

# WHO Guidelines on Diagnosis and Classification of Hyperglycaemia first Detected in Pregnancy

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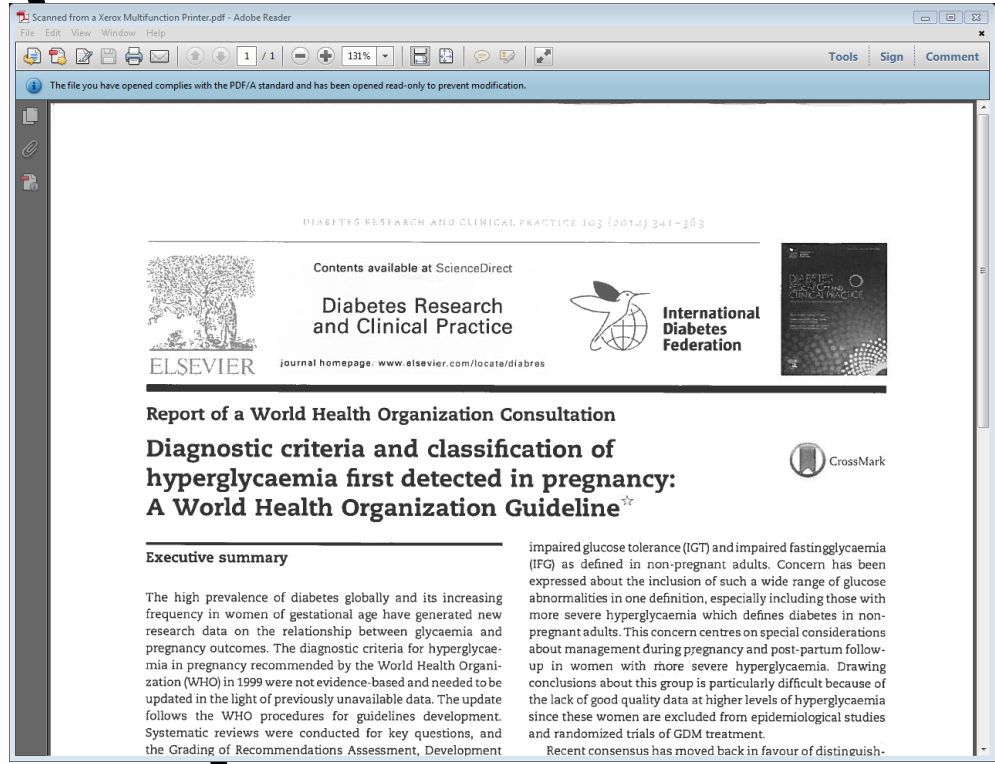
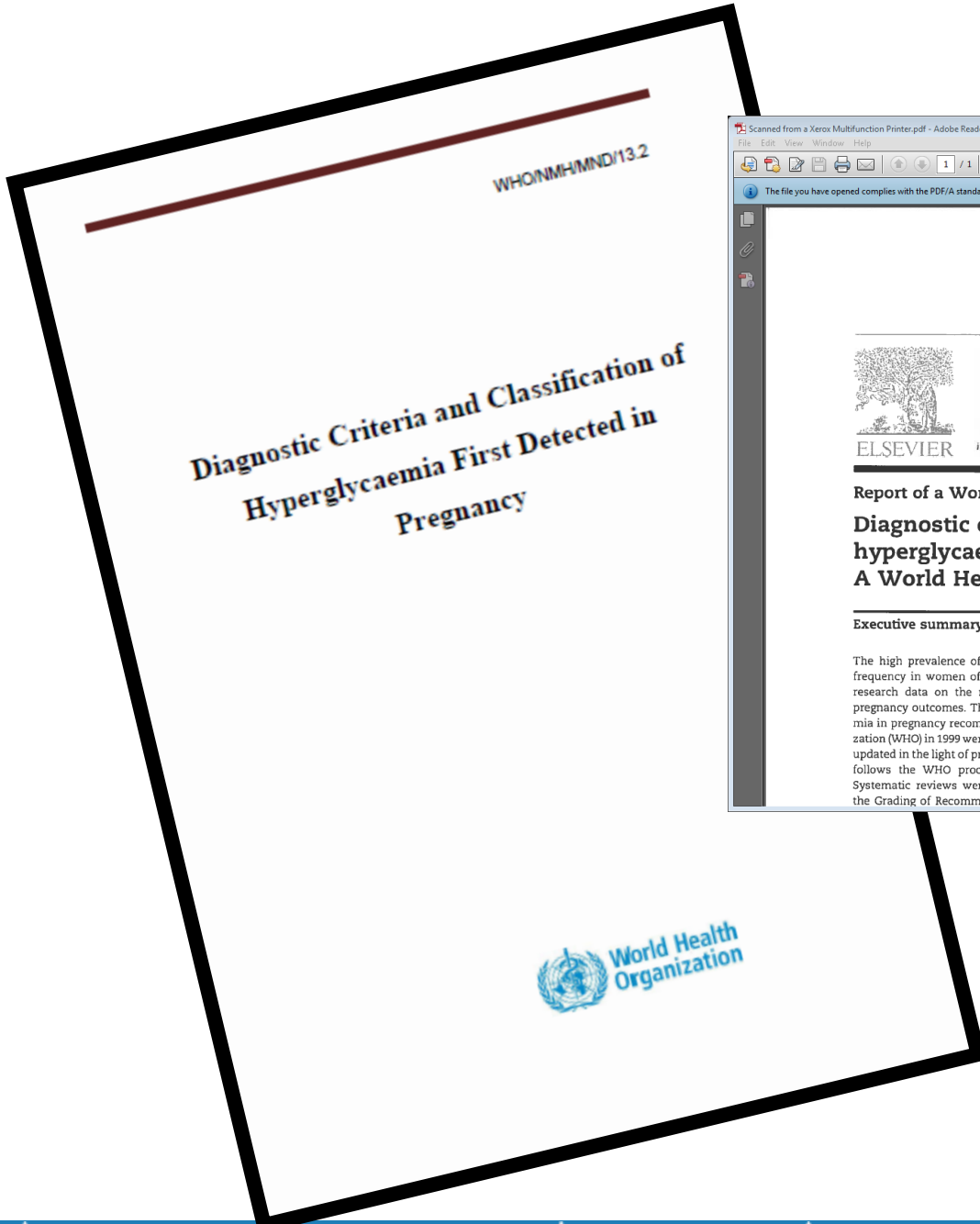
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# Update of the 1999 WHO classification and diagnosis

- **Diagnostic criteria** for hyperglycaemia in pregnancy recommended by WHO in 1999 were not evidence-based  
→ needed to be updated in the light of new data
- A panel of international experts convened at WHO to revise the **Diagnosis and Classification** of hyperglycemia in pregnancy

# Update of the 1999 WHO classification and diagnosis

- WHO procedures for guidelines development:
  - Systematic reviews for key questions
  - GRADE methodology to assess quality of the evidence and determine the strength of the recommendation on the diagnostic cut-off values for GDM
  - Where evidence was absent (diagnosis of diabetes in pregnancy) or GRADE was not deemed suitable (classification) → recommendations were based on consensus.



2013

# After examining the best available evidence, WHO made three recommendations

## Recommendation 1

Hyperglycaemia first detected at any time during pregnancy should be classified as either :

- **Diabetes mellitus in pregnancy**
- **Gestational diabetes mellitus (GDM)**

Quality of evidence: not graded

Strength of recommendation: not evaluated

# After examining the best available evidence, WHO made three recommendations

## Recommendation 2

**Diabetes in pregnancy** should be diagnosed if one or more of the following criteria are met:

- fasting plasma glucose  $\geq 7.0$  mmol/l (126 mg/dl)
- 2-hour plasma glucose  $\geq 11.1$  mmol/l (200 mg/dl) following a 75g oral glucose load
- random plasma glucose  $\geq 11.1$  mmol/l (200 mg/dl) in the presence of diabetes symptoms.

Quality of evidence: not graded

Strength of recommendation: not evaluated

# After examining the best available evidence, WHO made three recommendations

## Recommendation 3

**GDM should be diagnosed** at any time in pregnancy if one or more of the following criteria are met:

- fasting plasma glucose **5.1-6.9 mmol/l (92 -125 mg/dl)**
- 1-hour plasma glucose  **$\geq 10.0$  mmol/l (180 mg/dl)**  
following a 75g oral glucose load
- 2-hour plasma glucose **8.5-11.0 mmol/l (153 -199 mg/dl)**  
following a 75g oral glucose load

Quality of evidence: very low

Strength of recommendation: weak

## Important:

# Differentiation between pre-existing (albeit unknown) diabetes in pregnant women versus GDM

- Fasting glucose  $\geq 126$  mg/dL OR
- 2-hour 75 g oral glucose challenge  $\geq 200$  mg OR
- Random glucose  $\geq 200$  mg with symptoms of diabetes



This is Diabetes in Pregnancy (and not GDM)

*If undiagnosed and untreated, these women (who represent a **small proportion** of all pregnancies) could have maternal and perinatal complications.*



# Most frequent adverse pregnancy outcomes in hyperglycaemia

	Congenital anomalies/ miscarriage	Perinatal /maternal mortality	Neonatal macrosomia	Future DM in offspring	Hypertensive disorders of pregnancy	Future DM in mother
Type 1 DM	+	+	+	+	+	n/a
Type 2 DM	+	+	+	+	+	n/a
<b>GDM</b>	?	?	+	?	+	+

# 2013 WHO diagnostic criteria for GDM

- Diagnostic criteria for GDM are based on the risk of some adverse pregnancy outcomes
- However since there is a continuous risk of adverse outcomes with increasing glycaemia, any diagnostic thresholds will be arbitrary
- **Maternal or perinatal MORTALITY** were not part of the outcomes used to establish the new diagnostic criteria; these events are very rare and **have not been associated with GDM** in the HAPO study, which enrolled over 25,000 women in 11 different countries.

# 2013 WHO diagnostic criteria for GDM

- WHO endorsed the criteria proposed by the International Association for the Study of Diabetes in Pregnancy Group (IADPSG), based on the findings of the HAPO study
- Pregnancies with 1 or more of these values have an 1.75 fold higher risk for one or more of these outcomes:
  - **birth weight >90th percentile**
  - **cord C-peptide >90th percentile**
  - **neonatal percent body fat >90th percentile**

compared to women with mean values for fasting, 1-hour, and 2-hour OGTT plasma glucose values.

- There is **no association with MORTALITY** outcomes

# 2013 WHO diagnostic criteria for GDM

- WHO **has not** issued recommendations on screening for hyperglycaemia in pregnancy

# What would be the impact of universal screening for GDM?

Impact of gestational diabetes mellitus screening strategies on perinatal outcomes: a simulation study.

Falavigna M, Prestes I, Schmidt MI, Duncan BB, Colagiuri S, Roglic G.  
Diabetes Res Clin Pract. 2013 Mar;99(3):358-65

# No screening for GDM versus universal screening using the WHO 2013/ IADPSG-criteria: simulated effect on outcomes (Falavigna, 2013)

Assuming :

- GDM prevalence according to WHO/IADPSG: 15% (13% - 17.3%)
- Incidence of Large for Gestational Age (LGA) Births: 9,5% (9% - 10%)
- Incidence of Pre-eclampsia: 4,8% (3% - 7%)
- Frequency of Caesarean Section: 19% (10% - 30%)

Outcome	Incidence reduction	NNS*	GRADE	Quality Coments
<b>LGA Births</b>	<b>0.85%</b> (0,56 – 1,32)	<b>117</b> (76 – 180)	<b>Very low</b> + ○ ○ ○	Downgraded due to indirect evidence (-2) and inconsistency
<b>Pre-eclampsia</b>	<b>0.39%</b> (0,16 – 0,61)	<b>257</b> (162 – 627)	<b>Very low</b> + ○ ○ ○	Downgraded due to indirect evidence (-2) and inconsistency (-1)
<b>Caesarean delivery</b>	<b>Not significant</b>	<b>Not significant</b>	<b>Very low</b> + ○ ○ ○	Downgraded due to indirect evidence (-2), inconsistency (-1) and lack of blinding (-1)

***“ Universal screening for GDM has **a modest impact** on pregnancy outcomes. Costs and resources should also be considered in local selection of a screening approach.”***

Falavigna et al Diabetes Res Clin Pract. 2013 Mar;99(3):358-65.