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Association between gestational diabetes mellitus diagnostic criteria and adverse pregnancy outcomes—a systematic review and meta-analysis of adjusted effect sizes from studies using current diagnostic criteria

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ABSTRACT

Objectives To quantify the association between Gestational Diabetes Mellitus (GDM) and adverse pregnancy outcomes and primarily compare the associations between diagnostic criteria following the International Association of Diabetes and Pregnancy Study Groups (IADPSG) recommendations and non-IADPSG criteria, which use higher blood glucose cut-offs.

Design Systematic review and meta-analysis of observational studies using contemporary GDM diagnostic criteria.

Data sources PubMed, Scopus, Google Scholar, Cochrane Database of Systematic Reviews and the Cumulative Index to Nursing and Allied Health Literature (CINAHL) were searched for articles published between 2010 and 2023. The search was carried out on 15 May 2023.

Eligibility criteria Studies were included if they were observational studies that reported adjusted effect sizes for GDM-related adverse outcomes and compared outcomes between women with and without GDM, used contemporary diagnostic criteria and were conducted after 2010.

Data extraction and synthesis Two reviewers independently extracted data and assessed study quality using the MethodologicAl STandards for Epidemiological Research (MASTER) scale. Bias-adjusted inverse variance heterogeneity meta-analysis models were used to synthesise adjusted effect sizes. The same meta-analytic models were used to synthesise the overall OR and their 95% CIs for comparisons of the criteria which followed the IADPSG recommendations to other criteria, mostly with higher blood glucose cut-offs (non-IADPSG).

Results We included 30 studies involving 642 355 participants. GDM was associated with higher odds of maternal outcomes, namely; caesarean section (adjusted OR (aOR) 1.24, 95% CI 1.01 to 1.51) and pregnancy-induced hypertension (aOR 1.55, 95% CI 1.03 to 2.34). GDM was associated with higher odds of neonatal outcomes, specifically; macrosomia (aOR 1.38, 95% CI 1.13 to 1.69), large for gestational age (aOR 1.42, 95% CI 1.23 to 1.63), preterm birth (aOR 1.41, 95% CI 1.21 to 1.64), neonatal intensive care unit admission (aOR 1.42, 95% CI 1.12 to 1.78), neonatal hypoglycaemia (aOR 3.08, 95% CI 1.80 to 5.26) and jaundice (aOR 1.47, 95% CI 1.12 to 1.91). Further analyses showed no major differences in adverse pregnancy outcomes between IADPSG and non-IADPSG criteria.

Conclusions GDM is consistently associated with adverse pregnancy, maternal and foetal outcomes, regardless of the diagnostic criteria used. These findings suggest no significant difference in risk between lower and higher blood glucose cut-offs used in GDM diagnosis.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ Utilised contemporary studies with modern Gestational Diabetes Mellitus (GDM) diagnosis criteria, relevant to current debate on screening and diagnosis of GDM.
⇒ Included only adjusted effect sizes, minimising the influence of confounding on the relationship between GDM and outcomes.
⇒ Limitations include the use of data from observational studies, where confounding factors could not be fully eliminated.
⇒ Had a limited number of studies using non-International Association of Diabetes and Pregnancy Study Group criteria, potentially affecting the conclusiveness of the analysis.

INTRODUCTION

Gestational diabetes mellitus (GDM) is defined as any degree of glucose intolerance with onset or first recognition during pregnancy and it affects 14% of pregnancies globally.[1 2] After delivery, most women diagnosed with GDM revert to normal glycemic status, however, both the mother and their offspring are at a higher risk of developing type 2 diabetes and cardiovascular disease later

in life.[3 4] The hyperglycaemia and pregnancy outcomes (HAPO) study showed that there was a linear increase in the risk of adverse pregnancy outcomes with increasing blood glucose, but there are no known cut-offs at which the risk of these outcomes becomes significantly elevated, unlike diabetes outside of pregnancy.[5 6] Although many guideline bodies have adopted the International Association of Diabetes and Pregnancy Study Groups (IADPSG) recommendations, debate is still ongoing about the appropriate GDM screening strategies, blood glucose cut-offs and timing of GDM testing.[7–9] Given the variation of the diagnostic criteria for GDM and screening approaches internationally, the prevalence of GDM varies widely.[10] It is still not clear how the heterogeneity in screening approaches and diagnostic criteria affects the association between GDM and adverse pregnancy outcomes.

There is now abundant evidence that GDM not only causes adverse pregnancy outcomes and future type 2 diabetes and cardiovascular disease, but also has impact on a woman's mental health and is associated with higher costs to the health system.[3 4 11–14] The landmark HAPO study findings showed that milder levels of hyperglycaemia can adversely affect pregnancy outcomes.[5] These findings resulted in changes and revisions to many international GDM diagnosis guidelines, based on the recommendations of the IADPSG published in 2010.[6] The WHO in 2013,[15] the American Diabetes Association (ADA),[16] the Australasian Diabetes in Pregnancy Society (ADIPS)[17] and the Society for Endocrinology, Metabolism and Diabetes of South Africa (SEMDSA)[18] are examples of guideline bodies which adapted their GDM diagnostic guidelines to align with the IADPSG recommendations. The IADPSG recommends universal screening for GDM of all pregnant women without pre-existing diabetes, between 24 and 28 weeks of gestation using a one-step 2 hour 75 g oral glucose tolerance test (OGTT) and to diagnose GDM if a woman has one abnormal test result based on the following cut-offs: fasting plasma glucose (FPG)≥5.1 mmol/L, 1 hour OGTT plasma glucose≥10.0 mmol/L or 2 hour OGTT plasma glucose≥8.5 mmol/L.[6]

Despite the consensus on the adverse effects of hyperglycaemia on pregnancy outcomes, there is still a lack of agreement on GDM screening, testing and diagnosis, evidenced by the existence of more than 30 different GDM dianostic guidelines in use in many regions and countries worldwide.[19] The differences in these criteria are not only in diagnostic maternal blood glucose levels, but also in the screening approaches, glucose testing methods and timing of GDM screening. Some of the heterogeneity also stems from differences in resource allocation for GDM care, while others arise from uncertainty in the evidence about the appropriate GDM screening and testing approaches. Some notable guideline bodies that have not adopted the IADPSG recommendations are the National Institute for Health and Care Excellence (NICE) which recommends risk factor-based GDM screening and has maintained a higher fasting glucose of ≥5.6 mmol/L for GDM diagnosis.[20] Another example is the Diabetes in Pregnancy Study Group India (DIPSI) which recommends testing in a non-fasting state and diagnosis of GDM only if the 2 hour plasma glucose is ≥7.8 mmol/L.[21] The heterogeneity in GDM screening and diagnostic criteria is likely one reason why there is variability in the observed effect magnitudes of the association between GDM and adverse pregnancy outcomes.

Findings on the estimates of the effect of GDM on adverse pregnancy outcomes are still not conclusive. A recent meta-analysis[22] evaluated the association between GDM and adverse pregnancy outcomes. However, this meta-analysis included studies based on older diagnostic criteria that are no longer in practice, potentially encompassing cohorts which include overt diabetes and pre-existing diabetes. This limitation may have led to overestimation of the impact of GDM by including undiagnosed pre-existing diabetes in the analysis. Further, some meta-analyses used unadjusted odds ratios (ORs), thereby reported associations that could be confounded.[23] To address these limitations, the current meta-analysis investigated the effect of GDM, diagnosed using contemporary criteria, on adverse pregnancy outcomes, and compared the effect sizes between criteria that conformed to the IADPSG recommendations and non-IADPSG criteria that generally used higher blood glucose cut-offs. By restricting our analysis to studies that report adjusted effect sizes, we aim to minimise the influence of confounders and provide a more accurate estimate of the true association between GDM and adverse pregnancy outcomes under current diagnostic practices.

RESEARCH QUESTIONS

What is the effect of GDM, diagnosed using contemporary criteria, on each adverse pregnancy outcome? Does the effect of GDM on adverse pregnancy outcomes differ between different GDM diagnostic criteria?

METHODS

Study design

A systematic review and meta-analysis of relevant studies was conducted. The study protocol is registered on the International Prospective Register of Systematic Reviews (PROSPERO) (CRD42020155061) and it follows the Preferred Reporting Items for Systematic Reviews and Meta-Analyses protocol extension (PRISMA-P).[24]

Search strategy for identification of studies

Data sources and electronic searches

PubMed, Scopus, Google Scholar, Cochrane Central Register of Controlled Trials (CENTRAL), the Cumulative Index to Nursing and Allied Health Literature (CINAHL) were searched for articles published between 2010 and 2023. The search was carried out on 15 May 2023. Medical subject headings (MeSH words) and keyword searches for GDM and pregnancy outcomes were used in the search. Supplementary Tables 1-3

contains the search strategy. Further, the reference lists of included papers were also searched. EndNote was used to remove duplicate, and studies were screened for inclusion using the Rayyan systematic review management website (www.rayyan.ai). Two reviewers (EM, AE) independently screened the studies for inclusion within Rayyan. Following the initial screening, four reviewers (EM, AE, BE, YE) evaluated the papers for inclusion using full text, according to the specified inclusion criteria.

Studies inclusion criteria

Inclusion criteria

Studies were included if they were observational cohort, cross-sectional and case–control comparing adverse pregnancy outcomes between women with and those without GDM. The studies were included if they were conducted between 2010, when the IADPSG recommendations were published, to the year 2023 and if they reported adjusted ORs for the association between GDM and adverse pregnancy outcomes. Experimental studies were included only if they compared GDM diagnostic criteria as intervention and comparators.

Exclusion criteria

Studies were excluded if they were conducted prior to 2010, review articles, included animal studies, did not report an effect size or any outcomes related to this study, did not report adjusted effect sizes or included participants with pre-existing diabetes.

Outcomes of interest

Maternal outcomes

Maternal outcomes included caesarean section, pregnancy-induced hypertension (PIH) and pre-eclampsia. Caesarean sections included both elective and emergency. PIH was defined as a systolic blood pressure≥140 mm Hg or diastolic blood pressure≥90 mm Hg diagnosed at ≥20 weeks gestation. Pre-eclampsia was defined as hypertension (≥140/90 mm Hg) and proteinuria.

Foetal outcomes

Foetal outcomes included large-for-gestational-age (LGA), small-for-gestational-age (SGA), macrosomia, preterm birth, shoulder dystocia, neonatal hypoglycaemia, neonatal intensive care unit admission (NICU), jaundice and respiratory distress syndrome (RDS). Macrosomia was defined as birth weight greater than 4000 g. LGA was defined as birth weight above the 90th percentile for gestational age. SGA was defined as birth weight of less than 10th percentile for gestational age. Preterm birth was defined as birth before 37 completed weeks of gestation.

Data extraction and management

For duplicate publications, we only included the article that contains the most information, and all others were excluded. The following data were extracted from the articles: study characteristics such as the publication year, duration of the study, region, country, study design, sample size, GDM diagnostic criteria used, numbers of participants with the outcomes of interest and the effect size with their corresponding CIs. Data were extracted into a predesigned and piloted Microsoft Office Excel spreadsheet. For each study, two reviewers independently extracted the data and compared thereafter. Disparity in data extracted was resolved via discussion between all the reviewers.

Assessment of risk of bias

The risk of bias and external validity of the included studies was assessed using the MethodologicAl STandards for Epidemiological Research (MASTER) scale.[25] Two reviewers independently assessed each study, and differences were resolved by discussion. If no consensus was reached, a third reviewer was consulted to resolve the conflict.

Data synthesis

Study characteristics and other data were narratively described and were presented as tables. Because the included studies were observational, of varying quality, a bias-adjusted inverse variance heterogeneity (quality effects) model was used as to synthesise overall effect sizes for the meta-analysis, with quality weights derived from the MASTER scale. Estimates from the random-effects model were also computed for comparison purposes, since this is the most widely used model in literature. The I^2 statistic and the Cochrane's Q p-values were both used to assess the heterogeneity. Doi plots and funnel plots were used for the assessment of publication bias. To explore the association between GDM diagnostic criteria and the odds of adverse outcomes, further analyses were carried out by comparing IADPSG to non-IADPSG. Non-IADPSG criteria in this study were Carpenter-Coustan (CC) (two studies[26 27]), 2008 Canadian Diabetes Association (CDA) (one study[28]), ADA 2014 (one study[29]), WHO 1999 (one study[30]) and the ADIPS (one study[31]). The studies using CC criteria employed universal OGTT screening. The cut-offs used in these studies varied. For CC and ADA 2014 criteria, fasting glucose≥5.3 mmol/L, 1-hour≥10.0 mmol/L and 2-hour≥8.6 mmol/L were used (n=7612). The WHO 1999 cut-offs included fasting glucose≥7.0 mmol/L or 2 hour glucose≥7.8 mmol/L (n=42 656). The 2008 CDA criteria used fasting glucose≥5.3 mmol/L, 1-hour≥10.6 mmol/L and 2-hour≥8.9 mmol/L (n=2 70 843). The ADIPS cut-offs used included fasting glucose≥5.5 mmol/L and 2-hour≥8.0 mmol/L (n=32 013). For analysis purposes, the non-IADPSG criteria were grouped together, since they used a higher FPG and are therefore expected to result in stronger associations with adverse pregnancy outcomes. The analysis was carried out using Stata V.17 software.

Patient and public involvement

No patients or members of the public were involved in this study.

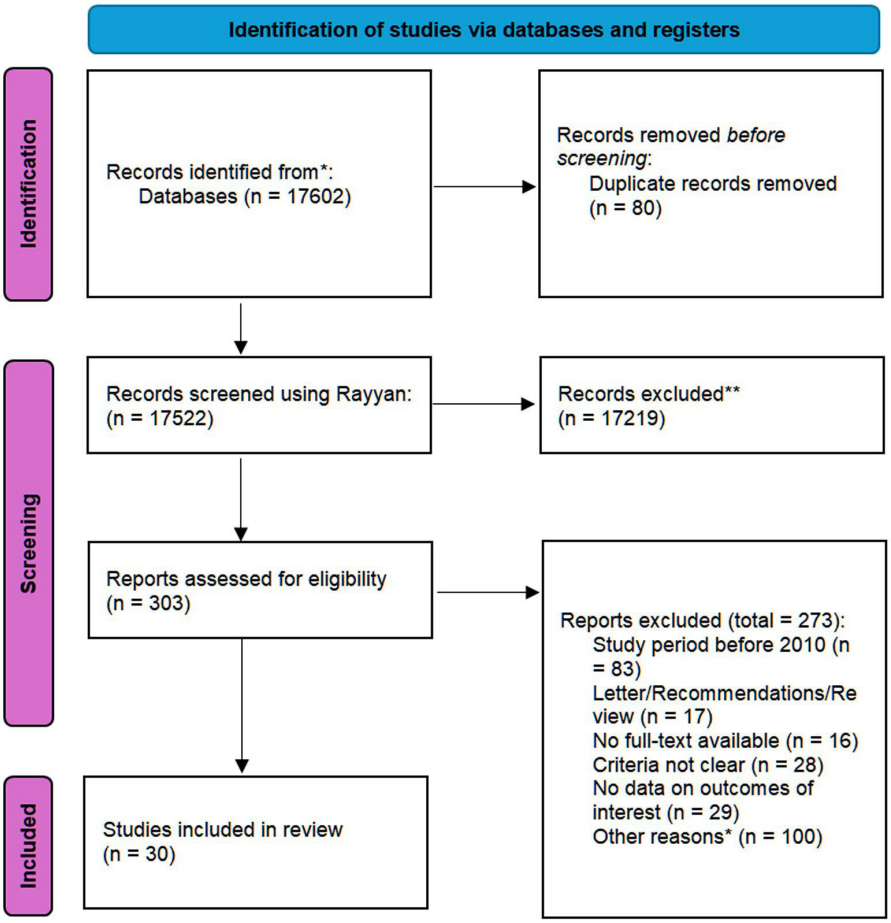

Figure 1 PRISMA flow chart showing the search. *Other reasons—did not exclude pre-existing diabetes, did not report relevant effect sizes (adjusted OR/RR). PRISMA, Preferred Reporting Items for Systematic reviews and Meta-Analyses.

RESULTS

Search results

A total of 17513 records were identified. There were 80 duplicate records that were removed. Figure 1 shows the PRISMA flow chart for the search process. Out of 305 study records selected at the initial title and abstract screening, 273 were excluded as they did not meet the inclusion criteria. The reasons for the exclusions were as follows: studies conducted before 2010 (n=83), letters/recommendations/reviews (n=17), studies where full texts were not available (n=16), studies where the criteria used were not clear (n=28), studies with no outcomes of interest (n=29) and studies excluded for other reasons (n=100). The list of excluded studies and reasons for exclusion are in online supplemental table 4. A total of 30 studies[26–55] with 642 355 participants were finally included.

Characteristics of included studies

Table 1 shows the characteristics of the included studies. Of the 30 included studies, most (n=17) were from Asia,[26 27 29 37–39 41–44 47 48 51–55] four were from Europe,[30 34 36 49] three were from the Middle East,[32 33 50] two were from Australia,[31 40] two were from Africa,[45 46] one was from South America[35] and one was from North America[28] (table 1). The studies were from these countries: Australia,[31 40] Brazil,[35] Croatia,[30 36] India,[48] Iran,[26] Saudi Arabia,[32 50] Qatar,[33] Italy,[34 49] Canada,[28] Vietnam,[29 38 53] South Korea,[27] China[37 41–44 47 51 52 54 55] and Ethiopia.[45 46] All the studies employed either cross-sectional or cohort designs. Four of these studies contained two independent populations that were analysed separately in the meta-analysis. In table 1, these populations are labelled as 'Author, Year A' for the first population and 'Author, Year B' for the second population. While the total number of studies is 30, the inclusion of these separate populations increased the total number of assessed populations in the meta-analysis to 34. The years of data collection were from 2010 to 2023. All studies have employed universal screening.

Quality of included studies

Overall, most of the studies had relatively high scores in the quality assessment using the MASTER scale[56] (online supplemental figure 1). Four studies[33–35 55] scored 28/36, four studies[29 38 40 48] had a score of 27/36 and four studies[27 42 49 52] had a score of 26/36. The scores of the remaining studies ranged from 22/36 to 25/36. The main deficiencies were in equal retention, equal ascertainment, equal prognosis and sufficient analysis domains (online supplemental figure 1).

Maternal outcomes

Table 2 shows the results of the overall syntheses for the association between GDM and adverse pregnancy outcomes.

Table 1 Characteristics of included studies

Study	Study duration	Country	Sample size	Region	Study design	Criteria	Screening
Alfadhli *et al*, 2015[32]	2011–2014	Saudi Arabia	954	Middle East	Cohort	IADPSG	Universal
Bashir *et al*, 2020[33]	2015–2016	Qatar	2221	Middle East	Cohort	IADPSG	Universal
Capula *et al*, 2013[34]	2010–2012	Italy	2448	Europe	Cohort	IADPSG	Universal
Carvalho *et al*, 2023[35]	2020–2020	Brazil	1618	South America	Cross-sectional	IADPSG	Universal
Darbandi *et al*, 2022[26]	2018–2018	Iran	3675	Asia	Cross-sectional	Non-IADPSG (CC)	Universal
Djelmis *et al*, 2016[36]	2012–2014	Croatia	4646	Europe	Cohort	IADPSG	Universal
Erjavec *et al*, 2016[30]	2010–2010	Croatia	42 656	Europe	Cross-sectional	Non-IADPSG (WHO-1999)	Universal
Erjavec *et al*, 2016[30]	2014–2014	Croatia	39 092	Europe	Cross-sectional	IADPSG	Universal
He *et al*, 2023[37]	2012–2021	China	115 097	Asia	Cohort	IADPSG	Universal
Hiersch *et al*, 2019[28]	2012–2016	Canada	266 942	North America	Cohort	Non-IADPSG (CDA)	Universal
Hiersch *et al*, 2019[28]	2012–2016	Canada	3901	North America	Cohort	Non-IADPSG (CDA)	Universal
Hirst *et al*, 2012[38]	2010–2011	Vietnam	2772	Asia	Cohort	IADPSG	Universal
Kawasaki *et al*, 2023[39]	2015–2019	Japan	1807	Asia	Cohort	IADPSG	Universal
Kim *et al*, 2019[27]	2014–2016	Korea	1907	Asia	Cohort	Non-IADPSG (CC)	Universal
Kim *et al*, 2019[27]	2014–2016	Korea	1969	Asia	Cohort	IADPSG	Universal
Laafira *et al*, 2016[40]	2011–2014	Australia	3105	Australia	Cohort	IADPSG	Universal
Li *et al*, 2014[41]	2011–2011	China	54 275	Asia	Cross-sectional	IADPSG	Universal
Lin *et al*, 2022[42]	2012–2020	China	2151	Asia	Cohort	IADPSG	Universal
Mak *et al*, 2019[43]	2015–2015	China	1901	Asia	Cohort	IADPSG	Universal
Mei *et al*, 2021[44]	2016–2018	China	333	Asia	Cohort	IADPSG	Universal
Muche *et al*, 2020[45]	2018–2019	Ethiopia	694	Africa	Cohort	IADPSG	Universal
Muche *et al*, 2020[46]	2018–2019	Ethiopia	684	Africa	Cohort	IADPSG	Universal
Nguyen *et al*, 2020[29]	2015–2016	Vietnam	2030	Asia	Cohort	Non-IADPSG (ADA-2014)	Universal
Pan *et al*, 2015[47]	2010–2012	China	17 808	Asia	Cohort	IADPSG	Universal
Punnose *et al*, 2022[48]	2011–2017	India	2638	Asia	Cohort	IADPSG	Universal
Ronco *et al*, 2023[49]	2010–2020	Italy	2364	Europe	Cohort	IADPSG	Universal
Wahabi *et al*, 2017[50]	2013–2015	Saudi Arabia	9723	Middle East	Cohort	IADPSG	Universal
Wan *et al*, 2019A[31]	2010–2013	Australia	3419	Australia	Cohort	Non-IADPSG (ADIPS)	Universal
Wan *et al*, 2019B[31]	2010–2013	Australia	28 594	Australia	Cohort	Non-IADPSG (ADIPS)	Universal
Wang *et al*, 2021[52]	2012–2013	China	8844	Asia	Cohort	IADPSG	Universal
Wang *et al*, 2023[51]	2018–2020	China	2031	Asia	Cohort	IADPSG	Universal
Yang *et al*, 2018[55]	2011–2015	China	1232	Asia	Cohort	IADPSG	Universal
Yue *et al*, 2022[53]	2016–2018	Vietnam	4703	Asia	Cohort	IADPSG	Universal
Zou *et al*, 2022[54]	2016–2018	China	4121	Asia	Cohort	IADPSG	Universal

ADA, American Diabetes Association; ADIPS, Australasian Diabetes in Pregnancy Society; CC, Carpenter-Coustan; CDA, Canadian Diabetes Association; IADPSG, International Association of Diabetes and Pregnancy Study Groups.

A total of 18 studies[26–28 30–33 35 36 40 42 43 45 48–50 52 53] reported data on total C-sections, with adjusted ORs (aORs) between 0.8[31 42] and 2.3.[36] The overall aOR of total C-section was 1.24 (95% CI 1.01 to 1.51) with high heterogeneity (I^2=85.9%) (online supplemental figure 2). GDM was associated with a 25% increase in the odds of pre-eclampsia, in overall synthesis (aOR 1.25, 95% CI 1.00 to 1.56, I^2=31.8%, n=8 studies[27 28 31 33–35 38 49]) (online

Table 2 Results of overall syntheses for the association between GDM and each adverse pregnancy outcome

Outcome	Overall aOR (95% CI)	I^2 (%)	LFK*	Number of studies
Maternal outcomes				
Total C section	1.24 (1.01, 1.51)	85.9	1.7	18
Pre-eclampsia	1.25 (1.00, 1.56)	31.8	1.6	8
PIH	1.55 (1.03, 2.34)	69.4	−2.8	7
Birth size-related neonatal outcomes				
Macrosomia	1.38 (1.13, 1.69)	75.0	4.2	19
LGA	1.42 (1.23, 1.63)	60.1	2.8	19
SGA	0.91 (0.80, 1.04)	40.1	0.8	14
Shoulder dystocia	1.20 (0.86, 1.66)	0.0	−1.0	4
Other neonatal outcomes				
Preterm birth	1.41 (1.21, 1.64)	62.3	0.0	17
NICU admission	1.42 (1.12, 1.78)	78.7	0.0	14
Neonatal hypoglycaemia	3.08 (1.80, 5.26)	86.3	1.1	7
Jaundice	1.47 (1.12, 1.91)	65.0	−5.0	6
RDS	1.22 (1.01, 1.47)	40.1	2.7	6

*The LFK is a measure of symmetry of publication bias plots and reflects major asymmetry when its absolute value is greater than 2 (or −2).
aOR, adjsuted OR; GDM, Gestational Diabetes Mellitus; LGA, large-for-gestational-age; NICU, neonatal intensive care unit admission; PIH, pregnancy-induced hypertension; SGA, small-for-gestational-age.

supplemental figure 3). Finally, in overall synthesis of seven studies,[27 28 31 33–35 38 45 47–49] GDM showed an estimated 55% increase in the odds of PIH (aOR 1.55, 95% CI 1.03 to 2.34, I^2=69.4%; online supplemental figure 4). The analyses suggested minor evidence of publication bias for all maternal outcomes, except for PIH which showed major evidence (online supplemental figures 5–7). In further analyses, compared with the IADPSG, non-IADPSG criteria showed similar odds of pre-eclampsia, PIH and total C-section (table 3).

Birth size-related neonatal outcomes

Data from 19 studies were included in the analysis of macrosomia.[26 27 29 31–33 36 37 40 41 43 46–48 50 52–55] The overall aOR for macrosomia was 1.38 (95% CI 1.13 to 1.69) with moderate heterogeneity (I^2=75.0%) (online supplemental figure 8). Overall, GDM was associated with 1.42-fold higher odds of LGA (aOR 1.42, 95% CI 1.23 to 1.63, I^2=60.1%, n=19[27 29 31 33–38 42–44 46–49 52–54]) (online supplemental figure 9). However, the synthesis suggested no significant associations between GDM and the odds of SGA (aOR 0.91, 95% CI 0.80 to 1.04, I^2=40.1%, n=14;[27 31 33 34 38 39 42–44 46 49 52–54]online supplemental figure 10) or shoulder dystocia (aOR 1.20, 95% CI 0.86 to 1.66, I^2=0.0%, n=4;[27 31 32 50] online supplemental figure 11). The analyses suggested evidence of publication bias for macrosomia and LGA, minor evidence for shoulder dystocia and no evidence of publication bias for SGA (online supplemental figures 12–15). In further analyses, compared with the non-IADPSG, the IADPSG criteria showed similar odds of macrosomia, LGA and SGA (table 3).

Other neonatal outcomes

In an analysis of 17 studies,[26–28 31–34 38 39 43 46–48 50–53] GDM was associated with increased odds of preterm birth (online supplemental figure 16), with an overall aOR of 1.41 (95% CI 1.21 to 1.64) and moderate heterogeneity (I^2=62.3%). For NICU admission, data from 14 studies[27 28 31–35 38 39 42 43 48 50 53] showed that GDM was associated with a 1.42-fold increased odds (aOR 1.42, 95% CI 1.12 to 1.78) with high heterogeneity (I^2=78.7%) (online supplemental figure 17). The overall aOR for neonatal hypoglycaemia was 3.08 (95% CI 1.80 to 5.26, I^2=86.3%, n=7[27 28 31–33 38 42]) (online supplemental figure 18). GDM was associated with 1.47-fold higher odds of neonatal jaundice (aOR 1.47, 95% CI 1.12 to 1.91, I^2=65.0%, n=6;[27 28 31–34] online supplemental figure 19). Moreover, GDM was associated with a 1.22-fold increased odds of neonatal RDS (aOR 1.22, 95% CI 1.01 to 1.47, I^2=40.1%, n=6;[28 31–34 42] online supplemental figure 20). The analyses suggested evidence of publication bias for jaundice and RDS, minor evidence for neonatal hypoglycaemia and no evidence of publication bias for preterm birth and NICU admission (online supplemental figures 21–25). Analyses by diagnostic criteria showed that, compared with non-IADPSG, IADPSG criteria showed similar odds of jaundice, RDS, neonatal hypoglycaemia, preterm birth and NICU admission (table 3).

DISCUSSION

In this meta-analysis of 30 studies, we found strong associations between GDM diagnosed using contemporary

Table 3 Results of analyses by criteria for the association between GDM and each adverse pregnancy outcome

Outcome	Criteria	Overall aOR (95% CI)	P for interaction
Maternal outcomes			
Total C-section	IADPSG	1.34 (1.12, 1.60)	0.398
	Non-IADPSG	1.20 (1.02, 1.43)	
Pre-eclampsia	IADPSG	1.08 (0.60, 1.94)	0.565
	Non-IADPSG	1.29 (1.11, 1.49)	
PIH	IADPSG	1.34 (0.82, 2.16)	0.636
	Non-IADPSG	1.57 (0.98, 2.54)	
Birth size-related neonatal outcomes			
Macrosomia	IADPSG	1.42 (1.24, 1.63)	0.577
	Non-IADPSG	1.04 (0.34, 3.13)	
LGA	IADPSG	1.41 (1.20, 1.66)	0.759
	Non-IADPSG	1.48 (1.14, 1.94)	
SGA	IADPSG	0.94 (0.80, 1.10)	0.298
	Non-IADPSG	0.81 (0.65, 1.01)	
Shoulder dystocia	IADPSG	1.36 (0.63, 2.95)	0.761
	Non-IADPSG	1.16 (0.60, 2.26)	
Other neonatal outcomes			
Preterm birth	IADPSG	1.44 (1.21, 1.71)	0.797
	Non-IADPSG	1.39 (1.15, 1.86)	
NICU admission	IADPSG	1.32 (1.11, 1.58)	0.723
	Non-IADPSG	1.41 (1.04, 1.92)	
Neonatal hypoglycaemia	IADPSG	3.09 (1.52, 6.29)	0.956
	Non-IADPSG	3.01 (1.64, 5.51)	
Jaundice	IADPSG	1.54 (1.24, 1.92)	0.816
	Non-IADPSG	1.46 (0.96, 2.22)	
RDS	IADPSG	1.32 (1.01, 1.74)	0.574
	Non-IADPSG	1.19 (0.92, 1.54)	

aOR, adjusted OR; GDM, Gestational Diabetes Mellitus; LGA, large-for-gestational-age; NICU, neonatal intensive care unit admission; PIH, pregnancy-induced hypertension; RDS, respiratory distress syndrome; SGA, small-for-gestational-age.

criteria and adverse pregnancy outcomes. The highest associations were observed for neonatal hypoglycaemia, PIH, jaundice, NICU admission, macrosomia, LGA and preterm birth. We found no major differences in the effect of GDM between IADPSG-based criteria and criteria that used higher glucose cut-offs.

We found no major differences between IADPSG and non-IADPSG criteria on the effect of GDM on adverse pregnancy, maternal and foetal outcomes. When comparing IADPSG to stricter GDM criteria, this meta-analysis showed that no outcome differed by criteria. Our findings are similar to those of older meta-analyses which have also found that the risk of adverse pregnancy outcomes was not largely different across the different diagnostic criteria.[23 57–59] A key difference between our synthesis and the older previously publishes studies is that we included contemporary studies, with adjusted effect magnitudes, that were conducted after 2010 when the IADPSG recommendations were published. Our findings and those of previously published studies raise the question about the benefits of using lower glucose cut-offs for the diagnosis GDM. It has been argued that the use of criteria with lower fasting glucose cut-offs combined with universal screening, like the IADPSG, leads to an increase in GDM prevalence, without a concurrent increase in benefit (ie, reduced pregnancy outcomes and postpartum type 2 diabetes).[10]

Our findings have several implications. For healthcare systems, adopting the IADSPG criteria, that is, universal screening and lower glycaemic thresholds compared with targeted screening and generally higher glycaemic diagnostic thresholds, may strain resources, as more women would require screening, monitoring and interventions. This could lead to an increase in healthcare costs,[60 61] which will lead to an increased burden, especially in settings where resources are already constrained. On the other hand, selective or targeted screening may result in some proportions of women progressing with

undiagnosed hyperglycaemia in pregnancy, and the consequent higher risk of adverse pregnancy outcomes. The NICE, for example, has opted to keep their guidelines which use risk factor-based screening and higher glycaemic thresholds. It is crucial to balance the costs and benefits of adopting either the IADPSG recommendations or selective screening, higher glycaemic threshold approaches such as that used by the NICE. These considerations may be different for different health systems, depending on affordability and healthcare system capacity. For clinicians, these findings highlight the need for careful consideration when diagnosing and managing GDM, as they should be mindful of the potential for overdiagnosis and overtreatment, and they should tailor management strategies based on each patient's individual risk factors, ensuring that interventions are justified and beneficial. For women, the increased likelihood of a GDM diagnosis that comes with universal screening and lower glycaemic thresholds may result in increased anxiety and an increased likelihood of medical interventions, without a clear improvement of outcomes. GDM diagnosis has been associated with a higher occurrence of mental health problems in pregnant women.[62 63] It is therefore critical to provide women with clear and balanced information along with the implications, and to promote shared decision-making. More research is needed to identify appropriate blood glucose cut-offs where the benefit of GDM diagnosis outweighs the unintended negative consequences.

GDM was associated with around a 25% increase in the odds of pre-eclampsia and total C-section and 56% increase in the odds of PIH. A previous meta-analysis showed a 50% increase in pre-eclampsia and a 40% increase in C-sections in women with than in those without gestational diabetes mellitus.[22] The HAPO study found that the occurrence of pre-eclampsia was positively associated with blood glucose level even after adjusting for clinical centre, age, Body Mass Index, height, smoking status, alcohol consumption, family history of diabetes, gestational age at OGTT and urinary tract infection.[13 64] GDM causes increase in the insulin secretion by the foetal pancreas which itself is an anabolic hormone and leads to increase in the foetal weight. Fetuses with high birth size are usually delivered by caesarean sections as vaginal deliveries carry high risks to both mothers and babies.[65] The pathophysiology of pre-eclampsia is not well understood, and the association observed in these studies may be bidirectional. Irrespective of direction of association, the findings of this meta-analysis confirm the need to screen and monitor women with GDM for pre-eclampsia and PIH. Notably, pre-eclampsia and PIH are all associated with higher rates of both emergency and elective C-sections, and therefore may partly explain the higher risk of C-section in women with GDM.

The current meta-analysis showed that GDM was associated with higher the odds of neonatal hypoglycaemia, LGA, macrosomia, preterm birth, jaundice, NICU admission, RDS and shoulder dystocia. The higher odds of birth-size-related complications, LGA, macrosomia and shoulder dystocia, are likely because of maternal hyperglycaemia, which leads to a high glucose intrauterine environment which promotes foetal hyperglycaemia and hyperinsulinemia, which in turn induce excess fat deposition in the fetus.[66 67] Notably, the highest OR was observed for neonatal hypoglycaemia, with threefold higher odds for GDM exposed neonates compared with the non-GDM exposed neonates. However, it is important to consider that this risk could be exaggerated due to the possibility of allocation bias for this outcome. Neonates born to mothers with GDM are more likely to be routinely tested for blood glucose levels shortly after birth due to the known risks of hypoglycaemia, whereas neonates of non-GDM pregnancies do not typically undergo such testing unless clinically indicated. This difference in clinical practice likely increases the detection rate of hypoglycaemia in the GDM group, which could lead to an overestimation of the association between GDM and neonatal hypoglycaemia. Previous meta-analyses have generally found that GDM was associated with adverse pregnancy outcomes.[21 22] However, our findings differ from those of many of these previous meta-analyses in that our aORs, although still suggesting a higher risk of adverse pregnancy outcomes with GDM, are generally lower than those reported by the other meta-analyses.[23] This discrepancy is mostly due to the other meta-analyses having used unadjusted effect sizes. GDM is thought to cause RDS by interfering with the production of surfactant lipids and proteins.[68] Notably, some previous meta-analyses have reported contrasting findings in terms of the associations observed. Ye *et al*, using a meta-analysis of unadjusted ORs and studies with criteria that are no longer in use, found no association between shoulder dystocia and GDM was not significant.[22] Tehrani *et al* used a meta-analysis of unadjusted ORs and reported a 20% decrease in the odds SGA, contrary to our finding.[23]

A strength of this study is the use of contemporary studies using contemporary GDM diagnosis criteria, therefore contributing to the current debate about the appropriate screening tests and testing strategy for GDM. We only included adjusted effect sizes, thus minimising the effect of confounding on the relationship between GDM and the outcomes, which is the main limitation of existing meta-analyses. However, this study has some limitations. Since this study uses data from observational studies, the role of confounding cannot be fully eliminated. Our findings require confirmation by experimental randomised controlled trials which compare these criteria. Additionally, most of the included studies were conducted in Asia (54%), and relatively fewer studies from the other regions. This may limit the generalisability of our findings to non-Asian populations. Finally, the small number of studies using non-IADPSG criteria, most of which employed cut-offs relatively close to those recommended by IADPSG, limits the strength of the comparison between IADPSG and non-IADPSG criteria, as the non-IADPSG group may

not fully represent the diversity of diagnostic approaches in use.

Conclusion

GDM showed consistent associations with pregnancy, maternal and foetal outcomes, with no major differences in the effects when different contemporary criteria were used.

Contributors Conceptualisation: EM, AME and TC; data curation: EM, AME, BE, YE and AG; formal analysis: EM and AME. TC; investigation: EM and AME, TC; methodology: EM, AME and TC; supervision: TC; visualisation: EM; validation: EM, AME and TC. Software: EM, AME and TC; resources: EM, AME and TC; project administration: EM. Writing—original draft: EM, AME, BE, YE and TC; writing—review and editing: EM, AME, BE, YE, AG and TC is the guarantor.

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Patient consent for publication Not applicable.

Ethics approval This study involves human participants but ethical approval is not required as the review utilises published data. Exempted this study. Participants gave informed consent to participate in the study before taking part.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement Data are available upon reasonable request. All data relevant to the study are included in the article or uploaded as supplementary information.

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REFERENCES

1 Wang H, Li N, Chivese T, *et al*. IDF Diabetes Atlas: Estimation of Global and Regional Gestational Diabetes Mellitus Prevalence for 2021 by International Association of Diabetes in Pregnancy Study Group's Criteria. *Diabetes Res Clin Pract* 2022;183:S0168-8227(21)00409-5.
2 Sweeting A, Hannah W, Backman H, *et al*. Epidemiology and management of gestational diabetes. *Lancet* 2024;404:175–92.
3 Vounzoulaki E, Khunti K, Abner SC, *et al*. Progression to type 2 diabetes in women with a known history of gestational diabetes: systematic review and meta-analysis. *BMJ* 2020;369:m1361.
4 Chivese T, Norris SA, Levitt NS. High prevalence of cardiovascular risk factors and insulin resistance 6 years after hyperglycemia first detected in pregnancy in Cape Town, South Africa. *BMJ Open Diabetes Res Care* 2019;7:e000740.
5 Coustan DR, Lowe LP, Metzger BE, *et al*. The Hyperglycemia and Adverse Pregnancy Outcome (HAPO) study: paving the way for new diagnostic criteria for gestational diabetes mellitus. *Am J Obstet Gynecol* 2010;202:654.
6 International Association of Diabetes and Pregnancy Study Groups Consensus Panel, Metzger BE, Gabbe SG, *et al*. International association of diabetes and pregnancy study groups recommendations on the diagnosis and classification of hyperglycemia in pregnancy. *Diabetes Care* 2010;33:676–82.
7 Doi SAR, Bashir M, Sheehan MT, *et al*. Unifying the diagnosis of gestational diabetes mellitus: Introducing the NPRP criteria. *Prim Care Diabetes* 2022;16:96–101.
8 Jensen RC, Jensen DM, Gibbons KS, *et al*. Adapting fasting plasma glucose threshold for GDM diagnosis according to the population distribution - An approach to the Danish paradox. *Diabetes Res Clin Pract* 2021;175:S0168-8227(21)00191-1.
9 McIntyre HD, Jensen DM, Jensen RC, *et al*. Gestational Diabetes Mellitus: Does One Size Fit All? A Challenge to Uniform Worldwide Diagnostic Thresholds. *Diabetes Care* 2018;41:1339–42.
10 Behboudi-Gandevani S, Amiri M, Bidhendi Yarandi R, *et al*. The impact of diagnostic criteria for gestational diabetes on its prevalence: a systematic review and meta-analysis. *Diabetol Metab Syndr* 2019;11:11.
11 Damm P, Houshmand-Oeregaard A, Kelstrup L, *et al*. Gestational diabetes mellitus and long-term consequences for mother and offspring: a view from Denmark. *Diabetologia* 2016;59:1396–9.
12 Bommer C, Sagalova V, Heesemann E, *et al*. Global Economic Burden of Diabetes in Adults: Projections From 2015 to 2030. *Diabetes Care* 2018;41:963–70.
13 Metzger BE, Lowe LP, Dyer AR, *et al*. Hyperglycemia and adverse pregnancy outcomes. *N Engl J Med* 2008;358:1991–2002.
14 Kim SY, England JL, Sharma JA, *et al*. Gestational diabetes mellitus and risk of childhood overweight and obesity in offspring: a systematic review. *Exp Diabetes Res* 2011;2011:541308.
15 World Health Organization. Diagnostic Criteria and Classification of Hyperglycaemia First Detected in Pregnancy, 2013. Available: https://apps.who.int/iris/handle/10665/85975
16 Goyal A, Gupta Y, Singla R, *et al*. American Diabetes Association "Standards of Medical Care-2020 for Gestational Diabetes Mellitus": A Critical Appraisal. *Diabetes Ther* 2020;11:1639–44.
17 Nankervis AMH, Moses R, Ross GP, *et al*. ADIPS Consensus Guidelines for the Testing and Diagnosis of Hyperglycaemia in Pregnancy in Australia and New Zealand, 2014. Available: https://www.adips.org/downloads/2014ADIPSGDMGuidelinesV18.11.2014.pdf
18 Society for Endocrinology, M.a.D.o.S.A. SEMDSA 2017 Guidelines for the Management of Type 2 diabetes mellitus. 2017.
19 Tsakiridis I, Giouleka S, Mamopoulos A, *et al*. Diagnosis and Management of Gestational Diabetes Mellitus: An Overview of National and International Guidelines. *Obstet Gynecol Surv* 2021;76:367–81.
20 Excellence,N.I.f.H.C.a. Diabetes in pregnancy: management from preconception to the postnatal period, 2015. Available: https://www.nice.org.uk/guidance/ng3/chapter/Recommendations#gestational-diabetes
21 India, D.i.P.s.G. Diagnosis & Management of Gestational Diabetes Mellitus, 2021. Available: https://icogonline.org/wp-content/uploads/pdf/gcpr/gdm-dipsi-guidline.pdf
22 Ye W, Luo C, Huang J, *et al*. Gestational diabetes mellitus and adverse pregnancy outcomes: systematic review and meta-analysis. *BMJ* 2022;377:e067946.
23 Tehrani FR, Naz MSG, Bidhendi-Yarandi R, *et al*. Effect of Different Types of Diagnostic Criteria for Gestational Diabetes Mellitus on Adverse Neonatal Outcomes: A Systematic Review, Meta-Analysis, and Meta-Regression. *Diabetes Metab J* 2022;46:605–19.
24 Page MJ, Moher D, Bossuyt PM, *et al*. PRISMA 2020 explanation and elaboration: updated guidance and exemplars for reporting systematic reviews. *BMJ* 2021;372:n160.
25 Ahmed AI, Kaleem MZ, Elshoeibi AM, *et al*. MASTER scale for methodological quality assessment: Reliability assessment and update. *J Evid Based Med* 2024;17:263–6.
26 Darbandi M, Rezaeian S, Dianatinasab M, *et al*. Prevalence of gestational diabetes and its association with stillbirth, preterm birth, macrosomia, abortion and cesarean delivery: a national prevalence study of 11 provinces in Iran. *J Prev Med Hyg* 2021;62:E885–91.
27 Kim MH, Kwak SH, Kim SH, *et al*. Pregnancy Outcomes of Women Additionally Diagnosed as Gestational Diabetes by the International Association of the Diabetes and Pregnancy Study Groups Criteria. *Diabetes Metab J* 2019;43:766–75.
28 Hiersch L, Berger H, Okby R, *et al*. Gestational diabetes mellitus is associated with adverse outcomes in twin pregnancies. *Am J Obstet Gynecol* 2019;220:S0002-9378(18)30911-6.
29 Nguyen CL, Lee AH, Minh Pham N, *et al*. Prevalence and pregnancy outcomes of gestational diabetes mellitus by different international

diagnostic criteria: a prospective cohort study in Vietnam. *J Matern Fetal Neonatal Med* 2020;33:3706–12.
30 Erjavec K, Poljičanin T, Matijević R. Impact of the Implementation of New WHO Diagnostic Criteria for Gestational Diabetes Mellitus on Prevalence and Perinatal Outcomes: A Population-Based Study. *J Pregnancy* 2016;2016:2670912.
31 Wan CS, Abell S, Aroni R, *et al*. Ethnic differences in prevalence, risk factors, and perinatal outcomes of gestational diabetes mellitus: A comparison between immigrant ethnic Chinese women and Australian-born Caucasian women in Australia. *J Diabetes* 2019;11:809–17.
32 Alfadhli EM, Osman EN, Basri TH, *et al*. Gestational diabetes among Saudi women: prevalence, risk factors and pregnancy outcomes. *Ann Saudi Med* 2015;35:222–30.
33 Bashir M, Aboulfotouh M, Dabbous Z, *et al*. Metformin-treated-GDM has lower risk of macrosomia compared to diet-treated GDM- a retrospective cohort study. *J Matern Fetal Neonatal Med* 2020;33:2366–71.
34 Capula C, Chiefari E, Vero A, *et al*. Gestational Diabetes Mellitus: Screening and Outcomes in Southern Italian Pregnant Women. *ISRN Endocrinol* 2013;2013:1–8.
35 de Carvalho LS, de Oliveira AAD, Grabovski TCM, *et al*. Maternal prepregnancy obesity and gestational diabetes influence on adverse perinatal outcomes. *Arch Endocrinol Metab* 2023;67:e000605.
36 Djelmis J, Pavić M, Mulliqi Kotori V, *et al*. Prevalence of gestational diabetes mellitus according to IADPSG and NICE criteria. *Int J Gynaecol Obstet* 2016;135:250–4.
37 He LR, Yu L, Guo Y. Birth weight and large for gestational age trends in offspring of pregnant women with gestational diabetes mellitus in southern China, 2012-2021. *Front Endocrinol (Lausanne)* 2023;14:1166533.
38 Hirst JE, Tran TS, Do MAT, *et al*. Consequences of gestational diabetes in an urban hospital in Viet Nam: a prospective cohort study. *PLoS Med* 2012;9:e1001272.
39 Kawasaki M, Arata N, Sugiyama T, *et al*. Risk of fetal undergrowth in the management of gestational diabetes mellitus in Japan. *J Diabetes Investig* 2023;14:614–22.
40 Laafira A, White SW, Griffin CJ, *et al*. Impact of the new IADPSG gestational diabetes diagnostic criteria on pregnancy outcomes in Western Australia. *Aust N Z J Obstet Gynaecol* 2016;56:36–41.
41 Li G, Kong L, Li Z, *et al*. Prevalence of macrosomia and its risk factors in china: a multicentre survey based on birth data involving 101,723 singleton term infants. *Paediatr Perinat Epidemiol* 2014;28:345–50.
42 Lin D, Fan D, Li P, *et al*. Perinatal outcomes among twin pregnancies with gestational diabetes mellitus: A nine-year retrospective cohort study. *Front Public Health* 2022;10:946186.
43 Mak JKL, Lee AH, Pham NM, *et al*. Gestational diabetes incidence and delivery outcomes in Western China: A prospective cohort study. *Birth* 2019;46:166–72.
44 Mei Y, Yu J, Wen L, *et al*. Perinatal outcomes and offspring growth profiles in twin pregnancies complicated by gestational diabetes mellitus: A longitudinal cohort study. *Diabetes Res Clin Pract* 2021;171:S0168-8227(20)30880-9.
45 Muche AA, Olayemi OO, Gete YK. Effects of gestational diabetes mellitus on risk of adverse maternal outcomes: a prospective cohort study in Northwest Ethiopia. *BMC Pregnancy Childbirth* 2020;20:73.
46 Muche AA, Olayemi OO, Gete YK. Gestational diabetes mellitus increased the risk of adverse neonatal outcomes: A prospective cohort study in Northwest Ethiopia. *Midwifery* 2020;87:S0266-6138(20)30086-3.
47 Pan L, Leng J, Liu G, *et al*. Pregnancy outcomes of Chinese women with gestational diabetes mellitus defined by the IADPSG's but not by the 1999 WHO's criteria. *Clin Endocrinol (Oxf)* 2015;83:684–93.
48 Punnose J, Malhotra RK, Sukhija K, *et al*. Gestational diabetes mellitus in early pregnancy amongst Asian Indian women: Evidence for poor pregnancy outcomes despite treatment. *Diabet Med* 2023;40:e14993.
49 Ronco A, Roero S, Arduino S, *et al*. Gestational Diabetes Mellitus Does Not Worsen Obstetrical and Neonatal Outcomes of Twin Pregnancy. *J Clin Med* 2023;12:3129.
50 Wahabi H, Fayed A, Esmaeil S, *et al*. Prevalence and Complications of Pregestational and Gestational Diabetes in Saudi Women: Analysis from Riyadh Mother and Baby Cohort Study (RAHMA). *Biomed Res Int* 2017;2017:6878263.
51 Wang KL, Zhang M, Li Q, *et al*. Association between gestational diabetes mellitus and preterm birth subtypes. *Zhonghua Liu Xing Bing Xue Za Zhi* 2023;44:809–15.
52 Wang X, Zhang X, Zhou M, *et al*. Association of Gestational Diabetes Mellitus with Adverse Pregnancy Outcomes and Its Interaction with Maternal Age in Chinese Urban Women. *J Diabetes Res* 2021;2021:5516937.
53 Yue S, Thi VTK, Dung LP, *et al*. Clinical consequences of gestational diabetes mellitus and maternal obesity as defined by asian BMI thresholds in Viet Nam: a prospective, hospital-based, cohort study. *BMC Pregnancy Childbirth* 2022;22:195.
54 Zou J-J, Wei Q, Shi Y-Y, *et al*. Longitudinal Associations Between Maternal Glucose Levels and Ultrasonographic Fetal Biometrics in a Shanghai Cohort. *JAMA Netw Open* 2022;5:e226407.
55 Yang Y, Wang Z, Mo M, *et al*. The association of gestational diabetes mellitus with fetal birth weight. *J Diabetes Complications* 2018;32:635–42.
56 Stone JC, Glass K, Clark J, *et al*. The MethodologicAl STandards for Epidemiological Research (MASTER) scale demonstrated a unified framework for bias assessment. *J Clin Epidemiol* 2021;134:52–64.
57 Ramezani Tehrani F, Naz MSG, Yarandi RB, *et al*. The Impact of Diagnostic Criteria for Gestational Diabetes Mellitus on Adverse Maternal Outcomes: A Systematic Review and Meta-Analysis. *J Clin Med* 2021;10:666.
58 Wendland EM, Torloni MR, Falavigna M, *et al*. Gestational diabetes and pregnancy outcomes--a systematic review of the World Health Organization (WHO) and the International Association of Diabetes in Pregnancy Study Groups (IADPSG) diagnostic criteria. *BMC Pregnancy Childbirth* 2012;12:23.
59 Hartling L, Dryden DM, Guthrie A, *et al*. Diagnostic thresholds for gestational diabetes and their impact on pregnancy outcomes: a systematic review. *Diabet Med* 2014;31:319–31.
60 Mission JF, Ohno MS, Cheng YW, *et al*. Gestational diabetes screening with the new IADPSG guidelines: a cost-effectiveness analysis. *Am J Obstet Gynecol* 2012;207:S0002-9378(12)00662-X.
61 Werner EF, Pettker CM, Zuckerwise L, *et al*. Screening for gestational diabetes mellitus: are the criteria proposed by the international association of the Diabetes and Pregnancy Study Groups cost-effective? *Diabetes Care* 2012;35:529–35.
62 Wilson CA, Newham J, Rankin J, *et al*. Is there an increased risk of perinatal mental disorder in women with gestational diabetes? A systematic review and meta-analysis. *Diabet Med* 2020;37:602–22.
63 Fischer S, Morales-Suárez-Varela M. The Bidirectional Relationship between Gestational Diabetes and Depression in Pregnant Women: A Systematic Search and Review. *Healthcare (Basel) -> Healthc (Basel)* 2023;11:404.
64 Yang Y, Wu N. Gestational Diabetes Mellitus and Preeclampsia: Correlation and Influencing Factors. *Front Cardiovasc Med* 2022;9:831297.
65 Phaloprakarn C, Tangjitgamol S. Risk score for predicting primary cesarean delivery in women with gestational diabetes mellitus. *BMC Pregnancy Childbirth* 2020;20:607.
66 Kc K, Shakya S, Zhang H. Gestational Diabetes Mellitus and Macrosomia: A Literature Review. *Ann Nutr Metab* 2015;66:14–20.
2 Hay W. *Growth and development: physiological aspects, in encyclopediaof human nutrition, 4th edn*. AcademicPress, 2023.
68 Yildiz Atar H, Baatz JE, Ryan RM. Molecular Mechanisms of Maternal Diabetes Effects on Fetal and Neonatal Surfactant. *Children (Basel)* 2021;8:281.

Supplementary Materials for "Association between gestational diabetes mellitus diagnostic criteria and adverse pregnancy outcomes– a systematic review and meta-analysis of adjusted effect sizes from studies using current diagnostic criteria"

Supplementary Table 1: PubMed Search Strategy

Population:		
#1	MeSH terms:	Diabetes, Gestational
#2	Text Word:	Gestational Diabetes OR GDM OR Gestational Diabetes Mellitus OR Pregnancy-induced diabetes OR Diabetes in Pregnancy OR Hyperglycaemia in Pregnancy OR Hyperglycemia in Pregnancy OR gestational hyperglycemia OR greasational diabete* OR gestational glucose OR pregnancy diabete* OR pregnancy glucose OR maternal hyperglycemia OR maternal diabete* OR maternal glucose OR HIP OR glucose intolerance in pregnancy
#3	#1 OR #2	
Outcomes		
#4	Text Word:	Fetal outcomes OR Foetal outcomes OR Macrosomia OR Large for Gestational Age OR Perinatal Mortality OR Shoulder Dystocia OR Congenital Malformation OR Miscarriage OR Spontaneous Abortion OR Neonatal Hypoglycaemia OR Neonatal Hypoglycemia OR Hyperbilirubinaemia OR Hyperbilirubinemia OR Birth Asphyxia OR Admission to the Neonatal Intensive Care Unit OR Overweight OR Obesity OR Offspring OR Child OR Childhood OR Children OR spontaneous miscarriage OR pregnancy loss OR instrumental birth OR caesarean section OR C-section OR hypertensi* OR PIH OR pregnancy-induced hypertension OR preeclampsia OR eclampsia OR mortality OR death OR stillbirth OR congenital OR anomaly OR impair* OR disability* OR prematur* OR preter* OR low birth weight OR LBW OR large for gestational age OR LGA OR small for gestational age OR SGA OR neonatal hypo* OR jaundice OR respiratory distress syndrome OR RDS OR NICU OR neonatal intensive care unit
#5	#3 AND #4	
#6	#5 NOT (review OR metaanalysis OR systematic review OR meta-analysis OR literature review)	

Filters

1. 2010-2023

2. Humans

Supplementary Table 2: Cochrane Search Strategy

Population:		
#1	Key Word:	Gestational Diabetes OR GDM OR Gestational Diabetes Mellitus OR Pregnancy-induced diabetes OR Diabetes in Pregnancy OR Hyperglycaemia in Pregnancy OR Hyperglycemia in Pregnancy
#4	#1 OR #2 OR #3	
#5	Pregnancy	
Outcomes		
#6	Key Word:	Fetal Outcomes OR Foetal Outcomes OR Macrosomia OR Large for Gestational Age OR Perinatal Mortality OR Shoulder Dystocia OR Congenital Malformation OR Miscarriage OR Spontaneous Abortion OR Neonatal Hypoglycaemia OR Neonatal Hypoglycemia OR Hyperbilirubinaemia OR Hyperbilirubinemia OR Birth Asphyxia OR Admission to the Neonatal Intensive Care Unit OR Overweight OR Obesity OR Long Term Outcomes in Offsprings OR co-ordinated care OR coordinated integrated care OR co-ordinated integrated care OR multicare OR multiservice OR multiclinic
#10	#4 AND #5 AND #8 AND #9	

Supplementary Table 3: Scopus Search Strategy

Population:		
#1	Key Word:	Gestational Diabetes OR GDM OR Gestational Diabetes Mellitus OR Pregnancy-induced diabetes OR Diabetes in Pregnancy OR Hyperglycaemia in Pregnancy OR Hyperglycemia in Pregnancy
Outcomes:		
#2	Key Word:	Macrosomia OR Mortality OR Shoulder Dystocia OR Congenital OR Malformation OR Miscarriage OR Abortion OR Hypoglycaemia OR Hypoglycemia OR Hyperbilirubinaemia OR Hyperbilirubinemia OR Birth Asphyxia OR Overweight OR Obesity
#3	#1 AND #2	

Supplementary Table 4: Table of excluded studies

Study	Reason for exclusion
Stanescu 2014	Arguments/controversies
Abd Latif 2022	No relevant effect size
Abdelwahab 2023	No full-text article
Abell 2017	Study period before 2010
Absalom 2019	No relevant effect size
Abu 2022	No full-text article
Alberico 2014	Criteria not clear
Ali 2018	No relevant effect size
Al-Shwyiat 2022	No outcomes of interest
Anderberg 2010	Study period before 2010
Asemi 2021	Letter
Au 2016	No relevant effect size
Aulinas 2013	Study period before 2010
Aung 2015	No relevant effect size
Aviram 2016	Study period before 2010
Badakhsh 2016	Criteria not clear
Baharvand 2022	No outcomes of interest
Bahl 2022	No outcomes of interest
Bai 2023	No outcomes of interest
Bartáková 2017	No relevant effect size
Bashir 2018	No relevant effect size
Bashir 2019	No relevant effect size
Bashir 2021	No relevant effect size
Basri2018	No relevant effect size
Bassaw 2012	Criteria not clear
Basu 2012	Study period before 2010
Bauer 2023	No relevant effect size
Bayoumi 2021	Correction
Beetham 2022	No outcomes of interest
Benhalim 2019	No relevant effect size
Benhalima 2013	No relevant effect size
Berggren 2011	No relevant effect size
Berghella 2019	Letter
Bhavadharini 2021	No relevant effect size
Bianchi 2018	No relevant effect size
Black 2010	Study period before 2010
Blickstein 2018	Study period before 2010
Blomberg 2023	No outcomes of interest
Bodmer-Roy 2012	Study period before 2010

Bogdanet 2017	No relevant effect size
Bomba-Opoń 2022	No outcomes of interest
Bordin 2020	Study period before 2010
Boriboonhirunsarn 2023	No outcomes of interest
Brankica 2016	No relevant effect size
Briana 2022	No full-text article
Brown 2022	No relevant effect size
Buffarini 2019	Study period before 2010
Cai 2016	No relevant effect size
Catalano 2012	Study period before 2010
Chen 2021	No outcomes of interest
Chen 2022	No outcomes of interest
Chen 2022	No relevant effect size
Chen 2023	No outcomes of interest
Cheng 2019	Included pre-gestational diabetes
Cheung 2018	No relevant effect size
Chew 2013	Included pre-gestational diabetes
Cho 2016	Study period before 2010
Choi 2022	No relevant effect size
Chung 2022	Criteria not clear
Cosson 2013	No relevant effect size
Cosson 2022	Criteria not clear
Côté-Corriveau 2021	Letter
Dalfrà 2011	Study period before 2010
Davis 2018	Study period before 2010
de Wit 2021	No relevant effect size
Deng 2022	Criteria not clear
Ding 2018	No relevant effect size
Domanski 2018	Study period before 2010
Donovan 2017	No relevant effect size
Duran 2014	No relevant effect size
Ehmann 2019	Criteria not clear
Ekeroma 2015	No relevant effect size
Esakoff 2011	Study period before 2010
Ethridge 2014	No relevant effect size
Feghali 2018	Study period before 2010
Feleke 2022	No outcomes of interest
Feleke 2022	No relevant effect size
Feng 2017	No relevant effect size
Foeller 2015	Study period before 2010
Gao 2022	No outcomes of interest

García-Patterson 2020	No outcomes of interest
Gasim 2012	Study period before 2010
Glover 2016	Study period before 2010
Goedegebure 2018	No relevant effect size
Gojnic 2022	No relevant effect size
Gopalakrishnan 2015	No outcomes of interest
Gorban 2021	No relevant effect size
Gorgal 2012	No relevant effect size
Greenberg 2021	No full-text article
Gregory 2022	No outcomes of interest
Grotenfelt 2019	Study period before 2010
Gu 2019	No outcomes of interest
He 2020	No relevant effect size
Hernandez-Rivas 2013	Study period before 2010
Hildén 2019	No relevant effect size
Hildén 2020	Study period before 2010
Hillier 2022	Study period before 2010
Hosseini 2018	No outcomes of interest
Huang 2016	No full-text article
Huhn 2017	No full-text article
Ikenoue 2014	No relevant effect size
Immanuel 2021	Criteria not clear
Jain 2016	No relevant effect size
Jao 2013	Letter
Jin 2020	No relevant effect size
Kalra 2013	No relevant effect size
Karcaaltincaba 2011	Study period before 2010
Kaul 2022	Criteria not clear
Keikkala 2020	No relevant effect size
Kgosidialwa 2015	Study period before 2010
Kim 2021	No relevant effect size
Kirke 2014	No outcomes of interest
Koivunen 2017	Criteria not clear
Koivunen 2020	Study period before 2010
König 2014	Study period before 2010
Koning 2018	No relevant effect size
Kosman 2016	Included pre-gestational diabetes
Kösüs 2013	No outcomes of interest
Kragelund 2021	Study period before 2010
Kragelund 2021	Study period before 2010
Kumari 2018	No relevant effect size

Kung 2022	Criteria not clear
Kwong 2019	Study period before 2010
Lapolla 2011	No relevant effect size
Lara-Barea 2022	No outcomes of interest
Lee 2018	No relevant effect size
Lee 2020	No relevant effect size
Leybovitz-Haleluya 2018	No relevant effect size
Li 2020	No outcomes of interest
Li 2020	No relevant effect size
Liu 2012	Study period before 2010
Liu 2020	No outcomes of interest
Liu 2020	Criteria not clear
Lloreda-Garcia 2016	Criteria not clear
Lu 2016	Study period before 2010
Lu 2019	Study period before 2010
Lu 2023	Criteria not clear
Lucovnik 2020	No outcomes of interest
Luengmettakul 2015	Criteria not clear
Macaulay 2018	No relevant effect size
Macrì 2018	Study period before 2010
Makwana 2017	No relevant effect size
Maresh 2021	No outcomes of interest
Mayo 2015	Study period before 2010
McIntyre 2018	No relevant effect size
Mdoe 2021	No relevant effect size
Meek 2015	Study period before 2010
Miailhe 2015	No relevant effect size
Miao2017	No relevant effect size
Mikkelsen 2011	Study period before 2010
Minsart 2014	No relevant effect size
Mitanchez 2014	Review
Morikawa 2017	No relevant effect size
Mwanri 2014	No relevant effect size
Myszkowski 2023	No relevant effect size
Nabi 2022	No relevant effect size
Nayak 2013	No relevant effect size
Nelson 2023	Initiative
Nguyen 2016	Study period before 2010
Nicolosi 2020	Study period before 2010
No article	No full-text article
Ogonowski 2015	Study period before 2010

Olerich 2022	Criteria not clear
Oster 2014	Study period before 2010
O'Sullivan 2012	No full-text article
O'Sullivan 2016	Study period before 2010
Ovesen 2015	Study period before 2010
Park 2015	Study period before 2010
Parveen 2022	No relevant effect size
Pavic 2021	Study period before 2010
Perak 2021	No outcomes of interest
Picon 2022	No full-text article
Pintaudi 2018	No relevant effect size
Poulain 2015	Study period before 2010
Pouliot 2019	No relevant effect size
Protsenko 2010	No full-text article
Qadir 2012	No full-text article
Ramanjaneya 2021	Corrigendum
Redman 2021	Criteria not clear
Rehder 2011	No full-text article
Reichelt 2017	Study period before 2010
Reitzle 2023	No relevant effect size
Ritchie 2023	No relevant effect size
Rotem 2022	No relevant effect size
Ryan 2018	No relevant effect size
Ryan 2020	Study period before 2010
Sacks 2015	Study period before 2010
Sagili 2015	No relevant effect size
Sajani 2014	No full-text article
Sarkar 2022	No full-text article
Saxena 2011	Study period before 2010
Schmidt 2022	No full-text article
Schneider 2011	Study period before 2010
Seely 2023	No relevant effect size
Selen 2022	No relevant effect size
Sesmilo 2017	Study period before 2010
Sesmilo 2020	Study period before 2010
Seval 2016	Study period before 2010
Shah 2020	Study period before 2010
Shahbazian 2016	No relevant effect size
Shahbazian 2016	No relevant effect size
Shang 2014	No relevant effect size
Shang 2014	Study period before 2010

Shi 2020	No outcomes of interest
Shindo 2020	Study period before 2010
Shub 2019	Study period before 2010
Siegel 2017	Study period before 2010
Silva 2021	Review
Silveira 2021	Criteria not clear
Singh 2018	Criteria not clear
Sirimarco 2017	No relevant effect size
Sletner 2017	Study period before 2010
Soliman 2018	No relevant effect size
Soliman 2018	No relevant effect size
Somasundaram 2016	Review
Song 2014	Study period before 2010
Song 2019	No outcomes of interest
Song 2020	No relevant effect size
Sperling 2023	No relevant effect size
Srichumchit 2015	Study period before 2010
Stuebe 2015	Study period before 2010
Sudasinghe 2018	No relevant effect size
Sugiyama 2017	Study period before 2010
Sun 2020	No relevant effect size
Sunder 2022	No relevant effect size
Sunjaya 2018	Includes pre-gestational diabetes
Surendran 2019	Review
Sweeting 2016	Study period before 2010
Tan 2017	No relevant effect size
Todi 2020	No outcomes of interest
Tomić 2013	Study period before 2010
Tong 2022	Criteria not clear
Tong 2022	Criteria not clear
Tundidor 2012	Study period before 2010
Uma 2017	No relevant effect size
Vale 2023	Criteria not clear
Valias 2022	No relevant effect size
Vélez 2020	Study period before 2010
Violante-Ortíz 2023	No full-text article
Voldner 210	Study period before 2010
von Katterfeld 2012	Study period before 2010
Wahabi 2013	No relevant effect size
Wahi 2011	Study period before 2010
Wahlberg 2016	Study period before 2010

Wang 2013	Study period before 2010
Wei 2014	Study period before 2010
Wei 2016	Criteria not clear
Wells 2015	Study period before 2010
Wielandt 2015	Study period before 2010
Wilmot 2014	Recommendations
Wilmot 2014	Recommendations
Wilmot 2014	Recommendations
Wilmot 2014	Recommendations
Wolka 2022	Included pre-gestational diabetes
Wong 2012	Study period before 2010
Xaverius 2022	Criteria not clear
Yan 2017	Study period before 2010
Yang 2019	No relevant effect size
Yang 2019	Study period before 2010
Yang 2023	Criteria not clear
Ye 2021	No relevant effect size
Yesildager 2016	Criteria not clear
Yin 2022	Comment
Youngwanichsetha 2014	Criteria not clear
Yu 2014	No relevant effect size
Zahid 2022	Study period before 2010
Zawiejska 2014	Study period before 2010
Zeki 2018	Study period before 2010
Zhang 2018	No relevant effect size
Zhao 2020	Criteria not clear
Zhao 2023	No relevant effect size
Zheng 2022	No relevant effect size
Żurawska-Kliś 2016	No relevant effect size

References for studies in Supplementary Table 1

1. Stanescu A, Stoicescu SM. Neonatal hypoglycemia screening in newborns from diabetic mothers--arguments and controversies. J Med Life. 2014;7 Spec No. 3(Spec Iss 3):51-52.
2. Abd Latif, R., Yusof, N. A., Yahya, R., Muda, Z., Tengku Lih, T. B., Mohamed, K., Lah, D., Abd Kadir, R., Hassan, M., Wan Sulaiman, W. R., Akbar Merican, S. A., & Mohd Hanafi, M. S. I. (2022). The prevalence of gestational diabetes, associated factors and feto-maternal outcome among antenatal women attending health clinics in Terengganu. Malaysian family physician : the official journal of the Academy of Family Physicians of Malaysia, 17(3), 43–52. https://doi.org/10.51866/oal302
3. Abdelwahab, M., Frey, H. A., Lynch, C. D., Klebanoff, M. A., Thung, S. F., Costantine, M. M., Landon, M. B., & Venkatesh, K. K. (2023). Association between Diabetes in Pregnancy

and Shoulder Dystocia by Infant Birth Weight in an Era of Cesarean Delivery for Suspected Macrosomia. In American Journal of Perinatology. Georg Thieme Verlag KG. https://doi.org/10.1055/s-0043-1764206

4. Abell SK, Teede HJ. The IADPSG diagnostic criteria identify women with increased risk of adverse pregnancy outcomes in Victoria. Aust N Z J Obstet Gynaecol. 2017;57(5):564-568. doi:10.1111/ajo.12676
5. Absalom G, Zinga J, Margerison C, van der Pligt P. Associations of dietetic management with maternal and neonatal health outcomes in women diagnosed with gestational diabetes: a retrospective cohort study. J Hum Nutr Diet. 2019;32(6):728-736. doi:10.1111/jhn.12682
6. Abu Shqara, R., Nakhleh Francis, Y., Or, S., Lowenstein, L., & Frank Wolf, M. (2022). Obstetrical Outcome following Diagnosis of Gestational Diabetes in the Third Trimester (>29 Weeks) versus Second Trimester (24–28 Weeks): A Retrospective Comparative Study. In American Journal of Perinatology. Georg Thieme Verlag KG. https://doi.org/10.1055/s-0042-1759865
7. Alberico S, Montico M, Barresi V, et al. The role of gestational diabetes, pre-pregnancy body mass index and gestational weight gain on the risk of newborn macrosomia: results from a prospective multicentre study. BMC Pregnancy Childbirth. 2014;14:23. Published 2014 Jan 15. doi:10.1186/1471-2393-14-23
8. Ali A, Shastry S, Nithiyananthan R, Ali A, Ganapathy R. Gestational diabetes-Predictors of response to treatment and obstetric outcome. Eur J Obstet Gynecol Reprod Biol. 2018;220:57-60. doi:10.1016/j.ejogrb.2017.11.014
9. Al-Shwyiat, R. M. M., & Radwan, A. M. (2023). Fetal anomalies in gestational diabetes mellitus and risk of fetal anomalies in relation to pre-conceptional blood sugar and glycosylated hemoglobin. Journal of mother and child, 26(1), 73–77. https://doi.org/10.34763/jmotherandchild.20222601.d-22-00040
10. Anderberg E, Källén K, Berntorp K. The impact of gestational diabetes mellitus on pregnancy outcome comparing different cut-off criteria for abnormal glucose tolerance. Acta Obstet Gynecol Scand. 2010;89(12):1532-1537. doi:10.3109/00016349.2010.526186
11. Asemi, Z., Tabassi, Z., Samimi, M., Fahiminejad, T., & Esmaillzadeh, A. (2021). Favorable effects of the Dietary Approaches to Stop Hypertension diet on glucose tolerance and lipid profiles in gestational diabetes: a randomised clinical trial – Expression of concern. In British Journal of Nutrition (Vol. 127, Issue 1, pp. 151–151). Cambridge University Press (CUP). https://doi.org/10.1017/s0007114521002002
12. Au CPY, Raynes-Greenow CH, Turner RM, Carberry AE, Jeffery HE. Antenatal management of gestational diabetes mellitus can improve neonatal outcomes. Midwifery. 2016;34:66-71. doi:10.1016/j.midw.2016.01.001
13. Aulinas A, Biagetti B, Vinagre I, et al. Diabetes mellitus gestacional y etnia materna: alta prevalencia de macrosomía fetal en mujeres no caucásicas [Gestational diabetes mellitus and maternal ethnicity: high prevalence of fetal macrosomia in non-Caucasian women]. Med Clin (Barc). 2013;141(6):240-245. doi:10.1016/j.medcli.2012.05.034
14. Aung YY, Sowter M, Kenealy T, Herman J, Ekeroma A. Gestational diabetes mellitus screening, management and outcomes in the Cook Islands. N Z Med J 2015;128:21-8. - PubMed

15. Aviram A, Guy L, Ashwal E, Hiersch L, Yogev Y, Hadar E. Pregnancy outcome in pregnancies complicated with gestational diabetes mellitus and late preterm birth. Diabetes Res Clin Pract. 2016;113:198-203. doi:10.1016/j.diabres.2015.12.018
16. Badakhsh M, Shahdadi H, Amirshahi M, Hashemi Benjar Z. Evaluation of maternal and fetal complications in healthy and diabetic pregnant women. J Diabetes Nurs. 2016; 4 (2) :79-88
17. Baharvand, P., Anbari, K., & Hamidi, H. (2022). Perceived social support in pregnant women with gestational diabetes attending hospitals in western Iran compared to healthy controls and its relationship with perceived anxiety. In Journal of Diabetes & Metabolic Disorders (Vol. 21, Issue 2, pp. 1549–1555). Springer Science and Business Media LLC. https://doi.org/10.1007/s40200-022-01100-5
18. Bahl, S., Dhabhai, N., Taneja, S., Mittal, P., Dewan, R., Kaur, J., Chaudhary, R., Bhandari, N., & Chowdhury, R. (2022). Burden, risk factors and outcomes associated with gestational diabetes in a population-based cohort of pregnant women from North India. In BMC Pregnancy and Childbirth (Vol. 22, Issue 1). Springer Science and Business Media LLC. https://doi.org/10.1186/s12884-022-04389-5
19. Bai, W., Wang, H., Fang, R., Lin, M., Qin, Y., Han, H., Cui, J., Zhang, R., Ma, Y., Chen, D., Zhang, W., Wang, L., & Yu, H. (2023). Evaluating the effect of gestational diabetes mellitus on macrosomia based on the characteristics of oral glucose tolerance test. In Clinica Chimica Acta (Vol. 544, p. 117362). Elsevier BV. https://doi.org/10.1016/j.cca.2023.117362
20. Bartáková V, Ťápalová V, Wágnerová K, Janků P, Bělobrádková J, Kaňková K. Pacientky s obezitou, hypertenzí a nutností aplikace inzulinu při diagnóze gestační diabetes mellitus vyžadují zvýšenou porodnickou péči [Pregnancy outcomes in women with gestational diabetes: specific subgroups might require increased attention]. Ceska Gynekol. 2017;82(1):16-23.
21. Bashir M, E Abdel-Rahman M, Aboulfotouh M, et al. Prevalence of newly detected diabetes in pregnancy in Qatar, using universal screening. PLoS One. 2018;13(8):e0201247. Published 2018 Aug 3. doi:10.1371/journal.pone.0201247
22. Bashir M, Baagar K, Naem E, et al. Pregnancy outcomes of early detected gestational diabetes: a retrospective comparison cohort study, Qatar. BMJ Open. 2019;9(2):e023612. Published 2019 Feb 19. doi:10.1136/bmjopen-2018-023612
23. Bashir M, Ibrahim I, Eltaher F, et al. . Screening pregnant women in a high-risk population with WHO-2013 or NICE diagnostic criteria does not affect the prevalence of gestational diabetes. Sci Rep 2021;11:5604-04. 10.1038/s41598-021-84918-y - DOI - PMC - PubMed
24. Basri NI, Mahdy ZA, Ahmad S, et al. The World Health Organization (WHO) versus The International Association of Diabetes and Pregnancy Study Group (IADPSG) diagnostic criteria of gestational diabetes mellitus (GDM) and their associated maternal and neonatal outcomes. Horm Mol Biol Clin Investig. 2018;34(1):10.1515/hmbci-2017-0077. Published 2018 Feb 17. doi:10.1515/hmbci-2017-0077
25. Bassaw B, Mohammed N, Ramsewak S, et al. Pregnancy outcome among women universally screened for gestational diabetes mellitus with a lime-flavoured drink. J Obstet Gynaecol. 2012;32(5):422-425. doi:10.3109/01443615.2012.658896
26. Basu, A., Bhatti, N. and Lee, B. (2012), Pregnancy outcome in women with gestational diabetes: results of a four-year audit. Practical Diabetes, 29: 237-241. https://doi.org/10.1002/pdi.1699

27. Bauer, S. T., Cate, J. J. M., Whitsel, A. I., & Combs, C. A. (2023). Society for Maternal-Fetal Medicine Special Statement: Quality metric on the rate of postpartum diabetes screening after pregnancies with gestational diabetes mellitus. In American Journal of Obstetrics and Gynecology (Vol. 228, Issue 4, pp. B2–B9). Elsevier BV. https://doi.org/10.1016/j.ajog.2022.12.315
28. Bayoumi, M. A. A., Masri, R. M., Matani, N. Y. S., Hendaus, M. A., Masri, M. M., Chandra, P., Langtree, L. J., D'Souza, S., Olayiwola, N. O., Shahbal, S., Elmalik, E. E., Bakry, M. S., Gad, A. I., & Agarwal, R. (2021). Correction to: Maternal and neonatal outcomes in mothers with diabetes mellitus in Qatari population. In BMC Pregnancy and Childbirth (Vol. 21, Issue 1). Springer Science and Business Media LLC. https://doi.org/10.1186/s12884-021-04244-z
29. Beetham, K. S., Spathis, J. G., Hoffmann, S., Brown, W. J., Clifton, V., & Mielke, G. I. (2022). Longitudinal association of physical activity during pregnancy with maternal and infant outcomes: Findings from the Australian longitudinal study of women's health. In Women's Health (Vol. 18, p. 174550572211423). SAGE Publications. https://doi.org/10.1177/17455057221142357
30. Benhalima K, Van Crombrugge P, Moyson C, et al. Characteristics and pregnancy outcomes across gestational diabetes mellitus subtypes based on insulin resistance. Diabetologia. 2019;62(11):2118-2128. doi:10.1007/s00125-019-4961-7
31. Benhalima K, Hanssens M, Devlieger R, Verhaeghe J, Mathieu C. Analysis of pregnancy outcomes using the new IADPSG recommendation compared with the Carpenter and Coustan criteria in an area with a low prevalence of gestational diabetes. Int J Endocrinol 2013;2013:248121. 10.1155/2013/248121. - DOI - PMC - PubMed
32. Berggren EK, Boggess KA, Stuebe AM, Jonsson Funk M. National Diabetes Data Group vs Carpenter-Coustan criteria to diagnose gestational diabetes. Am J Obstet Gynecol 2011;205:253.e1-7. 10.1016/j.ajog.2011.06.026. - DOI - PMC - PubMed
33. Berghella V, Caissutti C, Saccone G, Khalifeh A. One-Step Approach to Identifying Gestational Diabetes Mellitus: Association With Perinatal Outcomes. Obstet Gynecol. 2019;133(2):383. doi:10.1097/AOG.0000000000003093
34. Bhavadharini, B., Anjana, R. M., Deepa, M., Pradeepa, R., Uma, R., Saravanan, P., & Mohan, V. (2021). Association between number of abnormal glucose values and severity of fasting plasma glucose in IADPSG criteria and maternal outcomes in women with gestational diabetes mellitus. In Acta Diabetologica (Vol. 59, Issue 3, pp. 349–357). Springer Science and Business Media LLC. https://doi.org/10.1007/s00592-021-01815-6
35. Bianchi C, de Gennaro G, Romano M, et al. Pre-pregnancy obesity, gestational diabetes or gestational weight gain: Which is the strongest predictor of pregnancy outcomes?. Diabetes Res Clin Pract. 2018;144:286-293. doi:10.1016/j.diabres.2018.08.019
36. Black MH, Sacks DA, Xiang AH, Lawrence JM. Clinical outcomes of pregnancies complicated by mild gestational diabetes mellitus differ by combinations of abnormal oral glucose tolerance test values. Diabetes Care. 2010;33(12):2524-2530. doi:10.2337/dc10-1445
37. Blickstein I, Doyev R, Trojner Bregar A, Bržan Šimenc G, Verdenik I, Tul N. The effect of gestational diabetes, pre-gravid maternal obesity, and their combination ('diabesity') on outcomes of singleton gestations. J Matern Fetal Neonatal Med. 2018;31(5):640-643. doi:10.1080/14767058.2017.1293030
38. Blomberg, L., Backman, K., Kirjavainen, P. V., Karvonen, A. M., Harju, M., & Keski-Nisula, L. (2023). Vulvovaginal yeast infections, gestational diabetes and pregnancy outcome. In

BMC Pregnancy and Childbirth (Vol. 23, Issue 1). Springer Science and Business Media LLC. https://doi.org/10.1186/s12884-023-05391-1

39. Bodmer-Roy S, Morin L, Cousineau J, Rey E. Pregnancy outcomes in women with and without gestational diabetes mellitus according to the International Association of the Diabetes and Pregnancy Study Groups criteria. Obstet Gynecol. 2012;120(4):746-752. doi:10.1097/AOG.0b013e31826994ec
40. Bogdanet D, Egan AM, Reddin C, et al. ATLANTIC DIP: Insulin Therapy for Women With IADPSG-Diagnosed Gestational Diabetes Mellitus. Does It Work?. J Clin Endocrinol Metab. 2017;102(3):849-857. doi:10.1210/jc.2016-2911
41. Bomba-Opoń, D. A., Godek, B., Czekaj, L., Huras, H., Jakubiec-Wisniewska, K., Janowiec, K., Leszczynska-Gorzelak, B., Slodzinska, M., Zimmer, M., Bek, W., Rokita†, W., Zmelonek-Znamirowska, A., Kalinka, J., Biesiada, P., Stanczyk, P., Cnota, W., Malec, M., Laudanski, P., Zadykowicz, R., & Wielgos, M. (2022). Hyperglycemia in pregnancy — prevalence and perinatal outcomes. A retrospective multicenter cohort study in Poland. In Ginekologia Polska. VM Media SP. zo.o VM Group SK. https://doi.org/10.5603/gp.a2021.0257
42. Bordin P, Dotto L, Battistella L, et al. Gestational diabetes mellitus yesterday, today and tomorrow: A 13 year italian cohort study. Diabetes Res Clin Pract. 2020;167:108360. doi:10.1016/j.diabres.2020.108360
43. Boriboonhirunsarn, D., & Tanpong, S. (2023). Rate of Spontaneous Preterm Delivery Between Pregnant Women With and Without Gestational Diabetes. In Cureus. Cureus, Inc. https://doi.org/10.7759/cureus.34565
44. Brankica K, Valentina VN, Slagjana SK, Sasha JM. Maternal 75-g OGTT glucose levels as predictive factors for large-for-gestational age newborns in women with gestational diabetes mellitus. Arch Endocrinol Metab. 2016;60(1):36-41. doi:10.1590/2359-3997000000126
45. Briana, D. D., & Malamitsi-Puchner, A. (2022). Effect of Gestational Diabetes Mellitus and Hypercholesterolemia on Fetal Cardiovascular Disease Risk: The Role of Epigenetics. In Current Vascular Pharmacology (Vol. 20, Issue 4, pp. 379–380). Bentham Science Publishers Ltd. https://doi.org/10.2174/1570161120666220804090725
46. Brown, S. D., Hedderson, M. M., Zhu, Y., Tsai, A.-L., Feng, J., Quesenberry, C. P., & Ferrara, A. (2022). Uptake of guideline-recommended postpartum diabetes screening among diverse women with gestational diabetes: associations with patient factors in an integrated health system in the USA. In BMJ Open Diabetes Research & Care (Vol. 10, Issue 3, p. e002726). BMJ. https://doi.org/10.1136/bmjdrc-2021-002726
47. Buffarini R, Barros AJD, Matijasevich A, Loret de Mola C, Santos IS. Gestational diabetes mellitus, pre-gestational BMI and offspring BMI z-score during infancy and childhood: 2004 Pelotas Birth Cohort. BMJ Open. 2019;9(7):e024734. Published 2019 Jul 9. doi:10.1136/bmjopen-2018-024734
48. Cai S, Qiu A, Broekman BFP, et al. GUSTO study group . The influence of gestational diabetes on neurodevelopment of children in the first two years of life: a prospective study. PLoS One 2016;11:e0162113. 10.1371/journal.pone.0162113 - DOI - PMC - PubMed
49. Catalano PM, McIntyre HD, Cruickshank JK, et al. The hyperglycemia and adverse pregnancy outcome study: associations of GDM and obesity with pregnancy outcomes. Diabetes Care. 2012;35(4):780-786. doi:10.2337/dc11-1790
50. Chen, Y., Ye, X., Wu, H., Huang, X., Ke, C., Chen, Y., Wu, H., & Wu, X. (2021). Association of Postpartum Pain Sensitivity and Postpartum Depression: A Prospective Observational

Study. In Pain and Therapy (Vol. 10, Issue 2, pp. 1619–1633). Springer Science and Business Media LLC. https://doi.org/10.1007/s40122-021-00325-1

51. Chen, H.-M., Wu, C.-F., Hsieh, C.-J., Kuo, F.-C., Sun, C.-W., Wang, S.-L., Chen, M.-L., & Wu, M.-T. (2022). Relationship of maternal body weight and gestational diabetes mellitus with large-for-gestational-age babies at birth in Taiwan: The TMICS cohort. In Taiwanese Journal of Obstetrics and Gynecology (Vol. 61, Issue 2, pp. 234–242). Elsevier BV. https://doi.org/10.1016/j.tjog.2022.02.010
52. Chen, S.-C., Lee, C.-N., Hu, F.-C., Kuo, C.-H., Lin, M.-W., Chen, K.-Y., Tai, Y.-Y., Lin, C.-H., Yen, I.-W., Lin, S.-Y., & Li, H.-Y. (2022). Gestational hypertriglyceridemia and adverse pregnancy outcomes: A search for cutoffs using generalized additive models. In Diabetes Research and Clinical Practice (Vol. 186, p. 109820). Elsevier BV. https://doi.org/10.1016/j.diabres.2022.109820
53. Chen, Y.-H., Chen, W.-Y., Chang, C.-Y., Cho, C.-Y., Tang, Y.-H., Yeh, C.-C., Yang, Y.-H., Tsao, P.-C., & Lee, Y.-S. (2023). Association between maternal factors and fetal macrosomia in full-term singleton births. In Journal of the Chinese Medical Association (Vol. 86, Issue 3, pp. 324–329). Ovid Technologies (Wolters Kluwer Health). https://doi.org/10.1097/jcma.0000000000000871
54. Cheng E, Longmore DK, Barzi F, et al. Birth outcomes in women with gestational diabetes managed by lifestyle modification alone: The PANDORA study. Diabetes Res Clin Pract. 2019;157:107876. doi:10.1016/j.diabres.2019.107876
55. Cheung NW, Jiang S, Athayde N. Impact of the IADPSG criteria for gestational diabetes, and of obesity, on pregnancy outcomes. Aust N Z J Obstet Gynaecol 2018;58:553-9. 10.1111/ajo.12772. - DOI - PubMed
56. Chew WF, Rokiah P, Chan SP, Chee WS, Lee LF, Chan YM. Prevalence of glucose intolerance, and associated antenatal and historical risk factors among Malaysian women with a history of gestational diabetes mellitus [published correction appears in Singapore Med J. 2013 Jan;54(1):58]. Singapore Med J. 2012;53(12):814-820.
57. Cho HY, Jung I, Kim SJ. The association between maternal hyperglycemia and perinatal outcomes in gestational diabetes mellitus patients: A retrospective cohort study. Medicine (Baltimore). 2016;95(36):e4712. doi:10.1097/MD.0000000000004712
58. Choi, M. J., Choi, J., & Chung, C. W. (2022). Risk and Risk Factors for Postpartum Type 2 Diabetes Mellitus in Women with Gestational Diabetes: A Korean Nationwide Cohort Study. In Endocrinology and Metabolism (Vol. 37, Issue 1, pp. 112–123). Korean Endocrine Society. https://doi.org/10.3803/enm.2021.1276
59. Chung, Y. S., Moon, H., & Kim, E. H. (2022). Risk of obstetric and neonatal morbidity in gestational diabetes in a single institution: A retrospective, observational study. In Medicine (Vol. 101, Issue 39, p. e30777). Ovid Technologies (Wolters Kluwer Health). https://doi.org/10.1097/md.0000000000030777
60. Cosson E, Benbara A, Pharisien I, et al. . Diagnostic and prognostic performances over 9 years of a selective screening strategy for gestational diabetes mellitus in a cohort of 18,775 subjects. Diabetes Care 2013;36:598-603. 10.2337/dc12-1428. - DOI - PMC - PubMed
61. Cosson, E., Vicaut, E., Tatulashvili, S., Portal, J.-J., Nachtergaele, C., Sal, M., Berkane, N., Pinto, S., Rezgani, A., Carbillon, L., & Bihan, H. (2022). Is there a residual risk of large-for-gestational-age infant related to gestational diabetes mellitus when it is treated? In Diabetes & Metabolism (Vol. 48, Issue 5, p. 101376). Elsevier BV. https://doi.org/10.1016/j.diabet.2022.101376

62. Côté-Corriveau, G., Marcoux, S., Leduc, V., Healy-Profitós, J., & Auger, N. (2022). Response to Comment on Marcoux et al. Varying Impact of Gestational Diabetes Mellitus on Incidence of Childhood Cancers: An Age-Stratified Retrospective Cohort Study. Diabetes Care 2022;45:1177–1183. In Diabetes Care (Vol. 45, Issue 11, pp. e155–e156). American Diabetes Association. https://doi.org/10.2337/dci22-0028
63. Dalfrà MG, Ragazzi E, Masin M, et al. Pregnancy outcome in immigrant women with gestational diabetes mellitus. Gynecol Endocrinol. 2011;27(6):379-383. doi:10.3109/09513590.2010.493249
64. Davis EM, Scifres CM, Abebe K, et al. . Comparison of birth outcomes by gestational diabetes screening criteria. AJP Rep 2018;8:e280-8. 10.1055/s-0038-1675343. - DOI - PMC - PubMed
65. de Wit L, Zijlmans AB, Rademaker D, et al. . Estimated impact of introduction of new diagnostic criteria for gestational diabetes mellitus. World J Diabetes 2021;12:868-82. 10.4239/wjd.v12.i6.868. - DOI - PMC - PubMed
66. Deng, L., Ning, B., & Yang, H. (2022). Association between gestational diabetes mellitus and adverse obstetric outcomes among women with advanced maternal age: A retrospective cohort study. In Medicine (Vol. 101, Issue 40, p. e30588). Ovid Technologies (Wolters Kluwer Health). https://doi.org/10.1097/md.0000000000030588
67. Ding TT, Xiang J, Luo BR, Hu J. Relationship between the IADPSG-criteria-defined abnormal glucose values and adverse pregnancy outcomes among women having gestational diabetes mellitus: A retrospective cohort study. Medicine (Baltimore). 2018;97(43):e12920. doi:10.1097/MD.0000000000012920
68. Domanski G, Lange AE, Ittermann T, et al. . Evaluation of neonatal and maternal morbidity in mothers with gestational diabetes: a population-based study. BMC Pregnancy Childbirth 2018;18:367. 10.1186/s12884-018-2005-9. - DOI - PMC - PubMed
69. Donovan LE, Edwards AL, Savu A, et al. . Population-level outcomes with a 2-step approach for gestational diabetes screening and diagnosis. Can J Diabetes 2017;41:596-602. 10.1016/j.jcjd.2016.12.010. - DOI - PubMed
70. Duran A, Sáenz S, Torrejón MJ, et al. . Introduction of IADPSG criteria for the screening and diagnosis of gestational diabetes mellitus results in improved pregnancy outcomes at a lower cost in a large cohort of pregnant women: the St. Carlos Gestational Diabetes Study. Diabetes Care 2014;37:2442-50. 10.2337/dc14-0179. - DOI - PubMed
71. Ehmann DMT, Hickman PE, Potter JM. Are the changes in diagnostic criteria for gestational diabetes mellitus reflected in perinatal outcomes? A retrospective assessment. Aust N Z J Obstet Gynaecol. 2019;59(5):693-698. doi:10.1111/ajo.12956
72. Ekeroma AJ, Chandran GS, McCowan L, Ansell D, Eagleton C, Kenealy T. Impact of using the International Association of Diabetes and Pregnancy Study Groups criteria in South Auckland: prevalence, interventions and outcomes. Aust N Z J Obstet Gynaecol 2015;55:34-41. 10.1111/ajo.12267. - DOI - PubMed
73. Esakoff TF, Caughey AB, Block-Kurbisch I, Inturrisi M, Cheng YW. Perinatal outcomes in patients with gestational diabetes mellitus by race/ethnicity. J Matern Fetal Neonatal Med. 2011;24(3):422-426. doi:10.3109/14767058.2010.504287
74. Ethridge JK, Jr, Catalano PM, Waters TP. Perinatal outcomes associated with the diagnosis of gestational diabetes made by the International Association of the Diabetes and Pregnancy Study Groups criteria. Obstet Gynecol 2014;124:571-8. 10.1097/AOG.0000000000000412. - DOI - PMC - PubMed

75. Feghali MN, Abebe KZ, Comer DM, Caritis S, Catov JM, Scifres CM. Pregnancy outcomes in women with an early diagnosis of gestational diabetes mellitus. Diabetes Res Clin Pract. 2018;138:177-186. doi:10.1016/j.diabres.2018.02.004
76. Feleke, B. E., Feleke, T. E., Adane, W. G., Kassahun, M. B., Girma, A., Alebachew, A., Misgan, E., Mekonnin, A. W., Guadie, W., Engedaw, H. A., Gebeyehu, M., & Biadglegne, F. (2022). Maternal and newborn effects of gestational diabetes mellitus: A prospective cohort study. In Primary Care Diabetes (Vol. 16, Issue 1, pp. 89–95). Elsevier BV. https://doi.org/10.1016/j.pcd.2021.09.007
77. Feleke BE, Feleke TE, Adane WG, et al. . Maternal and newborn effects of gestational diabetes mellitus: A prospective cohort study. Prim Care Diabetes 2022;16:89-95. 10.1016/j.pcd.2021.09.007. - DOI - PubMed
78. Feng H, Zhu WW, Yang HX, et al. Relationship between Oral Glucose Tolerance Test Characteristics and Adverse Pregnancy Outcomes among Women with Gestational Diabetes Mellitus. Chin Med J (Engl). 2017;130(9):1012-1018. doi:10.4103/0366-6999.204928
79. Foeller ME, Zhao S, Szabo A, Cruz MO. Neonatal outcomes in twin pregnancies complicated by gestational diabetes compared with non-diabetic twins. J Perinatol. 2015;35(12):1043-1047. doi:10.1038/jp.2015.133
80. Gao, L., Chen, C.-R., Wang, F., Ji, Q., Chen, K.-N., Yang, Y., & Liu, H.-W. (2022). Relationship between age of pregnant women with gestational diabetes mellitus and mode of delivery and neonatal Apgar score. In World Journal of Diabetes (Vol. 13, Issue 9, pp. 776–785). Baishideng Publishing Group Inc. https://doi.org/10.4239/wjd.v13.i9.776
81. García-Patterson, A., Balsells, M., Bartha, J. L., Solà, I., & Corcoy, R. (2020). Current evidence about better perinatal outcomes associated to one step approach in the diagnosis of gestational diabetes mellitus is not of high quality. In The Journal of Maternal-Fetal & Neonatal Medicine (Vol. 35, Issue 8, pp. 1580–1582). Informa UK Limited. https://doi.org/10.1080/14767058.2020.1759532
82. Gasim T. Gestational diabetes mellitus: maternal and perinatal outcomes in 220 saudi women. Oman Med J. 2012;27(2):140-144. doi:10.5001/omj.2012.29
83. Glover AV, Tita A, Biggio JR, Harper LM. Examining the Starting Dose of Glyburide in Gestational Diabetes. Am J Perinatol. 2016;33(2):214-220. doi:10.1055/s-0035-1564063
84. Goedegebure EAR, Koning SH, Hoogenberg K, et al. Pregnancy outcomes in women with gestational diabetes mellitus diagnosed according to the WHO-2013 and WHO-1999 diagnostic criteria: a multicentre retrospective cohort study. BMC Pregnancy Childbirth. 2018;18(1):152. Published 2018 May 10. doi:10.1186/s12884-018-1810-5
85. Gojnic, M., Todorovic, J., Stanisavljevic, D., Jotic, A., Lukic, L., Milicic, T., Lalic, N., Lalic, K., Stoiljkovic, M., Stanisavljevic, T., Stefanovic, A., Stefanovic, K., Vrzic-Petronijevic, S., Petronijevic, M., Terzic-Supic, Z., Macura, M., Perovic, M., Babic, S., Piperac, P., … Dugalic, S. (2022). Maternal and Fetal Outcomes among Pregnant Women with Diabetes. In International Journal of Environmental Research and Public Health (Vol. 19, Issue 6, p. 3684). MDPI AG. https://doi.org/10.3390/ijerph19063684
86. Gopalakrishnan V, Singh R, Pradeep Y, et al. Evaluation of the prevalence of gestational diabetes mellitus in North Indians using the International Association of Diabetes and Pregnancy Study groups (IADPSG) criteria. J Postgrad Med. 2015;61(3):155-158. doi:10.4103/0022-3859.159306
87. Gorban de Lapertosa S, Sucani S, Salzberg S, et al. DPSG-SAD Group . Prevalence of gestational diabetes mellitus in Argentina according to the Latin American Diabetes

Association (ALAD) and International Association of Diabetes and Pregnancy Study Groups (IADPSG) diagnostic criteria and the associated maternal-neonatal complications. Health Care Women Int 2021;42:636-56. 10.1080/07399332.2020.1800012. - DOI - PubMed

88. Gorgal R, Gonçalves E, Barros M, et al. . Gestational diabetes mellitus: a risk factor for non-elective cesarean section. J Obstet Gynaecol Res 2012;38:154-9. 10.1111/j.1447-0756.2011.01659.x. - DOI - PubMed
89. Greenberg, V. R., Lundsberg, L. S., Reddy, U. M., Grobman, W. A., Parker, C. B., Parry, S., Post, R. J., Shanks, A. L., Silver, R. M., Simhan, H., Wapner, R. J., & Merriam, A. A. (2021). Perinatal Outcomes in Obese Women with One Abnormal Value on 3-Hour Oral Glucose Tolerance Test. In American Journal of Perinatology (Vol. 39, Issue 05, pp. 464–472). Georg Thieme Verlag KG. https://doi.org/10.1055/s-0041-1740005
90. Gregory, E. F., Passarella, M., Levine, L. D., & Lorch, S. A. (2022). Interconception Preventive Care and Recurrence of Pregnancy Complications for Medicaid-Insured Women. In Journal of Women's Health (Vol. 31, Issue 6, pp. 826–833). Mary Ann Liebert Inc. https://doi.org/10.1089/jwh.2021.0355
91. Grotenfelt NE, Rönö K, Eriksson JG, et al. Neonatal outcomes among offspring of obese women diagnosed with gestational diabetes mellitus in early versus late pregnancy. J Public Health (Oxf). 2019;41(3):535-542. doi:10.1093/pubmed/fdy159
92. Gu Y, Lu J, Li W, et al. . Joint Associations of Maternal Gestational Diabetes and Hypertensive Disorders of Pregnancy With Overweight in Offspring. Front Endocrinol (Lausanne) 2019;10:645. 10.3389/fendo.2019.00645. - DOI - PMC - PubMed
93. He Z, Tang Y, Xie H, et al. . Economic burden of IADPSG gestational diabetes diagnostic criteria in China: propensity score matching analysis from a 7-year retrospective cohort. BMJ Open Diabetes Res Care 2020;8:e001538. 10.1136/bmjdrc-2020-001538. - DOI - PMC - PubMed
94. Hernandez-Rivas E, Flores-Le Roux JA, Benaiges D, et al. Gestational diabetes in a multiethnic population of Spain: clinical characteristics and perinatal outcomes. Diabetes Res Clin Pract. 2013;100(2):215-221. doi:10.1016/j.diabres.2013.01.030
95. Hildén K, Hanson U, Persson M, Magnuson A, Simmons D, Fadl H. Gestational diabetes and adiposity are independent risk factors for perinatal outcomes: a population based cohort study in Sweden. Diabet Med 2019;36:151-7. 10.1111/dme.13843. - DOI - PMC - PubMed
96. Hildén K, Magnuson A, Hanson U, Simmons D, Fadl H. Trends in pregnancy outcomes for women with gestational diabetes mellitus in Sweden 1998-2012: a nationwide cohort study. Diabet Med. 2020;37(12):2050-2057. doi:10.1111/dme.14266
97. Hillier, T. A., Pedula, K. L., Ogasawara, K. K., Vesco, K. K., Oshiro, C., & Van Marter, J. L. (2022). Impact of earlier gestational diabetes screening for pregnant people with obesity on maternal and perinatal outcomes. In Journal of Perinatal Medicine (Vol. 50, Issue 8, pp. 1036–1044). Walter de Gruyter GmbH. https://doi.org/10.1515/jpm-2021-0581
98. Hosseini E, Janghorbani M, Aminorroaya A. Incidence, risk factors, and pregnancy outcomes of gestational diabetes mellitus using one-step versus two-step diagnostic approaches: A population-based cohort study in Isfahan, Iran. Diabetes Res Clin Pract. 2018;140:288-294. doi:10.1016/j.diabres.2018.04.014
99. Huang S, Xu Y, Chen M, et al. Zhonghua Liu Xing Bing Xue Za Zhi. 2016;37(1):45-49. doi:10.3760/cma.j.issn.0254-6450.2016.01.009

100. Huhn EA, Massaro N, Streckeisen S, et al. . Fourfold increase in prevalence of gestational diabetes mellitus after adoption of the new International Association of Diabetes and Pregnancy Study Groups (IADPSG) criteria. J Perinat Med 2017;45:359-66. 10.1515/jpm-2016-0099. - DOI - PubMed
101. Ikenoue S, Miyakoshi K, Saisho Y, et al. . Clinical impact of women with gestational diabetes mellitus by the new consensus criteria: two year experience in a single institution in Japan. Endocr J 2014;61:353-8. 10.1507/endocrj.EJ13-0496. - DOI - PubMed
102. Immanuel J, Eagleton C, Baker J, Simmons D. Pregnancy outcomes among multi-ethnic women with different degrees of hyperglycaemia during pregnancy in an urban New Zealand population and their association with postnatal HbA1c uptake. Aust N Z J Obstet Gynaecol. 2021;61(1):69-77. doi:10.1111/ajo.13231
103. Jain R, Davey S, Davey A, Raghav SK, Singh JV. Can the management of blood sugar levels in gestational diabetes mellitus cases be an indicator of maternal and fetal outcomes? The results of a prospective cohort study from India. J Family Community Med 2016;23:94-9. 10.4103/2230-8229.181002. - DOI - PMC - PubMed
104. Jao J, Wong M, Van Dyke RB, et al. Gestational diabetes mellitus in HIV-infected and -uninfected pregnant women in Cameroon. Diabetes Care. 2013;36(9):e141-e142. doi:10.2337/dc13-0968
105. Jin D, Rich-Edwards JW, Chen C, et al. . Gestational diabetes mellitus: predictive value of fetal growth measurements by ultrasonography at 22-24 weeks: a retrospective cohort study of medical records. Nutrients 2020;12:E3645. 10.3390/nu12123645. - DOI - PMC - PubMed
106. Kalra P, Kachhwaha CP, Singh HV. Prevalence of gestational diabetes mellitus and its outcome in western Rajasthan. Indian J Endocrinol Metab 2013;17:677-80. 10.4103/2230-8210.113760 - DOI - PMC - PubMed
107. Karcaaltincaba D, Buyukkaragoz B, Kandemir O, Yalvac S, Kıykac-Altınbaş S, Haberal A. Gestational diabetes and gestational impaired glucose tolerance in 1653 teenage pregnancies: prevalence, risk factors and pregnancy outcomes. J Pediatr Adolesc Gynecol. 2011;24(2):62-65. doi:10.1016/j.jpag.2010.07.003
108. Kaul, P., Savu, A., Yeung, R. O., & Ryan, E. A. (2022). Association between maternal glucose and large for gestational outcomes: Real-world evidence to support Hyperglycaemia and Adverse Pregnancy Outcomes (HAPO) study findings. In Diabetic Medicine (Vol. 39, Issue 6). Wiley. https://doi.org/10.1111/dme.14786
109. Keikkala E, Mustaniemi S, Koivunen S, et al. . Cohort Profile: The Finnish Gestational Diabetes (FinnGeDi) Study. Int J Epidemiol 2020;49:762-763g. 10.1093/ije/dyaa039. - DOI - PMC - PubMed
110. Kgosidialwa O, Egan AM, Carmody L, Kirwan B, Gunning P, Dunne FP. Treatment with diet and exercise for women with gestational diabetes mellitus diagnosed using IADPSG criteria. J Clin Endocrinol Metab 2015;100:4629-36. 10.1210/jc.2015-3259. - DOI - PubMed
111. Kim W, Park SK, Kim YL. Fetal abdominal obesity detected at 24 to 28 weeks of gestation persists until delivery despite management of gestational diabetes mellitus. Diabetes Metab J 2021;45:547-57. 10.4093/dmj.2020.0078. - DOI - PMC - PubMed
112. Kirke AB, Evans SF, Walters BN. Gestational diabetes in a rural, regional centre in south Western Australia: predictors of risk. Rural Remote Health 2014;14:2667. 10.22605/RRH2667 - DOI - PubMed

113. Koivunen S, Torkki A, Bloigu A, et al. Towards national comprehensive gestational diabetes screening - consequences for neonatal outcome and care. Acta Obstet Gynecol Scand. 2017;96(1):106-113. doi:10.1111/aogs.13030
114. Koivunen S, Viljakainen M, Männistö T, et al. Pregnancy outcomes according to the definition of gestational diabetes. PLoS One. 2020;15(3):e0229496. Published 2020 Mar 5. doi:10.1371/journal.pone.0229496
115. König AB, Junginger S, Reusch J, Louwen F, Badenhoop K. Gestational diabetes outcome in a single center study: higher BMI in children after six months. Horm Metab Res. 2014;46(11):804-809. doi:10.1055/s-0034-1375652
116. Koning SH, van Zanden JJ, Hoogenberg K, et al. New diagnostic criteria for gestational diabetes mellitus and their impact on the number of diagnoses and pregnancy outcomes. Diabetologia. 2018;61(4):800-809. doi:10.1007/s00125-017-4506-x
117. Kosman MW, Eskes SA, van Selst J, et al. Perinatal outcomes in gestational diabetes in relation to ethnicity in the Netherlands. Neth J Med. 2016;74(1):22-29.
118. Kösüs N, Kösüs A, Duran M, Turhan NO. Effect of number of abnormal oral glucose tolerance test (OGTT) values on birthweight in women with gestational diabetes. Indian J Med Res 2013;137:95-101. - PMC - PubMed
119. Kragelund Nielsen K, Andersen GS, Damm P, Nybo Andersen AM. Migration, gestational diabetes, and adverse pregnancy outcomes: a nationwide study of singleton deliveries in Denmark. J Clin Endocrinol Metab 2021;106:e5075-87. 10.1210/clinem/dgab528. - DOI - PubMed
120. Kragelund Nielsen, K., Andersen, G. S., Damm, P., & Nybo Andersen, A.-M. (2021). Migration, Gestational Diabetes, and Adverse Pregnancy Outcomes: A Nationwide Study of Singleton Deliveries in Denmark. In The Journal of Clinical Endocrinology & Metabolism. The Endocrine Society. https://doi.org/10.1210/clinem/dgab528
121. Kumari R, Dalal V, Kachhawa G, et al. . Maternal and perinatal outcome in gestational diabetes mellitus in a tertiary care hospital in Delhi. Indian J Endocrinol Metab 2018;22:116-20. 10.4103/ijem.IJEM_582_17. - DOI - PMC - PubMed
122. Kung, W., Kuo, H., Lee, C., Zen, Y., Kong, L., & Lin, C. (2022). Association between gestational abnormal glucose tolerance and maternal-fetal outcomes. In Journal of Obstetrics and Gynaecology Research (Vol. 48, Issue 10, pp. 2505–2513). Wiley. https://doi.org/10.1111/jog.15350
123. Kwong W, Ray JG, Wu W, Feig DS, Lowe J, Lipscombe LL. Perinatal Outcomes Among Different Asian Groups With Gestational Diabetes Mellitus in Ontario: A Cohort Study. Can J Diabetes. 2019;43(8):606-612. doi:10.1016/j.jcjd.2019.06.006
124. Lapolla A, Dalfrà MG, Ragazzi E, De Cata AP, Fedele D. New International Association of the Diabetes and Pregnancy Study Groups (IADPSG) recommendations for diagnosing gestational diabetes compared with former criteria: a retrospective study on pregnancy outcome. Diabet Med 2011;28:1074-7. 10.1111/j.1464-5491.2011.03351.x - DOI - PubMed
125. Lara-Barea, A., Sánchez-Lechuga, B., Vidal-Suárez, Á., Arroba, A., Bugatto, F., & López-Tinoco, C. (2022). Blood Pressure Monitoring and Perinatal Outcomes in Normotensive Women with Gestational Di
126. Lee HJ, Norwitz E, Lee B. Relationship between threatened miscarriage and gestational diabetes mellitus. BMC Pregnancy Childbirth 2018;18:318. 10.1186/s12884-018-1955-2. - DOI - PMC - PubMed

127. Lee KH, Han YJ, Chung JH, et al. . Treatment of gestational diabetes diagnosed by the IADPSG criteria decreases excessive fetal growth. Obstet Gynecol Sci 2020;63:19-26. 10.5468/ogs.2020.63.1.19. - DOI - PMC - PubMed
128. Leybovitz-Haleluya N, Wainstock T, Landau D, Sheiner E. Maternal gestational diabetes mellitus and the risk of subsequent pediatric cardiovascular diseases of the offspring: a population-based cohort study with up to 18 years of follow up. Acta Diabetol 2018;55:1037-42. 10.1007/s00592-018-1176-1. - DOI - PubMed
129. Li M, Hinkle SN, Grantz KL, et al. . Glycaemic status during pregnancy and longitudinal measures of fetal growth in a multi-racial US population: a prospective cohort study. Lancet Diabetes Endocrinol 2020;8:292-300. 10.1016/S2213-8587(20)30024-3. - DOI - PMC - PubMed
130. Li MF, Ma L, Yu TP, et al. Adverse maternal and neonatal outcomes in pregnant women with abnormal glucose metabolism. Diabetes Res Clin Pract. 2020;161:108085. doi:10.1016/j.diabres.2020.108085
131. Liu SL, Shah BR, Naqshbandi M, Tran V, Harris SB. Increased rates of adverse outcomes for gestational diabetes and pre-pregnancy diabetes in on-reserve First Nations Women in Ontario, Canada. Diabet Med. 2012;29(8):e180-e183. doi:10.1111/j.1464-5491.2012.03691.x
132. Liu PJ, Liu Y, Ma L, et al. . The predictive ability of two triglyceride-associated indices for gestational diabetes mellitus and large for gestational age infant among Chinese pregnancies: a preliminary cohort study. Diabetes Metab Syndr Obes 2020;13:2025-35. 10.2147/DMSO.S251846 - DOI - PMC – PubMed
133. Liu, B., Cai, J., Xu, Y., Long, Y., Deng, L., Lin, S., Zhang, J., Yang, J., Zhong, L., Luo, Y., Zhou, Y., Zhang, Y., Li, Z., Chen, H., & Wang, Z. (2020). Early Diagnosed Gestational Diabetes Mellitus Is Associated With Adverse Pregnancy Outcomes: A Prospective Cohort Study. The Journal of clinical endocrinology and metabolism, 105(12), dgaa633. https://doi.org/10.1210/clinem/dgaa633
134. Lloreda-García JM, Sevilla-Denia S, Rodríguez-Sánchez A, Muñoz-Martínez P, Díaz-Ruiz M. Perinatal outcome of macrosomic infants born to diabetic versus non-diabetic mothers. Resultados perinatales entre macrosomas hijos de madre diabética y macrosomas hijos de madre no diabética. Endocrinol Nutr. 2016;63(8):409-413. doi:10.1016/j.endonu.2016.04.010
135. Lu MC, Huang SS, Yan YH, Wang P. Use of the National Diabetes Data Group and the Carpenter-Coustan criteria for assessing gestational diabetes mellitus and risk of adverse pregnancy outcome. BMC Pregnancy Childbirth 2016;16:231. 10.1186/s12884-016-1030-9. - DOI - PMC - PubMed
136. Lu J, Zhang S, Li W, et al. Maternal Gestational Diabetes Is Associated With Offspring's Hypertension. Am J Hypertens. 2019;32(4):335-342. doi:10.1093/ajh/hpz005
137. Lu, L., He, L., Hu, J., & Li, J. (2023). Association between very advanced maternal age women with gestational diabetes mellitus and the risks of adverse infant outcomes: a cohort study from the NVSS 2014–2019. In BMC Pregnancy and Childbirth (Vol. 23, Issue 1). Springer Science and Business Media LLC. https://doi.org/10.1186/s12884-023-05449-0
138. Lucovnik M, Steblovnik L, Verdenik I, Premru-Srsen T, Tomazic M, Tul N. Changes in perinatal outcomes after implementation of IADPSG criteria for screening and diagnosis of gestational diabetes mellitus: A national survey. Int J Gynaecol Obstet. 2020;149(1):88-92. doi:10.1002/ijgo.13098

139. Luengmettakul J, Sunsaneevithayakul P, Talungchit P. Pregnancy outcome in women with gestational diabetes mellitus according to the Carpenter-Coustan criteria in Thailand. J Obstet Gynaecol Res 2015;41:1345-51. 10.1111/jog.12727. - DOI - PubMed
140. Macaulay S, Munthali RJ, Dunger DB, Norris SA. The effects of gestational diabetes mellitus on fetal growth and neonatal birth measures in an African cohort. Diabet Med 2018;35:1425-33. 10.1111/dme.13668. - DOI - PubMed
141. Macrì F, Pitocco D, di Pasquo E, et al. Gestational weight gain as an independent risk factor for adverse pregnancy outcomes in women with gestational diabetes. Eur Rev Med Pharmacol Sci. 2018;22(14):4403-4410. doi:10.26355/eurrev_201807_15490
142. Makwana M, Bhimwal RK, Ram C, et al. . Gestational diabetes mellitus with its maternal and foetal outcome: a clinical study. Int J Adv Med 2017;4:919- 25. 10.18203/2349-3933.ijam20172605 - DOI
143. Maresh, M., Lawrence, J. M., Scholtens, D. M., Kuang, A., Lowe, L. P., Deerochanawong, C., Sacks, D. A., Lowe, W. L., Jr, Dyer, A. R., & Metzger, B. E. (2021). Association of glucose metabolism and blood pressure during pregnancy with subsequent maternal blood pressure. In Journal of Human Hypertension (Vol. 36, Issue 1, pp. 61–68). Springer Science and Business Media LLC. https://doi.org/10.1038/s41371-020-00468-2
144. Mayo K, Melamed N, Vandenberghe H, Berger H. The impact of adoption of the International Association of Diabetes in Pregnancy Study Group criteria for the screening and diagnosis of gestational diabetes. Am J Obstet Gynecol 2015;212:224.e1-9. 10.1016/j.ajog.2014.08.027. - DOI - PubMed
145. McIntyre HD, Jensen DM, Jensen RC, et al. Gestational Diabetes Mellitus: Does One Size Fit All? A Challenge to Uniform Worldwide Diagnostic Thresholds. Diabetes Care. 2018;41(7):1339-1342. doi:10.2337/dc17-2393
146. Mdoe MB, Kibusi SM, Munyogwa MJ, Ernest AI. Prevalence and predictors of gestational diabetes mellitus among pregnant women attending antenatal clinic in Dodoma region, Tanzania: an analytical cross-sectional study. BMJ Nutr Prev Health 2021;4:69-79. 10.1136/bmjnph-2020-000149 - DOI - PMC - PubMed
147. Meek CL, Lewis HB, Patient C, Murphy HR, Simmons D. Diagnosis of gestational diabetes mellitus: falling through the net. Diabetologia 2015;58:2003-12. 10.1007/s00125-015-3647-z. - DOI - PMC - PubMed
148. Miailhe G, Kayem G, Girard G, Legardeur H, Mandelbrot L. Selective rather than universal screening for gestational diabetes mellitus? Eur J Obstet Gynecol Reprod Biol 2015;191:95-100. 10.1016/j.ejogrb.2015.05.003. - DOI - PubMed
149. Miao M, Dai M, Zhang Y, Sun F, Guo X, Sun G. Influence of maternal overweight, obesity and gestational weight gain on the perinatal outcomes in women with gestational diabetes mellitus. Sci Rep. 2017;7(1):305. Published 2017 Mar 22. doi:10.1038/s41598-017-00441-z
150. Mikkelsen MR, Nielsen SB, Stage E, Mathiesen ER, Damm P. High maternal HbA1c is associated with overweight in neonates. Dan Med Bull. 2011;58(9):A4309.
151. Minsart AF, N'guyen TS, Dimtsu H, Ratsimandresy R, Dada F, Ali Hadji R. Are the new IADPSG criteria for gestational diabetes useful in a country with a very high prevalence? Gynecol Endocrinol 2014;30:632-5. 10.3109/09513590.2014.911278. - DOI - PubMed
152. Mitanchez D, Burguet A, Simeoni U. Infants born to mothers with gestational diabetes mellitus: mild neonatal effects, a long-term threat to global health. J Pediatr. 2014;164(3):445-450. doi:10.1016/j.jpeds.2013.10.076

153. Morikawa M, Sugiyama T, Sagawa N, et al. . Perinatal mortality in Japanese women diagnosed with gestational diabetes mellitus and diabetes mellitus. J Obstet Gynaecol Res 2017;43:1700-7. 10.1111/jog.13431 - DOI - PubMed
154. Mwanri AW, Kinabo J, Ramaiya K, Feskens EJ. Prevalence of gestational diabetes mellitus in urban and rural Tanzania. Diabetes Res Clin Pract 2014;103:71-8. 10.1016/j.diabres.2013.11.021. - DOI - PubMed
155. Myszkowski, B., Stawska, A., Glogiewicz, M., Sekielska-Domanowska, M. I., Wisniewska-Cymbaluk, S., Adamczak, R., Lach, J., Cnota, W., & Dubiel, M. (2023). Influence of gestational diabetes in twin pregnancy on the condition of newborns and early neonatal complications. In Ginekologia Polska (Vol. 94, Issue 2, pp. 129–134). VM Media SP. zo.o VM Group SK. https://doi.org/10.5603/gp.a2022.0037
156. Nabi, T., Rafiq, N., Arifa, Q. A., & Mishra, S. (2022). Effect of Overt Diabetes and Gestational Diabetes Mellitus on Pregnancy Outcomes and Progression. In The Journal of Obstetrics and Gynecology of India (Vol. 72, Issue S1, pp. 235–242). Springer Science and Business Media LLC. https://doi.org/10.1007/s13224-022-01649-4
157. Nayak PK, Mitra S, Sahoo JP, Daniel M, Mathew A, Padma A. Feto-maternal outcomes in women with and without gestational diabetes mellitus according to the International Association of Diabetes and Pregnancy Study Groups (IADPSG) diagnostic criteria. Diabetes Metab Syndr 2013;7:206-9. 10.1016/j.dsx.2013.10.017. - DOI - PubMed
158. Nelson, D. B., Martin, R., Duryea, E. L., Lafferty, A. K., McIntire, D. D., Pruszynski, J., Rochin, E., & Spong, C. Y. (2023). Extending Maternal Care After Pregnancy: An Initiative to Address Health Care Disparities and Enhance Access to Care After Delivery. In The Joint Commission Journal on Quality and Patient Safety (Vol. 49, Issue 5, pp. 274–279). Elsevier BV. https://doi.org/10.1016/j.jcjq.2023.02.003
159. Nguyen TH, Yang JW, Mahone M, Godbout A. Are there benefits for gestational diabetes mellitus in treating lower levels of hyperglycemia than standard recommendations? Can J Diabetes 2016;40:548-54. 10.1016/j.jcjd.2016.05.009. - DOI - PubMed
160. Nicolosi BF, Vernini JM, Costa RA, et al. . Maternal factors associated with hyperglycemia in pregnancy and perinatal outcomes: a Brazilian reference center cohort study. Diabetol Metab Syndr 2020;12:49. 10.1186/s13098-020-00556-w. - DOI - PMC - PubMed
161. No article: Gestational Diabetes Tied to Hypoglycemia Even in Low-Risk Neonates
162. Ogonowski J, Miazgowski T. Intergenerational transmission of macrosomia in women with gestational diabetes and normal glucose tolerance. Eur J Obstet Gynecol Reprod Biol 2015;195:113-6. 10.1016/j.ejogrb.2015.10.002 - DOI - PubMed
163. Olerich, K. L. W., Souter, V. L., Fay, E. E., Katz, R., & Hwang, J. K. (2022). Cesarean delivery rates and indications in pregnancies complicated by diabetes. In The Journal of Maternal-Fetal & Neonatal Medicine (Vol. 35, Issue 26, pp. 10375–10383). Informa UK Limited. https://doi.org/10.1080/14767058.2022.2128653
164. Oster RT, King M, Morrish DW, Mayan MJ, Toth EL. Diabetes in pregnancy among First Nations women in Alberta, Canada: a retrospective analysis. BMC Pregnancy Childbirth 2014;14:136. 10.1186/1471-2393-14-136. - DOI - PMC - PubMed
165. O'Sullivan EP, Avalos G, O'Reilly M, et al. Atlantic DIP: the prevalence and consequences of gestational diabetes in Ireland. Ir Med J. 2012;105(5 Suppl):13-15.
166. O'Sullivan EP, Avalos G, O'Reilly M, et al. Atlantic Diabetes in Pregnancy (DIP): the prevalence and outcomes of gestational diabetes mellitus using new diagnostic criteria

[published correction appears in Diabetologia. 2016 Apr;59(4):873]. Diabetologia. 2011;54(7):1670-1675. doi:10.1007/s00125-011-2150-4

167. Ovesen PG, Jensen DM, Damm P, Rasmussen S, Kesmodel US. Maternal and neonatal outcomes in pregnancies complicated by gestational diabetes. a nation-wide study. J Matern Fetal Neonatal Med 2015;28:1720-4. 10.3109/14767058.2014.966677. - DOI - PubMed
168. Park S, Kim SH. Women with rigorously managed overt diabetes during pregnancy do not experience adverse infant outcomes but do remain at serious risk of postpartum diabetes. Endocr J 2015;62:319-27. 10.1507/endocrj.EJ14-0529. - DOI - PubMed
169. Parveen, N., Hassan, S.-N., Zahra, A., Iqbal, N., & Batool, A. (2022). Early-Onset of Gestational Diabetes vs. Late-Onset: Can We Revamp Pregnancy Outcomes? In Iranian Journal of Public Health. Knowledge E DMCC. https://doi.org/10.18502/ijph.v51i5.9418
170. Pavic M, Premuzic V, Zovak Pavic A, Bevanda M, Mihaljevic S, Oreskovic S. Prevalence of gestational diabetes mellitus and perinatal outcomes according to the old WHO criteria and IADPSG criteria. Psychiatr Danub 2021;33(Suppl 10):30-6. - PubMed
171. Perak AM, Lancki N, Kuang A, et al. Associations of gestational cardiovascular health with pregnancy outcomes: the Hyperglycemia and Adverse Pregnancy Outcome study. Am J Obstet Gynecol. 2021;224(2):210.e1-210.e17. doi:10.1016/j.ajog.2020.07.053
172. Picon, M., Stanhope, K. K., Jamieson, D. J., & Boulet, S. L. (2022). Identification of Distinct Risk Factors for Antepartum and Postpartum Preeclampsia in a High-Risk Safety-Net Hospital. In American Journal of Perinatology. Georg Thieme Verlag KG. https://doi.org/10.1055/a-1878-0149
173. Pintaudi B, Fresa R, Dalfrà M, et al. The risk stratification of adverse neonatal outcomes in women with gestational diabetes (STRONG) study. Acta Diabetol. 2018;55(12):1261-1273. doi:10.1007/s00592-018-1208-x
174. Poulain C, Duhamel A, Garabedian C, et al. Outcome of twin pregnancies associated with glucose intolerance. Diabetes Metab. 2015;41(5):387-392. doi:10.1016/j.diabet.2014.12.005
175. Pouliot A, Elmahboubi R, Adam C. Incidence and Outcomes of Gestational Diabetes Mellitus Using the New International Association of Diabetes in Pregnancy Study Group Criteria in Hôpital Maisonneuve-Rosemont. Can J Diabetes. 2019;43(8):594-599. doi:10.1016/j.jcjd.2019.10.003
176. Protsenko AM, Budykina TS, Morozov SG, Rybakov AS, Gribova IE, Protsenko AN. Patol Fiziol Eksp Ter. 2010;(2):18-22.
177. Qadir SY, Yasmin T, Fatima I. Maternal and foetal outcome in gestational diabetes. J Ayub Med Coll Abbottabad. 2012;24(3-4):17-20.
178. Ramanjaneya, M., Butler, A. E., Alkasem, M., Bashir, M., Jerobin, J., Godwin, A., Moin, A. S. M., Ahmed, L., Elrayess, M. A., Hunt, S. C., Atkin, S. L., & Abou-Samra, A.-B. (2021). Corrigendum: Association of Complement-Related Proteins in Subjects With and Without Second Trimester Gestational Diabetes. In Frontiers in Endocrinology (Vol. 12). Frontiers Media SA. https://doi.org/10.3389/fendo.2021.781347
179. Redman LM, Drews KL, Klein S, et al. LIFE-Moms Research Group . Attenuated early pregnancy weight gain by prenatal lifestyle interventions does not prevent gestational diabetes in the LIFE-Moms consortium. Diabetes Res Clin Pract 2021;171:108549. 10.1016/j.diabres.2020.108549. - DOI - PMC - PubMed

180. Rehder PM, Pereira BG, Silva JL. Resultados gestacionais e neonatais em mulheres com rastreamento positivo para diabetes mellitus e teste oral de tolerância à glicose - 100g normal [Gestational and neonatal outcomes in women with positive screening for diabetes mellitus and 100g oral glucose challenge test normal]. Rev Bras Ginecol Obstet. 2011;33(2):81-86.
181. Reichelt AJ, Weinert LS, Mastella LS, et al. Clinical characteristics of women with gestational diabetes - comparison of two cohorts enrolled 20 years apart in southern Brazil. Sao Paulo Med J. 2017;135(4):376-382. doi:10.1590/1516-3180.2016.0332190317
182. Reitzle, L., Heidemann, C., Baumert, J., Kaltheuner, M., Adamczewski, H., Icks, A., & Scheidt-Nave, C. (2023). Pregnancy complications in women with pregestational and gestational diabetes mellitus. In Deutsches Ärzteblatt international. Deutscher Arzte-Verlag GmbH. https://doi.org/10.3238/arztebl.m2022.0387
183. Ritchie, N. D., Seely, E. W., Nicklas, J. M., & Levkoff, S. E. (2023). Effectiveness of the National Diabetes Prevention Program After Gestational Diabetes. In American Journal of Preventive Medicine. Elsevier BV. https://doi.org/10.1016/j.amepre.2023.03.006
184. Rotem, R., Hirsch, A., Barg, M., Mor, P., Michaelson-Cohen, R., & Rottenstreich, M. (2022). Trial of labor following cesarean in preterm deliveries: success rates and maternal and neonatal outcomes: a multicenter retrospective study. In Archives of Gynecology and Obstetrics. Springer Science and Business Media LLC. https://doi.org/10.1007/s00404-022-06746-3
185. Ryan DK, Haddow L, Ramaesh A, et al. Early screening and treatment of gestational diabetes in high-risk women improves maternal and neonatal outcomes: A retrospective clinical audit. Diabetes Res Clin Pract. 2018;144:294-301. doi:10.1016/j.diabres.2018.09.013
186. Ryan EA, Savu A, Yeung RO, Moore LE, Bowker SL, Kaul P. Elevated fasting vs post-load glucose levels and pregnancy outcomes in gestational diabetes: a population-based study. Diabet Med 2020;37:114-22. 10.1111/dme.14173. - DOI - PubMed
187. Sacks DA, Black MH, Li X, Montoro MN, Lawrence JM. Adverse Pregnancy Outcomes Using The International Association of the Diabetes and Pregnancy Study Groups Criteria: Glycemic Thresholds and Associated Risks. Obstet Gynecol. 2015;126(1):67-73. doi:10.1097/AOG.0000000000000865
188. Sagili H, Kamalanathan S, Sahoo J, et al. . Comparison of different criteria for diagnosis of gestational diabetes mellitus. Indian J Endocrinol Metab 2015;19:824-8. 10.4103/2230-8210.167550. - DOI - PMC - PubMed
189. Sajani TT, Rahman MT, Karim MR. Maternal and fetal outcome of mothers with gestational diabetes mellitus attending BIRDEM Hospital. Mymensingh Med J. 2014;23(2):290-298.
190. Sarkar, A., Caughey, A. B., Cheng, Y. W., & Yee, L. M. (2022). Perinatal Outcomes of Twin Gestations with and without Gestational Diabetes Mellitus. In American Journal of Perinatology. Georg Thieme Verlag KG. https://doi.org/10.1055/s-0042-1743184
191. Saxena P, Tyagi S, Prakash A, Nigam A, Trivedi SS. Pregnancy outcome of women with gestational diabetes in a tertiary level hospital of north India. Indian J Community Med. 2011;36(2):120-123. doi:10.4103/0970-0218.84130
192. Schmidt, M. I. (2022). Rethinking gestational diabetes: hyperglycemia or a cluster of cardiometabolic abnormalities manifested during pregnancy? In Archives of

Endocrinology and Metabolism (Vol. 66, Issue 4, pp. 437–438). Archives of Endocrinology and Metabolism. https://doi.org/10.20945/2359-3997000000519

193. Schneider S, Hoeft B, Freerksen N, et al. Neonatal complications and risk factors among women with gestational diabetes mellitus. Acta Obstet Gynecol Scand. 2011;90(3):231-237. doi:10.1111/j.1600-0412.2010.01040.x
194. Seely, E. W., Ritchie, N. D., Nicklas, J. M., & Levkoff, S. E. (2023). Diabetes in Women After Gestational Diabetes: A Missed Opportunity for Prevention. In American Journal of Preventive Medicine (Vol. 64, Issue 1, pp. 137–141). Elsevier BV. https://doi.org/10.1016/j.amepre.2022.08.009
195. Selen, D. J., Edelson, P. K., James, K., Corelli, K., Hivert, M.-F., Meigs, J. B., Thadhani, R., Ecker, J., & Powe, C. E. (2022). Physiological subtypes of gestational glucose intolerance and risk of adverse pregnancy outcomes. In American Journal of Obstetrics and Gynecology (Vol. 226, Issue 2, p. 241.e1-241.e14). Elsevier BV. https://doi.org/10.1016/j.ajog.2021.08.016
196. Sesmilo G, Meler E, Perea V, et al. Maternal fasting glycemia and adverse pregnancy outcomes in a Mediterranean population. Acta Diabetol. 2017;54(3):293-299. doi:10.1007/s00592-016-0952-z
197. Sesmilo G, Prats P, Garcia S, et al. First-trimester fasting glycemia as a predictor of gestational diabetes (GDM) and adverse pregnancy outcomes. Acta Diabetol. 2020;57(6):697-703. doi:10.1007/s00592-019-01474-8
198. Seval MM, Cavkaytar S, Atak Z, Cagman M. Should we interpret the results of 'two-step' glucose screening again according to the obstetric outcomes? J Obstet Gynaecol 2016;36:705-9. 10.3109/01443615.2015.1134459. - DOI - PubMed
199. Shah BR, Sharifi F. Perinatal outcomes for untreated women with gestational diabetes by IADPSG criteria: a population-based study. BJOG. 2020;127(1):116-122. doi:10.1111/1471-0528.15964
200. Shahbazian H, Nouhjah S, Shahbazian N, et al. . Gestational diabetes mellitus in an Iranian pregnant population using IADPSG criteria: incidence, contributing factors and outcomes. Diabetes Metab Syndr 2016;10:242-6. 10.1016/j.dsx.2016.06.019. - DOI - PubMed
201. Shahbazian H, Nouhjah S, Shahbazian N, et al. Gestational diabetes mellitus in an Iranian pregnant population using IADPSG criteria: Incidence, contributing factors and outcomes. Diabetes Metab Syndr. 2016;10(4):242-246. doi:10.1016/j.dsx.2016.06.019
202. Shang M, Lin L. IADPSG criteria for diagnosing gestational diabetes mellitus and predicting adverse pregnancy outcomes. J Perinatol 2014;34:100-4. 10.1038/jp.2013.143. - DOI - PubMed
203. Shang M, Lin L, Ma L, Yin L. Investigation on the suitability of the International Association of Diabetes and Pregnancy Study Group diagnostic criteria for gestational diabetes mellitus in China. J Obstet Gynaecol. 2014;34(2):141-145. doi:10.3109/01443615.2013.832177
204. Shi X, Wang D, Lin M, et al. . Maternal gestational diabetes mellitus and offspring body mass index from 1 to 4 years. Endocr Pract 2020;26:619-26. 10.4158/EP-2019-0415. - DOI - PubMed
205. Shindo R, Aoki S, Kasai J, Saigusa Y, Nakanishi S, Miyagi E. Impact of introducing the International Association of Diabetes and Pregnancy Study Groups (IADPSG) criteria on pregnancy outcomes in Japan. Endocr J 2020;67:15-20. 10.1507/endocrj.EJ19-0279. - DOI - PubMed

206. Shub A, Chee T, Templeton A, et al. Timing of diagnosis of gestational diabetes and pregnancy outcomes: A retrospective cohort. Aust N Z J Obstet Gynaecol. 2019;59(1):96-101. doi:10.1111/ajo.12814
207. Siegel AM, Coxwell CA, Biggio JR, Tita A, Harper LM. Impact of Interval between Screening and Diagnosis of Gestational Diabetes on Pregnancy Outcomes. Am J Perinatol. 2017;34(6):557-562. doi:10.1055/s-0036-1594016
208. Silva CM, Arnegard ME, Maric-Bilkan C. Dysglycemia in Pregnancy and Maternal/Fetal Outcomes. J Womens Health (Larchmt). 2021;30(2):187-193. doi:10.1089/jwh.2020.8853
209. Silveira LRPD, Schmidt MI, Reichelt AAJ, Drehmer M. Obesity, gestational weight gain, and birth weight in women with gestational diabetes: the LINDA-Brasil (2014-2017) and the EBDG (1991-1995) studies. J Pediatr (Rio J). 2021;97(2):167-176. doi:10.1016/j.jped.2020.02.004
210. Singh H, Soyoltulga K, Fong T, Billimek J. Delivery Outcomes, Emergency Room Visits, and Psychological Aspects of Gestational Diabetes: Results From a Community Hospital Multiethnic Cohort. Diabetes Educ. 2018;44(5):465-474. doi:10.1177/0145721718795589
211. Sirimarco MP, Guerra HM, Lisboa EG, et al. . Diagnostic protocol for gestational diabetes mellitus (GDM) (IADPSG/ADA, 2011): influence on the occurrence of GDM and mild gestational hyperglycemia (MGH) and on the perinatal outcomes. Diabetol Metab Syndr 2017;9:2. 10.1186/s13098-016-0200-2. - DOI - PMC - PubMed
212. Sletner L, Jenum AK, Yajnik CS, et al. . Fetal growth trajectories in pregnancies of European and South Asian mothers with and without gestational diabetes, a population-based cohort study. PLoS One 2017;12:e0172946. 10.1371/journal.pone.0172946. - DOI - PMC - PubMed
213. Soliman A, Salama H, Al Rifai H, et al. . The effect of different forms of dysglycemia during pregnancy on maternal and fetal outcomes in treated women and comparison with large cohort studies. Acta Biomed 2018;89(S5):11-21. 10.23750/abm.v89iS4.7356. - DOI - PMC - PubMed
214. Soliman A, Salama H, Al Rifai H, et al. The effect of different forms of dysglycemia during pregnancy on maternal and fetal outcomes in treated women and comparison with large cohort studies. Acta Biomed. 2018;89(S5):11-21. Published 2018 May 23. doi:10.23750/abm.v89iS4.7356
215. Somasundaram NP, Subasinghe CJ, Maheshi Gimhani Amarawardena WK. Outcomes of offspring born to mothers with gestational diabetes. J Pak Med Assoc. 2016;66(9 Suppl 1):S91-S95.
216. Song Y, Zhang S, Song W. Correlation between macrosomia body indices and maternal fasting blood glucose. J Obstet Gynaecol. 2014;34(4):289-292. doi:10.3109/01443615.2012.729107
217. Song D, Lia M, Hurley JC. Recommended pre-analytical plasma glucose sampling methodology may distort gestational diabetes mellitus prevalence: implications for diagnostic thresholds. Diabet Med. 2019;36(10):1226-1233. doi:10.1111/dme.14073
218. Song D, Hurley JC, Lia M. Estimated Treatment Effects of Tight Glycaemic Targets in Mild Gestational Diabetes Mellitus: A Multiple Cut-Off Regression Discontinuity Study Design. Int J Environ Res Public Health. 2020;17(21):7725. Published 2020 Oct 22. doi:10.3390/ijerph17217725

219. Sperling, M. M., Leonard, S. A., Blumenfeld, Y. J., Carmichael, S. L., & Chueh, J. (2023). Prepregnancy body mass index and gestational diabetes mellitus across Asian and Pacific Islander subgroups in California. In AJOG Global Reports (Vol. 3, Issue 1, p. 100148). Elsevier BV. https://doi.org/10.1016/j.xagr.2022.100148
220. Srichumchit S, Luewan S, Tongsong T. Outcomes of pregnancy with gestational diabetes mellitus. Int J Gynaecol Obstet. 2015;131(3):251-254. doi:10.1016/j.ijgo.2015.05.033
221. Stuebe AM, Landon MB, Lai Y, et al. Is There a Threshold Oral Glucose Tolerance Test Value for Predicting Adverse Pregnancy Outcome?. Am J Perinatol. 2015;32(9):833-838. doi:10.1055/s-0034-1543949
222. Sudasinghe BH, Wijeyaratne CN, Ginige PS. Long and short-term outcomes of Gestational Diabetes Mellitus (GDM) among South Asian women - A community-based study. Diabetes Res Clin Pract. 2018;145:93-101. doi:10.1016/j.diabres.2018.04.013
223. Sugiyama MS, Cash HL, Roseveare C, Reklai R, Basilius K, Madraisau S. Assessment of Gestational Diabetes and Associated Risk Factors and Outcomes in the Pacific Island Nation of Palau. Matern Child Health J. 2017;21(10):1961-1966. doi:10.1007/s10995-017-2313-0
224. Sun YY, Juan J, Xu QQ, Su RN, Hirst JE, Yang HX. Increasing insulin resistance predicts adverse pregnancy outcomes in women with gestational diabetes mellitus. J Diabetes. 2020;12(6):438-446. doi:10.1111/1753-0407.13013
225. Sunder, A., Varghese, B., Darwish, B., Shaikho, N. M., AlSada, A., Albuainain, H., Alrowaijeh, S., Al-Khalifa, S. A., Khalid Bughamar, A., & Dayoub, N. (2022). Maternal Obesity: An Obstetric Risk. In Cureus. Cureus, Inc. https://doi.org/10.7759/cureus.29345
226. Sunjaya AP, Sunjaya AF. Diabetes in pregnancy and infant mortality: Link with glycemic control. Diabetes Metab Syndr. 2018;12(6):1031-1037. doi:10.1016/j.dsx.2018.06.019
227. Surendran A, Dixon D, Whyte M. Diabetes in pregnancy: a practical guide for midwives. 2019;27(7):413-419. doi:10.12968/bjom.2019.27.7.413
228. Sweeting AN, Ross GP, Hyett J, et al. Gestational Diabetes Mellitus in Early Pregnancy: Evidence for Poor Pregnancy Outcomes Despite Treatment. Diabetes Care. 2016;39(1):75-81. doi:10.2337/dc15-0433
229. Tan HLE, Luu J, Caswell A, Holliday E, Attia J, Acharya S. Impact of new International Association of Diabetes and Pregnancy Study Groups (IADPSG) diagnostic criteria on perinatal outcomes in a regional tertiary hospital in New South Wales, Australia. Diabetes Res Clin Pract 2017;134:191-8. 10.1016/j.diabres.2017.09.016. - DOI - PubMed
230. Todi S, Sagili H, Kamalanathan SK. Comparison of criteria of International Association of Diabetes and Pregnancy Study Groups (IADPSG) with National Institute for Health and Care Excellence (NICE) for diagnosis of gestational diabetes mellitus. Arch Gynecol Obstet. 2020;302(1):47-52. doi:10.1007/s00404-020-05564-9
231. Tomić V, Petrović O, Crnčević Orlić Ž, Mandić V. Gestational diabetes and pregnancy outcome - do we have right diagnostic criteria? J Matern Fetal Neonatal Med 2013;26:854-9. 10.3109/14767058.2013.776530 - DOI - PubMed
232. Tong JN, Wu LL, Chen YX, et al. . Fasting plasma glucose in the first trimester is related to gestational diabetes mellitus and adverse pregnancy outcomes. Endocrine 2022;75:70-81. 10.1007/s12020-021-02831-w. - DOI - PMC - PubMed
233. Tong, J.-N., Wu, L.-L., Chen, Y.-X., Guan, X.-N., Tian, F.-Y., Zhang, H.-F., Liu, K., Yin, A.-Q., Wu, X.-X., & Prof, J.-M. N. (2021). Fasting plasma glucose in the first trimester

is related to gestational diabetes mellitus and adverse pregnancy outcomes. In Endocrine (Vol. 75, Issue 1, pp. 70–81). Springer Science and Business Media LLC. https://doi.org/10.1007/s12020-021-02831-w

234. Tundidor D, García-Patterson A, María MA, et al. Perinatal maternal and neonatal outcomes in women with gestational diabetes mellitus according to fetal sex. Gend Med. 2012;9(6):411-417. doi:10.1016/j.genm.2012.09.002
235. Uma R, Bhavadharini B, Ranjani H, et al. Pregnancy outcome of gestational diabetes mellitus using a structured model of care : WINGS project (WINGS-10). J Obstet Gynaecol Res. 2017;43(3):468-475. doi:10.1111/jog.13249
236. Vale Bezerra, P. K., Chaves Cavalcanti, J. E., Carlete Filho, S. R., Medeiros, S. D. V., Oliveira, A. G., & Martins, R. R. (2023). Drug-related problems in hypertension and gestational diabetes mellitus: A hospital cohort. In N. C. Ngene (Ed.), PLOS ONE (Vol. 18, Issue 4, p. e0284053). Public Library of Science (PLoS). https://doi.org/10.1371/journal.pone.0284053
237. Valias, G. R., Gomes, P. R. L., Amaral, F. G., Alnuaimi, S., Monteiro, D., O'Sullivan, S., Zangaro, R., Cipolla-Neto, J., Acuna, J., Baltatu, O. C., & Campos, L. A. (2022). Urinary Angiotensinogen-Melatonin Ratio in Gestational Diabetes and Preeclampsia. In Frontiers in Molecular Biosciences (Vol. 9). Frontiers Media SA. https://doi.org/10.3389/fmolb.2022.800638
238. Vélez MP, Slater M, Griffiths R, et al. Diabetes during pregnancy and perinatal outcomes among First Nations women in Ontario, 2002/03-2014/15: a population-based cohort study. CMAJ Open. 2020;8(1):E214-E225. Published 2020 Mar 19. doi:10.9778/cmajo.20190195
239. Violante-Ortíz R, Fernández-Ordóñez NL, Requena-Rivera CA, Mojarro-Bazán SS, Alemán-Cabrera T. Desenlaces materno-fetales en mujeres con diabetes gestacional en un programa de control intensivo [Maternal-fetal outcomes in women with gestational diabetes in an intensive control program]. Rev Med Inst Mex Seguro Soc. 2023 Jan 2;61(1):61-67. Spanish. PMID: 36542519.
240. Voldner N, Qvigstad E, Frøslie KF, Godang K, Henriksen T, Bollerslev J. Increased risk of macrosomia among overweight women with high gestational rise in fasting glucose. J Matern Fetal Neonatal Med. 2010;23(1):74-81. doi:10.3109/14767050903121472
241. von Katterfeld B, Li J, McNamara B, Langridge AT. Maternal and neonatal outcomes associated with gestational diabetes in women from culturally and linguistically diverse backgrounds in Western Australia. Diabet Med. 2012;29(3):372-377. doi:10.1111/j.1464-5491.2011.03483.x
242. Wahabi HA, Esmaeil SA, Fayed A, Alzeidan RA. Gestational diabetes mellitus: maternal and perinatal outcomes in King Khalid University Hospital, Saudi Arabia. J Egypt Public Health Assoc 2013;88:104-8. 10.1097/01.EPX.0000430392.57811.20. - DOI - PubMed
243. Wahi P, Dogra V, Jandial K, et al. Prevalence of gestational diabetes mellitus (GDM) and its outcomes in Jammu region. J Assoc Physicians India. 2011;59:227-230.
244. Wahlberg J, Ekman B, Nyström L, Hanson U, Persson B, Arnqvist HJ. Gestational diabetes: glycaemic predictors for fetal macrosomia and maternal risk of future diabetes. Diabetes Res Clin Pract 2016;114:99-105. 10.1016/j.diabres.2015.12.017. - DOI - PubMed

245. Wang Z, Kanguru L, Hussein J, Fitzmaurice A, Ritchie K. Incidence of adverse outcomes associated with gestational diabetes mellitus in low- and middle-income countries. Int J Gynaecol Obstet. 2013;121(1):14-19. doi:10.1016/j.ijgo.2012.10.032
246. Wei Y, Yang H, Zhu W, et al. International Association of Diabetes and Pregnancy Study Group criteria is suitable for gestational diabetes mellitus diagnosis: further evidence from China. Chin Med J (Engl). 2014;127(20):3553-3556.
247. Wei YM, Yan J, Yang HX. Identification of severe gestational diabetes mellitus after new criteria used in China. J Perinatol 2016;36:90-4. 10.1038/jp.2015.151. - DOI - PubMed
248. Wells G, Bleicher K, Han X, et al. . Maternal diabetes, large-for-gestational-age births, and first trimester pregnancy-associated plasma protein-A. J Clin Endocrinol Metab 2015;100:2372-9. 10.1210/jc.2014-4103. - DOI - PubMed
249. Wielandt HB, Schønemann-Rigel H, Holst CB, Fenger-Grøn J. High risk of neonatal complications in children of mothers with gestational diabetes mellitus in their first pregnancy. Dan Med J. 2015;62(6):A5093.
250. Wilmot EG, Mansell P. Diabetes and pregnancy. Clin Med (Lond). 2014;14(6):677-680. doi:10.7861/clinmedicine.14-6-677
251. Wilmot EG, Mansell P. Diabetes and pregnancy. Clin Med (Lond). 2014;14(6):677-680. doi:10.7861/clinmedicine.14-6-677
252. Wilmot EG, Mansell P. Diabetes and pregnancy. Clin Med (Lond). 2014;14(6):677-680. doi:10.7861/clinmedicine.14-6-677
253. Wilmot EG, Mansell P. Diabetes and pregnancy. Clin Med (Lond). 2014;14(6):677-680. doi:10.7861/clinmedicine.14-6-677
254. Wolka, E., Deressa, W., & Reja, A. (2022). Effect of diabetes mellitus on pregnancy and birth outcomes in Wolaita Zone, Southern Ethiopia: A retrospective cohort study. In Diabetes & Metabolic Syndrome: Clinical Research & Reviews (Vol. 16, Issue 1, p. 102364). Elsevier BV. https://doi.org/10.1016/j.dsx.2021.102364
255. Wong VW. Gestational diabetes mellitus in five ethnic groups: a comparison of their clinical characteristics. Diabet Med. 2012;29(3):366-371. doi:10.1111/j.1464-5491.2011.03439.x
256. Xaverius, P. K., Howard, S. W., Kiel, D., Thurman, J. E., Wankum, E., Carter, C., Fang, C., & Carriere, R. (2022). Association of types of diabetes and insulin dependency on birth outcomes. In World Journal of Clinical Cases (Vol. 10, Issue 7, pp. 2147–2158). Baishideng Publishing Group Inc. https://doi.org/10.12998/wjcc.v10.i7.2147
257. Yan Y, Liu Z, Liu D. Heterogeneity of glycometabolism in patients with gestational diabetes mellitus: Retrospective study of 1,683 pregnant women. J Diabetes Investig 2017;8:554-9. 10.1111/jdi.12595. - DOI - PMC - PubMed
258. Yang W, Liu J, Li J, et al. Interactive effects of prepregnancy overweight and gestational diabetes on macrosomia and large for gestational age: A population-based prospective cohort in Tianjin, China. Diabetes Res Clin Pract. 2019;154:82-89. doi:10.1016/j.diabres.2019.06.014
259. Yang GR, Dye TD, Li D. Effects of pre-gestational diabetes mellitus and gestational diabetes mellitus on macrosomia and birth defects in Upstate New York. Diabetes Res Clin Pract. 2019;155:107811. doi:10.1016/j.diabres.2019.107811
260. Yang, Y., Lin, Q., Ma, L., Lai, Z., Xie, J., Zhang, Z., Wu, X., Luo, W., Hu, P., Wang, X., Guo, X., & Lin, H. (2023). Maternal fasting glucose levels throughout the pregnancy and risk of adverse birth outcomes in newborns: a birth cohort study in Foshan city,

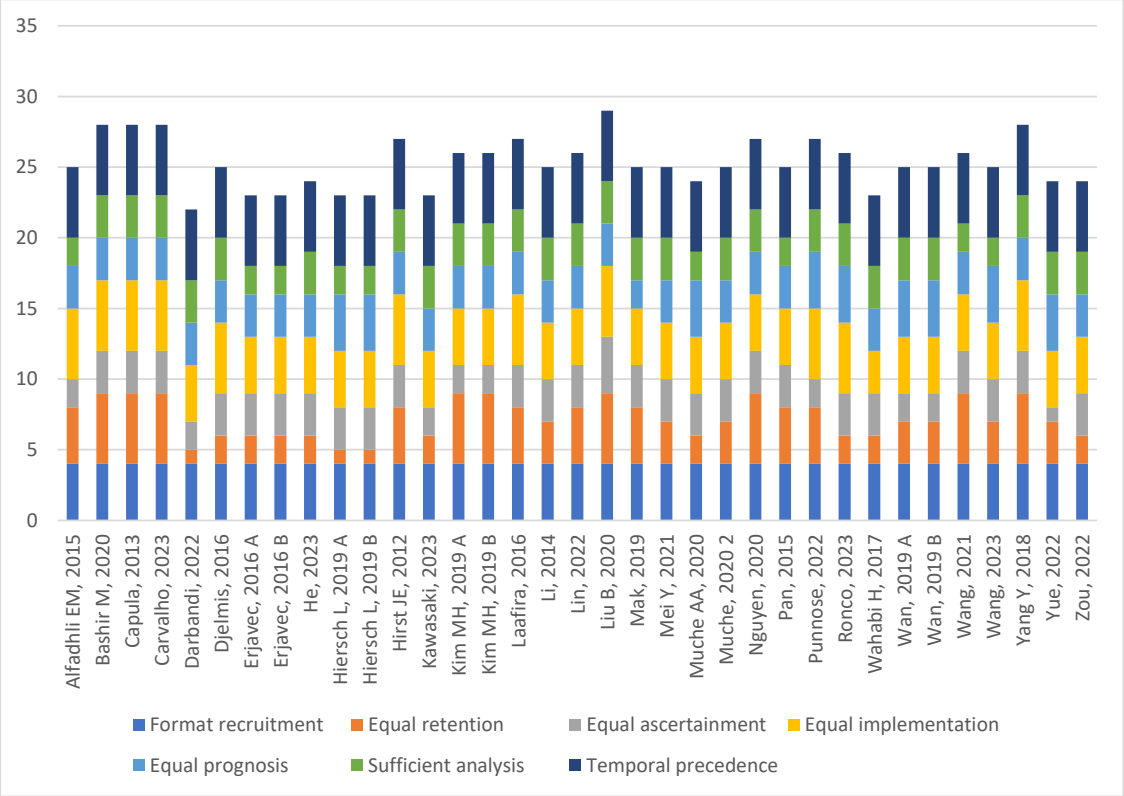
Southern China. In European Journal of Endocrinology (Vol. 188, Issue 1). Oxford University Press (OUP). https://doi.org/10.1093/ejendo/lvac019

261. Ye, Y., Xiong, Y., Zhou, Q., Xiao, X., & Li, X. (2021). Early-Pregnancy Intermediate Hyperglycemia and Adverse Pregnancy Outcomes Among Women Without Gestational Diabetes. In The Journal of Clinical Endocrinology & Metabolism (Vol. 107, Issue 4, pp. e1541–e1548). The Endocrine Society. https://doi.org/10.1210/clinem/dgab841
262. Yesildager E, Koken G, Gungor AN, et al. Perinatal outcomes of borderline diabetic pregnant women. J Obstet Gynaecol. 2014;34(8):666-668. doi:10.3109/01443615.2014.920788
263. Yin, M., Zhang, Y., Wang, J., & Li, X. (2022). Comment on Marcoux et al. Varying Impact of Gestational Diabetes Mellitus on Incidence of Childhood Cancers: An Age-Stratified Retrospective Cohort Study. Diabetes Care 2022;45:1177–1183. In Diabetes Care (Vol. 45, Issue 11, pp. e153–e154). American Diabetes Association. https://doi.org/10.2337/dc22-0954
264. Youngwanichsetha S, Phumdoung S. Association between neonatal hypoglycaemia and prediabetes in postpartum women with a history of gestational diabetes. J Clin Nurs. 2014;23(15-16):2181-2185. doi:10.1111/jocn.12488
265. Yu F, Lv L, Liang Z, et al. Continuous glucose monitoring effects on maternal glycemic control and pregnancy outcomes in patients with gestational diabetes mellitus: a prospective cohort study. J Clin Endocrinol Metab. 2014;99(12):4674-4682. doi:10.1210/jc.2013-4332
266. Zahid, S., Hashem, A., Minhas, A. S., Bennett, W. L., Honigberg, M. C., Lewey, J., Davis, M. B., & Michos, E. D. (2022). Trends, Predictors, and Outcomes of Cardiovascular Complications at Delivery Associated With Gestational Diabetes: A National Inpatient Sample Analysis (2004–2019). In Journal of the American Heart Association (Vol. 11, Issue 21). Ovid Technologies (Wolters Kluwer Health). https://doi.org/10.1161/jaha.122.026786
267. Zawiejska A, Wender-Ozegowska E, Radzicka S, Brazert J. Maternal hyperglycemia according to IADPSG criteria as a predictor of perinatal complications in women with gestational diabetes: a retrospective observational study. J Matern Fetal Neonatal Med. 2014;27(15):1526-1530. doi:10.3109/14767058.2013.863866
268. Zeki R, Oats JJN, Wang AY, Li Z, Homer CSE, Sullivan EA. Cesarean section and diabetes during pregnancy: An NSW population study using the Robson classification. J Obstet Gynaecol Res 2018;44:890-8. 10.1111/jog.13605. - DOI - PubMed
269. Zhang X, Liao Q, Wang F, Li D. Association of gestational diabetes mellitus and abnormal vaginal flora with adverse pregnancy outcomes. Medicine (Baltimore) 2018;97:e11891. 10.1097/MD.0000000000011891. - DOI - PMC - PubMed
270. Zhao D, Yuan S, Ma Y, An YX, Yang YX, Yang JK. Associations of maternal hyperglycemia in the second and third trimesters of pregnancy with prematurity. Medicine (Baltimore) 2020;99:e19663. 10.1097/MD.0000000000019663 - DOI - PMC - PubMed
271. Zhao, D., Liu, D., Shi, W., Shan, L., Yue, W., Qu, P., Yin, C., & Mi, Y. (2023). Association between Maternal Blood Glucose Levels during Pregnancy and Birth Outcomes: A Birth Cohort Study. In International Journal of Environmental Research and Public Health (Vol. 20, Issue 3, p. 2102). MDPI AG. https://doi.org/10.3390/ijerph20032102
272. Zheng, M.-M., Lu, Y., Cai, Y.-S., Li, M.-X., Fei, Y., & Zheng, D. (2022). Preventive effect of one-day outpatient health management on adverse pregnancy outcomes in

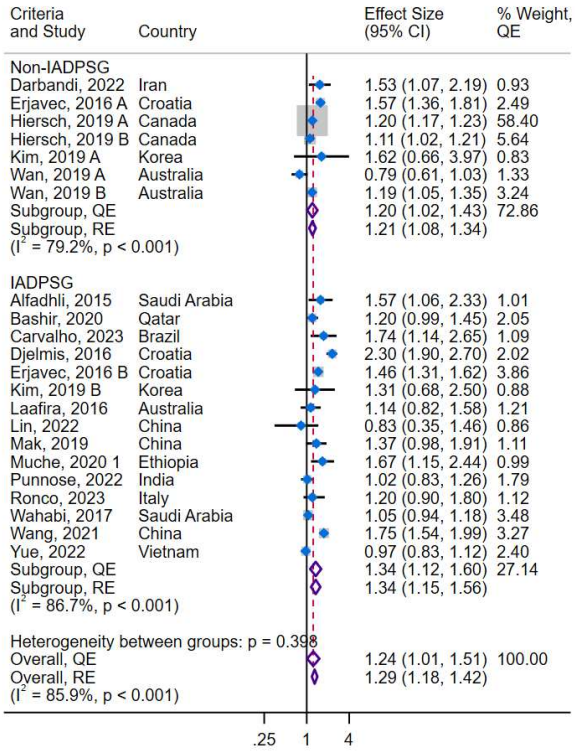
patients with gestational diabetes mellitus: a retrospective cohort study. In Translational Pediatrics (Vol. 11, Issue 8, pp. 1362–1373). AME Publishing Company. https://doi.org/10.21037/tp-22-324

273. Żurawska-Kliś M, Kosiński M, Wender-Ożegowska E, et al. Obstetric results of the multicenter, nationwide, scientific-educational program for pregnant women with gestational diabetes mellitus (GDM). Ginekol Pol. 2016;87(9):651-658. doi:10.5603/GP.2016.0061

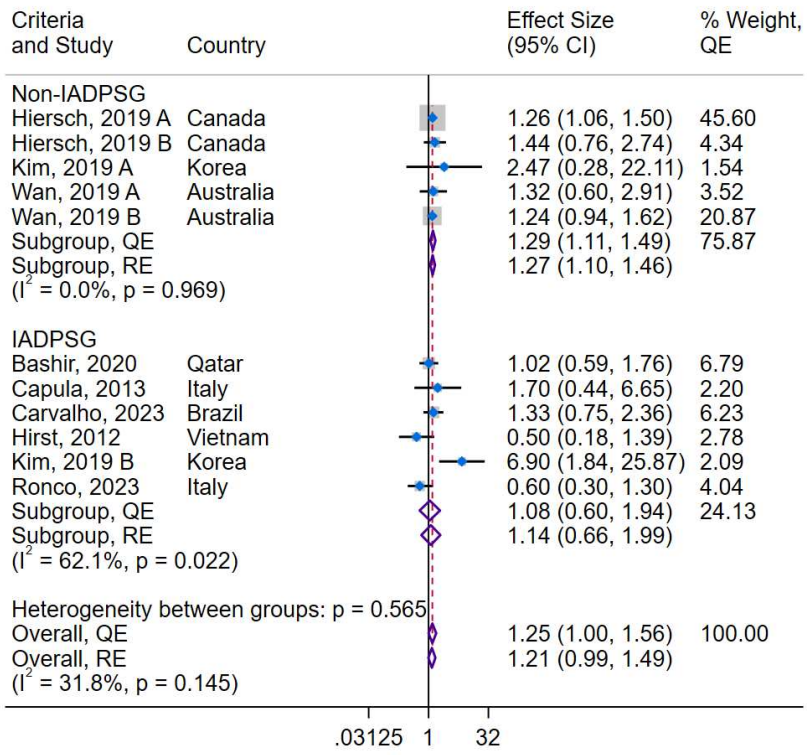
Supplementary Fig. 1: MASTER Scale Assessment



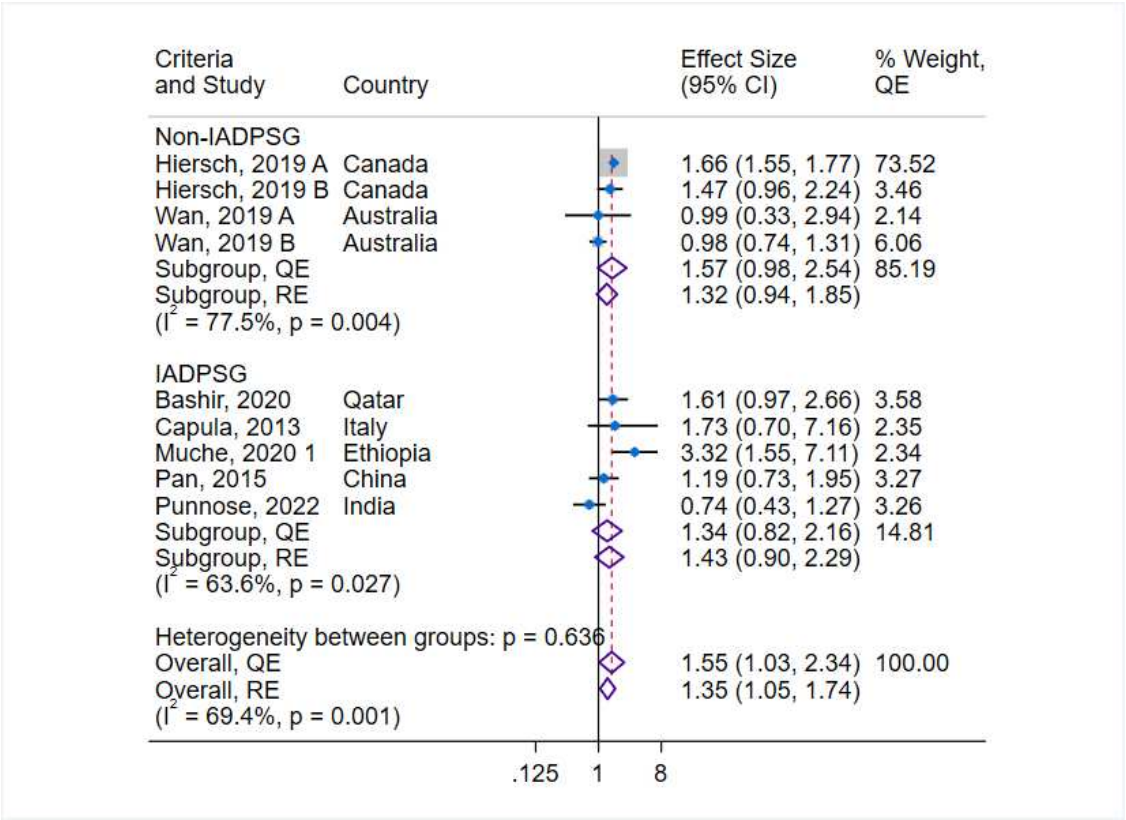
Supplementary Fig. 2: Forest plot for cesarean sections



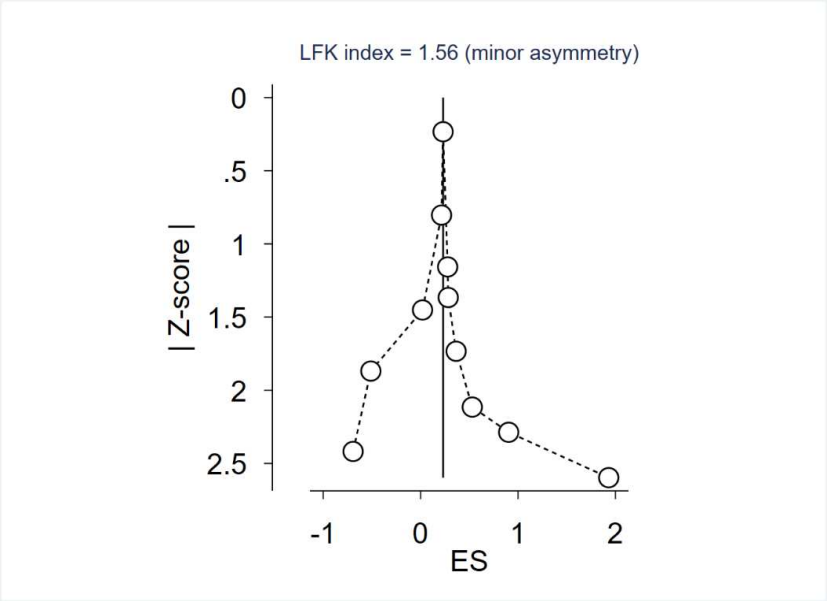
Supplementary Fig. 3: Forest plot for preeclampsia

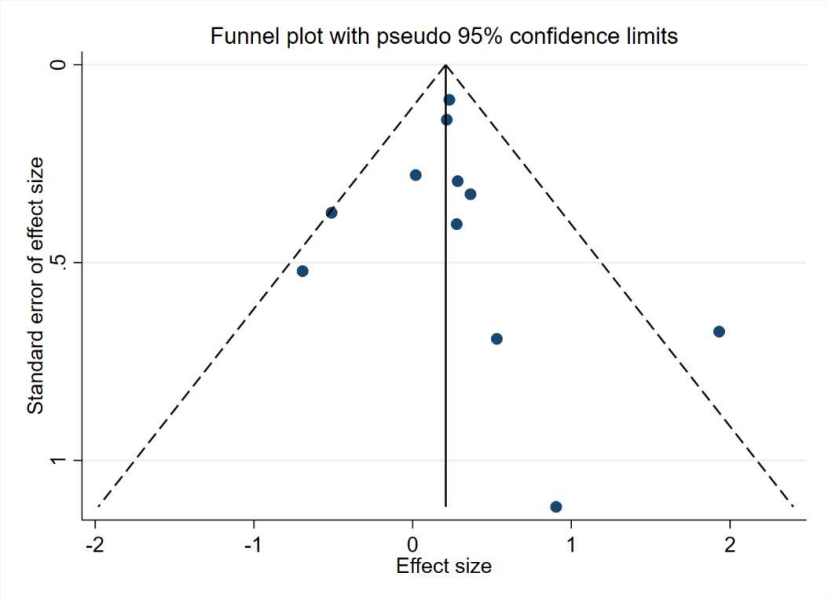


Supplementary Fig. 4: Forest plot for PIH

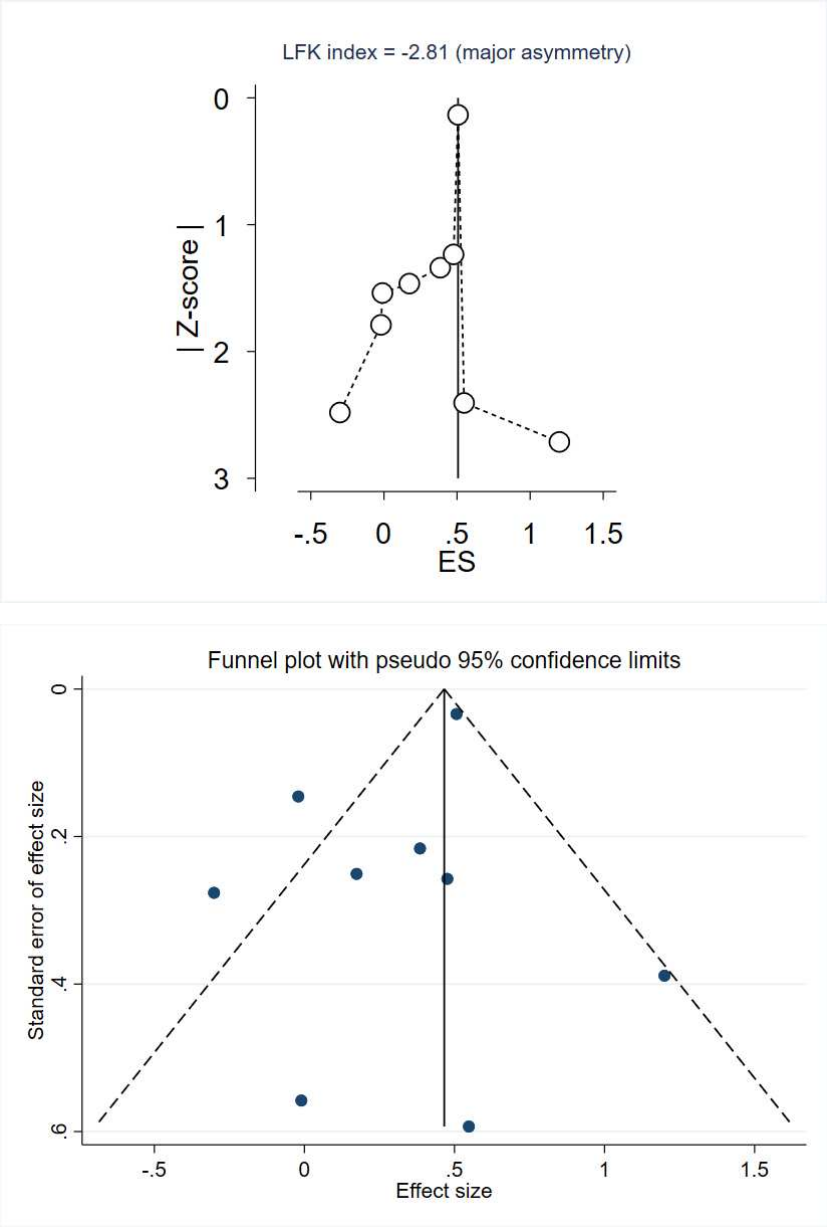


Supplementary Fig. 5: Doi and funnel plots for publication bias assessment for preeclampsia

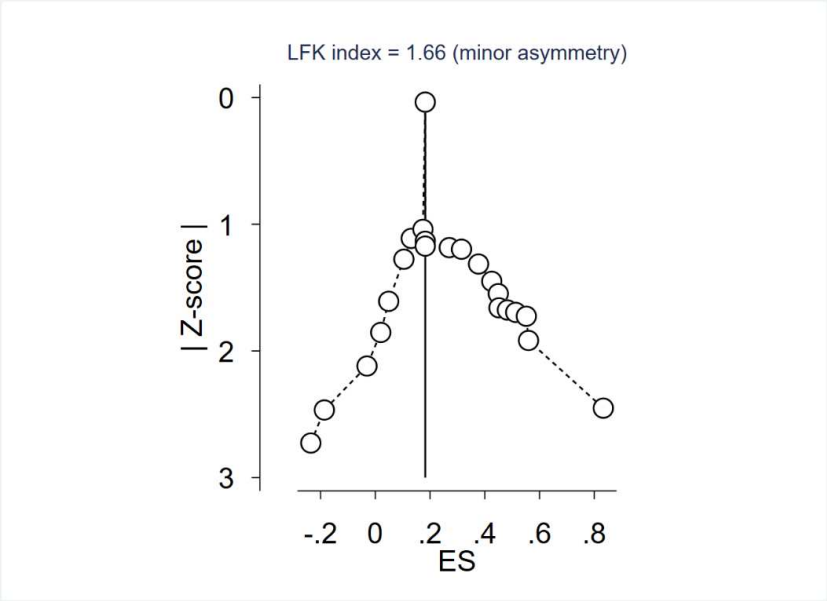


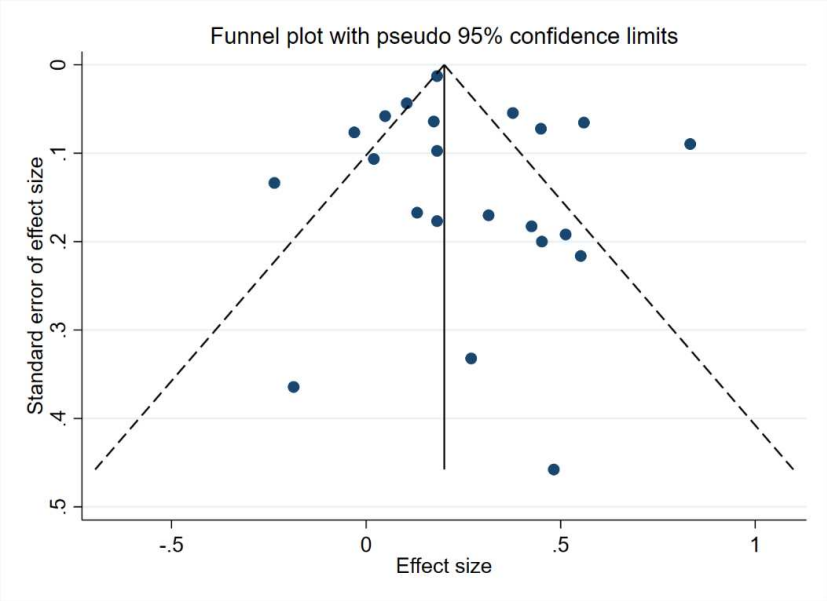


Supplementary Fig. 6: Doi and funnel plots for publication bias assessment for PIH

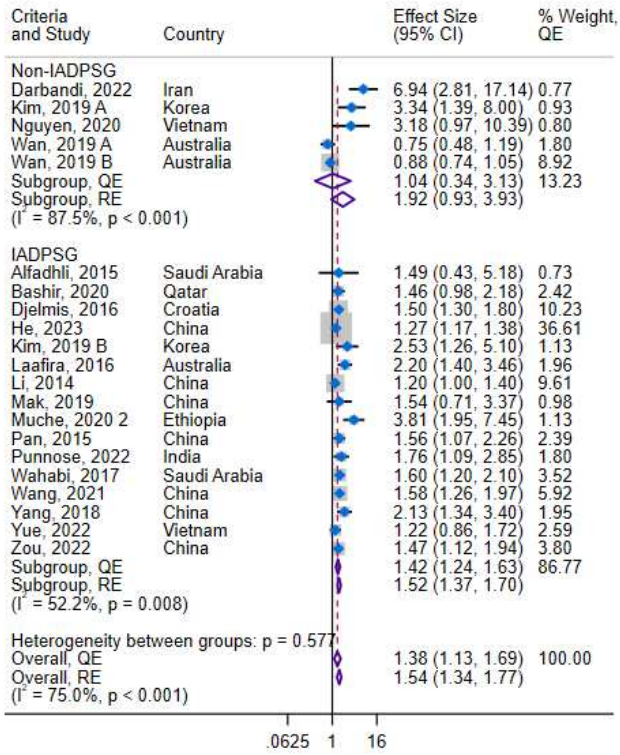


Supplementary Fig. 7: Doi and funnel plots for publication bias assessment for caesarean sections

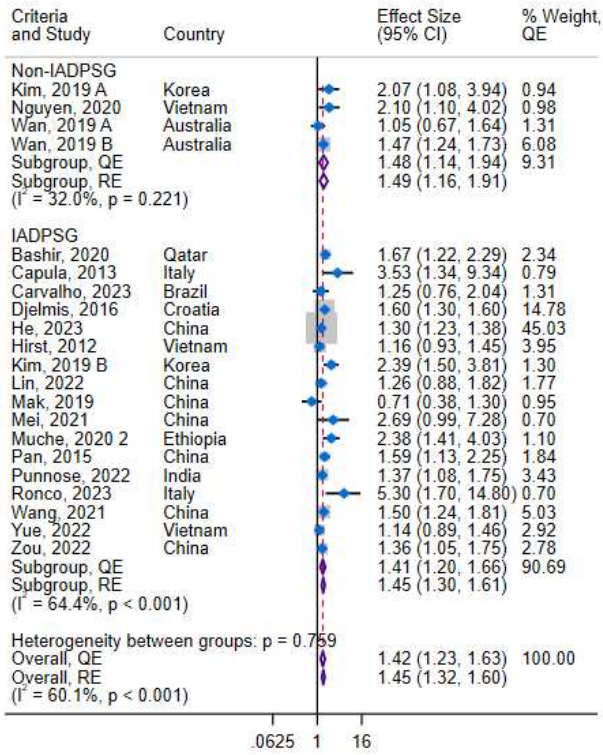




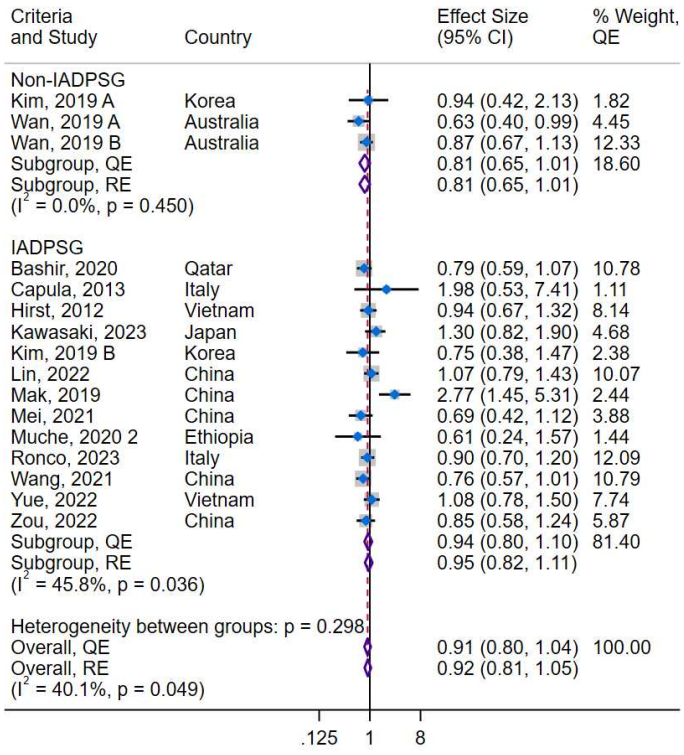
Supplementary Fig. 8: Forest plot for macrosomia



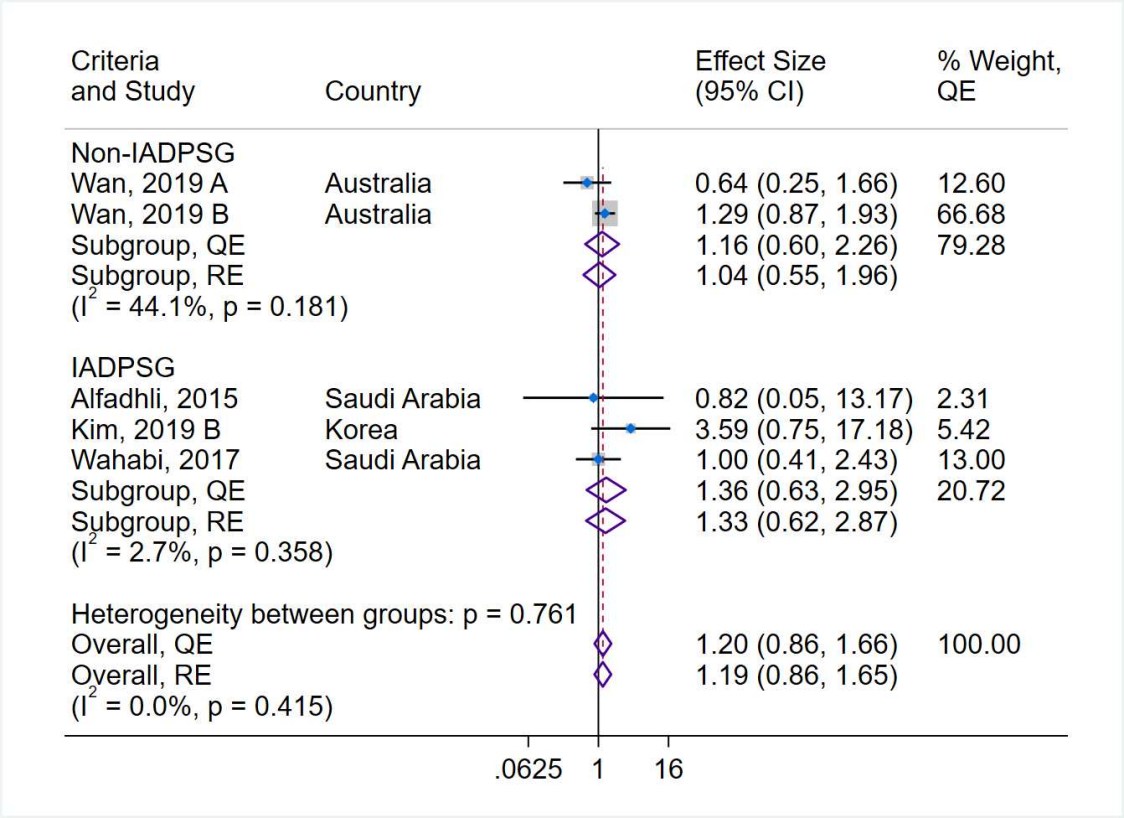
Supplementary Fig. 9: Forest plot for LGA



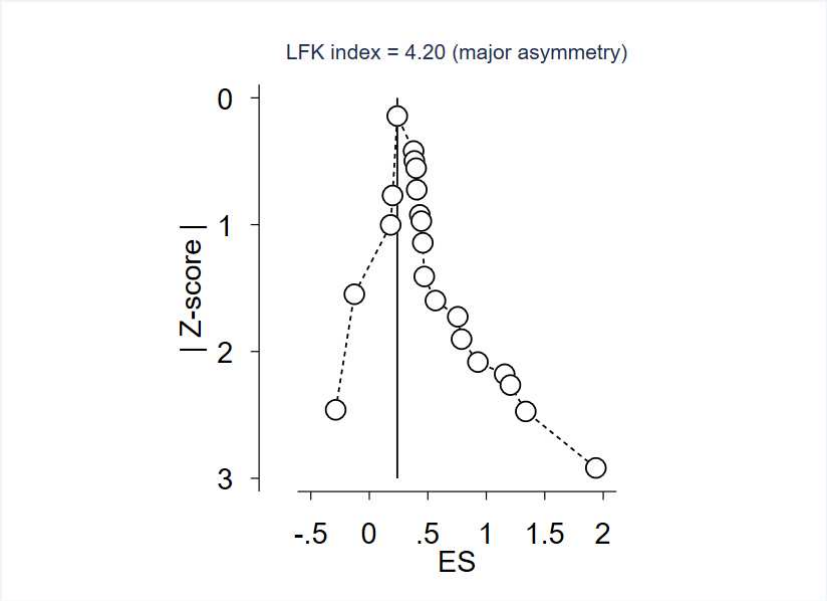
Supplementary Fig. 10: Forest plot for SGA

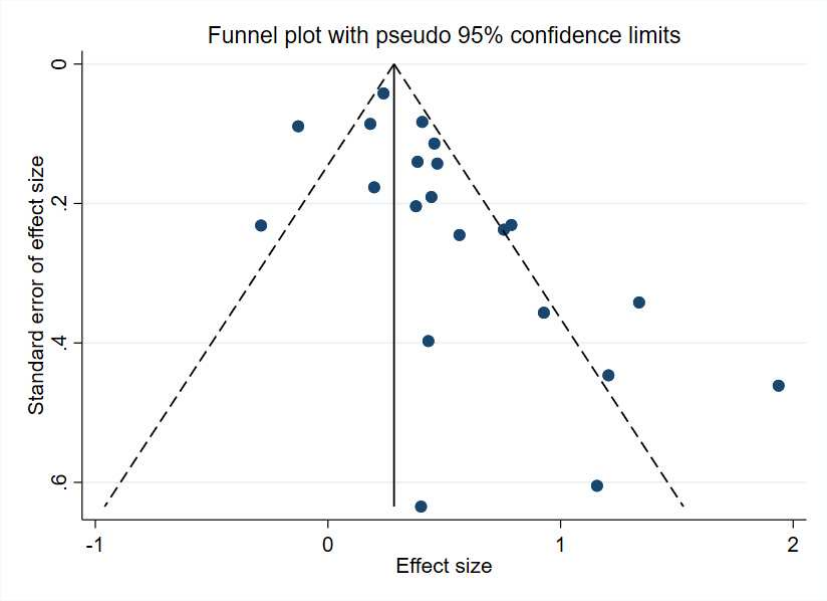


Supplementary Fig. 11: Forest plot for shoulder dystocia

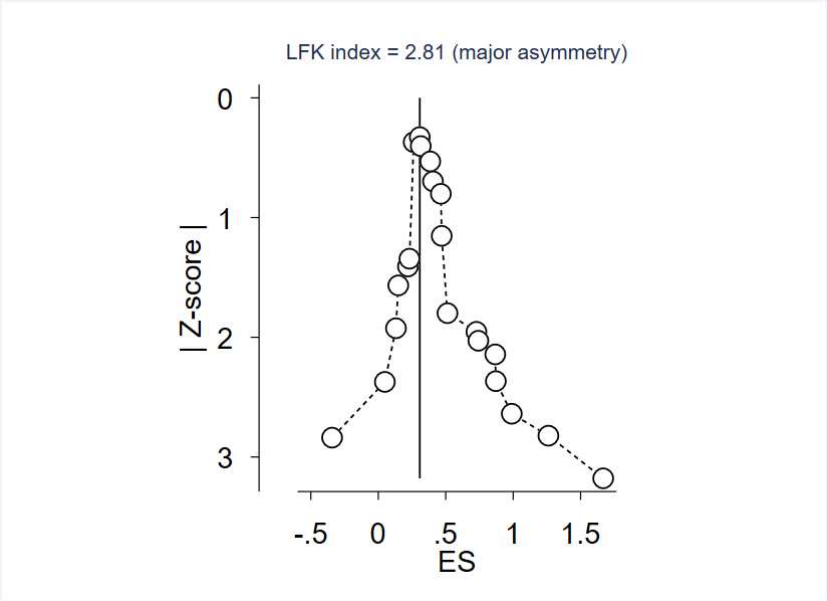


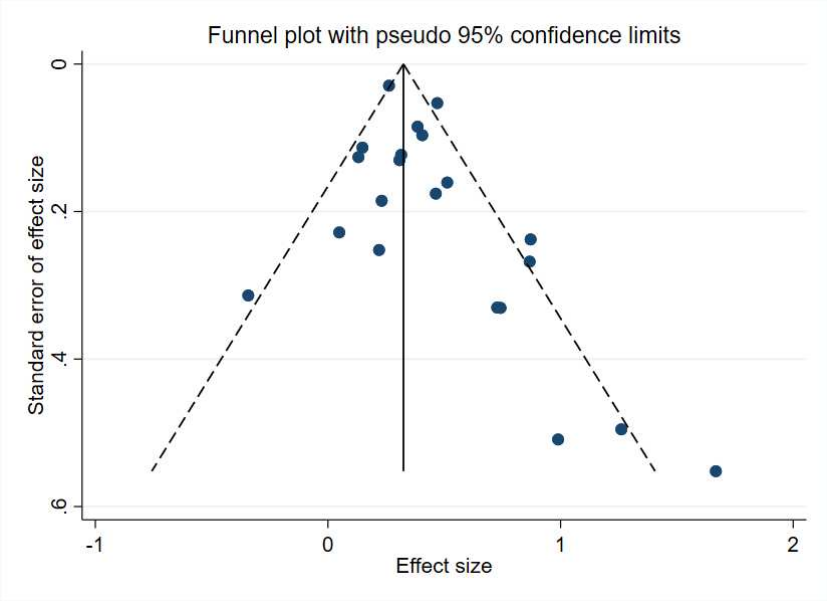
Supplementary Fig. 12: Doi and funnel plots for publication bias assessment for macrosomia



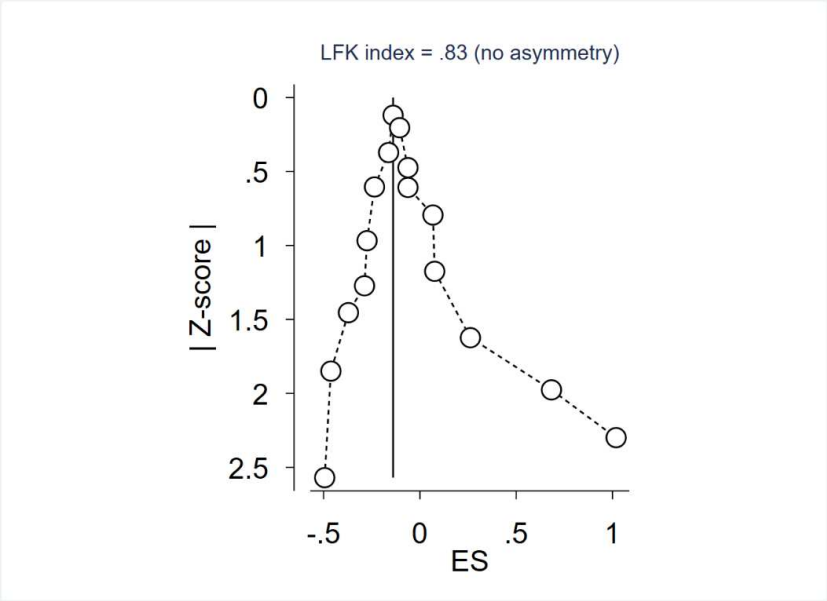


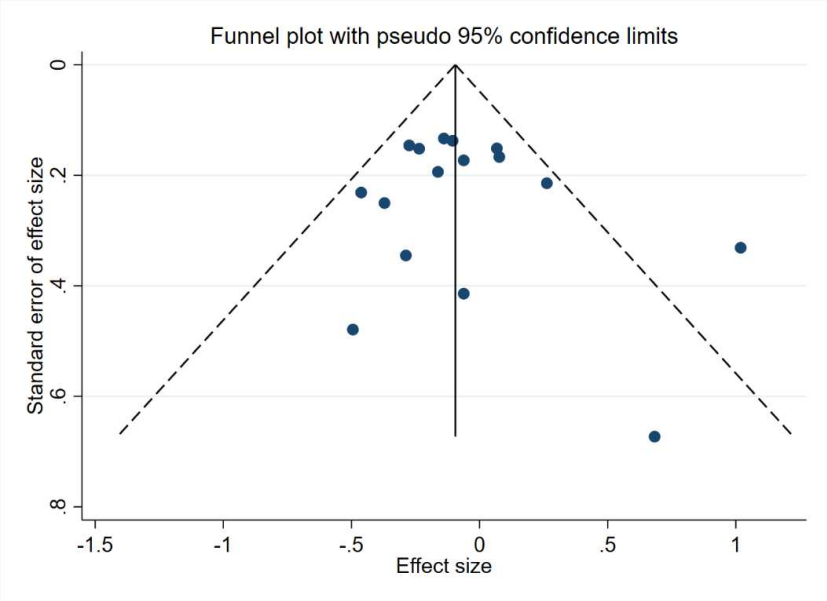
Supplementary Fig. 13: Doi and funnel plots for publication bias assessment for LGA



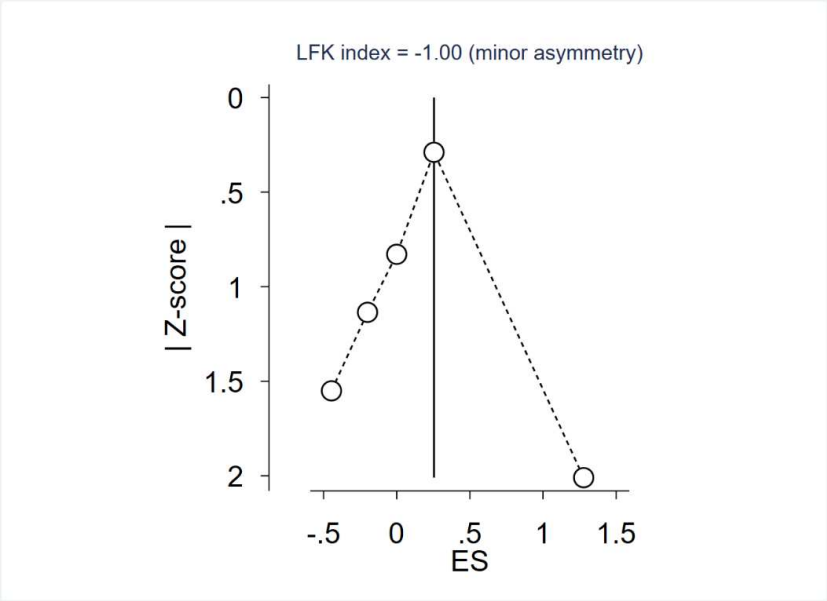


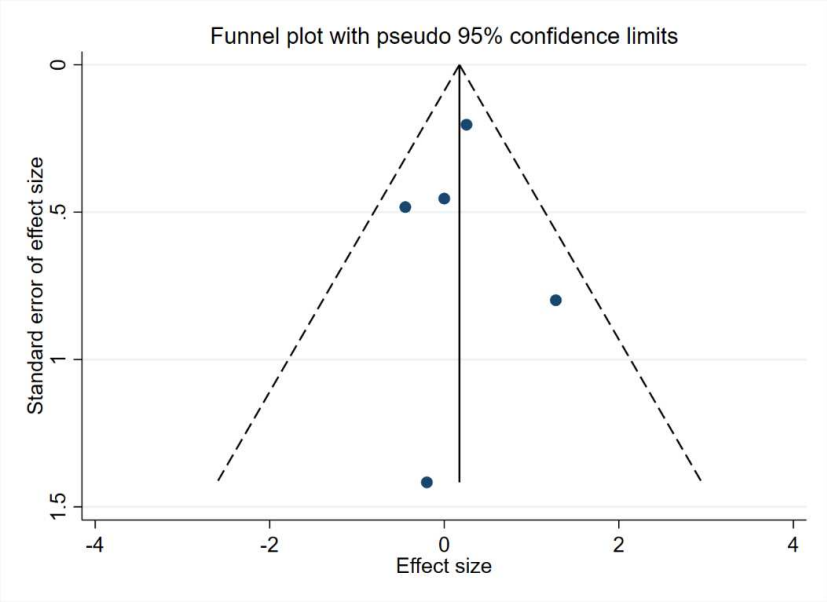
Supplementary Fig. 14: Doi and funnel plots for publication bias assessment for SGA



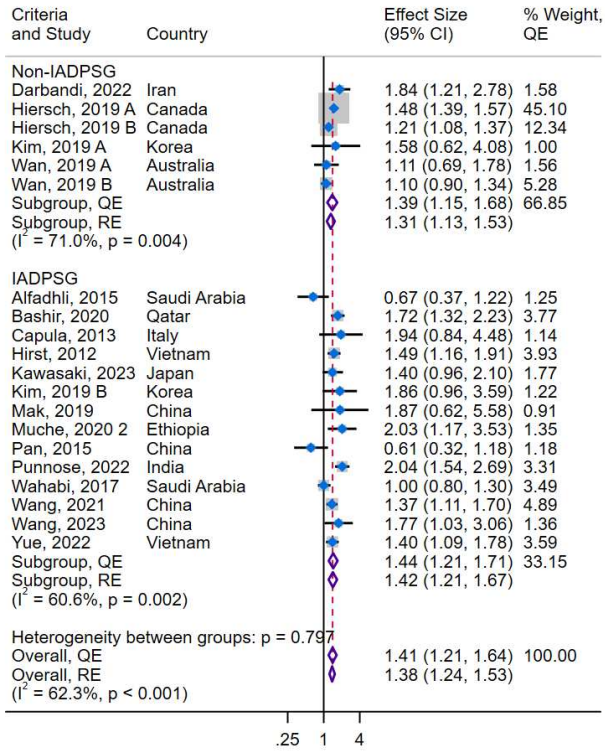


Supplementary Fig. 15: Doi and funnel plots for publication bias assessment for shoulder dystocia

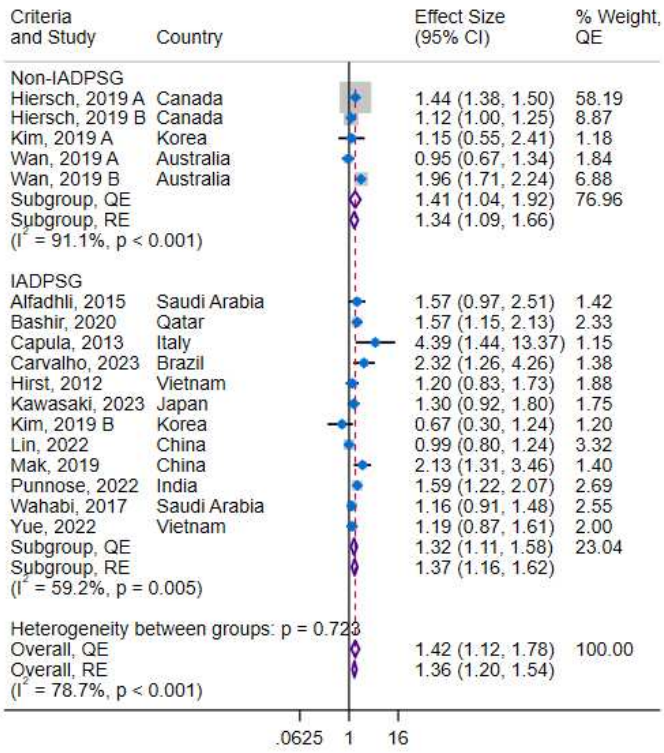




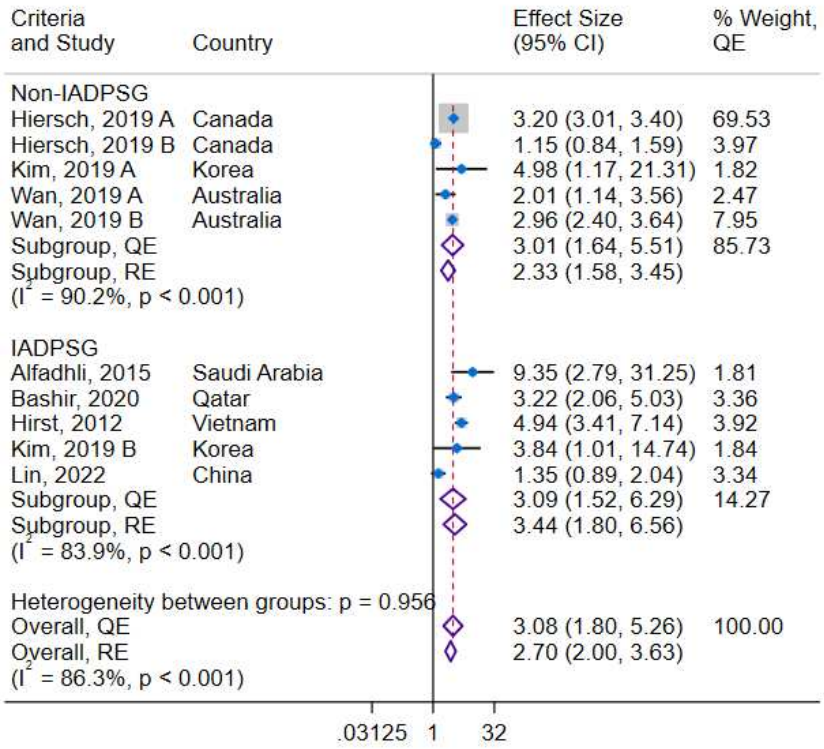
Supplementary Fig. 16: Forest plot for preterm birth



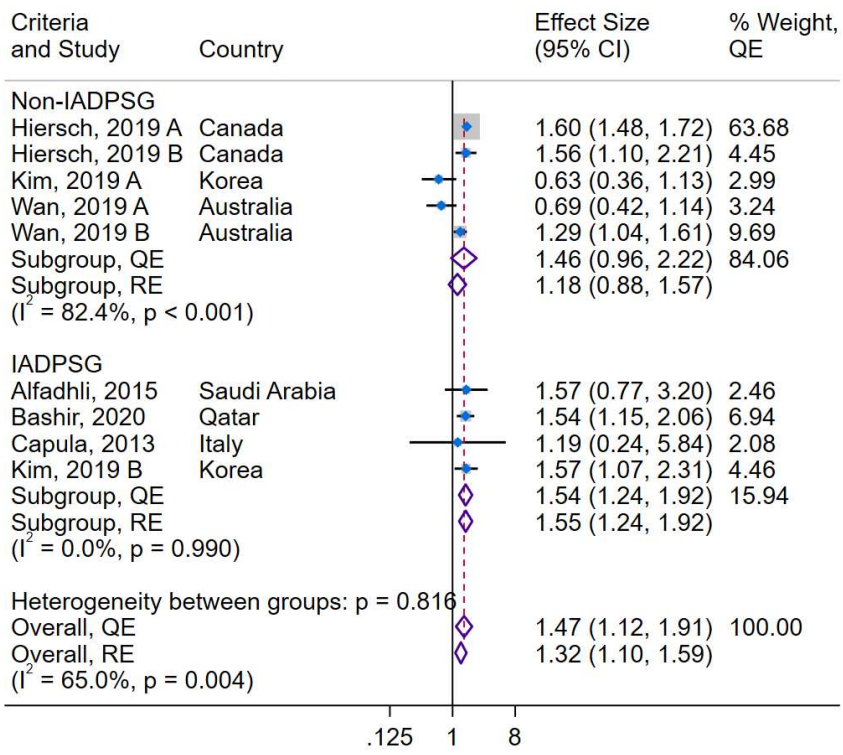
Supplementary Fig. 17: Forest plot for NICU admission



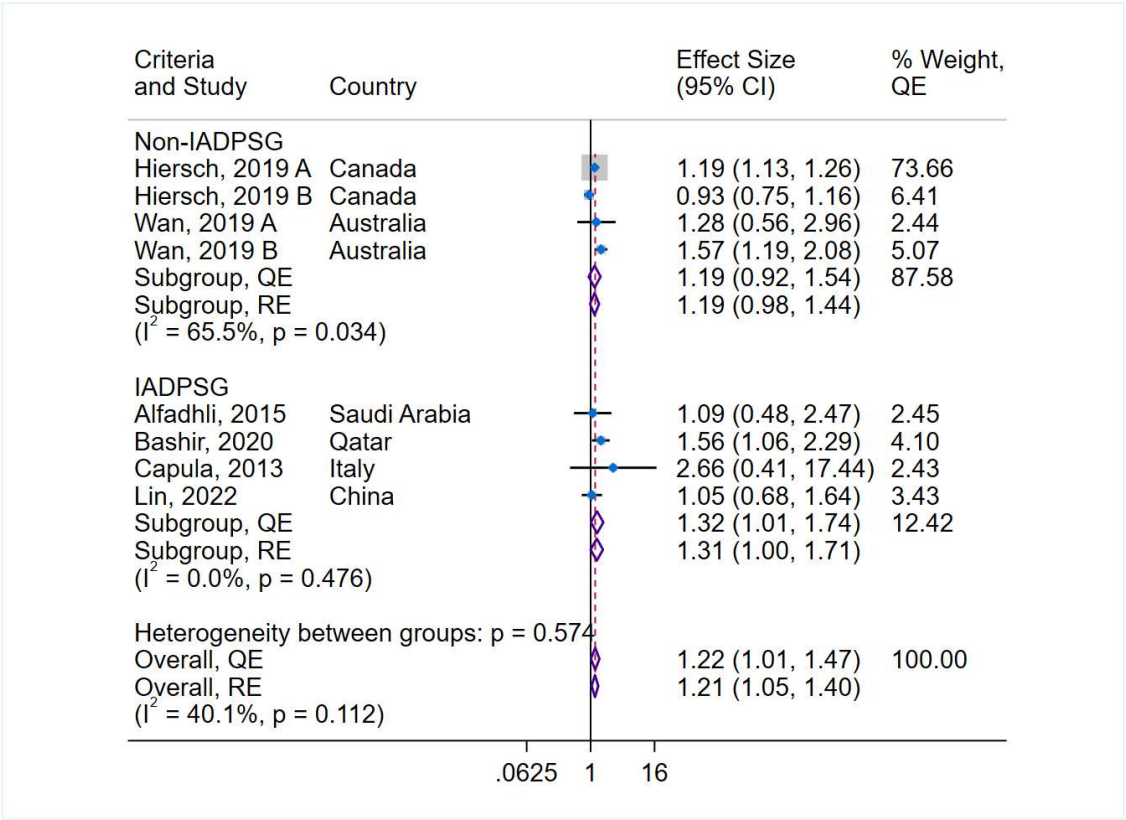
Supplementary Fig. 18: Forest plot for neonatal hypoglycemia



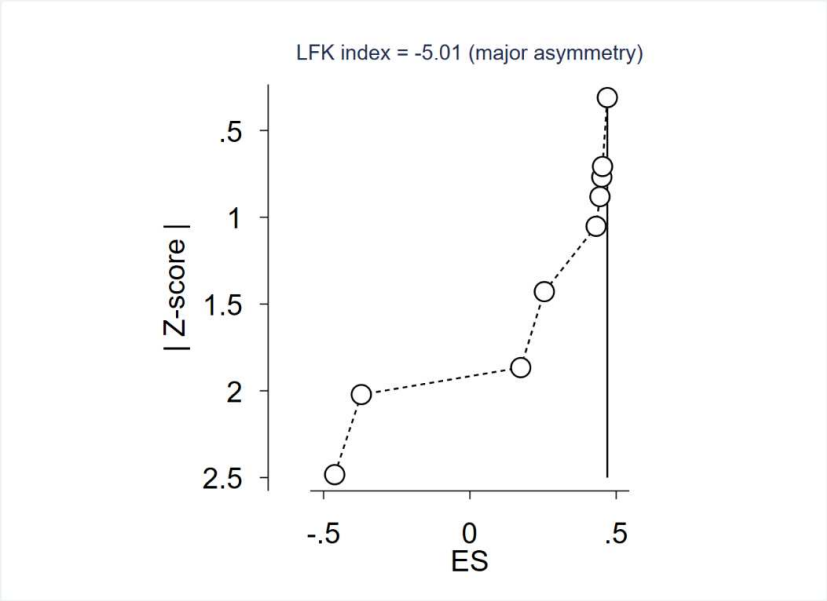
Supplementary Fig. 19: Forest plot for jaundice

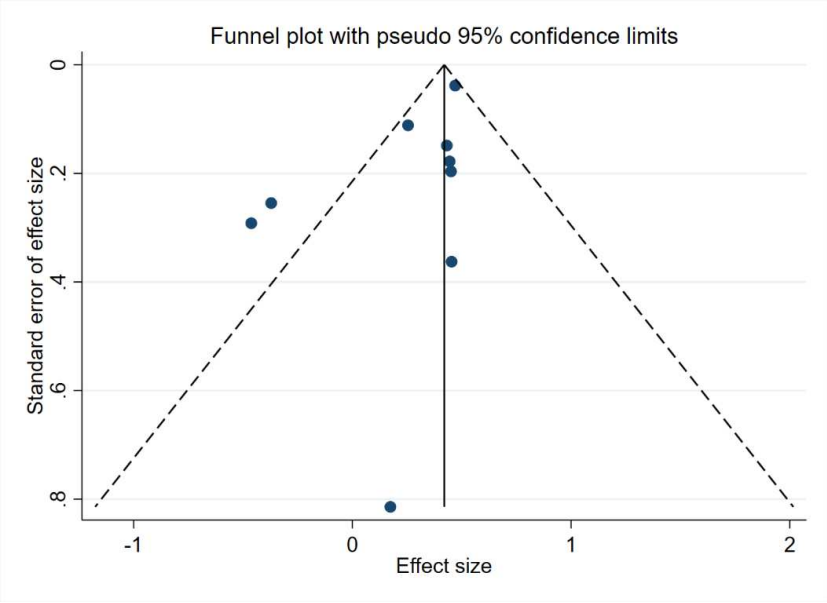


Supplementary Fig. 20: Forest plot for RDS

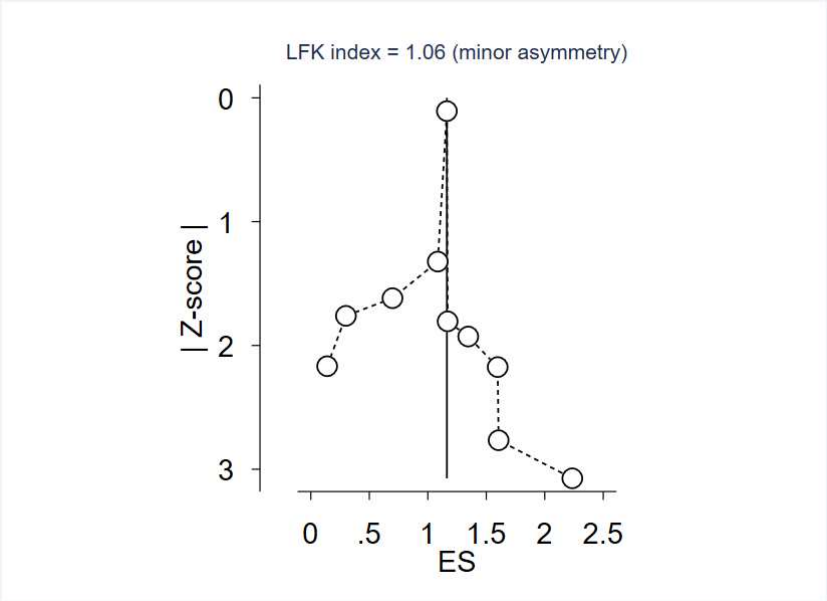


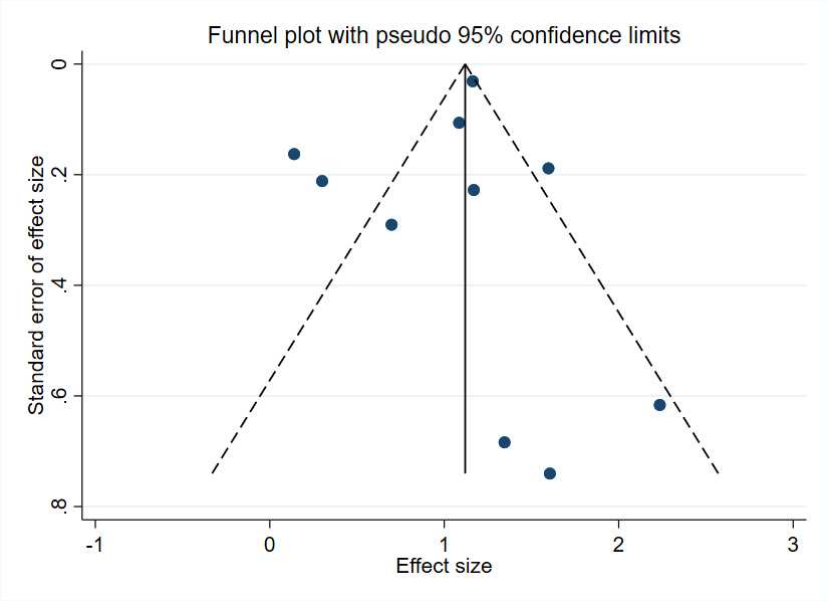
Supplementary Fig. 21: Doi and funnel plots for publication bias assessment for jaundice



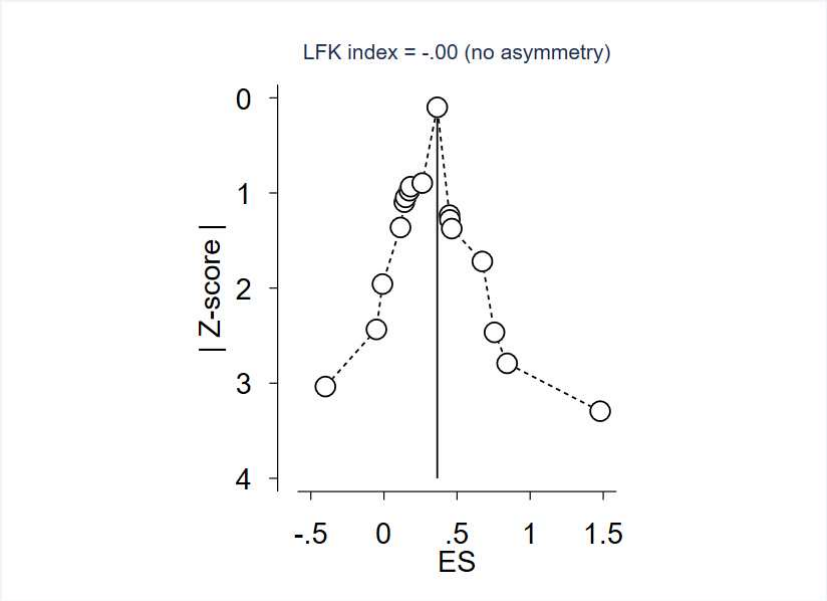


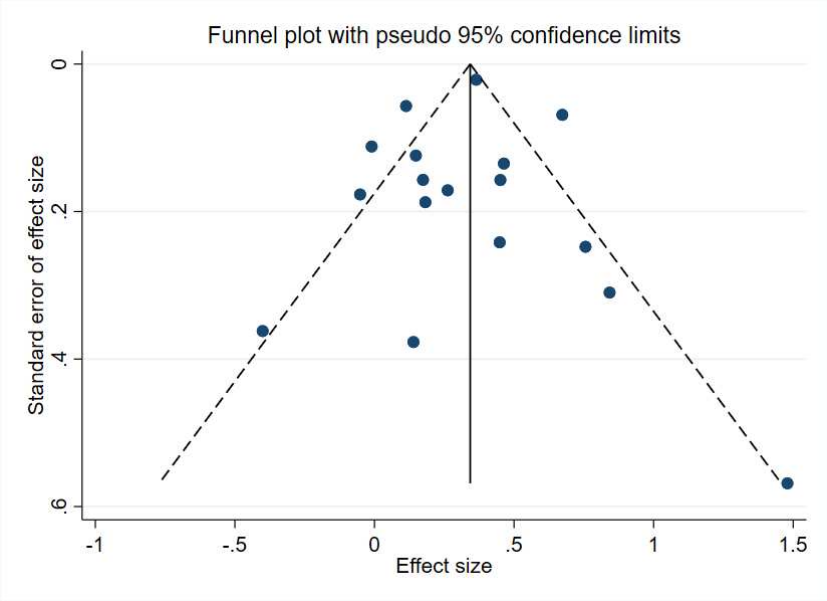
Supplementary Fig. 22: Doi and funnel plots for publication bias assessment for neonatal hypoglycemia



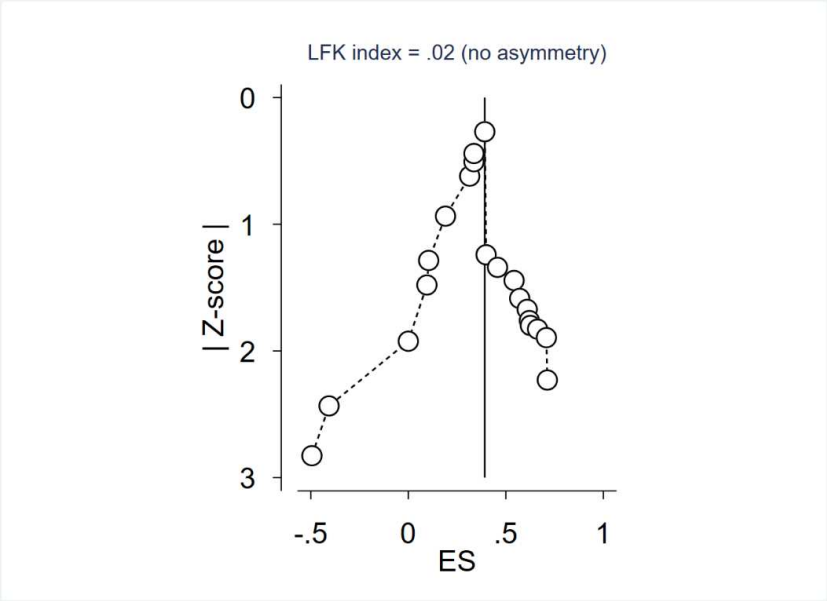


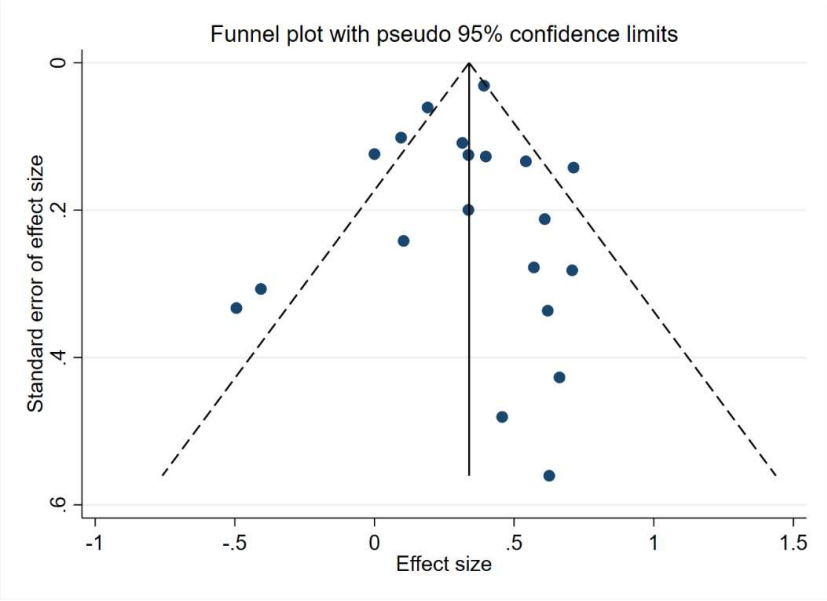
Supplementary Fig. 23: Doi and funnel plots for publication bias assessment for NICU admission





Supplementary Fig. 24: Doi and funnel plots for publication bias assessment for preterm birth





Supplementary Fig. 25: Doi and funnel plots for publication bias assessment for RDS