggest an unmet need in managing those with T1DM to identify the optimal time and reason to consider alternative BIA introduction.

CONCLUSION

The results suggests T1DM continues to place a significant burden on both patients and the healthcare system, even among those initiated on BIA. Within the contemporary management of T1DM, there is scope for technologies that can fundamentally alter the course of the disease, reducing both the cumulative lifetime burden of on patients and the overall cost to the healthcare system.

LIMITATION

Linkage between HES and CPRD results in loss of data since general practitioners included in CPRD do not fully overlap with secondary care settings in HES.

REFERENCES

1. Stedman M, Lunt M, Davies M, et al. Cost of hospital treatment of type 1 diabetes (T1DM) and type 2 diabetes (T2DM) compared to the non-diabetes population: a detailed economic evaluation. BMJ Open 2020;10:e033231. doi:10.1136/bmjopen-2019-033231

DISCLOSURES & CONTACT