

National Pregnancy in Diabetes (NPID) Audit Report 2020



England and Wales

14th October 2021



Information and technology
for better health and care

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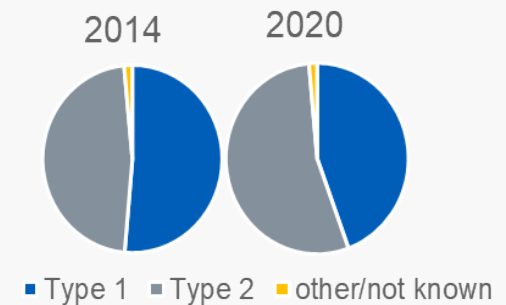
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National Pregnancy in Diabetes Audit, 2020

**Executive summary,
key findings
and recommendations**

Executive summary

- Women with type 2 diabetes now make up 54% of diabetes' pregnancies, compared to 47% in 2014. This represents a doubling in the proportion of pregnancies complicated by type 2 diabetes since the 2002-2003 CEMACH report¹ (27% type 2 diabetes). Targeted weight management services and diabetes prevention programmes better orientated to the growing numbers of younger women with early-onset type 2 diabetes (or previous gestational diabetes) are needed.
- Congenital anomalies are lowest in women with early pregnancy HbA1c ≤ 48 mmol/mol. There has been no improvement in the preparation for pregnancy over the past seven years, with seven out of eight women not prepared for pregnancy. Pregnancy preparation rates are lowest in women from the most deprived communities – only 6% of women with type 2 diabetes and 21% with type 1 diabetes living in deprived quintiles were prepared for pregnancy as per NICE guidelines. Interventions such as regional pre-pregnancy co-ordinators focused on enhanced provision of contraception and pregnancy preparation in women with diabetes from deprived communities are recommended.
- Perinatal deaths, preterm births, large for gestational age (LGA) birthweight and neonatal care admissions are all lowest in women with HbA1c < 43 mmol/mol after 24 weeks gestation, suggesting that lower HbA1c targets are associated with optimal neonatal outcomes in type 1 and type 2 diabetes. More data are needed to evaluate whether widening access to technologies such as Libre or continuous glucose monitoring will support optimal glucose levels during the second and third trimesters, especially among pregnant women with type 2 diabetes.



Key findings from NPID 2019 and 2020

- There are now more pregnancies in women with type 2 diabetes than in women with type 1 diabetes. Women with type 2 diabetes face additional healthcare inequalities and are frequently not prepared for pregnancy. They have reduced use of insulin and folic acid before pregnancy, and higher rates of perinatal deaths across all HbA1c categories between 43-80 mmol/mol after 24 weeks gestation. Stillbirths occurred more commonly in both large and small for gestational age babies in type 2 diabetes and in small for gestational age babies in type 1 diabetes.
- Despite the additional challenges of supporting women with diabetes during the COVID-19 pandemic, pregnancy outcomes are comparable in 2019 and 2020. Data on 4,540 pregnancies in 2020 are included, down only 325 from 2019 (4,865 in 2019).
- For women with diabetes, 98.8% of registered births (live and stillbirths) in 2019 and 2020 were live births, compared with 99.6% of registered births in the 2019 general maternity population.
- An early pregnancy HbA1c of ≤ 48 mmol/mol is associated with lower rates of congenital anomaly and perinatal death but is achieved only in a minority of women with diabetes, and is least likely in women who live in deprived areas. For women with type 1 and type 2 diabetes, a HbA1c of > 43 mmol/mol after 24 weeks gestation is associated with increased perinatal death.
- Preterm births, large for gestational age (LGA) birthweight and neonatal care admissions are all lower in women with HbA1c < 43 mmol/mol after 24 weeks gestation.

Recommendations

1. Dedicated pre-pregnancy co-ordinators focused on enhanced provision of contraception and support for pregnancy preparation are recommended to improve glycaemic management and 5mg folic acid supplementation before pregnancy, especially in women with type 1 and type 2 diabetes, living in the most deprived regions.
2. We found fewer preterm births, large for gestational age (LGA) birthweight, neonatal care admissions and perinatal deaths in women with HbA1c <43mmol/mol from 24 weeks gestation, both in the current 2019-2020 and recent datasets*. NICE guidelines [NG3 Diabetes in pregnancy: management from preconception to the postnatal period], recommend use of continuous glucose monitoring (CGM) in type 1 diabetes. Data are now needed to evaluate whether Libre or CGM use will improve glucose levels, target HbA1c attainment and neonatal health outcomes in pregnant women with type 2 diabetes.
3. Access to structured education, weight management and diabetes prevention programmes for women with previous gestational and early-onset type 2 diabetes should be prioritised.

**Characteristics and outcomes of pregnant women with type 1 and type 2 diabetes: national population based 5-year cohort study The Lancet Diabetes Endocrinol. 2021;9(3):153-164*

National Pregnancy in Diabetes Audit, 2020

Introduction

The National Pregnancy in Diabetes Audit (NPID)

NPID measures the quality of antenatal care and pregnancy outcomes for women with pre-gestational diabetes. It is intended to support local, regional and national quality improvement. The audit has been running since 2014 and is a continuous data collection.

NPID addresses three high level audit questions:

1. Were women with diabetes adequately prepared for pregnancy?
2. Were appropriate steps taken during pregnancy to minimise adverse outcomes to the mother?
3. Were adverse neonatal outcomes minimised?



Data are submitted by antenatal diabetes services in England, Wales and the Isle of Man. Data are collected in England under the direction of NHS England. In Wales and the Isle of Man women consent for their data to be included in the audit.

NPID is part of the National Diabetes Audit (NDA). To reduce the burden of data collection, NPID data is linked to NDA data, Hospital Episode Statistics (HES) / Patient Episode Database for Wales (PEDW), the National Neonatal Research Database (NNRD) and the Maternity Services Dataset (MSDS).

Audit participation

Many thanks are due to all diabetes pregnancy healthcare professionals who contributed data, despite extenuating circumstances, during the NHS COVID-19 pressures from March 2020-2021.

Service participation in 2019

- 172 services submitted data on pregnancies with a recorded outcome in 2019
- 9 services submitted data to the audit for the first time in 2019
- 3 services, that submitted ten or more records in 2018 and had not closed, did not participate in 2019



Service participation in 2020

- 162 services submitted data on pregnancies with a recorded outcome in 2020
- 6 services submitted data to the audit for the first time in 2020
- 5 services, that submitted ten or more records in 2019 and had not closed, did not participate in 2020

Record volumes 2019 and 2020

- There were 325 (6.7%) fewer pregnancies among women with diabetes recorded in 2020, compared to 2019, which could reflect COVID-19 related reporting challenges or fewer conceptions in 2020.

Table 1: Numbers of women, pregnancies and outcomes, 2019 and 2020

	Pregnancies ending in 2019				Pregnancies ending in 2020			
	All diabetes	Type 1 diabetes	Type 2 diabetes	Other diabetes ^a	All diabetes	Type 1 diabetes	Type 2 diabetes	Other diabetes ^a
Women	4,845	2,150	2,615	80	4,525	2,010	2,445	70
Pregnancies ^b	4,865	2,160	2,630	80	4,540	2,015	2,455	70
Total pregnancy outcomes ^c	4,925	2,180	2,670	80	4,595	2,035	2,490	70
Pregnancies ongoing after 24 weeks	4,355	1,935	2,345	75	4,060	1,830	2,170	60
Miscarriages	440	185	250	5	425	155	260	10
Live births after 24 weeks	4,345	1,915	2,355	75	4,060	1,825	2,175	60
Stillbirths	60	35	25	0	45	20	25	0
Total infants born after 24 weeks	4,400	1,950	2,380	75	4,105	1,845	2,200	60
Live births with gestation unknown	5	5	5	0	5	0	5	0
Live births before 24 weeks	5	5	5	0	5	5	5	0
Neonatal deaths	50	25	25	0	55	20	35	0
Congenital anomalies	200	95	100	5	170	85	85	5
Total registered births	4,410	1,950	2,385	75	4,110	1,845	2,205	60

^a Diabetes type not specified, Maturity Onset Diabetes of the Young (MODY) or 'other' diabetes type

^b 15 women in 2020 and 20 in 2019 had two pregnancies recorded

^c 55 twin or triplet pregnancies were recorded in 2020 and 60 in 2019

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Characteristics of women



Demographics

- Women with type 2 diabetes now make up 54% of pregnancies, compared to 47% in 2014
- Women with type 2 diabetes are older, have a shorter duration of diabetes and higher BMI than women with type 1 diabetes

Table 2: Median age, duration of diabetes and BMI by diabetes type, 2019 and 2020

	Type 1 diabetes		Type 2 diabetes	
	Median	(10th-90th centile)	Median	(10th-90th centile)
Age at end of pregnancy (years)	30	(22 - 37)	34	(27 - 41)
Diabetes duration, years	14	(3 - 25)	3	(0 - 10)
BMI at booking (kg/m ²)	26.0	(21.2 - 34.0)	32.7	(24.8 - 42.7)

- Women with type 2 diabetes are more likely to come from a deprived area and/or be of minority ethnicity

Figure 1: Ethnicity by diabetes type, 2020

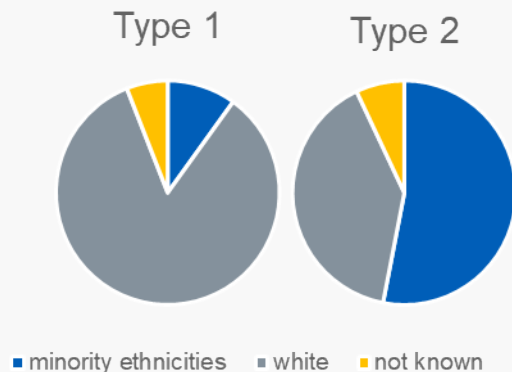
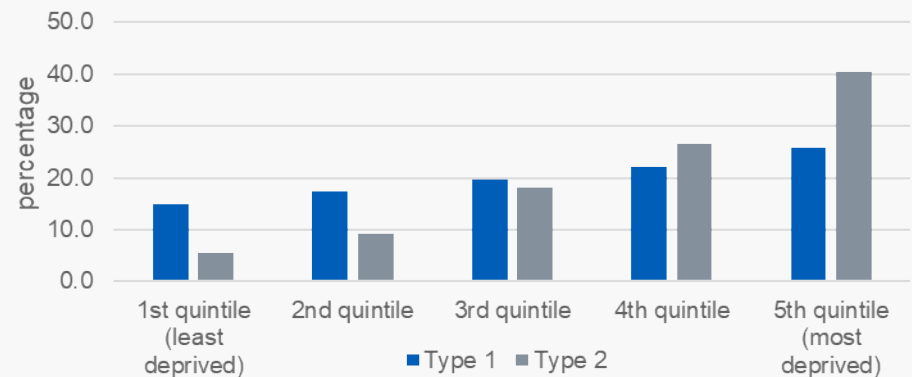


Figure 2: Deprivation by diabetes type, 2020



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Audit Question 1: Were women with diabetes adequately prepared for pregnancy?

"It is deeply concerning that so few women are well prepared for pregnancy. A real step-change is needed here, with better systems and a coordinated effort both between primary and secondary health care providers and between diabetes and maternity teams. All women with diabetes between the ages of 15-50 years should be offered access to safe, effective contraception"



Early pregnancy HbA1c and serious adverse outcomes (congenital anomaly & perinatal death)

- Rates of major congenital anomaly were lowest in women with early pregnancy HbA1c ≤ 48 mmol/mol
- Rates of serious adverse outcomes (congenital anomaly and perinatal death) were lowest in women with early pregnancy HbA1c ≤ 48 mmol/mol and highest with HbA1c > 86 mmol/mol

Figure 3: Congenital anomaly^a, by diabetes type and early pregnancy HbA1c

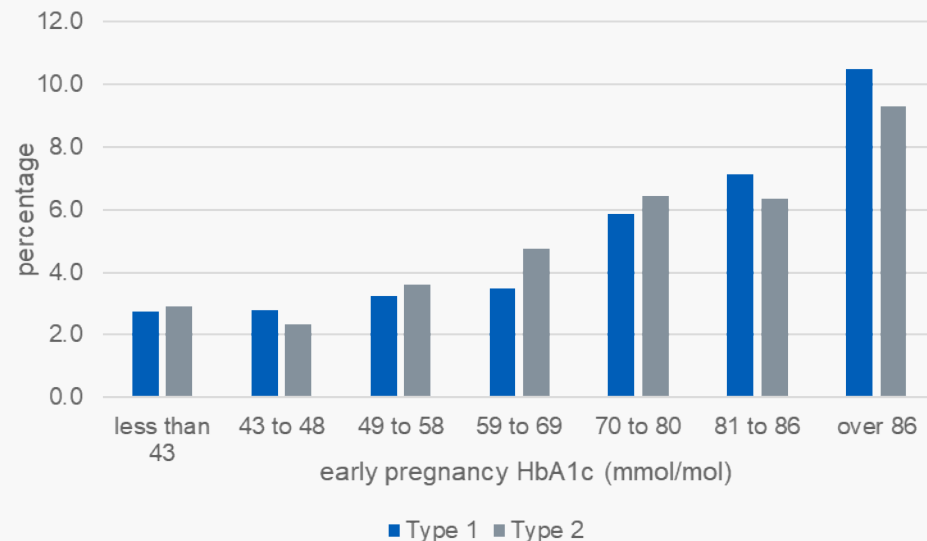
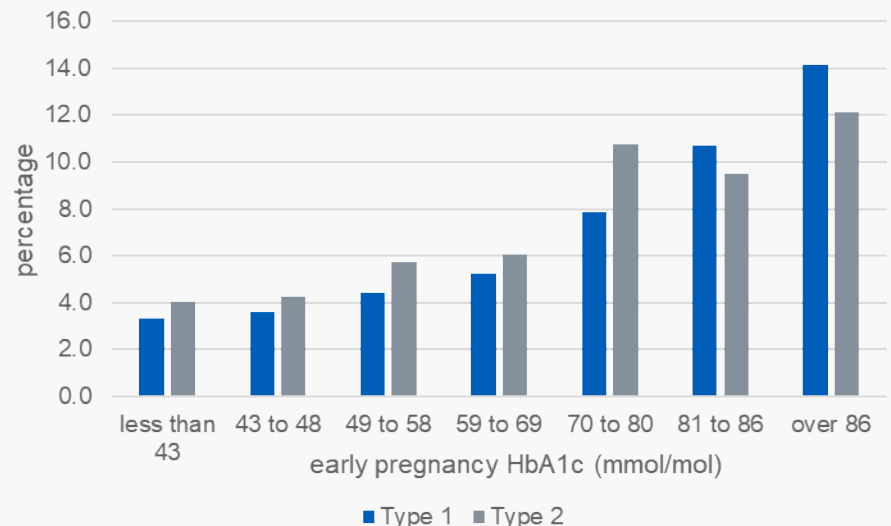


Figure 4: Serious adverse outcome^a by diabetes type and early pregnancy HbA1c



^a Includes all pregnancies during 2014-2020 with singleton live births and terminations at any gestation, stillbirths and miscarriages after 20 weeks.

Preparation for pregnancy 2014 to 2020

- Overall seven out of eight women were not well prepared for pregnancy and this proportion has remained unchanged over the past seven years
- Current approaches to pregnancy preparation are not working for most women with diabetes, particularly Black women and women living in more deprived communities

Figure 6: Percentage of women who were well prepared for pregnancy by deprivation quintile

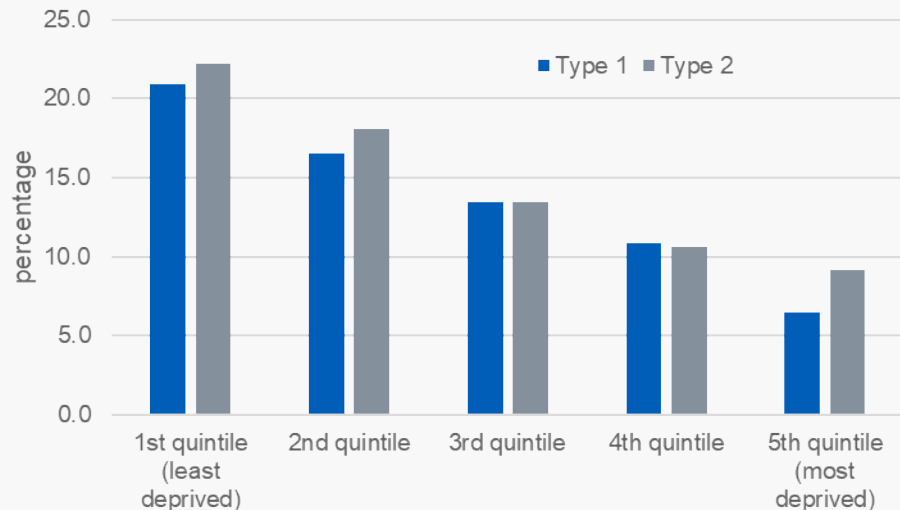


Figure 5: Percentage of women who were well prepared for pregnancy by audit year

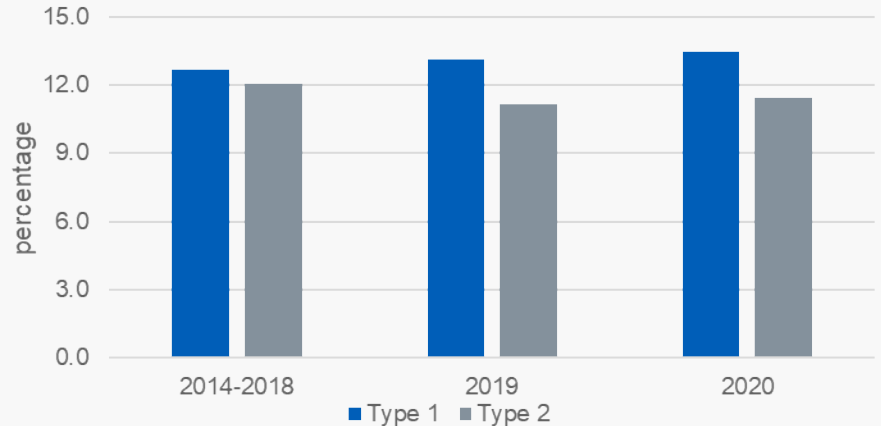
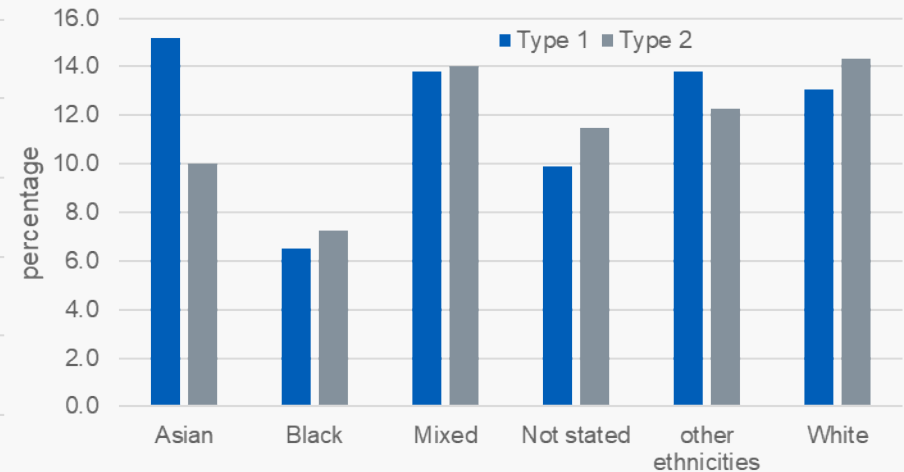


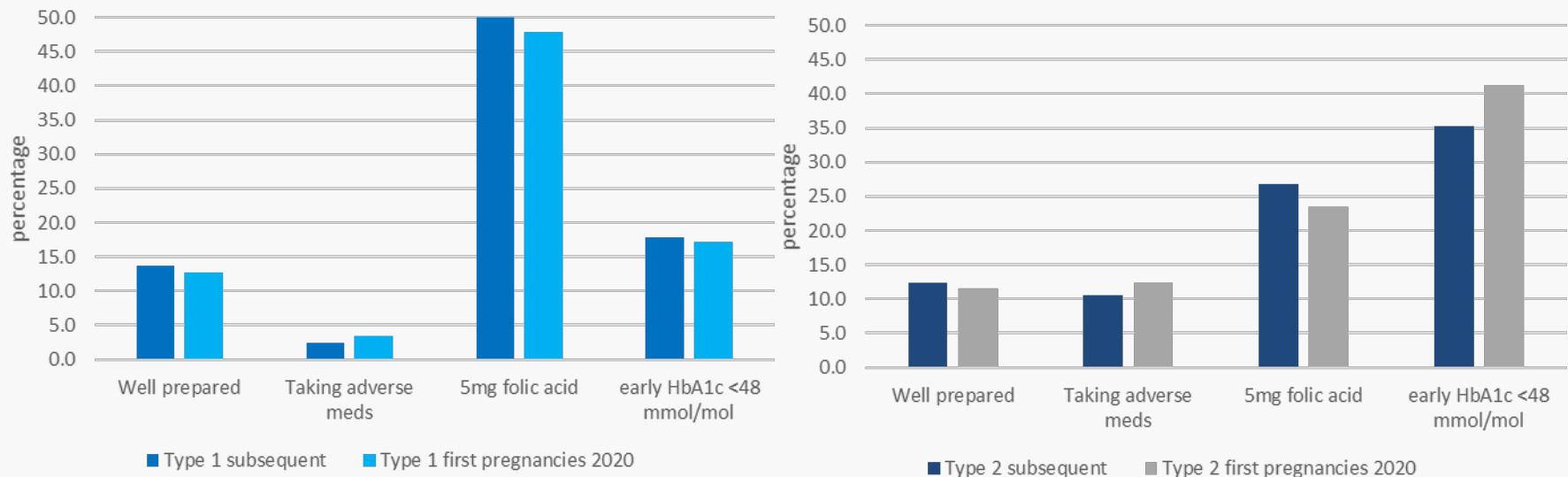
Figure 7: Percentage of women who were well prepared for pregnancy by ethnicity



Preparation for second/subsequent pregnancies

- We compared pregnancy preparation in pregnancies known to be second or subsequent pregnancies in NPID (4,780 pregnancies) with first pregnancies in NPID ending in 2020^a (3,305 pregnancies)
- There was no overall improvement in pregnancy preparation between first and subsequent pregnancies, further emphasising that current healthcare system approaches are not working for most women with type 1 and type 2 diabetes
- In type 2 diabetes pregnancies there are higher levels of 5mg folic acid supplementation but lower rates of target HbA1c attainment in subsequent pregnancies, compared to first pregnancies

Figure 8: Percentage of women who had first trimester HbA1c less than 48 mmol/mol, had taken 5mg folic acid and were not on adverse medication in second/subsequent pregnancies 2014 to 2020 compared to first pregnancies 2020^a, by diabetes type



Longitudinal trends in early pregnancy HbA1c, 5mg folic acid and use of potentially harmful medications 2014 to 2020

- There are no changes in pregnancy preparation with widespread above target HbA1c, low rates of folic acid supplementation and up to 12% of women taking potentially harmful medications
- Pregnancy preparation in women with type 1 and type 2 diabetes has not improved for the past seven years

Figure 9: Percentage of pregnancies with early HbA1c less than 48 mmol/mol

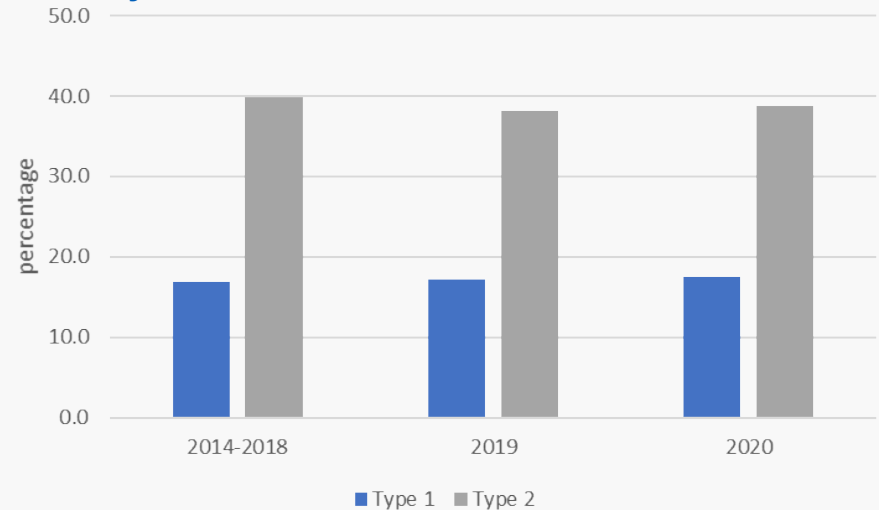


Figure 10: Percentage of women who were taking statins or ACE* inhibitors/ARB*s, or who were on adverse diabetes medication at LMP*

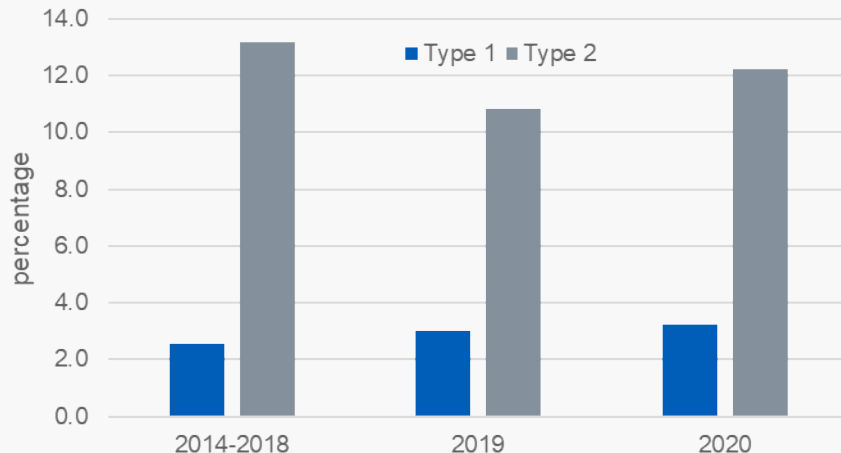
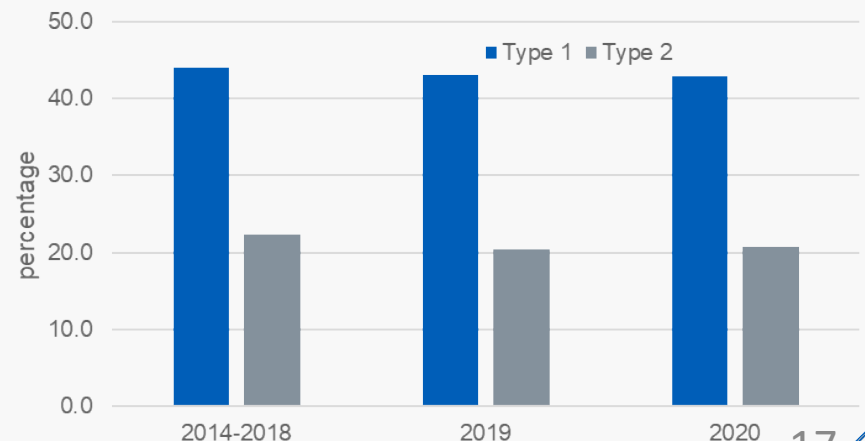


Figure 11: Percentage of pregnancies where 5mg folic acid was taken prior to LMP



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Audit Question 2: Were appropriate steps taken during pregnancy to minimise adverse outcomes to the mother?

"We cannot underestimate the challenges of providing pregnancy care and support for women with diabetes during the COVID-19 pandemic and are grateful for the work services have put into caring for women with diabetes. But reflecting on experiences of being pregnant both before and during COVID-19, the care feels really different and more fragmented. We are concerned that women are missing out on necessary checks and support".

Trends in hypoglycaemia and diabetic ketoacidosis (DKA)

- There are an increasing proportion of pregnancies with at least one antenatal hospital episode of hypoglycaemia, both in women with type 1 and in women with type 2 diabetes
- In 2019, 3.2% of pregnant women with type 1 diabetes experienced at least one antenatal hospital episode of DKA

Figure 12: Percentage of pregnancies with at least one hospital episode with diagnosed hypoglycaemia^a during pregnancy, 2014-2019

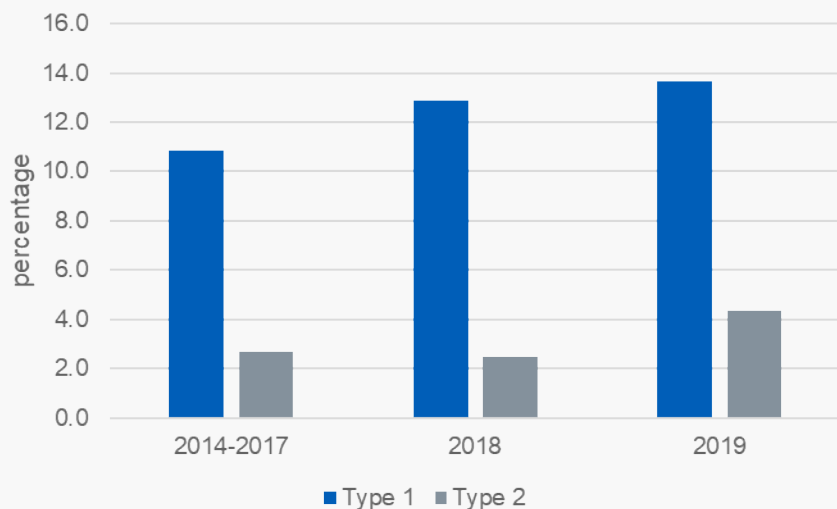
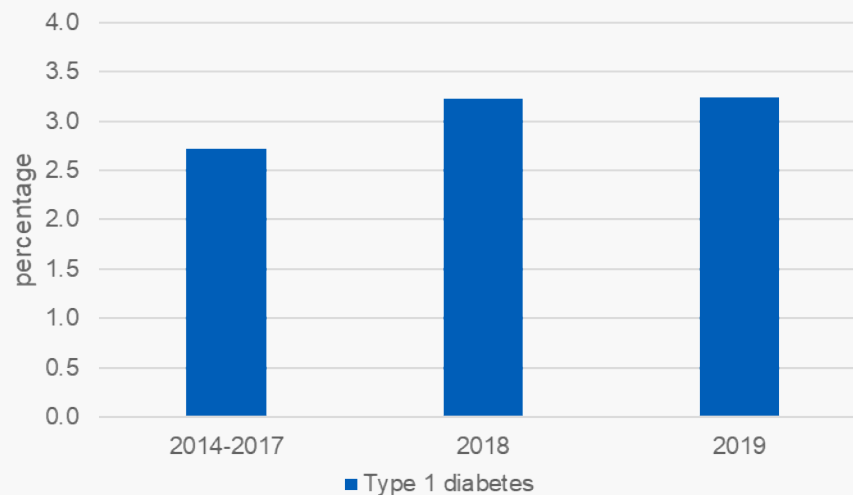


Figure 13: Percentage of pregnancies with at least one hospital episode with diagnosed DKA^a during pregnancy, 2014-2019



^aThese measures use linked HES/PEDW data. The latest available HES/PEDW dataset is for 2019/20 meaning that 2020 pregnancies cannot be linked

Type 1 diabetes: Glycaemia and antenatal admissions with hypoglycaemia or DKA in pump or MDI users

- Women using insulin pumps were more likely than those using multiple daily injections (MDI) to achieve target glycaemia in early and in late pregnancy
- There were no differences in antenatal hospital episodes of DKA or hypoglycaemia between insulin pump and MDI users

Figure 14: Percentage of pregnancies with HbA1c<48 mmol/mol, by pump/MDI use, type 1 diabetes, 2019 and 2020

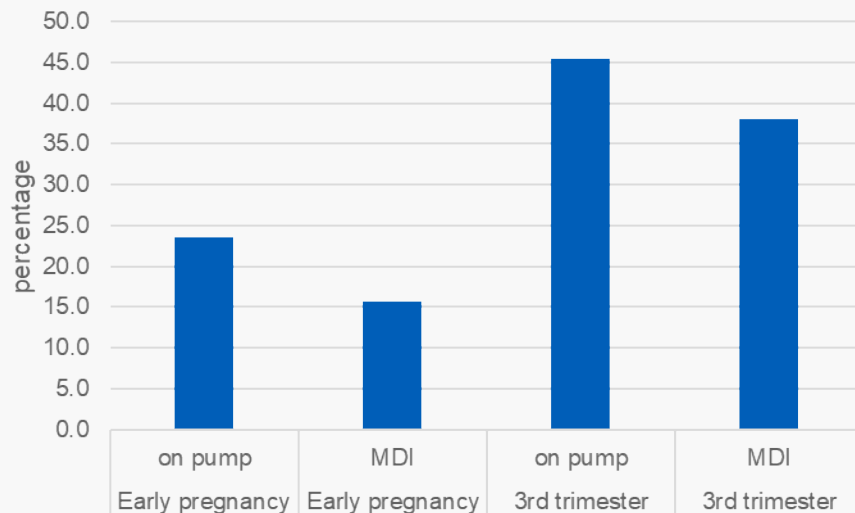
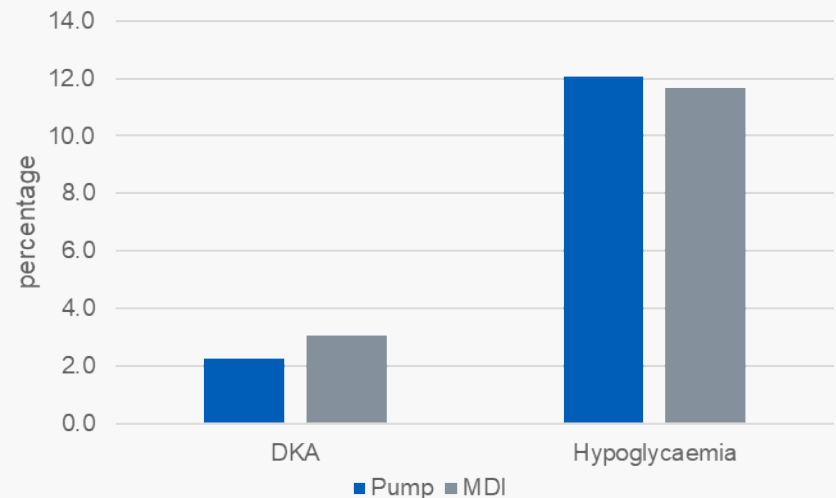


Figure 15: Percentage of pregnancies admitted for DKA^a or hypoglycaemia^a, by pump/MDI use, type 1 diabetes, 2014 to 2019

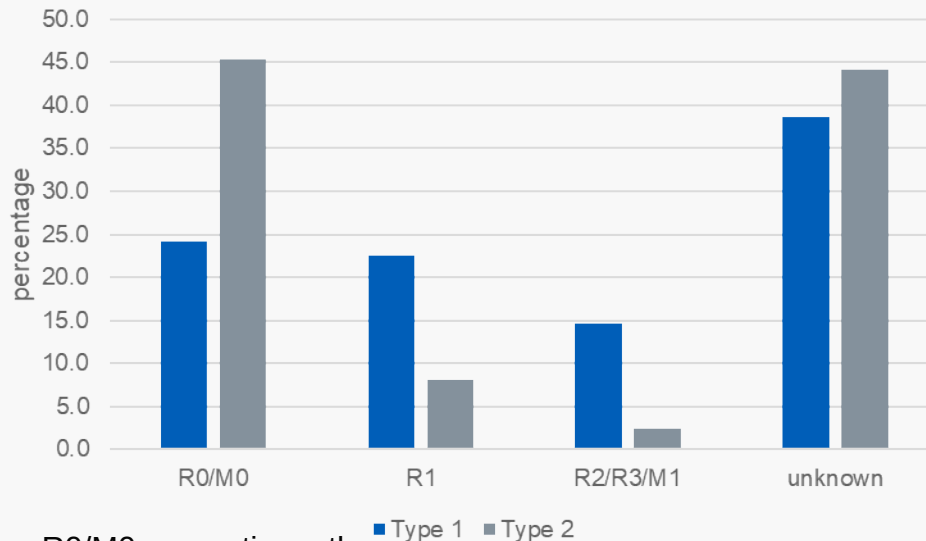


^aThese measures use linked HES/PEDW data. The latest available HES/PEDW dataset is for 2019/20 meaning that 2020 pregnancies cannot be linked

Retinopathy and renal status

- Retinal and renal data was available for 61.4% and 80.0% of women with type 1 diabetes and 55.8% and 75.5% of women with type 2 diabetes respectively
- 37.2% of women with type 1 diabetes and 10.5% of women with type 2 diabetes had retinopathy with moderate to severe retinal disease in 14.6% of women with type 1 diabetes
- 8.1% of women with type 1 and 3.6% with type 2 diabetes had some renal impairment

Figure 16: Percentage of pregnancies by retinal status, 2014-2020

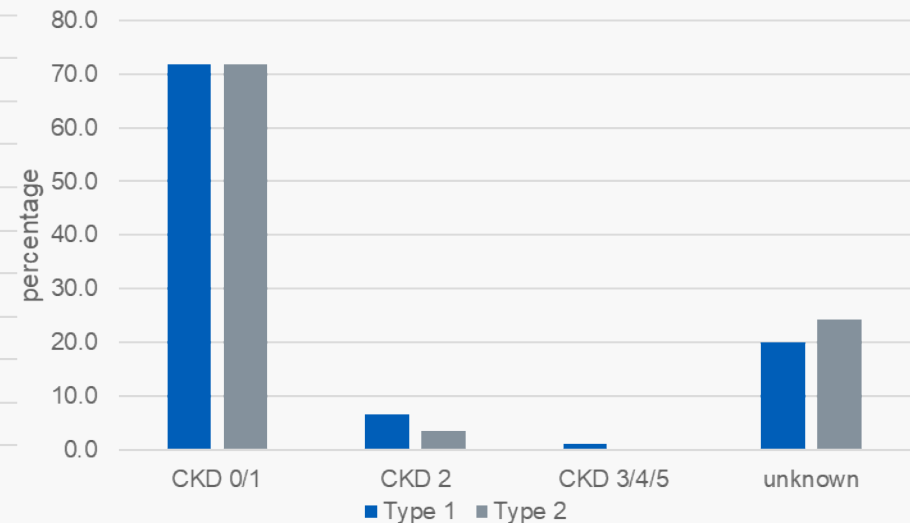


R0/M0 – no retinopathy

R1 – mild retinopathy

R2/R3/M1 – severe retinopathy

Figure 17: Percentage of pregnancies by renal status, 2014-2020



CKD 0/1– no renal impairment

CKD 2 – mild renal impairment

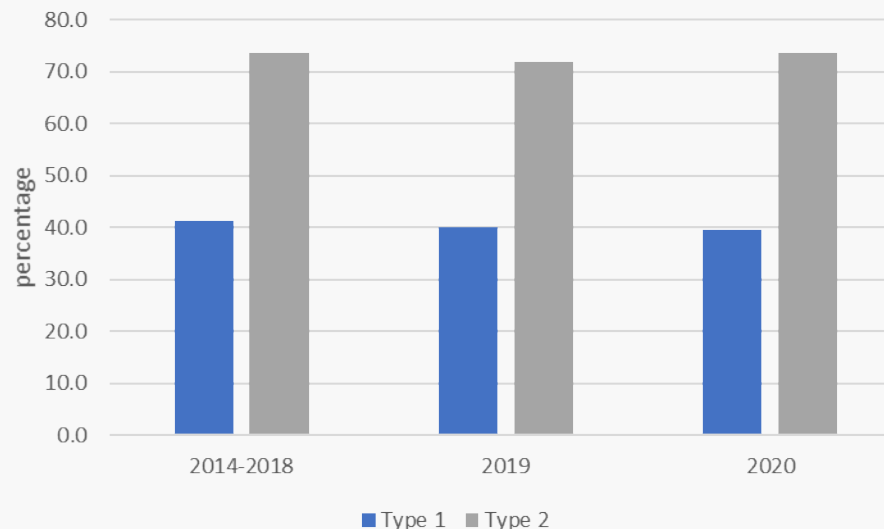
CKD 3/4/5– severe renal impairment



HbA1c in late pregnancy

- HbA1c is a key marker for obstetric and neonatal risk
- For both type 1 and type 2 diabetes, the percentage of pregnancies with late pregnancy HbA1c less than 48 mmol/mol has not changed over the past seven years
- Freestyle Libre was widely available to women with type 1 diabetes in 2020 but we did not start data collection on which women used Libre or Continuous Glucose Monitoring (CGM) until 2021

Figure 18: Percentage of pregnancies where third trimester HbA_{1c} was less than 48 mmol/mol, 2014 to 2020



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Audit Question 3: Were adverse neonatal outcomes minimised?

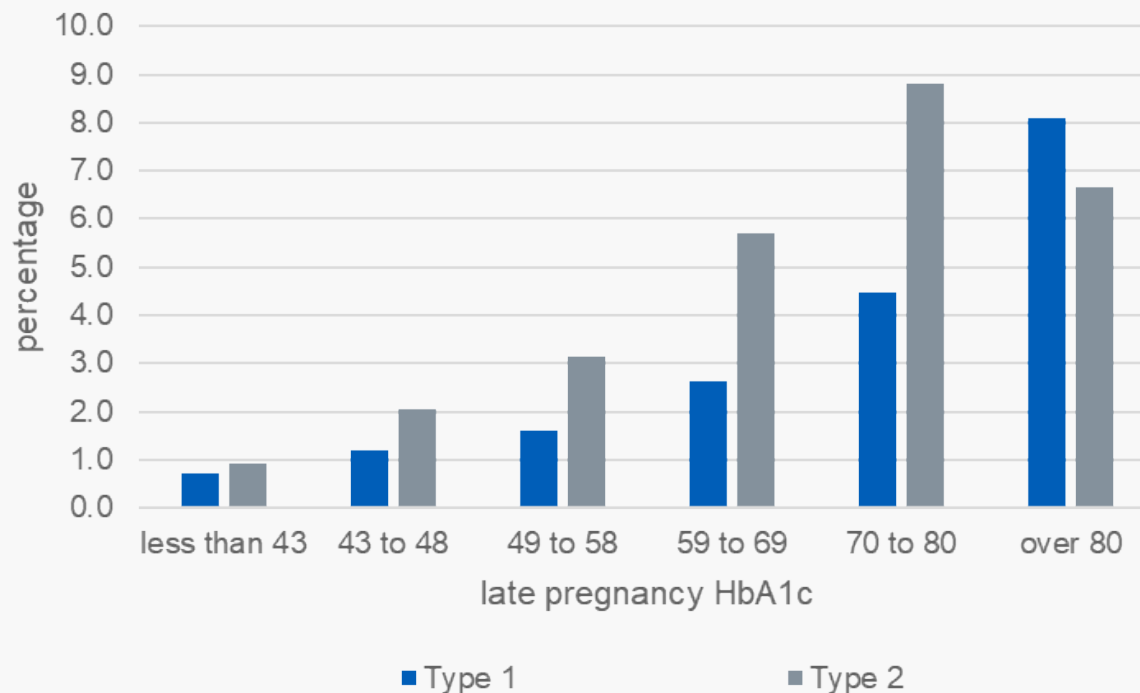
"We are extremely worried that even pre-pandemic, outcomes for women and babies haven't improved since 2014. We welcome the national roll out of CGM for women with type 1 diabetes and look forward to seeing the impact this has on outcomes for women and their babies".



Late Pregnancy HbA1c and Perinatal deaths

- Perinatal deaths increased with higher HbA1c in late pregnancy
- Perinatal deaths were lowest in pregnancies with late HbA1c <43mmol/mol^a

Figure 19: Percentage of singleton births where there was a perinatal death, by diabetes type and late pregnancy HbA1c, 2014-2020



^a The 2008 NICE guidelines recommended aiming for HbA1c below 43 mmol/L. The number of pregnancies where late pregnancy HbA1c is over 86 mmol/mol is too small for reliable calculation. Therefore all values over 80 mmol/mol are grouped together.

Were neonatal complications minimised?

- Preterm births, large for gestational age (LGA) and neonatal care admissions increased with higher HbA1c in late pregnancy
- Preterm births, LGA and neonatal care admissions were lowest in pregnancies with late HbA1c <43mmol/mol

Figure 20: Percentage of babies admitted to neonatal care

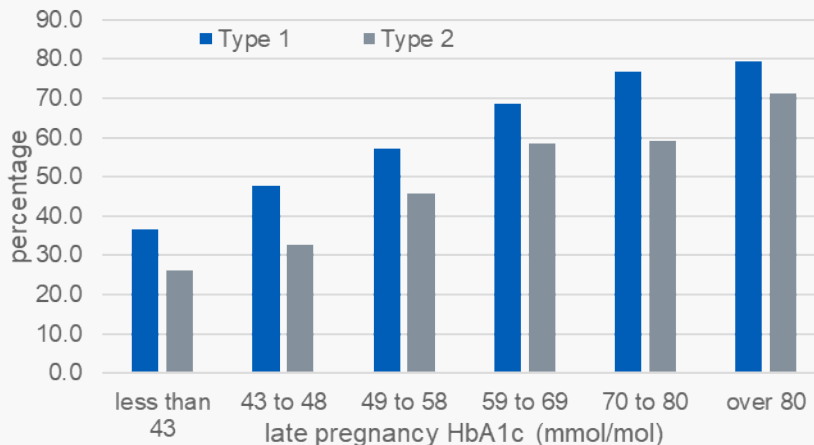


Figure 21: Percentage of preterm live births before 37 weeks

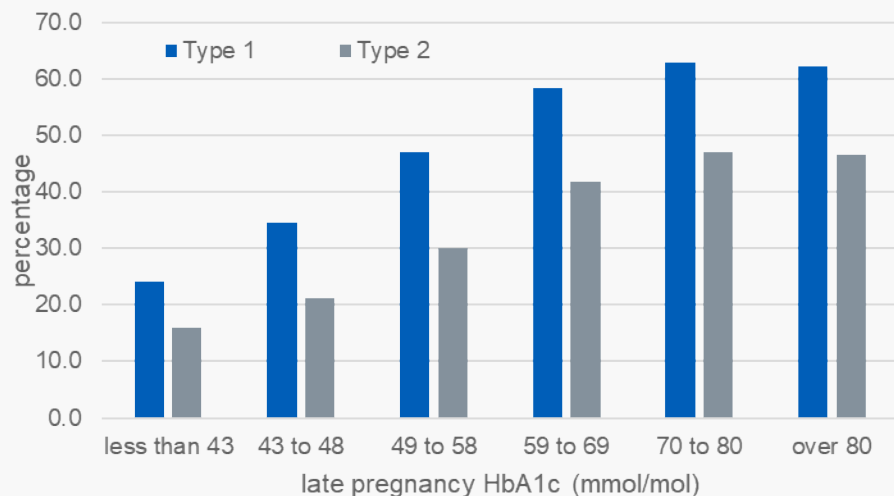
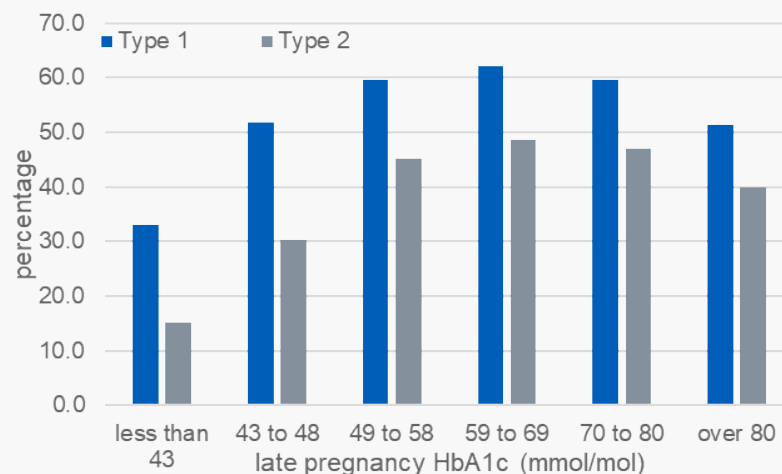


Figure 22: Percentage of large for gestational age babies



Preterm births and method of delivery

- The median gestational age at delivery was 37⁺⁰ in type 1 and 37⁺⁵ in type 2 diabetes
- The proportion of vaginal deliveries increased weekly between 37-39 weeks in type 1 and 35-38 in type 2
- Almost all deliveries occurred by 39 weeks in both type 1 and type 2 diabetes

Figure 23: Percentage of live and stillbirths by diabetes type and gestation at delivery, 2019-2020

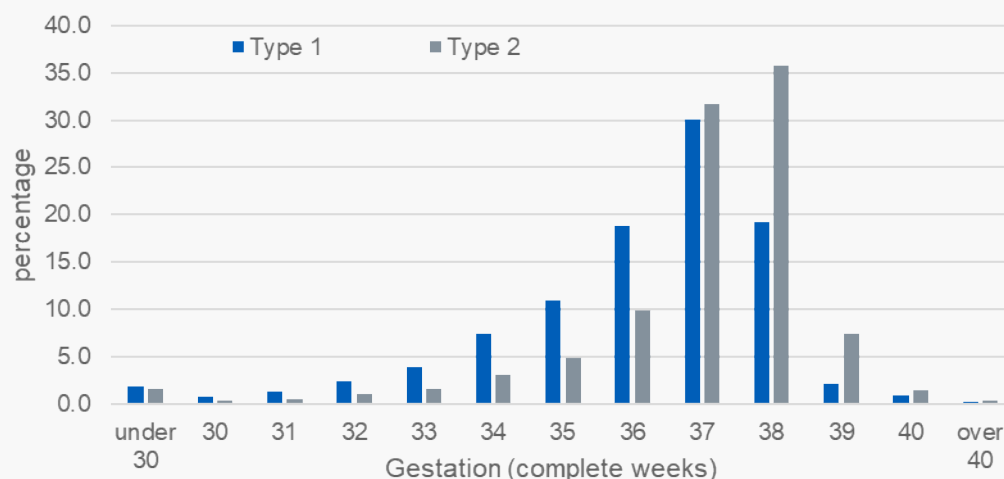
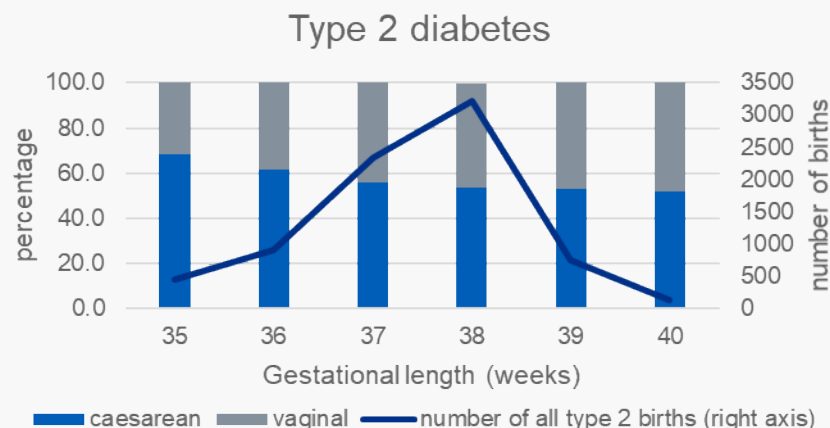
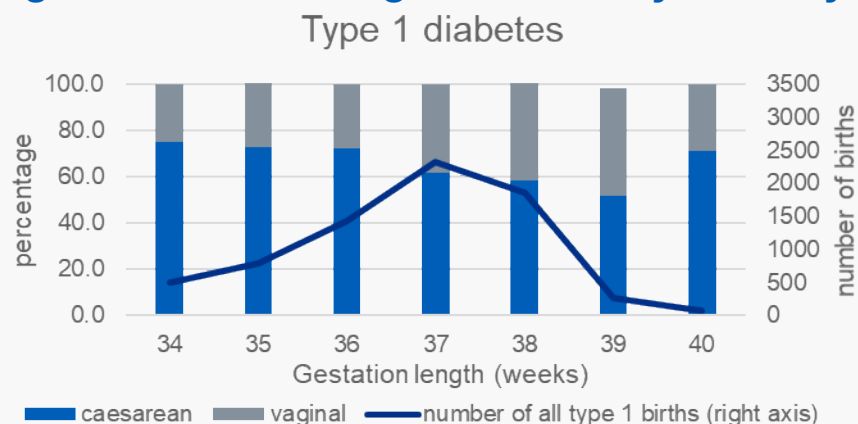


Figure 24: Percentage of births by delivery method^a, gestation and diabetes type, 2014-2019



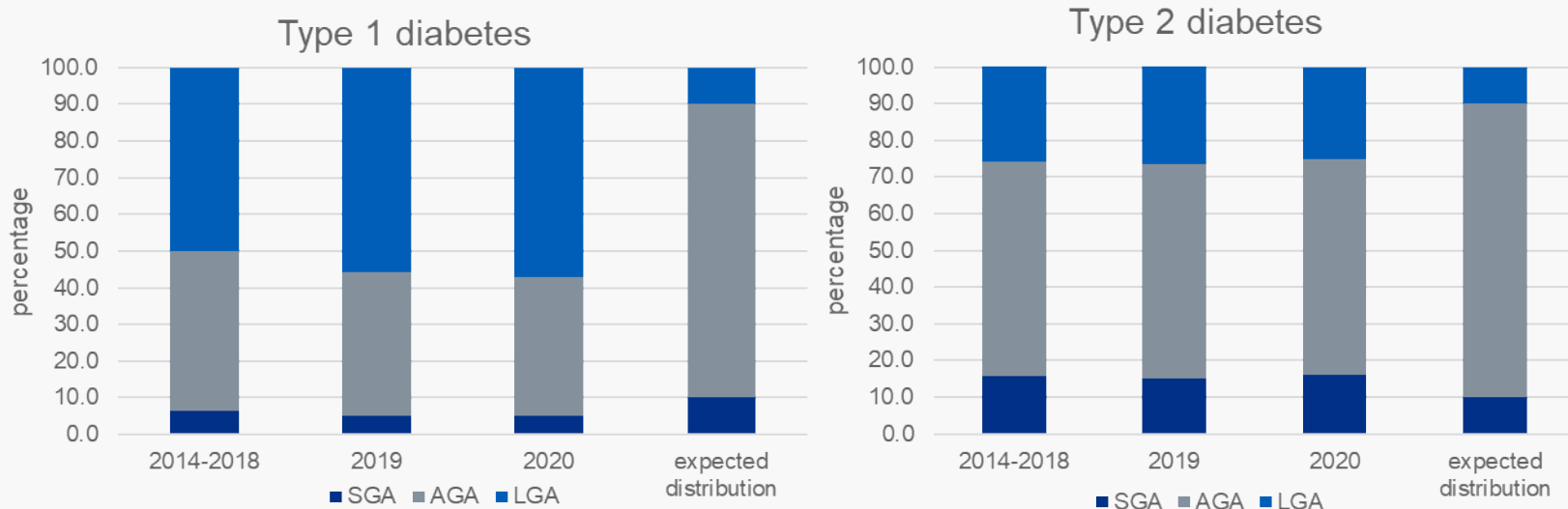
^aThese measures use linked HES/PEDW data. The latest available HES/PEDW dataset is for 2019/20 meaning that 2020 pregnancies cannot be linked

Large and small for gestational age babies

- 57% of type 1 and 25% of type 2 babies were LGA (using Gestation Related Optimal Weight (GROW) centiles)
- LGA rates are high and increasing in type 1 diabetes
- SGA rates are higher in type 2 diabetes

GROW centiles adjust birthweight for maternal ethnicity, height, weight and gestational age at delivery.

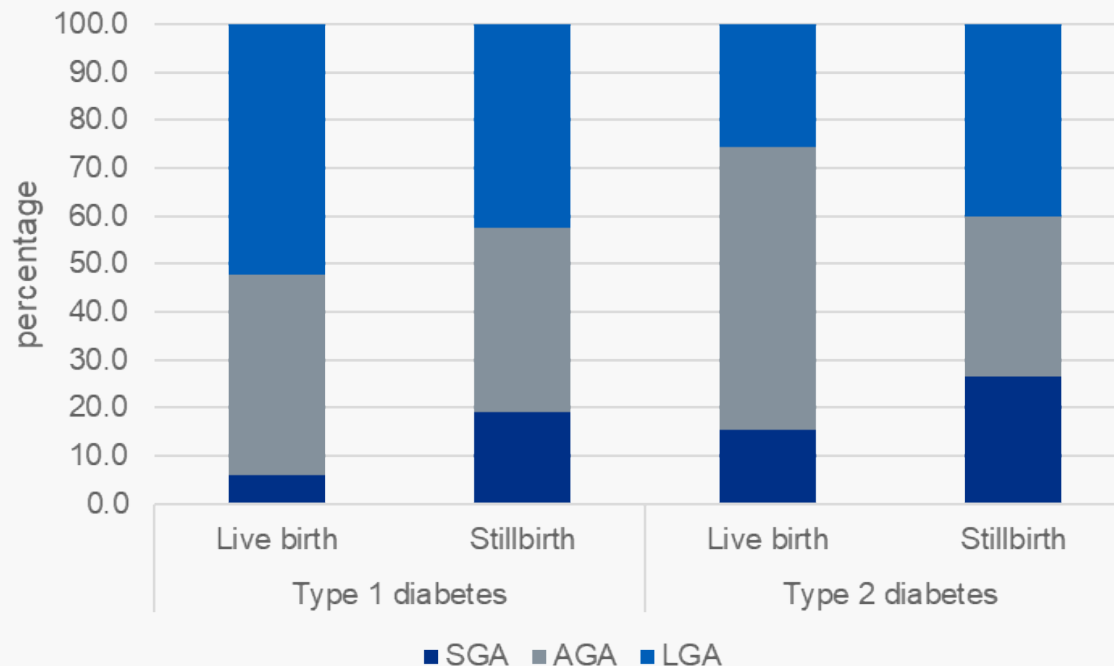
Figure 25: Large for Gestational Age (LGA), Appropriate for Gestational Age (AGA) and Small for Gestational Age (SGA) infants by diabetes Type, 2014-20



Stillbirth and birthweight

- SGA babies were more common in stillbirths than in live births (19.2% vs 5.9% type 1, 26.7% vs 15.5% type 2) in both types of diabetes
- LGA babies were less common in stillbirths than in live births (42.3% vs 52.2%), among women with type 1 diabetes
- LGA babies were more common in stillbirths than in livebirths in type 2 diabetes (40.0% vs 25.7%)

Figure 26: Large for Gestational Age (LGA), Appropriate for Gestational Age (AGA) and Small for Gestational Age (SGA) infants by diabetes type and whether live or stillborn, 2014-20



Type 1 diabetes: Late pregnancy HbA1c and neonatal complications in pump and MDI users

- Late pregnancy HbA1c levels were lower among women using insulin pumps compared to multiple daily injections (MDI) from early pregnancy
- Preterm births, large for gestational age and neonatal care admissions were lowest in pregnancies with HbA1c <43mmol/mol

Figure 27: Percentage of babies admitted to neonatal care by late HbA1c and pump vs MDI use

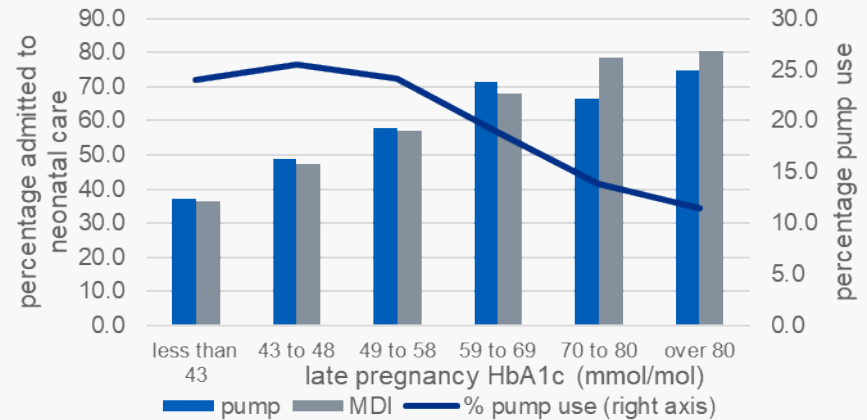


Figure 28: Percentage live preterm births before 37 weeks by late HbA1c and pump vs MDI use

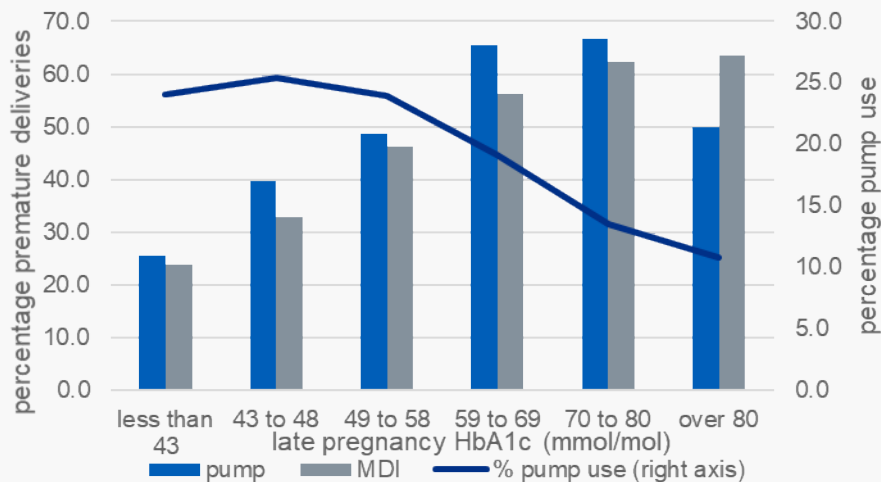
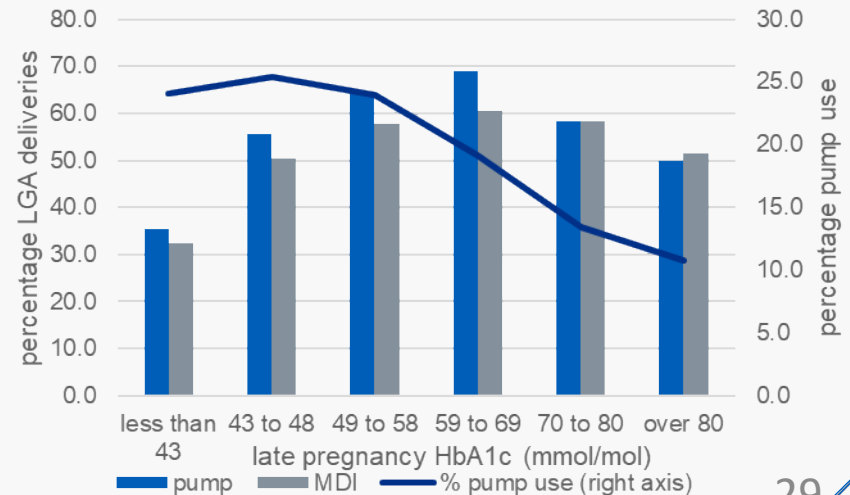


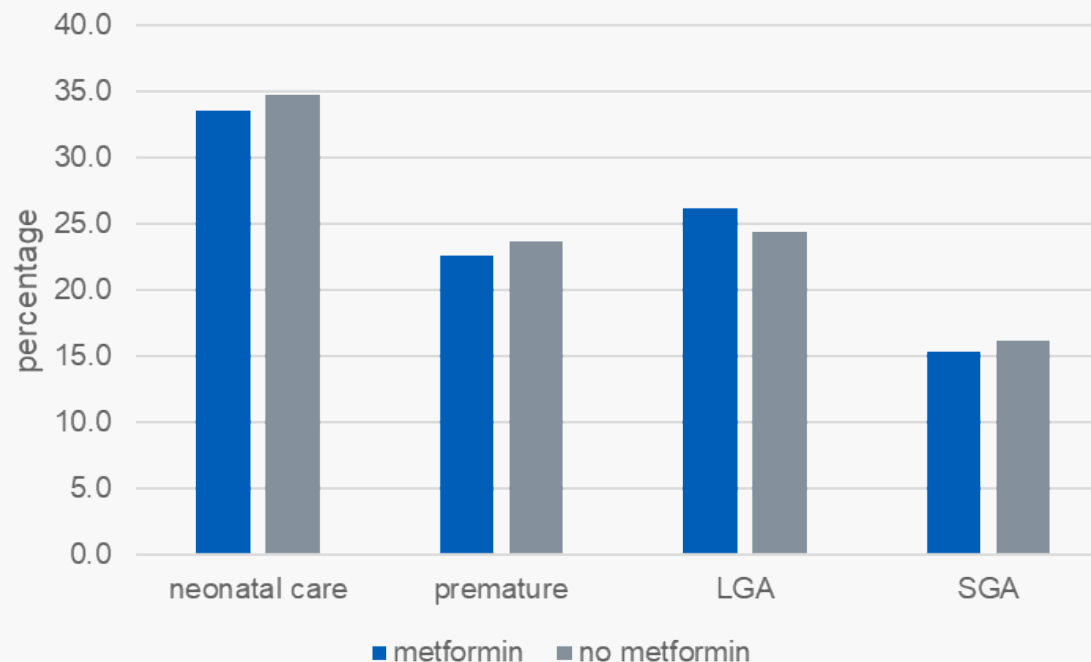
Figure 29: Percentage of babies born large for gestational age by late HbA1c and pump vs MDI use



Type 2 diabetes: Neonatal complications in women using metformin in early pregnancy

- There was no evidence for increased preterm births, SGA or neonatal care admissions in babies of mothers who used metformin at the time of booking (first contact)
- We found no obvious benefits or harms associated with the use of metformin in early pregnancy (<20 weeks)

Figure 30: Type 2 diabetes: Percentage of obstetric and neonatal outcomes by use of metformin in early pregnancy, 2014-2020



Data are lacking on whether metformin use continued or was started during pregnancy

Admissions to neonatal care unit

- 51% of singleton infants born to women with type 1, and 31% of those born to women with type 2 diabetes were admitted to neonatal care in 2020
- These percentages have not changed over the last seven years
- The median length of stay in neonatal care units was slightly shorter for babies born to women with type 2 diabetes (5 days), than those born to women with type 1 diabetes (6 days)

Figure 31: Percentage of live births where there was an admission to a neonatal unit, by diabetes type, 2014-2020^a

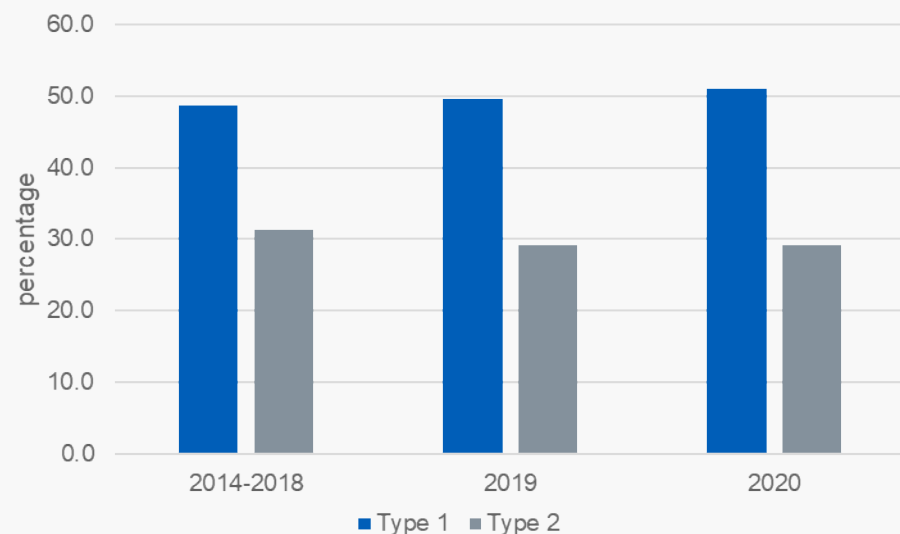


Table 3: Median length of stay in neonatal care, by diabetes type, 2014-2020^a

Diabetes Type	number of infants	MEDIAN length of stay	lower quartile	upper quartile
1	6300	6	3	12
2	4195	5	2	11

^aFigures use data from the National Neonatal Research Database (NNRD)

National Pregnancy in Diabetes Audit 2020

**Additional
information,
appendices and
references**



Maternal characteristics by diabetes type

Table A1: maternal characteristics, 2019 and 2020

	Type 1 Diabetes (10th to 90th centile)	Type 2 Diabetes (10th to 90th centile)
Age at end of pregnancy, years	n= 4,175	n= 5,085
median (10th - 90th centile)	30 (22 - 37)	34 (27 - 41)
Ethnicity - percentage in each ethnic group	n= 4,160	n= 4,730
White	85.2	40.6
Mixed	1.4	2.4
Asian	4.2	38.2
Black	2.6	9.7
Other	1.3	2.9
Not stated/not known	5.3	6.2
Social deprivation - percentage in each quintile	n= 4,105	n= 4,675
1st quintile (least deprived)	15.0	5.8
2nd quintile	17.7	10.1
3rd quintile	19.7	17.3
4th quintile	22.2	26.4
5th quintile (most deprived)	25.5	40.3
Weight	n= 4,175	n= 5,085
Weight at booking (kg)		
median (10th - 90th centile)	70 (56 - 94)	86 (62 - 118)
BMI at booking, kg/m2	n= 4,175	n= 5,085
median (10th - 90th centile)	26 (21.2 - 34)	33 (24.8 - 42.7)
percentage by category		
BMI < 25	42.2	10.5
BMI 25 to < 30	33.9	24.1
BMI ≥ 30	24.0	65.3

Pregnancies ending in 2019 and 2020

Socio-economic gradient by ethnicity

Figure A1: Percentage of NPID pregnancies in each deprivation quintile by ethnicity, all diabetes Types, 2020

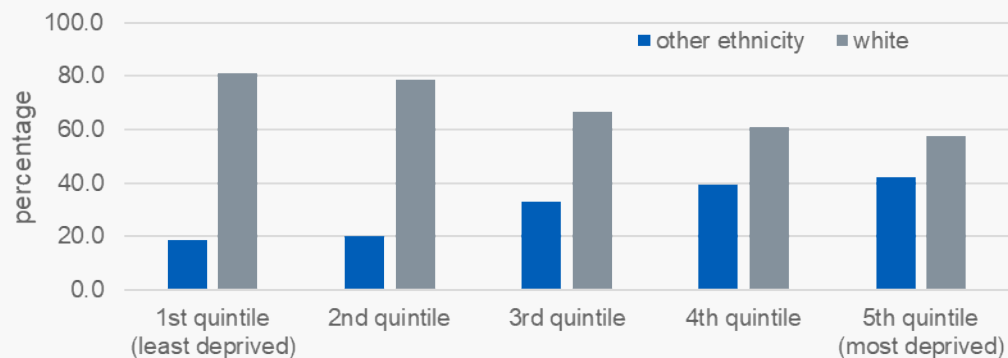
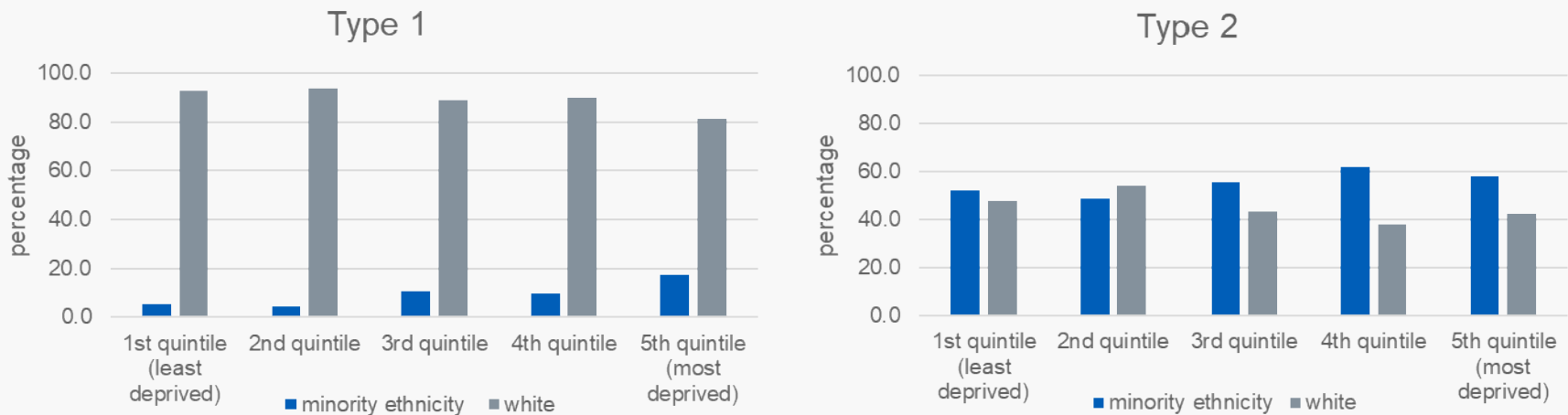


Figure A2: Percentage of NPID pregnancies in each deprivation quintile by ethnicity and diabetes type, 2020



Pre-pregnancy diabetes therapies

Table A2: Diabetes therapies used in pregnancy, 2019 and 2020

	Type 1 Diabetes	Type 2 Diabetes
Diabetes medication (% on each medication)	n= 4,175	n= 5,085
Insulin	94.7	4.9
Insulin and metformin	3.5	10.1
Metformin only ¹	0.5	52.3
Diet only ²	0.6	23.4
On other diabetes medications (total) ³	0.4	6.8
Sulphonylurea or glitinide	0.1	3.6
Gliptin	0.1	2.7
GLP-1 analogue	0.2	1.3
Pioglitazone	0.1	0.2

Pregnancies ending in 2019 and 2020

Distribution of HbA1c values

Figure A3: Number of NPID pregnancies by early pregnancy HbA1c range and diabetes type, 2014-2020

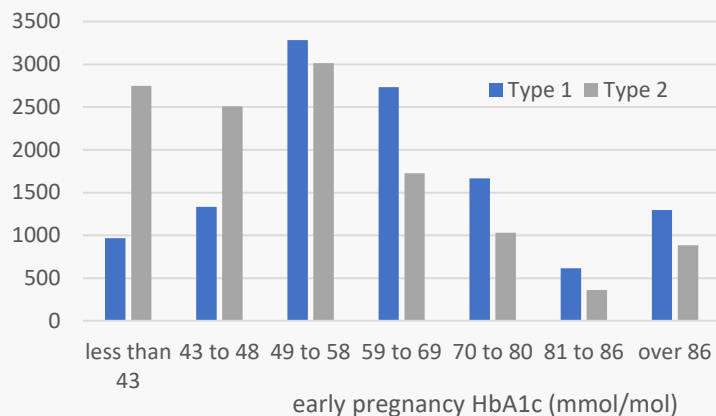
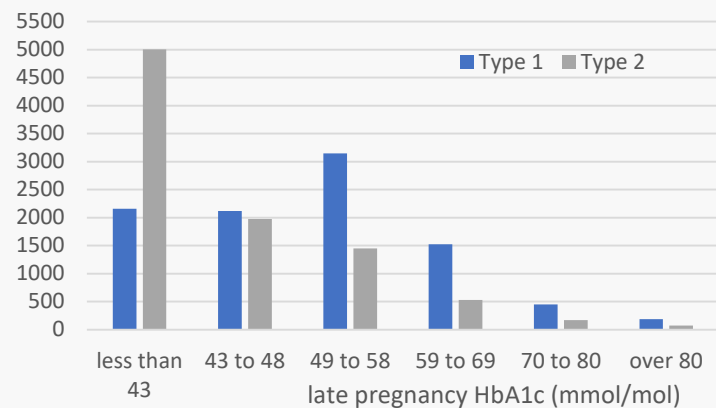


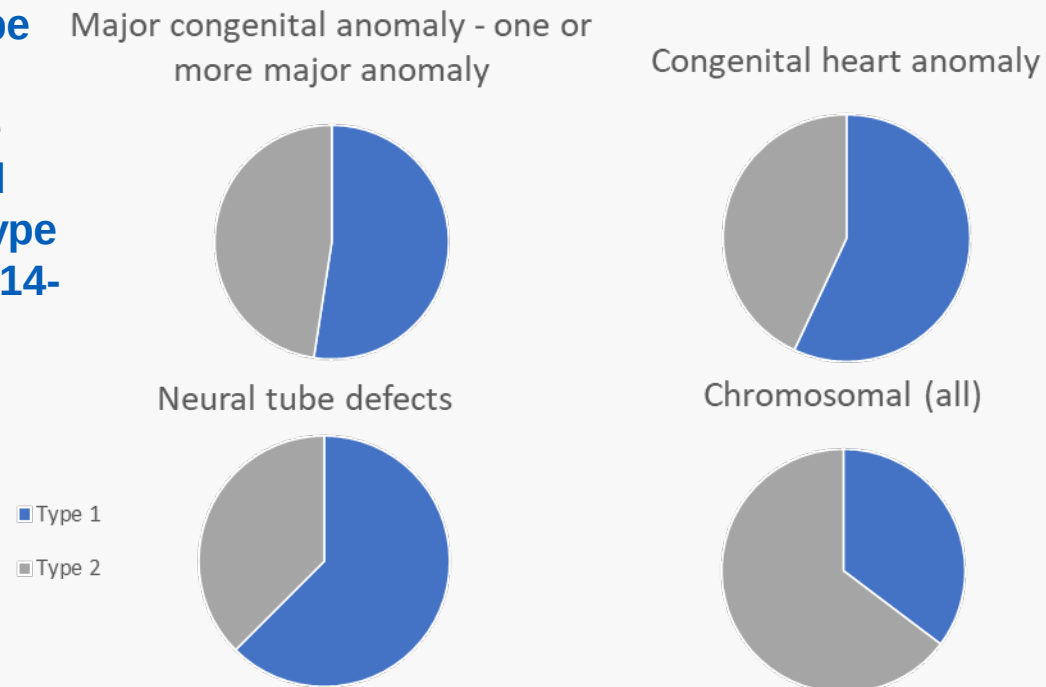
Figure A4: Number of NPID pregnancies by late pregnancy HbA1c range and diabetes type, 2014-2020



Congenital anomalies by type of diabetes

- The congenital anomaly rate for pregnancies^a ending in 2019 and 2020 was 47.4 per 1,000 pregnancies for Type 1 diabetes and 40.3 for Type 2 diabetes
- Slightly over half (52%) of all major congenital anomalies were seen in pregnancies of women with Type 1 diabetes
- 56% of congenital heart anomalies and 63% of neural tube defects occurred in Type 1 pregnancies
- Two-thirds (65%) of chromosomal defects occurred in Type 2 pregnancies

Figure A5: Diabetes type split of pregnancy outcomes^b where there was a major congenital anomaly, by diabetes type and anomaly group, 2014-2020



^a Includes live births and terminations at any gestation, stillbirths and miscarriages after 20 weeks.

^b Infants are counted once per group

Congenital anomalies

Table A3: Number of births^{a,b} where there was a congenital anomaly, by diabetes Type and congenital anomaly group, 2014-2020

Congenital Anomaly	Mother diabetes type		
	Type 1	Type 2	Type 1 and Type 2
All anomalies - major and minor	565	525	1,090
Major congenital anomaly - one or more major anomaly	535	485	1,020
Nervous system (all)	70	55	125
Neural tube defects	25	15	45
Other nervous system	45	40	85
Eye	5	5	5
Ear	5	5	10
Congenital heart anomaly	225	170	395
Limb, musculoskeletal and connective tissue	75	70	150
Internal urogenital system	65	45	110
External genital	25	20	50
Respiratory	15	15	30
Orofacial clefts	25	30	55
Digestive	25	35	60
Other non-chromosomal	55	65	120
Chromosomal (all)	30	55	85
Trisomy 21	15	30	40
Other chromosomal	15	30	45
Excluded minor anomalies	50	60	110

^a Includes live births and terminations at any gestation, stillbirths and miscarriages after 20 weeks.

^b Babies are counted once per group - hence a baby with four defects in four major groups will be counted once in "All anomalies", once in "Major congenital anomalies", and once in each of the four groups. Therefore the calculated totals from the groups will not match the overall totals

Pregnancy outcomes

- 98.8% of registered births (live and stillbirths) in the 2019 and 2020 NPID audit years were live births, compared with 99.6% of all registered births in 2019 in the general England and Wales maternity population².

Table A4: Pregnancy outcomes^a, 2019 and 2020 combined

	Live birth	Stillbirth	Miscarriage ^b
Type 1 diabetes	3,745	55	345
Type 2 diabetes	4,540	50	510
Other ^c	135	0	15

^a A small number of terminations of pregnancy are not shown here

^b Early miscarriages (prior to booking) are likely to be under-reported.

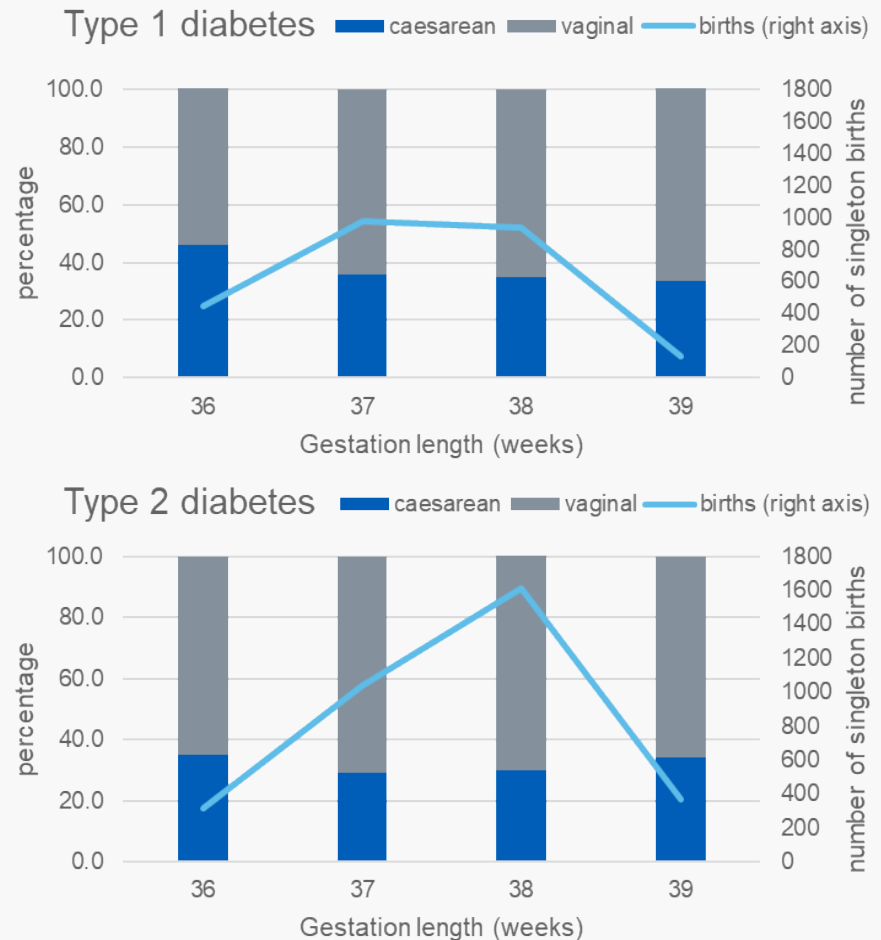
^c Diabetes type not specified, maturity onset diabetes of the young (MODY) or 'Other' diabetes type.

² 2019 was the latest data available on registered births. See References section.

Trends in induced labour

- The proportion of vaginal deliveries after induction of labour increased from 36 to 39 weeks gestation in women with type 1 diabetes
- The proportion of vaginal deliveries after induction of labour was between 65-70% from 36 to 39 weeks in women with type 2 diabetes

Figure A6: Percentage of births where labour was induced^a, by timing and method of delivery, 2014-2019



^aThese measures use linked HES/PEDW data. The latest available HES/PEDW dataset is for 2019/20 meaning that 2020 pregnancies cannot be linked

Quality Improvement

A **Quality Improvement Collaborative** (QIC) was incorporated into the NPID programme for 2018/19. The aim was to promote and support QI projects with the additional power of collaboration between teams, sharing ideas about projects, what they learned and how to implement changes.

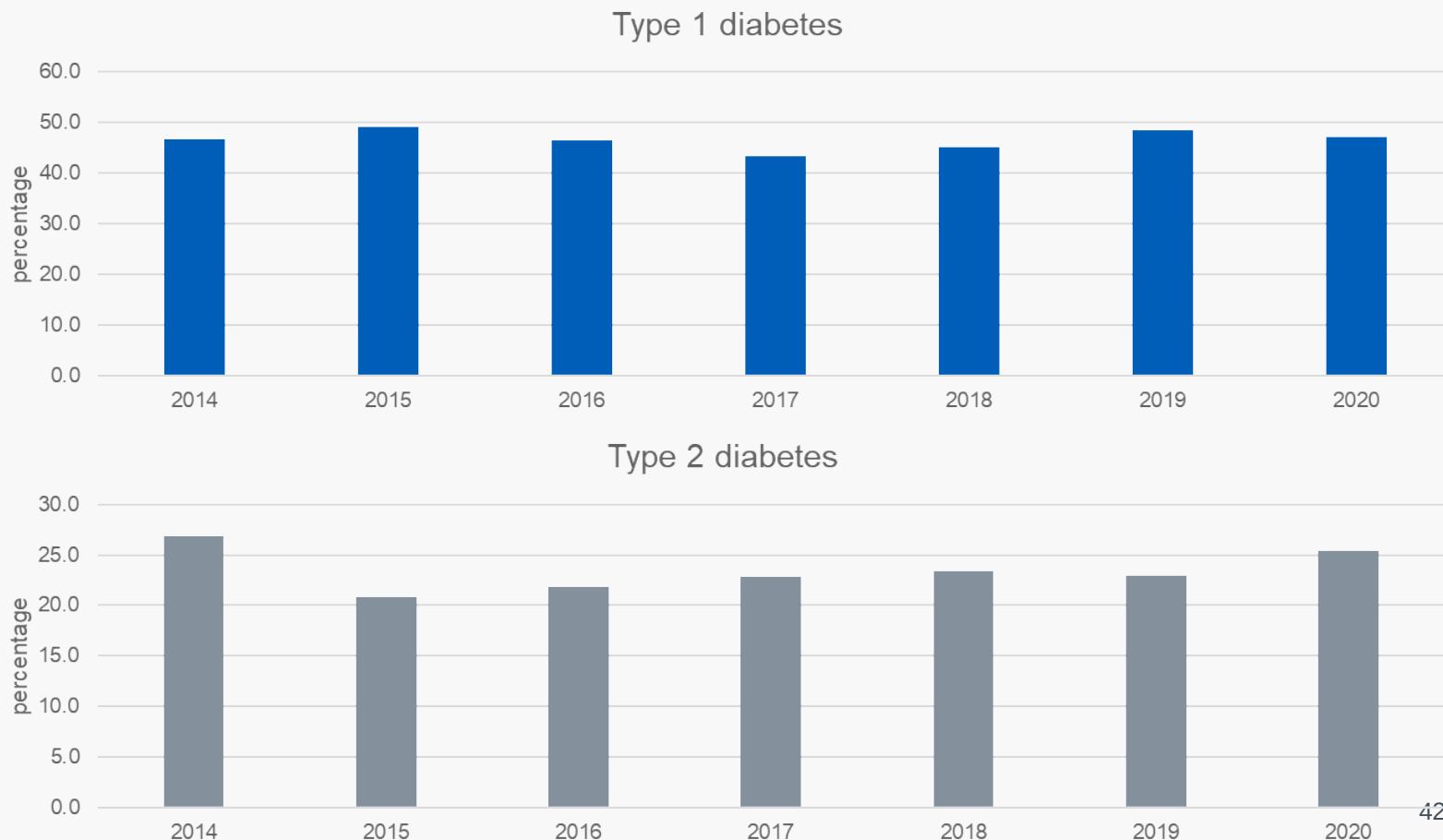
18 NHS provider organisations across England and Wales participated, with each service developing a tailored improvement plan to address local needs. The collaborative developed quality improvement work around the following diabetes in pregnancy topics:

- Use of 5mg folic acid supplements
- Keeping HbA1c below 48 mmol/mol where safely achievable
- Stopping / substituting oral glucose-lowering medications apart from metformin
- Stopping statins and ACE inhibitors/ARBs

Quality Improvement organisations: changes in 5mg folic acid use before pregnancy

- Despite some year-to-year variation there was no improvement in 5mg folic acid use over 7 years, further emphasising the need for healthcare system changes

Figure A7: Percentage of pregnancies where 5mg of folic acid was taken at time of LMP, Type 1 and Type 2 diabetes, Quality Improvement organisations, 2014-2020



Prepared in collaboration with:



The National Diabetes Audit (NDA) is commissioned by the **Healthcare Quality Improvement Partnership (HQIP)** as part of the National Clinical Audit and Patient Outcomes Programme (NCAPOP). 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 in patient outcomes, and in particular, to increase the impact that clinical audit, outcome review programmes and registries have on healthcare quality in England and Wales. HQIP holds the contract to commission, manage, and develop the National Clinical Audit and Patient Outcomes Programme (NCAPOP), comprising around 40 projects covering 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 projects, other devolved administrations and crown dependencies. www.hqip.org.uk/national-programmes



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Diabetes UK is the charity leading the fight against the most devastating and fastest growing health crisis of our time, creating a world where diabetes can do no harm. They provide patient engagement and quality improvement services to the audit programme.

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NDAU
Neonatal Data Analysis
Unit



We are grateful to all the families that agreed to the inclusion of their baby's data in the National Neonatal Research Database (the NNRD) and the health professionals and neonatal units for contributing data and the Neonatal Data Analysis Unit team at Imperial College London.

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