

# Diagnostic and prognostic performance of alternative approaches to identification of hyperglycaemia in pregnant women during the Covid-19 pandemic

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## INTRODUCTION

- Undiagnosed gestational diabetes mellitus (GDM) causes stillbirth
- During the Covid-19 pandemic, many sites have had to suspend oral glucose tolerance tests (OGTTs), the mainstay of GDM diagnosis internationally.
- Alternative strategies have been urgently needed to prevent harm (table 1)
- However, the introduction of entirely untested diagnostic criteria is unprecedented
- **Aim: to evaluate the diagnostic and prognostic performance of these alternative strategies**

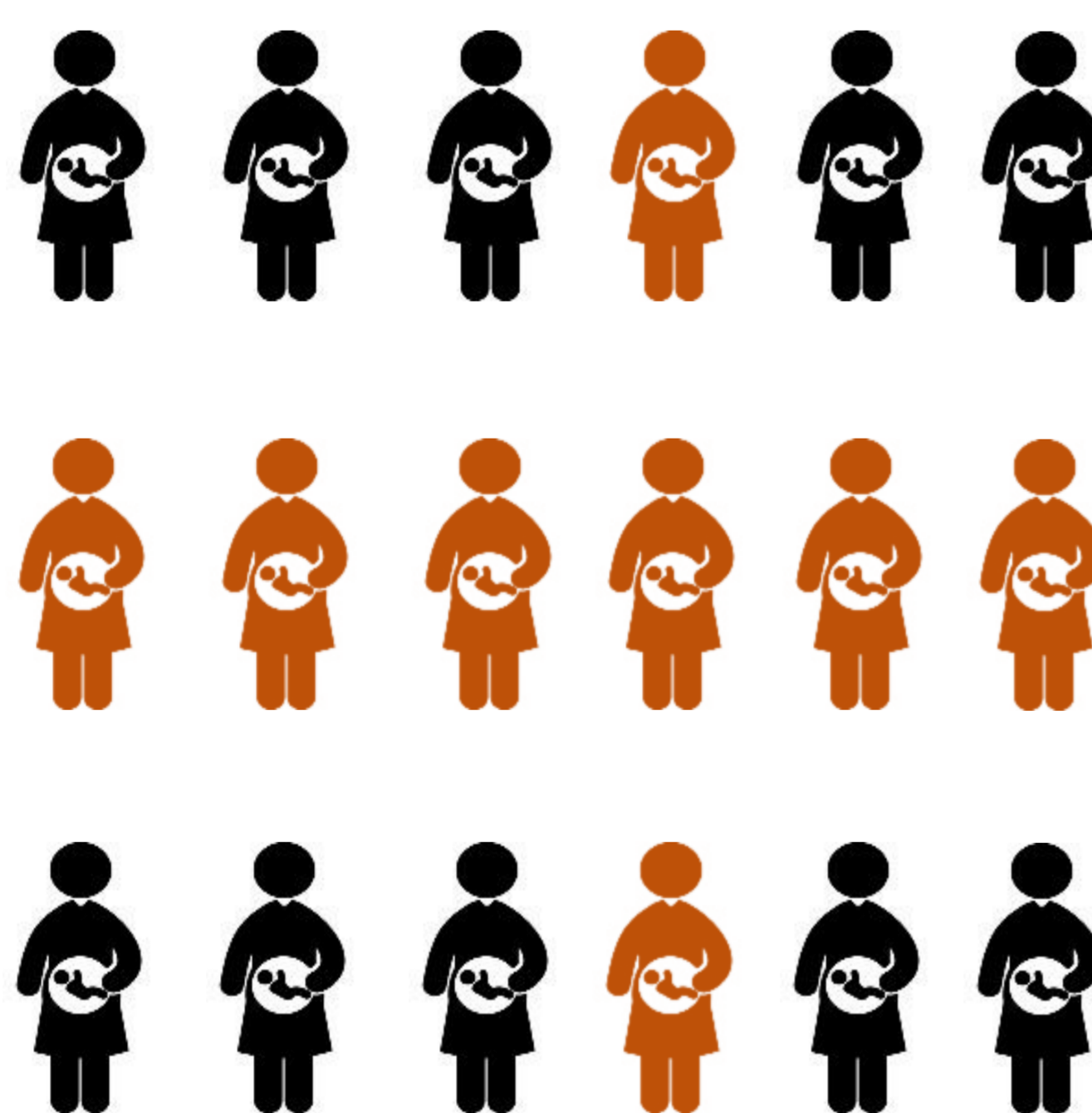
Table 1: RCOG interim diagnostic pathway for GDM

UK Covid-19 GDM diagnosis	
Glucose measures at 12 weeks	HbA1c and RPG or FPG
Interpretation of early pregnancy glucose measures	Early GDM: HbA1c 41-47 mmol/mol or RPG 9-11mmol/L
	Likely T2DM: HbA1C ≥ 48 mmol/mol or RPG ≥ 11.1mmol/L.
Glucose measures at 28 weeks	HbA1c and RPG or FPG
Interpretation of glucose measures at 28 weeks	GDM diagnosed if: HbA1C ≥ 39 mmol/mol or RPG ≥ 9 mmol/L or FPG ≥ 5.6 mmol/l

## METHODS

### Three datasets:

1. Old CUH data, n=17736, 2004-2008, retrospective
2. New CUH data, n=826, 2014-2019, retrospective
3. OPHELIA study, n=361, 2019 ongoing, prospective multicentre observational study



## RESULTS

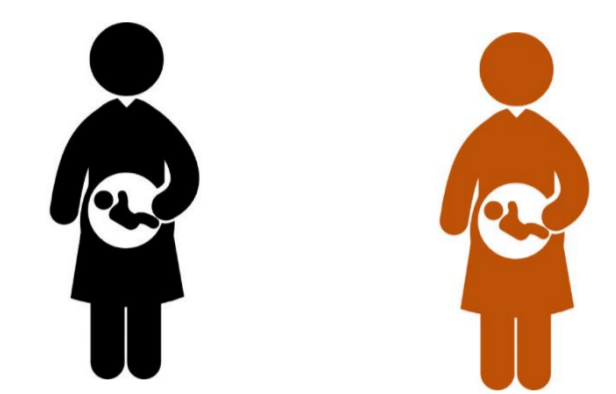
### At 12 weeks – random plasma glucose (table 2)

Old CUH data, n=17736

Women with +ve GCT – i.e. increased risk

Table 2: Ability of random plasma glucose at 12 weeks to predict pregnancy outcomes

	OR (95%CI)
NICE-GDM	2.35 (2.24-2.46)***
IADPSG-GDM	2.45 (2.34-2.57)***
Large-for-gestational age	1.10 (1.06-1.13)***
Caesarean delivery	1.15 (1.21-1.17)***
Admission to neonatal intensive care unit (NICU)	1.06 (1.02-1.11)**



Women without GDM: 98% correctly identified  
Women with GDM: 29% correctly identified

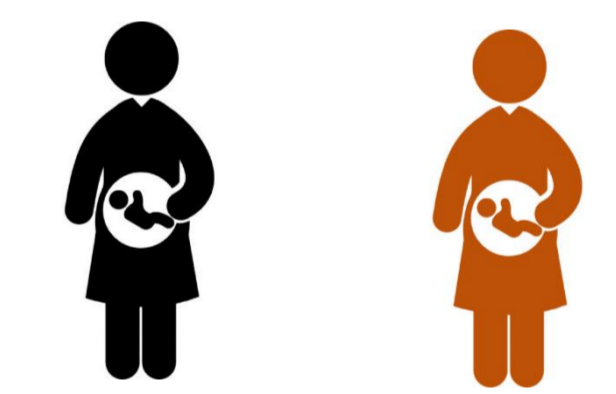
### At 28 weeks – Fasting plasma glucose (table 3)

Old CUH data, n=17736

Women with +ve GCT – i.e. increased risk

Table 3: Ability of fasting plasma glucose at 28 weeks to predict pregnancy outcomes

	OR (95%CI)
NICE-GDM	4.84 (4.13-5.67)***
IADPSG-GDM	16.00 (12.98-19.71)***
Large-for-gestational age	1.87 (1.63-2.14)***
Caesarean delivery	1.48 (1.32-1.67)***
Admission to NICU	1.03 (0.82-1.28)

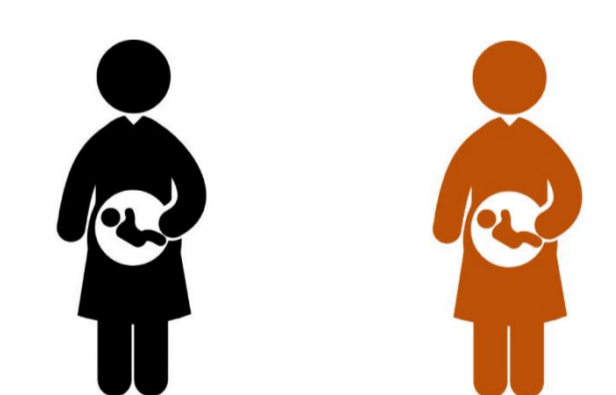


Women without GDM: 100% correctly identified  
Women with GDM: 28% correctly identified

### At 28 weeks – HbA1c (table 4)

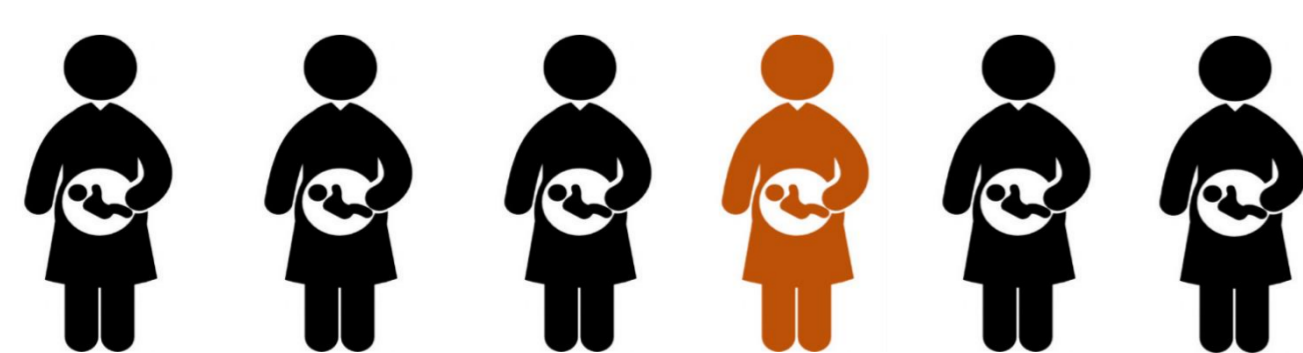
Table 4: Ability of HbA1c at 28 weeks to predict pregnancy outcomes

	AUROC (95%CI)	STUDY
NICE-GDM	0.83 (0.75-0.90)***	OPHELIA
IADPSG-GDM	0.84 (0.77-0.91)***	OPHELIA
OR (95%CI) STUDY		
Large-for-gestational age	1.04 (1.00-1.08)*	RECENT CUH
Caesarean delivery	1.04 (1.01-1.08)**	RECENT CUH
Neonatal hypoglycaemia	1.05 (1.02-1.08)**	RECENT CUH
Admission to NICU	1.02 (0.98-1.06)	RECENT CUH



Women without GDM: 100% correctly identified  
Women with GDM: 28% correctly identified

## Have the RCOG criteria led to any improvements in care?



- It is easy to criticise sensitivity and specificity but RCOG Covid-19 criteria were introduced quickly at a time of great clinical challenge.
- Some screening is better than no screening for GDM.
- Increased convenience for women, aligned to antenatal care
- Opportunity for universal testing (i.e. of every pregnant woman)
- Opportunity to identify high risk women from 12 weeks
- HbA1c probably identifies some women who might not be identified using an OGTT - ?improved pick-up of pre-pregnancy pre-diabetes

## CONCLUSIONS

- No method of GDM diagnosis is perfect
- OGTTs have many flaws too
- All studied methods of diagnosis were associated with:
  - GDM
  - Complications of hyperglycaemia
- All studied methods performed poorly in terms of sensitivity
- Altering thresholds for diagnosis would improve pick-up
- HbA1c for all women may have some advantages.
- OGTTs should be reinstated as soon as possible.



Women without GDM: RCOG criteria = Good at excluding GDM  
Women with GDM: RCOG criteria = Poor at identifying GDM