Evidence on term breech since the Term Breech Trial

Rixa Freeze, PhD

January 2018

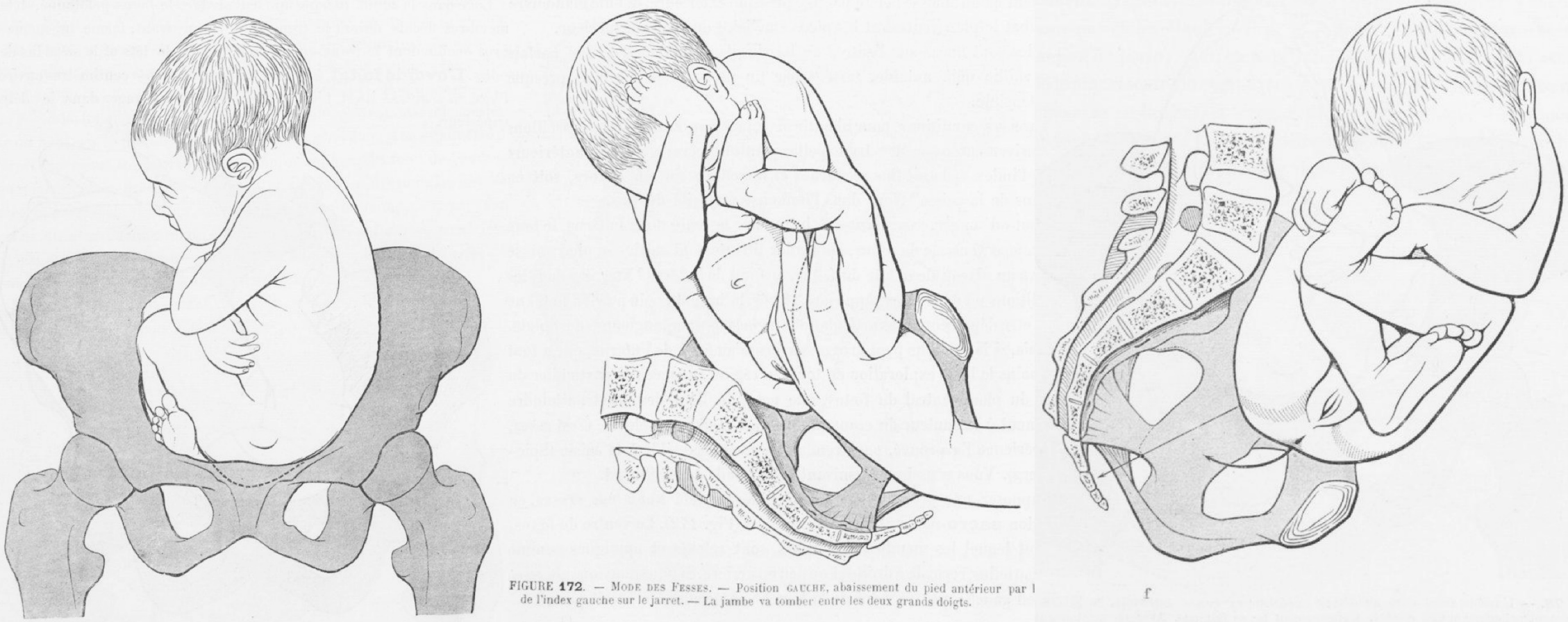


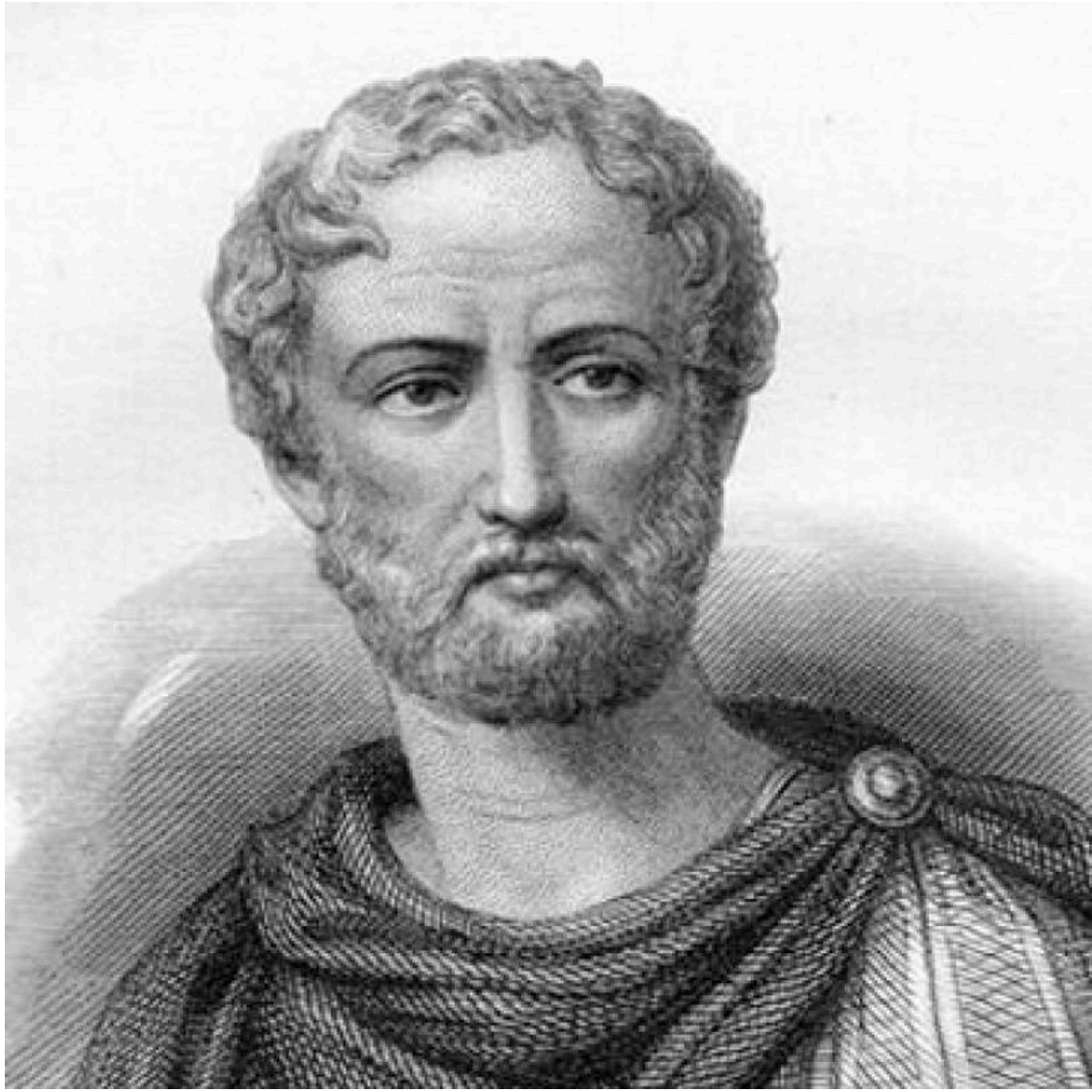
FIGURE 172. — Mode des Fesses. — Position gauche, abaissement du pied antérieur par l de l'index gauche sur le jarret. — La jambe va tomber entre les deux grands doigts.

Is vaginal breech birth safe?

Breech in ancient Rome

Pliny The Elder, *Natural History* (1st century AD)

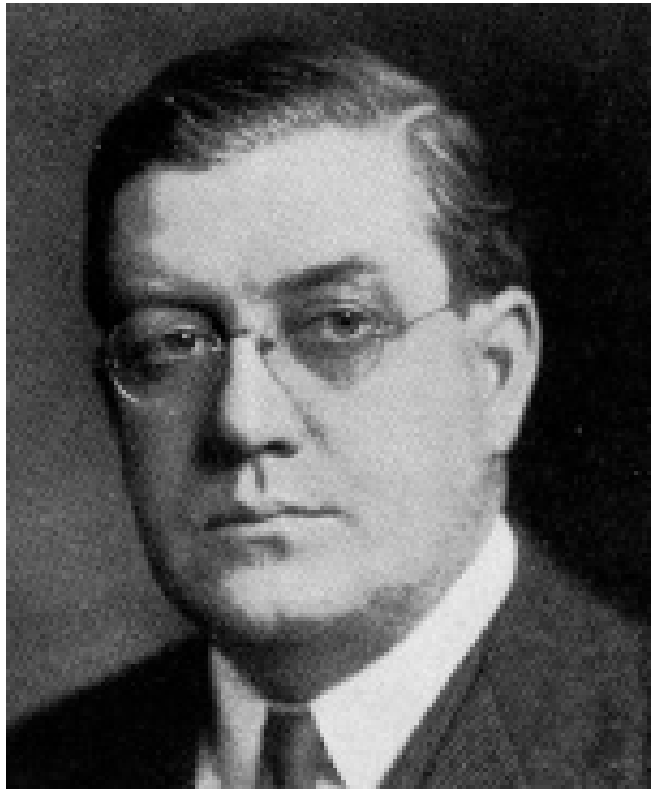
- “A breech delivery, feet first, is against nature and this is the reason why those so delivered are called Agrippa—as having been born with difficulty.”



Pliny the Elder. *Natural History*. Penguin UK, Feb 5, 2004

Dr. Jennings Crawford Litzenberg, 1870-1949, U of Minnesota

"Any physician who said that he wasn't afraid of a breech or never had trouble with a breech was either someone who didn't do any work in obstetrics or was an 'outright' liar."



Lang L. Management of breech presentation. *Lancet* 1961; 81: 210.

Breech birth is…

often **different**
sometimes **difficult**
on rare occasions, **dangerous**

- In depth: studies on term breech outcomes
- Briefly:
  - Pelvimetry
  - Innovations in vaginal breech birth
  - Other relevant research

- Preterm breech
- Multiple gestations
- ECV
- Studies on FHR/EFW/antenatal detection
- Causes of breech presentation
- Breech maneuvers

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Search results

Items: 1 to 20 of 1993

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1. Amnioinfusion for women with a singleton **breech** presentation and a previous failed external cephalic version: a randomized controlled trial.
Diguisto C, Winer N, Descriaud C, Tavernier E, Weymuller V, Giraudeau B, Perrotin F.
J Matern Fetal Neonatal Med. 2018 Apr;31(8):993-999. doi: 10.1080/14767058.2017.1304909. Epub 2017 Mar 28.
PMID: 28279119
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2. Neonatal outcomes of preterm twins according to mode of birth and presentation.
Hunter T, Shah J, Synnes A, Shivananda S, Ryan G, Shah PS, Murphy KE; ; on behalf of the Canadian Neonatal Network.
J Matern Fetal Neonatal Med. 2018 Mar;31(5):682-688. doi: 10.1080/14767058.2017.1295441. Epub 2017 Mar 8.
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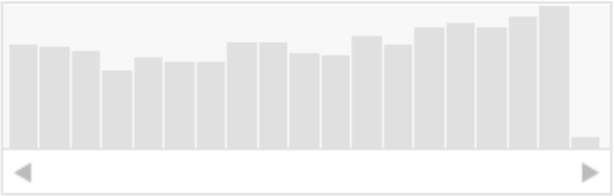
3. Developmental dysplasia of the hip: an update on diagnosis and management from birth to 6 months

Results by year



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Prevalence and Perinatal Outcomes of Singleton Term **Breech** Deli [J Environ Public Health. 2017]

[External cephalic version of **breech** fetus after 36 weeks of gestation - ev [Ceska Gynekol. 2017]

Maternal and neonatal outcomes of vaginal **breech** delivery for singleton te [BMJ Open. 2017]

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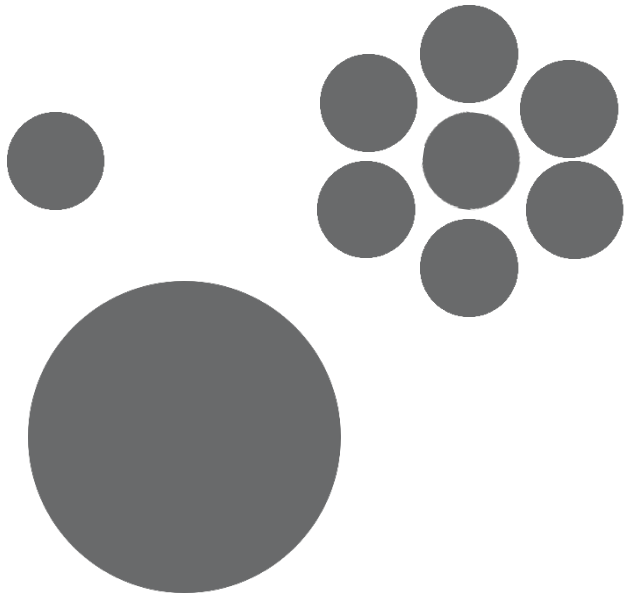

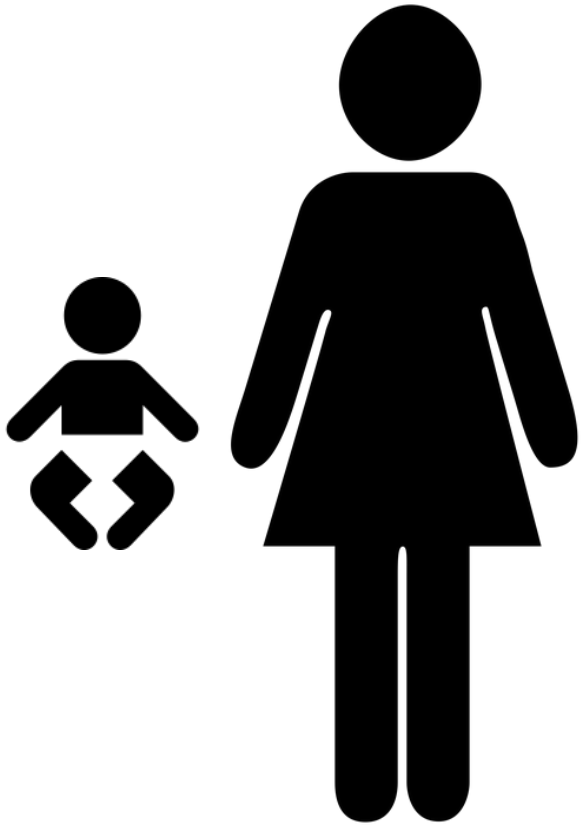

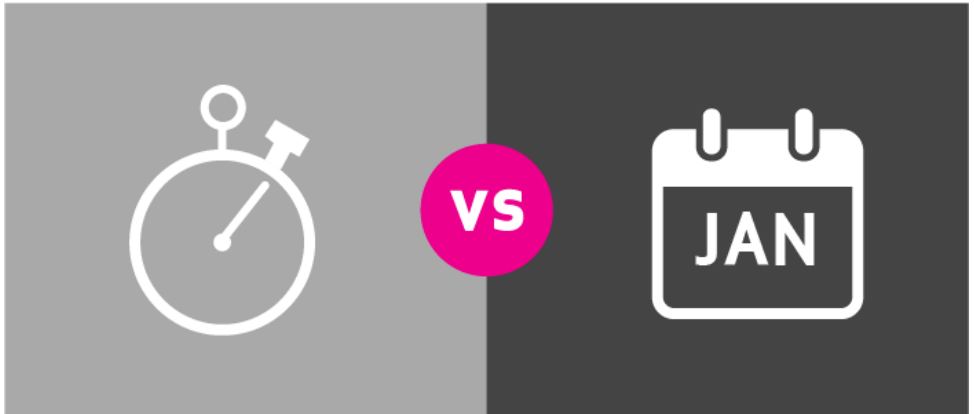
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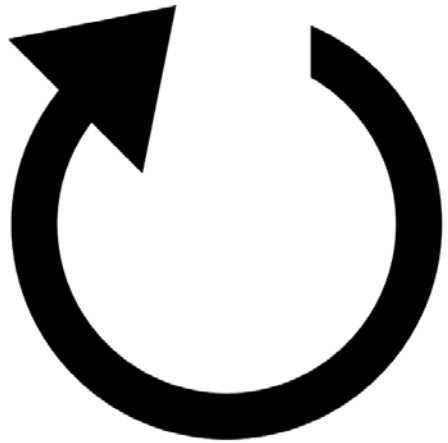


TBT: Term Breech Trial (2000)
VBB: vaginal breech birth
pVBB: planned vaginal breech birth
CS: cesarean section
pCS: planned cesarean section
ILCS: in-labor cesarean section
MOD: mode of delivery
PNM: perinatal mortality
NNM: neonatal mortality
NN Mb: neonatal morbidity
M Mb: maternal morbidity

Wright 1959 (USA)

Trolle 1960 (Denmark)

Reduction of Perinatal Mortality and Morbidity in Breech Delivery Through Routine Use of Cesarean Section

RALPH C. WRIGHT, M.D.

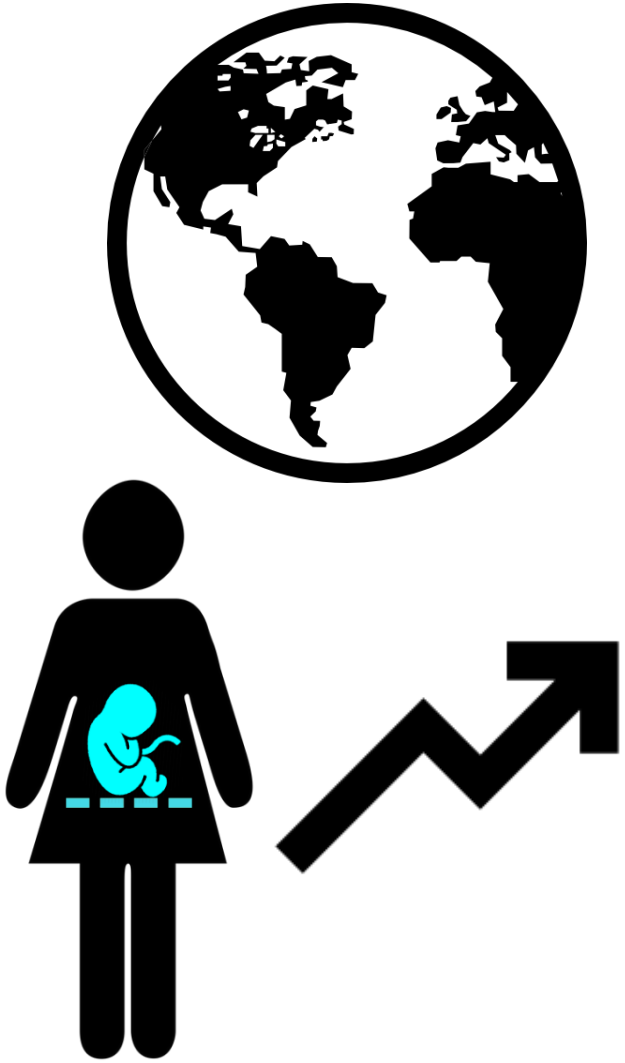
IN SPITE OF BETTER understanding and improved technics, breech delivery continues to present a serious problem to the obstetrician. Certainly the loss or damage of a baby *as the result of labor and delivery* is one of the most distressing circumstances encountered in our specialty, both to doctor and patient. In our efforts to reduce perinatal mortality and morbidity, we must develop a *safer* approach to delivery of the fetus in breech presentation.

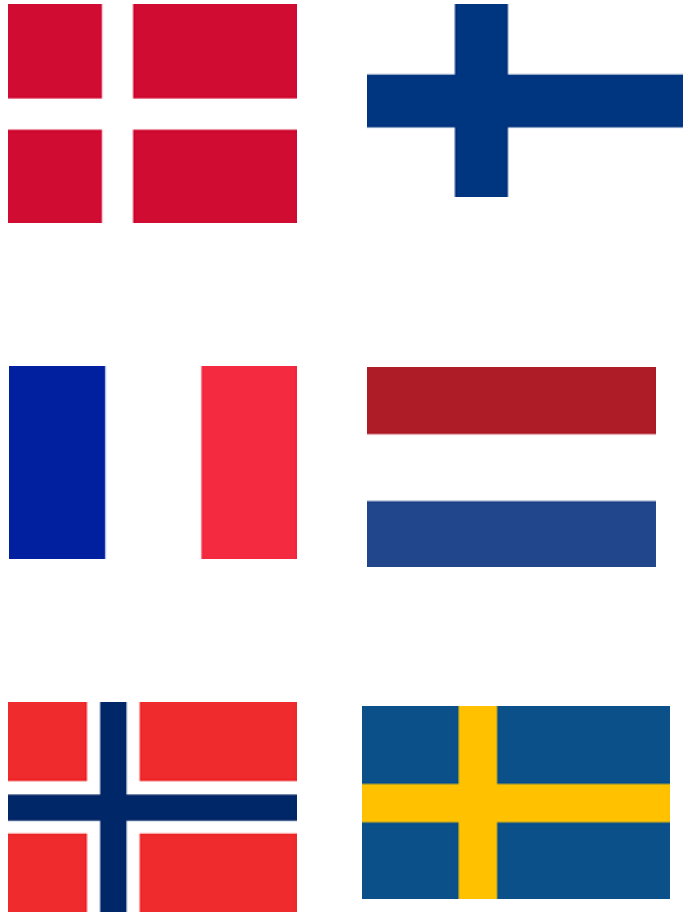
Recognizing the problem, many have recommended external version during the antepartum period, and where this can be done effectively and safely it is a useful procedure. However, at best, it is only a partial solution.

Kohl, pooling the results from a number of teaching institutions, were able to analyze the results of 1456 breech deliveries performed since 1950. The corrected fetal mortality rate of premature infants was 26.9 per cent, while that of mature infants was 4.7 per cent. It is significant that the fetal mortality of mature breech infants delivered by cesarean section was only 1.6 per cent, or one third the fetal loss from vaginal delivery. This suggests that *two thirds of the term infants lost at breech delivery could be salvaged by routine cesarean section.*

In the statistics obtained from the Community Obstetrical Study in Hartford County, Conn. (April 1959), there were 358 term

Before the Term Breech Trial





RCTs before the Term Breech Trial

Collea (1980): 208 frank TB

Gimovsky (1983): 105 nonfrank TB

Randomized Management of the Nonfrank Bre Presentation at Term: A Preliminary Report

MARTIN L. GIMOVSKY, ROGER L. WALLACE, BARRY S. SCHIFRIN
RICHARD H. PAUL

Division of Maternal-Fetal Medicine, Department of Obstetrics and Gynecology, University of Southern California School and Women's Hospital, Los Angeles County/University of Southern California Medical Center, Los Angeles, Calif

Am. J. Obstet. Gynecol. *146:* 34, 1983

Concern over the rising cesarean section rate has led to renewed interest in possible alternatives to routine cesarean section for breech delivery. One potential method is the use of protocols to select patients who may be allowed a trial of labor. This method has been limited to the term frank breech presenting infant, but retrospective data suggest that it may apply to nonfrank breech pr term also. The present authors undertook a prospective study, comparing elective cesare a selective management protocol for nonfrank presentation.

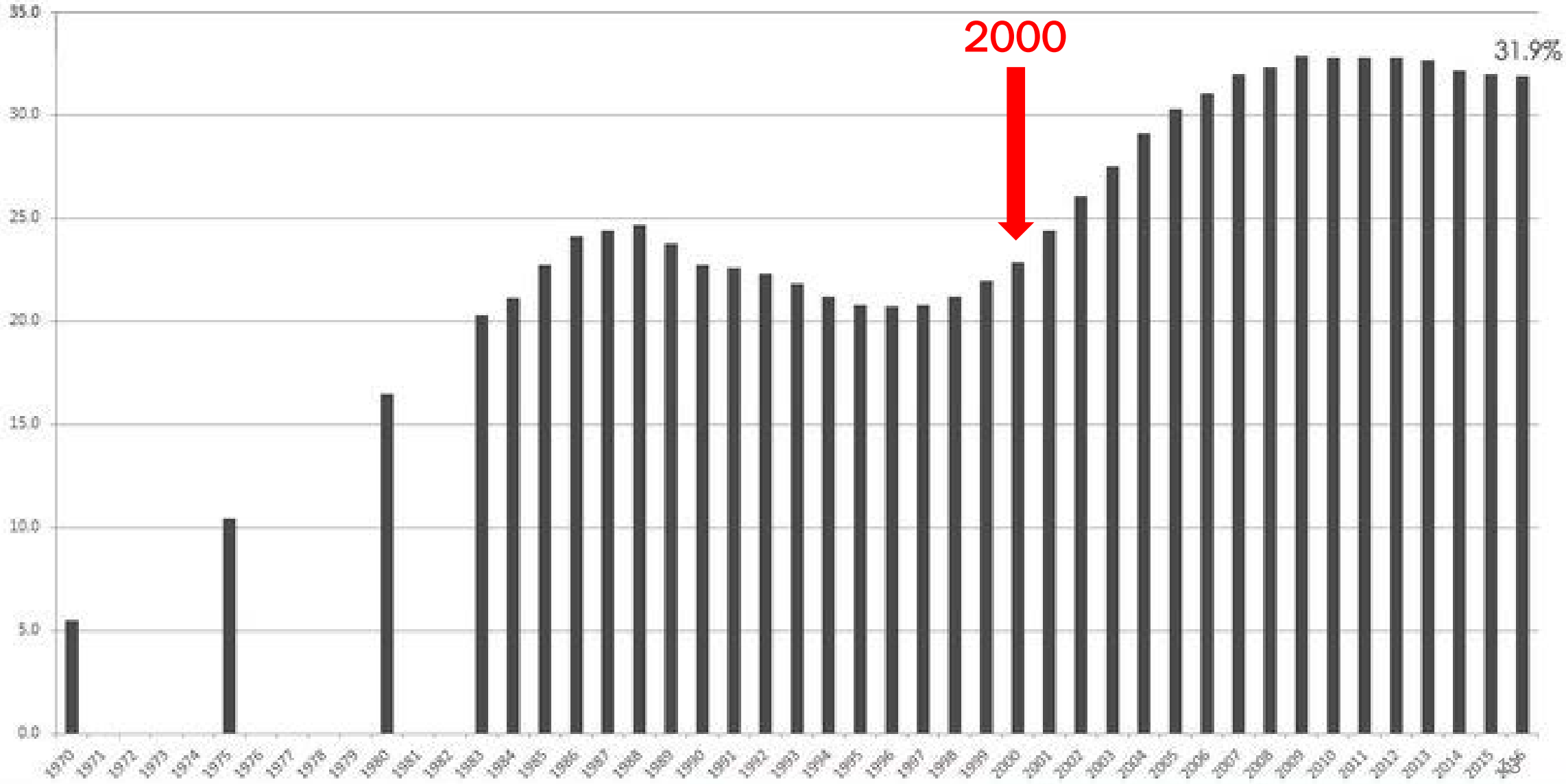
One hundred and five patients participated

The randomized management of term frank breech presentation: A study of 208 cases

JOSEPH V. COLLEA, M.D.
CONNIE CHEIN, M.D.
EDWARD J. QUILLIGAN, M.D.
Los Angeles, California

A prospective study of 208 women in labor at term with singleton fetuses in a frank breech presentation was carried out. One hundred fifteen patients were randomized to a vaginal delivery group and 93 to an elective cesarean section group. Of the 93 women scheduled for cesarean section, 88 were delivered according to protocol. Five women progressed rapidly in labor and were delivered vaginally without complications. Of the 115 women scheduled for vaginal delivery, x-ray pelvimetry was obtained on 112. Three women were delivered vaginally without incident before x-ray pelvimetry could be obtained. One of these women was delivered of an infant who died shortly after birth of lethal congenital anomalies. Of the 112 women with x-ray pelvimetry, 52 had one or more inadequate pelvic measurements and were scheduled for indicated cesarean section. Three women, however, were delivered vaginally without incident before operation could be performed. Of the remaining 60 patients in this group, 49 were delivered vaginally without a perinatal death. Eleven women required cesarean section for difficulties during labor. There were no maternal deaths, but 73 (49.3%) of the 148 women who were delivered by cesarean section in this study experienced postpartum morbidity. Only four (6.7%) of the 60 women delivered vaginally had postpartum complications. Based on the data, it seems reasonable to allow vaginal delivery in carefully selected cases of term frank breech presentation. (AM. J. OBSTET. GYNECOL. 137:235, 1980.)

U.S. Cesarean Rate, 1970 - 2016



One study to rule them all…

"A prospective randomised trial is urgently needed to provide definitive evidence on the safest method of delivering fetuses in breech presentation at term." (Danielian 1996)

Term Breech Trial

- 122 centers in 26 countries
- 2,088 women randomized
- Selection criteria:
  - singleton term breech
  - live at randomization
  - frank/complete
  - <4000 g
  - head not hyperextended
  - no fetal anomalies

Articles

Planned caesarean section versus planned vaginal birth for breech presentation at term: a randomised multicentre trial

*Mary E Hannah, Walter J Hannah, Sheila A Hewson, Ellen D Hodnett, Saroj Saigal, Andrew R Willan, for the Term Breech Trial Collaborative Group**

Summary

Background For 3–4% of pregnancies, the fetus will be in the breech presentation at term. For most of these women, the approach to delivery is controversial. We did a randomised trial to compare a policy of planned caesarean section with a policy of planned vaginal birth for selected breech-presentation pregnancies.

Methods At 121 centres in 26 countries, 2088 women with a singleton fetus in a frank or complete breech presentation were randomly assigned planned caesarean section or planned vaginal birth. Women having a vaginal breech delivery had an experienced clinician at the birth. Mothers and infants were followed-up to 6 weeks post partum. The primary outcomes were perinatal mortality, neonatal mortality, or serious neonatal morbidity; and maternal mortality or serious maternal morbidity. Analysis was by intention to treat.

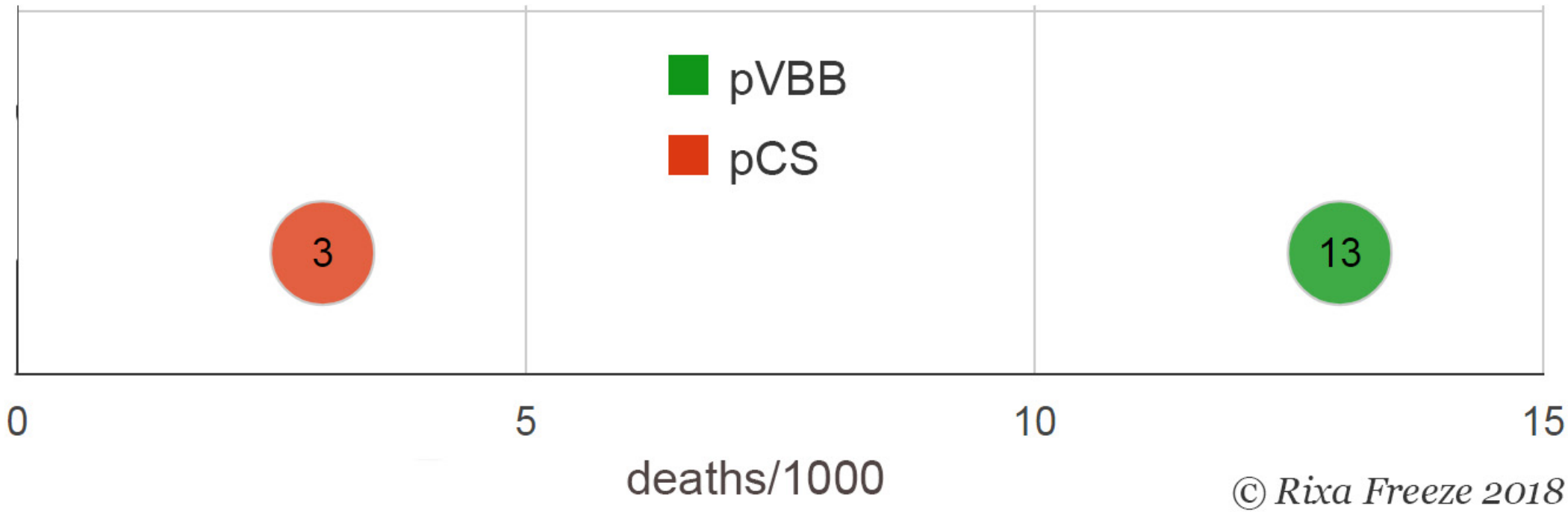
Findings Data were received for 2083 women. Of the 1041 women assigned planned caesarean section, 941 (90·4%) were delivered by caesarean section. Of the 1042 women assigned planned vaginal birth, 591 (56·7%) delivered vaginally. Perinatal mortality, neonatal mortality, or serious

Introduction

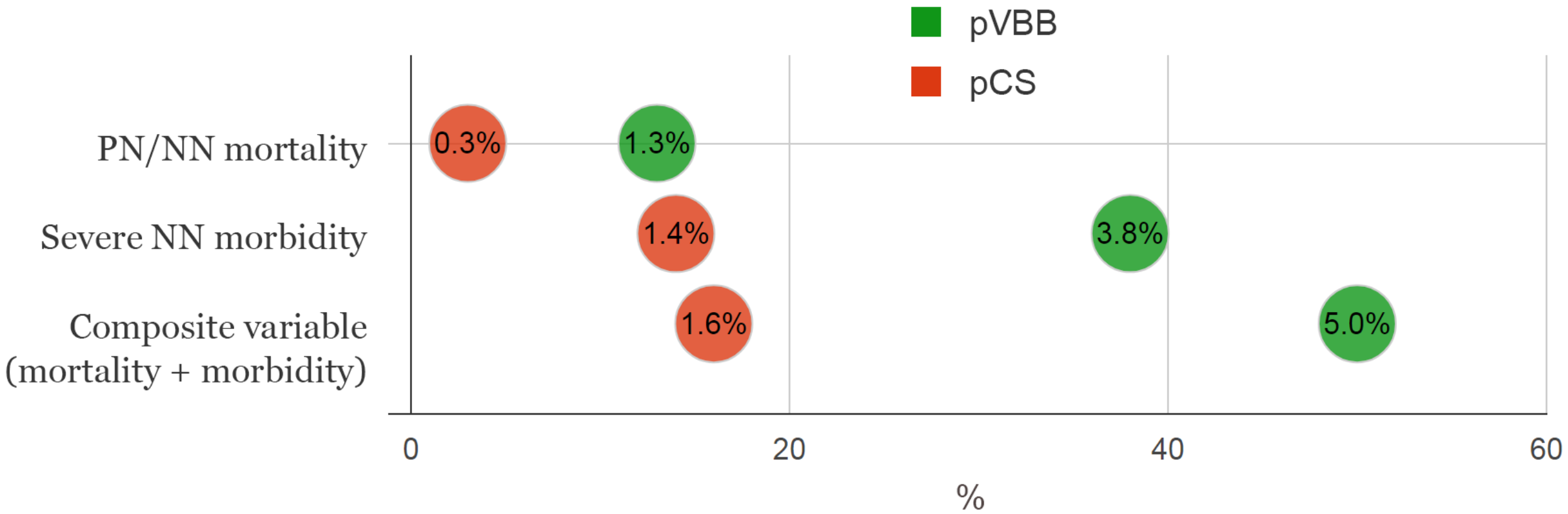
About 3–4% of all pregnancies reach term with a fetus in the breech presentation.[1] Data from previously published cohort studies have shown that, in general, planned caesarean section is better than planned vaginal birth for the fetus that presents as a breech at term.[2,3] These studies are potentially biased, however, because women were not allocated to the different modes of delivery at random. Other concerns are that the studies might have included pregnancies that would not currently be considered for a trial of labour (eg, footling breech presentation [with the feet entering the birth canal ahead of any other part of the body]), and that clinicians undertaking vaginal breech deliveries may not have been experienced in the technique. Two randomised controlled trials and a Cochrane meta-analysis of these trials have not found planned caesarean section to be associated with substantial benefits for the fetus, but both trials had very small sample sizes.[4–6]

There is a general consensus that planned caesarean section is better than planned vaginal birth for the delivery of the fetus in the breech presentation at term if the presentation is footling, if the fetus is compromised, if the fetus is large or has a congenital abnormality that

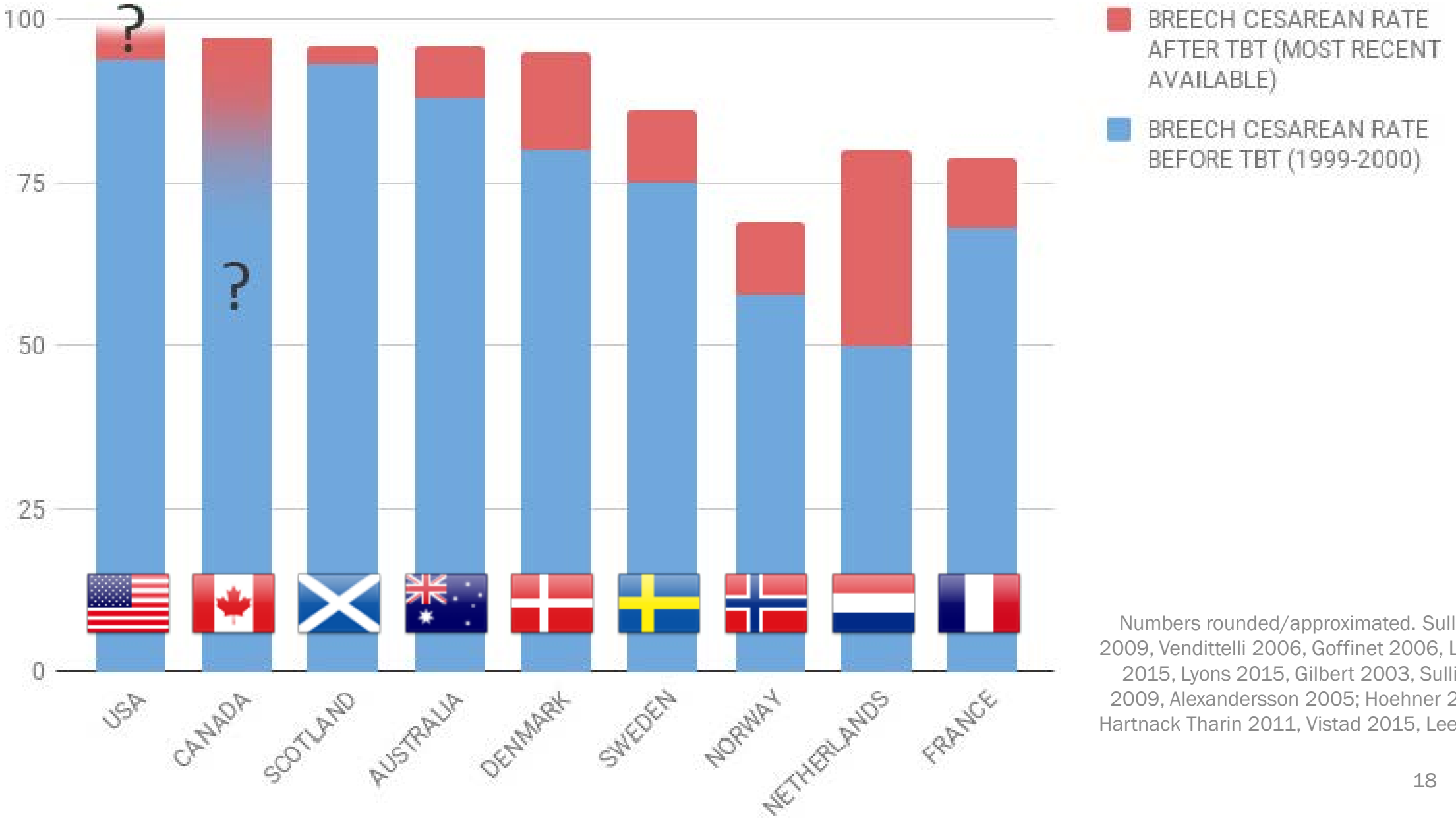
PNM/NNM in the Term Breech Trial



Mortality & severe morbidity in the Term Breech Trial



CHANGES IN CESAREAN RATE FOR TERM BREECHES



Numbers rounded/approximated. Sullivan 2009, Vendittelli 2006, Goffinet 2006, Lansac 2015, Lyons 2015, Gilbert 2003, Sullivan 2009, Alexandersson 2005; Hoehner 2006, Hartnack Tharin 2011, Vistad 2015, Lee 2008

Netherlands

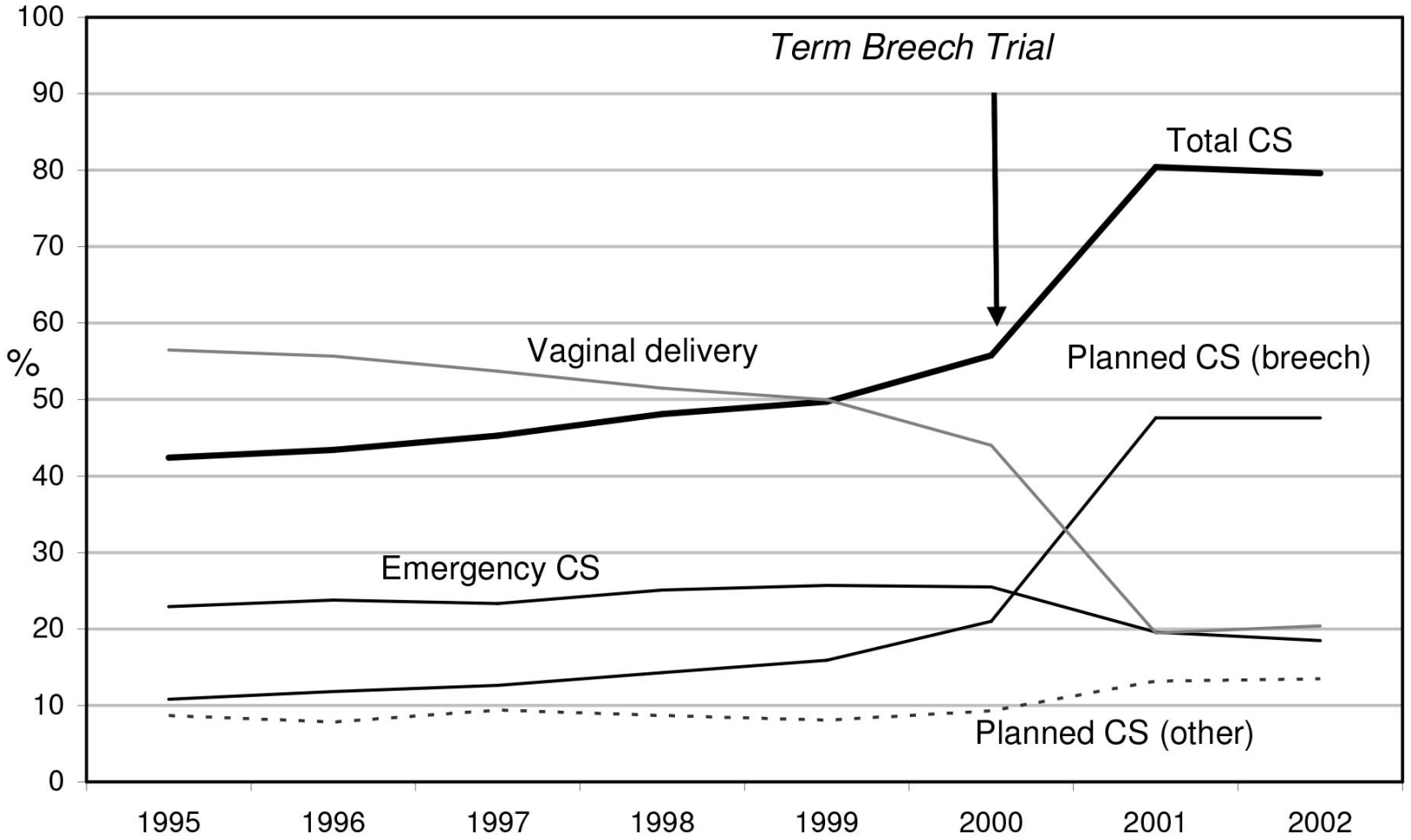


Figure 1. Trends in vaginal delivery and caesarean section in women with a term singleton infant in breech presentation between 1995 – 2002.

Tanzania

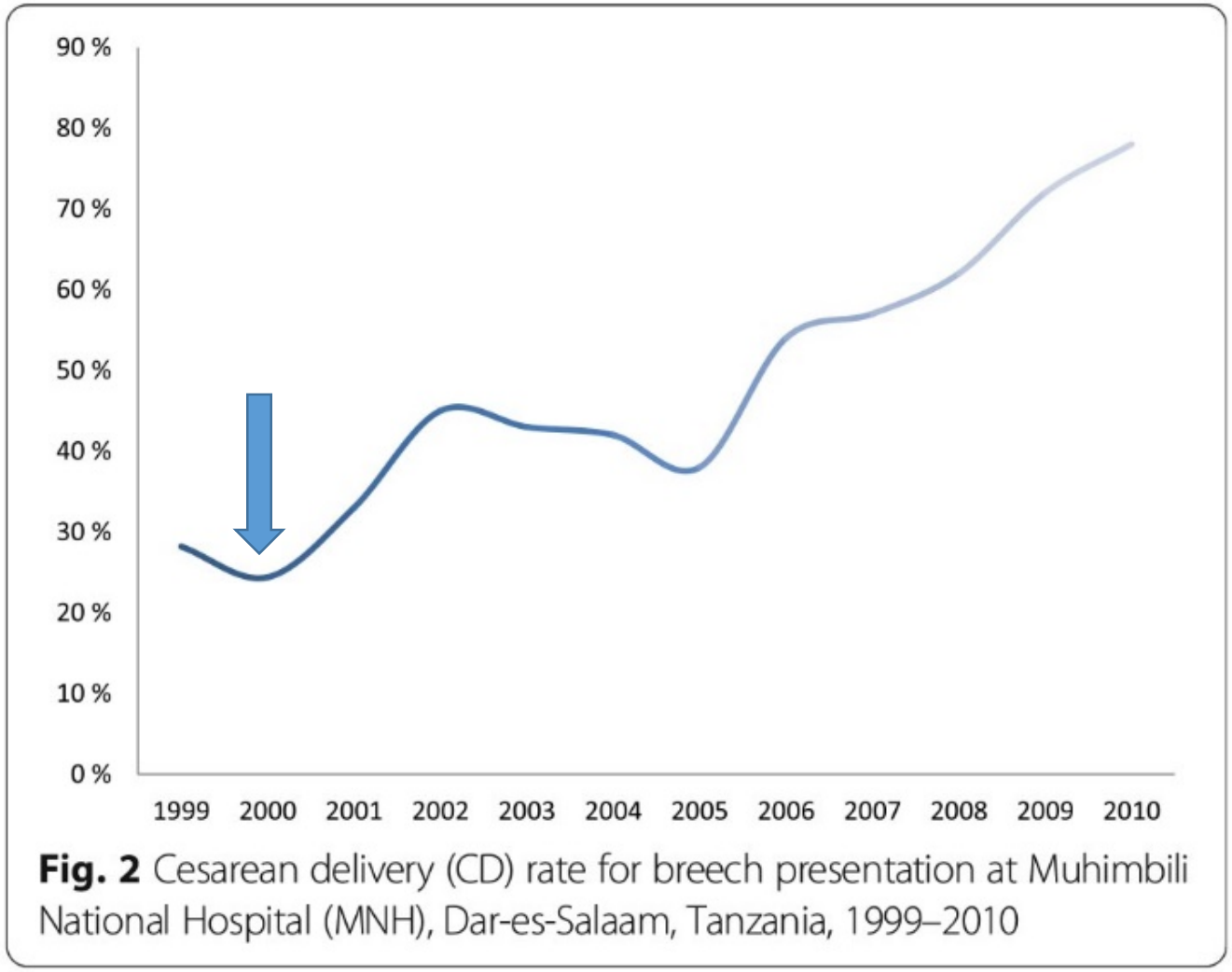
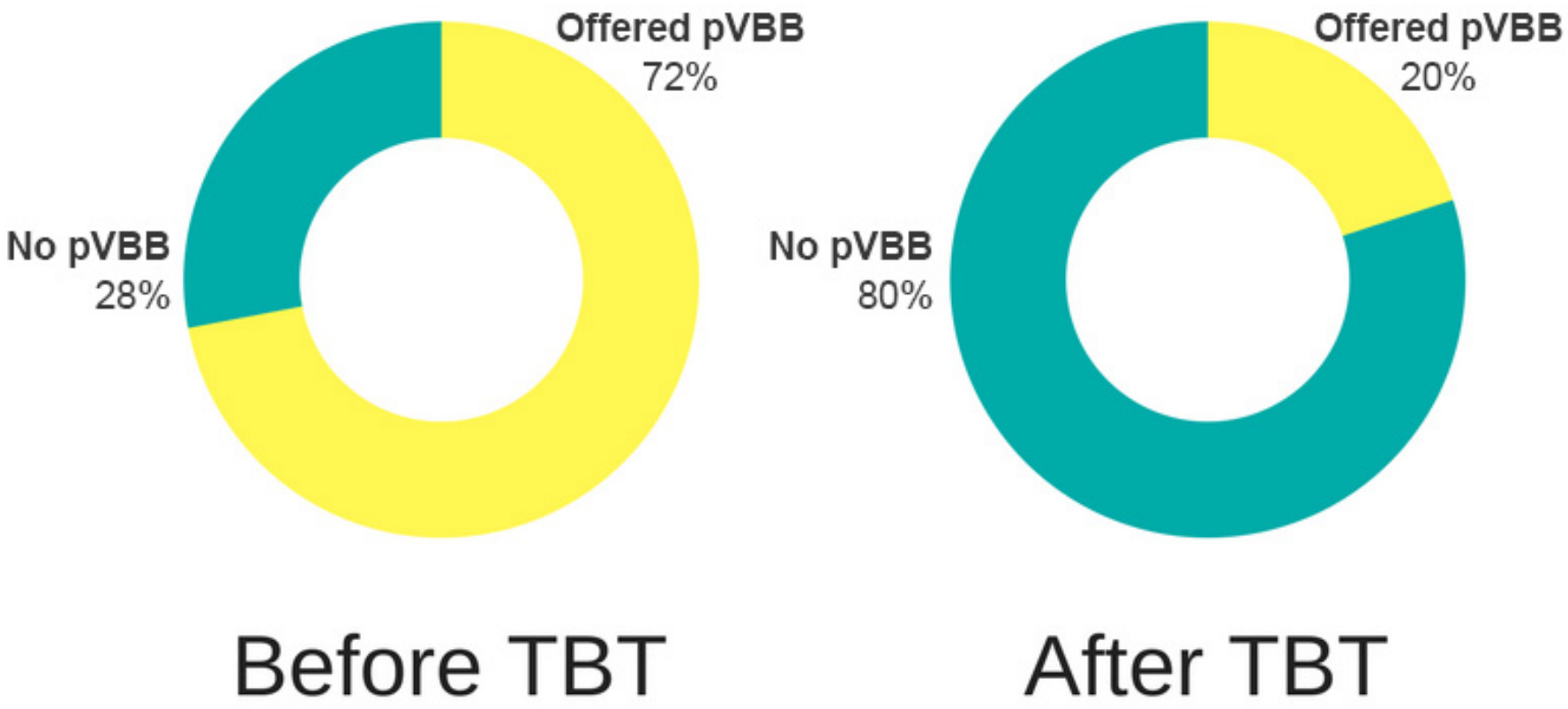


Fig. 2 Cesarean delivery (CD) rate for breech presentation at Muhimbili National Hospital (MNH), Dar-es-Salaam, Tanzania, 1999–2010

TBT centers in 2002

Australian OBs



Critiques of TBT

Recruitment & randomization

- High rate of randomization during labor (43% overall)
  - 50% of pCS group were randomized in active labor
- Twins, cephalic births accidentally included
- High rates of non-participation in some countries (1 woman from Denmark)

Jensen 2015, Glezerman 2005, Vendittelli 2002, Vendittelli 2006, Turner 2006, Daviss 2010, Van 2002, Vidaeff 2006, Halmesmaki 2001, Kotaska 2004, Keirse 2002, Grant 2002

Critiques of TBT

Labor management & protocols

- Not all mothers had an experienced OB present
- cEFM rare
- Pelvimetry not routine
- Many centers did not have access to ultrasound
- > 30% had no ultrasound to confirm head flexion
- Inconsistent labor management & suboptimal standard of care in some hospitals

Jensen 2015, Glezerman 2005, Vendittelli 2002, Vendittelli 2006, Turner 2006, Daviss 2010, Van 2002, Vidaeff 2006, Halmesmaki 2001, Kotaska 2004, Keirse 2002, Grant 2002

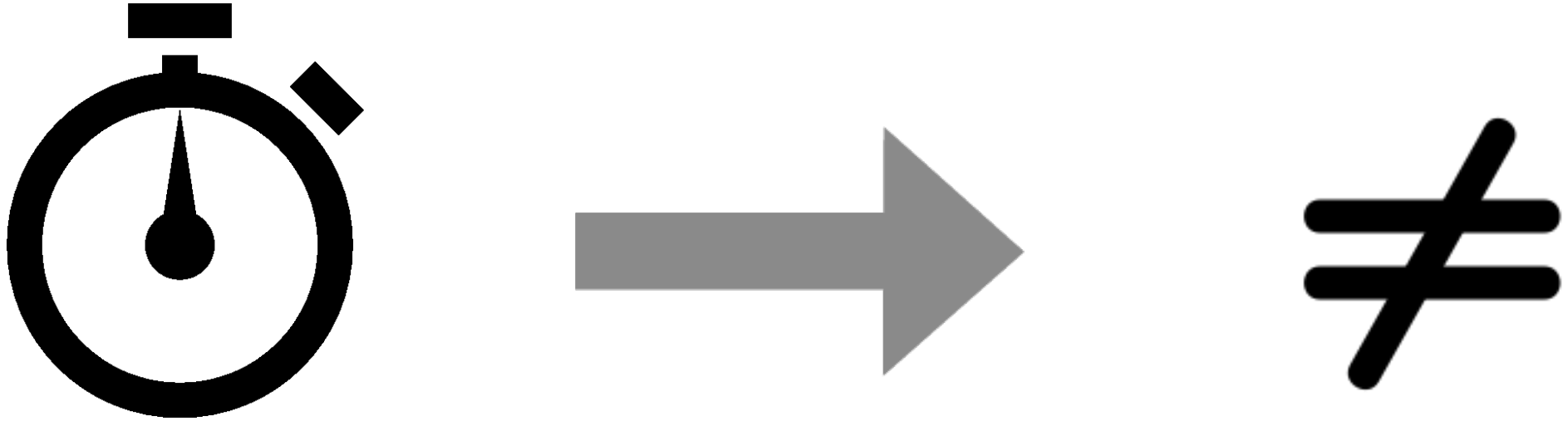
Critiques of TBT

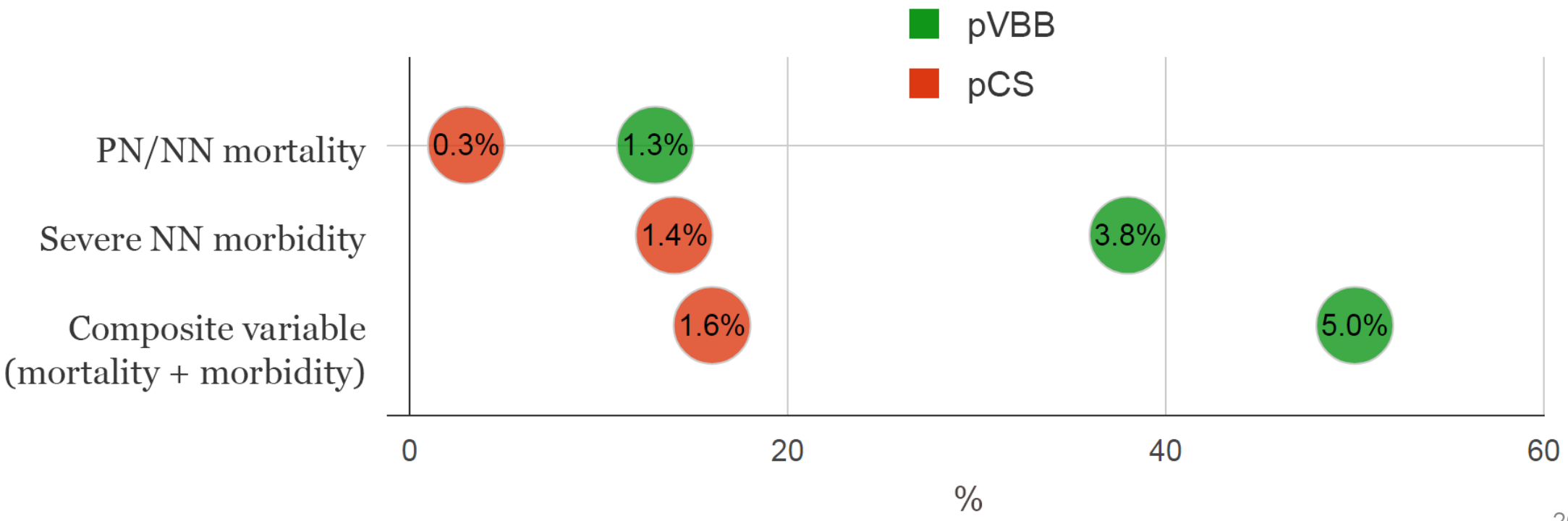
Most cases of perinatal death (out of 16 total) not attributable to mode of delivery

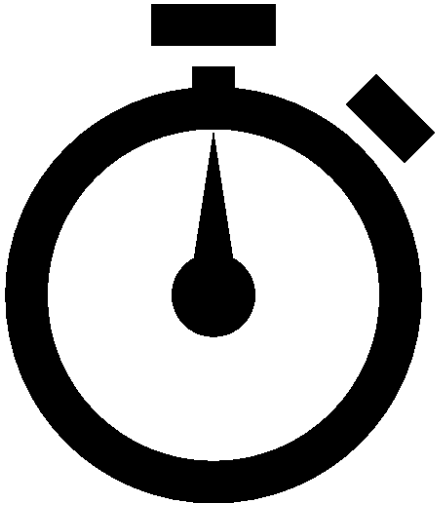
Of these 16 perinatal deaths, there were…

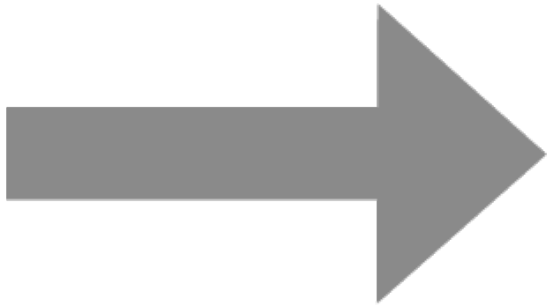
- 2 sets of twins (1 stillborn before randomization)
- 2 growth restricted babies
- 1 malformed baby
- 1 baby with spina bifida
- 1 cephalic presentation (stillborn before randomization)

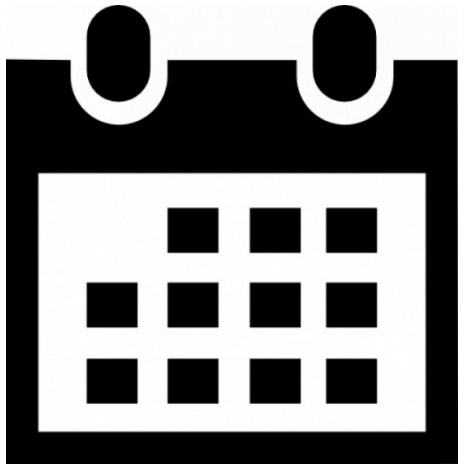
Jensen 2015, Glezerman 2005, Vendittelli 2002, Vendittelli 2006, Turner 2006, Daviss 2010, Van 2002, Vidaeff 2006, Halmesmaki 2001, Kotaska 2004, Keirse 2002, Grant 2002

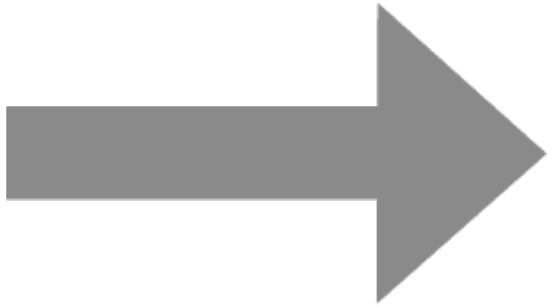












Long-term 2-year followup

- No increased risk of death or neuro-developmental delay at 2 years of age

American Journal of Obstetrics and Gynecology (2004) 191, 864–71

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Outcomes of children at 2 years after planned cesarean birth versus planned vaginal birth for breech presentation at term: The International Randomized Term Breech Trial

Hilary Whyte, MD,[a,d] Mary E. Hannah, MDCM,[b,d,e] Saroj Saigal, MD,[i] Walter J. Hannah, MD,[b] Sheila Hewson, BA,[e] Kofi Amankwah, MD,[b] Mary ...D,[e,h] Patricia Guselle, BA,[e] Michael Helewa, MD,[j] ...leen Hutton, PhD,[b] Rose Kung, MD,[b] ...ss, PhD,[b,d] Andrew Willan, PhD,[c,e] for the 2-year ... Trial Collaborative Group (Appendix)

...ck Children,[a] Department of Obstetrics and Gynaecology, Sunnybrook and ... Public Health Sciences,[c] Health Policy Management and Evaluation,[d] ... Research Unit at the Centre for Research in Women's Health,[e] ..., Toronto, Ontario, Canada, Department of Obstetrics and Gynaecology, ...o, Canada, Department of Clinical Epidemiology and Biostatistics[h] and ...on, Ontario, Canada, and Department of Obstetrics and Gynaecology, St ..., Winnipeg, Manitoba, Canada[j]

KEY WORDS
Cesarean delivery
Breech presentation
Infant

Objective: The purpose of this study was to determine whether planned cesarean delivery for the singleton fetus in breech presentation at term reduces the risk of death or neurodevelopmental delay at 2 years of age.

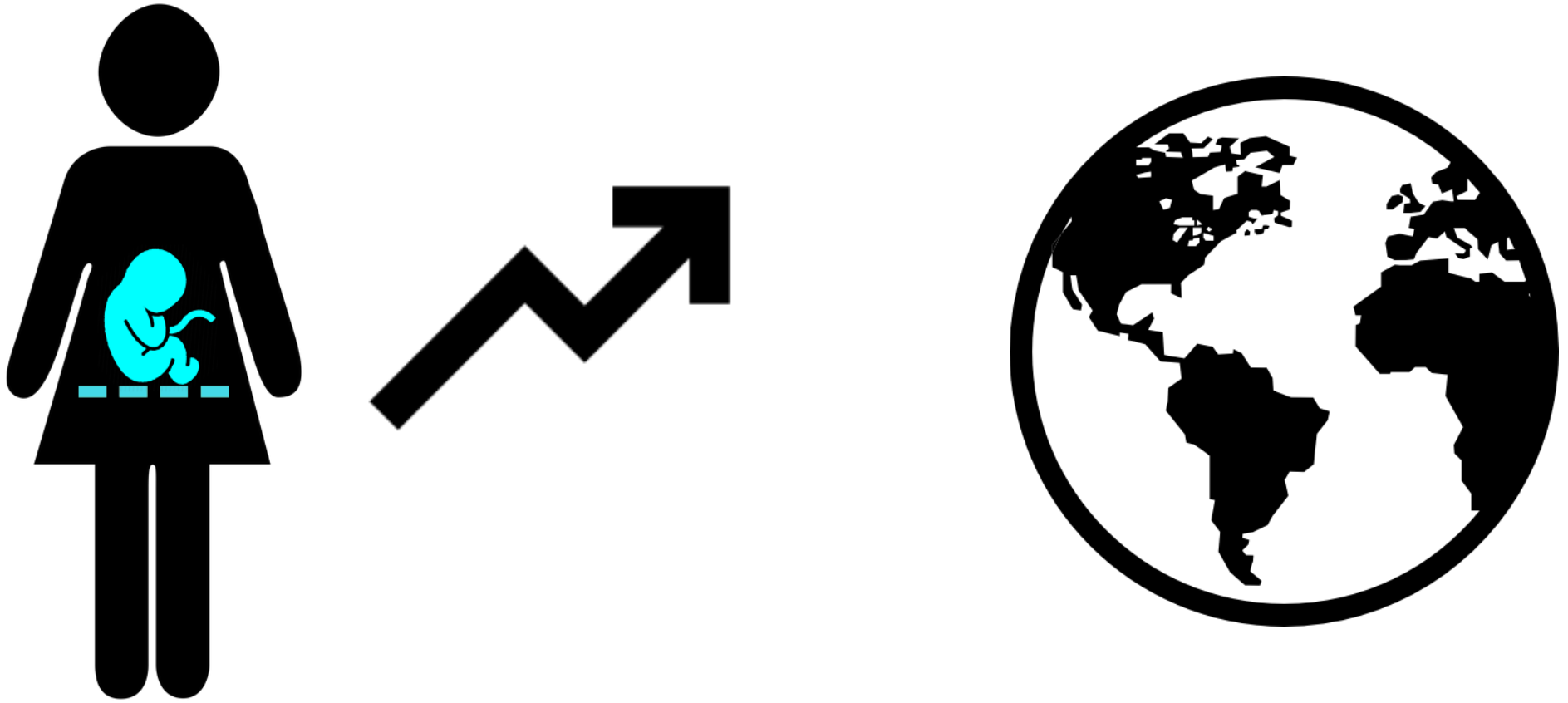
Study design: In selected centers in the Term Breech Trial, children were screened for abnormalities at ≥2 years of age with the Ages and Stages Questionnaire, followed by a neurodevelopmental assessment if the Ages and Stages Questionnaire score was abnormal.

Results: A total of 923 of 1159 children (79.6%) from 85 centers were followed to 2 years of age. The risk of death or neurodevelopmental delay was no different for the planned cesarean than for the planned vaginal birth groups (14 children [3.1%] vs 13 children [2.8%], relative risk, 1.09; 95% CI, 0.52- 2.30; P =.85; risk difference, +0.3%; 95% CI, −1.9%, +2.4%).

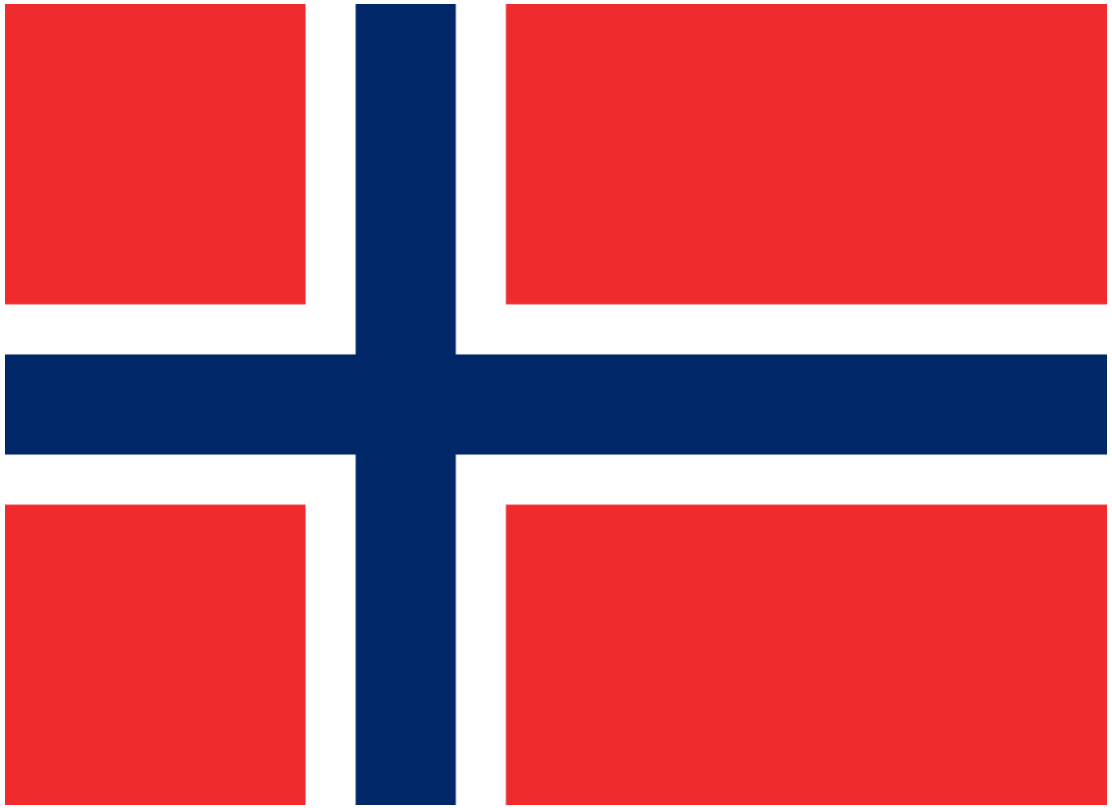
Conclusion: Planned cesarean delivery is not associated with a reduction in risk of death or neurodevelopmental delay in children at 2 years of age.

...he purpose of this study was to determine whether planned cesarean delivery for the ...us in breech presentation at term reduces the risk of death or neurodevelopmental ...ears of age.
...n: In selected centers in the Term Breech Trial, children were screened for ... at ≥2 years of age with the Ages and Stages Questionnaire, followed by

After the TBT 2-year followup study

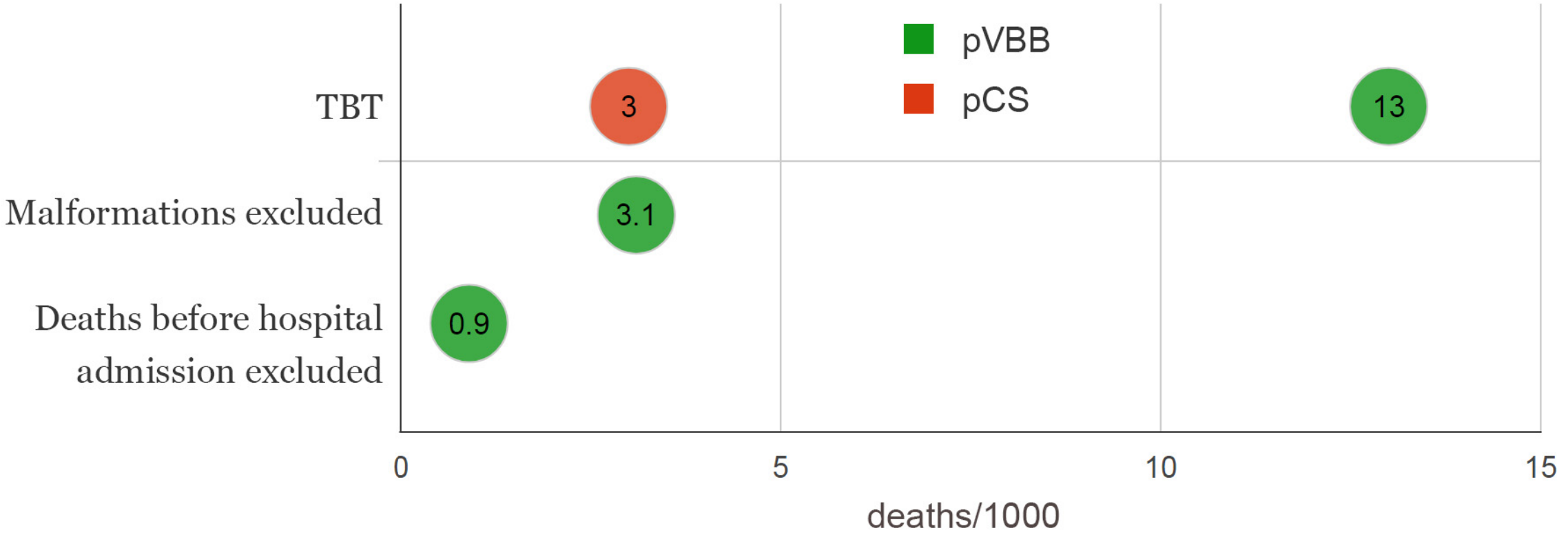


Norway's response, 2003



- Systematic review of the literature
- Examined national registry data

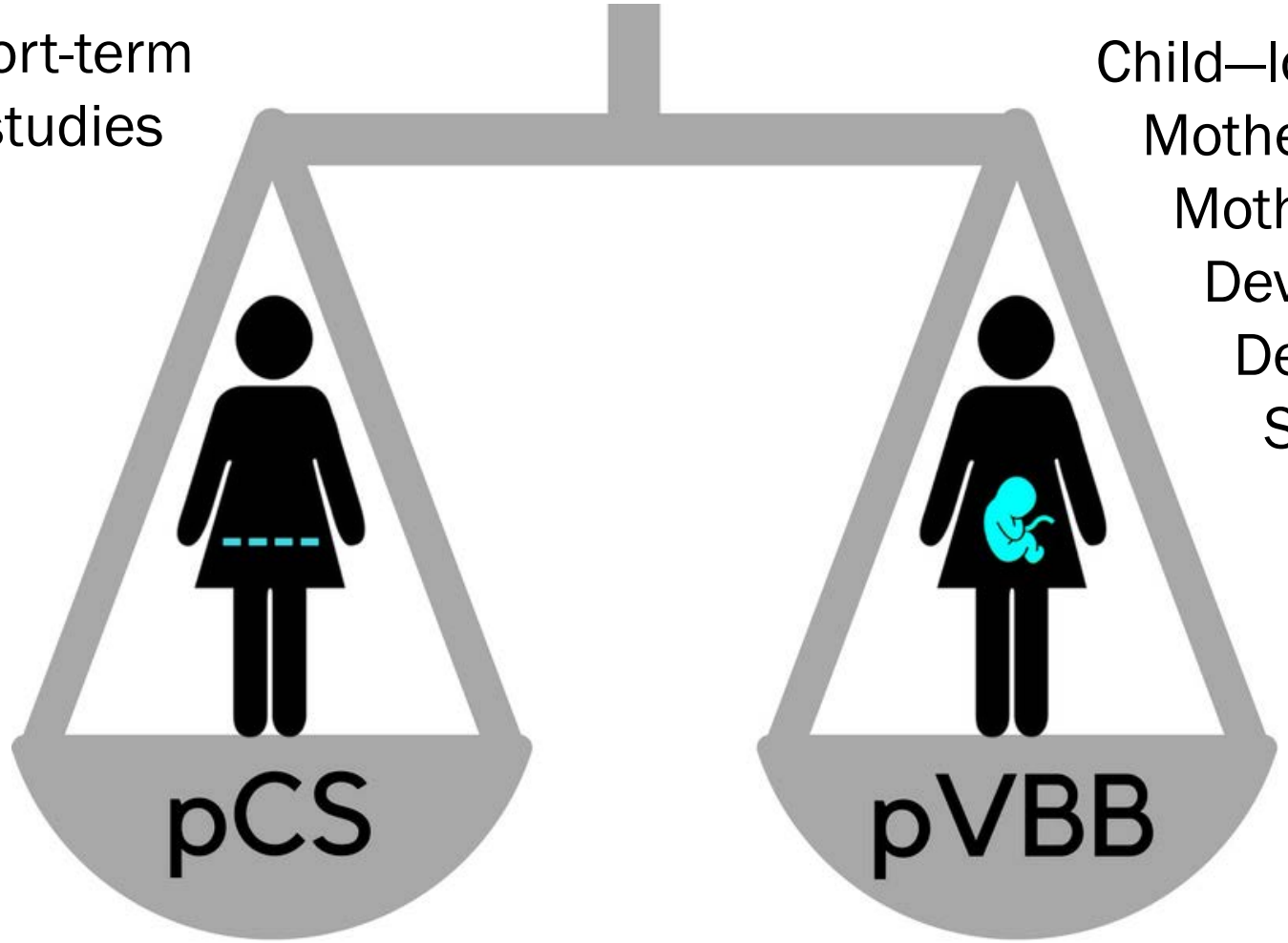
PNM for pVBB in Norway



Vistad 2015, Øian 2003, Haheim 2004

Where does the balance fall?

Neonate—short-term
Registry studies



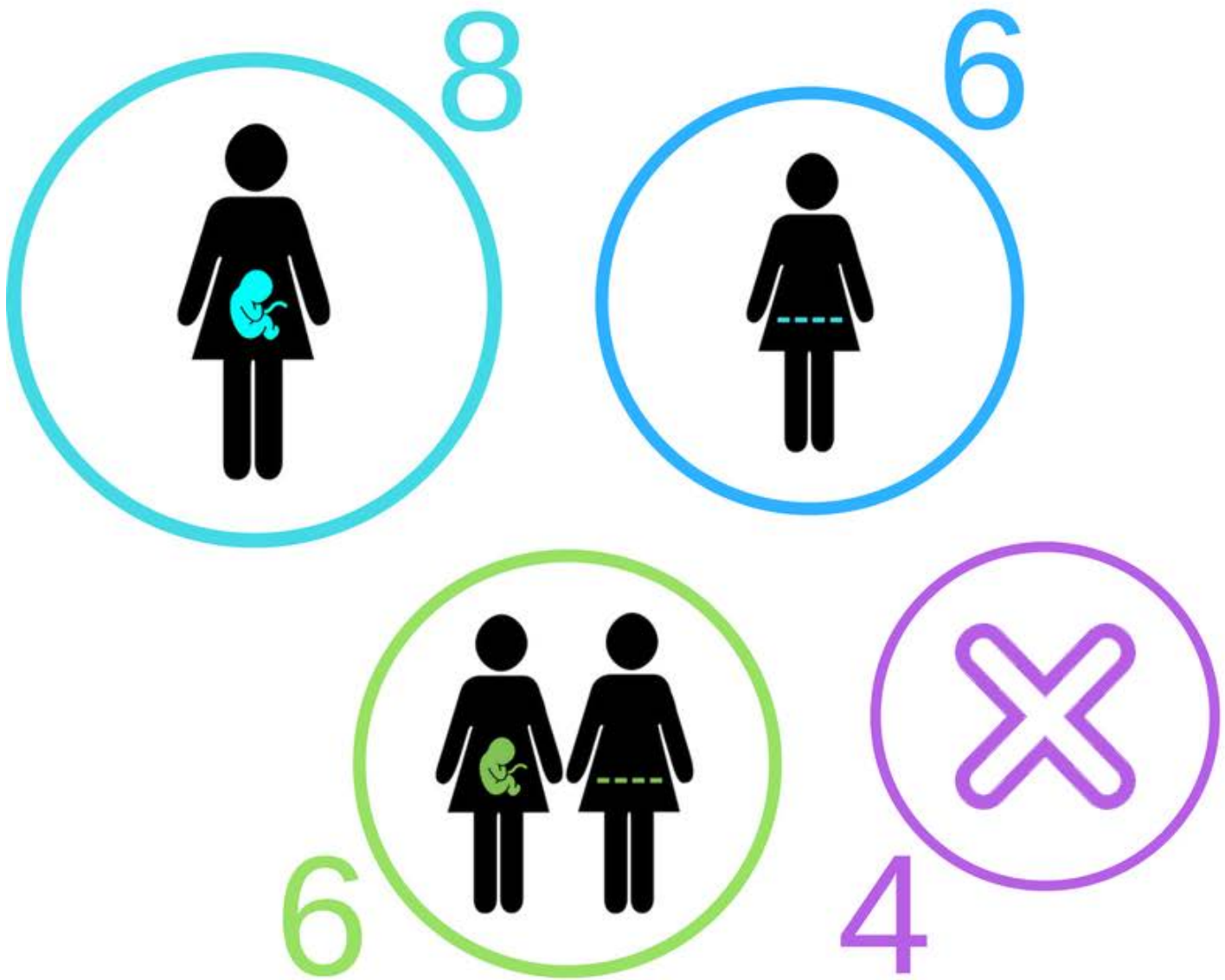
Child—long-term
Mother—short-term
Mother—long-term
Developing nations
Developed nations
Single-center studies
Multi-center studies

National registry studies

- Little information about antenatal & postnatal periods
- Little information about pre-labor decisions
- Planned MOD must be inferred
- Heterogeneous obstetric practices
- Retrospective

- Large sample sizes for statistical calculations
- Effects over an entire population

24 registry studies



Albrechtsen 2000 (Norway, 27)
Roberts 2000 (NSW Australia, 8)
Ulander 2004 (Finland, 3)
Vistad 2015 (Norway, 21)
Bin 2017 (Australia, 12)
Bjellmo 2017 (Norway, 11)
Macharey 2017 “Neuro” (Finland, 7)
Macharey 2017 “Risks” (Finland, 10)

Gilbert 2003 (CA, USA, 9)
Krebs 2003 (Denmark, 14)
Krebs 2005 (Denmark, 11)
Herbst 2005 (Sweden, 11)
Vlemmix 2014 (Netherlands, 9)
Jensen 2015 (Denmark, 8)

Rietberg 2003 (Netherlands, 6)
Rietberg 2005 (Netherlands, 8)
Pasupathy 2009 (Scotland, 20)
Hartnack Tharin 2011 (Denmark, 12)
Lyons 2015 (Canada, 9)
Bin 2016 (NSW Australia, 4)

Krebs 2002 (Denmark, 11)
Hoehner 2006 (MO, USA, 7)
Sullivan 2009 (Australia, 15)
Macharey 2017 “Breech" (Finland, 10)

Multi-center studies

- Some have small cohorts; underpowered for statistical calculations

- Some have large enough cohorts for powerful statistical calculations
- Often prospective
- Detailed information about planned MOD
- Detailed information about selection criteria & labor management

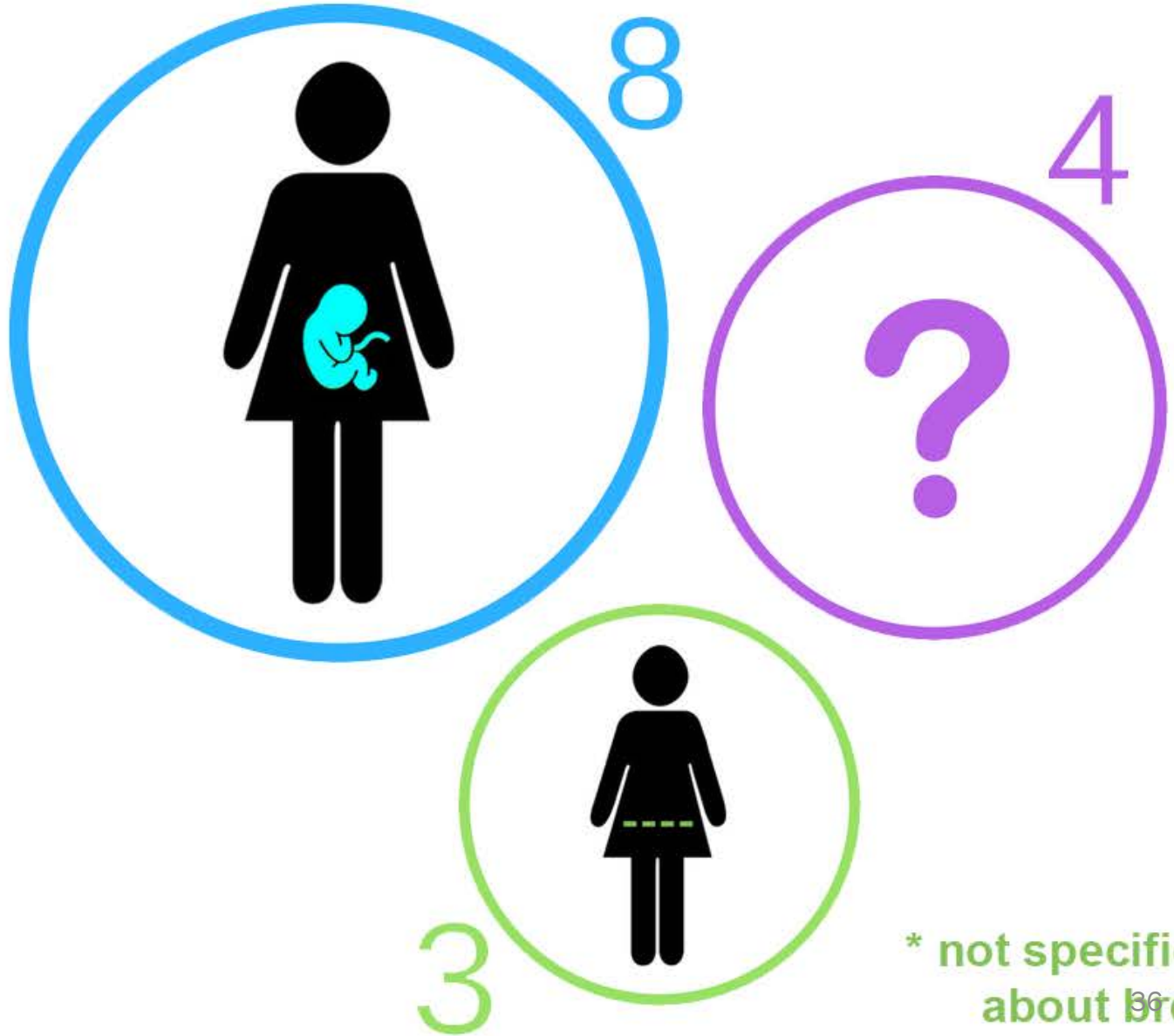
15 multi-center studies

P = prospective

de Leeuw 2002 (Netherlands, 2) **P**
Vendittelli 2002 (France, 175)
Goffinet 2006 (Fr/Belg, 174) **P**
(PREMODA)
Vendittelli 2006 (France, 175)
Molkenboer 2007 (Netherlands, 2)
Van Eygen 2008 (Zimbabwe, 7)
Ouattara 2016 (Burkina Faso, 3) **P**
Fonseca 2017 (Portugal, 7)

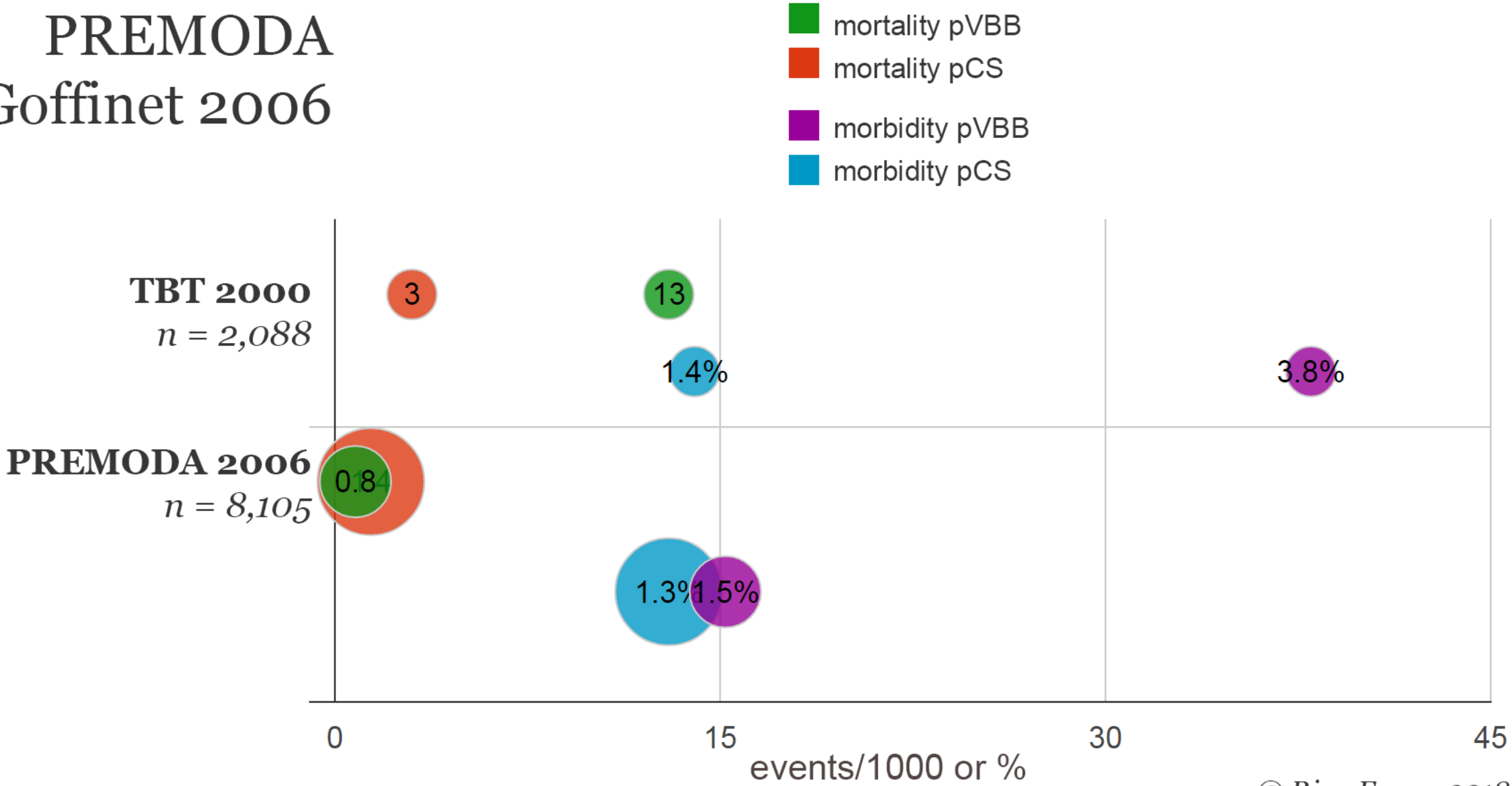
Regalia 2000 (Italy, 3)
Roman 2008 (Fr/Belg, 174)
Hehir 2012 (Ireland, 3)
Kozuki 2017 (Nepal, ?)

Golfier 2001 (France, 4)
Villar 2007 (Latin America, 120) *
Lumbiganon 2010 (Cambodia, 122) *



* not specifically about breech

PREMODA
Goffinet 2006

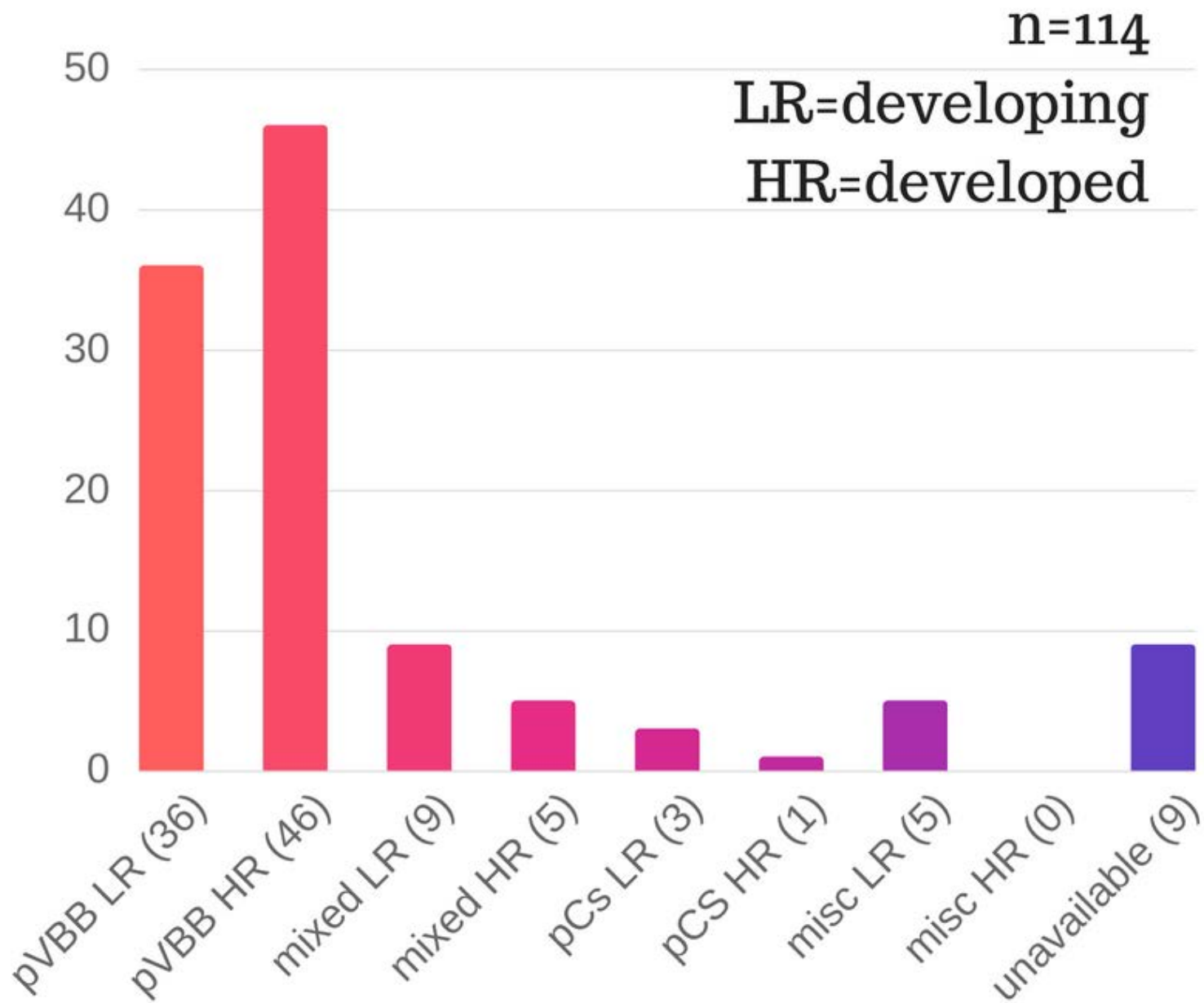


Single-center studies

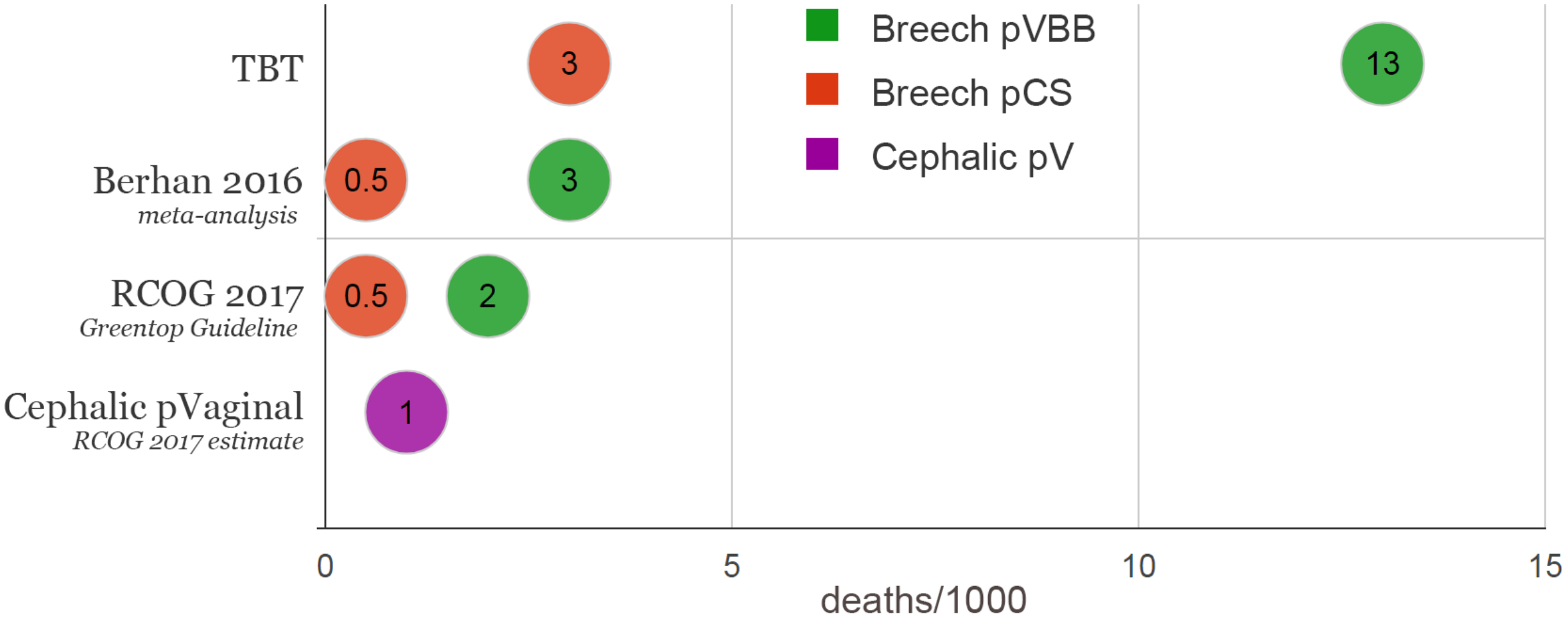
- Many are retrospective
- Smaller sample sizes limit statistical calculations

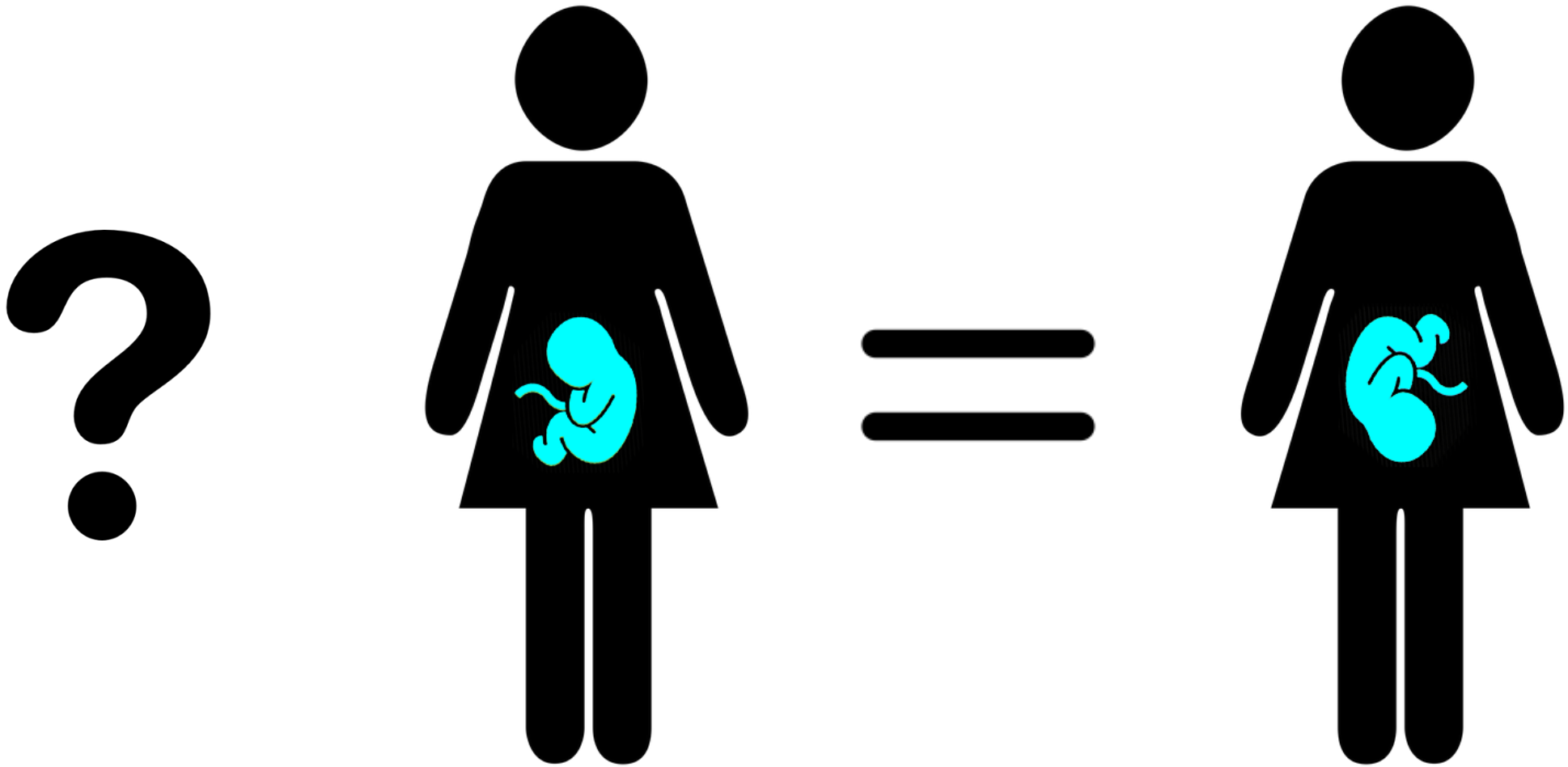
- Detailed picture of breech outcomes in a single institution
- Detailed descriptions of counseling, selection criteria, and labor management
- Planned MOD is known
- Useful for individual women planning to give birth in that unit

Single-center studies



Risk of pVBB: TBT vs recent estimates





Lawrence Impey (RCOG 2017)

Term breech arguments should be set in the context of vaginal cephalic birth.

Are we holding breech to a higher standard than cephalic?

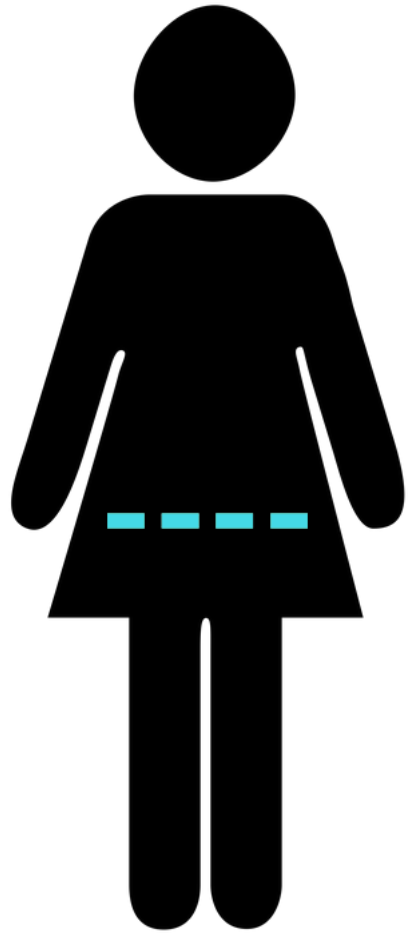
planned cephalic birth

1.3/1000
"excess" PND

1.0/1000
AP deaths

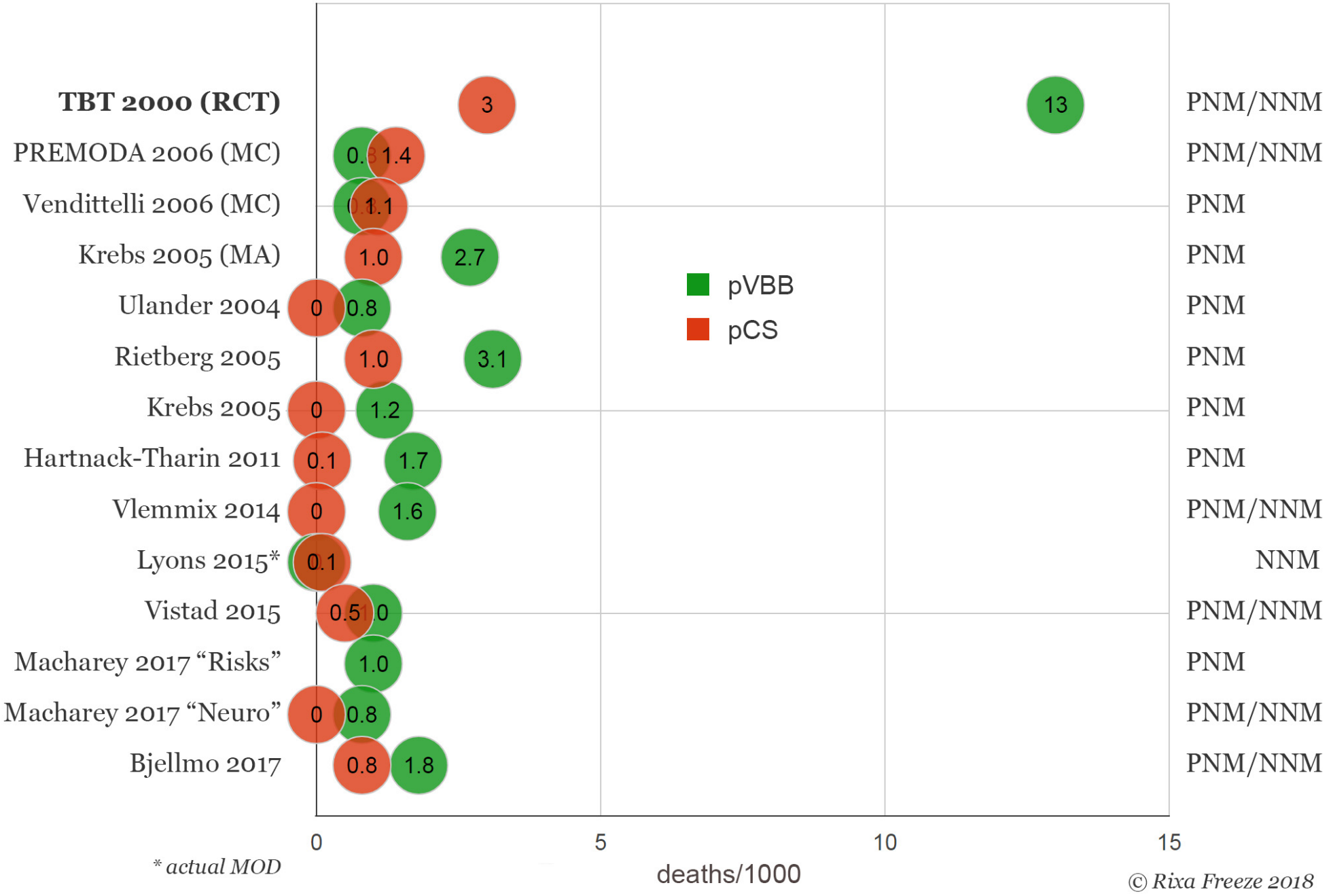
0.3/1000
IP deaths

pCS at 39 weeks



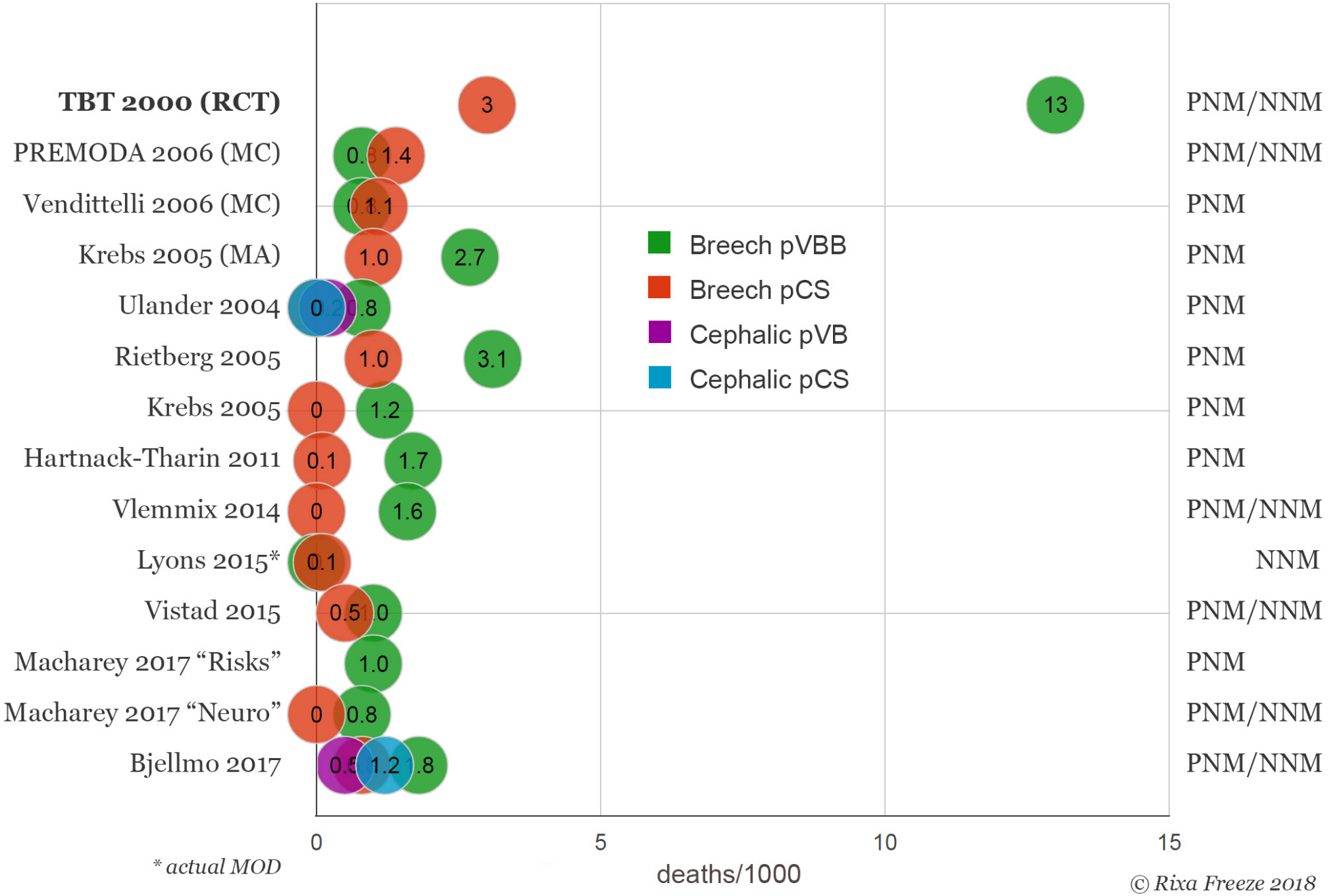
RCOG 2017 Green-top Guideline:
Management of Breech Presentation

PNM/NNM for term breech: Planned vaginal vs. planned CS



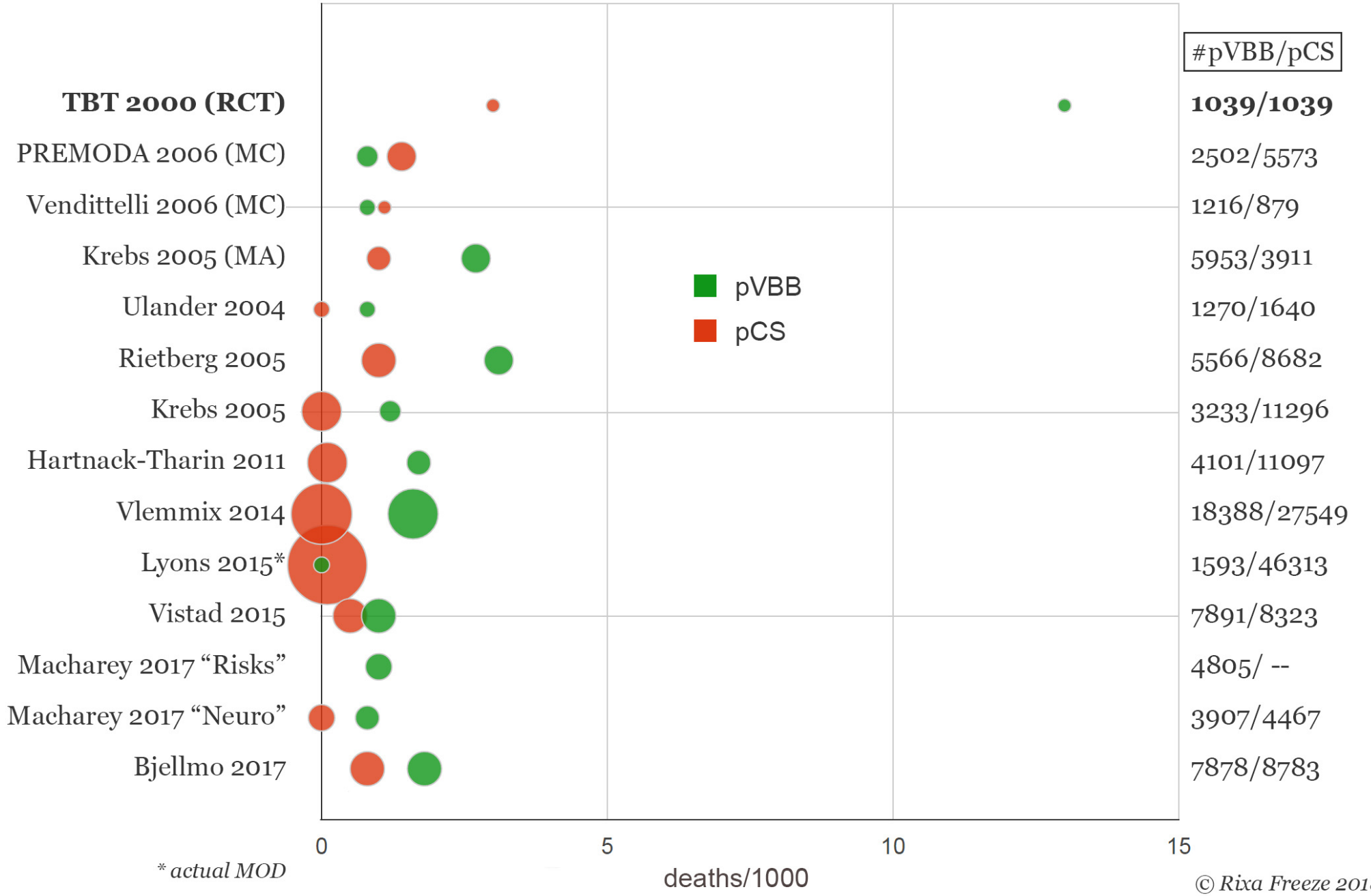
* *actual MOD*

PNM/NNM for term breech & cephalic births



** actual MOD*

PNM/NNM for term breech by sample size



* *actual MOD*

Short-term NN risks: mortality

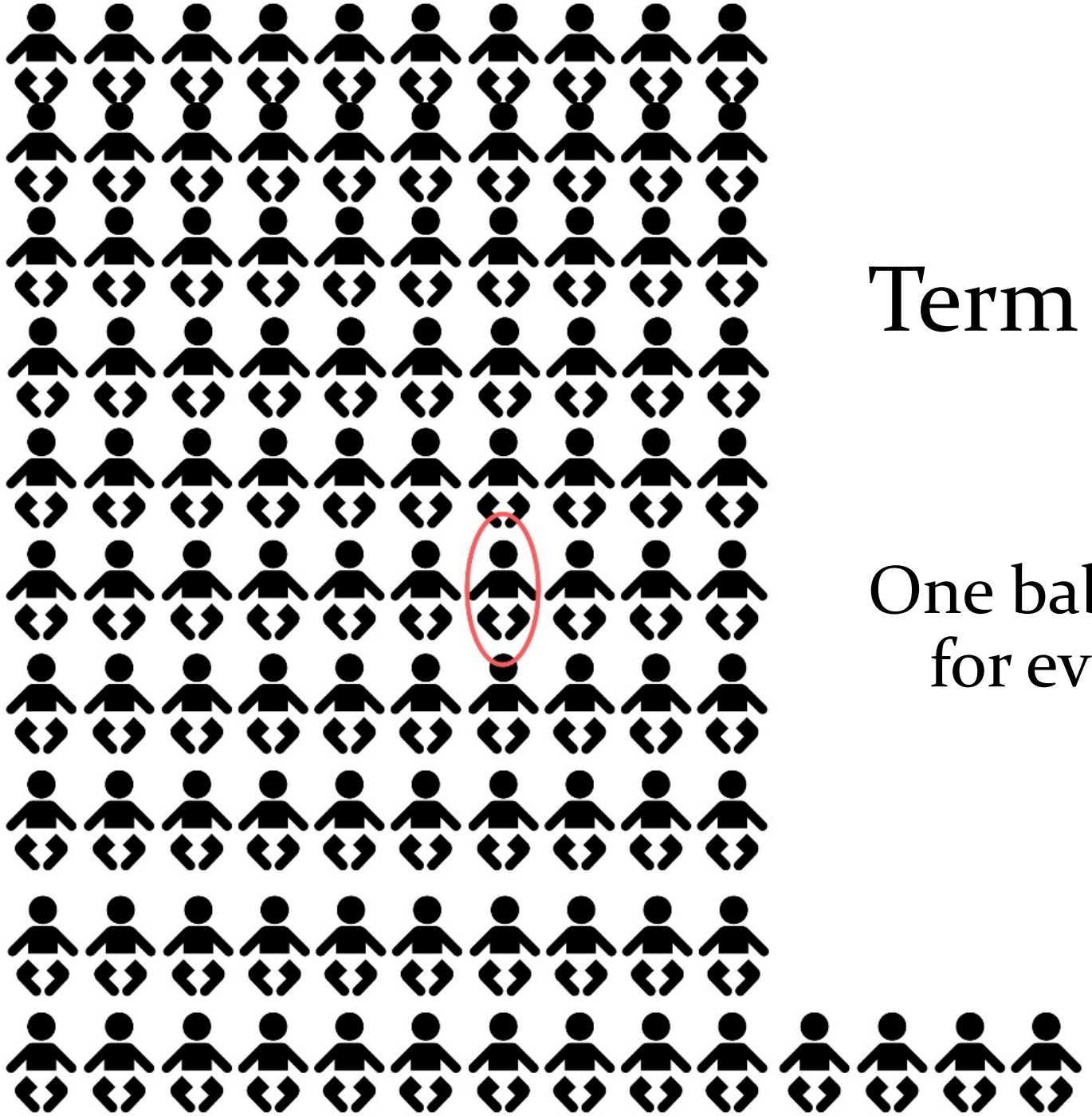
Registry studies that support pVBB in terms of PNM/NNM

Author, date	Location	Findings
Roberts 2000	NSW, Australia	No change in overall PNM despite decline in VBB rate from 29.4% to 19.7% between 1990-97
Ulander 2004	Finland	No significant difference in outcomes (except Apgar suppression)
Vistad 2015	Norway	No significant difference in post-TBT period

Short-term NN risks: mortality

Some registry studies find benefits to pCS, but at lower rates than expected.

- Increased CS rate after TBT only explained 16% of the reduction in mortality over time (Pasupathy 2009, Scotland)
- Effect of pCS on NNM & Mb was evident, but less than anticipated based on TBT findings (Rietberg 2003, Netherlands)



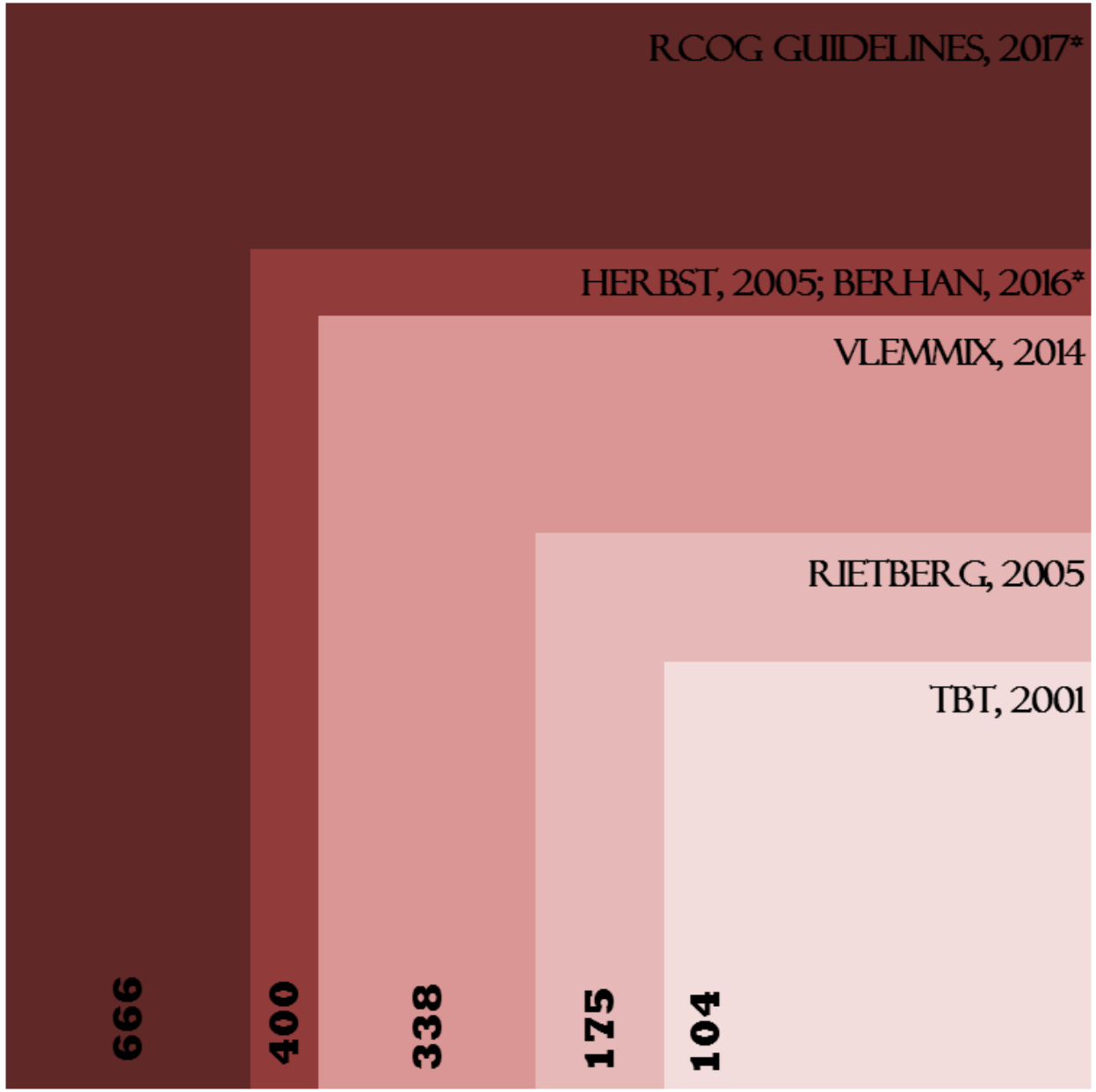
Term Breech Trial: NNT

One baby would be saved for every 104 planned cesareans

Other NNTs compared to the TBT

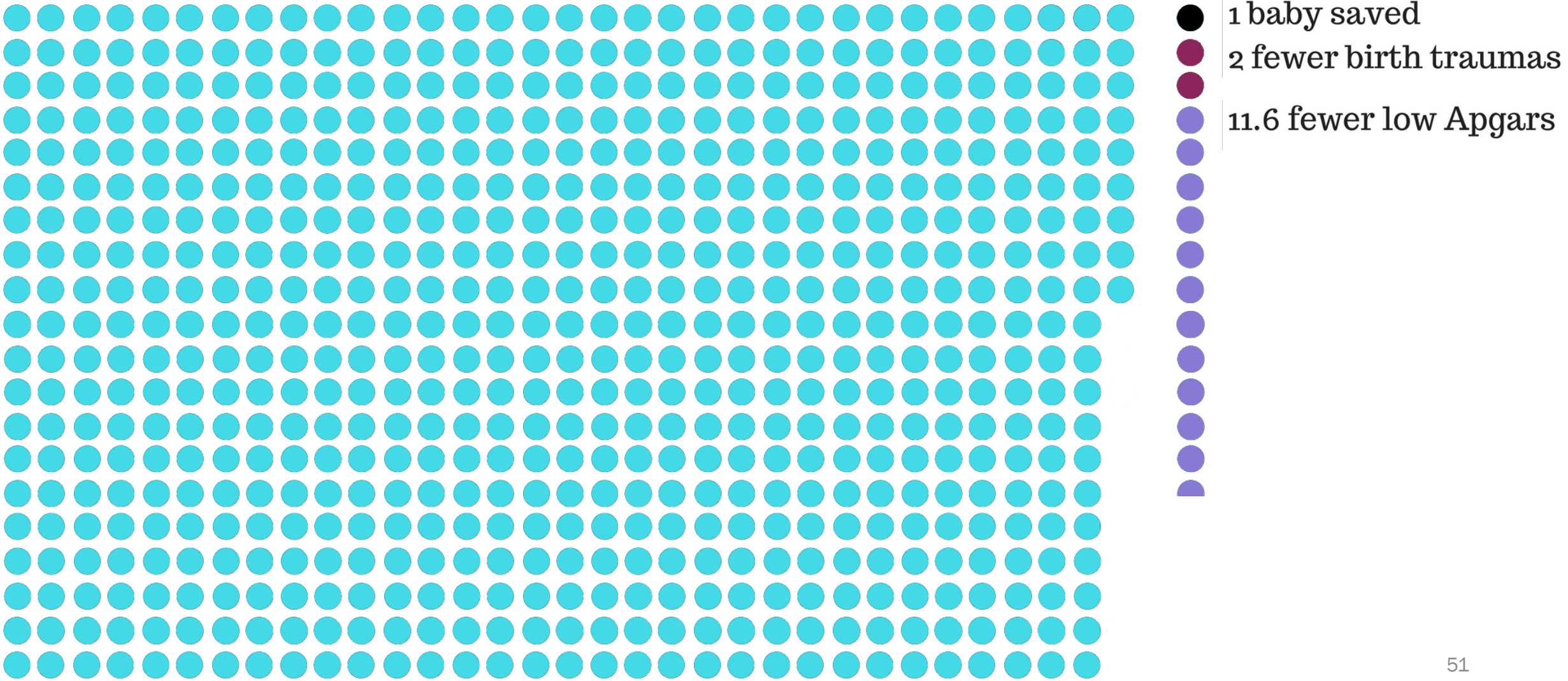
PREMODA, 2006: no difference.

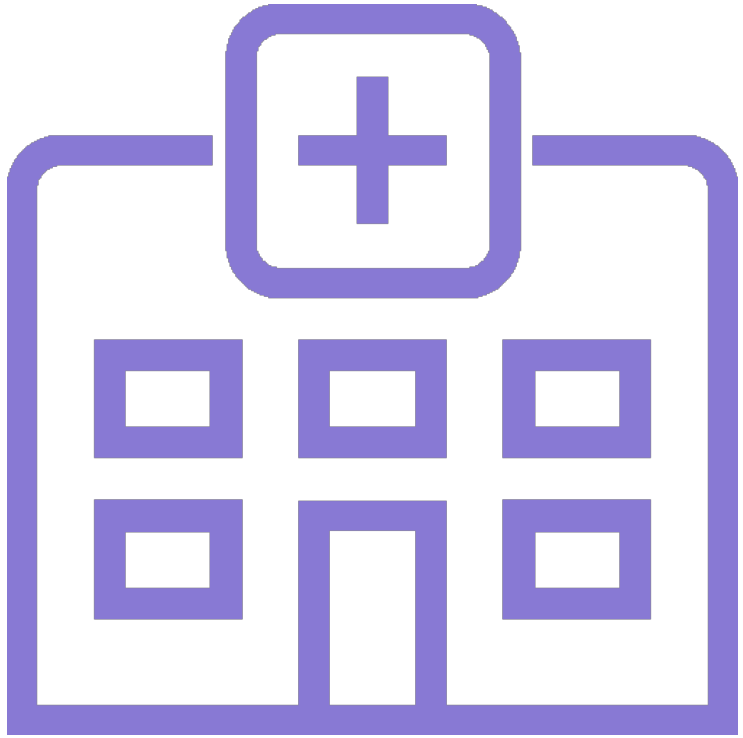
* inferred



Vlemmix 2014

for every + 649 pCS...



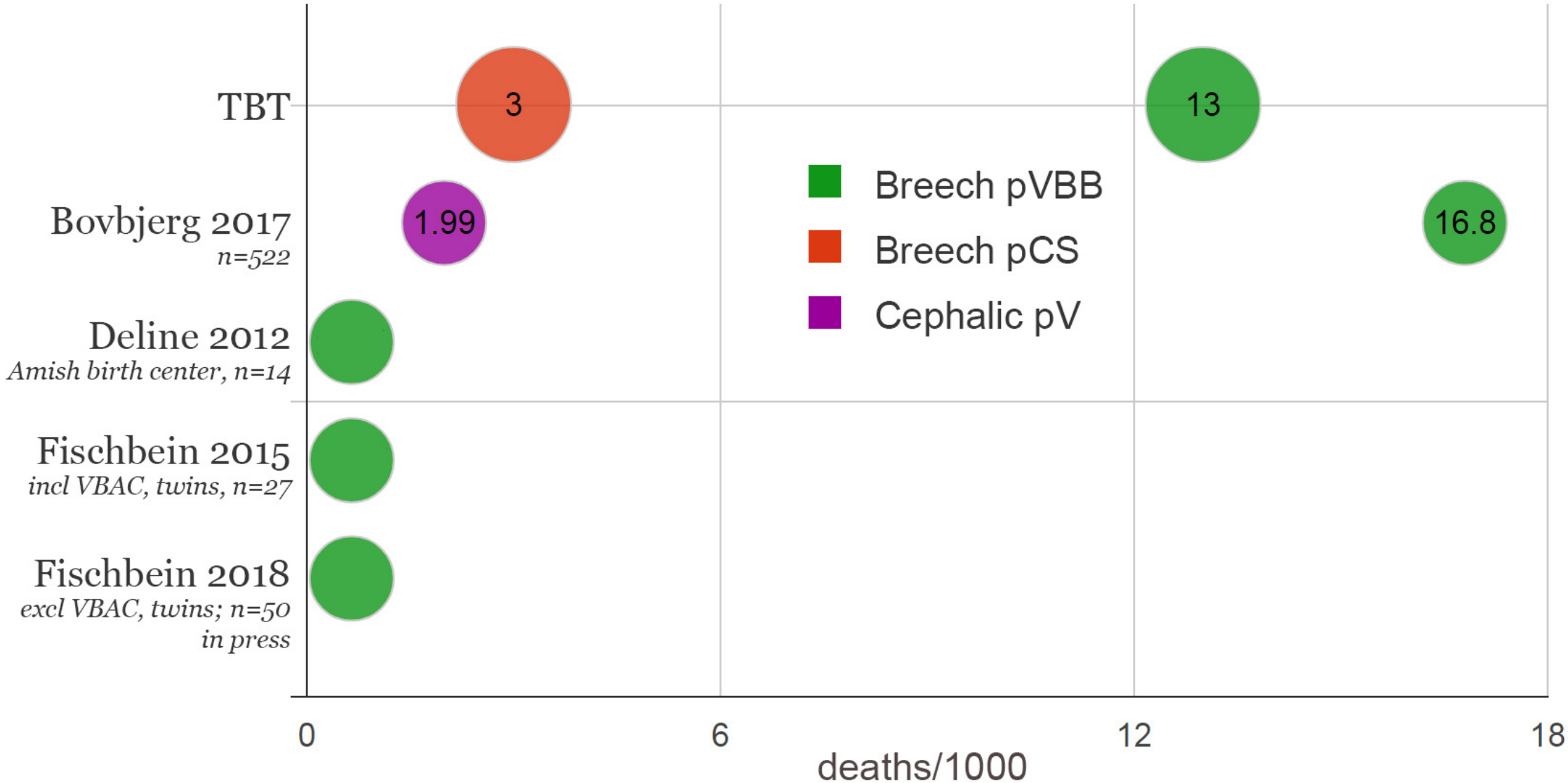


MANA Statistics Project 2.0 (2004-09)
MANA Statistics Project 4.0 (2012-present)

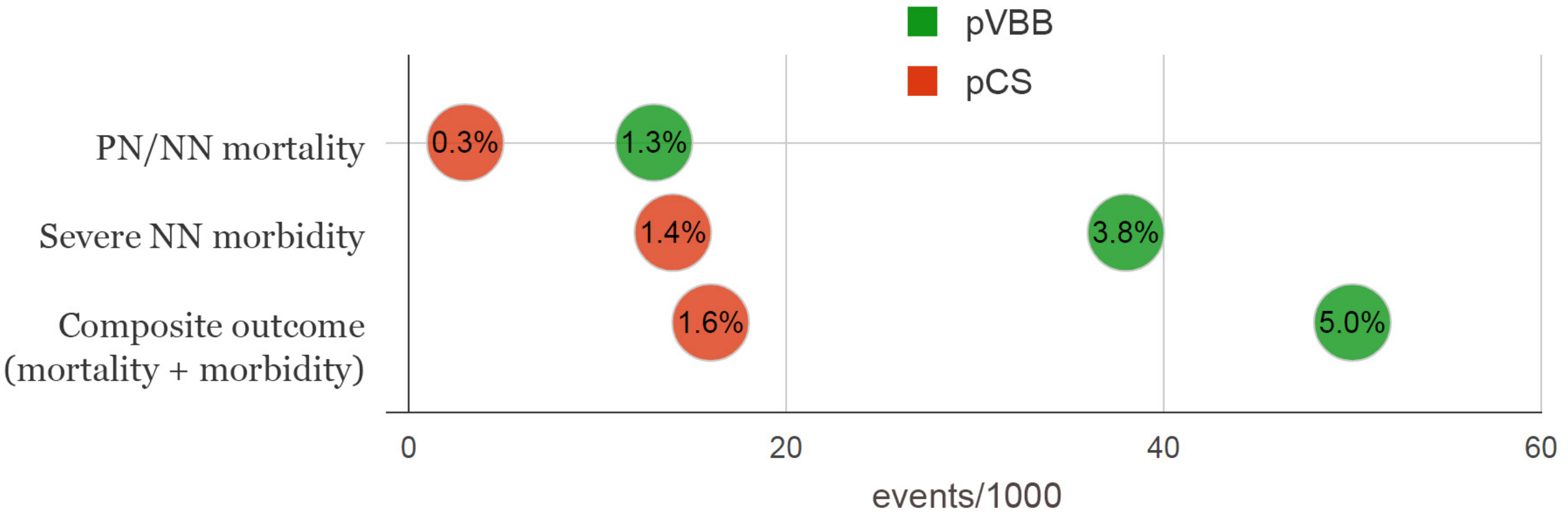
CDC birth certificate data

Deline (Amish birth center)
Fischbein 2015, 2018 (home/BC)

PNM for out-of-hospital pVBB



Mortality & severe morbidity in the Term Breech Trial



Short-term NN risks: morbidity

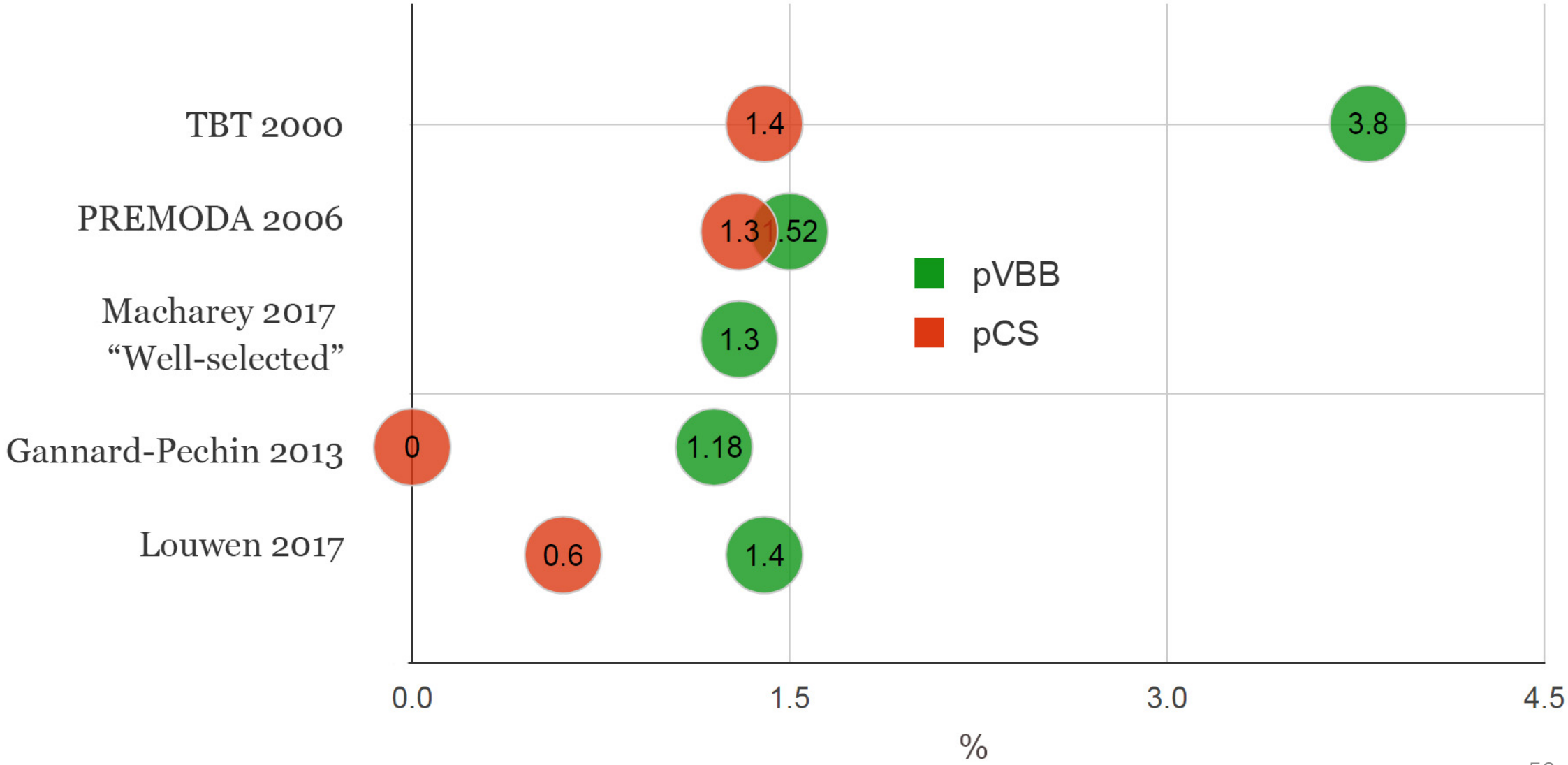
Many studies show:

higher rates of short-term NN morbidity (i.e., low 5-minute Apgars, NICU stays, ventilation, birth trauma) for pVBB…

but at **lower rates** than the TBT.

Photo used with permission

Comparison of severe NN morbidity

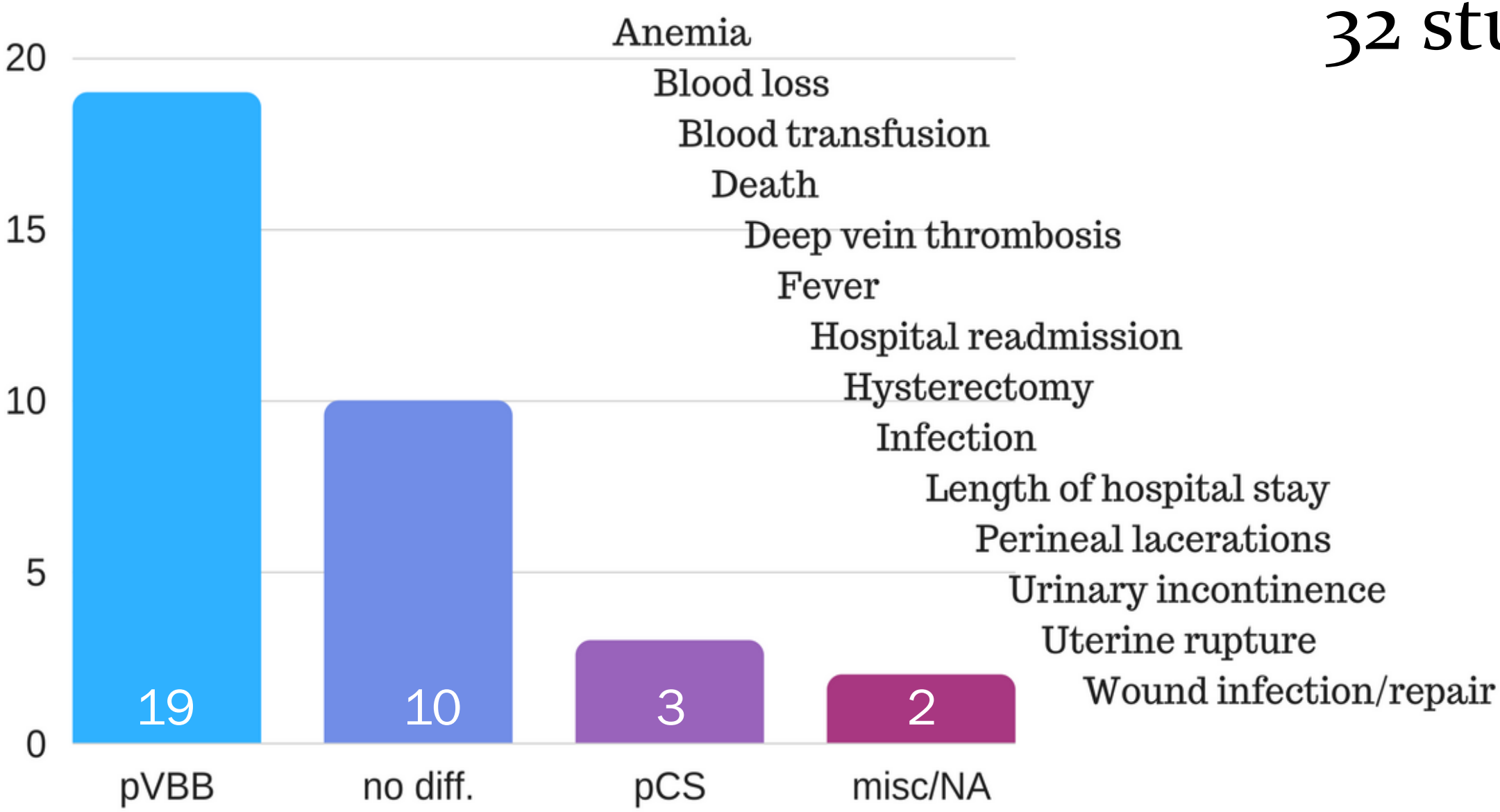


Long-term risks of cesarean for the child

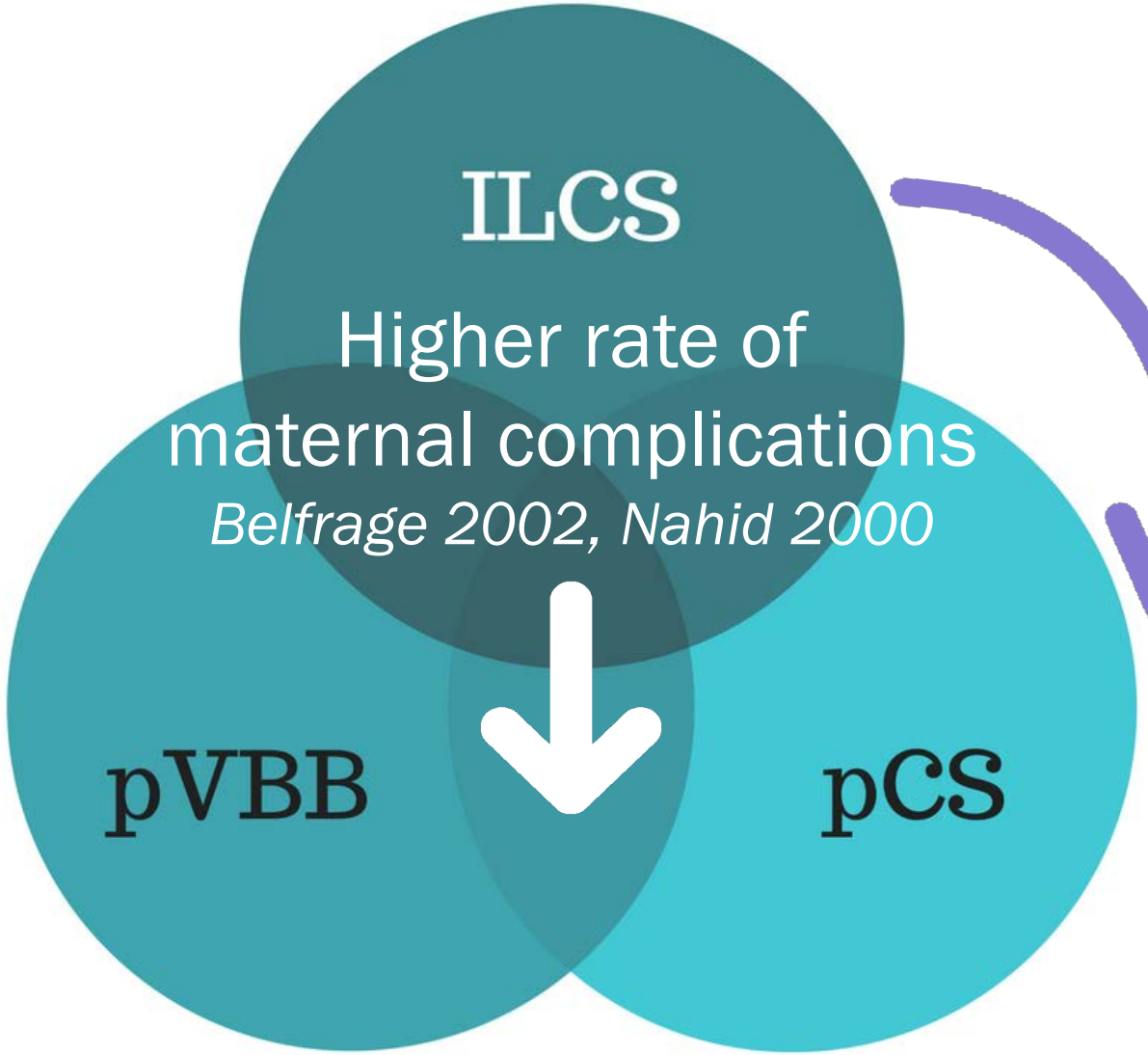
- Childhood asthma
- Type I diabetes
- Autoimmune diseases and allergic diseases
- Altered stem cell epigenetics

Thavagnanam 2008, Cardwell 2008, Neu 2011, Almgren 2014

Short-term maternal outcomes 32 studies



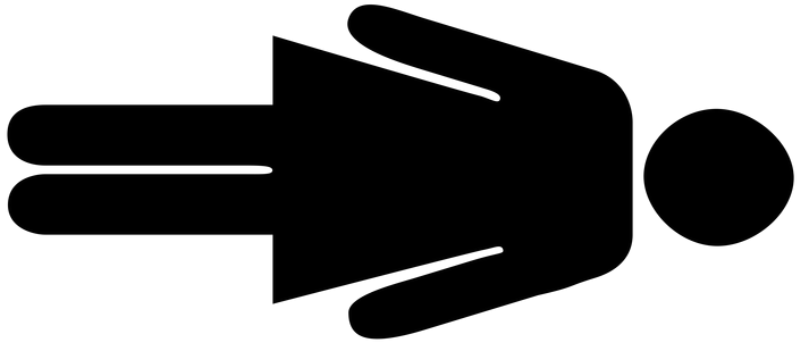
Maternal outcomes from ILCS



Fever, hemorrhage, pelvic infection, anemia, operations for wound infection
Krebs 2003

No significant differences
Broche 2005

Maternal mortality

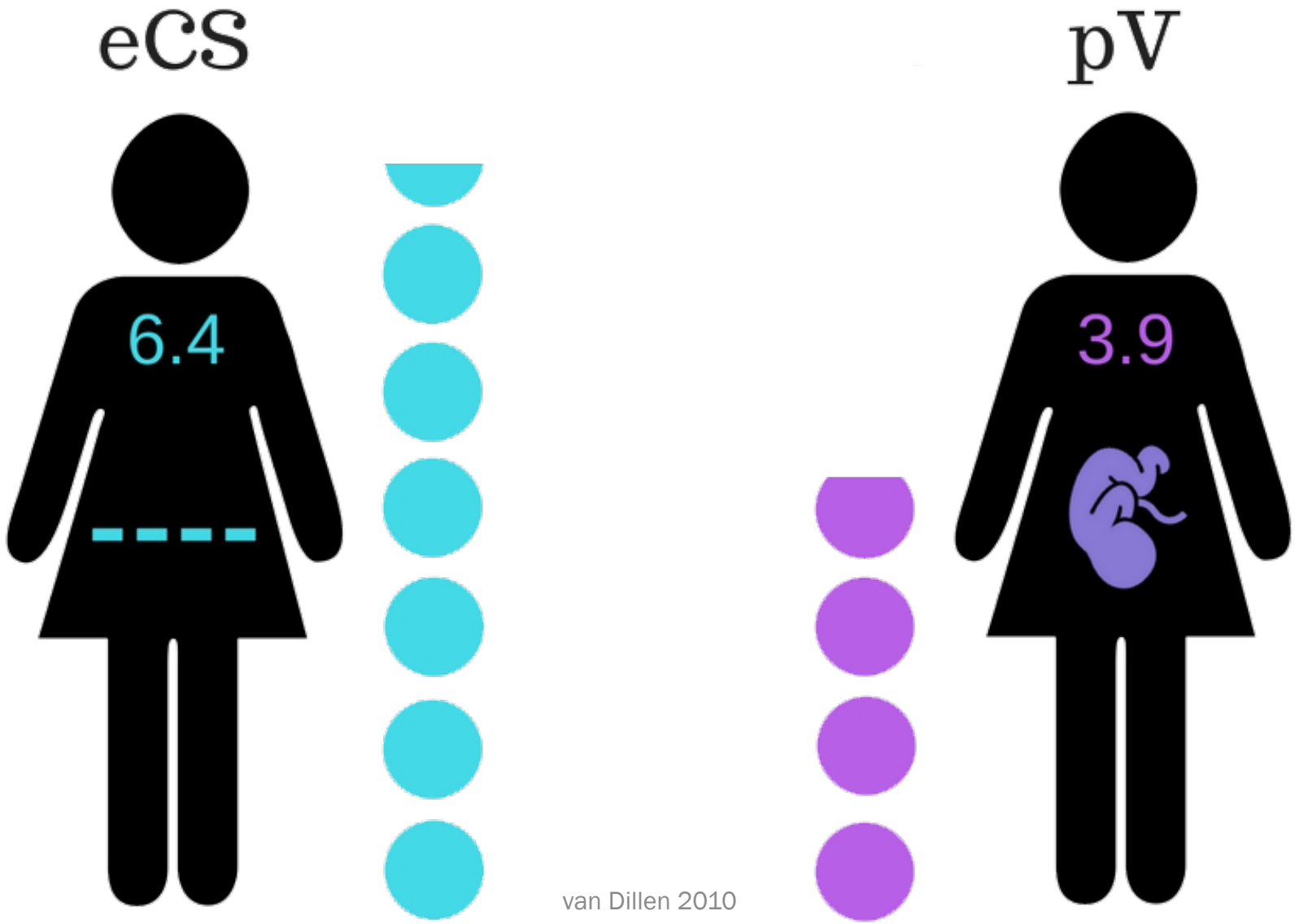


4 studies mention maternal deaths:

- 2 deaths in Högberg 2016 (1/908 V d/t ruptured uterus, 1/747 CS d/t anesthetic complications)
- 1 pCS death in Toivonen 2012 (out of 497 pCS, described as a “complicated cesarean”)
- 4 pCS deaths in Schutte 2007 (out of 8,599 pCS and 16,351 total CS)
- 3 deaths in Krebs 2003 (2 deaths 40 & 55 days after ILCS; 1 death after VBAC following CS for breech)

SAMM

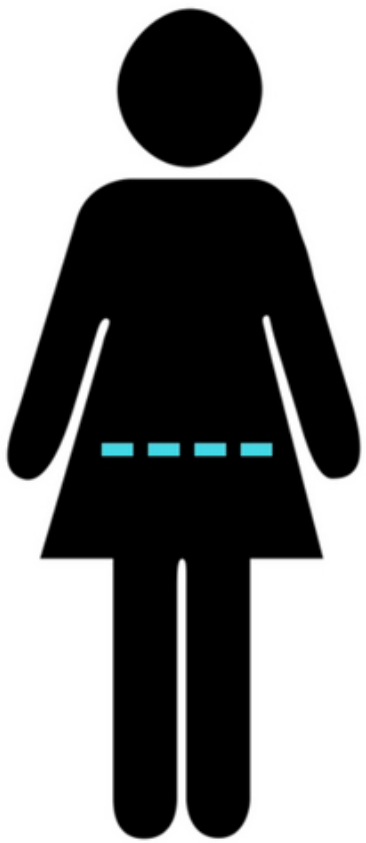
/1000



van Dillen 2010

SAMM after cesarean

birth by CS → next pregnancy



"Women with a previous CS were at increased risk for SAMM in their present pregnancy."
van Dillen 2010

Long-term maternal outcomes (7 studies)

Authors	Outcomes studied	Findings
Krebs 2003	S & LT complications postpartum & in future pregnancies/fertility	ST complications more common with ILCS than pCS pCS has higher rate of fever & infection than pVBB pCS has low risk of severe maternal complications.
Hannah 2004	2-year TBT followup on maternal outcomes	Similar
Verhoeven 2005	Long-term maternal risks in this & future pregnancies	Well-selected VBB is preferred due to maternal considerations
Molkenboer 2007	Maternal health outcomes 2 yrs after TBD	Similar
Su 2007	Factors associated w/ MMb in TBT	Lowest after VB, highest after ILCS
Krebs 2003	Subsequent ectopic pregnancy, miscarriage, placental complications, uterine rupture, adverse NN outcome	Similar
Vlemmix	(submitted)	

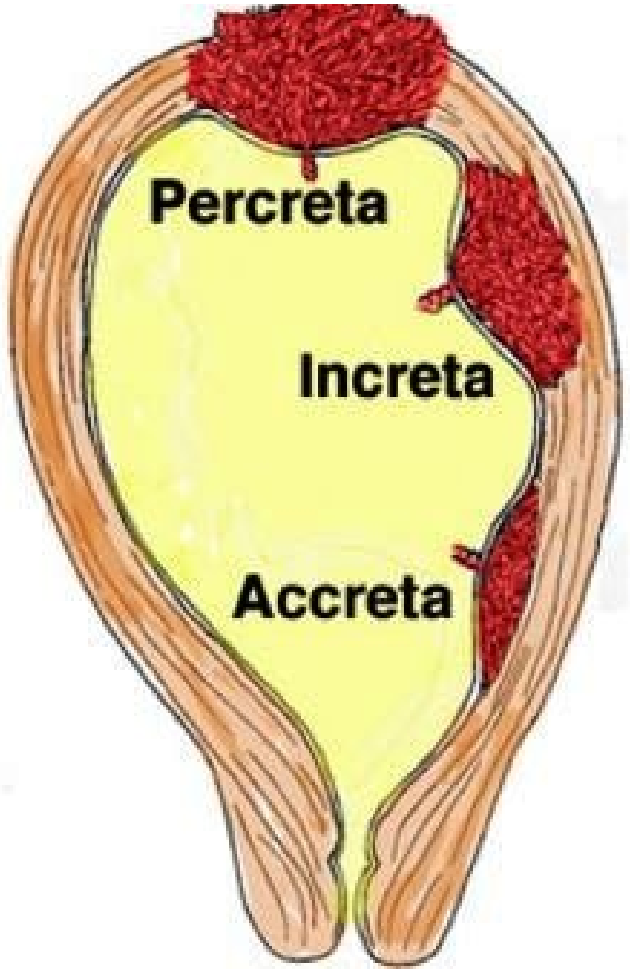
Complications in future pregnancies

"increased risk of maternal morbidity and mortality due to the caesarean section and an increased maternal and fetal risk in subsequent pregnancies, especially uterine rupture and placental invasion of the uterine scar during subsequent pregnancies."

Rietberg 2005 (registry, Netherlands)

Placenta accreta/percreta/increta

- More cesareans → more accretas
- US CS rate is 31.9%; repeat CS rate is 88%
- Placenta accreta has tripled since the 1980s, from 1 /1250 to 1/333 births.
- Maternal death related to placenta accreta and its complications is as high as 1 in 14.

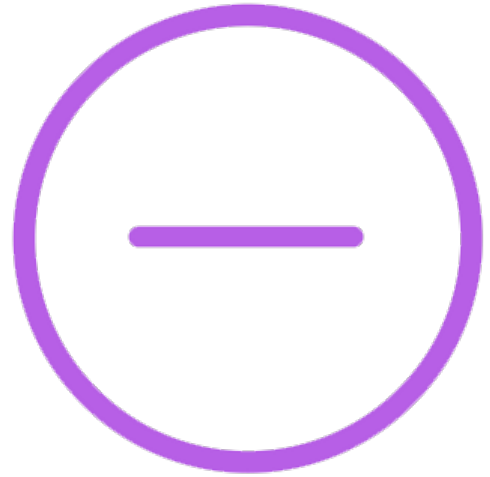


Complex risk calculus

$$ {}_a D_t^{\alpha} f(t) = \frac{1}{\Gamma(n-a)} \frac{d^n}{dt^n} \int_a^t \frac{f(\tau)}{(t-\tau)^{\alpha-n+1}} d\tau, $$

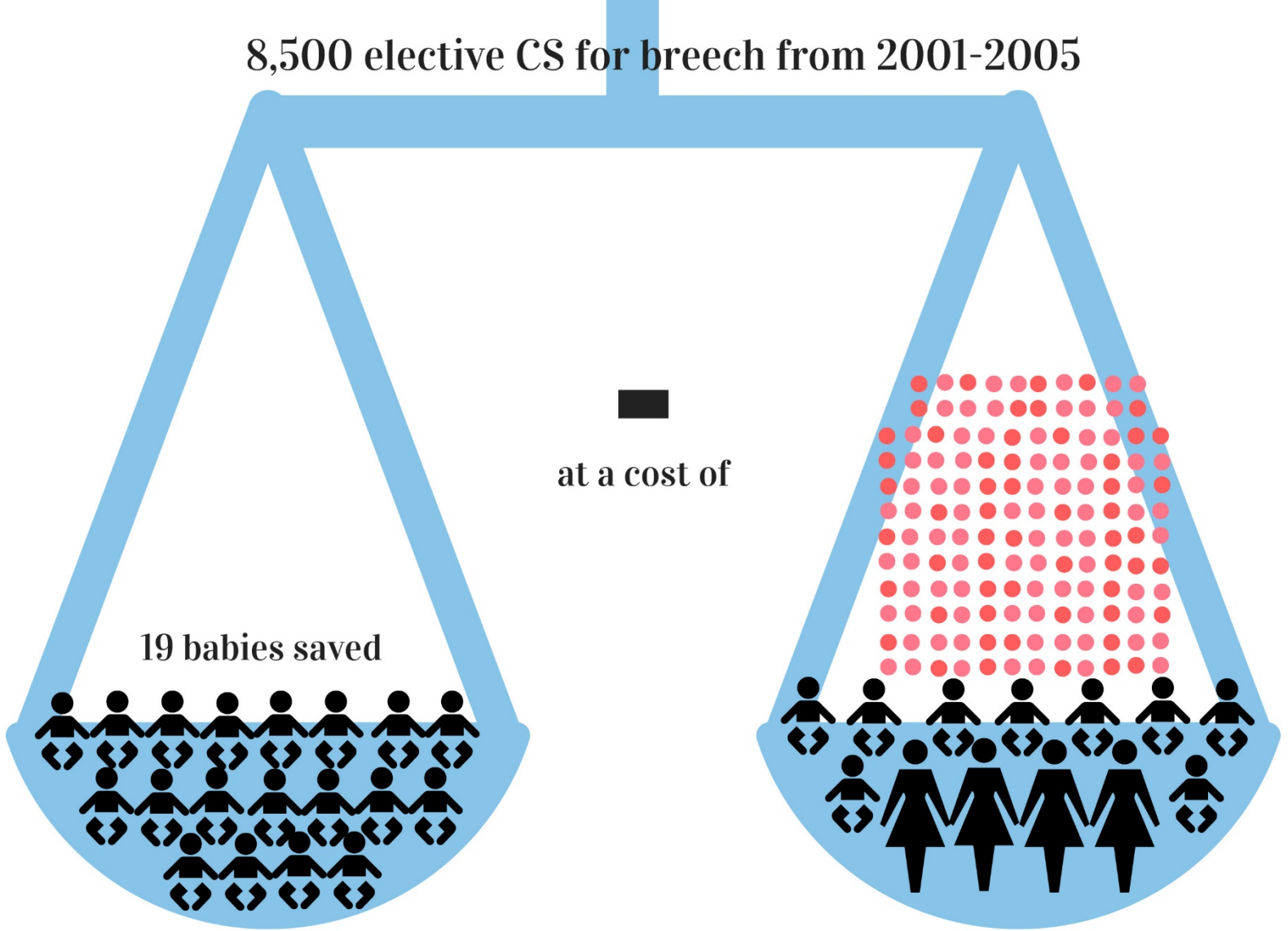
In the Netherlands, “for every infant saved by a caesarean section, one woman will experience a uterine rupture during a subsequent pregnancy.”

Visser 2005



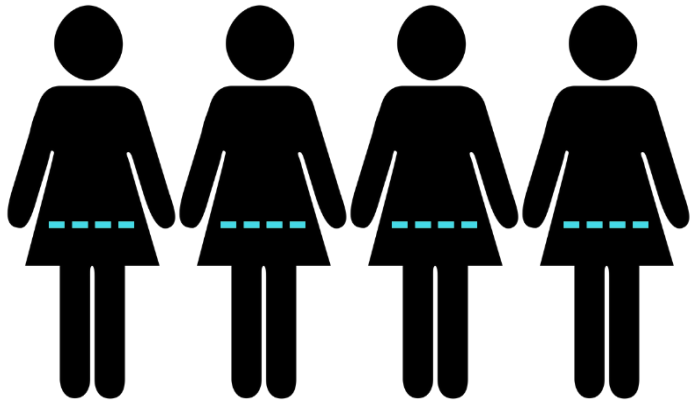
Complex risk calculus
Verhoeven, 2005

8,500 elective CS for breech from 2001-2005



4 avoidable maternal deaths
9 fetal deaths in future due to uterine scar
140 potentially life-threatening maternal complications in future pregnancies

Elective CS for breech 2000-2002 (n=8,599)



4 direct maternal deaths

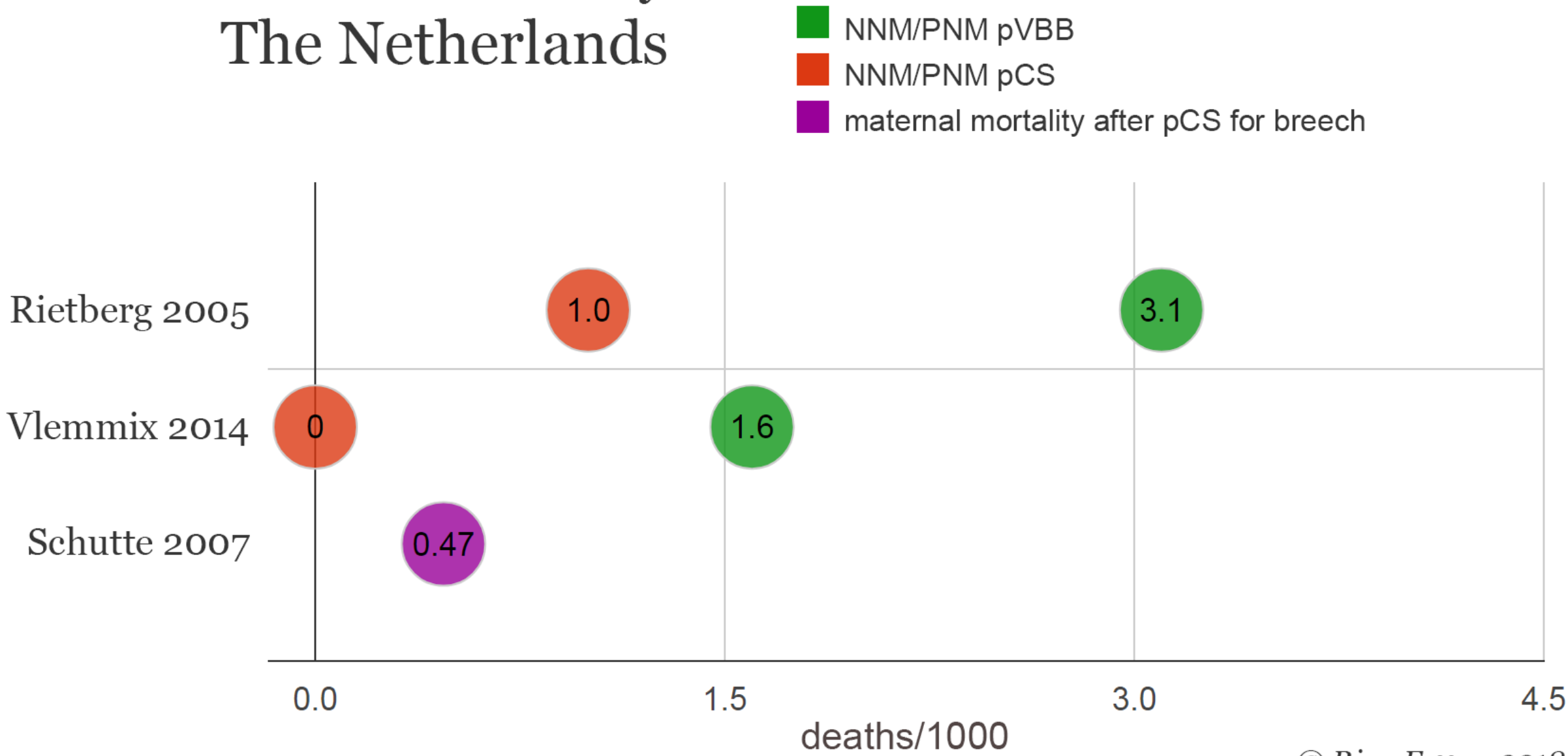
CFR = 0.47/1000

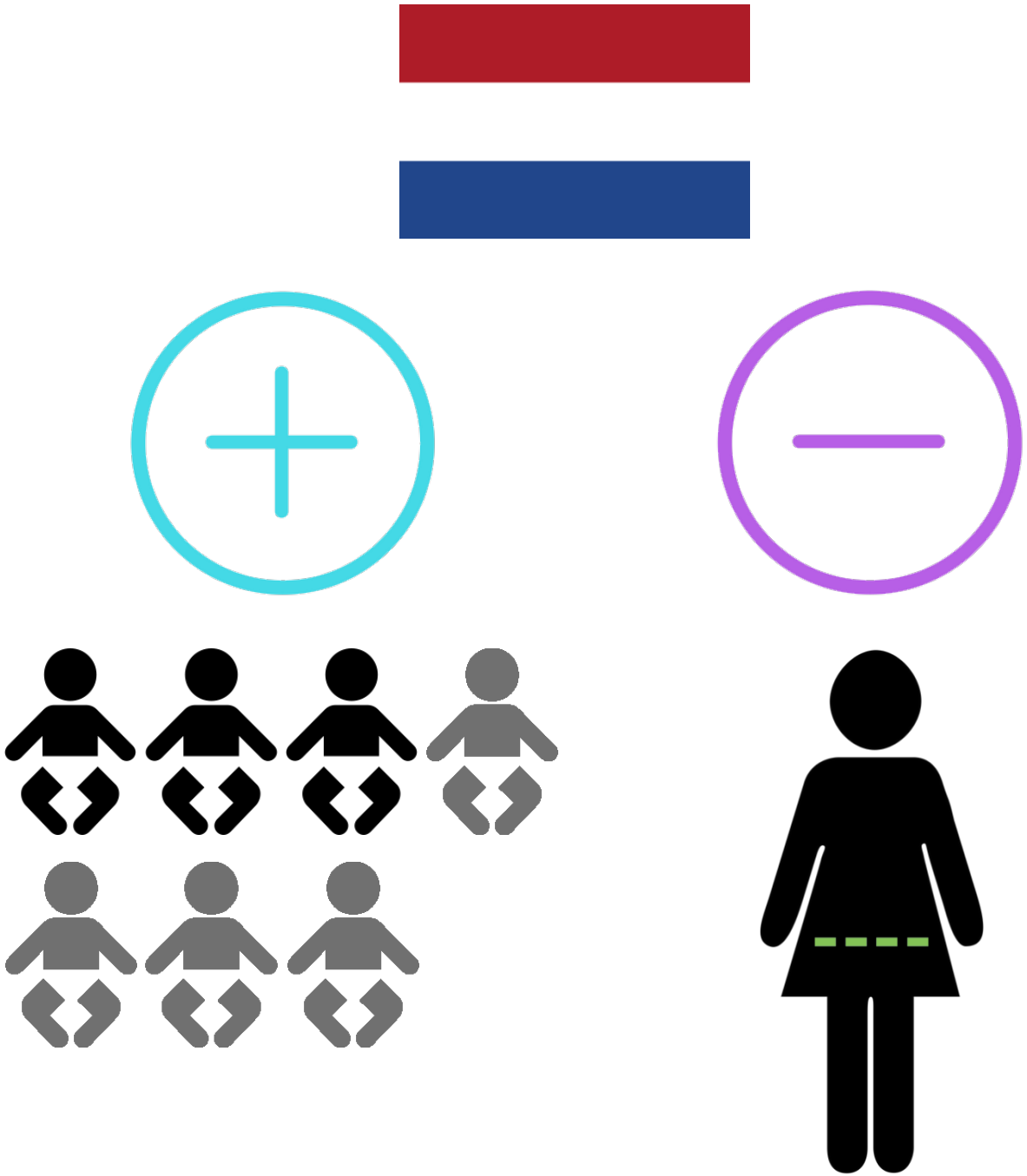
pVBB for breech 2000-2002 (n=7,752)

0 maternal deaths (ILCS or VBB)

Schutte 2007

NN & maternal mortality
The Netherlands



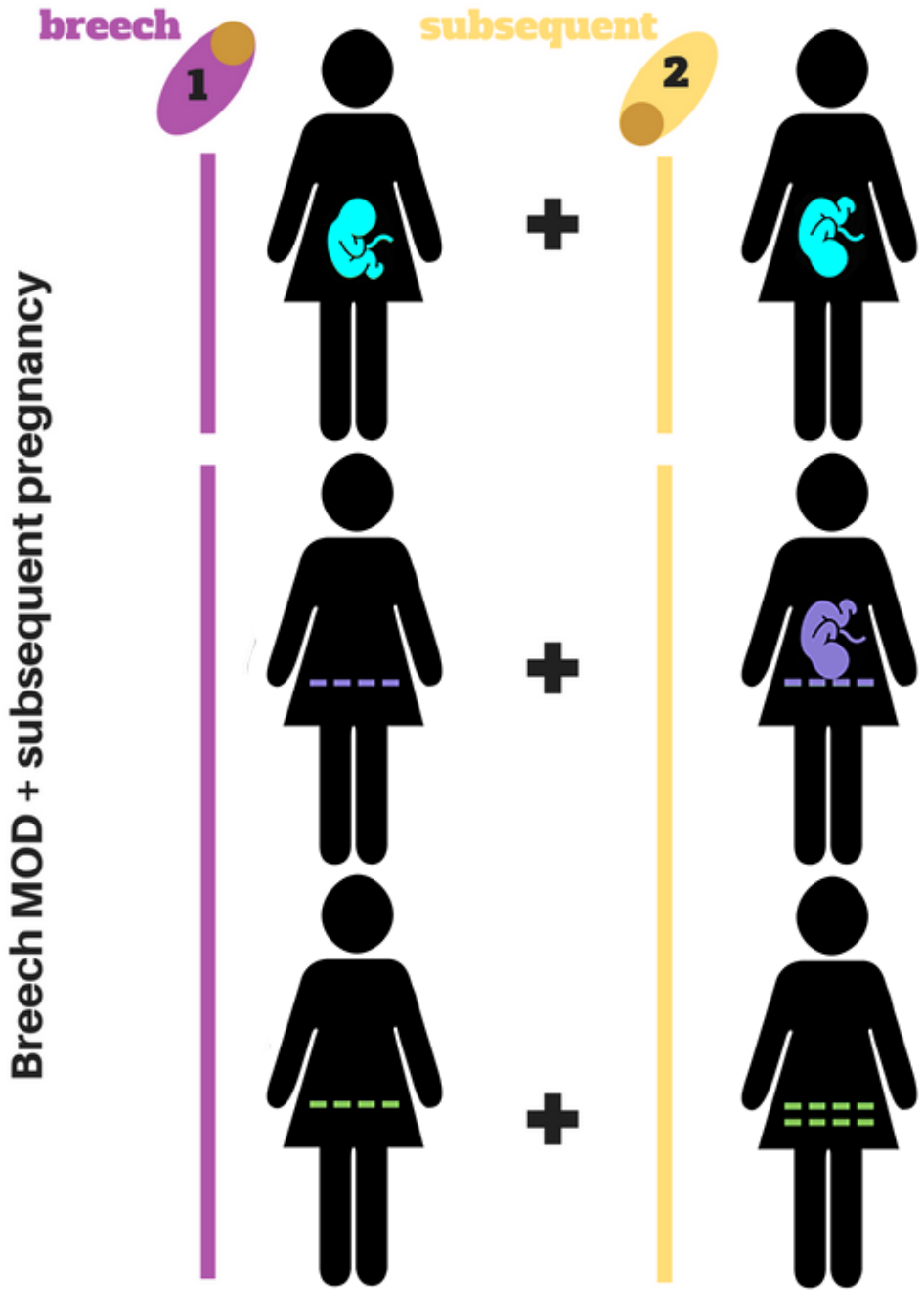


Odds of mother dying after pCS

1 / 2,130

Odds of baby dying after pCS

up to 1 / 1,666



Analysis of Risk

(x 10,000) vs.

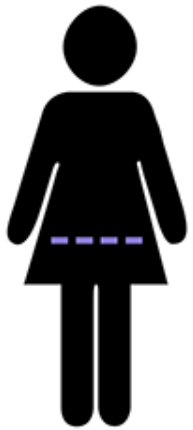
(x 10,000) = ?

(x 10,000) = ?

Dr. Thomas van den Akker

10,000 pCS + 10,000 VBAC

compared to 10,000 VBB + 10,000 VB



4-5 maternal deaths

26 babies saved
(breech c/s)

ZERO infants
ultimately saved

27 babies lost
(vbac)

25 severe acute maternal morbidities

4 peripartum hysterectomies

153 post partum hemorrhages
17 uterine ruptures
4 placental abruptions
invasive placenta
placenta previa

10,000 pCS + 10,000 RCS

compared to 10,000 VBB + 10,000 VB

4-? maternal deaths

26 babies saved
(breech c/s)

=12 neonates saved

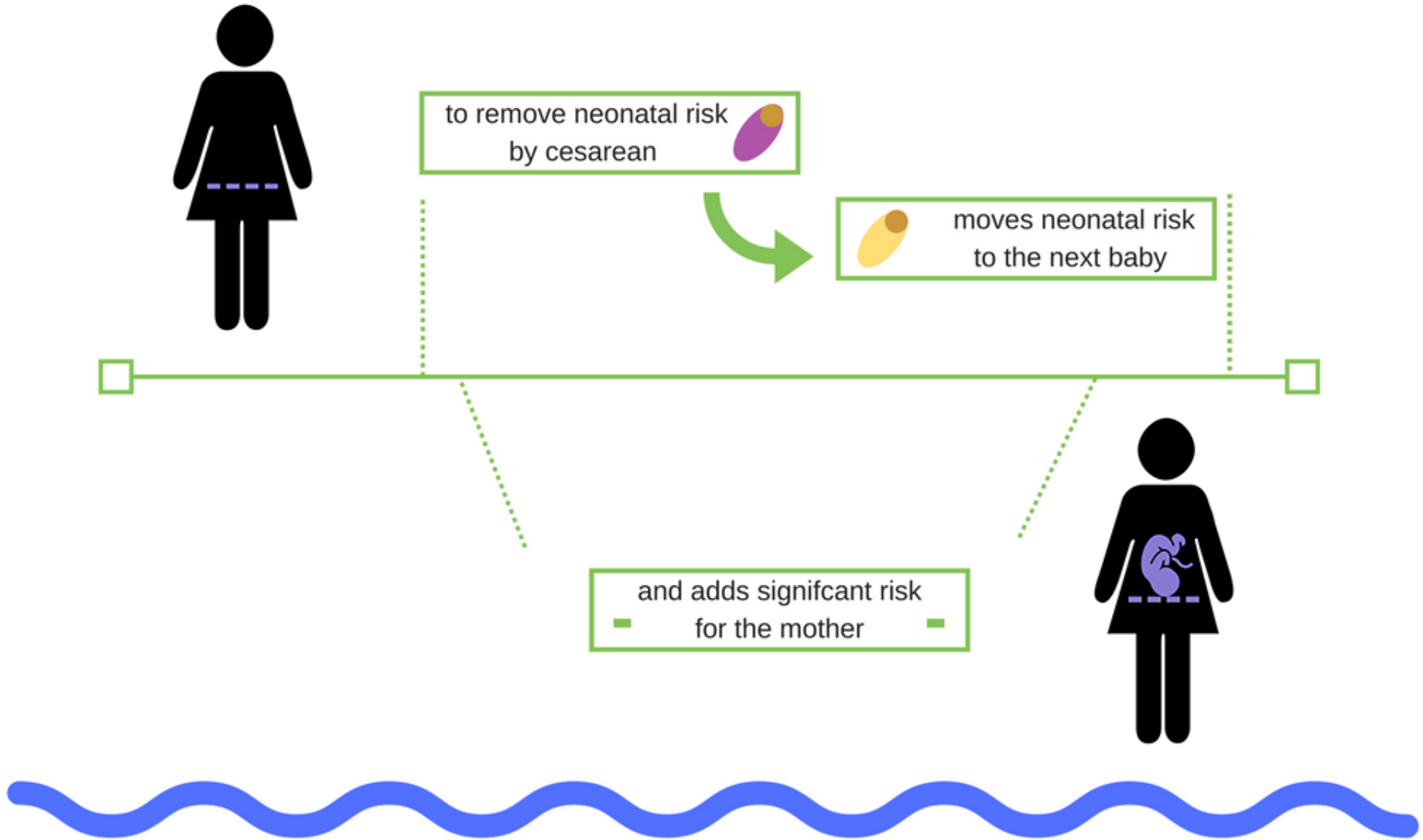
14 babies lost
(RCS)

25 severe acute maternal morbidities

4 peripartum hysterectomies

severe acute maternal morbidities
peripartum hysterectomies
postpartum hemorrhage
uterine rupture
placental abruption
invasive placenta

Cesarean is deferred risk



This is true whether the subsequent birth is vaginal or cesarean.

Dr. Thomas van den Akker

“Who pays the price? (Foreign) women and future siblings.” 1st Amsterdam Breech Conference, 2016.

Sources:

- Su 2007
- Hannah 2004
- Van Dillen 2010
- Schutte 2007
- Vlemmix (submitted)

Maternal mortality after CS in the developing world

Tanzania
Van Roosmalen 2014

1.9%

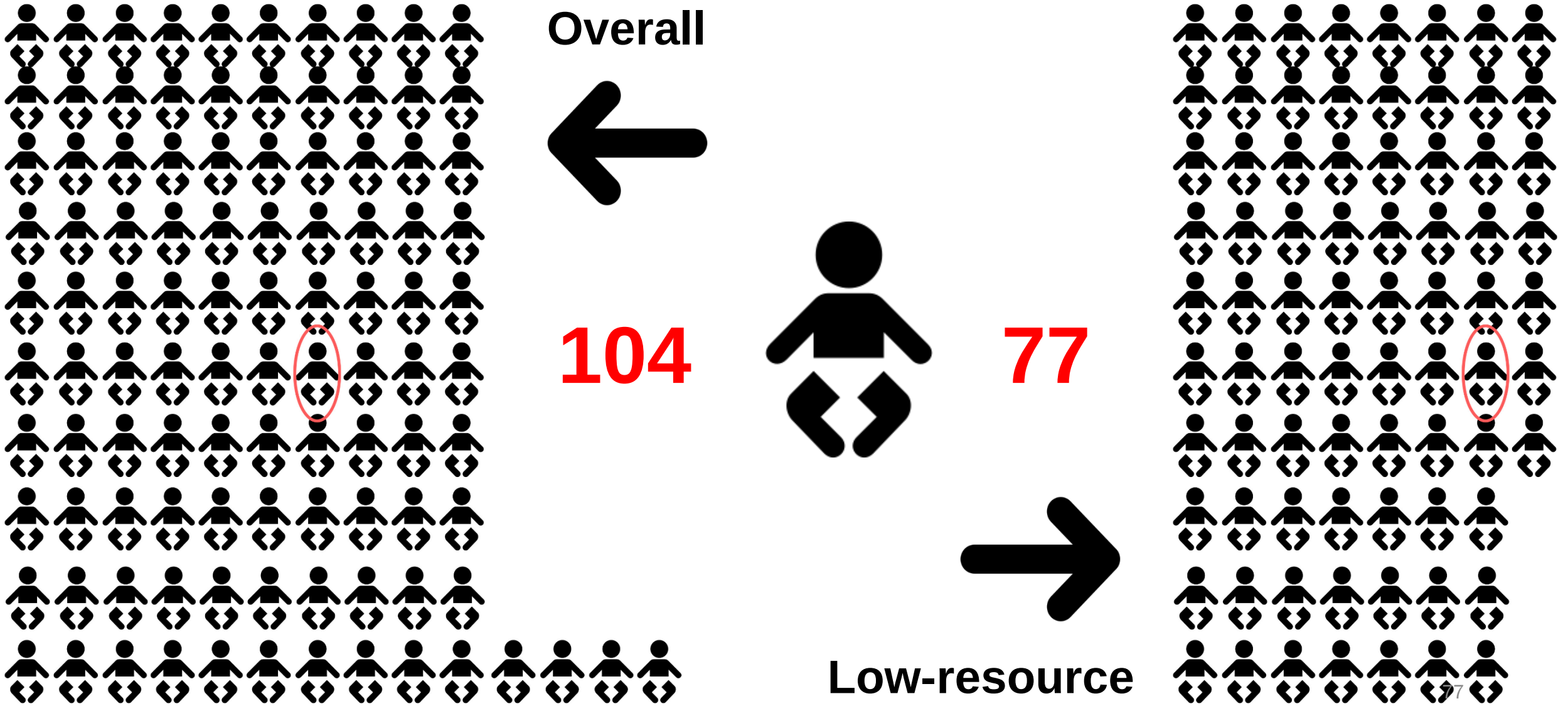
Zimbabwe
van Eygen 2008

1.6%

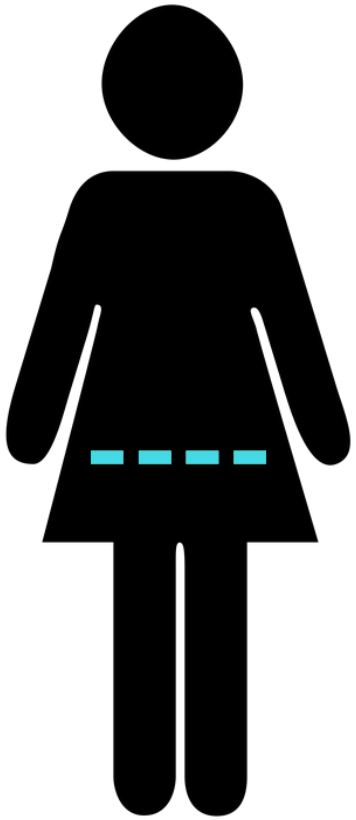
Malawi
van den Akker 2015

1.0%

TBT NNT



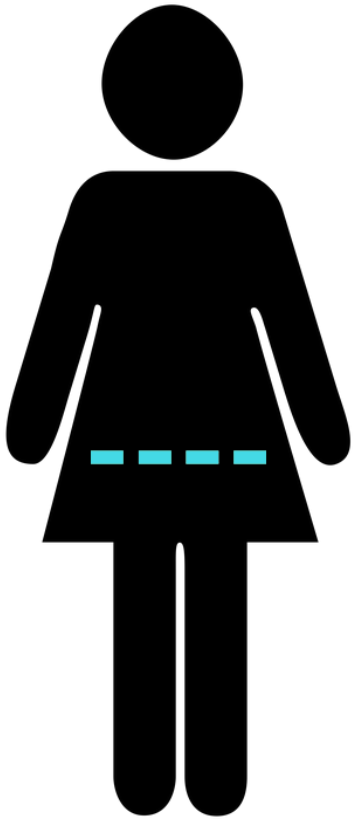
X 1,000



NNT=77

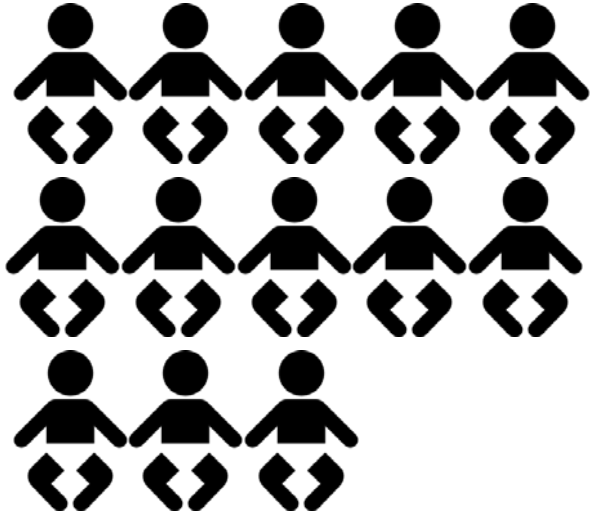
Malawi Tanzania Zimbabwe

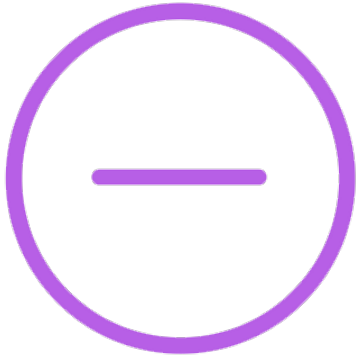
X 1,000

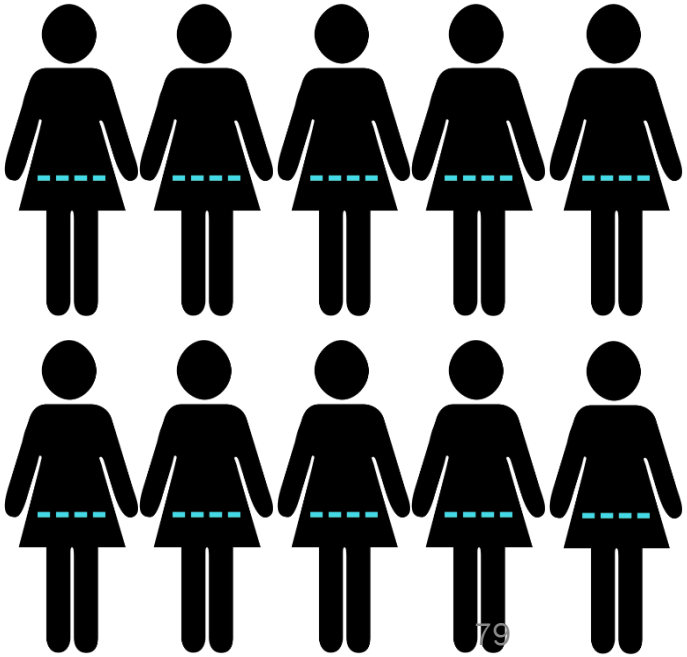


NNT=77

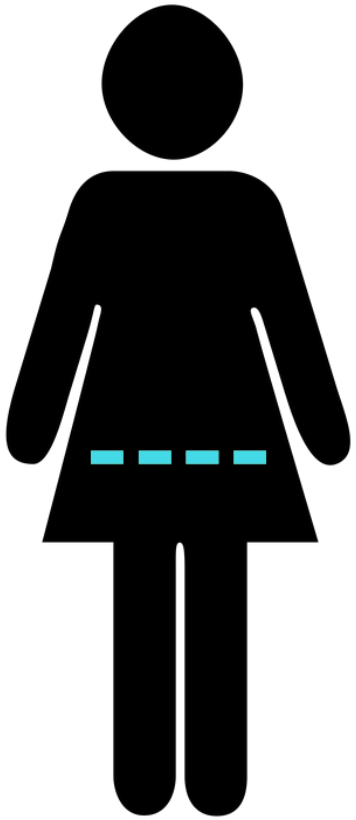
Malawi CFR 1.0%





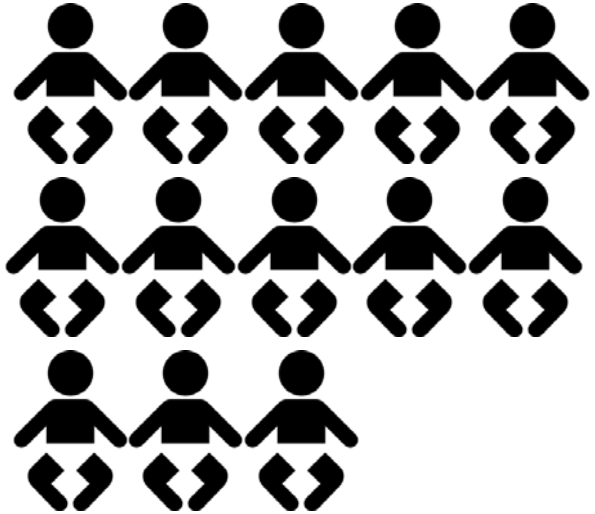


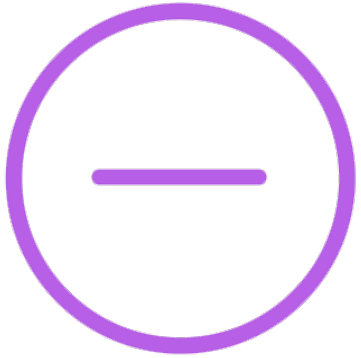
X 1,000

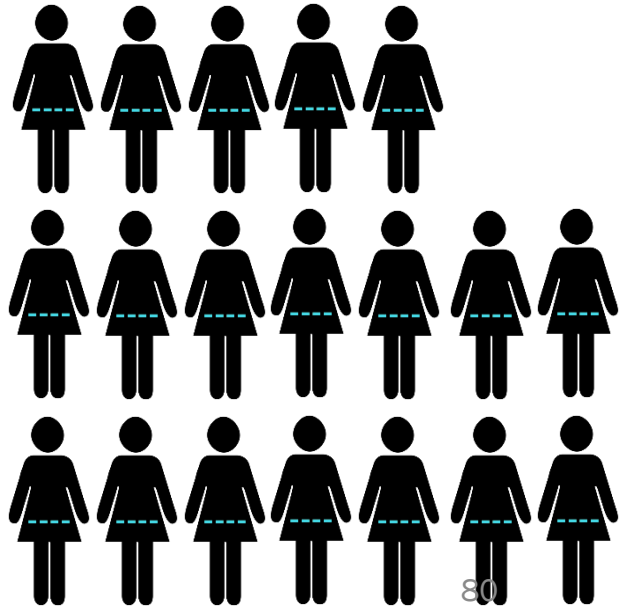


NNT=77

Tanzania CFR 1.9%







van Eygen 2008

Rural Zimbabwe

Overall PNMR	64/1000
Breech PNMR VBB	175/1000
Breech PNMR CS	38/1000
CFR	1.6%

"no correlation between the BrPNMR and the CS rate"

But…assuming CS has the maximum beneficial effect…what are the consequences?

Our second finding of a very high case fatality rate of 1.6% related to CS (for any indication), is a reason for great concern. We calculate that delivering 1000 babies in breech presentation by CS (excluding those whose outcome cannot be influenced by labour management) would save 137 babies, while 16 mothers would die as a result of the operation. Assuming that each woman will have two more deliveries and one third of these will be by CS, this policy would cause 656 (984 x 2/3) additional CS in the future, and 11 more maternal deaths, and this does not include the women who will die from a ruptured uterus during a subsequent pregnancy before they can have a repeat CS. Therefore, delivering all term breech presentations by CS would save 137 babies, but at least 27 women would die. In our view this is totally unacceptable. In addition, orphaned babies also have a high risk of dying.

In this rural setting only a minority of women deliver in district hospitals. Thus, women with an easy vaginal breech delivery (at home or in a clinic) resulting in a live baby were not taken into account in this study. If all breech presentations at term were delivered by CS, then even more CS would be performed but a lower percentage of babies would benefit.

Reverse breech extraction (RBE)

When the head is deeply wedged in the pelvis, is it better to *push* or *pull* the baby out during a cesarean section?

- 21 articles, most published after 2000
- 2 systematic reviews found that RBE (pull) is significantly safer than pushing the head back up (push)

Breech skills can make difficult vertex cesareans safer

Berhan 2014, Jeve 2016

Pelvimetry studies & pVBB

"A kneeling squat position significantly increases the bony transverse and anteroposterior dimension in the mid pelvic plane and the pelvic outlet." (Reitter 2014)

Böttcher 2001
Al-lakkany 2002
Franz 2017
Jeyabalan 2005
Rozenberg 2007
Michel 2011
Bisits 2015
Hoffmann 2016
McMaster-Fay 2015

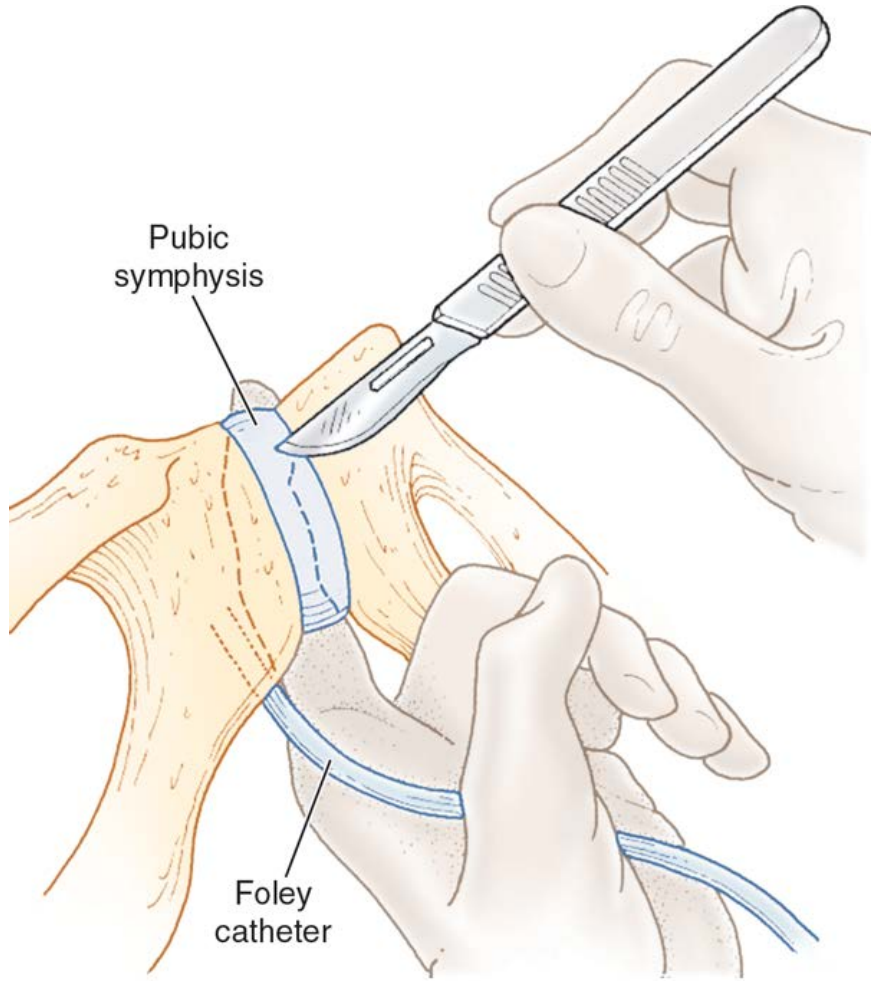
FIGURE 1
Kneeling squat position

A 1.5-T magnetic resonance scanner (Magnetom Espree, Siemens, Erlangen, Germany).

Reitter. Obstetric MR pelvimetry changes according to position. Am J Obstet Gynecol 2014.

Being upright during labour and birth can increase the available space within your pelvis by 28-30%. More room for baby to be born.

More resources at **www.cub-support.com**



Source: Reichman EF: *Emergency Medicine Procedures, Second Edition:* www.accessemergencymedicine.com

Simulation training for breech skills

Simulation training is an effective way to teach and retain vaginal breech skills.

Deering 2006
Maslovitz 2007
Buerkle 2013
Jordan 2015
Noblot 2015
Easter 2016
Jordan 2016

Dr. Anke Reitter doing simulation training, Belfast, Ireland, 2017
Breechbirth.org.uk

Innovations in upright breech birth

Upright breech birth leads to:

- shorter 2nd stage
- fewer maternal & neonatal injuries
- fewer maneuvers required
- higher vaginal birth rate

Frye 2004
Banks 2007, 2009
Scamell 2010
Fahy 2011
Walker 2012, 2016 “Standards” & “Principles”, 2017
Reitter 2014
Bogner 2015
Louwen 2017
Wildschut 2017

Figure 4. Watchful waiting. At this stage of birth, the hands of the attending midwife do not touch the lower part of the body of the baby.

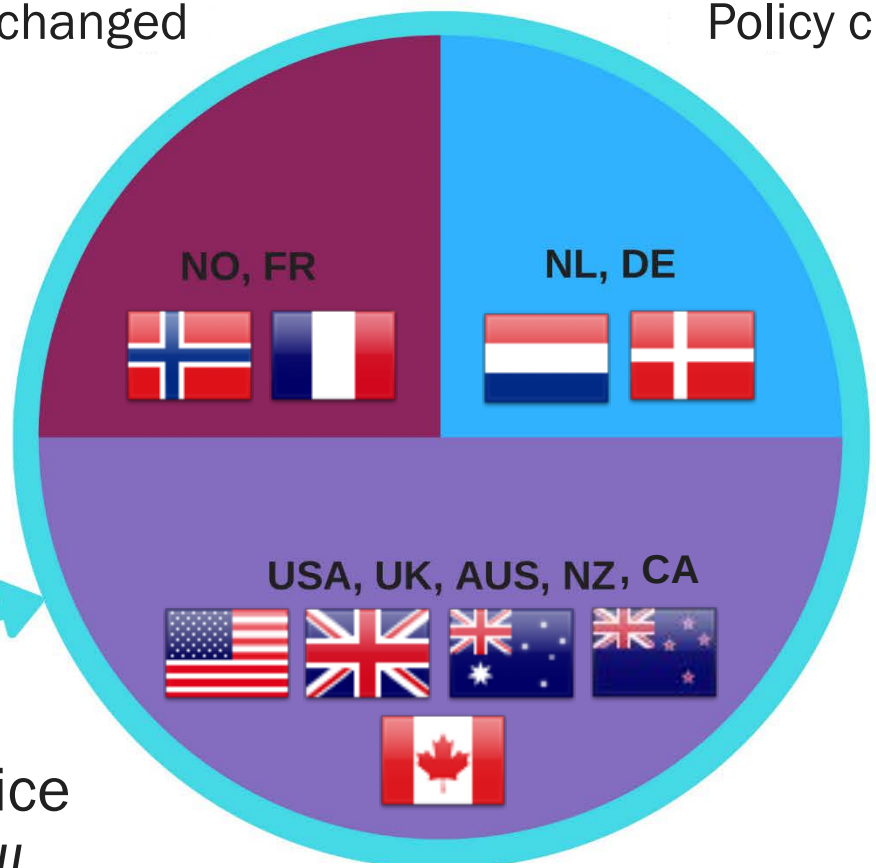
Is there any consensus?

Planned vaginal breech birth leads to Apgar suppression in the first 1-5 minutes

Changes in obstetric guidelines

Policy never changed

Policy changed



Obstetric practice changed in *all* countries

Policy changed, then revised

Changes in Cochrane reviews

Uncertainty

↓

Certainty

↓

Complex uncertainty

Changes in Cochrane reviews

Uncertainty in 2000:

“There is not enough evidence to evaluate the use of a policy of planned caesarean section for breech presentation.”

Certainty in 2001:

“Planned caesarean greatly reduces both perinatal/neonatal mortality and neonatal morbidity, at the expense of somewhat increased maternal morbidity.”

Complex uncertainty in 2015:

“The benefits need to be weighed against factors such as the mother's preference for vaginal birth and risks such as future pregnancy complications in the woman's specific healthcare setting....”

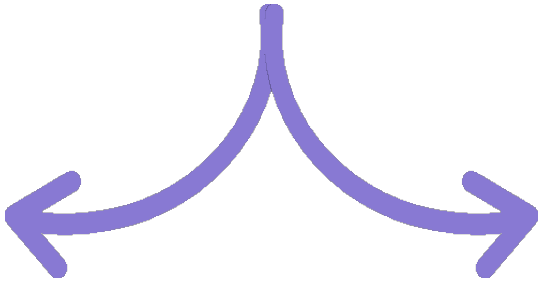
“The data from this review cannot be generalised to settings where caesarean section is not readily available, or to methods of breech delivery that differ materially from the clinical delivery protocols used in the trials reviewed....”

Research on strategies to improve the safety of breech delivery and to further investigate the possible association of caesarean section with infant medical problems is needed.”

Tips for counseling women

Provider bias

Counseling about breech strongly steers women in certain directions, depending on the counselor's preferences



Relative vs. Absolute Risk

Mowing the lawn is 2x as dangerous as shaving

You are 2x as likely to pick a red ball than a blue ball

True, but not very useful…

Relative (2x) vs. Absolute risk

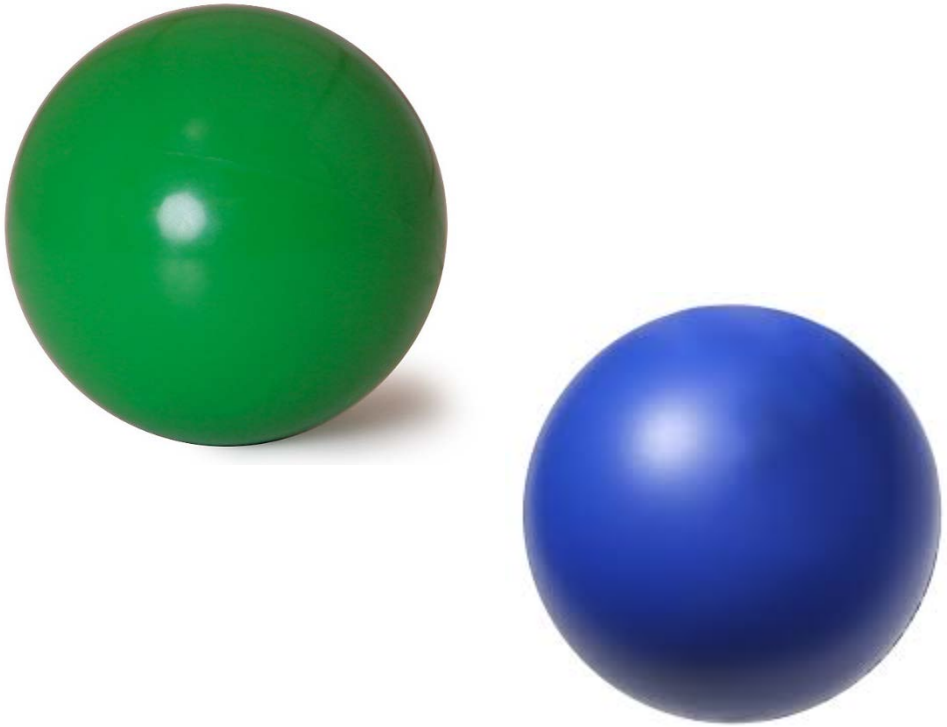
1/3,623

1/6,585

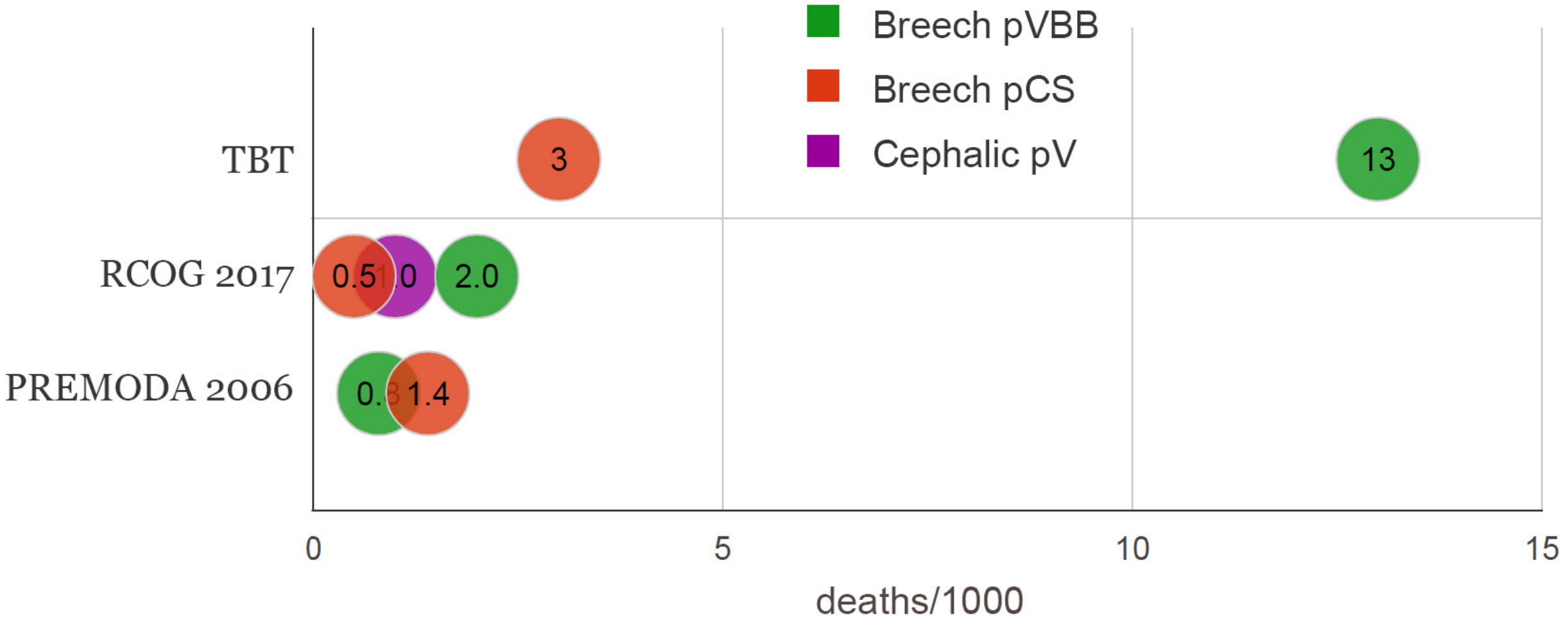
Relative (2x) vs. Absolute risk

1/2

1/4



Relative risk vs absolute risk

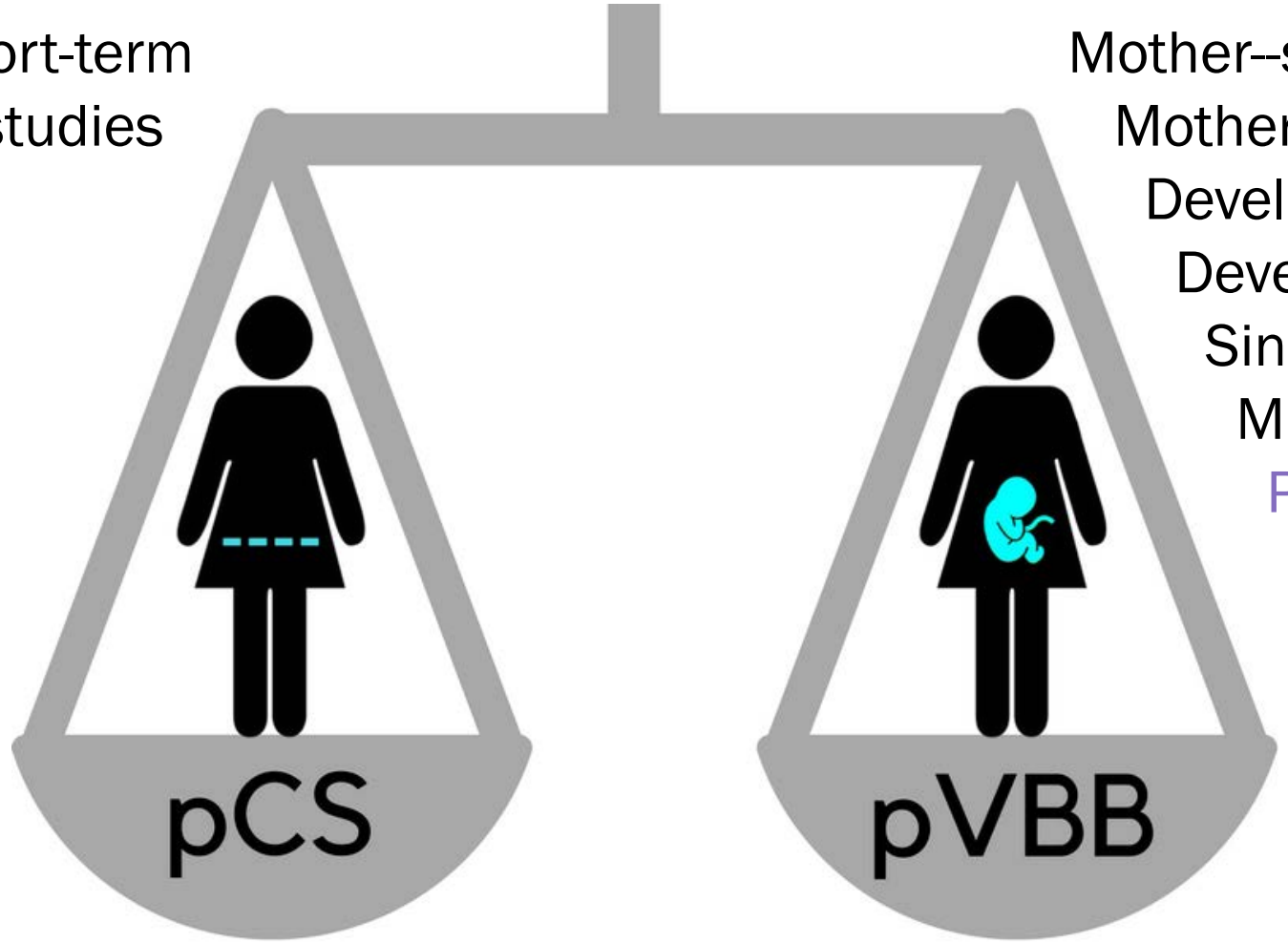


Where does the balance fall?

Child—long-term
Developed nations

Neonate—short-term
Registry studies

Mother--short-term
Mother—long-term
Developing nations
Developed nations
Single-center studies
Multi-center studies
Precipitous breech
Undiagnosed breech
Maternal autonomy



Is vaginal breech birth safe ?

Pressing issues

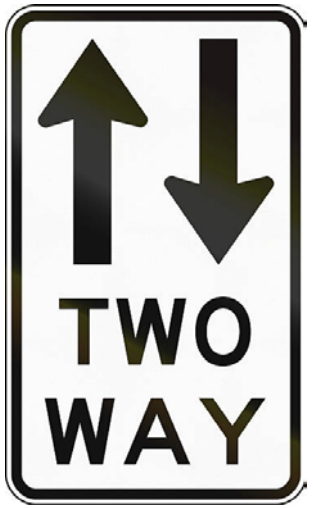
A policy of universal cesarean…

- leaves doctors and midwives less skilled
- makes undiagnosed/precipitous breech births less safe

Breech birth en route to the hospital, Brazil 2017.
Posted on Facebook by the parents.

Pressing issues

- Obstetric policy and practice favors short-term outcomes
- Who decides what level of risk is acceptable?
- What about maternal autonomy?



Pressing issues

Breech birth occurs within a woman's lifetime context (values, family situation, reproductive future).

For some women, a forced cesarean is permanently devastating:

> "I had a forced c-section because my baby was frank breech....I do not trust hospitals anymore. I hate my body now. I was loving it. I was loving my pregnancy until then. Now I feel like half a person. I have a baby but I didn't give birth."

What do women want?

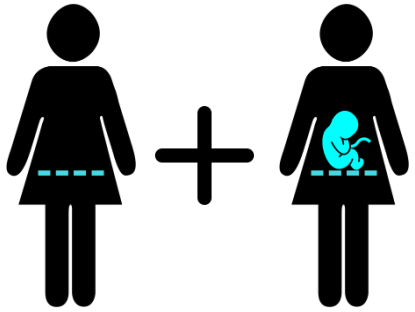
"For some women labour is an integral and treasured experience of pregnancy, something to be looked forward to, and achieving a vaginal delivery a life event of enormous magnitude. For others, delivery is an unwelcome bridge that has to be crossed and the option of a caesarean section may appear to be the answer to quiet prayers. The answer must surely be to offer individual choice after appropriate consultation based on existing data, allowing time for reflection before arriving at a final decision."

Thorpe-Beeston 1998

pCS

ILCS

VBB (& VBAC)



Thank you to Lauren McClain of
Better Birth Graphics!
betterbirthblog.org/shop

Thank you for listening!

Any questions?