



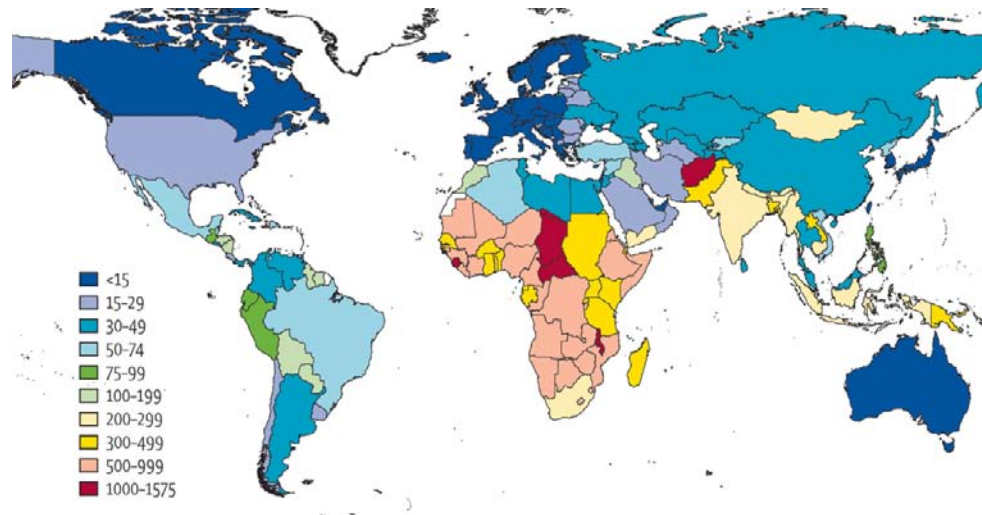
Postpartum haemorrhage

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Global maternal deaths, 2008

Total 350 000



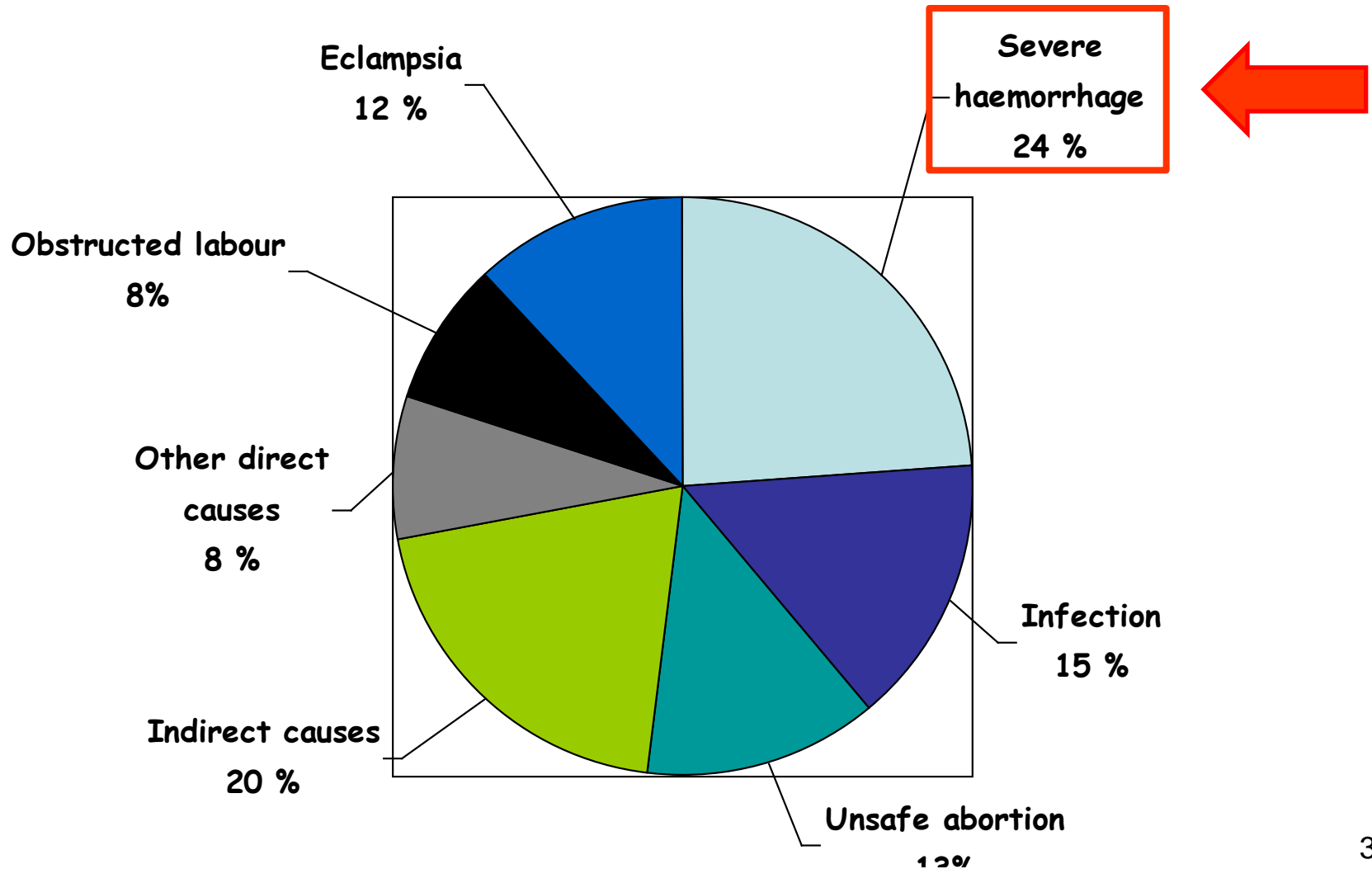
1000 women die every day due to childbearing

The majority occur in low resource settings

Maternal deaths are often sudden and unpredictable

Obstetric haemorrhage is the most frequent cause.

Causes of maternal deaths worldwide



Postpartum haemorrhage PPH

- *Definition: > 500 ml blood loss : > 10%*
- Major PPH > 1000 ml
- Severe > 1500 -2000 ml
- Lifethreatening > 2500 ml : 0.4%
- Potentially most serious maternal complications
- Most frequent cause of “near miss”

PPH Risk Factors

In pregnancy

- Placenta abruption
- Preeclampsia
- Previous PPH
- Previous C.section
- Multiple gestation
- Anemia
- Grand multipara

During delivery

- Augmented labour
- Stop in descent
- Prolonged 3.stage
- Assisted vag.delivery
- Episiotomy
- Lacerations

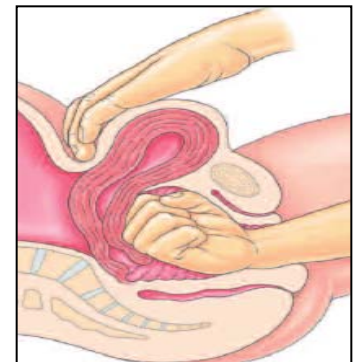
The 4 T-es of PPH

	CAUSE	INCIDENCE (APPROX)
TONE	<u>Atony</u>	70%
TRAUMA	Lacerations, hematoma, inversion, rupture	20%
TISSUE	Retained placenta, invasive placenta	10%
THROMBIN	Coagulopathies	1%



Delay in PPH recognition is the biggest threat

- Unpredictable - be prepared!
- > 1000 ml - be prepared
 - **Uterine atony is the main cause**
 - **Fundal Massage**
 - Iv. Access, coagulation status
- **Follow local protocols**
 - **uterotonic drugs (in a emergency box)**
 - misoprostol : Cytotec rectal
 - oxytocin (5 IU x2) im, or iv drips : 50 IU in 500ml
 - Ergometrine (0.2 mg) im or
 - 15 metyl PGF 2 alfa 0.25mg intra myometrial every 15 min
 - **Bimanual Uterine compression**
- **Call for HELP!** (senior OB, anesthetist, blood-lab
 - Operating theatre



Flow chart In the operating theatre

PPH interventions after vag- delivery

- Checking for **Trauma**: lacerations of vagina, cervix, hematoma, inversion
 - **Removing retained products**
(sweeping with hand, suction curettage),
 - Blood clotting corrected ??
 - Uterine tamponade (ballons, packing)
 - (Arterial embolization – interventional radiology ??)
 - Laparotomy: B-Lynch , Artery ligation
 - Hysterectomy if needed.
- Intensive Care Unit

Uterine Tamponade

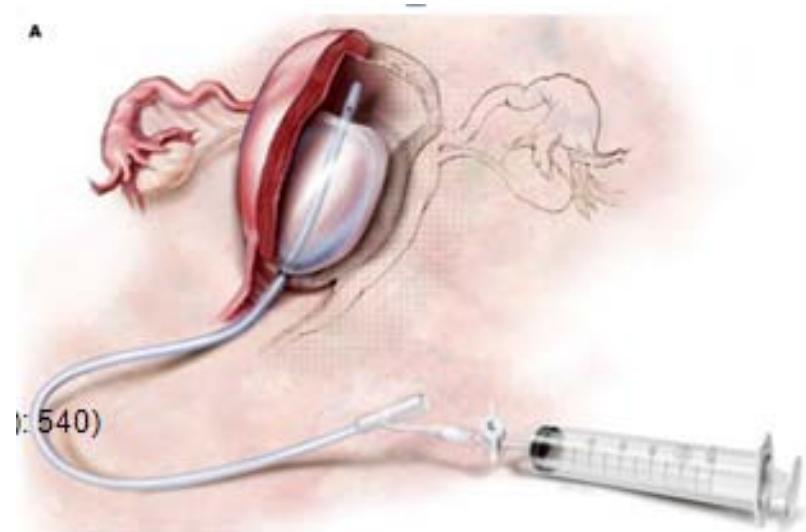
Balloon

Bakri

Foley cath,

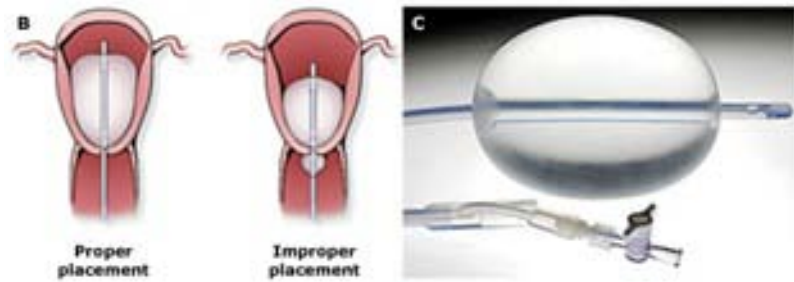
Remove after 4-6 h

Daytime



Gauze Packing

Effective in 78%

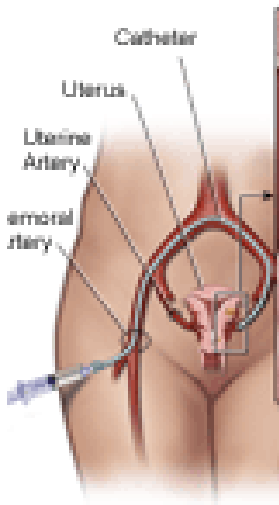


New method:

Uterine Artery Embolization

Need interventional Radiologist

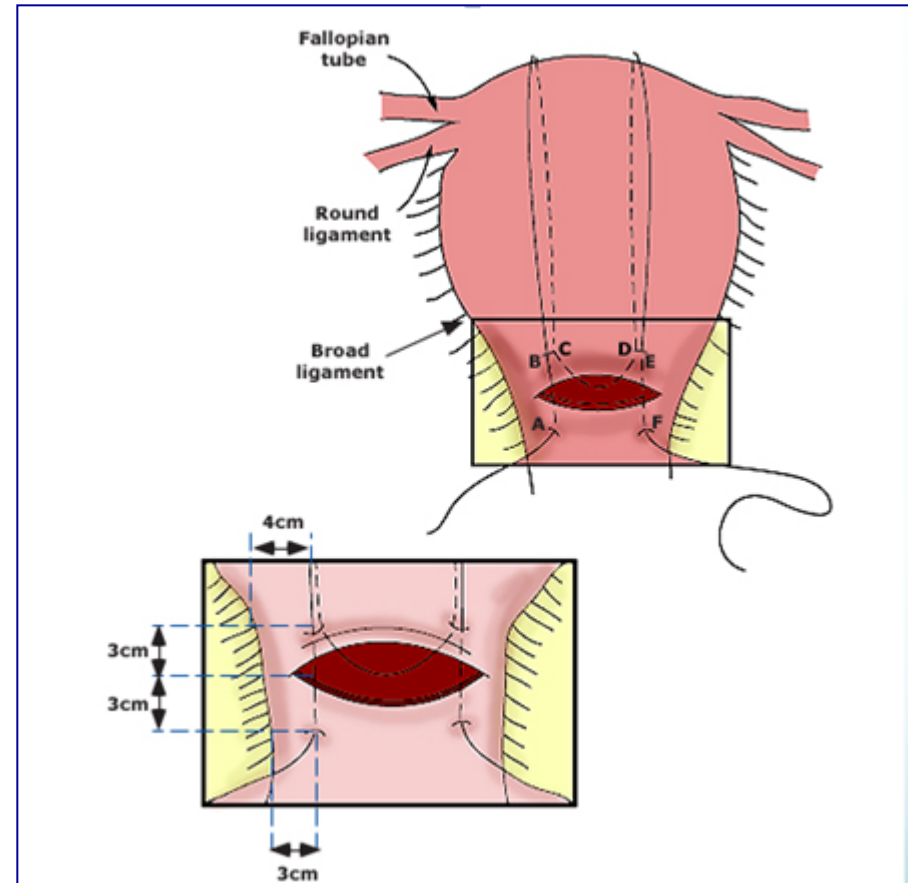
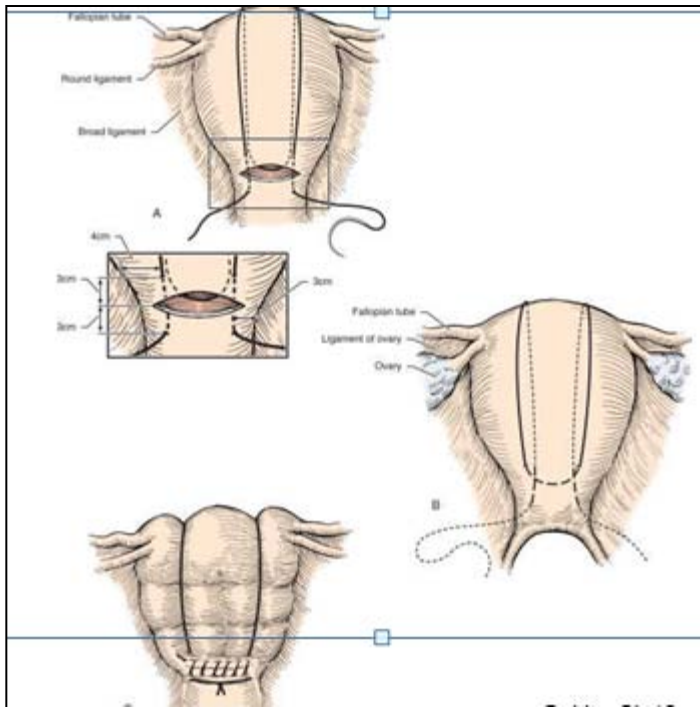
Effective in 71- 92 %



Surgical intervention

Uterine compression sutures

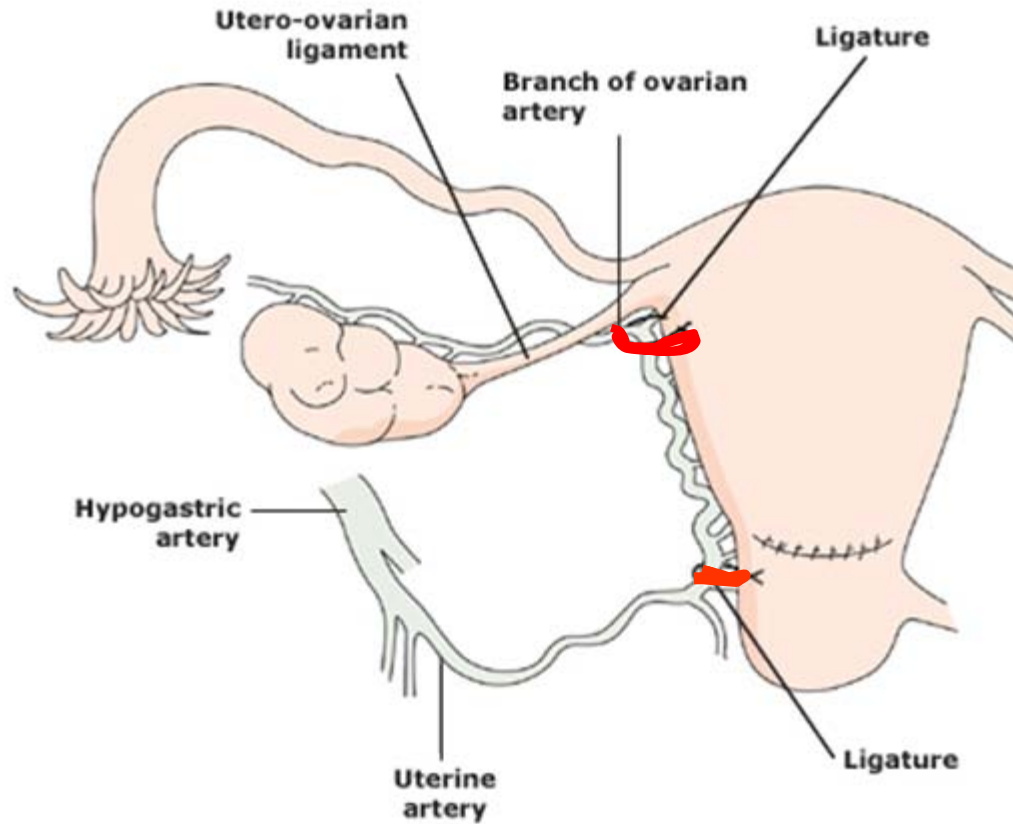
B-Lynch suture



32 cases → Failure 1 case

Surgical intervention

Bilateral Uterine vessel ligation: O'leary stitch



Ligation of the ascending uterine artery and the anastomotic branch of the ovarian artery

Final Surgical intervention

Removal of uterus



Prevention

- Make local guidelines, flow charts
 - Look at
 - WHO guideline
 - RCOG green top guideline 2011
 - National Guidelines
 - Training of maternity staff
 - Multidisciplinary team
 - Annual skill drills
 - Send your Key staff to ALSO course





ALSO course

Advanced life support in Obstetrics

- Nonprofit organization: primary function is to provide courses in the **management of obstetric emergencies**
- License from the Am. Acad. of Family Physicians 2001
- Recognised for **excellence** in obstetric education.
- Maternity care providers complete the course **every 3-5 yrs.**

Recommendation to avoid PPH

Active management of 3. stage of labour by skilled birth attendant

- give **uterotonic** soon after the baby's birth,

oxytocin (10 IU) preferred, or
Ergometrine (0.25 mg) or
Prostaglandins : Carboprost / im
misoprostol Cytotec



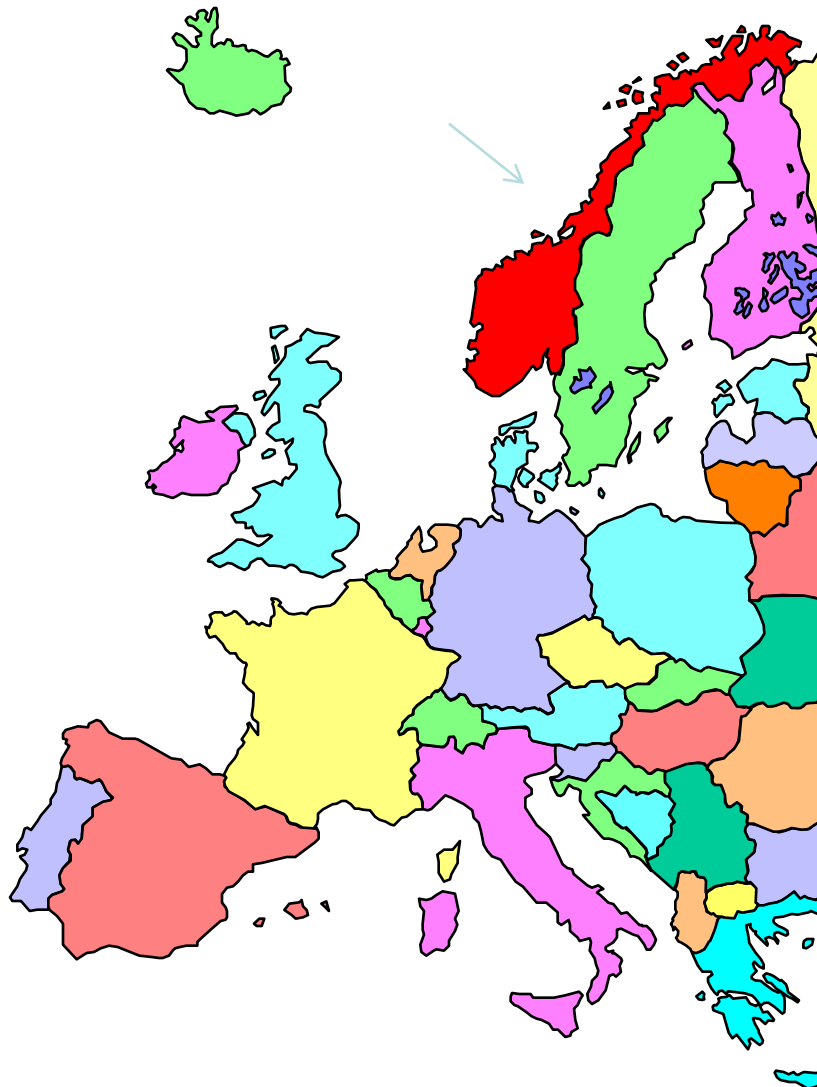
- **delayed cord clamping**
- delivery of placenta by **controlled cord traction**,
- **uterine massage.**

Summary of Handling

Active Management of Third Stage of Labor is imperative

- Always be prepared for PPH
 - risk factors are not always present
 - prevention does not always work
- Focus on the basics,
 - fluid/ blood product replacement
 - Follow the local protocol
- Tamponade with Balloon or gauze may be available
- Surgery

Norway



Population: : 5 mil

Birth: 60 000 per year

Antenatal care free

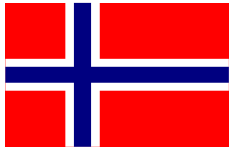
No private maternity hospitals

Midwives attend normal deliveries

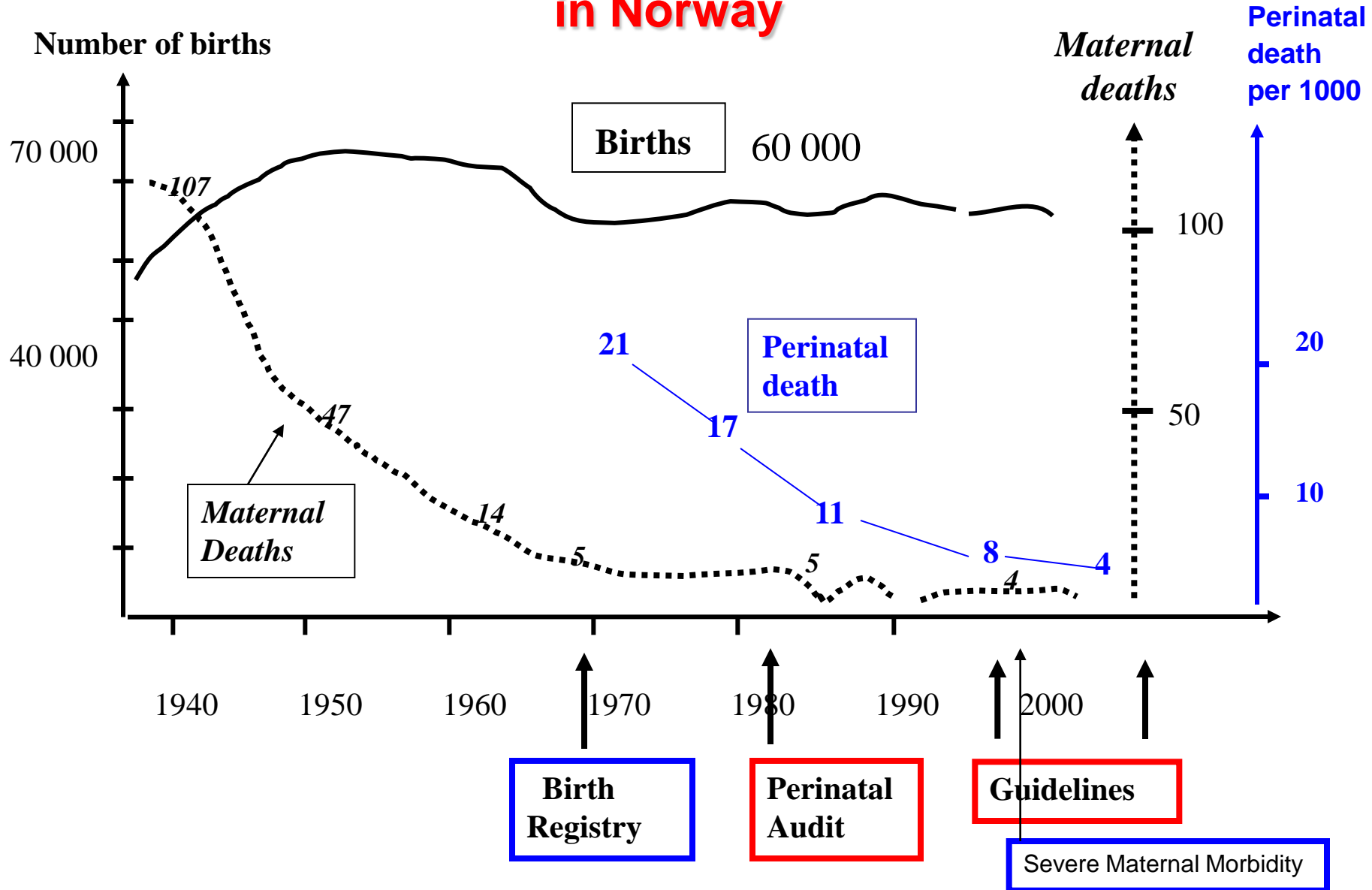
Assisted deliveries by OB 26%

C.section:





Maternal and perinatal mortality in Norway



How dangerous is labour and delivery for the mother ??

A Norwegian Research group

**Maternal Mortality and Severe Morbidity - Internat. collabor.
MOMS A and B (EU)**

Severe Obstetric hemorrhage - Medical Birth Register

Prospective Case - Control

Uterine rupture -

**Medical Birth Register
All cases in Norway last 40 years**

Research group

Babill Stray-Pedersen, leader

**Iqbal Al-Zirqi, PhD and post doc
LillTrine Nyfløt, PhD- candidate
Liv Ellingsen PhD- candicate
Lisa.Forsen statistician
Siri Vangen senior researcher ,**





Norway (1999 - 2005)

Study population: **307 500 mothers** > 16 gest.week

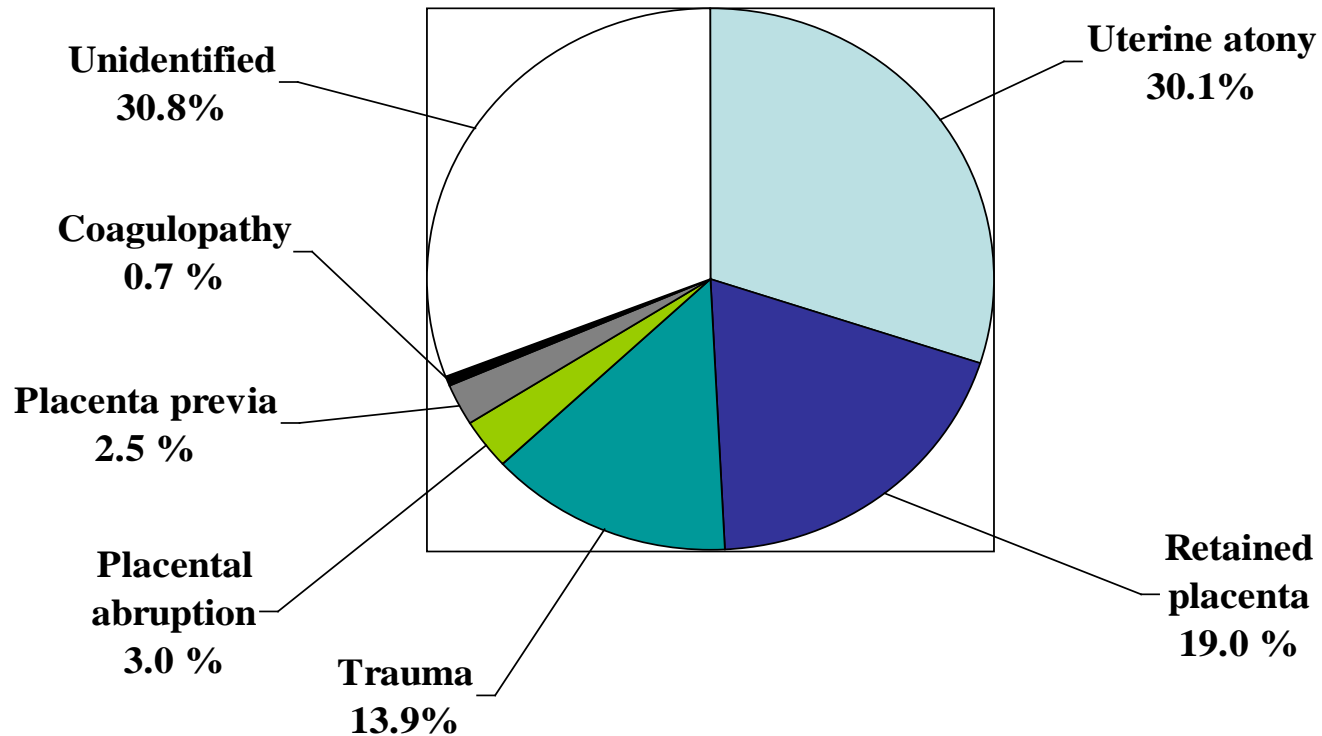
Severe obstetric hemorrhage,

- **bleeding > 1500 ml** < 24 hours postpartum (PP)
or
- **need for blood transfusion,**
-

Results

3501 mothers had severe PPH 1.1% .

Causes of severe obstetric haemorrhage



Risk factors for PPH > 1500ml:

307 500 women → 3501 cases (1.1%)

Variable	Adj odds ratio (95% CI)
Maternal age (ref: 25-29 yrs)	1
30-39	1.3 (1.2-1.4)
40+	1.8 (1.5-2.8)
Parity (ref: Para 1-4)	1
Para 0	1.3 (1.2-1.4)
Para 5+	1.1 (0.7-1.7)
Ethnic origin (ref: Europe)	1
South East Asian	1.7 (1.5-2.1)
Middle East	0.6 (0.4-0.8)
Induction of labour	1.6 (1.5-1.7)
Prolonged labour	1.9 (1.7-2.1)

Risk factors for PPH > 1500ml : 3501 cases

Mode of delivery	Adj. Odds Ratio (95%CI)	
Spontaneous vaginal (ref.)	1	
Operative vaginal	1.8	(1.6-2.0)
Previous C.Section	2.3	(1.6-3.1)
Elective C. Section	2.5	(2.2-2.8)
Emergency C.Section	3.6	(3.3-3.9)

Severe PPH

The impact of *mode of delivery* in women with *previous C.section*

Comparison

No previous CS

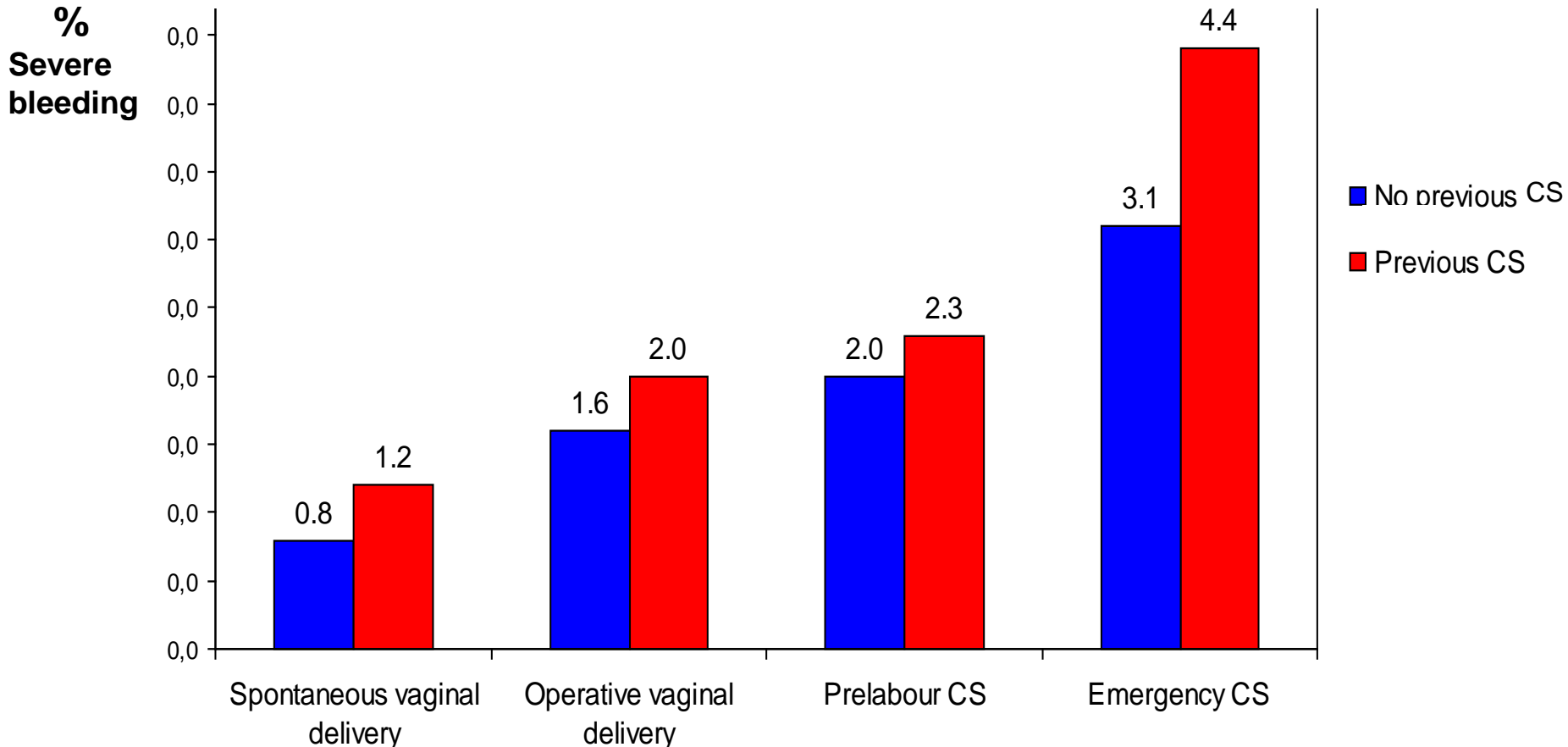
291 604 mothers →

1.0 % PPH

Previous CS

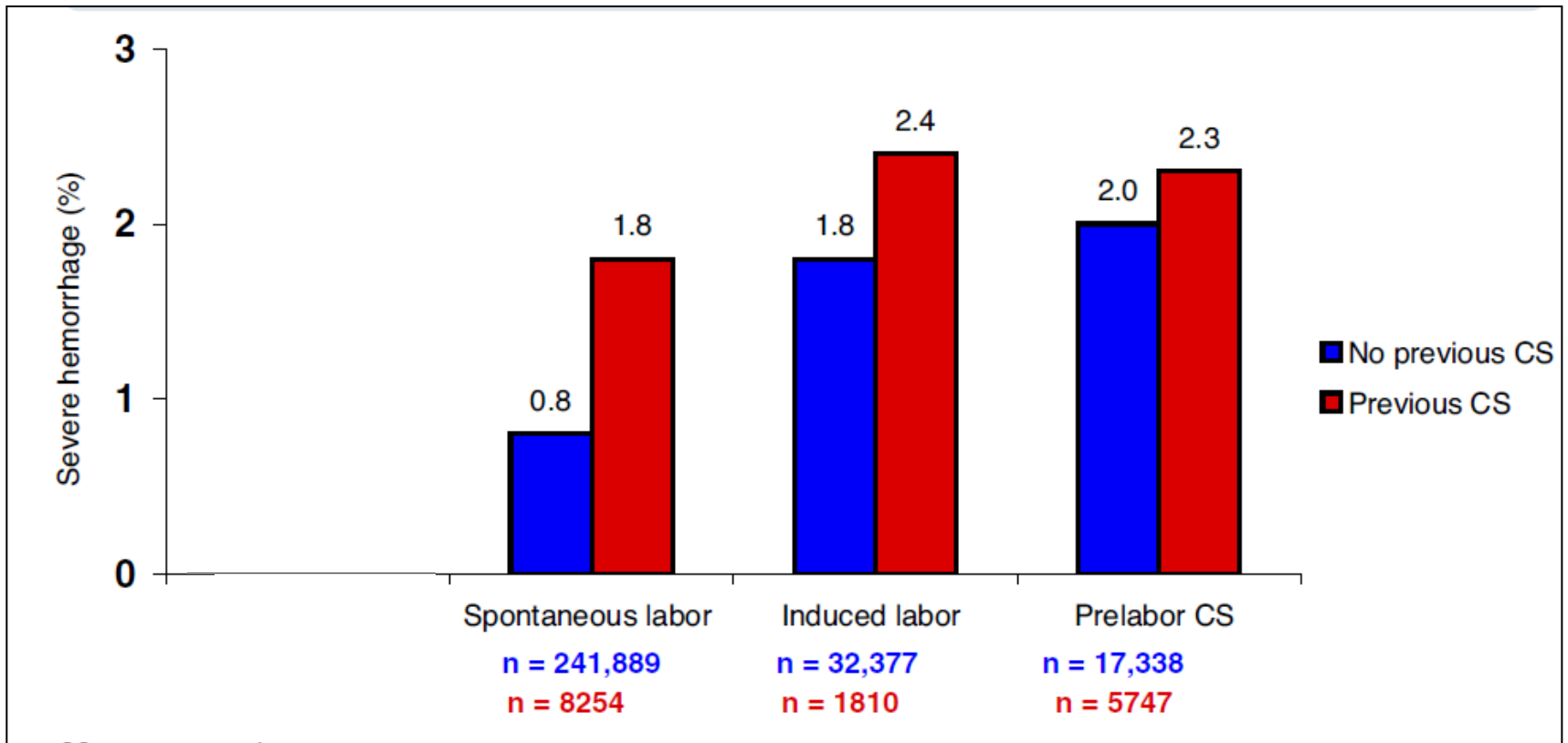
15 811 mothers →

2.1 % PPH



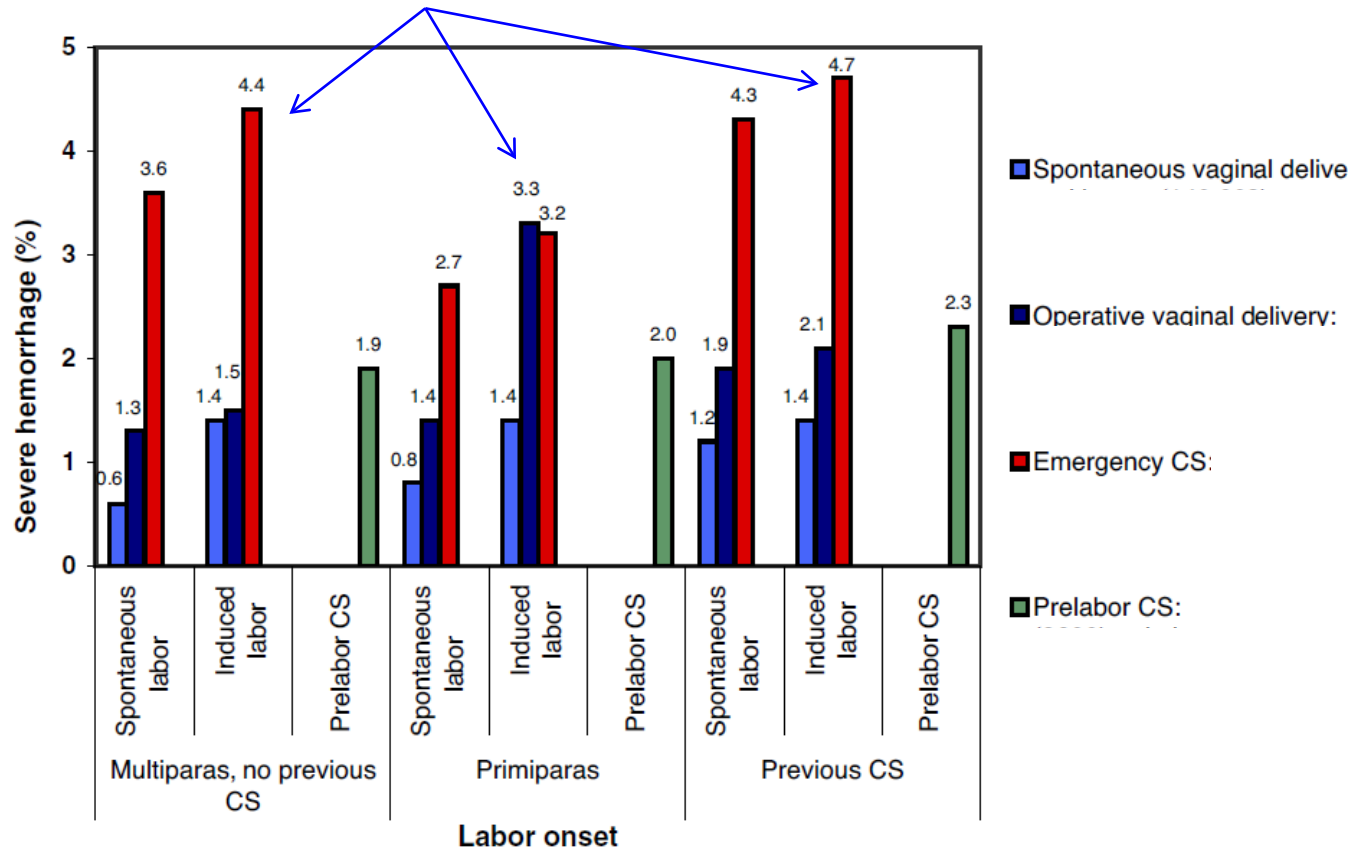
Mothers with previous C.section → more frequent severe bleeding

The impact of **onset of labor** on the risk of severe PPH > 1500 ml
in women with (N=15 811) and without (N= 291 604) **previous C.section**



Compared with spon. labor higher risk of bleeding Induction of labour (OR 1.7 (1.6-1.9)
Prelabor CS (OR 2.1 (1.8-2.3)

Severe Postpartum Hemorrhage for different onsets of labor and different delivery modes



Highest risk:

Emergency CS after induction in mothers with previous CS (OR, 6.57; 95% CI, 4.3–10.1)

Risk of maternal complications

3501 cases

Complication	No.	OR Severe PPH	(95% CI)
ICU admission	245	38.2	(32.5-44.8)
Sepsis	17	5.3	(3.2- 8.6)
Hysterectomy	6	115.9	(25.9-517.9)
Acute renal failure	2	86.9	(12.2-616.7)
Maternal death	7	46.8	(18.6-117.4)

Conclusion : Severe PPH

- Spontaneous labour and vaginal delivery had the lowest risk
- Induction increased the risk
- Prelabour CS had higher risk than spontaneous labour in mothers with and without previous CS.
- Mothers with previous CS
 - had higher risk of at all modes of deliveries except prelabor CS

- Highest risk of severe hemorrhage

- **Emergency CS after induction**

in mothers with previous CS

(OR, 6.9; 95% CI, 4.3–10.1)

- **Emergency CS** following spontaneous labor

in multiparas without previous CS

(OR: 6.8; 95% CI: 4.7-10.1).

Norwegian C.section project : 2000 Cs. → 32% comp

Risk of complications increases

unplanned acute c. section

low gest. age < 30 gest week

macrosomic babies

general anaesthesia

cervical dilation

0 cm → 16%

9-10cm → 33%

Uterine rupture



1. Uterine rupture after previous C section

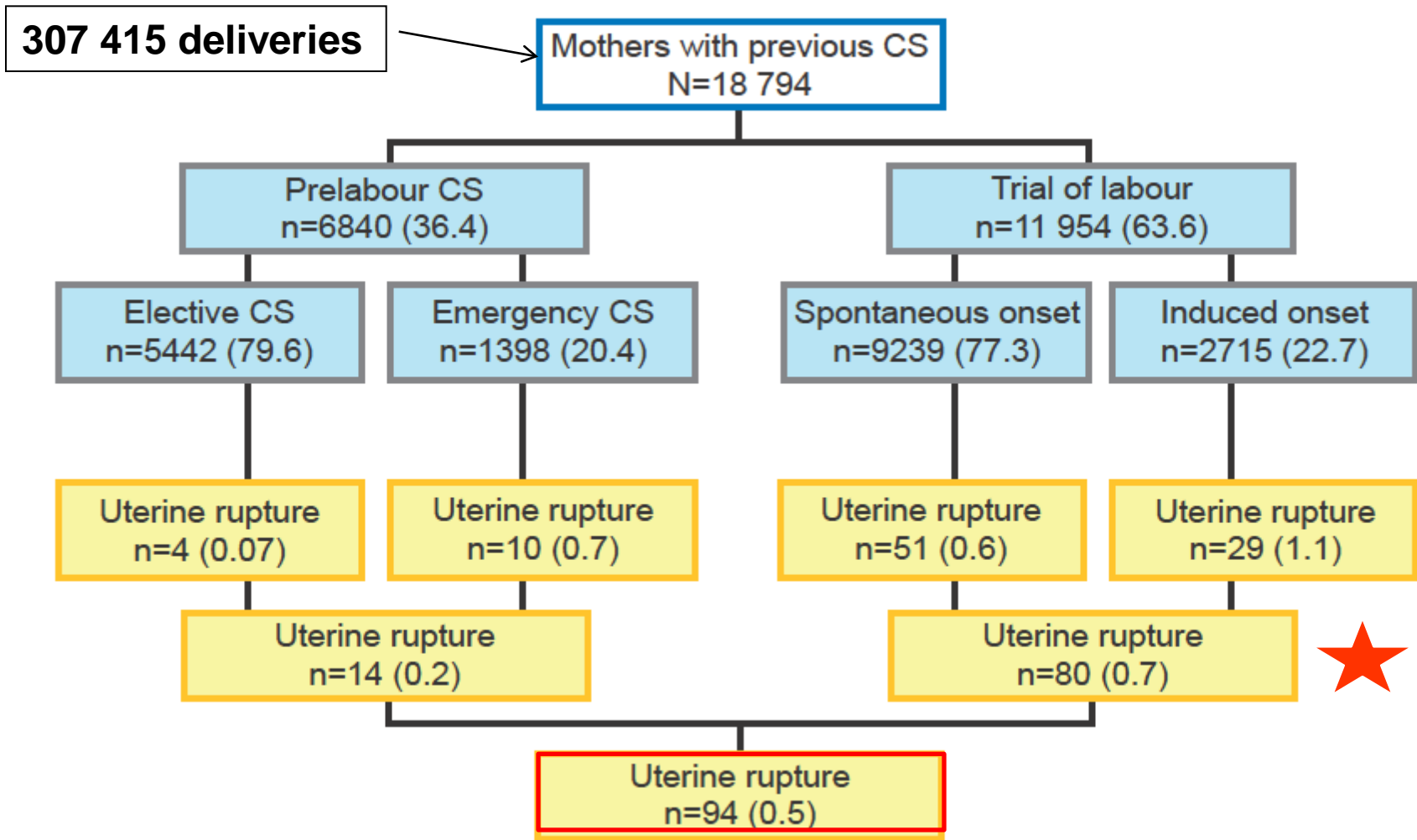
Al-Zirqi I, Stray-Pedersen B, Forsen L, Vangen S. BJOG 2010; 117:809–20.

5 years period (1999-2005): cases from Medical Birth Register of Norway



Uterine rupture at after previous C.Section

Prelabor CS and at trial of labor (%)



5 per 1000 previous C.section

Risk factors for Uterine rupture

18 794 previous C.Section

	Rupture /1000	Adjusted OR (95% CI)
<u>Start of labour</u>		
Elective CS (ref.)	0.7	1
Emergency prelabour CS	7.1	8.6 (2.6–28.0)
Spontaneous labour	5.5	6.6 (2.4–18.6)
Induced labour	10.7	12.6 (4.4–36.4) *
<u>Maternal age</u> <30yrs (ref.)	4.8	1
≥ 40	8.3	2.4 (1.1–5.5)
<u>Gestational age</u> 37- 40w (ref.)	3.9	1
≥ 41 w	9.7	1.7 (1.1–2.7)

*Only induction with prostaglandins increased the risk of rupture vs. Spontan labor in TOL group (OR: 2.72; 95%CI: 1.6–4.7)

Serious neonatal outcome after ruptures

Ruptures at:		No. (%)	Rupture vs. no rupture OR
Elective CS	5	0 (0.0)	NA
Emergency prelabour CS	11	0 (0.0)	NA
Trial of labour	81	9 (11.1) 3 deaths, 3 severe asphyxia, 3 post hypoxic encephalopathy	24.5 (11.9–51.9)

*Serious perinatal outcomes as a result of rupture occurred in **0.7/1000**

Conclusion

- The significant risk of severe bleeding related to CS indicates that C.section, even if planned, is not risk-free.
- Our findings support the recommendation to avoid induction of labour or CS without objective medical indication.
- Prelabour CS is a better option than trial of labor
- if the probability of emergency CS is considered to be high.