

# Association of ethnicity and socioeconomic status with health outcomes in women with gestational diabetes: Clinical Practice Research Datalink cohort study



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## Aim

To investigate, in women with previous gestational diabetes (GDM), the incidence of recurrent GDM, type 2 diabetes mellitus (T2DM), hypertension, and depression and differences in risk of these conditions by ethnicity and socioeconomic status.

## Methods

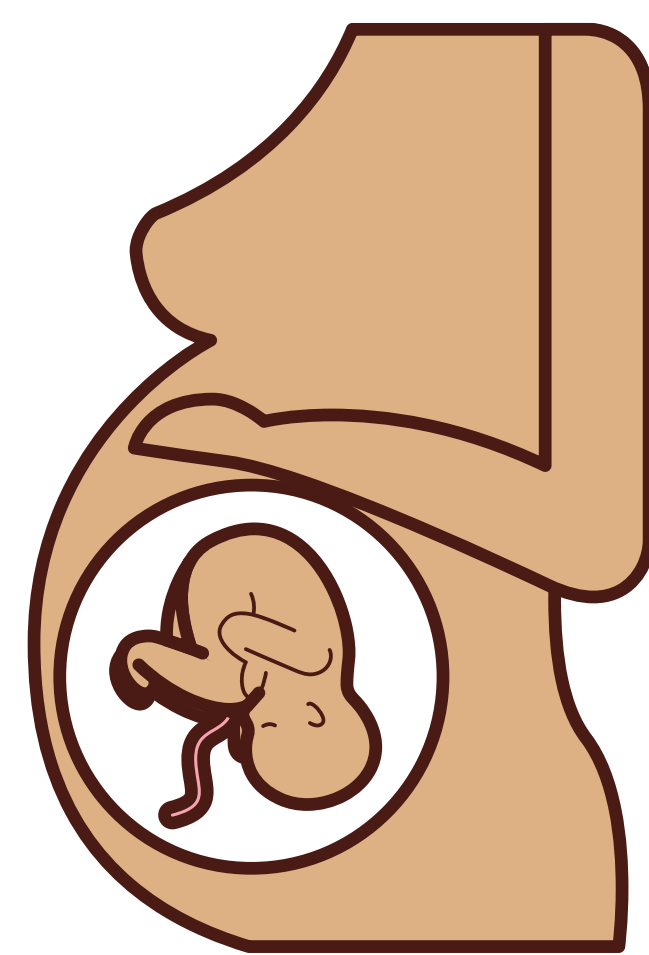
**Study Cohort:** Women with a diagnosis of GDM in the Clinical Practice Research Datalink (CPRD) between 01/01/2000 and 05/11/2018.

Delivery records obtained using linked data from Hospital Episode Statistics (HES) and patient-level deprivation using the Index of Multiple Deprivation (IMD).

The primary outcome (identified using CPRD, HES or both datasets) was the development of:

- recurrent GDM
- T2DM
- hypertension
- depression following delivery.

**Statistical Methods:** We performed survival analysis using the Royston and Parmar model to estimate the age-adjusted hazard ratios (aHRs) and 95% confidence intervals (CIs), to evaluate associations between factors and risk of developing a health condition.



## Results

Overall, 10,868 women were included in the study cohort.

During a total follow up of 58,479.29 person years (mean (SD): 5.38 (3.67) years), 2804 (25.80%) women developed recurrent GDM (IR: 4.79 per 100 person years; 95% CI: 4.62 to 4.98); 2256 (20.76%) depression (3.86; 3.70 to 4.02); 1257 (11.57%) T2DM (2.15; 2.03 to 2.27); and 519 (4.78%) hypertension (0.89; 0.81 to 0.97).

- South Asian ethnicity was associated with an increased risk of T2DM compared to White.
- Black ethnicity was associated with a greater risk of recurrent GDM and hypertension.
- Black and South Asian ethnicity were associated with a reduced risk of depression compared to White ethnicity.
- Increasing level of deprivation was associated with a greater risk for all health conditions.

(Results are presented in Table 1)

## Summary

The risk of health complications in women with previous GDM differs by ethnicity and socio-economic status. This highlights the importance of stratified assessment of this risk in the years following pregnancy.

Table 1. Associations between health conditions and risk factors (N=10,868)

Variable	Recurrent GDM (N=2,804)	Depression (N=2,256)	T2DM (N=1,257)	Hypertension (N=519)
<b>Ethnicity</b>				
White	Reference			
Black	1.49 (1.22 to 1.80)	0.23 (0.13 to 0.39)	1.25 (0.85 to 1.83)	2.93 (1.93 to 4.46)
South Asian	1.10 (0.97 to 1.25)	0.37 (0.29 to 0.46)	1.65 (1.34 to 2.05)	1.12 (0.77 to 1.64)
Mixed	0.62 (0.37 to 1.04)	0.52 (0.26 to 1.04)	1.10 (0.49 to 2.47)	1.23 (0.39 to 3.85)
Other	0.93 (0.78 to 1.12)	0.52 (0.40 to 0.69)	1.05 (0.76 to 1.43)	0.79 (0.47 to 1.35)
<b>IMD 2004 quintile</b>				
1 (least deprived)	Reference			
2	0.97 (0.83 to 1.12)	1.21 (1.00 to 1.47)	1.26 (0.96 to 1.65)	1.07 (0.71 to 1.63)
3	1.00 (0.86 to 1.17)	1.11 (0.92 to 1.36)	1.49 (1.14 to 1.94)	1.56 (1.06 to 2.31)
4	1.09 (0.95 to 1.25)	1.21 (1.01 to 1.46)	1.64 (1.27 to 2.11)	1.93 (1.34 to 2.78)
5	1.18 (1.02 to 1.36)	1.27 (1.05 to 1.53)	2.32 (1.82 to 2.97)	2.19 (1.51 to 3.16)
<b>Age</b>				
≤20 years	Reference			
21-30 years	0.97 (0.77 to 1.23)	0.62 (0.49 to 0.78)	0.99 (0.66 to 1.47)	2.39 (0.76 to 7.54)
31-40 years	0.66 (0.52 to 0.83)	0.46 (0.36 to 0.57)	1.13 (0.77 to 1.67)	4.55 (1.46 to 14.17)
≥41 years	0.37 (0.27 to 0.49)	0.49 (0.37 to 0.64)	1.19 (0.77 to 1.84)	8.16 (2.57 to 25.91)
<b>BMI</b>				
<18.5 kg/m <sup>2</sup>	1.33 (0.75 to 2.36)	1.25 (0.63 to 2.48)	2.12 (0.83 to 5.40)	NA*
18.5-24.9 kg/m <sup>2</sup>	Reference			
25-29.9 kg/m <sup>2</sup>	1.33 (1.03 to 1.72)	0.99 (0.71 to 1.37)	1.33 (0.82 to 2.17)	NA*
≥30 kg/m <sup>2</sup>	1.23 (0.96 to 1.58)	1.39 (1.04 to 1.85)	3.41 (2.30 to 5.06)	NA*
<b>Smoking status</b>				
Never	Reference			
Current/Former	0.98 (0.79 to 1.23)	2.14 (1.66 to 2.75)	0.83 (0.57 to 1.20)	1.13 (0.63 to 2.02)
<b>Treatment for GDM</b>				
No treatment**	Reference			
Metformin	0.96 (0.86 to 1.08)	1.08 (0.95 to 1.22)	1.49 (1.23 to 1.80)	1.41 (1.08 to 1.85)
Insulin (with or without metformin)	1.12 (1.02 to 1.23)	1.27 (1.15 to 1.41)	3.69 (3.27 to 4.15)	1.38 (1.11 to 1.70)

BMI= Body Mass Index, CI = Confidence Interval, GDM= Gestational Diabetes Mellitus, IMD = Index of Multiple Deprivation, aHR = age-adjusted hazard ratio. BMI was classified based on the World Health Organisation categories. \* Due to the large amount of missing data for BMI and low number of cases of hypertension, it was not possible to estimate HRs and 95% CI in a model adjusted for both age and BMI. \*\*Women who did not have any prescription on their records were classified as being treated with diet and exercise only according to the 2015 NICE guidelines. (No treatment).