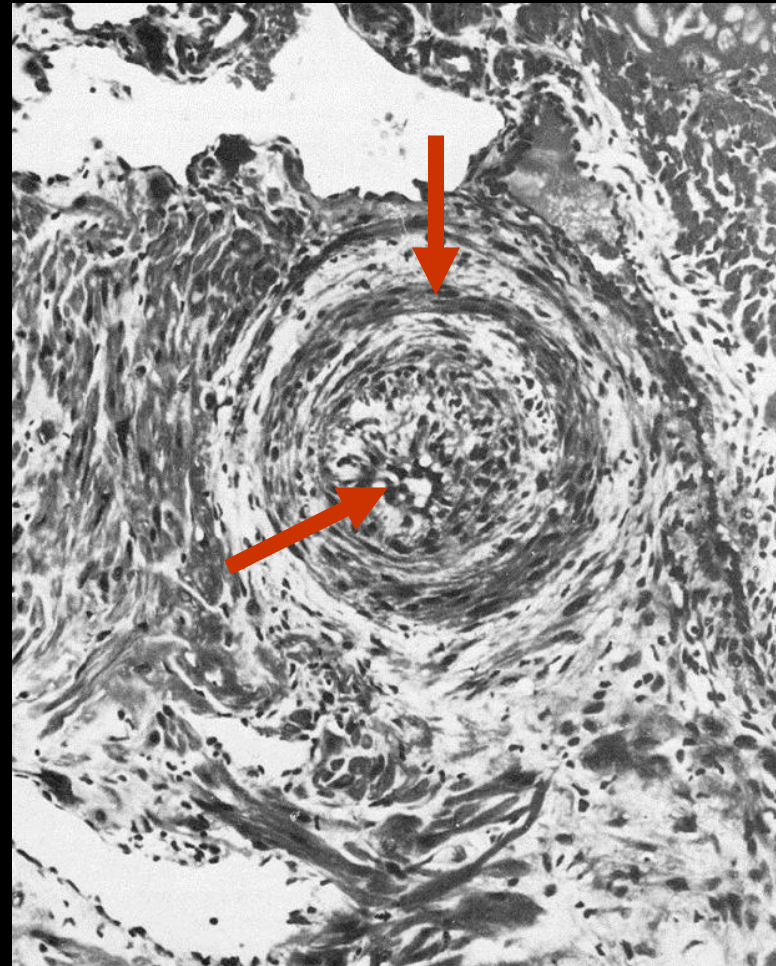
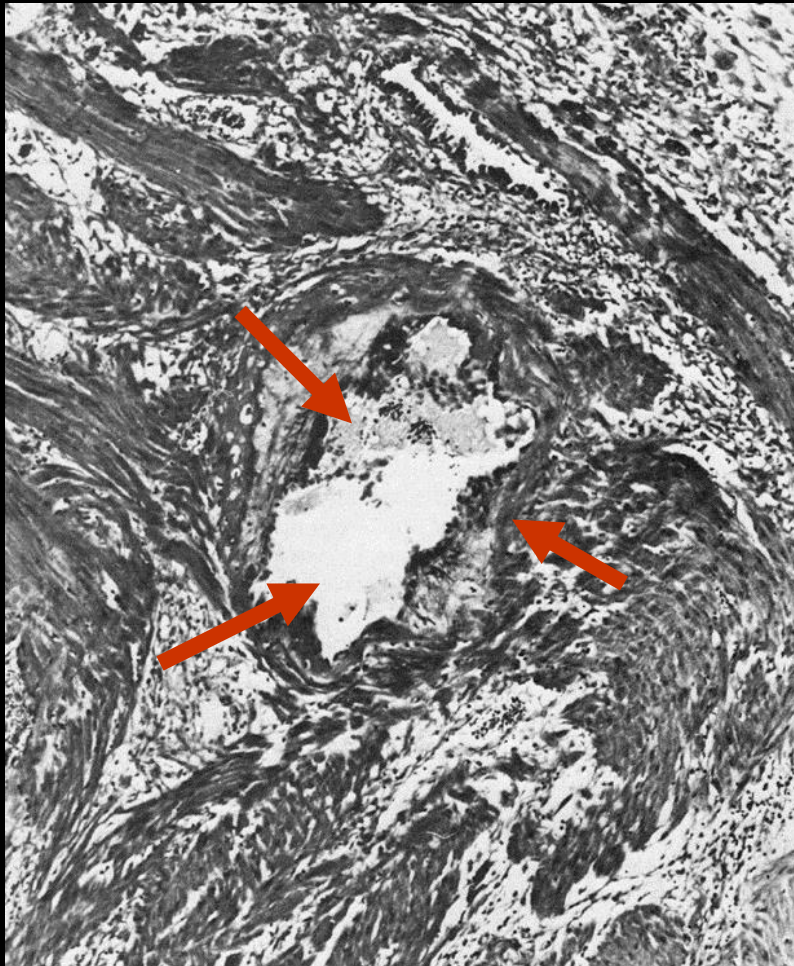


Prediction and Prevention of the Great Obstetrical Syndromes (GOS Study)

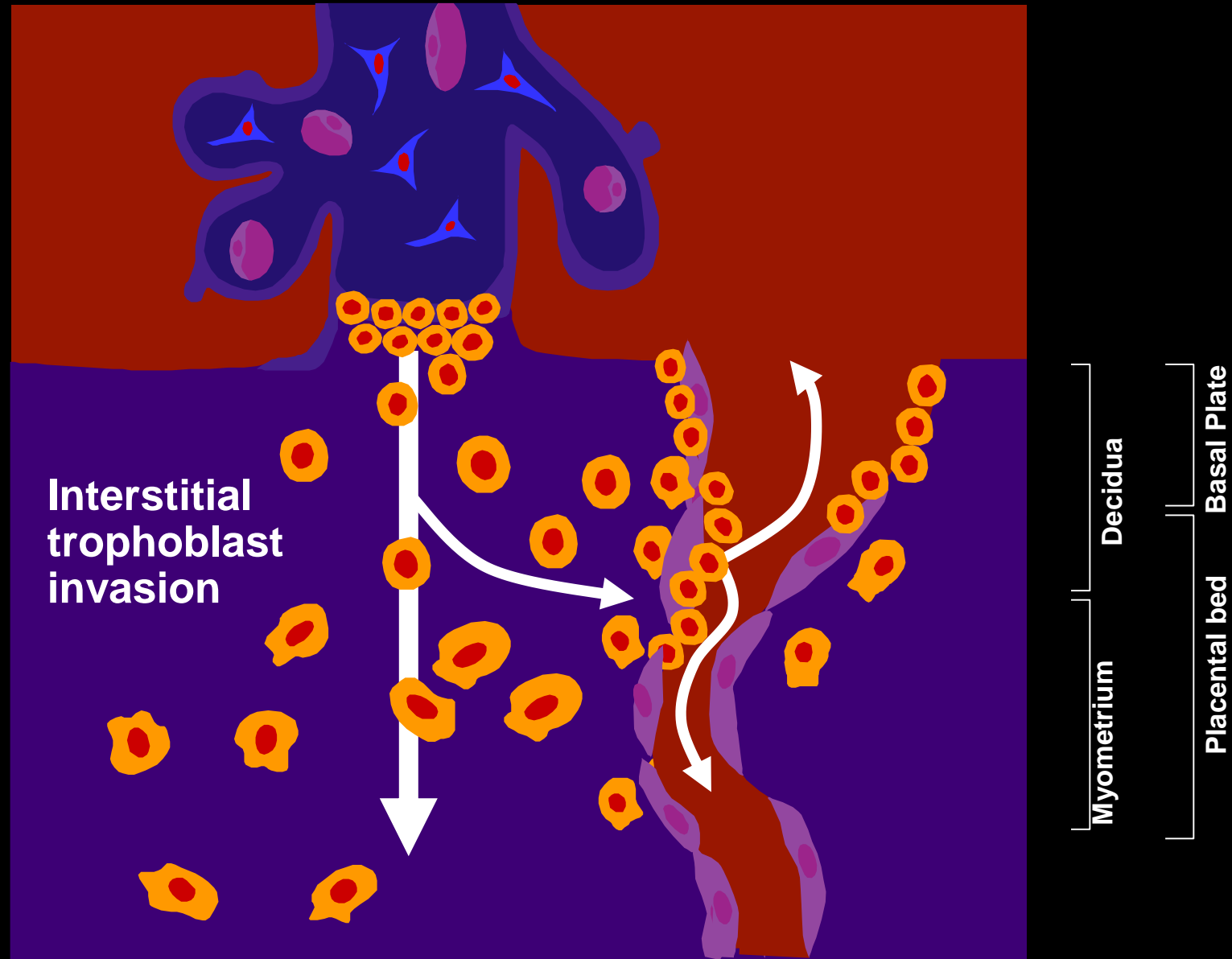
Emmanuel Bujold, MD, MSc

*Professor, Obstetrics and Gynaecology, Laval University
Funded by the Jeanne et Jean Louis-Lévesque Foundation*

Deep placentation disorder in preeclampsia



Transformation of spiral arteries **between 8 and 16 weeks'**



After Kaufman P, Black S, and Huppertz B.

Deep placentation disorder: Preterm vs Term PE

GA (weeks)	N	Maternal underperfusion		Adjusted OR (95% CI)
		Controls % (n/N)	PE % (n/N)	
≤ 25.0	102	21 (21/100)	100 (2/2)	Not available
25.1–26.9	80	25 (17/68)	75 (9/12)	11.1 (2.4–50.4)
27.0–28.9	101	22 (17/78)	70 (16/23)	10.3 (3.2–32.7)
29.0–30.9	161	22 (28/128)	73 (24/33)	8.8 (3.5–22.4)
31.0–32.9	194	25 (36/146)	73 (35/48)	8.2 (3.7–17.9)
33.0–34.9	468	20 (74/379)	55 (52/89)	6.3 (3.8–10.6)
35.0–36.9	721	18 (103/560)	47 (75/161)	3.5 (2.4–5.2)
37.0–38.9	1,976	14 (244/1,692)	35 (99/284)	3.0 (2.2–4.1)
39.0–40.9	3,740	15 (530/3,505)	34 (79/235)	2.7 (2.0–3.7)
≥ 41.0	764	15 (109/741)	13 (3/23)	0.8 (0.2–2.9)

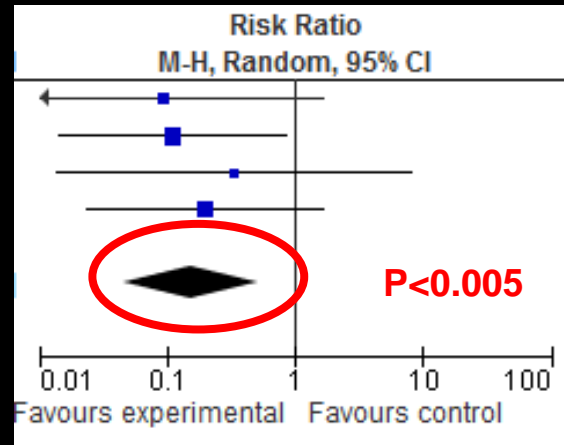
75% preterm PE

<35% term PE

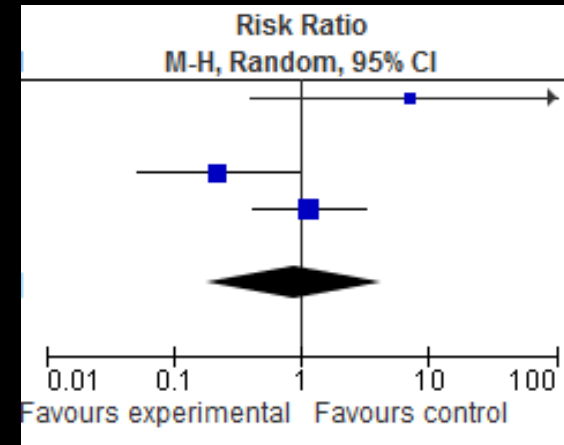
Deep placentation disorder is primarily associated
with preterm preeclampsia

Aspirin for the prevention of Preterm vs Term PE

Preterm



Term



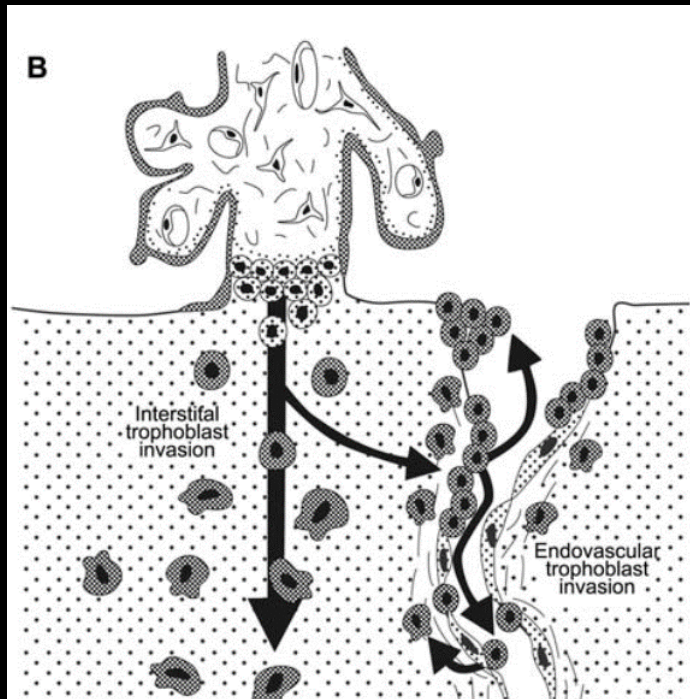
*Aspirin taken early in pregnancy
reduced the risk of **preterm PE (62%)***

Deep placentation disorders are associated with
other placental-mediated diseases...

OBSTETRICS

The “Great Obstetrical Syndromes” are associated with disorders of deep placentation

Ivo Brosens, MD; Robert Pijnenborg, PhD; Lisbeth Vercruysse, MSc; Roberto Romero, MD



**PE, FGR, stillbirth, sPTB and PPRM
share a common pathway of disease**

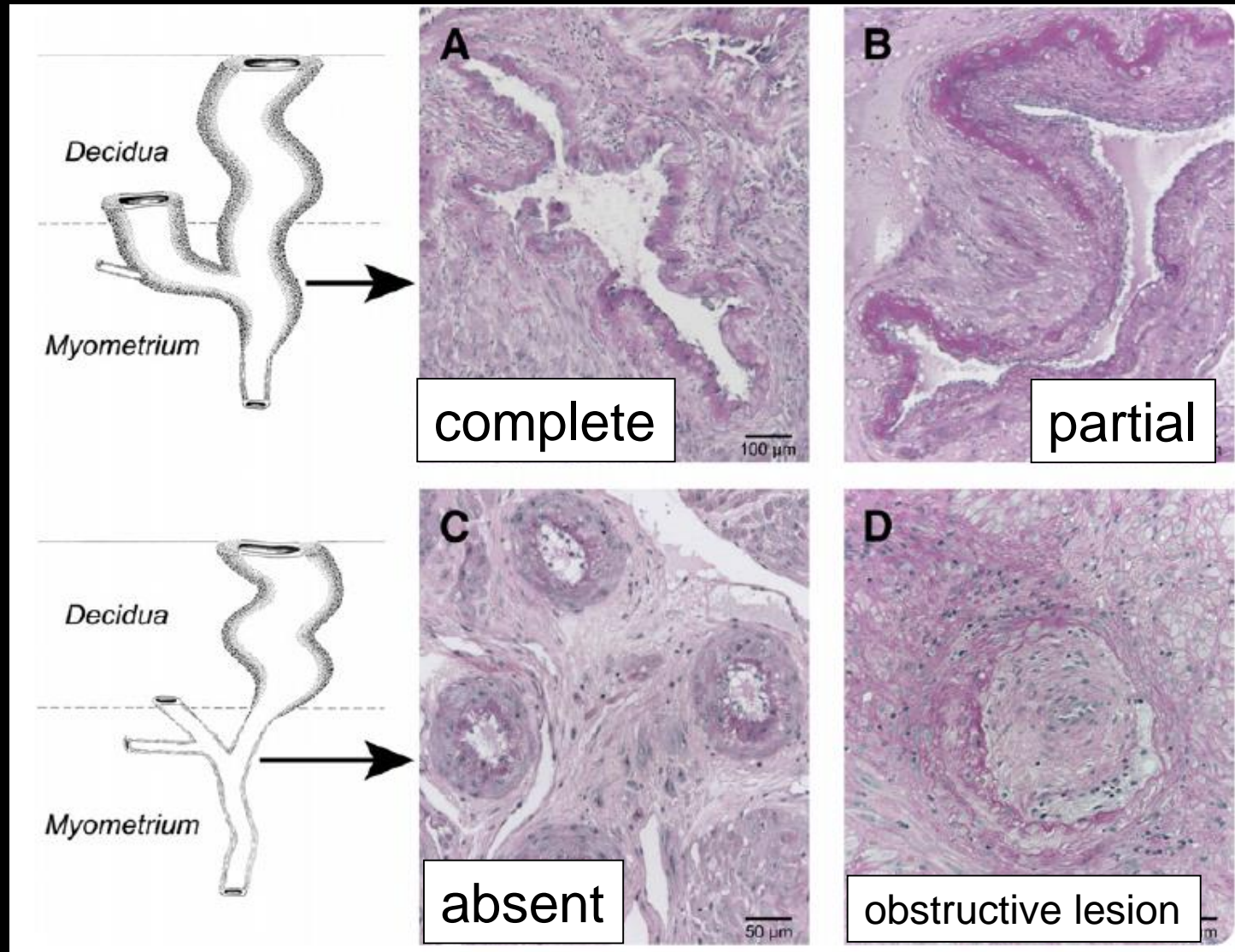


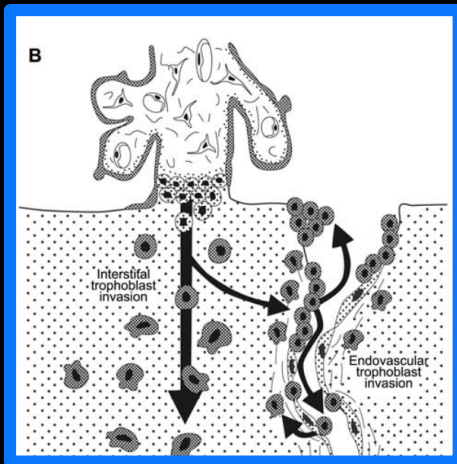
TABLE 3

Types of defective deep placentation associated with adverse pregnancy outcomes

Type of myometrial spiral artery remodeling	Phenotype
Partial	<div> Preterm labor Preterm premature rupture of membranes Intrauterine growth restriction without hypertension </div>
Absent	Preeclampsia
Absent with obstructive lesions	<div> Preeclampsia with intrauterine growth restriction Abruptio placentae Placental infarcts with fetal death </div>

Brosens. Classification of defective deep placentation. Am J Obstet Gynecol 2011.

PE <37 weeks, severe FGR, fetal death



Deep placentation disorders

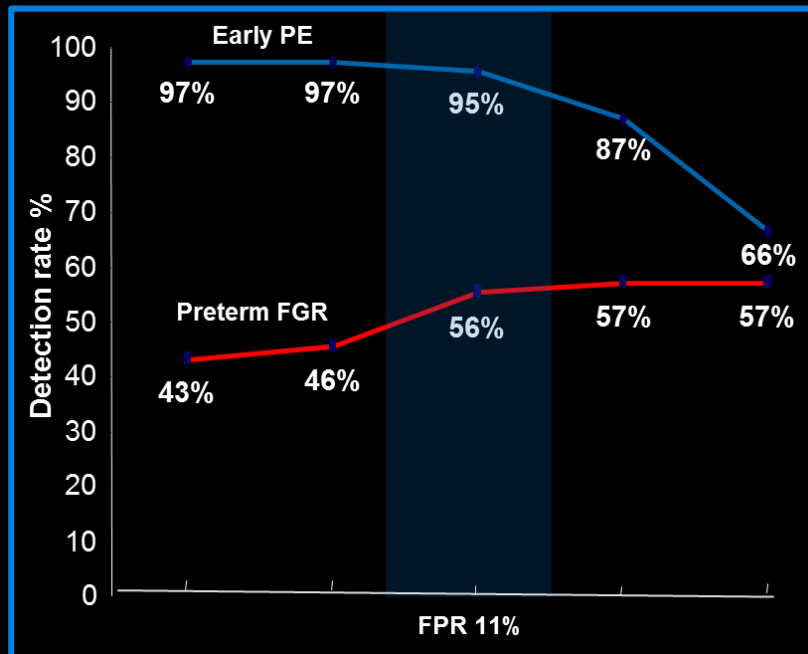


Prevention through daily aspirin

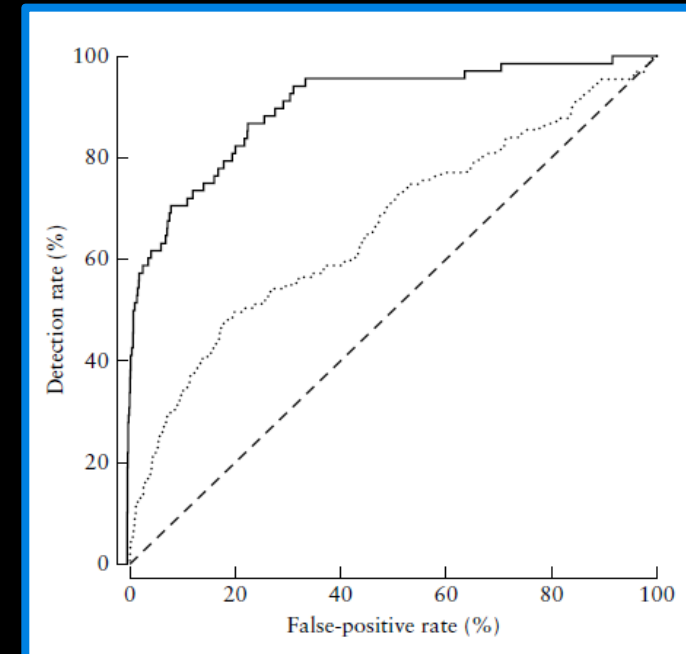


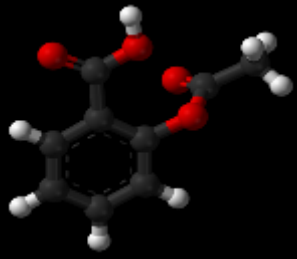
History, uterine PI, MAP, PAPP-A, PLGF at 11-13 weeks

Early-onset PE, preterm FGR



Stillbirth





Aspirin before 16 weeks

Prevention of Preeclampsia and Intrauterine Growth Restriction With Aspirin Started in Early Pregnancy

A Meta-Analysis

OBSTETRICS &
GYNECOLOGY



PE



FGR

Prevention of perinatal death and adverse perinatal outcome using low-dose aspirin: a meta-analysis

ULTRASOUND
in Obstetrics & Gynecology



Stillbirth

Opinion & Hypothesis

Could early aspirin prophylaxis prevent against preterm birth?

THE JOURNAL OF
MATERNAL-FETAL
& NEONATAL
MEDICINE



PTB

Meta-analysis on the effect of aspirin use for prevention of preeclampsia on placental abruption and antepartum hemorrhage



Abruption

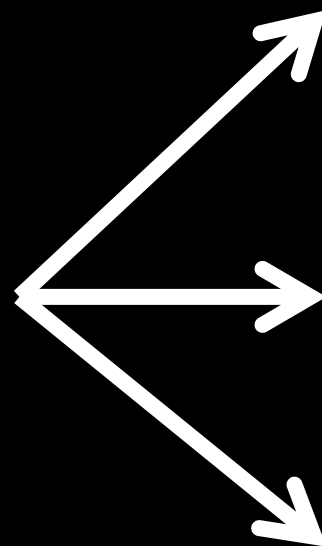
Prevention of deep placentation disorders could not
only reduce preeclampsia, but also other major
diseases of pregnancy

GOS study

Women at 11-14 weeks

FMF algorithm

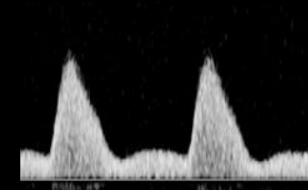
Preterm PE > 1/70



MAP



UtA Doppler



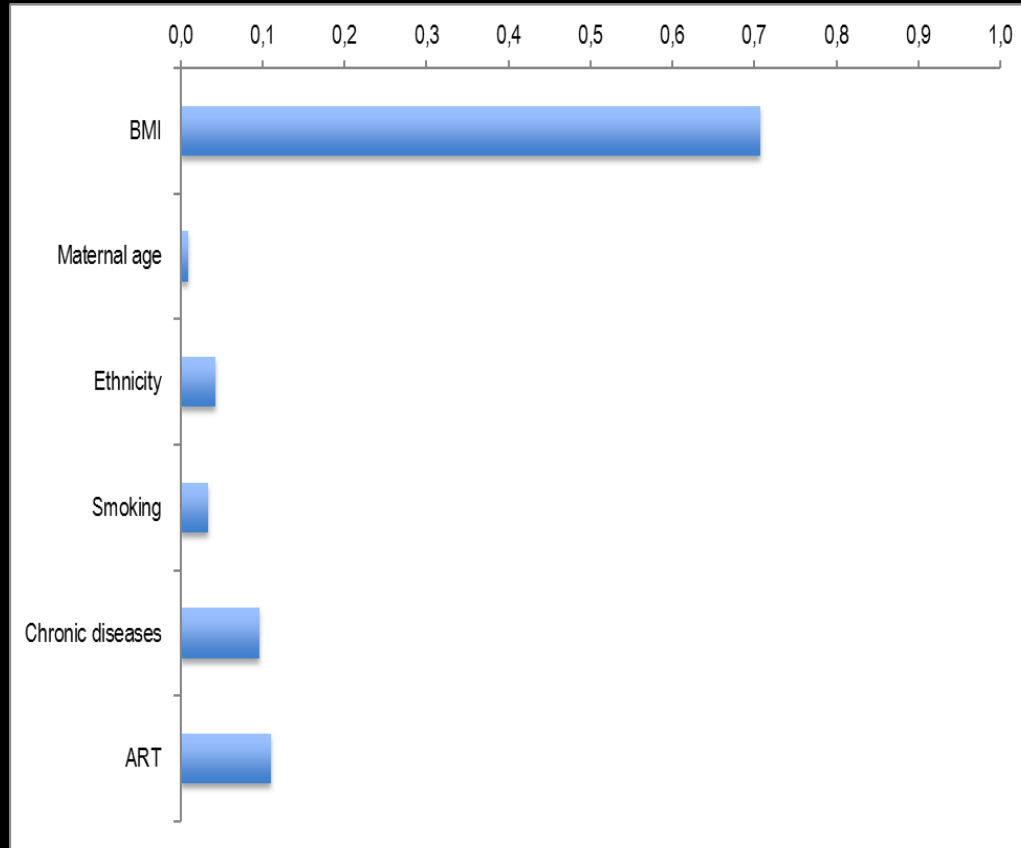
PAPP-A
PIGF



GOS study: 6073 participants

Maternal Age	29 years
Nulliparous	78 %
Caucasian	96 %
BMI	23.9 kg/m ²

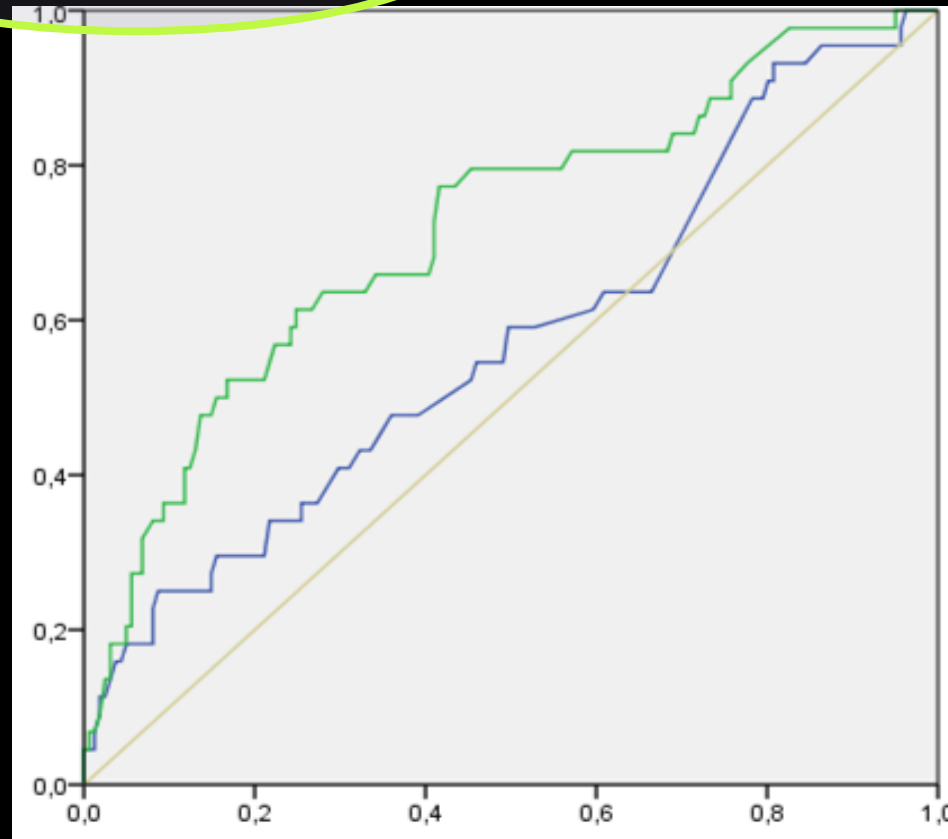
Maternal characteristics



BMI is the most important contributor

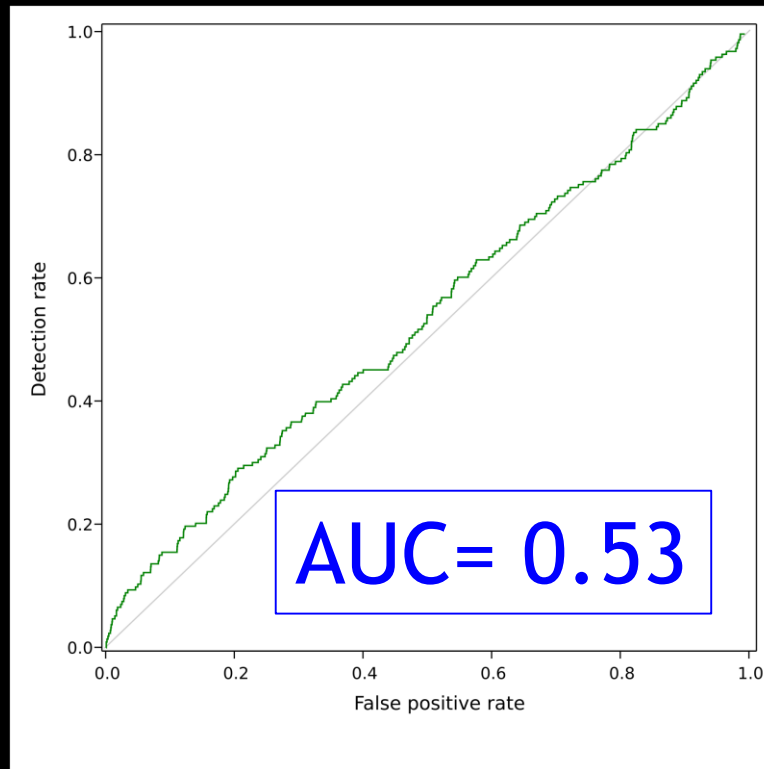
Mean Arterial Blood Pressure (MAP)

Automated device vs Manual device

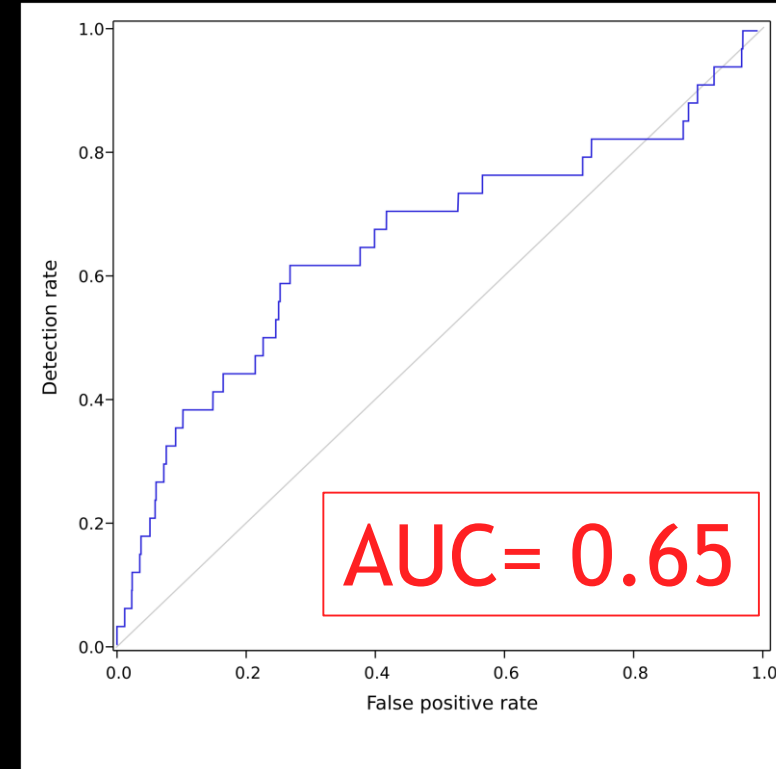


Uterine artery Doppler

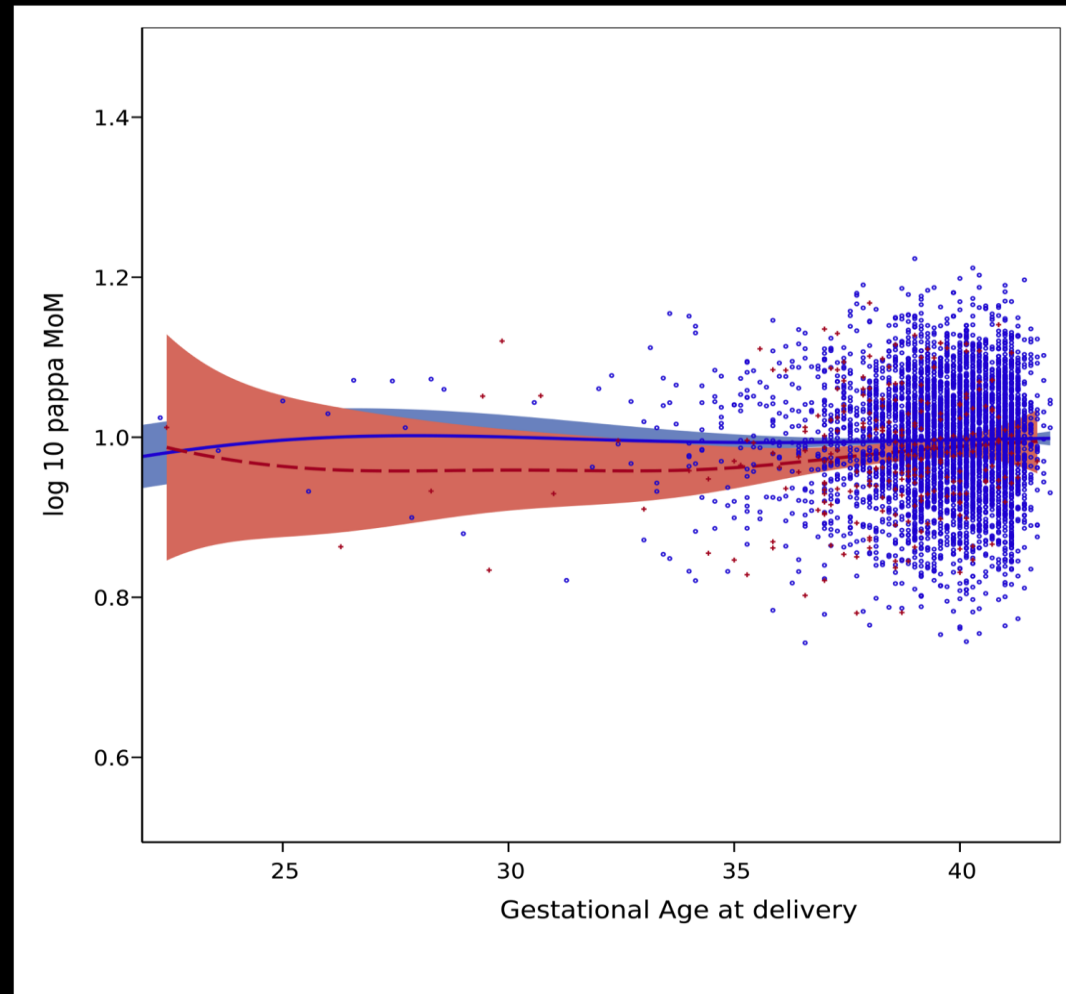
Term PE



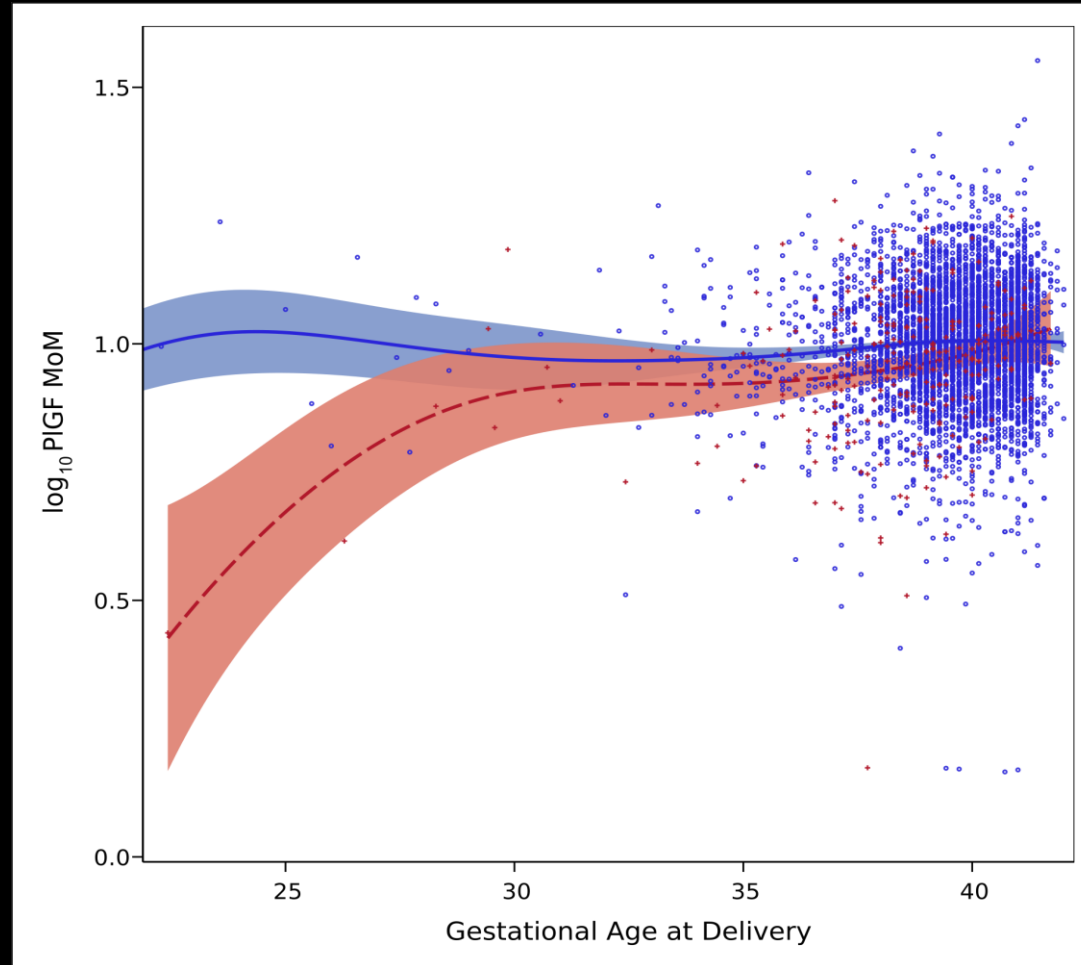
Preterm PE



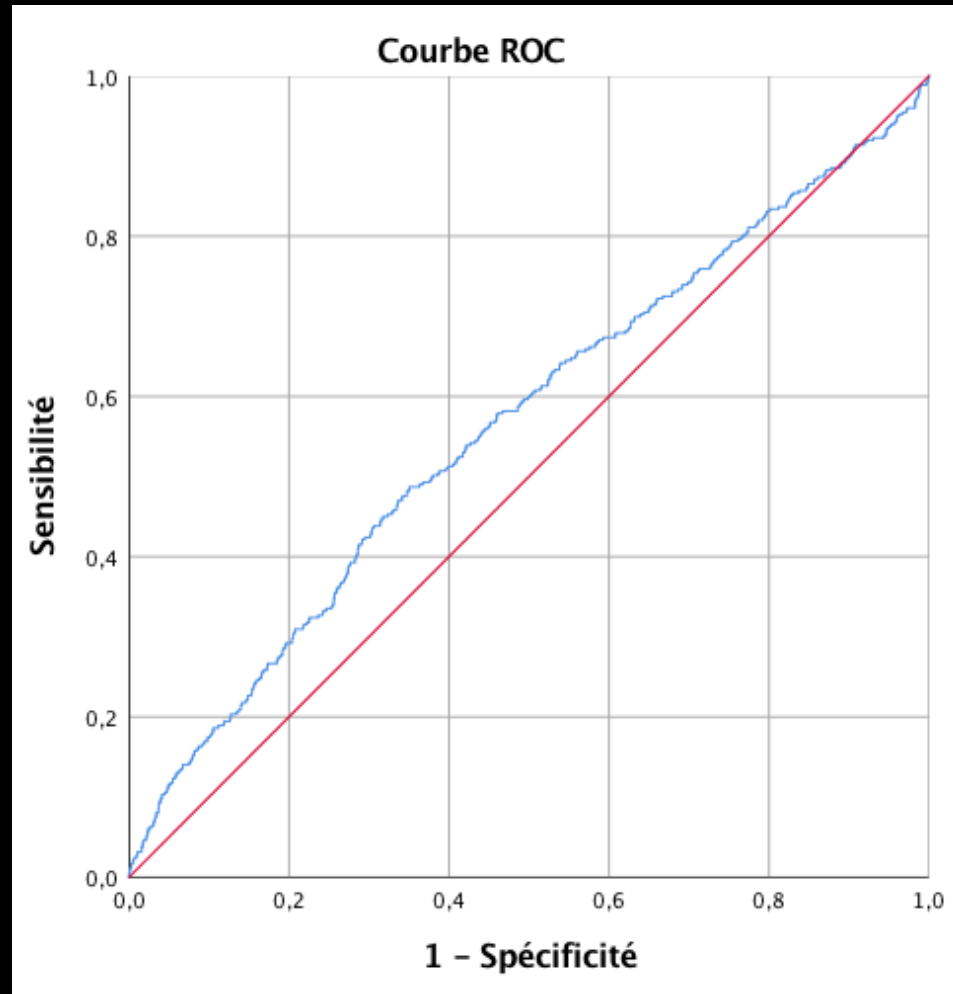
PAPP-A & PE



PIGF & PE

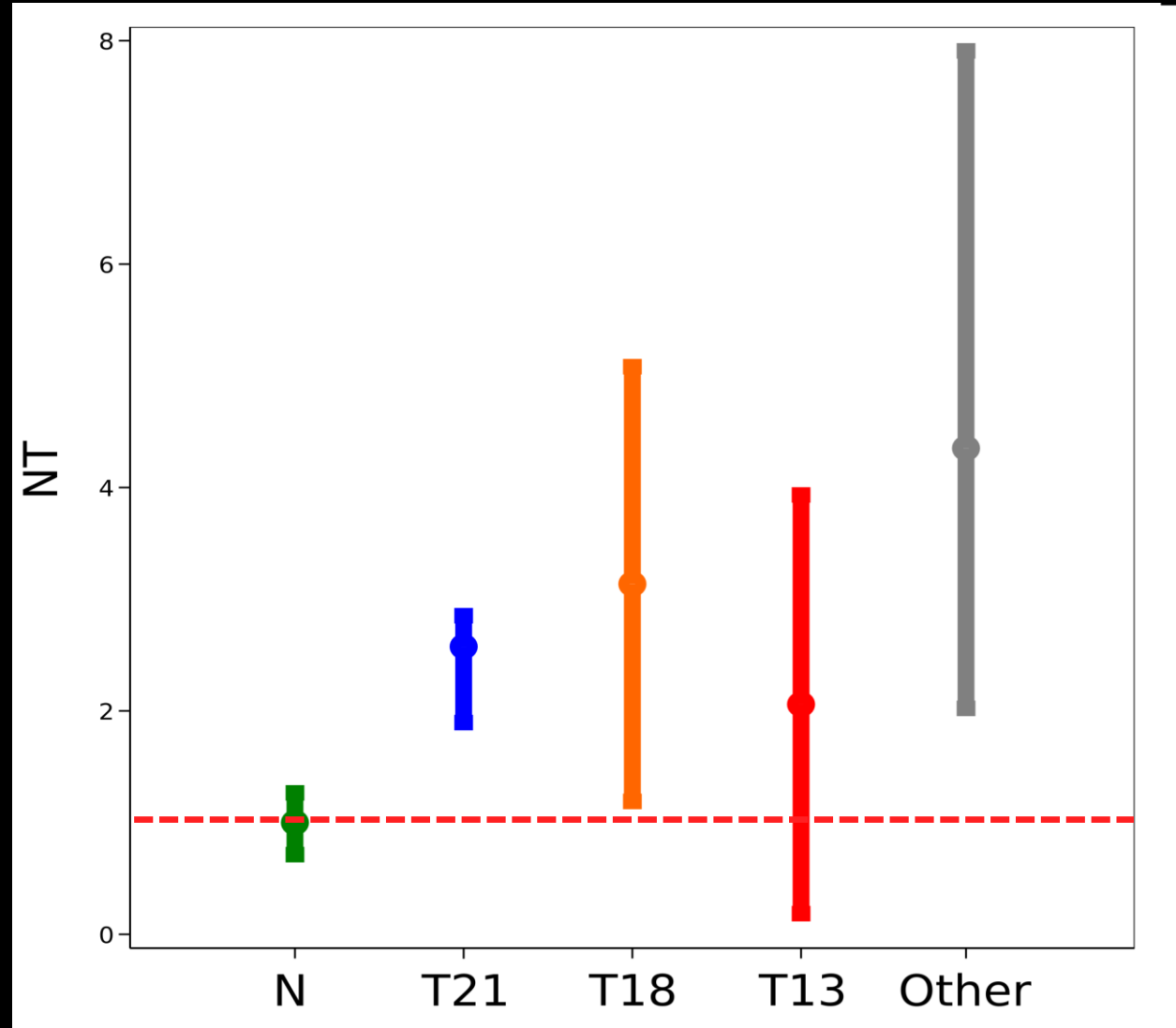


PIGF & sPTB

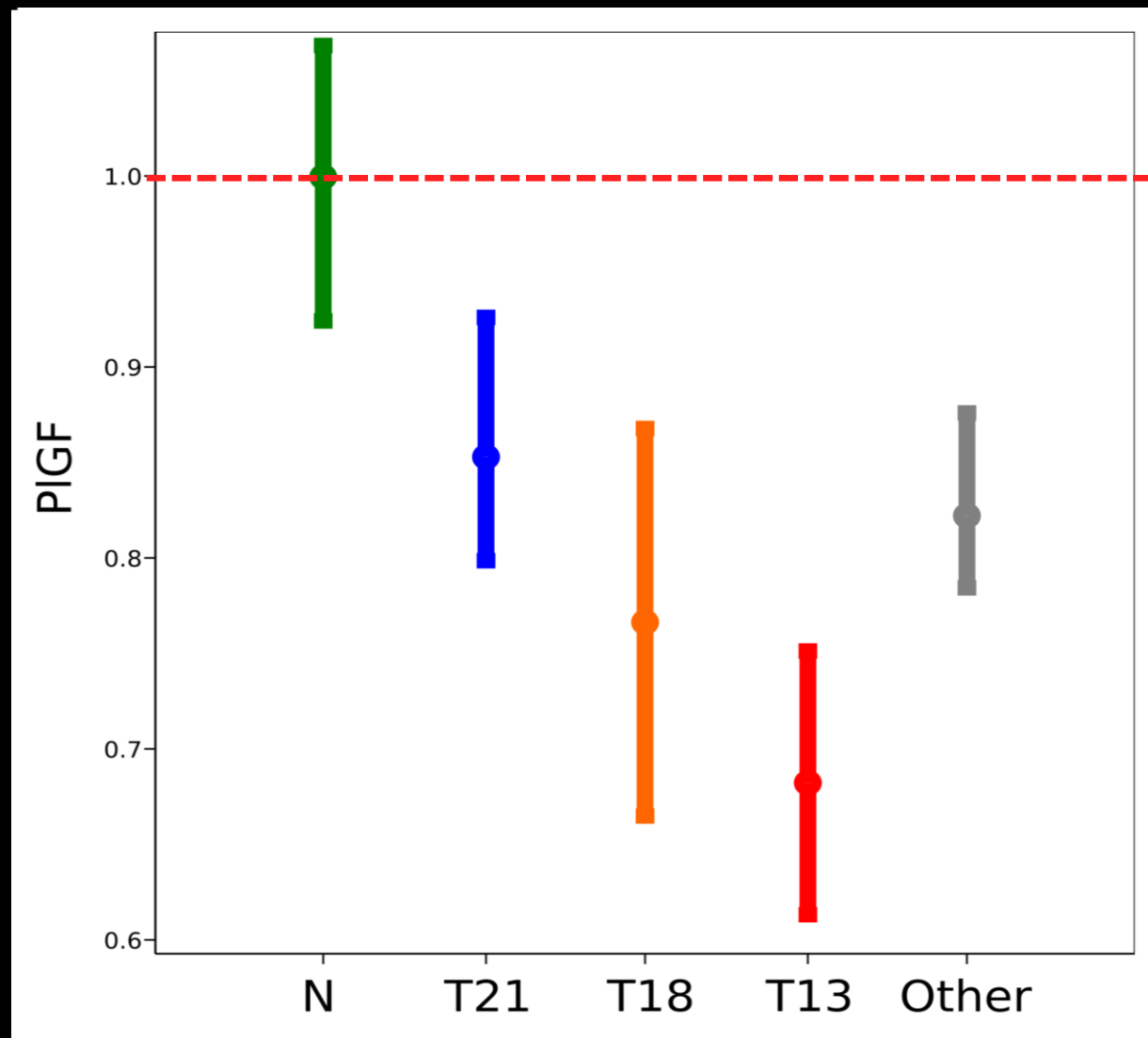


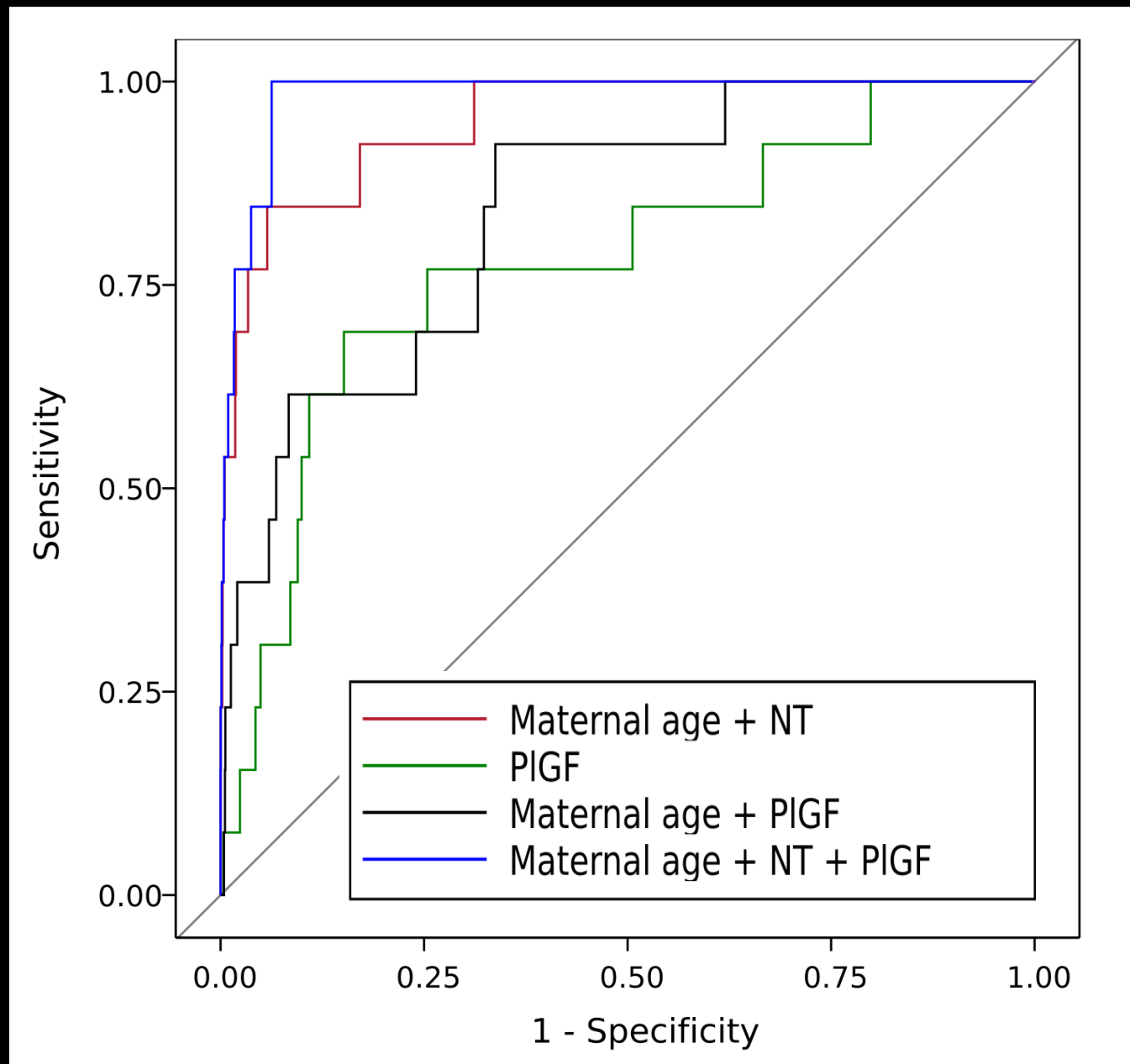
Screening for aneuploidy using NT & PlGF

NT

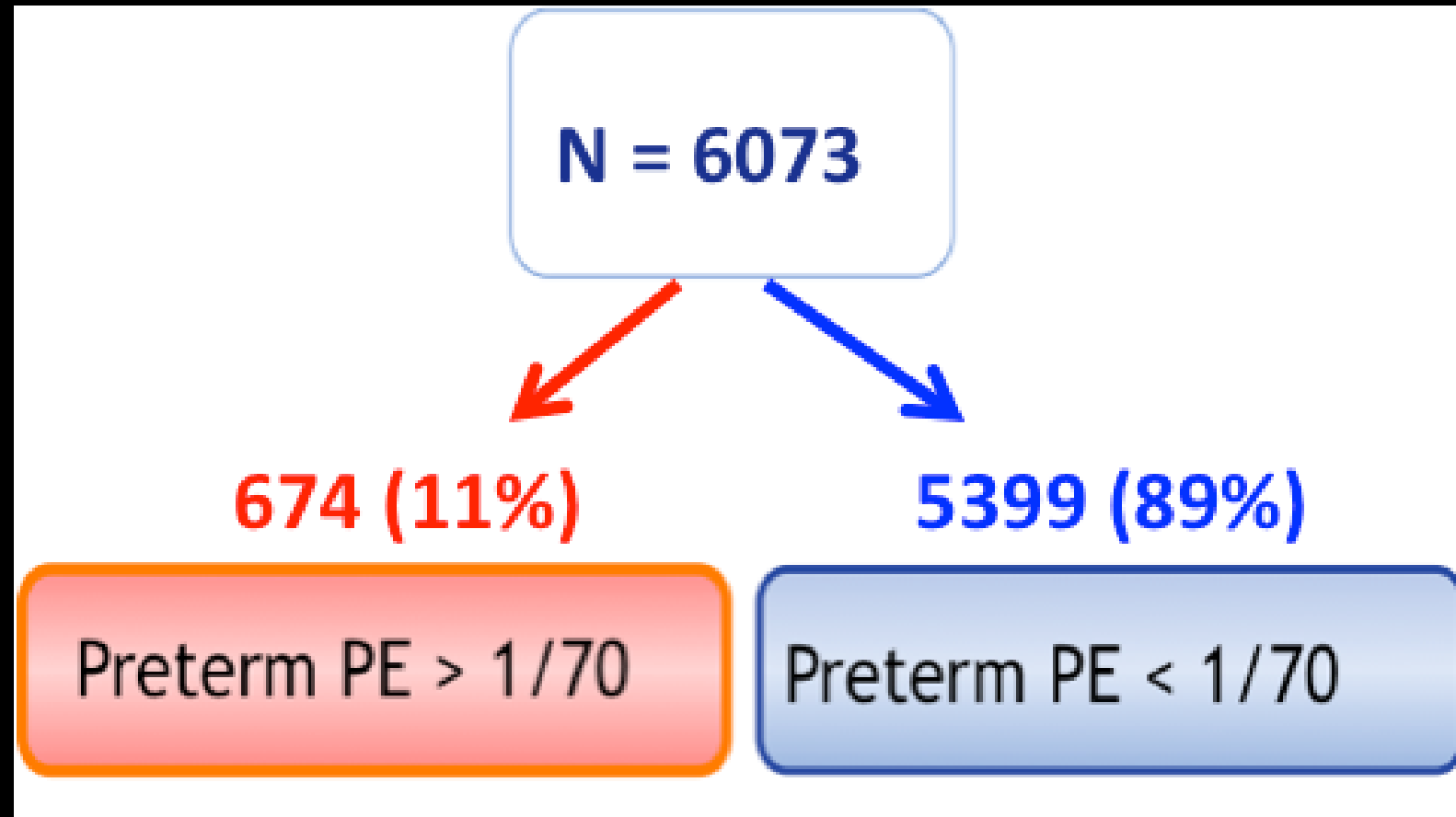


PIGF





FMF algorithm

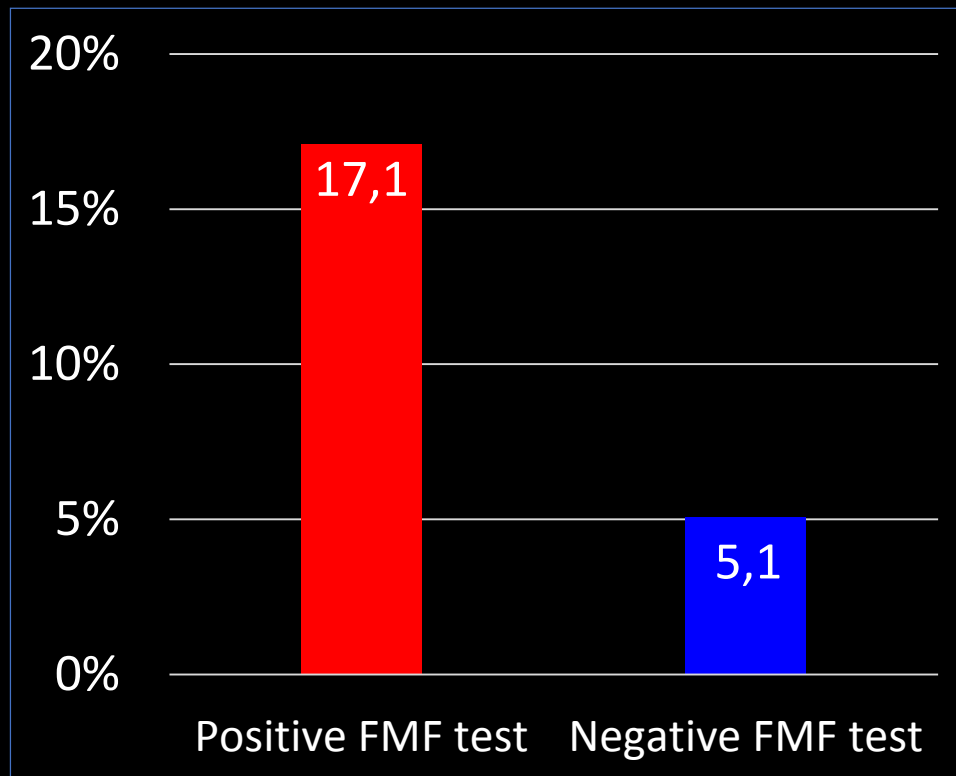


Outcomes

	Screened +	Screened -	Relative risk	P
PE < 37 weeks	3.7%	0.3%	12.3	<0.001
SGA <3rd	4.1%	1.4%	2.9	<0.001
Fetal death	1.2%	0.4%	3.0	0.004
Late miscarriage	0.9%	0.3%	3.0	0.04

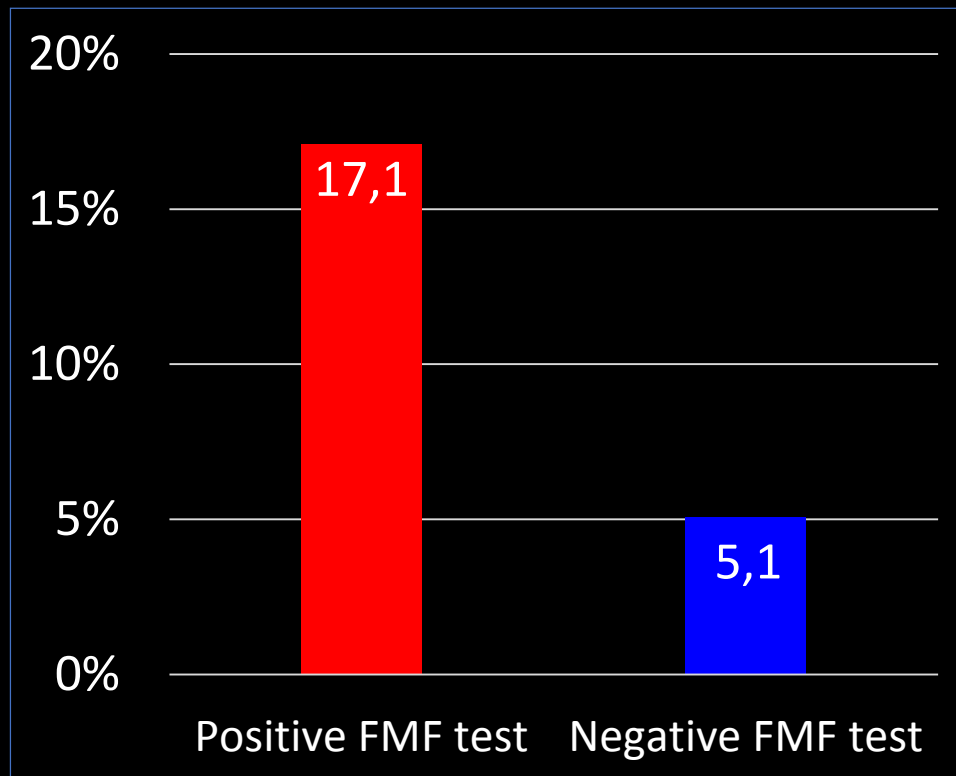
Outcomes

ANY GOS



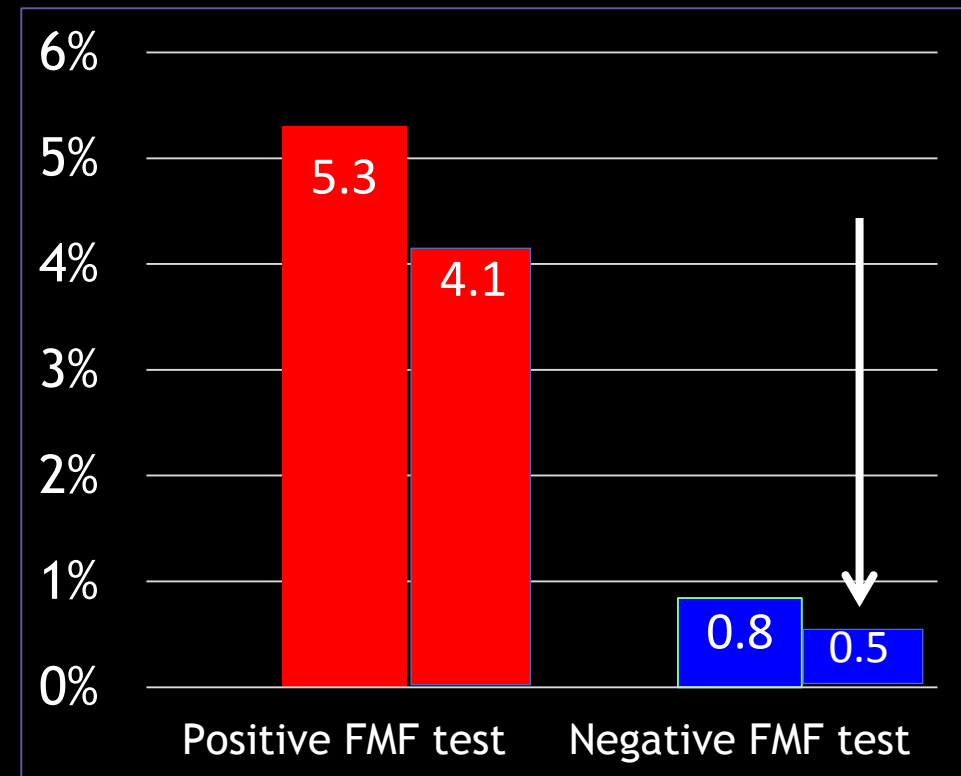
Outcomes

ANY GOS



SEVERE GOS

(Preterm PE, preterm SGA<3rd, Fetal death)



Relative risk: 8.2

GOS study: conclusions

FMF preterm PE test **>1/70** → high risk (**>5%**) of severe GOS*

FMF preterm PE test **<1/70** → low risk (**0.5%**) of severe GOS*

***PE & SGA<37wks, IUD**

Thank you!

Prediction and prevention of preterm PE combining
biomarkers in the first-trimester & aspirin is likely to
reduce the rate or preterm PE... HIGHLY associated
with deep placentation disorders

It is likely to reduce the rate of **other GOS**
(sPTB, IUGR, fetal death)... that are also associated
with deep placentation but that are considerably
more frequent!

Prediction and Prevention of the Great Obstetrical Syndromes (GOS Study)

Emmanuel Bujold, MD, MSc

*Professor, Obstetrics and Gynaecology, Laval University
Funded by the Jeanne et Jean Louis-Lévesque Foundation*