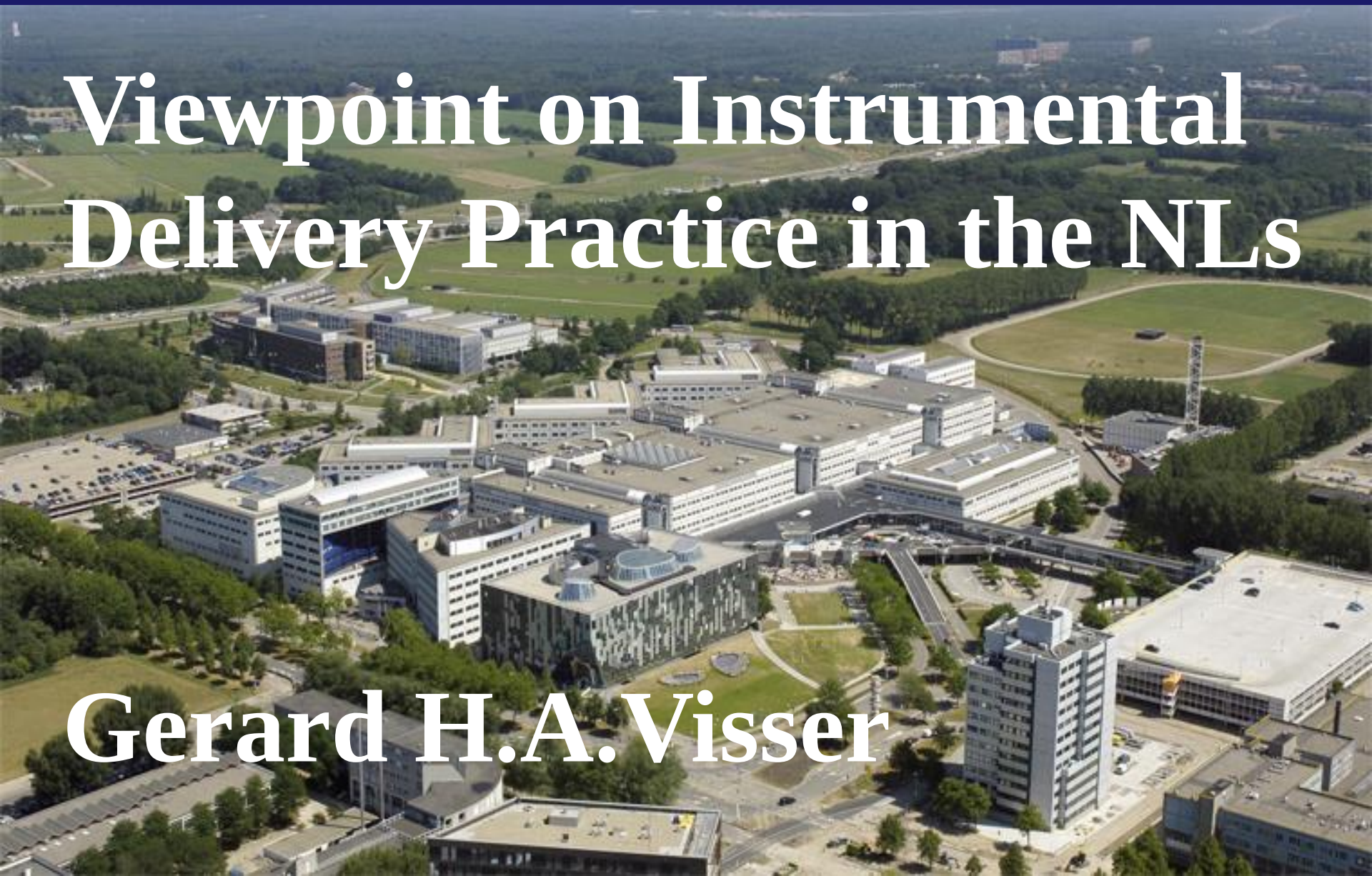
University Medical Center, Utrecht, the NL



Viewpoint on Instrumental Delivery Practice in the NLs

Gerard H.A.Visser

University Medical Center, Utrecht, the NL

Viewpoint on Instrumental Delivery Practice in the North of Europe

Gerard H.A.Visser

DOI: 10.1111/1471-0528.13284
www.bjog.org

Wide differences in mode of delivery within Europe: risk-stratified analyses of aggregated routine data from the Euro-Peristat study

AJ Macfarlane,[a] B Blondel,[b] AD Mohangoo,[c] M Cuttini,[d] J Nijhuis,[e] Z Novak,[f] HS Ólafsdóttir,[g] J Zeitlin,[b] the Euro-Peristat Scientific Committee

C.section: 14.8-52.2%

Vag instr: 0.5-16.4 %

(Data from 2010)

Regional Clusters with similar CS and vag delivery rates

- NW Europe: CS 17-20 % Vag Instrum 7-10%

- SE Europe: CS 35-60% Vag Instrum: 2-3%
- Eastern Europe: similar (even lower vag instrum delivery rates)

Regional Clusters with similar CS and instrum vag delivery rates

- NW Europe: CS 17-20 % Instrum 7-10%
- France 21 12

- USA 33 5
- Germany 31 6

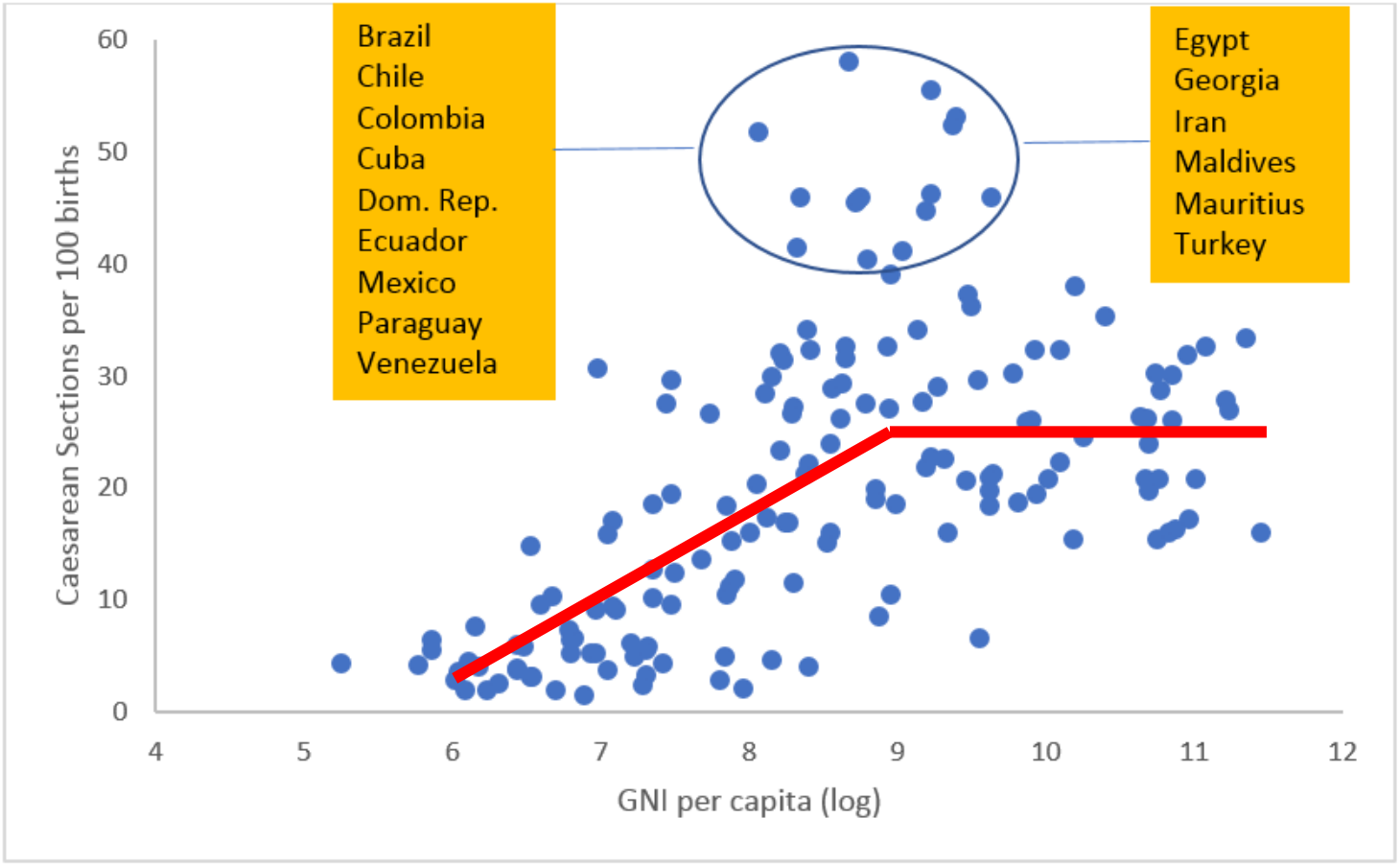
- SE Europe: CS 35-60% Instrum: 2-3%

Worldwide Worrying Trend

- Trend: more Csections, less instrum vaginal deliveries
- Trend: towards an unsafer birth (mother)
- Trend: subsequent pregnancy, impaired outcome for both mother and child

Csection rates per GNI per capita

Figure 3. Caesarean Section rate per 100 births, most recent data 168 countries, by GNI per capita (log) (highlight refers to countries with rates exceeding 40%).



Poland	**42**
Bulgaria	**43**
China	**44**
Lebanon	**45**
Romania	**47**
Cyprus	**57**
Greece	**60**

T.Boerma et al Lancet Oct 2018

Increase in CSs,increase in....

- Direct maternal morbidity
- Complications in subsequent pregnancies (rupture, plac accreta, preterm delivery, niche)
- Neonatal morbidity due to early delivery
- Auto immune and metabolic disease in the offspring

- No evidence for improved fetal outcome, for CS rates >10-20%

World Health Organization

FIGO International Federation of Gynecology and Obstetrics

hrp

WHO Statement on Caesarean Section Rates

Every effort should be made to provide caesarean sections to women in need, rather than striving to achieve a specific rate

Caesarean section rates at the population level

WHO conducted two studies: a systematic review of available studies that had sought to find the ideal caesarean rate within a given country or population, and a worldwide country-level analysis using the latest available data. Based on this available data, and using internationally accepted methods to assess the evidence with the most appropriate analytical techniques, WHO concludes:

1. Caesarean sections are effective in saving maternal and infant lives, but only when they are required for
2. At population level, caesarean section rates higher than 10% are not associated with reductions in maternal and newborn mortality rates.
3. Caesarean sections can cause significant and sometimes permanent complications, disability or death particularly in settings that lack the facilities and/or capacity to properly conduct safe surgery and treat surgical complications. Caesarean sections should ideally only be undertaken when medically necessary.
4. Every effort should be made to provide caesarean sections to women in need, rather than striving to achieve a specific rate.
5. The effects of caesarean section rates on other outcomes, such as maternal and perinatal morbidity, paediatric outcomes, and psychological or social well-being are still unclear. More research is needed to understand the health effects of caesarean section on immediate and future outcomes.

Caesarean section rates at the hospital level and the need for a universal classification system

There is currently no internationally accepted classification system for caesarean section that would allow meaningful and relevant comparisons of CS rates across different facilities, cities or regions. Among the existing systems used to classify caesarean sections, the 10-group classification (also known as the 'Robson classification') has in recent years become widely used in many countries. In 2014, WHO conducted a systematic review of the experience of users with the Robson classification to assess the pros and cons of its adoption, implementation and interpretation, and to identify barriers, facilitators and potential adaptations or modifications.

WHO proposes the Robson classification system as a global standard for assessing, monitoring and comparing caesarean section rates within healthcare facilities over time, and between facilities. In order to assist healthcare facilities in adopting the Robson classification, WHO will develop guidelines for its use, implementation and interpretation, including standardization of terms and definitions.

1

Molina et al, 19% JAMA 2015

Lancet miniseries on CSs

FIGO International Federation of Gynecology and Obstetrics

Optimising caesarean section use 1

Global epidemiology of use of and disparities in caesarean sections

Ties Boerma, Carine Ronsmans, Dessalegn Y Melesse, Aluisio J D Barros, Fernando C Barros, Liang Juan, Ann-Beth Moller, Lale Say, Ahmad Reza Hosse

Oct 12, 2018

In this Series p
(CS) use, globa
the world's birt
CS in 2015, wh
births). CS use
used in 44·3%
of births. The g
in health facili
(33·5%), with
15% of births
than 10% of bir
country dispari
versus the poor
low obstetric ri
1·6 times more

Introduction

Caesarean sect
women and ne
antepartum ha
presentation, a
common major
CS use has ir
frequency in ex
that is though
has been drive
indicated CS i
countries.[2-4] Ho
births has not
natal outcomes
income and m
less than 10% o
considered to

Optimising caesarean section use 2

Short-term and long-term effects of caesarean section on the health of women and children

Jane Sandall, Rachel M Tribe, Lisa Avery, Glen Mola, Gerard HA Visser, Caroline SE Homer, Deena Gibbons, Niamh M Kelly, Holly Powell Kennedy, Hussein Kidanto, Paul Taylor, Marleen Temmerman

A caesarean section (CS) ca
lead to short-term and long-t
without medical indication,
crucial, which we discuss i
higher after CS than after
placentation, ectopic pregna
There is emerging evidenc
exposures, and that these e
immune development, an in
diversity. The persistence o
CS use and greater incide
studies that focus on the effe
that link CS with childhood
inform novel strategies an
and development.

Introduction

Optimising caesarean section use 3

Interventions to reduce unnecessary caesarean sections in healthy women and babies

Ana Pilar Betrán, Marleen Temmerman, Carol Kingdon, Abdu Mohiddin, Newton Opiyo, Maria Regina Torloni, Jun Zhang, Othiniel Musana, Sikolia Z Wanyonyi, Ahmet Metin Gülmezoglu, Soo Downe

Lancet 2018; 392: 1358–68

This is the third in a Series of three papers on optimising caesarean section use

See Editorial page 1279

See Comment pages 1286, 1288, and 1290

UNDP/UNFPA/UNICEF/WHO/ World Bank Special

Optimising the use of caesarean section (CS) is of global concern. Underuse leads to maternal and perinatal mortality and morbidity. Conversely, overuse of CS has not shown benefits and can create harm. Worldwide, the frequency of CS continues to increase, and interventions to reduce unnecessary CSs have shown little success. Identifying the underlying factors for the continuing increase in CS use could improve the efficacy of interventions. In this Series paper, we describe the factors for CS use that are associated with women, families, health professionals, and health-care organisations and systems, and we examine behavioural, psychosocial, health system, and financial factors. We also outline the type and effects of interventions to reduce CS use that have been investigated. Clinical interventions, such as external cephalic version for breech delivery at term, vaginal breech delivery in appropriately selected women,

Lancet miniseries on CSs

FIGO International Federation of Gynecology and Obstetrics

Oct 12, 2018

FIGO position paper: how to stop the caesarean section epidemic

CrossMark

Worldwide there is an alarming increase in caesarean section (CS) rates. The medical profession on its own cannot reverse this trend. Joint actions with governmental bodies, the health care insurance industry, and women's groups are urgently needed to stop unnecessary CSs and enable women and families to be confident of receiving the most appropriate obstetric care for their individual circumstances.

CS rates are increasing worldwide without any signs of slowing down. Worldwide rates have increased from about 6% in 1990 to 19% in 2014.[1] National rates in the northern part of Europe are still below 20%, whereas those in the south eastern part of Europe, China and South America have increased to or above 50% of related problems in offspring.[6,7] Consequences for future pregnancies include an increase in spontaneous preterm birth, uterine rupture, and abnormal placentation that may result in excessive maternal bleeding and/or need for hysterectomy.[6,7] In the USA, the increasing CS rate has, although weakly, been associated with an increase in maternal mortality.[8] Similarly, in some African countries CS is associated with a very high maternal and neonatal mortality and morbidity, partly because of absence of facilities for instrumental vaginal delivery, delay in doing the procedure, and inadequate facilities and skills.[9] Hospital-acquired sepsis with resistant organisms also contributes to adverse outcomes from surgery.

The rise in CSs has to be stopped.

Endorsed by the Int Confederation of Midwives (ICM) and the ''Women deliver'' action group

FIGO position paper;

How to reduce the CS epidemic

- Doctor's fee for CS similar to that of vaginal del
- Financing of hospitals partly based on CS rate
- Uniform classification system (Robson)
- Women should be informed properly about risks and benefits of CSs
- Invest in better care and support, privacy, adequate pain relief
- **Improve training and reintroduce vaginal instrumental deliveries**

Visser et al, FIGO Committee Safe Motherhood, Lancet 2018

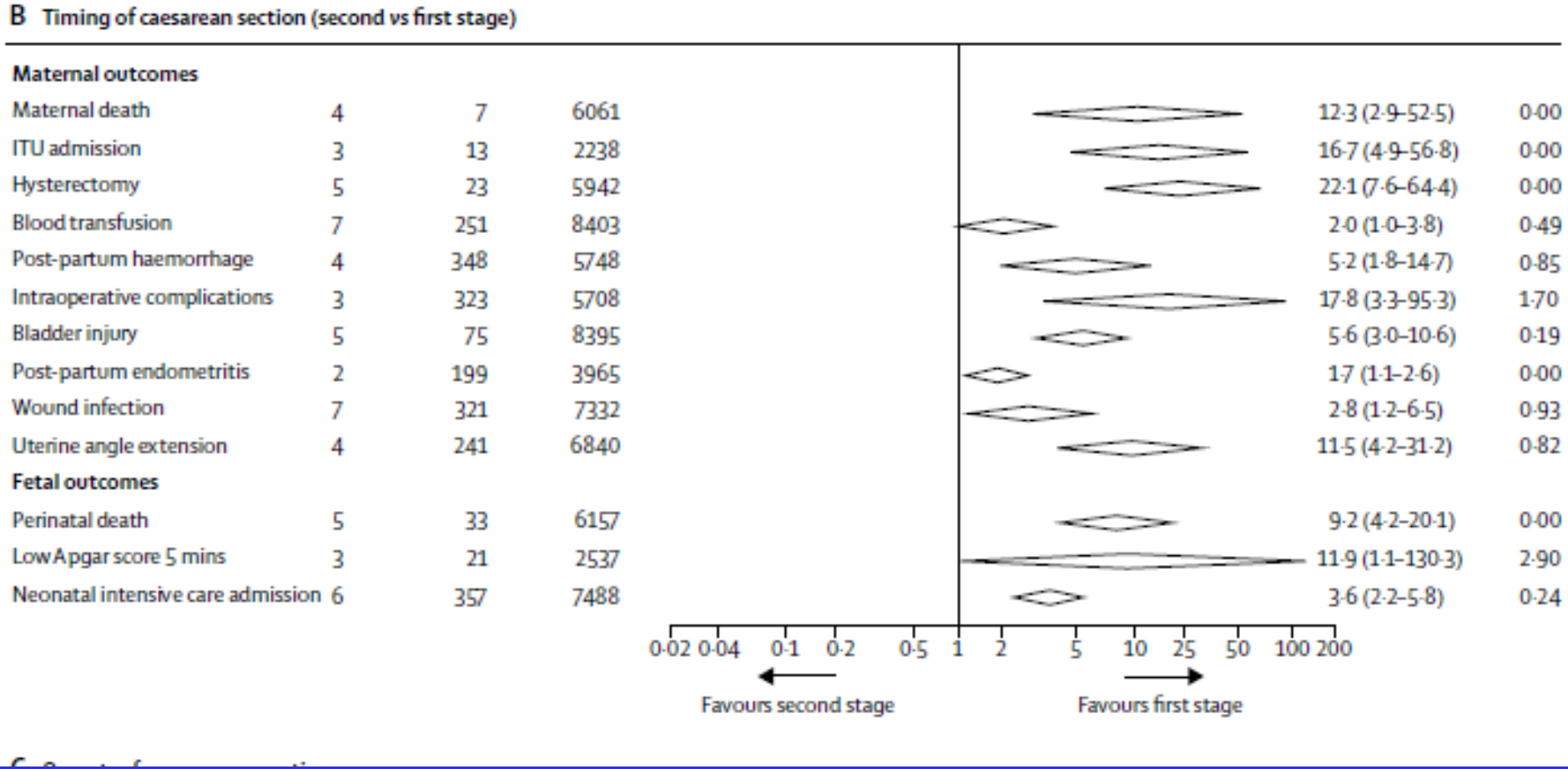
FIGO position paper;

How to reduce the CS epidemic

- Doctor's fee for CS similar to that of vaginal del
- Financing of hospitals partly based on CS rate
- Uniform classification system (Robson)
- **Low hanging fruit**
- Invest in better care and support, privacy, adequate pain relief
- Improve training and reintroduce vaginal instrum deliveries

Visser et al, FIGO Committee Safe Motherhood, Lancet 2018

Csection 1st versus 2nd stage



Sobhy et al, Lancet 2019

Vag instrum vs CS full dil. outcome subseq pregn

Wang et al Austr NZ JOG 2020

TABLE 2 Associations between mode of delivery in the index pregnancy and birth outcomes in the subsequent pregnancy

Outcome in subsequent pregnancy	Index pregnancy		
	MCI (*n* = 874)	CSFD (*N* = 425)	RR (95% CI) or MD (95% CI)
(A) Primary outcome – preterm birth			
Overall preterm birth < 37 weeks	28/874 (3.2%)	24/425 (5.7%)	1.76 (1.04–3.00)
Spontaneous preterm birth†	17/863 (2.0%)	18/419 (4.3%)	2.18 (1.14–4.19)
Overall preterm birth < 34 weeks	11/874 (1.3%)	12/425 (2.8%)	2.24 (1.00, 5.04)
(B) Secondary outcomes			
Blood loss > 500mLs	107/874 (12%)	44/425 (10%)	0.85 (0.61, 1.18)
APGAR at 5 min < 7	12/874 (1%)	10/425 (2%)	1.71 (0.75, 3.93)
Baby male	441/874 (50%)	225/425 (53%)	1.05 (0.94, 1.17)
NICU or special care admission	9/874 (1%)	4/425 (1%)	0.91 (0.28, 2.95)
Mean birth weight (g)	3435 (554)	3413 (639)	−21.3 (−89.0, 46.43)
Mean head circumference (cm)	34.5 (2.0)	34.7 (2.4)	0.17 (−0.08, 0.42)

†Cases were excluded where the cause of preterm birth was not attributable to the mode of birth in the index pregnancy.
CI, confidence interval; CSFD, caesarean section at full dilatation; MCI, mid-cavity instrumental; MD, mean difference; NICU, neonatal i unit; RR, relative risk.

PTB following vag del or full dilatation CS

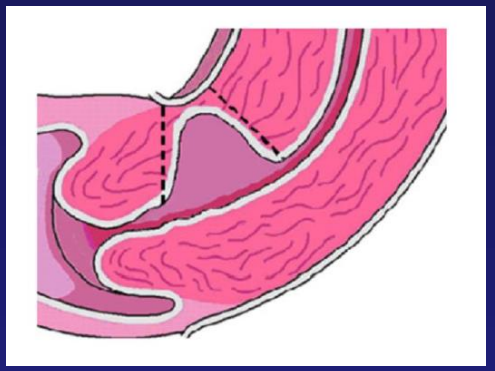
TABLE 2 Associations between mode of delivery in the index pregnancy and birth outcomes in the subsequent pregnancy

Outcome in subsequent pregnancy	Index pregnancy		
	MCI (*n* = 874)	CSFD (*N* = 425)	RR (95% CI) or MD (95% CI)
(A) Primary outcome – preterm birth			
Overall preterm birth < 37 weeks	28/874 (3.2%)	24/425 (5.7%)	1.76 (1.04–3.00)
Spontaneous preterm birth†	17/863 (2.0%)	18/419 (4.3%)	2.18 (1.14–4.19)
Overall preterm birth < 34 weeks	11/874 (1.3%)	12/425 (2.8%)	2.24 (1.00, 5.04)

	Vag	CS full dilation	
Spont PTB<37wks	**2.3**	**4.5%**	**aOR 3.3**
Spont PTB<34wks			**aOR 7.5**

(Williams et al, BJOG 2020)

Niche or CS scar



Distance internal os – niche/CS scar:

No labour	3-7cm	>7 cm
(n 103	261	43)
9.8 mm	2.5	-1.4

FMF Webinar May 3, 2020 (R.Kamel et al, Egypt)

Neonatal Morbidity: Spontaneous, vs Vag operative, vs Csection

TABLE 2. INCIDENCE OF MAJOR NEONATAL MORBIDITY AND RISK ASSOCIATED WITH OPERATIVE PROCEDURES AS COMPARED WITH SPONTANEOUS DELIVERY.*

CSection

CONDITION	SPONTANEOUS (N=387,799)	VACUUM (N=59,354)		DURING LABOR, NO ATTEMPT AT VAGINAL DELIVERY (N=82,075)†	
	Incidence	*Incidence*	*Odds Ratio*	*Incidence*	*Odds Ratio*
Subdural or cerebral hemorrhage	2.9	8.0	2.7 (1.9–3.9)	6.8	2.3 (1.7–3.2)
Intraventricular hemorrhage	1.1	1.5	1.4 (0.7–3.0)	2.6	2.4 (1.4–4.1)
Subarachnoid hemorrhage	1.3	2.2	1.7 (0.9–3.2)	1.1	0.9 (0.4–1.7)
Facial-nerve injury	3.3	4.6	1.7 (0.9–2.1)	2.8	0.8 (0.5–1.3)
Brachial plexus injury	7.7	17.6	2.3 (1.8–2.9)	1.6	0.2 (0.1–0.4)
Convulsions	6.4	11.7	1.8 (1.4–2.4)	19.9	3.1 (2.6–3.8)
CNS depression	3.1	9.2	2.9 (2.1–4.1)	9.4	3.0 (2.3–4.0)
Feeding difficulty	68.5	72.1	1.1 (1.0–1.2)	117.9	1.7 (1.6–1.8)
Mechanical ventilation	25.8	39.1	1.5 (1.3–1.8)	101.7	2.6 (2.2–3.0)

Towner et al, NEJM 1999

TABLE 2. INCIDENCE OF MAJOR NEONATAL MORBIDITY AND RISK ASSOCIATED WITH OPERATIVE PROCEDURES AS COMPARED WITH SPONTANEOUS DELIVERY.*

CONDITION	SPONTANEOUS (N=387,799)	VACUUM (N=59,354)		CSECTION DURING LABOR, NO ATTEMPT AT VAGINAL DELIVERY (N=82,075)†	
	Incidence	*Incidence*	*Odds Ratio*	*Incidence*	*Odds Ratio*
Subdural or cerebral hemorrhage	2.9	8.0	2.7 (1.9–3.9)	6.8	2.3 (1.7–3.2)
Intraventricular hemorrhage	1.1	1.5	1.4 (0.7–3.0)	2.6	2.4 (1.4–4.1)
Subarachnoid hemorrhage	1.3	2.2	1.7 (0.9–3.2)	1.1	0.9 (0.4–1.7)
Facial-nerve injury	3.3	4.6	1.7 (0.9–2.1)	2.8	0.8 (0.5–1.3)
Brachial plexus injury	7.7	17.6	2.3 (1.8–2.9)	1.6	0.2 (0.1–0.4)
Convulsions	6.4	11.7	1.8 (1.4–2.4)	19.9	3.1 (2.6–3.8)
CNS depression	3.1	9.2	2.9 (2.1–4.1)	9.4	3.0 (2.3–4.0)
Feeding difficulty	68.5	72.1	1.1 (1.0–1.2)	117.9	1.7 (1.6–1.8)
Mechanical ventilation	25.8	39.1	1.5 (1.3–1.8)	101.7	2.6 (2.2–3.0)

These data suggest that the common risk factor for neonatal morbidity/hemorrhage is abnormal labour

THE LANCET
Volume 358, Issue 9289, 13 October 2001, Pages 1203-1207

Articles

Early maternal and neonatal morbidity associated with operative delivery in second stage of labour: a cohort study

Dr Deirdre J Murphy MD [a], Rachel E Liebling MB [a], Lisa Verity MRCOG [b], Rebecca Swingler MB [b], Roshni Patel MRCOG [b]

Csection vs difficult Vag instrum delivery or CS because of failed instrum delivery

Interpretation

The data lend support to an aim to deliver women vaginally, unless there are clear signs of cephalopelvic disproportion, and underline the importance of skilled obstetricians supervising complex operative deliveries.

So ,regarding the Second stage of labour

Do not forget the option of a vaginal instrumental delivery

Vacuum vs Csection 2nd stage

Uganda	VE	2nd stage CS
N	358	423
• Mat mort	0	5 (1.2%)
• Severe morb	3 (0.8%)	18 (4.2%)*
• Dec-Del time	25 min	2.24 h
• Fetal death	3 (0.9)	18 (4.2%)*
• Perin Death	29 (8.4%)	45 (11%)

*Multivariate regression: mode of delivery independent effect
Nolens et al, Int J Gyn Obstet, 2018

Vacuum vs Csection 2nd stage

Uganda	VE	2nd stage CS
N	358	423
• Mat mort	0	5 (1.2%)
• Sev		
• Dec		
• Feta		
• Peri		

Low hanging fruit

*Multivariate regression: mode of delivery independent effect
Nolens et al, Int J Gyn Obstet, 2018

Vacuum; new concepts

- Prediction of risk of failed ventouse
- Use of ultrasound
- Use of different type of device (ODON)

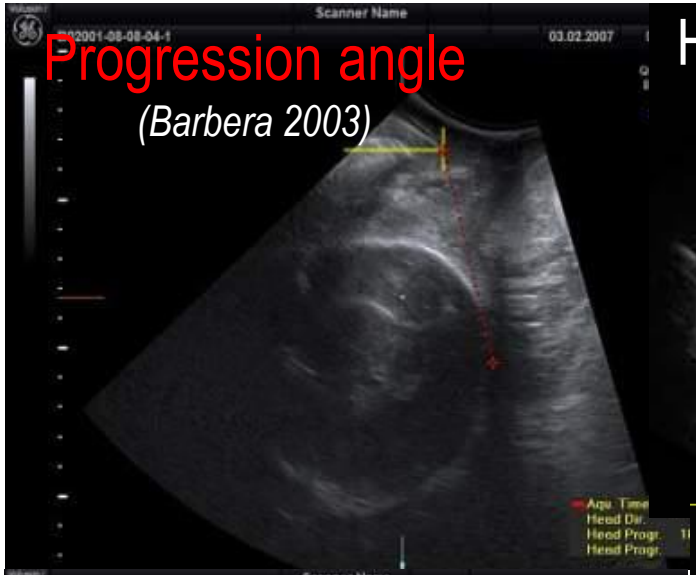
Risk factors failed vacuum

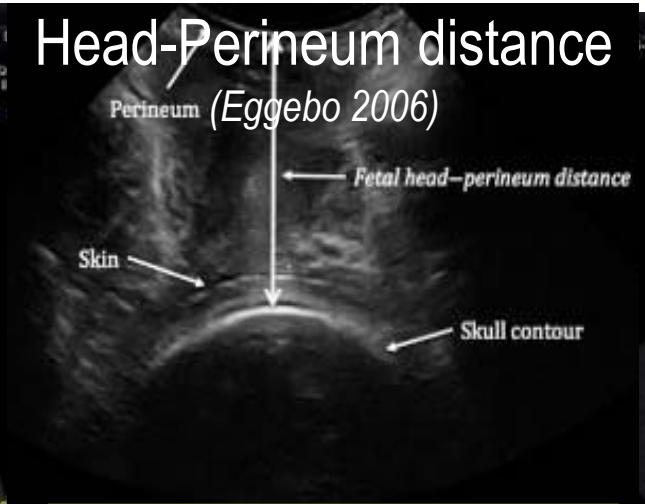
	ORatio	
• Increase gest age	1.2	per week
• Mat height	0.97	per cm
• Prev vag birth	0.32	
• Est fetal weight	5.7	>3.75kg vs <3.25 kg
• Epidural	3.0	
• Failure to progress	1.7	
• Station of the head	0.31	per station more desc
• Occ post	2.6	

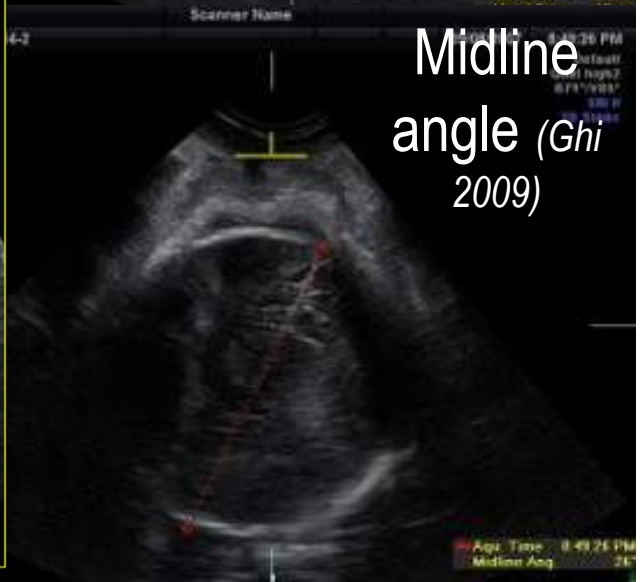
ROC area under the curve: 0.83

Verhoeven et al, Eur JOG 2016

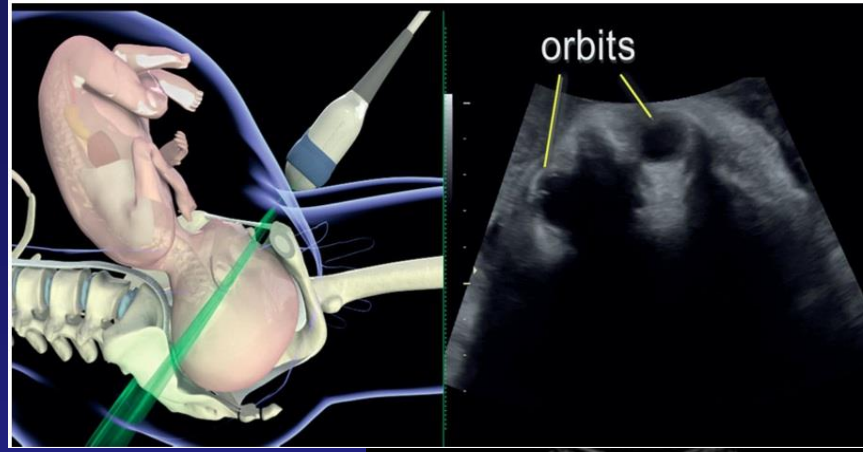
US in Labour in the Literature

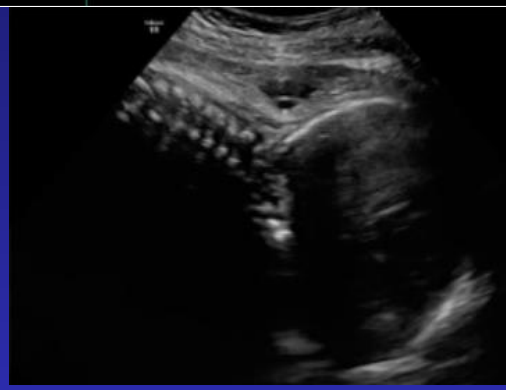






Head position
(transabd ultrasound)





Head-Perineum distance

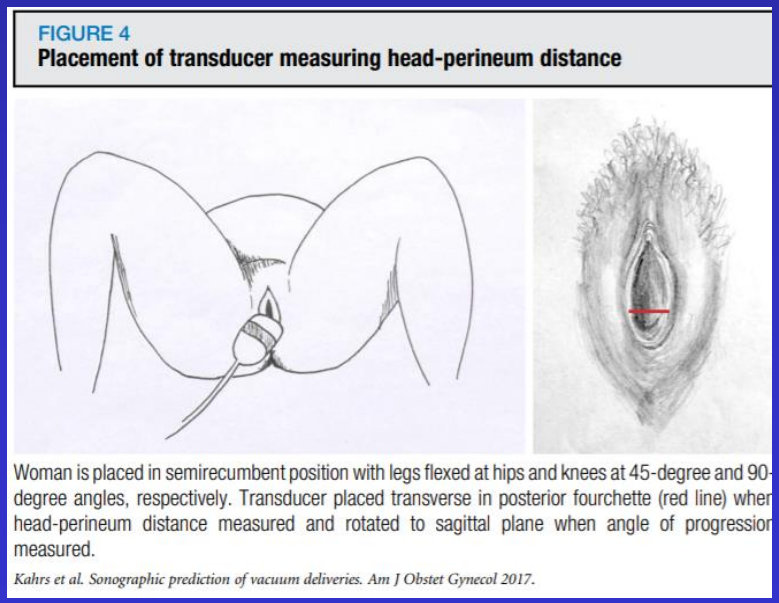
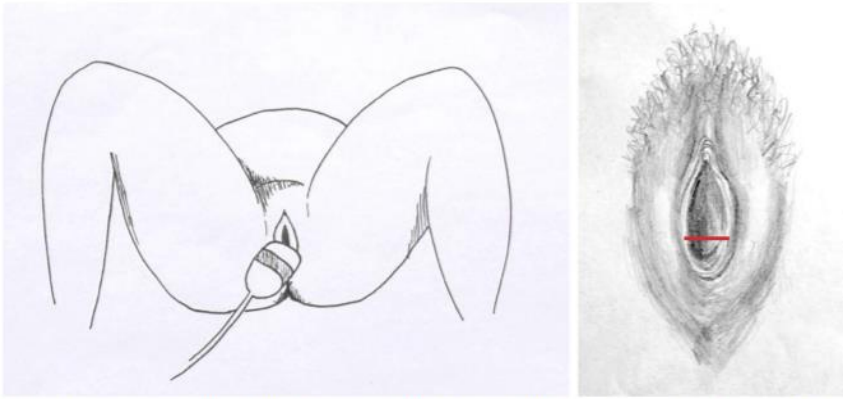


FIGURE 4
Placement of transducer measuring head-perineum distance

Woman is placed in semirecumbent position with legs flexed at hips and knees at 45-degree and 90-degree angles, respectively. Transducer placed transverse in posterior fourchette (red line) when head-perineum distance measured and rotated to sagittal plane when angle of progression measured.

Kahrs et al. Sonographic prediction of vacuum deliveries. Am J Obstet Gynecol 2017.

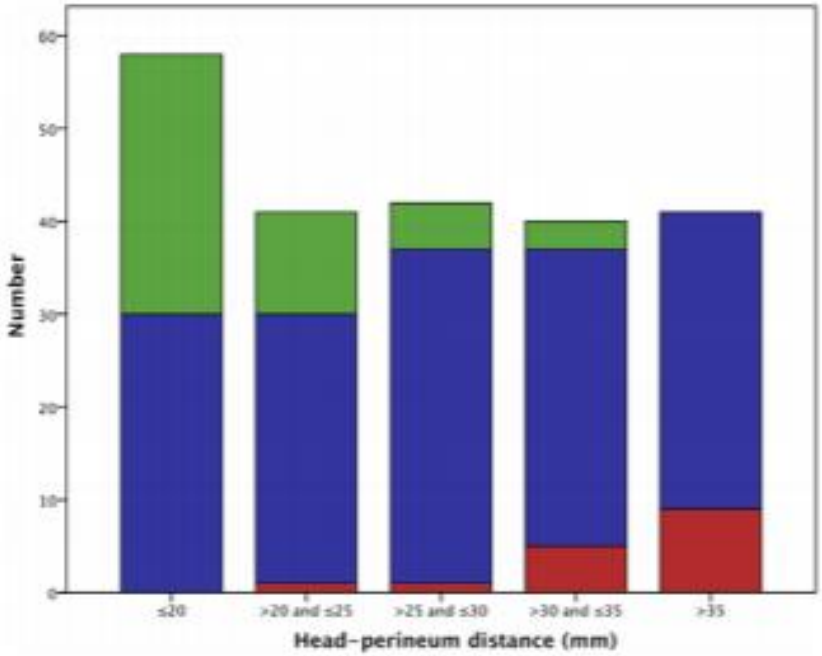
FIGURE 4
Placement of transducer measuring head-perineum distance



Woman is placed in semirecumbent position with legs flexed at hips and knees at 45-degree and 90-degree angles, respectively. Transducer placed transverse in posterior fourchette (red line) when head-perineum distance measured and rotated to sagittal plane when angle of progression measured.

Kahrs et al. Sonographic prediction of vacuum deliveries. Am J Obstet Gynecol 2017.

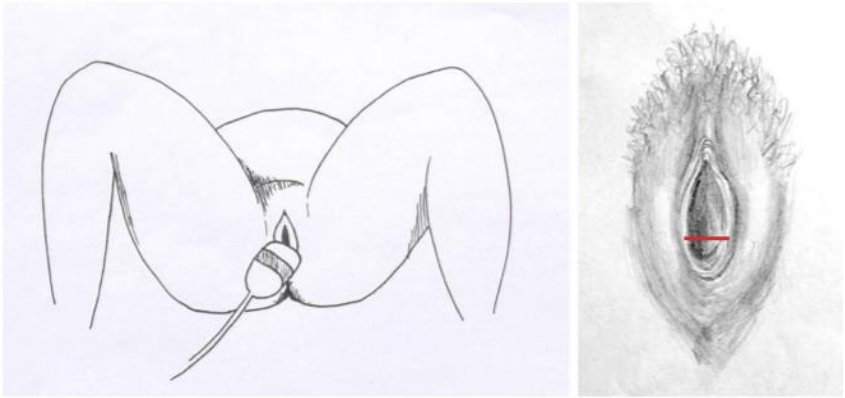
FIGURE 9
Delivery mode related to head-perineum distance



Distribution of spontaneous (green), operative vaginal (blue), and cesarean (red) deliveries in relation to head-perineum distance in nullipa-rous women with prolonged second stage of labor.

Kahrs et al. Sonographic prediction of vacuum deliveries. Am J Obstet Gynecol 2017.

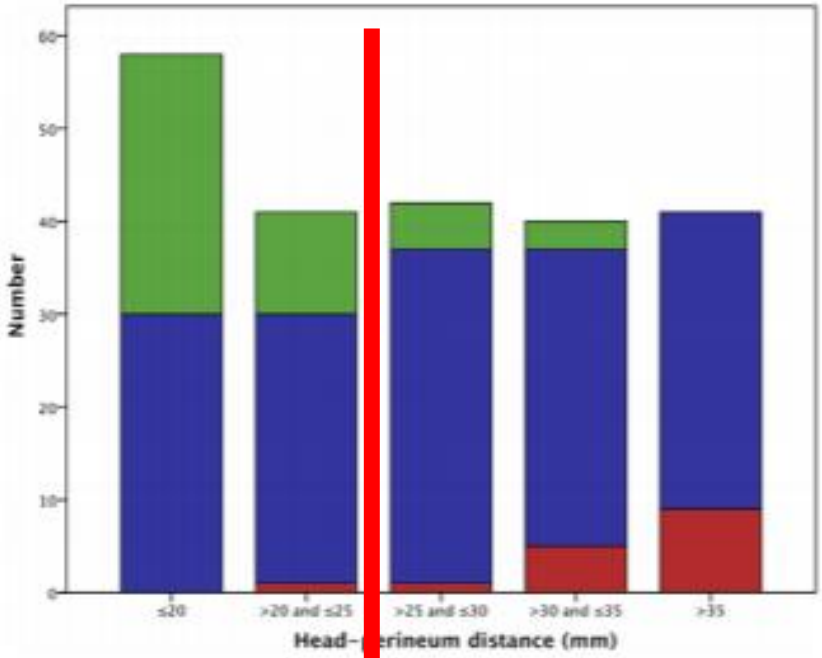
FIGURE 4
Placement of transducer measuring head-perineum distance



Woman is placed in semirecumbent position with legs flexed at hips and knees at 45-degree and 90-degree angles, respectively. Transducer placed transverse in posterior fourchette (red line) when head-perineum distance measured and rotated to sagittal plane when angle of progression measured.

Kahrs et al. Sonographic prediction of vacuum deliveries. Am J Obstet Gynecol 2017.

FIGURE 9
Delivery mode related to head-perineum distance

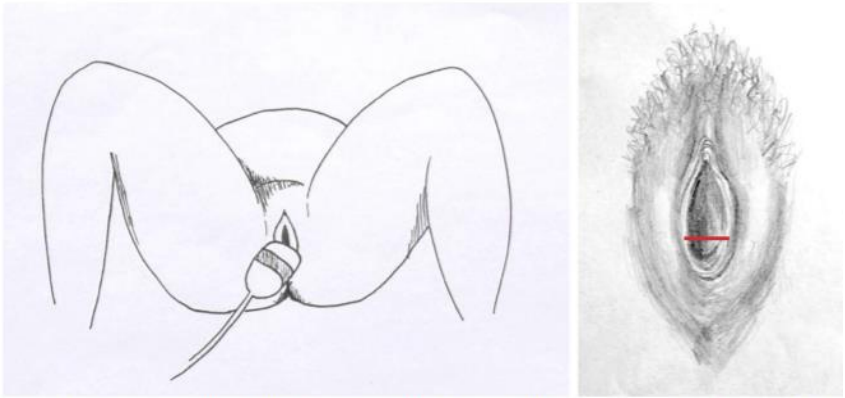


Distribution of spontaneous (green), operative and cesarean (red) deliveries in head-perineum distance in nullipa- with prolonged second stage of

Kahrs et al. Sonographic prediction of vacuum deliveries. Am J Obstet Gynecol 2017.

<25 mm: station +2

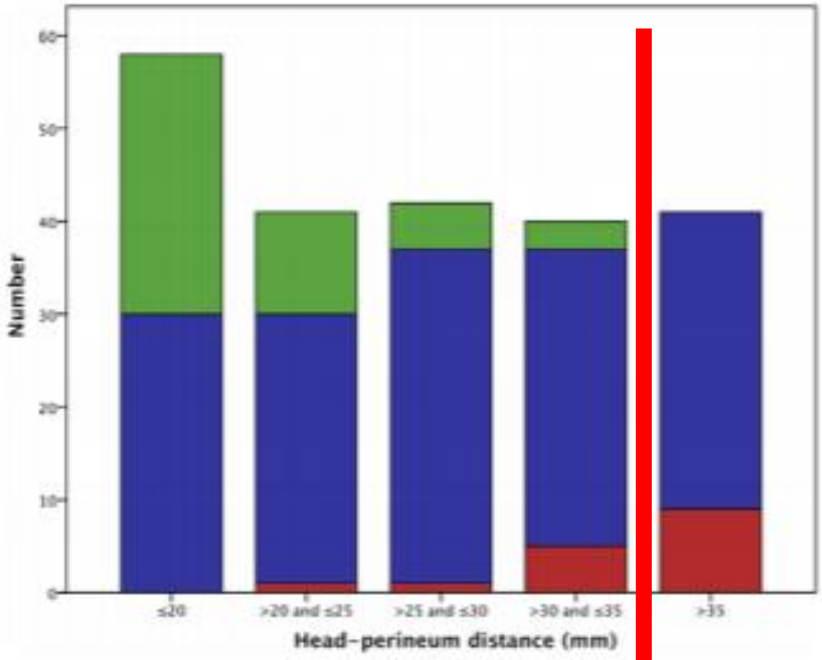
FIGURE 4
Placement of transducer measuring head-perineum distance



Woman is placed in semirecumbent position with legs flexed at hips and knees at 45-degree and 90-degree angles, respectively. Transducer placed transverse in posterior fourchette (red line) when head-perineum distance measured and rotated to sagittal plane when angle of progression measured.

Kahrs et al. Sonographic prediction of vacuum deliveries. Am J Obstet Gynecol 2017.

FIGURE 9
Delivery mode related to head-perineum distance



Distribution of spontaneous (green), operative and cesarean (red) deliveries in -perineum distance in nullipa- th prolonged secon stage of

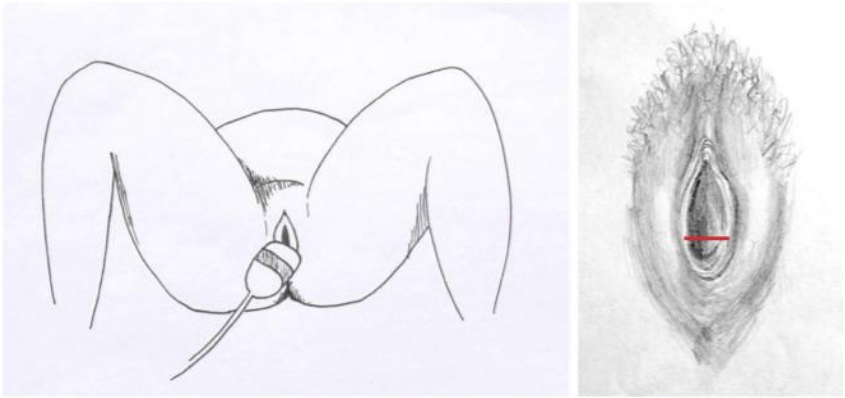
Kahrs et al. Sonographic prediction of vacuum deliveries. Am J Obstet Gynecol 2017.

<35 mm: station 0

Some guidance for a successful vag instrum delivery:

- Head-perineum distance <25 mm (station +2)
- Occiput Posterior: only if HPD<25 mm
- Occiput Anterior and HPD <35 mm (station 0); CS in 2% of cases (Kahrs et al AJOG 2017)
- Clinical judgement: mat height <1.5; very big baby etc

FIGURE 4
Placement of transducer measuring head-perineum distance



Woman is placed in semirecumbent position with legs flexed at hips and knees at 45-degree and 90-degree angles, respectively. Transducer placed transverse in posterior fourchette (red line) when head-perineum distance measured and rotated to sagittal plane when angle of progression measured.

Kahrs et al. Sonographic prediction of vacuum deliveries. Am J Obstet Gynecol 2017.

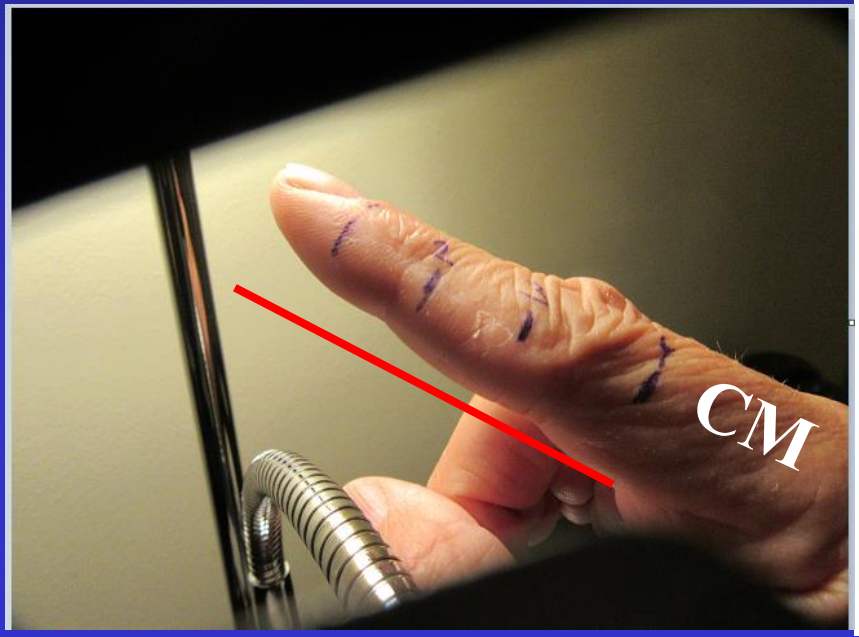
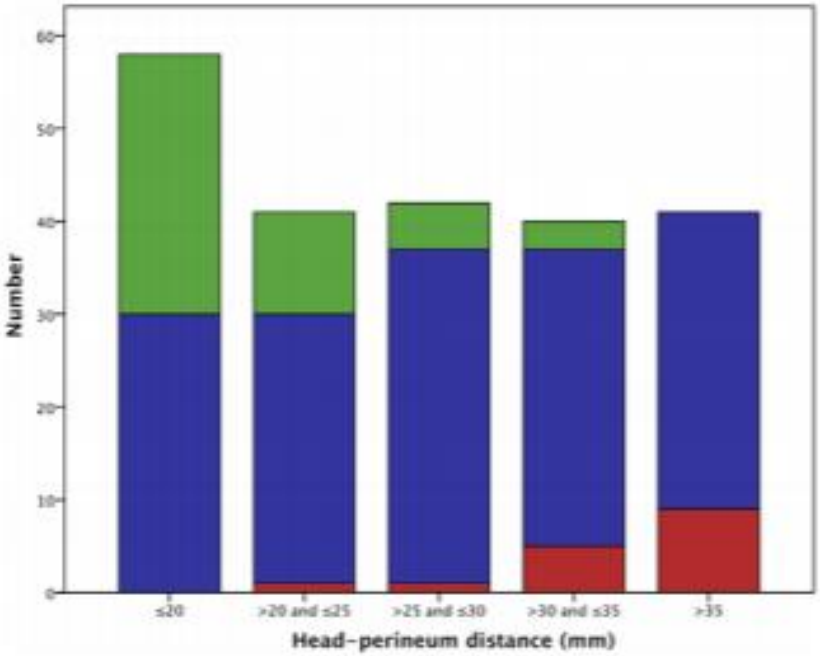


FIGURE 9
Delivery mode related to head-perineum distance

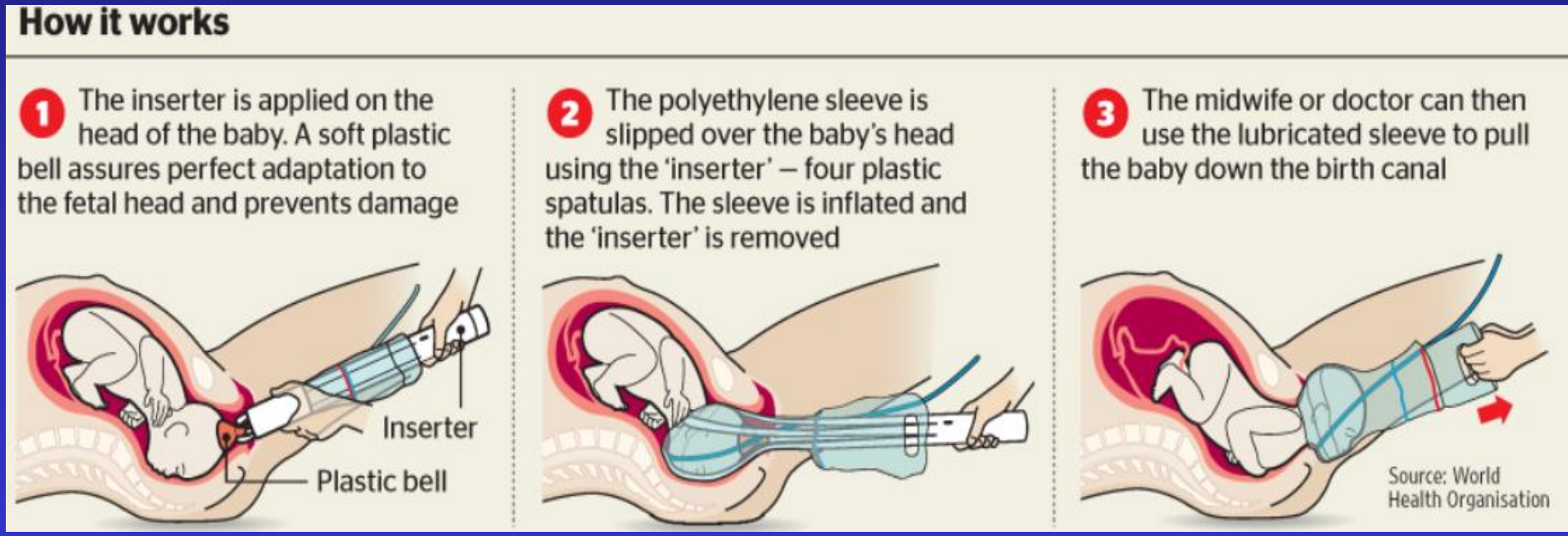


Distribution of spontaneous (green), operative vaginal (blue), and cesarean (red) deliveries in relation to head-perineum distance in nullipa-rous women with prolonged second stage of labor.

Kahrs et al. Sonographic prediction of vacuum deliveries. Am J Obstet Gynecol 2017.

Doctors do not use Vacuum or Forceps extractions anymore… a new tool..

The ODON device



ODON device

- Alternative to CS, especially in countries where access to care is limited
- Preliminary studies (phase 1 and 2):
- - reliable siting over safe area of fetal head
- - peak pressure extended on fetal head lower than forceps, higher than vacuum
- Perineal distension lower than forceps, similar as vacuum
- Less trauma to the fetal head
- Phase 3 studies in human; RCT
- Costs?

USA:

- **Conclusion:** Forceps and vacuum deliveries decreased during the study period. Low rates of operative delivery pose a challenge for resident education and may limit the degree to which women have access to alternatives to caesarean delivery. Initiatives that allow future generations of obstetricians to develop expertise in performing operative deliveries in the setting of decreased volume are an urgent resident education priority.

Merriam et al, BJOG 2017

So ,regarding the Second stage of labour

Do not forget the option of a vaginal instrumental delivery

THANK YOU