





















































uncertain.<sup>21,22</sup> This could be a topic for further research in the department. The safety of planned vaginal breech deliveries could be assessed in a prospective study where outcomes could be compared to those of planned CS for breech presentation.

As with most retrospective studies, the index study includes certain shortcomings associated with the nature of such a study. One of these would include certain data that is not available in case files e.g. documentation of blood loss.

The importance of early booking of all pregnancy cannot be over emphasized. Careful clinical assessment of fetal lie and presentation should be routine during prenatal examination, from 34 weeks onwards. Early detection and a policy of considering all non-cephalic singletons for ECV near term can see the reduction of both neonatal and maternal morbidity.

Breech births and caesarean deliveries can be significantly reduced by use of external cephalic version (ECV).<sup>23,24</sup> A systematic review showed that ECV at term was associated with a significant reduction in non-cephalic births (RR 0.42, 95% CI 0.35-0.50) and caesarean delivery (relative risk 0.52, 95% CI 0.39-0.71) The Royal College of Obstetricians and Gynaecologists recommends that a skilled service for ECV should be available and offered to women with breech presentation at term.<sup>12</sup> Likewise, the American College of Obstetricians and Gynecologists (ACOG) recommends that all women near term with breech presentation should be offered an attempt at version.<sup>25</sup> At Tygerberg Academic Hospital (TAH) has a policy for external cephalic version of breech singletons from as early as 36 weeks gestation. Included in this group are mothers with a previous caesarean section without other contra-indications for ECV. HIV sero-positive patients are not offered this procedure as studies are sparse regarding the rate of HIV transmission with ECV.<sup>26</sup>

The labour register of TBH showed a total of 7142 births in the year of 2007 of which 158 were breech deliveries, 7302 in 2008 of which 177 were breech and 6103 in 2009 of which 206 deliveries were breech deliveries. It is clear that breech presentations at term are a very real and constantly increasing reality in our clinical setting and that appropriate

management and decision making of the route of delivery is an indispensable skill for obstetricians and nurses alike.

When analyzing the registrar questionnaire it can be noted that although clinicians are performing an adequate number of breech vaginal deliveries, with an average of 10 deliveries per year, the skills training for clinicians is invaluable. Not all registrars learned skills from a senior clinician and skills training in skills labs are essential for initial and even continual training of these clinicians. It is suggested that these skills training programs be made compulsory for all registrars and that a biyearly attendance and completing of such a course be mandatory for those wishing to work in the labour ward.

In a developing country setting vaginal breech deliveries are an unavoidable reality in the labour ward. A large number of breech presentations are diagnosed at the time of onset of labour. This study was able to draw a comparison between the outcomes of a planned elective CS for breech and a vaginal delivery at term. It became clear when examining the data that not all patients in the vaginal delivery group underwent the careful selection process as stipulated in the TBH guidelines. It stands to question whether the outcomes of these can fairly be compared to the control group or whether conclusions should be drawn for management of planned vaginal deliveries based on these. Although not statistically significant, there was more morbidity and mortality associated with vaginal breech delivery.

### **Conclusion and Recommendations**

In conclusion this study found statistically significant differences in maternal ages between the two groups, with younger women delivering by CS; gravidity and parity was lower in the CS group; blood loss was observed to be higher in the CS group with more women requiring a blood transfusion when compared to vaginal delivery; there were more neonatal admissions in the vaginal delivery group as well as more birth trauma, seizures and neonatal death in this group; Apgar scores were higher in the CS group and finally, neonates born by CS were more commonly discharged at the same time as their mothers in the CS group.

Inevitable vaginal breech deliveries cannot be avoided in such a setting where the incidence of unbooked patients, with poor if any delivery plans made remains less than ideal. Vaginal breech deliveries under these conditions remain less than ideal and outcomes can be dire as seen in the neonatal death observed in this study. Although not statistically significant, there was more morbidity and mortality associated with vaginal breech delivery.

## References

1. Hickok DE, Gordon DC, Milberg JA, Williams MA, Daling JR. The frequency of breech presentation by gestational age at birth: a large populations-based study. *Am J Obstet Gynecol* 1992;166:851-52.
2. Hannah ME, Hannah WJ, Hewson SA, et al. Planned caesarean section versus planned vaginal birth for breech presentation at term: A randomised multicentre trial. *Lancet* 2000;356:1375.
3. Andrews K, Menticoglou S, Gagnon R. Vaginal delivery of breech presentation. *Int J Gynecol Obstet* 2009;226:557-566.
4. Whyte H, Hannah ME, Saigal S, Hewson S, Amankwah K, et al. Outcomes of children at 2 years after planned caesarean birth versus planned vaginal birth for breech presentation at term: The International Randomized Term Breech Trial. *Am J Obstet Gynecol* 2004;191:864-871.
5. Hofmeyr GJ, Hannah M. Planned caesarean section for term breech delivery. *Cochrane Database of Systematic Reviews* 2003, Issue 1. Art. No.: CD000166. DOI: 10.1002/14651858.CD000166 (Intervention Review).
6. Goffinet F, Carayol M, Foidart JM, Alexander S, Uzan S, Subtil D, et al.; PREMODA Study Group. Is planned vaginal delivery for breech presentation at term still an option? Results of an observational prospective survey in France and Belgium. *Am J Obstet Gynecol* 2006;194:1002-11.
7. Mode of term singleton breech delivery. ACOG Committee Opinion No 340, American College of Obstetricians and Gynaecologists. *Obstet Gynecol* 2006;108(1):235-237.
8. Pritchard JA, MacDonald PC. Dystocia caused by abnormalities in presentation, position or development of the fetus. In: Williams Obstetrics. Norwalk, CT. Appleton-Century Crofts 1980:787-796.

9. Villar J, Carroli G, Zavaleta N, et al. Maternal and neonatal individual risks and benefits associated with caesarean delivery: Multicentre prospective study. *BJM* 2007;335:1025.
10. Burrows LJ, Meyn LA, Weber AM. Maternal morbidity associated with vaginal versus caesarean delivery. *Obstet Gynecol* 2004;103:907.
11. Declercq E, Barger M, Cabra JH, et al. Maternal outcomes associated with planned primary caesarean births compared with planned vaginal births. *Obstet Gynecol* 2007;109(3):669.
12. Royal College of Obstetricians and Gynaecologists. RCOG Green Top Guidelines: The management of breech presentation. Guideline no. 20b. London; RCOG; December 2006.
13. American College of Obstetricians and Gynecologists. ACOG Committee Opinion No. 340, Mode of term singleton breech delivery. *Obstet Gynecol* 2006;108;235-7.
14. Giuliani A, Scholl WM, Basver A, Tamussino KF. Mode of delivery and outcome of 699 term singleton breech deliveries at a single centre. *Am J Obstet Gynecol* 2002;187:1694-1698.
15. Hellsten C, Lindqvist PG, Olofsson P. Vaginal breech delivery: is it still an option? *Eur J Obstet Gynecol Reprod Biol* 2003;111:122-8.
16. Kayem G, Goffinet F, Clement D, Hessabi M, Cabrol D. Breech presentation at term: morbidity and mortality according to the type of delivery at Port Royal Maternity hospital from 1993 through 1999. *Eur J Obstet Gynecol Reprod Biol* 2002;102:137-42.
17. Alarab M, Regan C, O'Connell MP, Keane DP, O'Herlihy C, Foley ME. Singleton vaginal delivery at term: still a safe option. *Obstet Gynecol* 2004;103:407-12.
18. Irion O, Almagbaly PH, Morabia A. Planned vaginal delivery versus elective caesarean section: a study of 705 singleton term breech presentations. *Br J Obstet Gynaecol* 1998;105:710-7.
19. Albrechtsen S, Rasmussen S, Reigstad H, Markestad T, Irgens LM, Dalaker K. Evaluation of a protocol for selecting fetuses in breech presentation for vaginal delivery or caesarean section. *Am J Obstet Gynecol* 1997;177:586-92.

20. Krause M, Lenz A, Feige A. Vaginale Beckenendlagengeburt—Entscheidungskriterien und Einfluss auf die kindliche Morbiditaet [*article in German*]. *Hebamme* 1999;12:22–9.20.
21. Su M, McLeod L, Ross S, Willan A. Factors associated with adverse perinatal outcome in the Term Breech Trial. *Am J Obstet Gynecol* 2003;189:740.
22. Su M, Hannah WJ, Willan A, et al. Planned caesarean section decreases the risk of adverse perinatal outcome due to both labour and delivery complications in the Term Breech Trial. *BJOG* 2004;111:1065.
23. Hofmeyr GJ, Gyte GML. Interventions to help external cephalic version for breech presentation at term. *Cochrane Database of Systematic Reviews* 2004, Issue 1. Art. No.: CD000184. DOI: 10.1002/14651858.CD000184.pub2.
24. Hofmeyr GJ, Kulier R. External cephalic version for breech presentation at term. *Cochrane Database of Systematic Reviews* 1996, Issue 1. Art. No.: CD000083. DOI: 10.1002/14651858.CD000083.
25. American College of Obstetricians and Gynecologists (2000, reaffirmed 2005). External cephalic version. ACOG Practice Bulletin No. 13. Washington, DC: American College of Obstetricians and Gynecologists.
26. Holmes WR, Hofmeyr GJ. Management of breech presentation in areas with high prevalence of HIV infection. *Int J Gynaecol Obstet* 2004;87:272.

**Table 1****Comparison of intra-partum management of vaginal breech deliveries**

	<b>TBT</b>	<b>TBH</b>
Induction	Yes	No
Amniotomy	Yes	No
Augmentation	Yes	No
Progress	≥ 0.5 cm/hr	≥ 1cm/hr
Descent (on full dilatation)	2 hours	Progressive descent
2 <sup>nd</sup> stage	≤ 1 hr	≤ 30 min

**Table 2****Secondary Outcomes*****Short-term perinatal/neonatal outcomes***

Serious neonatal morbidity (e.g. seizures, neonatal encephalopathy, birth trauma);  
 Apgar score less than seven at 5 minutes;  
 Neonatal intensive care unit admission;

***Short-term maternal outcomes***

Regional analgesia;  
 General anaesthesia;  
 Instrumental vaginal delivery;  
 Postpartum haemorrhage (blood loss greater than 500 mL during a vaginal delivery or greater than 1,000 mL with a CS);  
 Need for blood transfusion;  
 Wound infection;  
 Perineal injuries  
 (Only outcomes for which data were available will be included in the analysis tables. Numbers with inadequate information will also be documented.)

**Table 3****Comparison of Mode of Delivery - Continuous Variables**

Variables	Mode of Delivery	Minimum	Maximum	Mean	Median	Standard Deviation	P-value
Age	CS*	15	42	27.05		5.90	0.009
	VD*	17	44	29.98		6.28	
Gravidity	CS	1	7	1.88	2	1.42	0.004 <sup>x</sup>
	VD	1	10	3.11	3	1.80	
Parity	CS	0	4	1.03	1	1.14	0.002 <sup>x</sup>
	VD	0	7	1.93	2	1.62	
Gestation at Booking (weeks)	CS	6	40	20.60		7.77	0.750
	VD	1	38	21.48		9.13	
Breech Diagnosed (weeks)	CS	34	42	37.12		2.23	0.146
	VD	32	42	37.68		2.10	
Gestation at Labour (weeks)	CS	34	43	38.88		1.62	0.083
	VD	34	42	38.37		1.68	

\*CS (Caesarean Sections) VD (Vaginal Deliveries)

<sup>x</sup> P-values determined by Mann-Whitney U test

**Table 4****Blood loss during delivery**

	N	Mean	95% CI	95% CI	Median	Minimum	Maximum	Std.Dev.	P - value
CS	25	450.00	360.23	539.76	400.00	100	800	217.46	<0.0001
VD	82	268.41	228.26	308.56	200.00	0	800	182.72	

**Table 5****Days stayed in hospital post delivery**

	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>11</b>	<b>Row - Totals</b>
<b>Caesar</b>	1*	1	4	31	18	3	1	1	60
<b>Total %</b>	0.84%	0.84%	3.36%	26.05%	15.13%	2.52%	0.84%	0.84%	50.42%
<b>Vaginal</b>	12	30	10	4	2	0	1	0	59
<b>Total %</b>	10.08%	25.21%	8.40%	3.36%	1.68%	0.00%	0.84%	0.00%	49.58%
<b>Totals</b>	13	31	14	35	20	3	2	1	119
<b>Total %</b>	10.92%	26.05%	11.76%	29.41%	16.81%	2.52%	1.68%	0.84%	100.00%

\*Patient requested discharge on own responsibility

**Table 6****Duration of 1<sup>st</sup> and 2<sup>nd</sup> stages of vaginal delivery group**

<b>Hours</b>	<b>Valid N</b>	<b>Mean</b>	<b>95% CI</b>	<b>95% CI</b>	<b>Median</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Std.Dev.</b>
<b>MoD: Dur - 1st Stage</b>	57	5.64	4.59	6.69	5.00	1.41	24.00	3.955920
<b>MoD: Dur - 2nd Stage</b>	60	0.36	0.26	0.46	0.20	0.01	2.25	0.387976

MoD (Mode of Delivery)

**Table 7****Health professionals involved in performing CS and conducting vaginal deliveries**

	<b>Registrar</b>	<b>Consultant</b>	<b>Medical Officer</b>	<b>Nurse</b>	<b>Intern</b>
<b>CS</b>	21 (17.5%)	1 (1.7%)	35 (29.2%)	0 (0.0%)	0 (0.0%)
<b>VD</b>	34 (38.3%)	7 (5.8%)	7 (5.8%)	11 (9.2%)	1 (1.7%)

**Table 8****Birth Weight**

	N	Mean	Std.Dev.	Median	Minimum	Maximum
<b>CS</b>	60	3180.27	591.84	3100.00	1980.00	4520.00
<b>VD</b>	60	2960.02	500.19	2865.00	1900.00	4100.00

**Table 9****Birth Trauma**

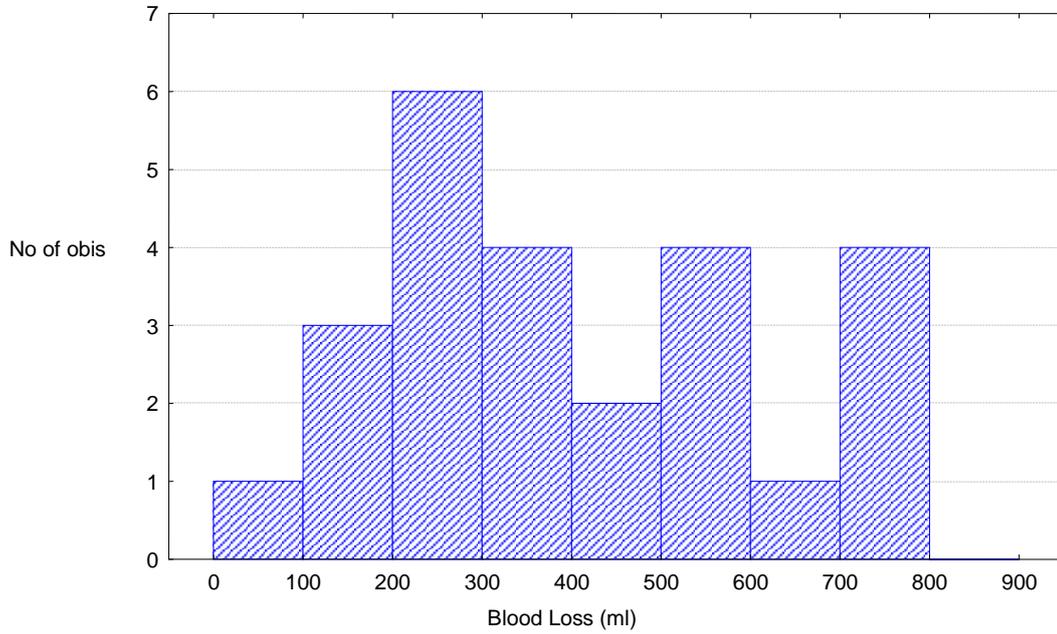
	No	Yes	N
<b>Caesar</b>	59	1	60
<b>Row %</b>	98.33%	1.67%	
<b>Vaginal</b>	57	3	60
<b>Row %</b>	95.00%	5%	
<b>Fisher's exact two-tailed test</b>			p=.20683

**Table 10****Comparison of birth weight distribution**

MoD	Study group	< 2500g	≥ 2500 – 3000g	≥ 3000g – 3500g	≥ 3500g – 4000g	≥ 4000g
<b>VD</b>	PREMODA	6.1%	30.1%	43.7%	17.6%	2.5%
	Index	13.3%	26.0%	23.2%	18.3%	1.7%
<b>CS</b>	PREMODA	5.3%	28.8%	42.1%	19.6%	4.2%
	Index	10.0%	22.0%	23.3%	18.3%	10.0%

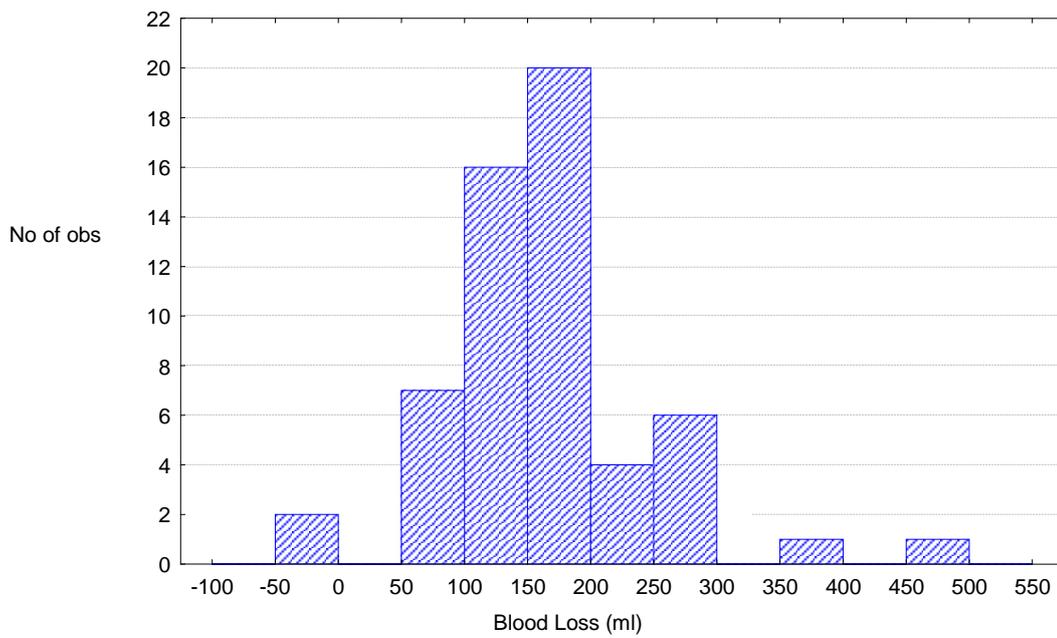
**Figure 1**

**Blood loss in the CS group**



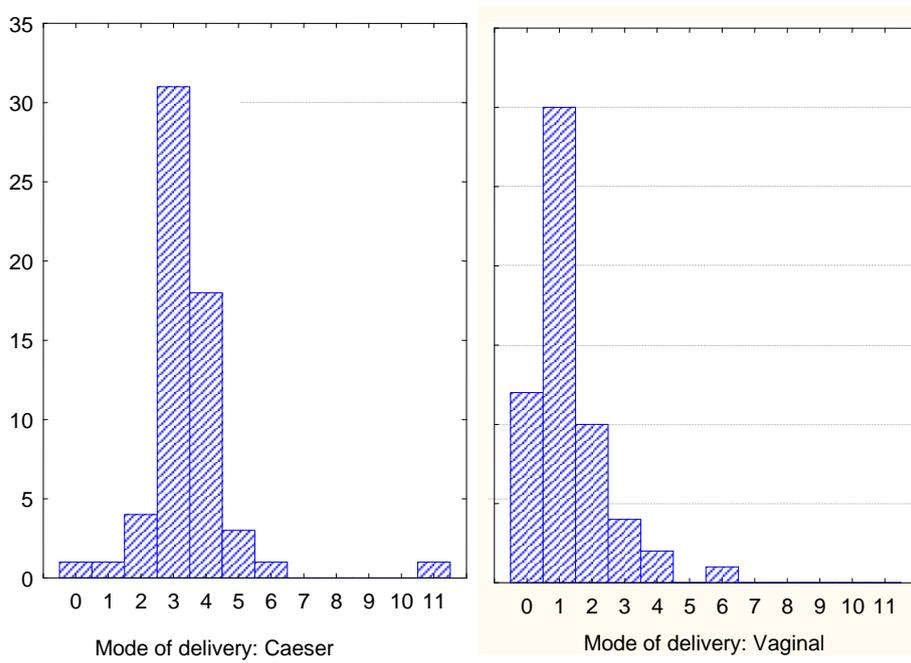
**Figure 2**

**Blood loss in the vaginal delivery group**



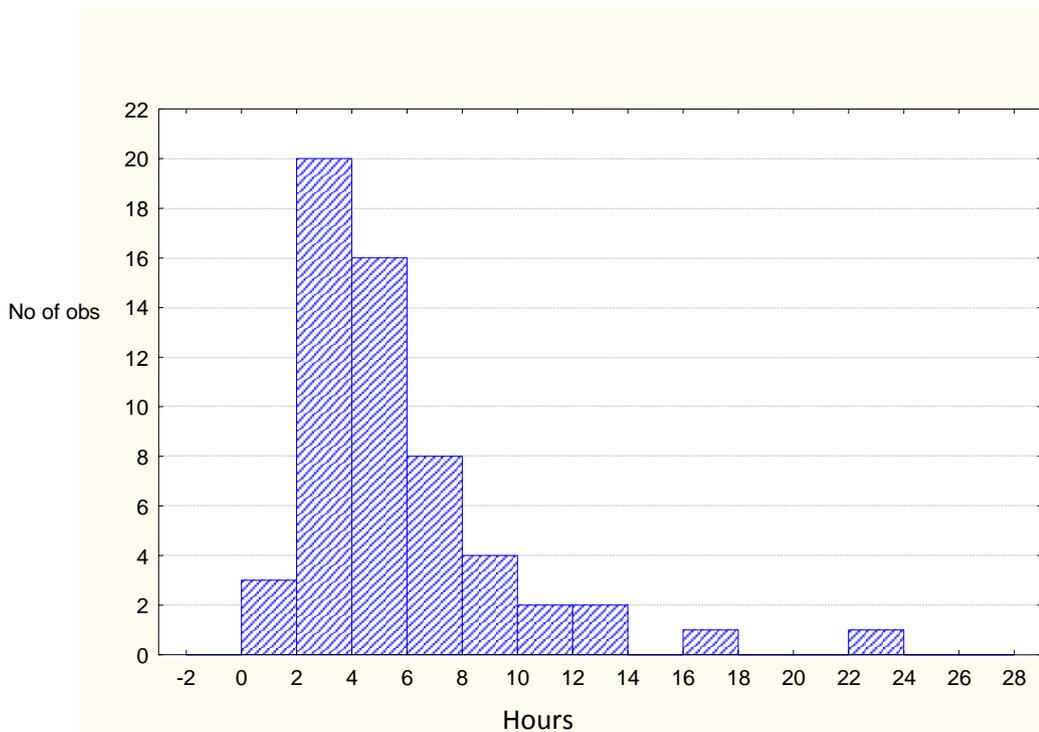
**Figure 3**

**Days stayed in hospital post delivery**



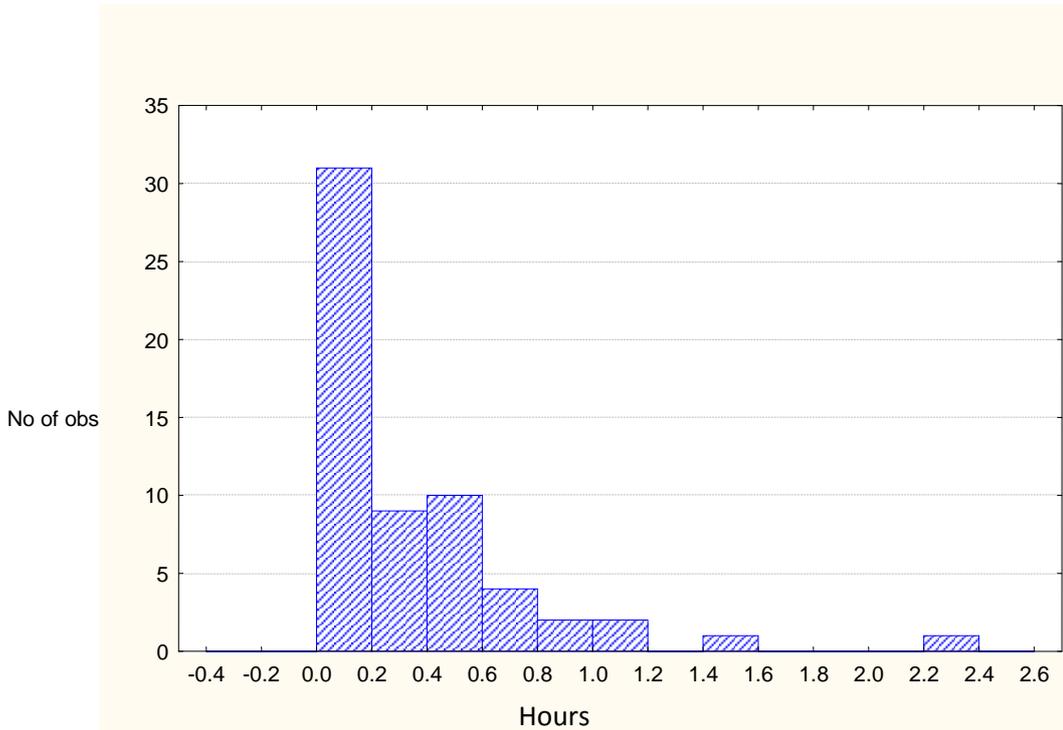
**Figure 4**

**Duration of 1<sup>st</sup> stage of labour – vaginal delivery group**



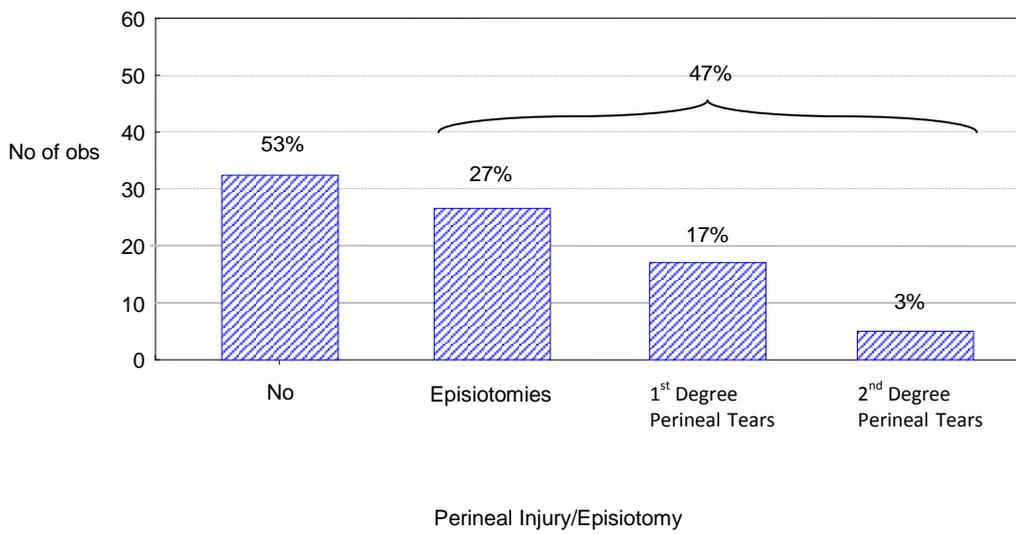
**Figure 5**

**Duration of the 2<sup>nd</sup> stage of labour – vaginal delivery group**



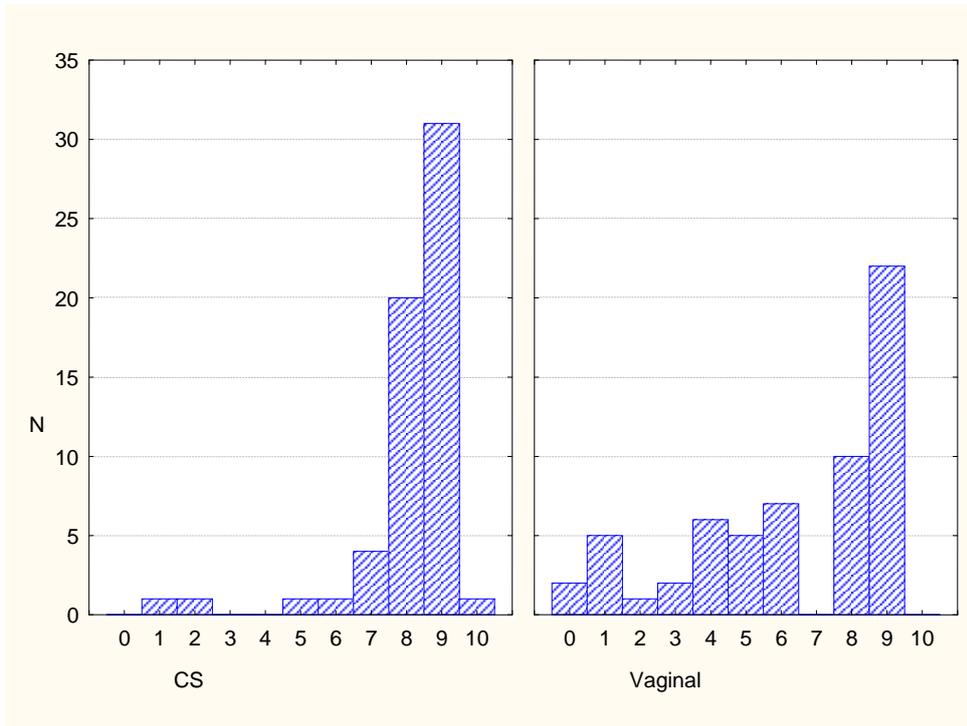
**Figure 6**

**Perineal injuries in the vaginal delivery group**



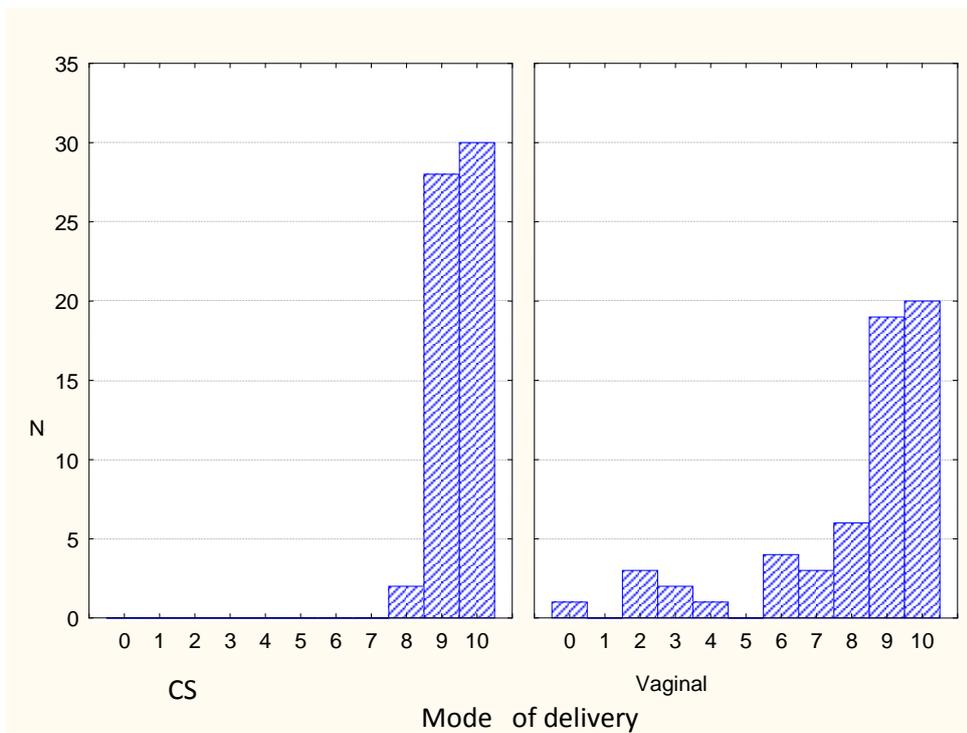
**Figure 7**

**Five minute Apgars scores**



**Figure 8**

**Ten minute Apgar scores**



## **Appendix A:**

### **Data Sheet:**

### **Number:**

#### **A- Maternal**

##### **General**

1. Study number (patient names kept separately)
2. Age
3. Gravida                      Para                      Miscarriage                      Top                      Ectopic
4. Gestation at booking: (in weeks)
5. Gestation at attempted version: N.A/ number of weeks
6. Gestation at onset of labour: (in weeks)
7. Breech diagnosed antenatally: yes/no
8. Planned mode of delivery: a. vaginal                      b. elective caesarean section
9. Mode of delivery: a. vaginal
  - i. Duration of 1<sup>st</sup> stage
  - ii. Duration of 2<sup>nd</sup> stage
  - iii. Augmentation with oxytocin requires: Yes/No
  - iv. Delivery done by nurse or doctor (medical officer/registrar/consultant)
  - v. Use of a forceps to deliver the after coming head: Yes/No

b. Caesarean section:

  - i. Anaesthetic – spinal / epidural / failed spinal or epidural + general / general
  - ii. Intra-operative complications
10. Blood loss
11. Blood transfusion required
12. Perineal injury/Episiotomy
13. Post-operative complications:
  - Fever (38° or more)
  - Wound infection
  - Lung complications
  - Other

**B- Neonatal**

1, Apgars: 5min /10min

2. Birth weight:

3. Sex: male/female

3. Neonatal:

Admission to high or critical care: Yes/No

Discharged with mother: Yes/No

4. Birth trauma

5. Seizures: Yes/No

6. Death: no/antenatal/perinatal/postnatal

7. Other



b. On average how many do you perform per year?

- i. 0 – 10
- ii. 10-20
- iii. > 20

c. Can you think of case(s) managed personally where there was **neonatal mortality** related to the delivery? If yes, how many? And please elaborate.

---

---

---

---

d. Can you think of case(s) managed personally where there was **neonatal morbidity** related to the delivery? If yes, how many? Please name the complication(s) and elaborate.

---

---

---

---

e. Can you think of a case(s) managed personally where there was **maternal mortality** related to the delivery? If, yes, how many and please elaborate.

---

---

---

---

f. Can you think of a case(s) managed personally where there was **maternal morbidity** related to the delivery? If, yes, how many and please name the complication(s) and elaborate.

---

---

---

---

g. Which manoeuvre(s) do you use during an assisted breech delivery in the following circumstances?

Legs if frank breech \_\_\_\_\_  
\_\_\_\_\_

Arms if flexed over chest \_\_\_\_\_  
\_\_\_\_\_

After coming foetal head \_\_\_\_\_  
\_\_\_\_\_

4. Do you think clinicians are properly trained at Tygerberg Hospital to perform vaginal breech delivery? Yes / No

Please clarify your answer:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

5. Do you think the current approach to the delivery of breech-lying neonates is appropriate? Yes / No

Please clarify your answer:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Other comments:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_