



HONG KONG COLLEGE OF OBSTETRICIANS & GYNAECOLOGISTS

Territory-Wide Audit in Obstetrics & Gynaecology



2014

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FOREWORD

Clinical audit is a systemic analysis of the performance of an individual or an organisation's clinical work, with the aims to evaluate the efficacy of current practice and to identify areas of need for improvement. It is also an integral part of clinical governance of each healthcare system in the modern days. Since 1994, the Hong Kong College of Obstetricians and Gynaecologists has conducted this 5 yearly Territory-wide audit in obstetrics and gynaecology, involving all public and private hospitals in Hong Kong. The epidemiology, disease pattern, clinical management and treatment outcomes for all obstetric deliveries and inpatient gynaecological care are being studied.

In this 5th report, as highlighted in the Overview, there are several changes compared with the previous reports, such as inclusion of some new conditions. Trend analyses over the past decades on various items were also made. Of note, on the obstetric side, the percentage of pregnant women aged ≥ 35 years old had been increasing, from 13.9% in 1994, to 24.2% in 2004, and 41.6% in 2014. With the advancing maternal age, the incidence of gestational diabetes and hypertensive disorders also increased, yet other the obstetric outcomes and complications in 2014 did not differ much from the previous years. A significant improvement in the practice of Down syndrome screening was also observed in 2014. Hence, the change in demographic situation of the parturients might have posed different resource implication to the health-care providers. On the gynaecological side, the total number of hospital admissions had increased by 14.5% compared with 2009, while the emergency and day-care admissions had increased by 60% and 154% respectively. The number of elective admission had dropped by 19%. At the same time, silent/ spontaneous miscarriage and threatened miscarriage were the two most common diagnoses for hospital admissions, contributing over 20% of cases. It is perhaps one of the areas where a closer look on whether the early pregnancy clinic can be re-structured for better utilization of hospital resources.

This audit contains much important information about the O&G service in Hong Kong which are of great value for the institutions and health-care providers. We have only just listed two areas for stimulation of thoughts. It is important here to thank all the participating hospitals, Fellows, Members and trainees who had helped in the collection of data. Without their contribution, the College would not be able to continue this important exercise. The College is also indebted to Dr YUEN Pong Mo and each member of the Working Group of this Audit/ Clinical Audit sub-committee (page 190). It is through their hard work and endeavour that this 5th report can be successfully compiled.

Professor LEUNG Tak Yeung
President
HKCOG

Dr LEUNG Tse Ngong
Chairman,
Quality Assurance Committee

August 2020

AN OVERVIEW OF THE REPORT

Territory-wide Audit 2014

The 2014 audit is the fifth audit exercise conducted by the Hong Kong College of Obstetricians & Gynaecologists since 1994. As in previous audits, there were a number of modification of the "Minimal Data Set" according to the change in practice and diagnostic criteria, and expansion of some clinically important area. In the obstetric side, the diagnosis of impaired glucose tolerance IGT was removed. The presence of ovarian cyst, uterine fibroids, non-caesarean section uterine scar and the diagnosis of placenta praevia were included. Down's syndrome screening using the OSCAR test or biochemical test was separated from the non-invasive fetal DNA screening and testing for trisomy. Fetal reduction for high multiple pregnancy was included. Post-partum haemorrhage was defined as blood loss > 500 ml following vaginal delivery or > 1000 ml following Caesarean delivery. Status of the amniotic fluid during labour was recorded and perineal tear was categorised into 4 different grades. The occurrence of maternal collapse, defined as an acute event involving the cardiorespiratory systems and/or brain, resulting in a reduced or absent conscious level (and potentially death), at any stage in pregnancy and up to six weeks after delivery was recorded and the definition of maternal death was specified (the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes). In the gynaecological side, new disease items were added to diseases of broad ligaments and pelvic peritoneum, and diseases of pregnancy and reproduction. Treatment coding for major abdominal operations for "benign and pre-malignant conditions" and that for "malignant conditions" were combined as in laparoscopic procedures. Laparoscopic and hysteroscopic procedures were separately coded. Complications were separated into intra-operative/procedural and post-operative/procedural complications. An ad hoc audit on intra-abdominal operation was conducted at the same time which looked into the details of all intra-abdominal operations, be it done by laparotomy or laparoscopy. In all public hospital, both the obstetric and gynaecological data were extracted from the Clinical Management System of the Hospital Authority. Data from private hospitals were first recorded in the audit forms by individual hospital and the forms were returned to the College for centralized data entry. A new web-based database program was developed by commercial vendor via the Information Technology Committee to capture both the obstetric and gynaecological data. Both the obstetric and gynaecological data from the 2 sources were then combined together and the data analysis was performed using Statistical Package for the Social Science (SPSS)

Obstetric report

The total number of deliveries in the year 2014 was significantly decreased compared with 2009. The drop was a result of the decrease in non-Hong Kong residents, mainly from the Mainland China, from 35,474 in 2009 to only 5,156 in 2014. In fact, the number of deliveries from Hong Kong residents increased from 44,258 to 54,516. Thus the audit in 2014 reflected more the characteristics and outcomes of the local Hong Kong parturients.

The proportion of parturients at or above 35 years old increased significantly to 42% and the proportion of parturients at or above 40 years old and elderly primigravidae had nearly doubled. This

was likely the major reason for the increase in the incidence of diabetes mellitus and hypertensive disorders in pregnancy. The change in diagnostic criteria of gestational diabetes could also be associated. The management of breech presentation and the incidences of other complications like preterm delivery were similar to previous audits.

Some changes in the intrapartum management that were observed in 2009 persisted in 2014. There was a further increase in the number of parturients undergoing induction of labour for social reasons, which became the second most common indication followed by pre-labour rupture of membranes. The number of instrumental deliveries further reduced, however unlike previous years, the number of forceps deliveries increased. The increase in forceps deliveries could be related to the emphasis in the need for special training in forceps deliveries by the College. The number of major perineal injury was much high (3.3%) after forceps deliveries and may be related to the relative lack of experience in this technique. As expected, the overall rate of caesarean sections slightly dropped from 42.1% to 37.3% in 2009 because of the zero quota policy for doubly non-permanent resident pregnant women. Previous caesarean sections remained the most common indication for caesarean section, followed by social reasons.

The incidence of post-partum haemorrhage (PPH) increased to 5% and one maternal death was associated with massive postpartum haemorrhage. Applications of compression uterine sutures and the use of uterine balloon tamponade, which were first included in the current audit, were the two most common interventions for the control of PPH, replacing uterine artery embolization and internal iliac artery ligation. The incidence of maternal collapse in pregnancy was 0.02%.

The rates of stillbirth, congenital abnormality and birth trauma remained low in 2014. However, the low incidence of birth trauma might still be under-reported as the diagnosis was made not immediately after birth.

Gynaecological report

The total number of hospital admissions increased to over 80,000 in 2014. While the number of elective admissions reduced, the number of day and emergency admissions increased.

Silent/Spontaneous miscarriage replaced first trimester termination of pregnancy to be the most common indication for admissions, followed by threatened miscarriage. This was in contrast to the running of Early Pregnancy Assessment Clinics in various public hospitals and the change in the practice of medical evacuation for miscarriage. First trimester termination of pregnancy became the third most common indication and the number dropped by almost 50% over the past 10 years. In contrast, the number of second trimester termination of pregnancy remained stable. The number of subfertility, uterine fibroids and endometriotic cyst continued to decrease while that of post-menopausal bleeding, endometrial polyp and menorrhagia increased dramatically. Although the total number was not high, there was a consistent increase in the group of genital displacement and urinary disorders over the years.

The number of admissions for major abdominal operations continued to decrease, especially for benign conditions. While the number of laparoscopic operation increase slightly, that of hysteroscopic operations almost doubled over the 10 years period. Major vaginal operation also

continued to increase. The number of robot-assisted procedures remained small and mostly performed for malignant conditions. Abdominal approach was still the main surgical approach for hysterectomy, but the proportions dropped to 50% in benign conditions and 57% in malignant conditions. Laparoscopic approach was being utilized for hysterectomy in 34% and 29% respectively. Less than 5% of the vaginal hysterectomies were performed in the absence of prolapse. The number of assisted reproduction procedures seemed to plateau since 2009. Over 90% of the embryo-transfer were carried out using fresh embryos. Corresponding to the reduction in the admission for first trimester termination of pregnancy, the number of suction termination of pregnancy dropped over 50%. Similarly, the number of evacuation of uterus after miscarriage also dropped by 40%. Concurrently, the use of prostaglandins tripled. This suggested the shift from surgical to medical evacuation of uterus in both induced abortion and miscarriage.

Complications associated with operations remained low with a trend of reduction over the 10 years period, and the rate was higher in operations for malignant conditions. The overall complication rate was 0.79%, with intra-operative complication rate being 0.24% and post-operative complication rate being 0.58%. Re-admission with 28 days of surgery was the most common complication. The overall incidence of inadvertent organ injury was only 0.09%, with bowel injury being the most common. The overall thrombo-embolic complication was 0.01% and that of haemorrhage with transfusion was 0.14%. There were more conversions to laparotomy in 2014. Hospital stay was shortened over the years with a mean of 1.9 days in 2014 and 50% of the admissions were discharged on the same day. As expected, the hospital stay after minimal access procedures was shorter compared to conventional surgery.

Intra-abdominal operation was performed in 9,912 (12.3%) admissions, 60% were laparoscopic procedures and 36% were laparotomy. Closed method was the main primary trocar entry technique for laparoscopic and robotic surgery, but the proportion was much higher in laparoscopy. For laparotomy, suprapubic transverse incision was used in 47% and midline incision in 36%, the latter was being used in 77% of malignant diseases, in contrast to < 20% in benign conditions. Pelvic adhesions were present in 35% of the cases, and cohesive adhesions were present in 8% and complete POD obliteration in 3-4%.

Participating Hospitals in Obstetric Audit

Participating hospitals	Number Reported		Number Audited	
	Maternities	Babies	Maternities	Babies
Canossa Hospital	761	788	770	786
Hong Kong Adventist Hospital	-	-	493	493
Hong Kong Baptist Hospital	2537	2570	2534	2557
Hong Kong Sanatorium & Hospital Ltd	3343	3388	3343	3384
Kwong Wah Hospital	5356	5457	5356	5457
Maltida International Hospital	1204	1225	1128	1137
Pamela Youde Nethersole Eastern Hospital	2744	2786	2744	2796
Precious Blood Hospital	658	654	646	646
Prince of Wales Hospital	6814	6897	6814	6921
Princess Margaret Hospital	4723	4803	4724	4803
Queen Elizabeth Hospital	6304	6420	6304	6439
Queen Mary Hospital	3752	3873	3762	3886
St Paul's Hospital	1607	1620	1607	1619
St Teresa's Hospital	5361	5398	3839	3846
Tsuen Wan Adventist Hospital	-	-	1266	1272
Tuen Mun Hospital	5531	5606	5531	5606
Union Hospital	4594	4637	4427	4435
United Christian Hospital	4350	4415	4350	4429
Total	59639	60537	59638	60512

Number reported refers to the total number of deliveries officially reported by individual hospital

Number audited refers to the total number of cases audited in individual hospital

Participating hospitals	% of hospital return		% of all audited cases	
	Maternities	Babies	Maternities	Babies
Canossa Hospital	101.18%	99.75%	1.29%	1.30%
Hong Kong Adventist Hospital	-	-	0.83%	0.81%
Hong Kong Baptist Hospital	99.88%	99.49%	4.25%	4.23%
Hong Kong Sanatorium & Hospital Ltd	100.00%	99.88%	5.61%	5.59%
Kwong Wah Hospital	100.00%	100.00%	8.98%	9.02%
Maltida International Hospital	93.69%	92.82%	1.89%	1.88%
Pamela Youde Nethersole Eastern Hospital	100.00%	100.36%	4.60%	4.62%
Precious Blood Hospital	98.18%	98.78%	1.08%	1.07%
Princess Margaret Hospital	100.00%	100.35%	11.43%	11.44%
Prince of Wales Hospital	100.02%	100.00%	7.92%	7.94%
Queen Elizabeth Hospital	100.00%	100.30%	10.57%	10.64%
Queen Mary Hospital	100.27%	100.34%	6.31%	6.42%
St Paul's Hospital	100.00%	99.94%	2.69%	2.68%
St Teresa's Hospital	71.61%	71.25%	6.44%	6.36%
Tsuen Wan Adventist Hospital			2.12%	2.10%
Tuen Mun Hospital	100.00%	100.00%	9.27%	9.26%
Union Hospital	96.36%	95.64%	7.42%	7.33%
United Christian Hospital	100.00%	100.32%	7.29%	7.32%
Total	100.00%	99.96%	100.00%	100.00%

% of hospital return refers to the percentage of cases returned for audit by individual hospital

% of all audited cases refers to the percentage of audited cases with respect to all audited cases

Participating Hospitals in Gynaecological Audit

Participating hospitals	Number of cases admitted	Number of cases audited (%)	
Canossa Hospital	1630	1300	(79.8%)
Caritas Medical Centre	1469	1400	(95.3%)
Evangel Hospital	517	500	(96.7%)
Family Planning Association of Hong Kong	3161	3144	(99.5%)
Hong Kong Adventist Hospital	-	79	
Hong Kong Baptist Hospital	6315	5585	(88.4%)
Hong Kong Sanatorium & Hospital	6727	6278	(93.3%)
Kwong Wah Hospital	5227	5116	(97.9%)
Maltida International Hospital	911	440	(48.3%)
North District Hospital	265	0	(0.00%)
Our Lady of Maryknoll Hospital	247	243	(98.3%)
Pamela Youde Nethersole Eastern Hospital	5432	5504	(101.2%)
Pok Oi Hospital	3997	3622	(90.6%)
Precious Blood Hospital (Caritas)	185	128	(69.2%)
Prince of Wales Hospital	8450	7814	(92.5%)
Princess Margaret Hospital	9473	6194	(65.4%)
Queen Elizabeth Hospital	7134	5513	(77.3%)
Queen Mary Hospital	6650	5423	(81.5%)
St Paul's Hospital	2168	1705	(78.6%)
St Teresa's Hospital	2632	21	(0.8%)
Tseung Kwan O Hospital	2064	1982	(96.0%)
Tsuen Wan Adventist Hospital	-	520	
Tuen Mun Hospital	10758	10254	(95.3%)
Union Hospital	5767	2986	(51.8%)
United Christian Hospital	5026	4646	(92.4%)
Total	96205	80397	(86.6%)

The Obstetric Report

2014

GENERAL OBSTETRIC STATISTICS

BACKGROUND INFORMATION OF THE RETURNED OBSTETRICAL DATA

	2004		2009		2014	
Records complete without error	46536	93.7%	76361	94.4%	56887	94.0%
Records with inconsistent data	1848	3.7%	3278	4.1%	1591	2.6%
Records with missing data	1492	3.0%	1567	1.9%	2034	3.4%
<i>Missing data on date of delivery</i>	145	0.3%	0	0.0%	866	1.4%
<i>Missing data on age</i>	1129	2.3%	758	0.9%	1045	1.7%
<i>Missing data on gestation</i>	131	0.3%	393	0.5%	488	0.8%
<i>Missing data on birth weight</i>	115	0.2%	610	0.8%	655	1.1%
<i>Missing data on Apgar Score</i>	211	0.4%	398	0.5%	566	0.9%

TOTAL NO. OF MATERNITIES

The total number of maternities increased from 49,110 in 2004 to 79,732 in 2009 due to the dramatic increase in parturients from mainland China who were not Hong Kong residents. In 2013, all public and private hospitals stopped accepting delivery bookings from non-local pregnant women due to the implementation of the zero-quota policy for “doubly non-permanent resident pregnant women” in Hong Kong. As a result, the number of deliveries from non-Hong Kong residents dropped significantly from 35,474 in 2009 to only 5,150 in 2014 and the total number of maternities in 2014 dropped to 59,638. However, the number of maternities from Hong Kong residents increased from 44,258 in 2009 to 54,488 in 2014.

The proportion of nulliparity was 54.6% for Hong Kong residents, which was similar to that in 2009 (54.8%). The incidence of multiple pregnancy increased from of 1.1% in 2004 to 1.4% in 2009 and further increased to 1.5% in 2014. The incidence of triplets in 2014 was 0.01%.

	2004		2009		2014	
Total no. of maternities	49110		79732		59638	
<i>Singleton</i>	48573	98.9%	78565	98.5%	58771	98.5%
<i>Twins</i>	528	1.1%	1152	1.4%	860	1.4%
<i>Triplets</i>	9	0.02%	15	0.02%	7	0.01%
Total no. of babies	49656		80908		60512	
<i>Live births</i>	49539	99.8%	80760	99.8%	60357	99.7%
<i>Stillbirths</i>	117	0.2%	148	0.2%	139	0.2%

16 cases of abortus in 2014 were excluded from fetal outcome analysis

CHARACTERISTICS OF PARTURIENTS AND PREGNANCIES

	Singleton Pregnancy		Multiple Pregnancy		Total
	Nulliparous	Multiparous	Nulliparous	Multiparous	
TOTAL	32529	26242	596	271	59638
Resident					
Yes	29198 (89.8%)	24460 (93.2%)	575 (96.5%)	255 (94.1%)	54488 (91.4%)
No	3331 (10.2%)	1782 (6.8%)	21 (3.5%)	16 (5.9%)	5150 (8.6%)
Chinese					
Yes	31442 (96.7%)	25057 (95.5%)	563 (94.5%)	254 (93.7%)	57316 (96.1%)
No	1087 (3.3%)	1185 (4.5%)	33 (5.5%)	17 (6.3%)	2322 (3.9%)
Pregnancy					
Natural	31691 (97.4%)	25997 (99.1%)	342 (57.4%)	211 (77.9%)	58241 (97.7%)
IVF	838 (2.6%)	245 (0.9%)	254 (42.6%)	60 (22.1%)	1397 (2.3%)

ANTENATAL COMPLICATIONS

	2004		2009		2014	
Diabetes mellitus (including IGT)	3108	6.3%	5228	6.6%	7191	12.1%
Hypertensive disorder in pregnancy	1250	2.5%	1700	2.1%	2244	3.8%
Anaemia	1956	4.0%	2279	2.9%	2494	4.2%
Thyroid diseases	635	1.3%	886	1.1%	1192	2.0%
Cardiac diseases	379	0.8%	470	0.6%	431	0.7%
Respiratory diseases	316	0.6%	460	0.6%	762	1.3%
Surgical diseases	218	0.4%	250	0.3%	89	0.1%
Psychiatric diseases	260	0.5%	493	0.6%	923	1.5%
Immunological diseases	69	0.1%	92	0.1%	137	0.2%
Renal diseases	118	0.2%	128	0.2%	115	0.2%
Epilepsy	69	0.1%	66	0.1%	109	0.2%
Gastrointestinal /biliary tract diseases	32	0.07%	38	0.05%	38	0.06%
Liver diseases	26	0.05%	55	0.1%	109	0.2%
Pelvic mass	-	-	-	-	1739	2.9%
<i>Ovarian cysts</i>	-	-	-	-	363	0.6%
<i>Uterine fibroids</i>	-	-	-	-	1411	2.4%

OBSTETRIC COMPLICATIONS

	2004		2009		2014	
Previous uterine scar	-	-	-	-	7729	12.9%
<i>Caesarean scar</i>	4373	8.9%	10088	12.7%	7501	12.6%
<i>Non-Caesarean scar</i>	-	-	-	-	273	0.5%
Preterm delivery (<37 weeks)	3296	6.7%	4873	6.1%	3853	6.5%
<i>Extremely (<28 weeks)</i>	159	0.3%	176	0.2%	178	0.3%
<i>Very (28 – 31 weeks)</i>	303	0.6%	348	0.4%	363	0.6%
<i>Moderate to late (32 – 36 weeks)</i>	2830	5.8%	4349	5.5%	3312	5.6%
Breech presentation (parturients)	1807	3.7%	2538	3.2%	2467	4.1%
Post-term delivery (≥42 weeks)	673	1.4%	210	0.3%	34	0.06%
Antepartum haemorrhage	984	2.0%	1170	1.5%	1449	2.4%

* Singleton or multiple pregnancies with first baby in breech presentation

MODE OF ONSET OF LABOUR

	2004		2009		2014	
Spontaneous	31319	63.8%	42037	52.7%	32688	54.8%
Induced	9025	18.4%	13106	16.4%	13305	22.3%
No labour	8766	17.8%	24581	30.8%	13645	22.9%

STATUS OF AMNIOTIC FLUID DURING LABOUR (For Each Baby)

	2014	
Clear liquor	54505	90.1%
Meconium stained liquor	5275	8.8%
<i>Mild</i>	3457	5.7%
<i>Moderate</i>	1225	2.0%
<i>Severe</i>	593	1.0%
Blood stained liquor	470	0.8%
No liquor	246	0.4%

PRESENTATION AND LIE AT DELIVERY (For Each Baby)

	2004		2009		2014	
Vertex	47362	95.4%	77807	96.2%	57801	95.5%
Breech	2081	4.2%	2862	3.5%	2467	4.1%
Brow presentation	6	0.01%	5	0.01%	4	0.007%
Face presentation	18	0.04%	19	0.02%	10	0.02%
Oblique lie	29	0.06%	42	0.05%	22	0.04%
Transverse lie	109	0.2%	102	0.1%	105	0.2%
Compound	9	0.02%	9	0.01%	13	0.02%
Others	42	0.08%	34	0.04%	22	0.04%
Unknown/Missing	0	0.00%	28	0.03%	52	0.09%

MODE OF DELIVERY (For Each Baby)

	2004		2009		2014	
Spontaneous vertex delivery	28898	58.2%	38418	47.5%	32344	53.5%
Vacuum extraction	4823	9.7%	7335	9.1%	4349	7.2%
Forceps delivery	465	0.9%	373	0.5%	670	1.1%
Vaginal breech delivery	108	0.2%	161	0.2%	146	0.2%
Lower segment CS before labour	8923	18.0%	24685	30.5%	13965	23.1%
Lower segment CS after labour	6378	12.8%	9661	11.9%	8878	14.7%
Classical Caesarean section	60	0.1%	235	0.3%	144	0.2%
Others/unknown	1	0.0002%	40	0.05%	0	0.0%

USE OF OXYTOTICS FOR THIRD STAGE OF LABOUR

	2014	
Syntometrine	24431	41.0%
Syntocinon	18126	30.4%
Duratocin	4783	8.0%
Nil	12298	20.6%

POSTPARTUM COMPLICATIONS

	2004		2009		2014	
Primary postpartum haemorrhage*	1295	2.6%	3349	4.2%	1487	2.5%
<i>Vaginal delivery (> 500 ml)</i>	-	-	1011	2.2%	1081	2.9%
<i>Caesarean section (> 1,000 ml)</i>	-	-	477	1.4%	406	1.8%
Episiotomy#	28124	57.3%	31782	39.9%	19748	33.1%
<i>Nulliparous</i>	17053	60.6%	18471	48.5%	14882	44.9%
<i>Multiparous</i>	11071	39.4%	13041	31.8%	4866	18.3%
Manual removal of placenta	1033	2.1%	1325	1.7%	544	0.9%
Vaginal delivery	477	46.2%	521	1.1%	401	1.1%
Caesarean section	556	53.8%	802	2.4%	142	0.6%
Puerperal pyrexia	294	0.6%	424	0.5%	231	0.4%
Breast abscess	16	0.03%	11	0.01%	4	0.007%
Urinary tract infection	168	0.3%	92	0.1%	90	0.2%
Genital tract infection	45	0.09%	172	0.2%	234	0.4%
Wound problem with intervention	153	0.3%	67	0.08%	91	0.2%

* *Post-partum haemorrhage was defined as blood loss > 500 ml within 24 hours of delivery before 2014 and > 500 ml following vaginal delivery and > 1,000 ml following Caesarean delivery in 2014.*

Only included vaginal deliveries

MATERNAL COMPLICATIONS

	2004		2009		2014	
Perineal laceration#	-	-	-	-	13566	36.3%
<i>First degree tear</i>	-	-	-	-	9775	26.1%
<i>Second degree tear</i>	-	-	-	-	3648	9.8%
<i>Third degree tear</i>	16	0.03%	67	0.1%	125	0.3%
<i>Fourth degree tear</i>	-	-	-	-	18	0.05%
Internal iliac artery ligation	3	0.006%	2	0.003%	2	0.003%
Uterine artery embolisation	0	0.0%	24	0.03%	3	0.005%
Uterine compression suture	-	-	-	-	71	0.1%
Uterine balloon tamponade	-	-	-	-	69	0.1%
Rupture of uterus	5	0.01%	6	0.01%	2	0.003%
Hysterectomy	21	0.04%	40	0.05%	23	0.04%
Maternal collapse	-	-	-	-	11	0.02%
Maternal death	3	0.006%	2	0.003%	2	0.003%

Only included vaginal deliveries

NEONATAL COMPLICATIONS

	2004		2009		2014	
Apgar score at 1 minutes						
0-3	250	0.50%	413	0.5%	220	0.4%
4-6	1298	2.6%	1088	1.34%	1110	1.8%
Apgar score at 5 minutes						
0-3	120	0.2%	304	0.4%	77	0.1%
4-6	123	0.3%	112	0.14%	157	0.3%
Admission to neonatal ICU	8953	18.0%	7967	9.8%	8013	13.2%
Major congenital abnormality	241	0.5%	204	0.3%	194	0.3%
Respiratory distress syndrome	23	0.05%	63	0.08%	35	0.06%
Intraventricular haemorrhage	1	0.002%	11	0.01%	23	0.04%
Necrotising enterocolitis	5	0.01%	6	0.01%	4	0.007%
Birth trauma	194	0.4%	229	0.3%	78	0.1%
Major infection	22	0.04%	94	0.1%	31	0.05%
Chromosomal abnormality	-	-	-	-	15	0.02%

MORTALITY RATES

	2004	2009	2014
Stillbirths (per 1000 total births)	117 (2.4/1000)	148 (1.8/1000)	139 (2.3/1000)
<i>No anomalies</i>	110 (0.2%)	141 (0.2%)	135 (0.2%)
<i>Birth weight > 1 kg</i>	74 (0.1%)	91 (0.1%)	99 (0.2%)
Neonatal Deaths (per 1000 live births)	61 (1.2/1000)	77 (1.0/1000)	59 (1.0/1000)
<i>No anomalies</i>	46 (0.09%)	65 (0.08%)	47 (0.08%)
<i>Birth weight > 1 kg</i>	31(0.06%)	44(0.05%)	32 (0.05%)
Perinatal Deaths (per 1000 total births)	167 (3.3/1000)	214 (2.6/1000)	186 (3.1/1000)
<i>No anomalies</i>	145 (0.3%)	195 (0.24%)	180 (0.3%)
<i>Birth weight > 1 kg</i>	101 (0.2%)	128 (0.16%)	123 (0.2%)

AGE AND PARITY OF PARTURIENTS

The proportion of parturients with advance maternal age (≥ 35 years old) significantly increased from 24.2% in 2004 to 31.6% in 2009 and 41.6% in 2014. The proportion of parturients aged ≥ 40 also significantly increased from 4.5% in 2004 to 5.9% in 2009 and 10.7% in 2014. The incidence of elderly primigravidae doubled over the 10 years period (9.1% in 2004; 10.5% in 2009; 17.8% in 2014).

PARITY OF THE PARTURIENTS

	2004		2009		2014	
Para 0	27500	56.0%	38664	48.5%	33125	55.5%
Para 1	17313	35.3%	34398	43.1%	21709	36.4%
Para 2	3433	7.0%	5601	7.0%	3929	6.6%
Para 3	632	1.3%	801	1.0%	647	1.1%
Para 4	159	0.3%	196	0.2%	152	0.3%
Para 5	48	0.1%	52	0.1%	42	0.07%
Para 6 and above	25	0.05%	20	0.03%	34	0.06%
Total	49110		79732		59638	

AGE OF THE PARTURIENTS

	2004		2009		2014	
< 20 years	395	0.8%	377	0.5%	125	0.2%
20-24 years	5358	10.9%	6530	8.2%	2560	4.3%
25-29 years	12564	25.6%	19321	24.2%	9569	16.0%
30-34 years	17759	36.2%	27531	34.5%	21496	36.0%
35-39 years	9672	19.7%	20529	25.7%	18451	30.9%
≥ 40 years	2233	4.5%	4696	5.9%	6402	10.7%
Unknown	1129	2.30%	748	0.9%	1035	1.7%
Total	49110		79732		59638	

AGE VS PARITY OF THE PARTURIENTS

	Para 0		Para 1		Para 2		Para 3 & above	
<20	118	0.4%	6	0.03%	1	0.03%	0	0%
20-24	2074	6.4%	449	2.1%	34	0.9%	3	0.3%
25-29	6695	20.6%	2501	11.7%	330	8.5%	43	5.0%
30-34	12965	39.9%	7280	34.1%	1060	27.3%	191	22.0%
35-39	8346	25.7%	8246	38.6%	1519	39.2%	340	39.2%
40-44	2085	6.4%	2676	12.5%	811	20.9%	243	28.0%
≥ 45	200	0.6%	217	1.0%	122	3.1%	48	5.5%
Total	32483		21375		3877		868	

Missing data on maternal age in 1047 cases (1.8%) in 2014

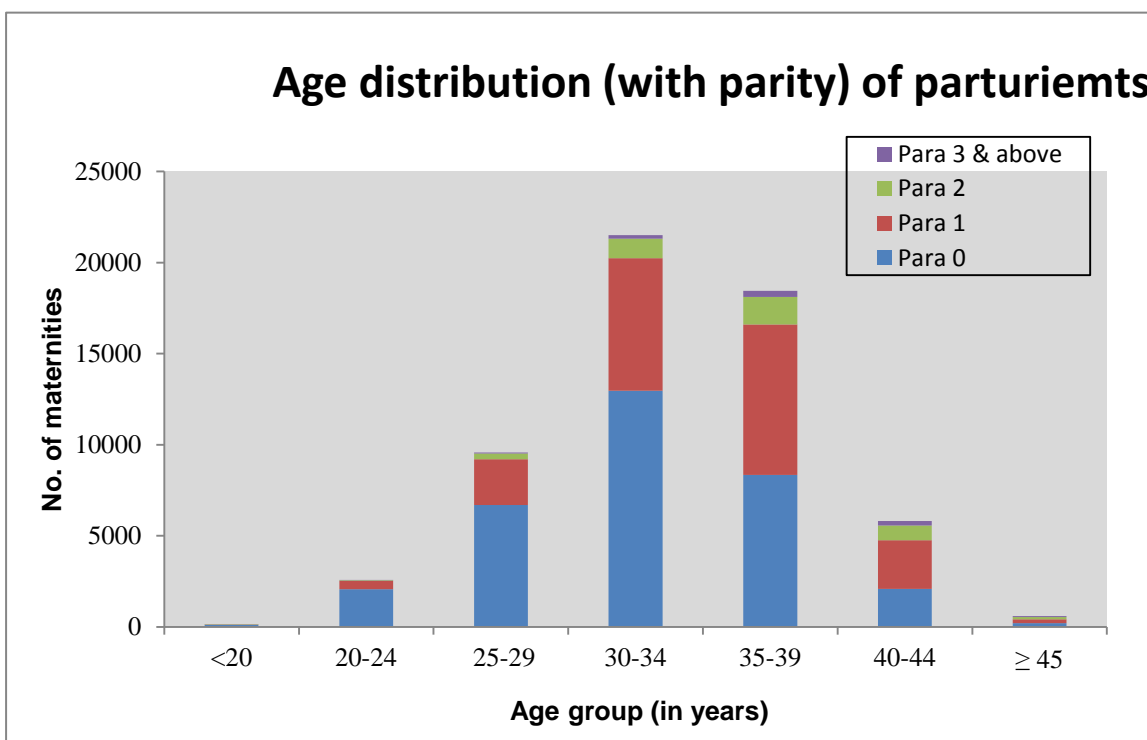


Figure O1 – Age distribution (with parity) of parturients

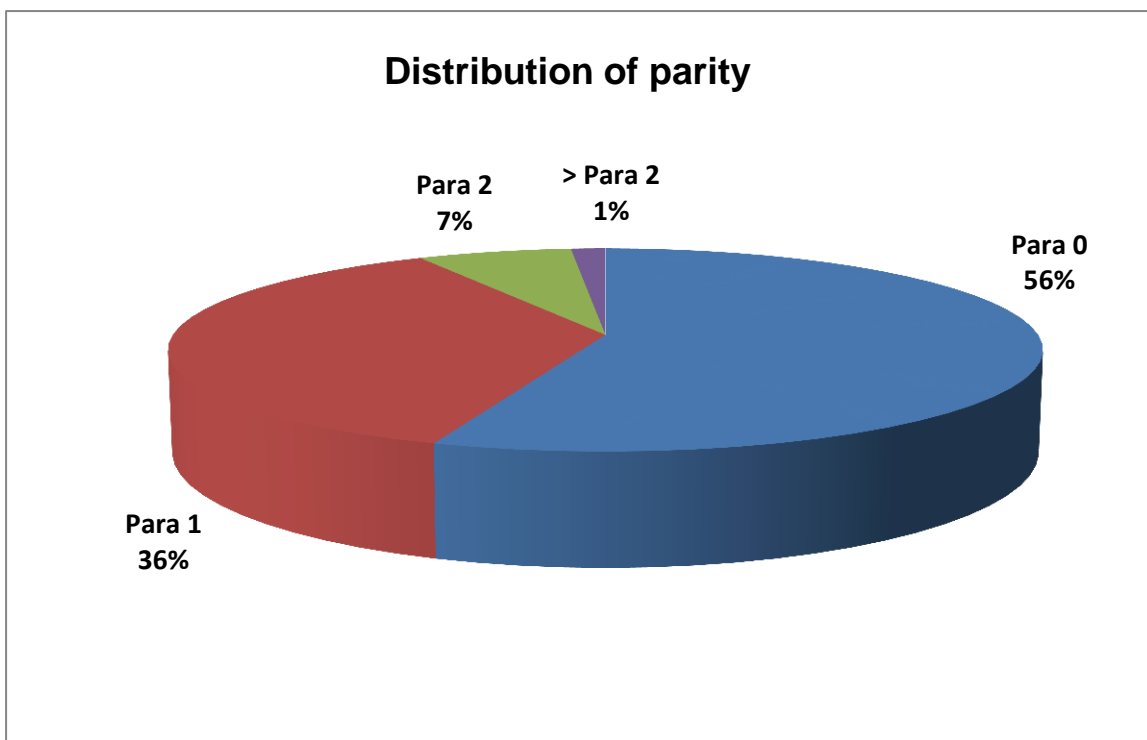


Figure O2 – Distribution of parity

COMMON ANTENATAL COMPLICATIONS

DIABETES MELLITUS

The overall incidence of diabetes mellitus (DM) almost doubled in 2014 (from 6.3% in 2004 and 6.6% in 2009 to 12.1% in 2014). This is largely due to the significant increase in the incidence of gestational DM (from 6.2% in 2004 and 6.4% in 2009 to 11.8% in 2014), though the incidence of pre-existing DM also increased (from 0.14% in 2004 and 0.13% in 2009 to 0.3% in 2014). This could be related to the increase in the number of parturients with advance maternal age (41.6% in 2014) and the change in the diagnostic criteria for gestational DM.

The incidence of DM among singleton pregnancies increased from 6.0% and 6.5% to 11.9%, while that among multiple pregnancies increased from 9.9% to 13.6% and 22.5%. The proportion of nulliparity remained roughly unchanged. There was a slight increase in the rate of induction of labour from 30% to 33.9%. The rate of spontaneous vertex delivery (52.4% in 2014) and the rate of caesarean section (39.6% in 2014) remained similar. The overall incidence of meconium stained liquor was 7.9%.

The incidence of macrosomia reduced from 5.7% in 2004 to 4.4% in 2009 and 3.0% in 2014. The rates of stillbirth and neonatal death among those with diabetes mellitus were 0.24% and 0.07% respectively. The perinatal mortality over the past 10 years remained stable at 3.0 per 1000 births among those with diabetes mellitus and was similar to those without the disease (3.1 per 1000 births).

	2004		2009		2014	
Pre-existing diabetes mellitus	70	2.3%	103	2.0%	164	2.3%
Gestational diabetes mellitus	754	24.3%	1315	25.2%	7027	97.7%
Impaired glucose tolerance	2284	73.5%	3810	72.9%	-	-
Total incidence	3108	6.3%	5228	6.6%	7191	12.1%

Impaired glucose tolerance was removed from the diagnosis of gestational diabetes mellitus in 2014

PREGNANCY

	2004		2009		2014	
TOTAL PREGNANCIES	3108		5228		7191	
<i>Singleton</i>	3049	98.1%	5069	97.0%	6975	97.0%
<i>Multiple</i>	59	1.9%	159	3.0%	216	3.0%
TOTAL BIRTHS	3170		5390		7403	

PARITY OF THE PATURIENTS

	2004		2009		2014	
Para 0	1471	47.3%	2439	44.9%	3477	48.4%
Para 1	1224	39.4%	2228	42.6%	2895	40.3%
Para 2	318	10.2%	496	9.5%	663	9.2%
Para 3 & above	95	3.1%	155	3.0%	156	2.2%

MODE OF ONSET OF LABOUR

	2004		2009		2014	
Spontaneous	1517	48.8%	2353	45.0%	3028	42.1%
Induced labour	923	29.7%	1576	30.1%	2438	33.9%
No labour	688	22.1%	1298	24.8%	1725	24.0%

GESTATION AT DELIVERY

	2004		2009		2014	
< 26 weeks	2	0.06%	3	0.06%	8	0.1%
26 – 28 weeks	12	0.4%	13	0.2%	18	0.3%
29 – 32 weeks	33	1.1%	71	1.4%	102	1.4%
33 – 36 weeks	245	7.9%	417	8.0%	534	7.4%
37 – 41 weeks	2801	90.1%	4715	90.2%	6519	90.7%
≥ 42 weeks	14	0.5%	7	0.1%	2	0.03%
Total	3107		5226		7183	

Missing data in gestation in 1 (0.03%) case, 2 (0.04%) in 2009 and 8 (0.1%) in 2014

STATUS OF AMNIOTIC FLUID DURING LABOUR (FOR EACH BABY)

	2014	
Clear liquor	6717	90.7%
Meconium stained liquor	576	7.8%
<i>Mild</i>	389	5.3%
<i>Moderate</i>	108	1.5%
<i>Severe</i>	79	1.1%
Blood stained liquor	81	1.1%
No liquor	29	0.4%

MODE OF DELIVERY (FOR EACH BABY)

	2004		2009		2014	
Spontaneous vertex delivery	1691	53.5%	2886	53.5%	3878	52.4%
Vacuum extraction	258	8.1%	347	6.4%	471	6.4%
Forceps delivery	31	1.0%	29	0.5%	104	1.4%
Vaginal breech delivery	7	0.2%	14	0.3%	14	0.2%
LSCS before labour	698	22.0%	1389	25.8%	1842	24.9%
LSCS after labour	476	15.0%	689	12.8%	1054	14.3%
Classical Caesarean section	9	0.3%	36	0.7%	31	0.4%

USE OF OXYTOTICS FOR THIRD STAGE OF LABOUR

	2014	
Syntometrine	2888	40.2%
Syntocinon	3224	44.8%
Duratocin	368	5.1%
Nil	711	9.9%

POSTPARTUM COMPLICATIONS

	2004		2009		2014	
Postpartum haemorrhage*	98	3.2%	502	9.6%	260	3.6%
<i>Vaginal delivery (> 500 ml)</i>	88	4.5%	112	3.4%	168	3.8%
<i>Caesarean section (> 1,000 ml)</i>	-	-	82	4.2%	92	3.3%
Blood transfusion	-	-	32	0.6%	98	1.4%
<i>Vaginal delivery</i>	-	-	13	0.4%	64	1.4%
<i>Caesarean section</i>	-	-	19	1.0%	34	1.2%
Episiotomy#	1623	52.2%	2351	72.2%	2284	51.4%
<i>Nulliparous</i>	855	58.1%	1284	91.1%	1630	71.4%
<i>Multiparous</i>	768	46.9%	1067	57.8%	654	28.6%
Manual removal of placenta	90	2.9%	94	1.8%	84	1.2%
<i>Vaginal delivery</i>	33	1.7%	49	1.5%	56	1.3%
<i>Caesarean section</i>	57	5.0%	45	2.3%	28	1.0%
Puerperal pyrexia	26	0.8%	49	0.9%	44	0.6%
Breast abscess	1	0.03%	1	0.02%	1	0.01%
Urinary tract infection	23	0.7%	15	0.3%	20	0.3%
Genital tract infection	5	0.2%	12	0.2%	30	0.4%
Wound problem with intervention	18	0.6%	24	0.5%	18	0.3%

* *Post-partum haemorrhage was defined as blood loss > 500 ml within 24 hours of delivery before 2014 and > 500 ml following vaginal delivery and > 1,000 ml following Caesarean delivery in 2014.*

#*Only included vaginal deliveries*

MATERNAL COMPLICATIONS

	2004		2009		2014	
Preterm (<37 weeks)	292	9.4%	504	9.6%	662	9.2%
<i>Singleton</i>	260	8.5%	417	8.2%	557	8.0%
<i>Multiple</i>	32	54.2%	87	54.7%	105	47.1%
Perineal laceration#	-	-	-	-	1856	41.8%
<i>First degree tear</i>	-	-	-	-	1326	29.9%
<i>Second degree tear</i>	-	-	-	-	509	11.5%
<i>Third degree tear</i>	2	0.06%	5	0.1%	16	0.4%
<i>Fourth degree tear</i>	-	-	-	-	5	0.1%
Internal iliac artery ligation	0	0.0%	2	0.04%	1	0.01%
Uterine artery embolization	0	0.0%	5	0.1%	2	0.03%
Uterine compression suture	-	-	-	-	21	0.3%
Uterine balloon tamponade	-	-	-	-	11	0.2%
Uterine rupture	1	0.03%	0	0.0%	1	0.01%
Hysterectomy	1	0.03%	5	0.1%	8	0.1%
Maternal collapse	-	-	-	-	1	0.01%
Maternal death	1	0.03%	0	0.0%	0	0.0%

#*Only included vaginal deliveries*

FETAL OUTCOME

	2004		2009		2014	
Alive at 28 days	3159	99.7%	5367	99.6%	7380	99.7%
Stillbirths	7	0.2%	13	0.2%	18	0.2%
Neonatal deaths	4	0.1%	10	0.2%	5	0.07%
Low birth weight (<2500 gm)	276	8.7%	564	10.5%	807	10.9%
<i>Singleton</i>	201	6.3%	362	6.7%	553	7.5%
<i>Multiple</i>	75	2.4%	202	3.7%	254	3.4%
Macrosomia (>4000 gm)	180	5.7%	236	4.4%	222	3.0%
Apgar score <4 at 1 minute	22	0.7%	25	0.5%	31	0.4%
Apgar score <4 at 5 minutes	9	0.3%	13	0.2%	8	0.1%

FETAL OUTCOME IN PREGNANCIES COMPLICATED WITH DIABETES MELLITUS

	No disease		Pre-existing DM		Gestational DM	
Alive at 28 days	52918	99.65%	164	98.80%	7216	99.71%
Stillbirth	121	0.23%	1	0.60%	17	0.24%
<i>Antenatal</i>	105	0.20%	1	0.60%	15	0.21%
<i>Intrapartum</i>	0	0.00%	0	0.00%	0	0.00%
<i>Undetermined</i>	16	0.03%	0	0.00%	2	0.03%
Neonatal death	54	0.10%	1	0.60%	4	0.06%
<i>Early</i>	43	0.08%	1	0.60%	3	0.04%
<i>Late</i>	11	0.02%	0	0.00%	1	0.01%
Total	53093		166		7237	

HYPERTENSIVE DISORDER IN PREGNANCY

Similar to diabetes mellitus, the overall incidence of hypertensive disorder in pregnancy also increased from 2.5% in 2004 and 2.1% in 2009 to 3.8% in 2014. The severity of the disease was difficult to interpret due to the high proportion of unknown severity (nearly 40% of cases). The incidence of eclampsia remained low at 0.035% in 2014, similar compared to 0.035% in 2004 and 0.02% in 2009.

Although the incidence of induction of labour increased with a slight increase in vaginal deliveries, the rate of caesarean delivery for those parturients with hypertensive disorder remained high at 54.2% in 2014. The overall incidence of meconium-stained liquor was 9.3%. The rate of preterm delivery in parturients with hypertensive disorder remained high (23.9%) and it applied to both singleton and multiple pregnancies. The rate of post-partum haemorrhage in vaginal delivery was 7.0% which was much higher than that in 2009. The incidence of low birth weight remained similar (30.5% in 2014).

The rate of stillbirth remained 0.7-1.0% while the rate of neonatal death dropped from 0.4% to 0.1%. The perinatal mortality rate was highest in parturients with severe form of hypertensive disorder (19.2 per 1,000 total births), which was almost 7 times higher than those without hypertension (2.9 per 1,000 total births). The magnitude of increase was similar to that in 2009. Parturients with mild form of hypertensive disorder (5.0 per 1,000 total births) also showed a significant increase in the perinatal mortality rate.

	2004		2009		2014	
Severity						
Mild	562	45.0%	684	40.2%	945	42.1%
Severe	334	26.7%	395	23.2%	431	19.2%
Unknown	354	28.3%	621	36.5%	868	38.7%
Category						
Eclampsia	17	1.4%	16	0.9%	21	0.9%
Pre-eclampsia	466	37.3%	580	34.1%	662	29.5%
<i>Mild pre-eclampsia</i>	141	11.3%	130	7.6%	212	9.4%
<i>Severe pre-eclampsia</i>	241	19.3%	287	16.9%	306	13.6%
<i>Unknown severity</i>	84	6.7%	163	9.6%	144	6.4%
Gestational hypertension	439	35.1%	553	31.5%	790	35.2%
<i>Mild gestational hypertension</i>	260	20.8%	265	15.6%	385	17.1%
<i>Severe gestational hypertension</i>	34	2.7%	38	2.2%	52	2.3%
<i>Unknown severity</i>	145	11.6%	250	14.7%	353	15.7%
Gestational proteinuria	83	6.6%	146	8.6%	183	8.2%
Chronic hypertension with no proteinuria	47	3.8%	84	4.9%	128	5.7%
Chronic hypertension with superimposed PET	27	2.2%	59	3.5%	54	2.4%
Unclassified	90	7.2%	97	5.7%	282	12.6%
No information	81	6.5%	165	9.7	124	5.5%
Total incidence	1250	2.5%	1700	2.1%	2244	3.8%

PREGNANCY

	2004		2009		2014	
TOTAL PREGNANCIES	1250		1700		2244	
<i>Singleton</i>	1197	95.8%	1603	94.3%	2125	94.7%
<i>Multiple</i>	53	4.2%	97	5.7%	119	5.3%
TOTAL BIRTHS	1302		1798		2361	

PARITY OF THE PATURIENTS

	2004		2009		2014	
Para 0	812	65.0%	1017	59.8%	1495	66.6%
Para 1	316	25.3%	541	31.8%	571	25.4%
Para 2	91	7.3%	112	6.6%	132	5.9%
Para 3 & above	31	2.5%	30	1.8%	46	2.1%

GESTATION AT DELIVERY

	2004		2009		2014	
< 26 weeks	4	0.3%	2	0.1%	7	0.3%
26 – 28 weeks	25	2.0%	25	1.5%	22	1.0%
29 – 32 weeks	63	5.0%	80	4.7%	94	4.2%
33 – 36 weeks	214	17.1%	335	19.7%	414	18.4%
37 – 41 weeks	932	74.6%	1249	73.5%	1703	75.9%
≥ 42 weeks	11	0.9%	4	0.2%	0	0.0%
Total	1249		1695		2240	

Missing date in 1 case (0.08%) in 2004, 5 (0.3%) in 2009 and 4 (0.2%) in 2014

MODE OF ONSET OF LABOUR

	2004		2009		2014	
Spontaneous	410	32.8%	409	24.1%	565	25.2%
Induced labour	420	33.6%	562	33.1%	918	40.9%
No labour	420	33.6%	729	42.9%	761	33.9%

STATUS OF AMNIOTIC FLUID DURING LABOUR (FOR EACH BABY)

	2014	
Clear liquor	2098	88.9%
Meconium stained liquor	213	9.0%
<i>Mild</i>	144	6.1%
<i>Moderate</i>	43	1.8%
<i>Severe</i>	26	1.1%
Blood stained liquor	43	1.8%
No liquor	7	0.3%

MODE OF DELIVERY (FOR EACH BABY)

	2004		2009		2014	
Spontaneous vertex delivery	457	35.1%	555	30.8%	887	37.6%
Vacuum extraction	128	9.8%	130	7.2%	168	7.1%
Forceps delivery	17	1.3%	18	1.0%	38	1.6%
Vaginal breech delivery	8	0.6%	6	0.3%	9	0.4%
LSCS before labour	446	34.2%	786	43.7%	846	35.8%
LSCS after labour	239	18.3%	282	15.7%	399	17.8%
Classical Caesarean section	7	0.5%	21	1.2%	14	0.6%

USE OF OXYTOTICS FOR THIRD STAGE OF LABOUR

	2014	
Syntometrine	84	3.7%
Syntocinon	1805	80.4%
Duratocin	103	4.6%
Nil	252	11.2%

POSTPARTUM COMPLICATIONS

	2004		2009		2014	
Postpartum haemorrhage*	59	4.7%	161	9.5%	113	5.0%
<i>Vaginal delivery (> 500 ml)</i>	-	-	30	4.3%	77	7.0%
<i>Caesarean section (> 1,000 ml)</i>	-	-	35	3.5%	36	3.1%
Blood transfusion	-	-	17	1.0%	35	1.6%
<i>Vaginal delivery</i>	-	-	5	0.7%	27	2.5%
<i>Caesarean section</i>	-	-	12	1.2%	8	0.7%
Episiotomy#	516	41.3%	510	72.6%	663	60.5%
<i>Nulliparous</i>	345	42.5%	335	86.3%	549	79.2%
<i>Multiparous</i>	171	39.0%	175	55.7%	114	28.3%
Manual removal of placenta	46	3.7%	39	2.3%	36	1.6%
<i>Vaginal delivery</i>	16	2.6%	11	1.6%	17	1.6%
<i>Caesarean section</i>	30	4.7%	28	2.8%	18	1.6%
Puerperal pyrexia	16	1.3%	29	1.7%	19	0.8%
Breast abscess	1	0.08%	0	0.0%	0	0.0%
Urinary tract infection	7	0.6%	8	0.5%	15	0.7%
Genital tract infection	10	0.0%	1	0.06%	10	0.4%
Wound problem with intervention	11	0.9%	14	0.8%	10	0.4%

* *Post-partum haemorrhage was defined as blood loss > 500 ml within 24 hours of delivery before 2014 and > 500 ml following vaginal delivery and > 1,000 ml following Caesarean delivery in 2014.*

Only included vaginal deliveries

MATERNAL COMPLICATIONS

	2004		2009		2014	
Preterm (<37 weeks)	306	24.5%	442	26.0%	537	23.9%
<i>Singleton</i>	274	22.9%	386	24.1%	454	21.4%
<i>Multiple</i>	32	60.3%	56	57.7%	83	69.7%
Perineal laceration#	-	-	-	-	347	31.7%
<i>First degree tear</i>	-	-	-	-	218	19.9%
<i>Second degree tear</i>	-	-	-	-	122	11.1%
<i>Third degree tear</i>	0	0.0%	2	0.1%	6	0.5%
<i>Fourth degree tear</i>	-	-	-	-	1	0.09%
Internal iliac artery ligation	0	0.0%	1	0.06%	0	0.0%
Uterine artery embolization	0	0.0%	3	0.2%	1	0.04%
Uterine compression suture	-	-	-	-	10	0.4%
Uterine balloon tamponade	-	-	-	-	5	0.2%
Uterine rupture	1	0.08%	0	0.0%	0	0.0%
Hysterectomy	1	0.08%	4	0.2%	2	0.09%
Maternal collapse	-	-	-	-	3	0.1%
Maternal death	0	0.0%	1	0.06%	0	0.0%

#Only included vaginal deliveries

FETAL OUTCOME

	2004		2009		2014	
Alive at 28 days	1288	98.8%	1776	98.7%	2343	99.2%
Stillbirths	10	0.8%	18	1.0%	15	0.7%
Neonatal deaths	5	0.4%	6	0.3%	3	0.1%
Low birth weight (<2500 gm)	384	29.5%	554	30.9%	687	29.1%
<i>Singleton</i>	320	26.8%	432	27.0%	520	24.5%
<i>Multiple</i>	64	60.4 %	122	62.2%	167	70.5%
Macrosomia (>4000 gm)	51	3.9%	52	2.9%	29	1.2%
Apgar score <4 at 1 minute	27	2.1%	24	1.3%	32	1.4%
Apgar score <4 at 5 minutes	12	0.9%	14	0.8%	15	0.6%

Missing data in birth weight in 41 (1.8%) in 2014

Missing data in Apgar score in 19 (1.1%) in 2014

FETAL OUTCOME IN PREGNANCIES COMPLICATED WITH HYPERTENSION

	No disease*		Hypertension					
			Mild	Severe	Unclassified			
Alive at 28 days	57955	99.66%	989	99.50%	460	98.08%	894	99.55%
Stillbirth	124	0.21%	4	0.40%	8	1.71%	3	0.33%
<i>Antenatal</i>	109	0.19%	3	0.30%	7	1.49%	2	0.22%
<i>Intrapartum</i>	0	0.00%	0	0.00%	0	0.00%	0	0.00%
<i>Undetermined</i>	15	0.03%	1	0.10%	1	0.21%	1	0.11%
Neonatal death	56	0.10%	1	0.10%	1	0.21%	1	0.11%
<i>Early</i>	44	0.08%	1	0.10%	1	0.21%	1	0.11%
<i>Late</i>	12	0.02%	0	0.00%	0	0.00%	0	0.00%
Total	58135		994		469		898	

*15 cases of abortion were excluded

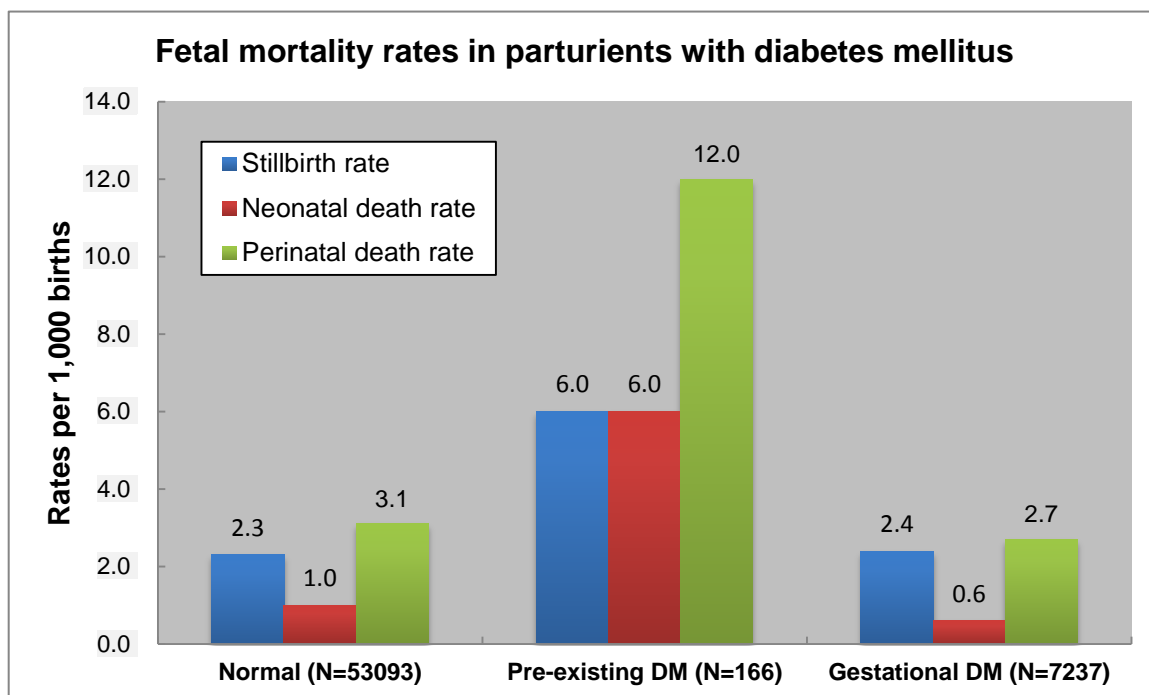


Figure O3 – Fetal mortality rates in parturients with diabetes mellitus

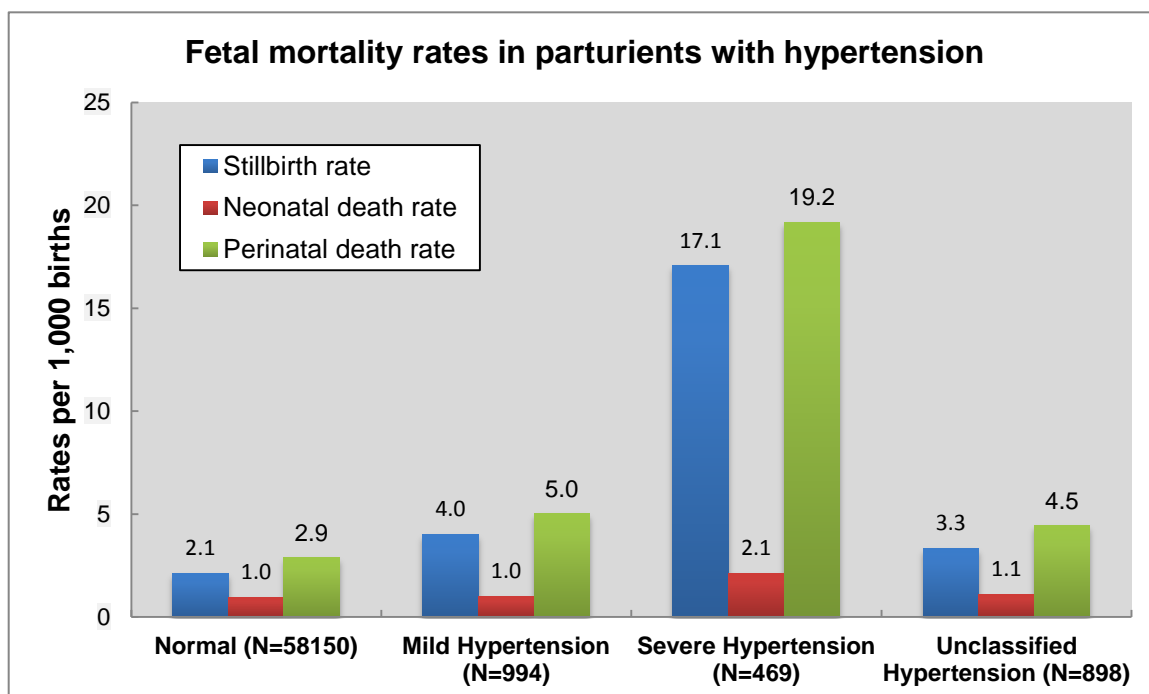


Figure O4 – Fetal mortality rates in parturients with hypertension

CARDIAC DISEASES

The overall incidence of cardiac diseases remained similarly low (0.7% in 2014). The types of cardiac diseases changed over time with an increase in the proportion of congenital heart disease and arrhythmia, whereas the proportion of rheumatic heart disease and mitral valvular prolapse dropped from 4.5% to 3.7% and 16.4% to 8.4% respectively.

There was no significant change in the pattern of labour onset and the incidence of caesarean section remained around 33%. The incidence of preterm delivery was higher than that in general population and the rate was 8-10% over the past 10 years. This was consistent with the higher incidence of low birth weight. Stillbirth and neonatal mortality rates were higher in 2009 as there were no stillbirths or neonatal deaths in both 2004 and 2014.

	2004		2009		2014	
Rheumatic heart disease	17	4.5%	22	4.7%	16	3.7%
Congenital heart disease	66	17.4%	111	23.6%	109	25.3%
Mitral valvular prolapse	62	16.4%	46	9.8%	36	8.4%
Arrhythmia	22	5.8%	62	13.2%	114	26.5%
Others	212	55.9%	229	48.7%	156	36.2%
Total incidence	379	0.8%	470	0.6%	431	0.7%

PREGNANCY

	2004		2009		2014	
TOTAL PREGNANCIES	379		470		431	
<i>Singleton</i>	376	99.2%	461	98.1%	423	98.1%
<i>Multiple</i>	3	0.8%	9	1.9%	8	1.9%
TOTAL BIRTHS	383		479		439	

BPARIITY OF THE PATURIENTS

	2004		2009		2014	
Para 0	185	48.8%	248	52.8%	238	55.2%
Para 1	158	41.7%	185	39.4%	152	35.3%
Para 2	28	7.4%	23	4.9%	32	7.4%
Para 3 & above	8	2.1%	14	3.0%	9	2.1%

GESTATION AT DELIVERY

	2004		2009		2014	
< 26 weeks	1	0.3%	1	0.2%	1	0.2%
26 – 28 weeks	1	0.3%	3	0.6%	1	0.2%
29 – 32 weeks	2	0.5%	3	0.6%	5	1.2%
33 – 36 weeks	35	9.2%	31	6.6%	34	7.9%
37 – 41 weeks	337	88.9%	431	91.7%	390	90.5%
≥ 42 weeks	3	0.8%	0	0.0%	0	0.0%
Total	379		469		431	

Missing date in 1 cases (0.2%) in 2009

MODE OF ONSET OF LABOUR

	2004		2009		2014	
Spontaneous	217	57.3%	257	54.7%	220	51.0%
Induced labour	86	22.7%	110	23.4%	116	26.9%
No labour	76	20.1%	103	21.9%	95	22.0%

STATUS OF AMNIOTIC FLUID DURING LABOUR (FOR EACH BABY)

	2014	
Clear liquor	393	89.5%
Meconium stained liquor	39	8.9%
<i>Mild</i>	26	5.9%
<i>Moderate</i>	10	2.3%
<i>Severe</i>	3	0.7%
Blood stained liquor	6	1.4%
No liquor	1	0.2%

MODE OF DELIVERY (FOR EACH BABY)

	2004		2009		2014	
Spontaneous vertex delivery	216	56.5%	282	58.9%	252	57.4%
Vacuum extraction	31	8.1%	44	9.2%	24	5.5%
Forceps delivery	2	0.5%	2	0.4%	11	2.5%
Vaginal breech delivery	0	0%	4	0.8%	1	0.2%
LSCS before labour	77	20.2%	106	22.6%	101	23.0%
LSCS after labour	56	14.7%	41	8.7%	48	10.9%
Classical Caesarean section	1	0.3%	0	0.0%	2	0.5%

USE OF OXYTOTICS FOR THIRD STAGE OF LABOUR

	2014	
Syntometrine	49	11.4%
Syntocinon	340	78.9%
Duratocin	17	3.9%
Nil	25	5.8%

POSTPARTUM COMPLICATIONS

	2004		2009		2014	
Postpartum haemorrhage*	7	1.8%	33	7.0%	16	3.7%
<i>Vaginal delivery (> 500 ml)</i>	7	2.8%	9	2.7%	11	3.8%
<i>Caesarean section (> 1,000 ml)</i>	-	-	8	5.7%	5	3.5%
Blood transfusion	-	-	0	0.0%	5	1.2%
<i>Vaginal delivery</i>	-	-	0	0.0%	4	1.4%
<i>Caesarean section</i>	-	-	0	0.0%	1	0.7%
Episiotomy#	205	54.1%	250	76.0%	153	53.1%
<i>Nulliparous</i>	109	58.9%	163	91.1%	121	79.6%
<i>Multiparous</i>	96	49.5%	87	58.0%	32	23.5%
Manual removal of placenta	7	1.8%	8	1.7%	3	0.7%
<i>Vaginal delivery</i>	4	1.6%	2	0.6%	2	0.7%
<i>Caesarean section</i>	3	2.3%	6	4.3%	1	0.7%
Puerperal pyrexia	1	0.3%	3	0.6%	1	0.2%
Breast abscess	0	0.0%	0	0.0%	0	0.0%
Urinary tract infection	1	0.3%	1	0.2%	3	0.7%
Genital tract infection	1	0.3%	1	0.2%	3	0.7%
Wound problem with intervention	2	0.5%	3	0.6%	2	0.5%

* Post-partum haemorrhage was defined as blood loss > 500 ml within 24 hours of delivery before 2014 and > 500 ml following vaginal delivery and > 1,000 ml following Caesarean delivery in 2014.

#Only included vaginal deliveries

MATERNAL COMPLICATIONS

	2004		2009		2014	
Preterm (<37 weeks)	39	10.3%	38	8.1%	41	9.5%
<i>Singleton</i>	37	9.8%	32	7.0%	37	8.7%
<i>Multiple</i>	2	66.7%	6	66.7%	4	50.0%
Perineal laceration#	-	-	-	-	123	42.7%
<i>First degree tear</i>	-	-	-	-	87	30.2%
<i>Second degree tear</i>	-	-	-	-	36	12.5%
<i>Third degree tear</i>	0	0.0%	1	0.2%	0	0.0%
<i>Fourth degree tear</i>	-	-	-	-	0	0.0%
Internal iliac artery ligation	0	0.0%	0	0.0%	0	0.0%
Uterine artery embolization	0	0.0%	0	0.0%	0	0.0%
Uterine compression suture	-	-	0	0.0%	1	0.2%
Uterine balloon tamponade	-	-	-	-	0	0.0%
Uterine rupture	0	0.0%	-	-	0	0.0%
Hysterectomy	1	0.3%	0	0.0%	2	0.5%
Maternal collapse	-	-	-	-	0	0.0%
Maternal death	0	0.0%	0	0.0%	0	0.0%

#Only included vaginal deliveries

FETAL OUTCOME

	2004		2009		2014	
Alive at 28 days	382	100%	472	98.5%	439	100%
Stillbirths	0	0%	5	1.0%	0	0.0%
Neonatal deaths	0	0%	2	0.4%	0	0.0%
Low birth weight (<2500 gm)	31	8.1%	50	10.4%	38	8.7%
<i>Singleton</i>	26	6.8%	37	7.7%	29	6.6%
<i>Multiple</i>	5	1.3%	13	2.7%	9	2.1%
Macrosomia (>4000 gm)	16	4.2%	22	4.6%	9	2.1%
Apgar score <4 at 1 minute	2	0.5%	3	0.6%	2	0.5%
Apgar score <4 at 5 minutes	0	0%	2	0.4%	0	0.0%

PELVIC MASSES - OVARIAN CYSTS

The data on ovarian cysts in pregnancy and ovarian surgery at delivery or post-partum period were first reported in the current audit. The incidence was ovarian cyst during pregnancy was 0.7% only. Ovarian cyst was diagnosed antenatally in 362 (83.6%), of which 81 (22.3%) underwent surgery in the antenatal period, 15 at delivery and 3 both antenatally and at delivery. Caesarean section was performed in 45.1% of parturients with ovarian cyst diagnosed antenatally, of which 70.2% did not undergo surgery for the ovarian cyst in the antenatal period. However, a higher proportion of parturients with ovarian surgery in antenatal period underwent Caesarean section before labour (70.2% vs 54.0%). One patient with ovarian cyst diagnosed antenatally and did not undergo surgery had Caesarean delivery with concurrent myomectomy but no ovarian surgery, suggesting that the ovarian cyst was a functional cyst.

OVARIAN CYSTS

	2014	
Ovarian cysts diagnosed in AN	362	0.6%
<i>No operation during pregnancy</i>	281	77.7%
<i>Operation during pregnancy</i>	81	22.3%
Ovarian surgery at delivery	89	0.1%
<i>Not diagnosed in AN</i>	71	0.1%
<i>Diagnosed with no surgery in AN</i>	15	0.03%
<i>Diagnosed with surgery in AN</i>	3	0.005%
Total incidence	433	0.7%

AN = antenatal period

PREGNANCY

	2014	
TOTAL PREGNANCIES	433	
<i>Singleton</i>	424	97.9%
<i>Multiple</i>	9	2.1%
TOTAL BIRTHS	442	

1 case of abortion in a singleton pregnancy was excluded

PARITY OF THE PATURIENTS

	2014	
Para 0	284	65.6%
Para 1	132	30.5%
Para 2	12	2.8%
Para 3	5	1.2%

AGE OF THE PARTURIENTS

	2014	
20 – 24 years old	11	2.5%
25 – 29 years old	47	10.9%
30 – 34 years old	172	39.7%
35 – 39 years old	149	34.4%
40 – 44 years old	49	11.3%
≥ 45 years old	4	0.9%
Total	432	

Missing date in 1 (0.2%) case

GESTATION AT DELIVERY

	2014	
< 26 weeks	0	0.0%
26 – 28 weeks	5	1.2%
29 – 32 weeks	10	2.3%
33 – 36 weeks	29	6.7%
37 – 41 weeks	389	89.8%
≥ 42 weeks	0	0.0%

MODE OF ONSET OF LABOUR

	2014	
Spontaneous	208	48.0%
Induced labour	100	23.1%
No labour	125	28.9%

STATUS OF AMNIOTIC FLUID DURING LABOUR (FOR EACH BABY)

	2014	
Clear liquor	381	86.2%
Meconium stained liquor	56	12.7%
<i>Mild</i>	37	8.4%
<i>Moderate</i>	12	2.7%
<i>Severe</i>	7	1.6%
Blood stained liquor	4	0.9%
No liquor	1	0.2%

MODE OF DELIVERY (FOR EACH BABY)

	2014	
Spontaneous vertex delivery	202	45.7%
Vacuum extraction	31	7.0%
Forceps delivery	5	1.1%
Vaginal breech delivery	0	0.0%
LSCS before labour	130	29.4%
LSCS after labour	71	16.1
Classical Caesarean section	3	0.7

CAESAREAN SECTION IN THOSE WITH OVARIAN CYST DIAGNOSED ANTENATALLY

	No AN surgery		AN surgery		Total	
Before labour	47	54.0%	26	70.2%	73	64.1%
After labour	40	46.0%	11	29.8%	51	35.8%
Total	87	20.1%	37	8.5%	124	11.8%

USE OF OXYTOTICS FOR THIRD STAGE OF LABOUR

	2014	
Syntometrine	166	38.3%
Syntocinon	200	46.2%
Duratocin	22	5.1%
Nil	45	10.4%

POSTPARTUM COMPLICATIONS

	2014	
Postpartum haemorrhage*	20	4.6%
<i>Vaginal delivery (> 500 ml)</i>	13	5.5%
<i>Caesarean section (> 1,000 ml)</i>	7	3.6%
Blood transfusion	6	1.4%
<i>Vaginal delivery</i>	4	1.7%
<i>Caesarean section</i>	2	1.0%
Episiotomy#	155	65.1%
<i>Nulliparous</i>	130	86.9%
<i>Multiparous</i>	22	29.3%
Manual removal of placenta	8	1.8%
<i>Vaginal delivery</i>	7	2.9%
<i>Caesarean section</i>	1	0.5%
Puerperal pyrexia	2	0.5%
Breast abscess	0	0.0%
Urinary tract infection	0	0.0%
Genital tract infection	0	0.0%
Wound problem with intervention	1	0.2%

* Post-partum haemorrhage was defined as blood loss > 500 ml within 24 hours of delivery before 2014 and > 500 ml following vaginal delivery and > 1,000 ml following Caesarean delivery in 2014.

#Only included vaginal deliveries

MATERNAL COMPLICATIONS

	2014	
Preterm (<37 weeks)	44	10.4%
<i>Singleton</i>	37	8.7%
<i>Multiple</i>	7	77.8%
Perineal laceration#	76	31.9%
<i>First degree tear</i>	58	24.4%
<i>Second degree tear</i>	18	7.6%
<i>Third degree tear</i>	0	00%
<i>Fourth degree tear</i>	0	0.0%
Internal iliac artery ligation	0	0.0%
Uterine artery embolization	0	0.0%
Uterine compression suture	1	0.2%
Uterine balloon tamponade	3	0.7%
Uterine rupture	0	0.0%
Hysterectomy	0	0.0%
Maternal collapse	0	0.0%
Maternal death	0	0.0%

#Only included vaginal deliveries

FETAL OUTCOME

	2014	
Alive at 28 days	442	99.8%
Stillbirths	0	0.0%
Neonatal deaths	0	0.0%
Low birth weight (<2500 gm)	53	12.0%
<i>Singleton</i>	36	8.5%
<i>Multiple</i>	17	94.4%
Macrosomia (>4000 gm)	9	2.0%
Apgar score <4 at 1 minute	2	0.5%
Apgar score <4 at 5 minutes	1	0.2%

PELVIC MASSES – UTERINE FIBROIDS

The data on uterine fibroids and myomectomy in pregnancy were first captured in the current audit. The incidence of uterine fibroids in pregnancy was 2.4%, of which 98.5% were diagnosed antenatally. Caesarean section was performed in 46.6% and concurrent myomectomy was carried out in 2.8%. The rate of post-partum haemorrhage was 3.8% and the risk was higher in those with Caesarean delivery (4.8% vs 2.9%), so was the need for blood transfusion (2.3% vs 0.6%). The risk of post-partum haemorrhage, especially severe haemorrhage (> 1,500 ml), and need for blood transfusion were higher when concurrent myomectomy during Caesarean section was performed. There was no hysterectomy or associated maternal mortality.

UTERINE FIBROIDS

	2014	
Diagnosed in AN	1410	2.4%
Myomectomy during delivery	40	0.07%
<i>Not diagnosed in AN</i>	21	52.5%
<i>Diagnosed in AN</i>	19	47.5%
Total incidence	1431	

AN = antenatal period

PREGNANCY

	2014	
TOTAL PREGNANCIES	1431	2.4%
<i>Singleton</i>	1406	98.3%
<i>Multiple</i>	25	1.7%
TOTAL BIRTHS	1456	

PARITY OF THE PATURIENTS

	2014	
Para 0	975	68.1%
Para 1	376	26.3%
Para 2	68	4.8%
Para 3 & above	12	0.8%

AGE OF THE PARTURIENTS

	2014	
20 – 24 years old	7	0.5%
25 – 29 years old	62	4.3%
30 – 34 years old	346	24.2%
35 – 39 years old	584	40.8%
40 – 44 years old	352	24.6%
≥ 45 years old	65	4.5%
Missing	15	1.0%
Total	1431	

GESTATION AT DELIVERY

	2014	
< 26 weeks	1	0.07%
26 – 28 weeks	8	0.6%
29 – 32 weeks	26	1.8%
33 – 36 weeks	93	6.5%
37 – 41 weeks	1300	90.8%
≥ 42 weeks	1428	99.8%
Missing	3	0.2%
Total	1431	

MODE OF ONSET OF LABOUR

	2014	
Spontaneous	650	45.4%
Induced labour	367	25.6%
No labour	414	28.9%

STATUS OF AMNIOTIC FLUID DURING LABOUR (FOR EACH BABY)

	2014	
Clear liquor	1324	90.9%
Meconium stained liquor	107	7.4%
<i>Mild</i>	57	3.9%
<i>Moderate</i>	30	2.1%
<i>Severe</i>	20	1.4%
Blood stained liquor	15	1.0%
No liquor	10	0.7%

MODE OF DELIVERY (FOR EACH BABY)

	2014	
Spontaneous vertex delivery	663	45.5%
Vacuum extraction	104	7.1%
Forceps delivery	18	1.2%
Vaginal breech delivery	4	0.3%
LSCS before labour	410	28.2%
LSCS after labour	239	16.4%
Classical Caesarean section	18	1.2%

CAESAREAN SECTION IN THOSE WITH UTERINE FIBROIDS DIAGNOSED ANTENATALLY

	No myomectomy		Myomectomy	
Before labour	380	62.7%	15	8.33%
After labour	226	37.2%	3	16.7%
Total	606		18	

USE OF OXYTOTICS FOR THIRD STAGE OF LABOUR

	2014	
Syntometrine	507	35.4%
Syntocinon	664	46.4%
Duratocin	78	5.5%
Nil	182	12.7%

POSTPARTUM COMPLICATIONS

	2014	
Postpartum haemorrhage*	54	3.8%
<i>Vaginal delivery (> 500 ml)</i>	23	2.9%
<i>Caesarean section (> 1,000 ml)</i>	31	4.8%
Blood transfusion	20	1.4%
<i>Vaginal delivery</i>	5	0.6%
<i>Caesarean section</i>	15	2.3%
Episiotomy#	521	66.2%
<i>Nulliparous</i>	431	83.2%
<i>Multiparous</i>	90	33.5%
Manual removal of placenta	17	1.2%
<i>Vaginal delivery</i>	13	1.7%
<i>Caesarean section</i>	4	0.6%
Puerperal pyrexia	5	0.3%
Breast abscess	0	0.0%
Urinary tract infection	1	0.1%
Genital tract infection	2	0.1%
Wound problem with intervention	2	0.1%

* Post-partum haemorrhage was defined as blood loss > 500 ml within 24 hours of delivery before 2014 and > 500 ml following vaginal delivery and > 1,000 ml following Caesarean delivery in 2014. #Only included vaginal deliveries

MYOMECTOMY AND BLOOD LOSS AT CAESAREAN SECTION

	No myomectomy		Myomectomy		Total	
Blood loss						
≤ 500 ml	494	81.5%	27	71.1%	521	80.9%
501-1000 ml	82	13.5%	10	26.3%	92	14.3%
1001 – 1500 ml	16	2.6%	0	0.0%	16	2.5%
> 1500 ml	14	2.3%	1	6.7%	15	2.3%
Blood transfusion	14	2.3%	1	6.7%	15	2.3%
Total	606		38		644	

MATERNAL COMPLICATIONS

	2014	
Preterm (<37 weeks)	128	8.9%
<i>Singleton</i>	114	8.1%
<i>Multiple</i>	14	56.0%
Perineal laceration#	251	31.9%
<i>First degree tear</i>	156	19.8%
<i>Second degree tear</i>	91	11.6%
<i>Third degree tear</i>	4	0.5%
<i>Fourth degree tear</i>	0	0.0%
Internal iliac artery ligation	0	0.0%
Uterine artery embolization	1	0.1%
Uterine compression suture	3	0.2%
Uterine balloon tamponade	4	0.3%
Uterine rupture	0	0.0%
Hysterectomy	0	0.0%
Maternal collapse	0	0.0%
Maternal death	0	0.0%

#Only included vaginal deliveries

MYOMECTOMY AND UTERINE COMPRESSION SUTURE OR BALLOON TAMPONADE

	Vaginal		Casearean		Total	
Uterine compression suture	0	0.0%	3	0.5%	3	0.2%
<i>No myomectomy</i>	0	0.0%	3	0.5%	3	0.5%
<i>Myomectomy</i>	0	0.0%	0	0.0%	0	0.0%
Uterine balloon tamponade	2	0.3%	2	0.3%	4	0.3%
<i>No myomectomy</i>	2	0.3%	1	0.2%	3	0.5%
<i>Myomectomy</i>	0	0.0%	1	2.6%	1	0.2%

FETAL OUTCOME

	2014	
Alive at 28 days	1451	99.7%
Stillbirths	3	0.2%
Neonatal deaths	2	0.1%
Low birth weight (<2500 gm)	170	11.7%
<i>Singleton</i>	135	79.4%
<i>Multiple</i>	35	20.6%
Macrosomia (>4000 gm)	23	1.6%
Apgar score <4 at 1 minute	8	0.5%
Apgar score <4 at 5 minutes	4	0.3%

ANTEPARTUM HAEMORRHAGE

The incidence of antepartum haemorrhage (APH) remained at 1.5-2.5% over the past 10 years. The causes of APH were also similar with majority of the cases being APH of unknown origin.

The amniotic fluid was meconium stained in 6.2% and blood stained in 5.0%. The rate of spontaneous vertex delivery was 30-40% whereas the rate of caesarean section remained at 50-55%. The incidences of preterm delivery (38.7%) and low birth rate (32.5%) were similarly to 2009 and these were significantly higher than those without APH. The overall rate of post-partum haemorrhage was much lower than that in 2009 and this was due to the change in the definition in 2014. The rate of post-partum haemorrhage was much higher in Caesarean section than vaginal delivery. The hysterectomy rate remained unchanged.

The stillbirth rate remained at 0.6-0.8% while the neonatal death rate fluctuated between 0.3% - 0.9% over the past 10 years. The perinatal mortality rate in those with APH of unknown origin was higher in 2014 (13.3 per 1,000 total births) than in 2009 (8.3 per 1,000 total births), and it was 5 times higher than those without APH (2.3 per 1,000 total births). The perinatal mortality rate for those with APH due to placenta abruptio was very high (56.1 per 1,000 total births).

	2004		2009		2014	
APH of unknown origin	577	58.6%	603	51.5%	871	60.1%
Placenta praevia	290	29.5%	455	38.9%	412	28.4%
Placenta abruptio	72	7.3%	73	6.2%	103	7.1%
Other causes	45	4.6%	39	3.3%	63	4.3%
Total incidence	984	2.0%	1170	1.5%	1449	2.4%

PREGNANCY

	2004		2009		2014	
TOTAL PREGNANCIES	984		1170		1449	
<i>Singleton</i>	951	96.6%	1139	97.4%	1391	96.0%
<i>Multiple</i>	33	3.4%	31	2.6%	58	4.0%
TOTAL BIRTHS	1019		1200		1509	

PARITY OF THE PATURIENTS

	2004		2009		2014	
Para 0	547	55.6%	640	54.7%	841	58.0%
Para 1	347	35.3%	435	37.2%	492	34.0%
Para 2	70	7.1%	68	5.8%	90	6.2%
Para 3 & above	20	2.0%	27	2.3%	26	1.8%

GESTATION AT DELIVERY

	2004		2009		2014	
< 26 weeks	8	0.8%	8	0.7%	20	1.4%
26 – 28 weeks	27	2.7%	22	1.9%	41	2.8%
29 – 32 weeks	77	7.8%	88	7.5%	109	7.5%
33 – 36 weeks	231	23.5%	302	25.8%	391	27.0%
37 – 41 weeks	637	64.7%	748	63.9%	887	61.2%
≥ 42 weeks	2	0.2%	0	0.0%	0	0.0%
Total	982		1168		1448	

Missing data in 2 cases (0.2%) in 2004, 2009 in 2 (0.2%) and 1 (0.07%) in 2014

MODE OF ONSET OF LABOUR

	2004		2009		2014	
Spontaneous	309	31.4%	336	28.7%	490	33.8%
Induced labour	286	29.1%	274	23.4%	421	29.1%
No labour	389	39.5%	560	47.9%	538	37.1%

STATUS OF AMNIOTIC FLUID DURING LABOUR (FOR EACH BABY)

	2014	
Clear liquor	1331	88.3%
Meconium stained liquor	94	6.2%
<i>Mild</i>	57	3.8%
<i>Moderate</i>	23	1.5%
<i>Severe</i>	14	0.9%
Blood stained liquor	75	5.0%
No liquor	7	0.5%

MODE OF DELIVERY FOR EACH BABY

	2004		2009		2014	
Spontaneous vertex delivery	384	37.7%	375	31.3%	615	40.8%
Vacuum extraction	67	6.6%	57	4.8%	54	3.6%
Forceps delivery	6	0.6%	6	0.5%	23	1.5%
Vaginal breech delivery	5	0.5%	10	0.8%	13	0.9%
LSCS before labour	399	39.2%	547	45.6%	546	36.2%
LSCS after labour	147	14.4%	171	14.3%	223	14.8%
Classical Caesarean section	11	1.1%	28	2.3%	33	2.2%

USE OF OXYTOTICS FOR THIRD STAGE OF LABOUR

	2014	
Syntometrine	493	34.0%
Syntocinon	778	53.7%
Duratocin	44	3.0%
Nil	134	9.2%

POSTPARTUM COMPLICATIONS

	2004		2009		2014	
Postpartum haemorrhage*	47	4.8%	272	23.2%	140	9.7%
<i>Vaginal delivery (> 500 ml)</i>	32	7.0%	12	2.7%	29	4.2%
<i>Caesarean section (> 1,000 ml)</i>	-	-	96	13.4%	111	14.8%
Blood transfusion	-	-	26	2.2%	42	2.9%
<i>Vaginal delivery</i>	-	-	3	0.7%	3	0.4%
<i>Caesarean section</i>	-	-	22	3.1%	39	5.2%
Episiotomy#	383	38.9%	300	67.3%	393	56.5%
<i>Nulliparous</i>	250	45.7%	217	82.5%	318	73.6%
<i>Multiparous</i>	133	30.4%	83	45.4%	75	28.4%
Manual removal of placenta	43	4.4%	21	1.8%	19	1.3%
<i>Vaginal delivery</i>	6	1.3%	6	1.3%	14	2.0%
<i>Caesarean section</i>	37	7.0%	15	2.1%	5	0.7%
Puerperal pyrexia	10	1.0%	21	1.8%	10	0.7%
Breast abscess	0	0.0%	0		0	0.0%
Urinary tract infection	9	0.9%	5	0.4%	5	0.3%
Genital tract infection	0	0.0%	2	0.2%	3	0.2%
Wound problem with intervention	0	0.0%	7	0.6%	4	0.3%

* Post-partum haemorrhage was defined as blood loss > 500 ml within 24 hours of delivery before 2014 and > 500 ml following vaginal delivery and > 1,000 ml following Caesarean delivery in 2014.

#Only included vaginal deliveries

MATERNAL COMPLICATIONS

	2004		2009		2014	
Preterm (<37 weeks)	343	34.9%	420	35.9%	561	38.7%
<i>Singleton</i>	313	33.0%	396	34.8%	513	36.9%
<i>Multiple</i>	30	90.9%	24	77.4%	48	82.8%
Perineal laceration#	-	-	-	-	221	31.7%
<i>First degree tear</i>	-	-	-	-	139	20.0%
<i>Second degree tear</i>	-	-	-	-	81	11.6%
<i>Third degree tear</i>	0	0.0%	0	0.0%	1	0.1%
<i>Fourth degree tear</i>	-	-	-	-	0	0.0%
Internal iliac artery ligation	1	0.1%	0	0.0%	1	0.07%
Uterine artery embolization	0	0.0%	9	0.8%	1	0.07%
Uterine compression suture	-	-	-	-	26	1.8%
Uterine balloon tamponade	-	-	-	-	16	1.1%
Uterine rupture	0	0.0%	0	0.0%	0	0.0%
Hysterectomy	9	0.9%	14	1.2%	10	0.7%
Maternal collapse	-	-	-	-	0	0.0%
Maternal death	0	0.0%	0	0.0%	0	0.0%

#Only included vaginal deliveries

FETAL OUTCOME

	2004		2009		2014	
Alive at 28 days	1003	98.4%	1189	99.1%	1484	98.3%
Stillbirths	8	0.8%	8	0.7%	9	0.6%
Neonatal deaths	8	0.8%	3	0.3%	14	0.9%
Low birth weight (<2500 gm)	295	28.9%	331	27.7%	490	32.5%
<i>Singleton</i>	236	23.2%	282	24.8%	403	29.0%
<i>Multiple</i>	59	86.8%	49	80.3%	87	73.7%
Macrosomia (>4000 gm)	16	1.6%	19	1.6%	8	0.5%
Apgar score <4 at 1 minute	26	2.6%	18	1.5%	42	2.8%
Apgar score <4 at 5 minutes	11	1.1%	8	0.7%	16	1.1%

FETAL OUTCOME IN PREGNANCY COMPLICATED WITH APH

	No APH	Unknown origin	Placenta praevia	Placenta abruptio	Other causes
Alive at 28 days	58814(99.70%)	890(98.45%)	430(99.31%)	101(94.39%)	63(100%)
Stillbirth	130 (0.22%)	3 (0.33%)	1 (0.23%)	5 (4.67%)	0 (0.00%)
<i>Antenatal</i>	113 (0.19%)	3 (0.33%)	1 (0.23%)	4 (3.73%)	0 (0.00%)
<i>Intrapartum</i>	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
<i>Undetermined</i>	17 (0.03%)	0 (0.00%)	0 (0.00%)	1 (0.93%)	0 (0.00%)
Neonatal death	45 (0.08%)	11 (1.22%)	2 (0.46%)	1 (0.93%)	0 (0.00%)
<i>Early</i>	35 (0.06%)	9 (1.00%)	2 (0.46%)	1 (0.93%)	0 (0.00%)
<i>Late</i>	10 (0.02%)	2 (0.22%)	0 (0.00%)	0 (0.0%)	0 (0.00%)
Total	58989	904	433	107	63

BREECH PRESENTATION AT BIRTH

All babies with breech presentation at delivery were included in the analysis. As it is difficult to count the exact number of pregnancies, all maternal data were also calculated based on the number of births. Data in 2009 and 2004 were regenerated from the raw data and therefore were different from that reported in previous reports.

The incidence of breech presentation at delivery stayed ~4% over the past 10 years but the proportion of multiple pregnancy increased from 13.3% in 2004 to 19.8% in 2014. The rate of preterm delivery remained at about 23-25% and that of low birth weight was 23-27%. The vaginal delivery rate remained 4-5% since 2004, in contrast to the 11.8% in 1999. This is likely related to the change of practice after the “Term Breech Trial” published in 2000 and majority of breech were delivered by caesarean section. Despite the change in the definition of post-partum haemorrhage in 2014, Caesarean section was associated with a much lower risk of post-partum haemorrhage than vaginal delivery. The incidences of very low Apgar score (< 4) among those with vaginal births dropped from 37.7% to 24.8% at 1 minute and 33.3% to 19.4% at 5 minutes. The stillbirth rate reduced from 1.5% to 1.0% while the neonatal mortality rate remained 0.7-1.0%.

	2004		2009		2014	
TOTAL BIRTHS	2081	4.2%	2862	3.5%	2467	4.1%
Singleton	1805	86.7%	2339	81.7%	1980	80.3%
Twins	267	12.8%	506	17.7%	478	19.4%
<i>First baby</i>	89	33.3%	195	38.5%	157	32.8%
<i>Second baby</i>	178	66.7%	311	61.5%	321	67.2%
Triplets	9	0.4%	17	0.6%	9	0.4%
<i>First baby</i>	3	33.3%	4	23.5%	1	11.1%
<i>Second baby</i>	3	33.3%	7	41.2%	4	44.4%
<i>Third baby</i>	3	33.3%	6	35.3%	4	44.4%

PARITY OF THE PATIENTS FOR EACH BABY

	2004		2009		2014	
Para 0	1333	64.1%	1652	57.7%	1654	67.0%
Para 1	595	28.6%	1014	35.4%	655	26.6%
Para 2	119	5.7%	166	5.8%	129	5.2%
Para 3 & above	34	1.6%	30	1.0%	29	1.2%

GESTATION AT DELIVERY FOR EACH BABY

	2004		2009		2014	
< 26 weeks	26	1.2%	24	0.8%	32	1.3%
26 – 28 weeks	47	2.3%	48	1.7%	62	2.5%
29 – 32 weeks	103	4.9%	149	5.2%	124	5.0%
33 – 36 weeks	329	15.8%	433	15.1%	389	15.8%
37 – 41 weeks	1564	75.2%	2201	76.9%	1854	75.2%
≥ 42 weeks	11	0.5%	3	0.1%	0	0.0%
Missing	1	0.05%	4	0.1%	6	0.2%

MODE OF ONSET OF LABOUR FOR EACH BABY

	2004		2009		2014	
Spontaneous	578	27.8%	602	21.0%	538	21.8%
Induced labour	37	1.8%	55	1.9%	74	3.0%
No labour	1466	70.4%	2205	88.0%	1855	75.2%

STATUS OF AMNIOTIC FLUID DURING LABOUR FOR EACH BABY

	2014	
Clear liquor	2332	94.5%
Meconium stained liquor	91	3.7%
<i>Mild</i>	65	2.6%
<i>Moderate</i>	14	0.6%
<i>Severe</i>	12	0.5%
Blood stained liquor	29	1.2%
No liquor	15	0.6%

MODE OF DELIVERY FOR EACH BABY

	2004		2009		2014	
Vaginal delivery	101	4.8%	135	4.7%	136	5.5%
LSCS before labour	1441	69.2%	2159	75.4%	1812	73.4%
LSCS after labour	519	24.9%	524	18.3%	474	19.2%
Classical Caesarean section	19	0.9%	43	1.5%	45	1.8%

Missing data in one case on mode of delivery in 2009

USE OF OXYTOTICS FOR THIRD STAGE OF LABOUR FOR EACH BABY

	2014	
Syntometrine	88	3.6%
Syntocinon	1772	71.8%
Duratocin	146	5.9%
Nil	461	18.7%

POSTPARTUM COMPLICATIONS FOR EACH BABY

	2004		2009		2014	
Postpartum haemorrhage*	30	1.4%	419	14.6%	84	3.4%
<i>Vaginal delivery (> 500 ml)</i>	5	4.9%	7	5.2%	15	11.0%
<i>Caesarean section (> 1,000 ml)</i>	-	-	83	3.0%	69	3.0%
Blood transfusion	-	-	16	0.6%	33	1.3%
<i>Vaginal delivery</i>	-	-	1	0.7%	5	3.7%
<i>Caesarean section</i>	-	-	15	0.6%	28	1.2%
Episiotomy#	42	41.2%	48	35.6%	56	2.3%
<i>Nulliparous</i>	19	42.2%	26	42.6%	28	36.4%
<i>Multiparous</i>	23	40.4%	22	29.7%	28	47.5%
Manual removal of placenta	99	4.8%	90	3.1%	39	1.6%
<i>Vaginal delivery</i>	3	2.9%	7	5.2%	9	6.6%
<i>Caesarean section</i>	96	4.9%	83	3.0%	30	1.3%
Puerperal pyrexia	23	1.1%	44	1.5%	8	0.3%
Breast abscess	0	0.3%	0	0.0%	0	0.0%
Urinary tract infection	12	0.6%	6	0.2%	3	0.1%
Genital tract infection	0	0.0%	3	0.1%	12	0.5%
Wound problem with intervention	10	0.5%	10	0.3%	4	0.2%

* Post-partum haemorrhage was defined as blood loss > 500 ml within 24 hours of delivery before 2014 and > 500 ml following vaginal delivery and > 1,000 ml following Caesarean delivery in 2014.

#Only included vaginal deliveries

MATERNAL COMPLICATIONS FOR EACH BABY

	2004		2009		2014	
Preterm (<37 weeks)	505	24.3%	654	22.9%	607	24.6%
<i>Singleton</i>	347	19.2%	381	16.3%	357	18.0%
<i>Multiple</i>	158	57.2%	273	52.2%	250	51.3%
Perineal laceration#	-	-	-	-	27	19.9%
<i>First degree tear</i>	-	-	-	-	16	11.8%
<i>Second degree tear</i>	-	-	-	-	10	7.4%
<i>Third degree tear</i>	0	0.0%	0	0.0%	1	0.7%
<i>Fourth degree tear</i>	-	-	-	-	0	0.0%
Internal iliac artery ligation	2	0.1%	0	0.0%	0	0.0%
Uterine artery embolization	0	0.0%	5	0.2%	2	0.08%
Uterine compression suture	-	-	-	-	8	0.3%
Uterine balloon tamponade	-	-	-	-	10	0.4%
Uterine rupture	0	0.0%	1	0.04%	0	0.0%
Hysterectomy	10	0.5%	7	0.2%	10	0.4%
Maternal collapse	-	-	-	-	0	0.0%
Maternal death	2	0.1%	2	0.07%	0	0.0%

#Only included vaginal deliveries

FETAL OUTCOME

	2004		2009		2014	
Alive at 28 days	2032	97.6%	2811	98.2%	2417	98.0
Stillbirths	31	1.5%	30	1.0%	27	1.1%
<i>Antepartum</i>	25	80.7%	26	86.7%	23	85.2%
<i>Intrapartum</i>	1	3.2%	0	0%	0	0.0%
<i>Undetermined</i>	5	16.1%	4	13.3%	4	14.8%
Neonatal deaths	18	0.9%	21	0.7%	23	1.0%
<i>Early</i>	14	77.8%	18	85.7%	19	82.6%
<i>Late</i>	4	22.2%	3	14.3%	4	17.4%
Low birth weight (<2500 gm)	476	22.9%	661	23.1%	665	27.0%
<i>Singleton</i>	304	63.9%	343	51.9%	350	17.8%
<i>Multiple</i>	172	36.1%	318	48.1%	315	64.7%
Macrosomia (>4000 gm)	38	1.8%	35	1.2%	24	1.0%
Apgar score <4 at 1 minute	65	3.1%	45	1.6%	73	3.0%
Apgar score <4 at 5 minutes	38	1.8%	25	0.9%	34	1.4%
Birth trauma	8	0.4%	3	0.1%	0	0.0%

LIVEBORN SINGLETONS IN BREECH PRESENTATION WITH LOW APGAR SCORES

Apgar Score	2004		2009		2014	
	Vaginal	Caesarean	Vaginal	Caesarean	Vaginal	Caesarean
At 1 minute						
0 – 3	26 (37.7%)	29 (1.7%)	25 (25.8%)	11(0.5%)	31 (24.8%)	42 (1.8%)
4 – 6	17 (24.6%)	138 (8.0%)	18 (18.6%)	128 (5.7%)	30 (24.0%)	191 (8.2%)
At 5 minutes						
0 – 3	23 (33.3%)	9 (0.5%)	20 (20.6%)	3 (0.1%)	24 (19.4%)	10 (0.4%)
4 – 6	2 (2.9%)	10 (0.6%)	5 (5.2%)	6 (0.3%)	10 (8.1%)	33 (1.4%)
Total	69	1727	97	2241	125	2323

EXTERNAL CEPHALIC VERSION

External cephalic version (ECV) was attempted in 137 pregnancies only, with the rate continued to drop from 11.6% in 2004 to 7.8% in 2009 and 5.7% in 2014. The procedure was successful in less than 50% which was lowest compared with previous audits. For those with successful ECV, vaginal delivery was achieved in only 62%, which was also lowest among previous audits. For those without ECV, the Caesarean section rate was over 90.7% which was similar to previous audits. For those with failed ECV, the Caesarean section rate was even higher and was 98.6% in 2014.

	2004		2009		2014	
No ECV	1430	88.4%	2308	92.2%	2269	94.3%
ECV	188	11.6%	194	7.8%	137	5.7%
<i>Successful ECV</i>	104	55.3%	120	61.9%	63	46.0%
<i>Failed ECV</i>	84	44.7%	74	38.1%	74	54.0%
Total incidence	1618	11.6%	2502	7.8%	2407	5.7%

No ECV

	2004		2009		2014	
Spontaneous	13	0.9%	54	2.3%	41	1.8%
Instrumental	2	0.1%	9	0.4%	5	0.2%
Vaginal breech	57	4.0%	104	4.5%	117	5.2%
Lower Segment Caesarean Section	1339	93.6%	2097	90.9%	2057	90.7%
Classical Caesarean Section	18	1.3%	43	1.9%	49	2.2%
Unknown	1	0.1%	1	0.04%	0	0.0%
Total	1430		2308		2269	

SUCCESSFUL ECV

	2004		2009		2014	
Spontaneous	71	68.3%	86	71.7%	39	61.9%
Instrumental	14	13.5%	11	9.2%	6	9.5%
Vaginal breech	0	0.0%	0	0.0%	1	1.6%
LSCS	19	18.3%	23	19.2%	17	27.0%
Classical CS	0	0.0%	0	0.0%	0	0.0%
Unknown	0	0.0%	0	0.0%	0	0.0%
Total	104		120		63	

FAILED ECV

	2004		2009		2014	
Spontaneous	0	0.0%	2	2.7%	0	0.0%
Instrumental	0	0.0%	0	0.0%	0	0.0%
Vaginal breech	2	2.4%	0	0.0%	1	1.4%
LSCS	82	97.6%	70	94.6%	73	98.6%
Classical CS	0	0.0%	1	1.4%	0	0.0%
Unknown	0	0.0%	1	1.4%	0	0.0%
Total	84		74		74	

PARTURIENTS WITH PREVIOUS UTERINE SCAR

The data on the presence of non-Caesarean section uterine scar was first captured in the current audit. The prevalence of parturients with previous uterine scar was 13.0%, of which previous Caesarean scar only accounted for 96.4%.

	2014	
TOTAL PREGNANCIES	7729	13.0%
<i>Singleton</i>	7651	99.0%
<i>Twins</i>	78	1.0%
<i>Triplets</i>	0	0.0%
TOTAL BIRTHS	7802	
<i>5 (0.07%) cases of abortus</i>		

TYPES OF UTERINE SCAR

	2014	
Caesarean scar only	7456	96.4%
Non-Caesarean scar only	228	2.9%
Both scar	45	0.6%
Total	7729	

CASEAREAN SECTION UTERINE SCAR

The prevalence of parturients having uterine scar from previous Caesarean section was 12.6% which was similar to that in 2009 and higher than that in 2004. While the overall caesarean section rate was over 80%, the rate of caesarean section before labour was 68.0% in 2014 which was lower than that in 2009 but similar to that in 2004. Postpartum haemorrhage rate was similar to that in 2009 when stratified according to the mode of delivery. The rate of uterine rupture remained 0.03-0.05%. Uterine compression suture and balloon tamponade virtually replaced uterine artery ligation and embolization for the management of post-partum haemorrhage and the hysterectomy rate remained at 0.1-0.2%. There were not much changes in the fetal outcome parameters.

	2004		2009		2014	
TOTAL PREGNANCIES	4373	8.9%	10088	12.7%	7501	12.6%
<i>Singleton</i>	4330	99.0%	9952	98.6%	7431	99.1%
<i>Twins</i>	41	1.0%	135	1.3%	70	0.9%
<i>Triplets</i>	1	0.02%	1	0.01%	0	0.0%
TOTAL BIRTHS	4417		10225		7566	
<i>5 (0.07%) cases of abortus</i>						

PARITY OF THE PATIENTS

	2004		2009		2014	
Para 0	122	2.8%	191	1.9%	64	0.9%
Para 1	3534	80.8%	8568	84.9%	6185	82.5%
Para 2	606	13.9%	1163	11.5%	1053	14.0%
Para 3 & above	111	2.5%	166	1.6%	199	2.6%

GESTATION AT DELIVERY

	2004		2009		2014	
< 26 weeks	1	0.02%	4	0.04%	16	0.2%
26 – 28 weeks	7	0.2%	16	0.2%	21	0.3%
29 – 32 weeks	9	0.2%	70	0.7%	75	1.0%
33 – 36 weeks	37	0.8%	548	5.4%	429	5.7%
37 – 41 weeks	4054	92.7%	9392	93.1%	6907	92.1%
≥ 42 weeks	25	0.6%	14	0.1%	1	0.01%
Missing	14	0.3%	44	0.4%	52	0.7%

MODE OF ONSET OF LABOUR

	2004		2009		2014	
Spontaneous	1249	28.6%	2064	20.5%	2091	27.9%
Induced labour	167	3.8%	224	2.2%	237	3.2%
No labour	2957	67.6%	7798	77.3%	5173	68.9%

Missing data on mode of onset of labour in 2 cases (0.02%) in 2009

STATUS OF AMNIOTIC FLUID DURING LABOUR (FOR EACH BABY)

	2014	
Clear liquor	7218	95.4%
Meconium stained liquor	304	4.0%
<i>Mild</i>	204	2.7%
<i>Moderate</i>	65	0.9%
<i>Severe</i>	35	0.5%
Blood stained liquor	38	0.5%
No liquor	6	0.08%

MODE OF DELIVERY (FOR EACH BABY)

	2004		2009		2014	
NSD	625	14.1%	976	9.7%	887	11.7%
Vacuum extraction	113	2.6%	205	2.0%	119	1.6%
Forceps	12	0.3%	18	0.2%	14	0.2%
Vaginal breech	8	0.2%	10	0.1%	10	0.1%
Lower Segment CS before labour	2939	66.5%	7667	76.0%	5150	68.1
Lower Segment CS after labour	696	15.8%	1151	11.4%	1340	17.7%
Classical CS	24	0.5%	54	0.5%	46	0.6%

USE OF OXYTOTICS FOR THIRD STAGE OF LABOUR

	2014	
Syntometrine	733	9.8%
Syntocinon	3464	46.2%
Duratocin	898	12.0%
Nil	2406	32.1%

POSTPARTUM COMPLICATIONS

	2004		2009		2014	
Postpartum haemorrhage*	77	1.8%	764	7.6%	154	2.1%
<i>Vaginal delivery (> 500 ml)</i>	53	7.0%	51	4.2%	51	5.0%
<i>Caesarean section (> 1,000 ml)</i>	-	-	136	1.5%	103	1.6%
Blood transfusion	-	-	62	0.6%	72	1.0%
<i>Vaginal delivery</i>	-	-	14	1.2%	20	1.9%
<i>Caesarean section</i>	-	-	47	0.5%	52	0.8%
Episiotomy#	611	14.0%	859	71.1%	604	58.7%
<i>Nulliparous</i>	6	4.9%	7	43.8%	4	40.0%
<i>Multiparous</i>	605	14.2%	852	71.4%	600	58.9%
Manual removal of placenta	124	2.8%	159	1.6%	44	0.6%
<i>Vaginal delivery</i>	12	1.6%	15	1.2%	15	1.5%
<i>Caesarean section</i>	112	3.1%	144	1.6%	29	0.4%
Puerperal pyrexia	29	0.7%	54	0.5%	12	0.2%
Breast abscess	1	0.02%	3	0.03%	1	0.01%
Urinary tract infection	36	0.8%	8	0.08%	9	0.1%
Genital tract infection	1	0.02%	3	0.03%	9	0.1%
Wound problem with intervention	12	0.3%	23	0.2%	5	0.07%

* *Post-partum haemorrhage was defined as blood loss > 500 ml within 24 hours of delivery before 2014 and > 500 ml following vaginal delivery and > 1,000 ml following Caesarean delivery in 2014.*

#*Only included vaginal deliveries*

MATERNAL COMPLICATIONS

	2004		2009		2014	
Preterm (<37 weeks)	280	6.4%	638	6.3%	541	7.2%
<i>Singleton</i>	263	6.1%	585	5.9%	513	6.9%
<i>Multiple</i>	17	42.5%	53	39.3%	28	40.0%
Perineal laceration#	-	-	-	-	307	29.8%
<i>First degree tear</i>	-	-	-	-	188	18.3%
<i>Second degree tear</i>	-	-	-	-	112	0.6%
<i>Third degree tear</i>	1	0.02%	2	0.02%	6	0.6%
<i>Fourth degree tear</i>	-	-	-	-	1	0.03%
Internal iliac artery ligation	1	0.02%	0	0.0%	0	0.0%
Uterine artery embolization	0	0.0%	10	0.1%	3	0.04%
Uterine compression suture	-	-	-	-	10	0.1%
Uterine balloon tamponade	-	-	-	-	14	0.2%
Uterine rupture	2	0.05%	5	0.05%	2	0.03%
Hysterectomy	6	0.1%	21	0.2%	10	0.1%
Maternal collapse	-	-	-	-	1	0.01%
Maternal death	0	0.0%	1	0.01%	0	0.0%

#Only included vaginal deliveries

FETAL OUTCOME

	2004		2009		2014	
Alive at 28 days	4407	99.8%	10205	99.8%	7552	99.7%
Stillbirths	6	0.1%	16	0.2%	9	0.1%
Neonatal deaths	4	0.2%	4	0.04%	5	0.07%
Low birth weight (<2500 gm)	265	6.0%	562	5.5%	486	6.5%
<i>Singleton</i>	220	83.0%	444	79.0%	421	5.7%
<i>Multiple</i>	45	17.0%	118	21.0%	65	46.4%
Macrosomia (>4000 gm)	170	3.8%	291	2.8%	177	2.3%
Apgar score <4 at 1 minute	18	0.4%	21	0.2%	35	0.5%
Apgar score <4 at 5 minutes	6	0.1%	12	0.1%	11	0.1%

NON-CAESAREAN SECTION UTERINE SCAR

The overall incidence was 0.5%. Most of the cases (88.3%) were related to previous myomectomy. Among them, 79.7% were delivered by Caesarean section and there was a significantly higher postpartum haemorrhage rate (12.1%) and hysterectomy rate (1.8%) when compared to the general population. There was no associated maternal mortality.

	2014	
TOTAL PREGNANCIES	273	0.5%
<i>Singleton</i>	265	97.1%
<i>Multiple</i>	8	2.9%
TOTAL BIRTHS	281	

TYPE OF NON-CAESAREAN SECTION UTERINE SCARS

	2014	
Abdominal myomectomy	173	63.4%
Laparoscopic myomectomy	68	24.9%
Hysterotomy	2	0.7%
Others	30	11.0%

PARITY OF THE PATURIENTS

	2014	
Para 0	175	64.1%
Para 1	86	31.5%
Para 2	9	3.3%
Para 3 & above	3	1.1%

MODE OF ONSET OF LABOUR

	2014	
Spontaneous	73	26.7%
Induced labour	12	4.4%
No labour	188	68.9%

GESTATION AT DELIVERY

	2014	
< 26 weeks	0	0.0%
26 – 28 weeks	1	0.4%
29 – 32 weeks	4	1.5%
33 – 36 weeks	27	9.9%
37 – 41 weeks	235	86.1%
≥ 42 weeks	0	0.0%
Total	267	

Missing date in 6 (2.2%) cases in 2014

STATUS OF AMNIOTIC FLUID DURING LABOUR (FOR EACH BABY)

	2014	
Clear liquor	266	94.7%
Meconium stained liquor	10	3.6%
<i>Mild</i>	6	2.1%
<i>Moderate</i>	2	0.7%
<i>Severe</i>	2	0.7%
Blood stained liquor	3	1.1%
No liquor	2	0.7%

MODE OF DELIVERY (FOR EACH BABY)

	2014	
Spontaneous vertex delivery	38	13.5%
Vacuum extraction	8	2.8%
Forceps delivery	1	0.4%
Vaginal breech delivery	2	0.7%
LSCS before labour	186	66.2%
LSCS after labour	38	13.5%
Classical Caesarean section	8	2.8%

USE OF OXYTOTICS FOR THIRD STAGE OF LABOUR

	2014	
Syntometrine	23	8.4%
Syntocinon	146	53.5%
Duratocin	28	10.3%
Nil	76	27.8%

POSTPARTUM COMPLICATIONS

	2014	
Postpartum haemorrhage*	33	12.1%
<i>Vaginal delivery (> 500 ml)</i>	2	4.1%
<i>Caesarean delivery (> 1,000 ml)</i>	31	13.8%
Blood transfusion	8	2.9%
<i>Vaginal delivery</i>	0	0.0%
<i>Caesarean delivery</i>	7	3.6%
Episiotomy#	27	55.1%
<i>Nulliparous</i>	22	71.0%
<i>Multiparous</i>	5	27.8%
Manual removal of placenta	1	0.4%
Puerperal pyrexia	0	0.0%
Breast abscess	0	0.0%
Urinary tract infection	1	0.4%
Genital tract infection	0	0.0%
Wound problem with intervention	0	0.0%

* Post-partum haemorrhage was defined as blood loss > 500 ml within 24 hours of delivery before 2014 and > 500 ml following vaginal delivery and > 1,000 ml following Caesarean delivery in 2014.

#Include vaginal deliveries only

MATERNAL COMPLICATIONS

	2014	
Preterm (<37 weeks)	32	11.7%
<i>Singleton</i>	29	10.9%
<i>Multiple</i>	3	37.5%
Perineal laceration#	14	28.6%
<i>First degree tear</i>	10	20.4%
<i>Second degree tear</i>	4	8.2%
<i>Third degree tear</i>	0	0.0%
<i>Fourth degree tear</i>	0	0.0%
Internal iliac artery ligation	0	0.0%
Uterine artery embolization	1	0.4%
Uterine compression suture	8	2.9%
Uterine balloon tamponade	3	1.1%
Uterine rupture	0	0.0%
Hysterectomy	5	1.8%
Maternal collapse	0	0.0%
Maternal death	0	0.0%

Missing data in gestation in 6(2.2%) cases in 2014

FETAL OUTCOME

	2014	
Alive at 28 days	279	99.3%
Stillbirths	1	0.4%
Neonatal deaths	1	0.4%
Low birth weight (<2500 gm)	27	9.6%
<i>Singleton</i>	21	7.5%
<i>Multiple</i>	6	2.1%
Macrosomia (>4000 gm)	5	1.8%
Apgar score <4 at 1 minute	1	0.4%
Apgar score <4 at 5 minutes	1	0.4%

DOWN'S SYNDROME SCREENING

The data on Down's syndrome screening (DSS) was captured since 2009. The available screening methods in 2009 were either first trimester combined nuchal translucency and biochemical screening, or second trimester biochemical screening. Invasive diagnostic tests (amniocentesis or chorionic villus sampling) and second trimester biochemical screening were offered for parturients with advance maternal age in the public hospitals. While second trimester biochemical screening was free in public hospitals, first trimester screening was a self-financed test. Thus the proportion of parturients who had undergone screening was low (15.8%) in 2009.

With the implementation of universal and free of charge DSS in the public hospitals and the development and availability of non-invasive prenatal test (NIPT), which was a self-financed test, the trend changed significantly. The proportion of parturients with DSS increased to 46% in 2014 and 90% of them underwent first trimester screening. However, the coverage rate was much lower than expected given that it was a "free universal screening" test. This might be related to the patients' choice in favour of NIPT, especially for those who had antenatal care in the private setting. However, the data on NIPT did not seem to be well captured in the current audit and therefore could not reflect the actual situation.

PREGNANCIES SCREENED OR TESTED

	2014	
TOTAL PREGNANCIES	28246	47.4%
<i>Singleton</i>	27968	99.0%
<i>Twins</i>	276	1.0%
<i>Triplets</i>	2	0.007%
TOTAL BIRTHS	28526	47.1%

BIOCHEMICAL AND NUCHAL TRANSLUCENCY TEST

	2009		2014	
No screening	67174	84.2%	31955	53.6%
First trimester screening	7855	9.9%	24557	41.2%
Second trimester screening	4170	5.2%	2874	4.8%
Both/Combined screening	533	0.7%	16	0.03%
Missing	0	0.0%	236	0.4%
TOTAL	79732		59638	

FETAL DNA TESTING (NON-INVASIVE PRENATAL TESTING)

	2014	
No screening	58307	99.8%
Screening	1228	2.1%
Testing (High risk)	101	0.2%
Missing	2	0.003%
TOTAL	59638	

RESIDENTIAL STATUS

	2009		2014	
Hong Kong Resident	44258		54324	
Screened	7551	17.1%	25252	46.5%
Not screened	36707	82.9%	29072	53.5%
Non Hong Kong Resident	35474		5096	
Screened	5007	14.1%	2994	58.8%
Not screened	30467	85.9%	2102	41.2%

Missing data in 218 cases (0.4%) in 2014

MATERNAL AGE AND SCREENING

	No screening	1 st trimester	2 nd trimester	Both trimester	Fetal DNA
<20	81 (0.3%)	31 (0.1%)	12 (0.4%)	0 (0.0%)	1 (0.1%)
20-24	1278 (4.1%)	980 (4.1%)	276 (9.7%)	0 (0.0%)	16 (2.1%)
25-29	4528 (14.6%)	4231 (17.7%)	675 (23.8%)	4 (25.0%)	82 (10.9%)
30-34	10997 (35.6%)	9261 (38.8%)	874 (30.8%)	1 (6.3%)	264 (35.1%)
35-39	10300 (33.3%)	7105 (29.8%)	719 (25.3%)	6 (37.5%)	262 (34.8%)
≥ 40	3740 (12.1%)	2232 (9.4%)	284 (10.0%)	5 (31.3%)	127 (16.9%)
Total	30924	23840	2840	16	752

Missing data on maternal age in 1266 cases (0.4%) in 2014

PRETERM LABOUR

The data on preterm labour was captured in 1999 but it was not specified whether it ended up with preterm delivery or not. In 2004, the data was specified as threatened preterm labour which did not proceed to delivery, either spontaneously or after tocolytic therapy. *The data on preterm labour included those preterm labours which were arrested either spontaneously or with tocolytic therapy and those which proceeded to delivery irrespective of whether tocolytic therapy was used or not. Those preterm deliveries without labour were excluded.* The data therefore included those with threatened and/or actual preterm labour.

Preterm labour occurred in 4.7% of all deliveries which was similar to the previous audits which ranged from 4.2 - 5.1%. The risk of preterm labour was much higher in multiple pregnancy, but the incidence dropped from 26.3% in 2004 and 22.5% in 2009 to 20.4% in 2014. In those with threatened preterm labour, 20.7% (n=82) delivered at < 32 weeks and 66.4% (n=263) delivered at 32-36 weeks.

Overall, tocolytic therapies were used in 7.7% of all preterm labour cases and the rate was slightly higher compared with previous audits. Steroids were used in 13.3% of all preterm labour cases, of which 45.3% received tocolytic therapy.

	2004		2009*		2014	
TOTAL PREGNANCIES	2527	5.1%	3342	4.2%	2795	4.7%
Singleton	2386	94.4%	3079	921%	2618	93.3%
Multiple	141	5.6%	262	7.9%	177	6.7%
Twins	138	97.9%	259	98.9%	174	98.3%
Triplets	3	2.1%	3	1.1%	3	1.7%
TOTAL BIRTHS	2670		3606		2972	

**Data reported in previous report were incorrect*

In 2014, there were 2 twin pregnancies with one twin being an abortus

HISTORY OF THREATENED PRETERM LABOUR

	2004		2009		2014	
TOTAL INCIDENCE	442	17.5%	467	14.0%	396	14.2%
Singleton	401	90.7%	425	91.0%	355	89.7%
Multiple	41	9.3%	42	9.0%	41	10.3%

ONSET OF LABOUR

	2004		2009*		2014	
Spontaneous	1928	76.3%	2581	77.2%	1942	69.5%
Induced labour	523	20.7%	638	19.1%	764	27.3%
No labour	76	3.0%	123	3.7%	88	3.2%

**Data reported in previous report were incorrect*

STATUS OF AMNIOTIC FLUID DURING LABOUR

	2014	
Clear liquor	2725	91.7%
Meconium stained liquor	123	4.1%
<i>Mild</i>	87	2.9%
<i>Moderate</i>	22	0.7%
<i>Severe</i>	14	0.5%
Blood stained liquor	104	3.5%
No liquor	20	0.7%

USE OF TOCOLYTICS

	2004		2009*		2014	
Not used	2380	94.2%	3153	94.3%	2577	92.3%
<i>With history of TPL</i>	357	15.0%	339	10.8%	275	10.7%
<i>Without history of TPL</i>	2023	85.0%	2814	89.2%	2302	89.3%
Used	147	5.8%	189	5.7%	216	7.7%
<i>With history of TPL</i>	85	57.8%	128	67.7%	121	56.0%
<i>Without history of TPL</i>	62	42.2%	61	32.3%	95	44.0%

TPL: threatened preterm labour

*Data reported in previous report were incorrect

USE OF STEROIDS

	2004		2009*		2014	
Not used	2244	88.8%	3015	90.2%	2418	86.6%
<i>With tocolytic</i>	28	0.2%	44	1.5%	46	1.9%
<i>Without tocolytic</i>	2216	99.8%	2971	98.5%	2372	98.1%
Used	283	11.2%	327	9.8%	375	13.4%
<i>With tocolytic</i>	119	42.0%	145	44.3%	170	45.3%
<i>Without tocolytic</i>	163	58.0%	182	55.7%	205	54.4%

*Data reported in previous report were wrong

USE OF STEROID IN THOSE WITH GESTATION AT DELIVERY < 34 WEEKS

	2004*		2009*		2014	
Not used	376	64.8%	439	66.9%	397	58.6%
<i>With tocolytic</i>	18	4.8%	24	5.5%	36	9.1%
<i>Without tocolytic</i>	358	95.2%	415	94.5%	361	90.9%
Used	204	35.2%	217	33.1%	281	41.4%
<i>With tocolytic</i>	94	46.1%	96	44.2%	133	47.3%
<i>Without tocolytic</i>	110	53.9%	121	55.8%	148	57.2%

*Previous data was reported on gestation \leq 34 weeks and data was re-generated from previous audit data

GESTATION AT DELIVERY FOR THOSE HAVING TOCOLYTIC TREATMENT

	2004		2009*		2014	
< 26 weeks	12	8.1%	16	8.5%	18	8.3%
26 - 28 weeks	22	14.9%	16	8.5%	34	15.8%
29 - 32 weeks	57	38.5%	66	34.9%	75	34.7%
33 - 36 weeks	38	25.7%	64	33.9%	68	31.5%
37 - 41 weeks	10	12.8%	27	14.3%	21	9.7%
≥ 42 weeks	0	0.0%	0	0.0%	0	0.0%

*Data was re-generated from previous audit data

FETAL OUTCOME

	2004		2009*		2014	
Alive at 28 days	2563	96.0%	3471	96.3%	2857	96.1%
Stillbirths	73	2.7%	95	2.6%	82	2.8%
Neonatal deaths	34	1.3%	40	1.1%	34	1.1%

*Data was re-generated from previous audit data

THOSE LIVE BIRTHS DELIVERED AT GESTATION < 34 WEEKS

	2004*		2009*		2014	
No use of steroids or tocolytics	345	57.9%	394	58.9%	321	47.7%
Use of steroids only	127	21.3%	135	20.2%	158	23.4%
Use of tocolytics only	20	3.4%	32	4.8%	42	6.2%
Use of both steroids and tocolytics	104	17.5%	108	16.1%	152	22.5%
Total	596		669		673	

Percentage refers to that of the total population in that group

*Previous data was reported on gestation ≤ 34 weeks and data was re-generated from previous audit data

THOSE ALIVE AT 28 DAYS DELIVERED AT GESTATION < 34 WEEKS

	2004*		2009*		2014	
No use of steroids or tocolytics	325	57.4%	370	58.6%	308	47.9%
Use of steroids only	121	21.4%	132	20.9%	153	23.8%
Use of tocolytics only	19	3.4%	28	4.4%	37	5.8%
Use of both steroids and tocolytics	101	17.8%	102	16.1%	145	22.5%
Total	566		632		643	

Percentage refers to that of the total population in that group

*Previous data was reported on gestation ≤ 34 weeks and data was re-generated from previous audit data

THOSE WITH NEONATAL DEATHS DELIVERED AT GESTATION < 34 WEEKS

	2004*		2009*		2014	
No use of steroids or tocolytics	20	66.7%	24	64.9%	13	43.3%
Use of steroids only	6	20.0%	3	8.1%	5	16.7%
Use of tocolytics only	1	3.3%	4	10.8%	5	16.7%
Use of both steroids and tocolytics	3	10.0%	6	16.2%	7	23.3%
Total	30		37		30	

Percentage refers to that of the total population in that group

*Previous data was reported on gestation ≤ 34 weeks and data was re-generated from previous audit data

THREATENED PRETERM LABOUR

Of all the reported threatened preterm labour, tocolytic therapy was used in only 30.6% and steroids were used in only 37.3% cases. Overall 87% of the cases delivered before 37 weeks. The use of tocolytics was associated with more delivery < 33 weeks (47.1% vs 18.5%) and less delivery ≥ 33 weeks (52.9% vs 81.5%). There was however no significant difference in the survival rate at 28 days.

	2004		2009		2014	
	Use of Tocolytics		Use of Tocolytics		Use of Tocolytics	
	No	Yes	No	Yes	No	Yes
Total	357 (0.7%)	85 (0.2%)	339 (0.4%)	128 (0.2%)	275 (0.5%)	121 (0.2%)
Singleton	326(91.3%)	75 (88.2%)	311(91.7%)	114(89.1%)	248(90.2%)	107(88.4%)
Multiple	31 (8.7%)	10 (11.8%)	28 (8.3%)	14 (10.9%)	27 (9.8%)	14 (11.6%)
No. of babies	388	95	367	143	302	135

ONSET OF LABOUR

	2004		2009		2014	
	Use of Tocolytics		Use of Tocolytics		Use of Tocolytics	
	No	Yes	No	Yes	No	Yes
Spontaneous	264(73.9%)	63 (74.1%)	218(64.3%)	87 (68.0%)	177(64.3%)	95 (78.5%)
Induction	37 (10.4%)	2 (2.4%)	31 (9.1%)	8 (6.2%)	34 (12.4%)	2 (1.7%)
No Labour	56 (15.7%)	20 (23.5%)	90 (26.5%)	33 (25.8%)	64 (23.3%)	24 (19.8%)

STATUS OF AMNIOTIC FLUID DURING LABOUR

	2014	
	Use of Tocolytics	
	No	Yes
Clear Liquor	275(90.8%)	125(92.6%)
Meconium	17 (5.6%)	5 (3.7%)
<i>Mild</i>	14 (4.6%)	4 (3.0%)
<i>Moderate</i>	2 (0.7%)	0 (0.0%)
<i>Severe</i>	1 (0.3%)	1 (0.7%)
Blood	11 (3.6%)	5 (3.7%)
No liquor	0 (0.0%)	0 (0.0%)

USE OF STEROIDS

	2004		2009		2014	
	Use of Tocolytics		Use of Tocolytics		Use of Tocolytics	
	No	Yes	No	Yes	No	Yes
Not used	305(85.4%)	15 (17.6%)	279(82.3%)	28 (21.9%)	231(83.7%)	18 (14.9%)
Used	52 (14.6%)	70 (82.4%)	60 (17.7%)	100(78.1%)	45 (16.3%)	103(85.1%)

GESTATION AT DELIVERY

	2004		2009		2014	
	Use of Tocolytics		Use of Tocolytics		Use of Tocolytics	
	No	Yes	No	Yes	No	Yes
< 26 wks	11 (3.1%)	7 (8.3%)	10 (3.0%)	9 (7.0%)	6 (2.2%)	10 (8.3%)
26 - 28 wks	17 (4.8%)	12 (14.3%)	9 (2.7%)	5 (3.9%)	15 (5.4%)	14 (11.6%)
29 - 32 wks	41 (11.5%)	29 (34.5%)	47 (13.9%)	40 (31.2%)	30 (10.9%)	33 (27.3%)
33 - 36 wks	253(71.1%)	19 (22.6%)	246(73.0%)	47 (36.7%)	195(70.6%)	43 (35.5%)
37 - 41 wks	32 (9.0%)	17 (20.2%)	25 (7.4%)	27 (21.1%)	30 (10.9%)	21 (17.4%)
≥ 42 wks	2 (0.6%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)

Missing data on gestation at delivery in 2 in 2004 and 2009

FETAL OUTCOME

	2004		2009*		2014	
	Use of Tocolytics		Use of Tocolytics		Use of Tocolytics	
	No	Yes	No	Yes	No	Yes
Alive at 28d	381(97.9%)	93 (97.9%)	358(97.6%)	140(9.7.9%)	293(97.0%)	130(96.3%)
Stillbirths	2 (0.5%)	1 (1.1%)	2 (0.5%)	0 (0.0%)	5 (1.7%)	0 (0.0%)
NND	6 (1.5%)	1 (1.1%)	7 (1.9%)	3 (2.1%)	4 (1.3%)	5 (3.7%)
Total	389	95	367	143	302	135

NND: Neonatal deaths

*Data was re-generated from previous audit data

THOSE LIVEBIRTHS DELIVERED AT GESTATION <34 WEEKS

	2004*		2009*		2014	
No use of steroids or tocolytics	69	(40.8%)	77	(42.3%)	47	(28.3%)
Use of steroids only	38	(22.5%)	31	(17.0%)	11	(6.6%)
Use of tocolytics only	7	(4.2%)	15	(8.3%)	29	(17.5%)
Use of both steroids and tocolytics	55	(32.5%)	59	(32.4%)	79	(47.6%)
Total	169		182		166	

Percentage refers to that of the total population

*Previous data was reported on gestation ≤ 34 weeks and data was re-generated from previous audit data

THOSE ALIVE AT 28 DAYS IN THOSE LIVEBIRTHS DELIVERED AT GESTATION <34 WEEKS

	2004*		2009*		2014	
No use of steroids or tocolytics	67	(40.9%)	72	(41.6%)	45	(28.5%)
Use of steroids only	36	(22.0%)	30	(17.4%)	10	(6.3%)
Use of tocolytics only	7	(4.2%)	13	(7.5%)	28	(17.7%)
Use of both steroids and tocolytics	54	(32.9%)	58	(33.5%)	75	(47.5%)
Total	163		173		158	

Percentage refers to that of the total population

*Previous data was reported on gestation ≤ 34 weeks and data was re-generated from previous audit data

THOSE WITH NEONATAL DEATHS IN THOSE LIVEBIRTHS DELIVERED AT
GESTATION <34 WEEKS

	2004*		2009*		2014	
No use of steroids or tocolytics	2	(33.3%)	5	(55.6%)	2	(25.0%)
Use of steroids only	3	(50.0%)	1	(11.1%)	1	(12.5%)
Use of tocolytics only	0	(0.0%)	2	(22.2%)	1	(12.5%)
Use of both steroids and tocolytics	1	(16.7%)	1	(11.1%)	4	50.0%)
Total	6		9		8	

Percentage refers to that of the total population

**Previous data was reported on gestation \leq 34 weeks and data was re-generated from previous audit data*

PRE-TERM DELIVERY

The incidence of preterm delivery (<37 completed weeks) decreased from 6.7% in 2004 to 6.1 % in 2009 and 5.8% in 2014. For singleton pregnancy, the incidence was 5.8%, whereas the incidence of preterm delivery for multiple pregnancies was 48.7%. There was no significant change compared with previous two audits.

The amniotic fluid was meconium stained in 4.3% and no liquor occurred in 0.7%. Among those babies delivered in preterm gestations, the proportion of very low birth weight (< 1500 gm) was 12.3% and higher than the reported figures in last two audits which were 12.0% and 9.7% in 2004 and 2009 respectively. This was associated with the increase in neonatal NICU admissions in more than half (50.5%) of the preterm delivery cases. However, the stillbirth and neonatal mortality rates remained similar.

	2004		2009		2014	
TOTAL PREGNANCIES	3292	6.7%	4873	6.1%	3853	5.8%
<i>Singleton</i>	3019	91.7%	4304	88.3%	3428	89.0%
<i>Twin</i>	265	8.0%	556	11.4%	418	10.8%
<i>Triplets</i>	8	0.2%	13	0.3%	7	0.2%
TOTAL BIRTHS	3574		5424		4270	

14 cases of abortus in 2014

SUB-CATEGORIES OF PRE-TERM DELIVERY

	2004		2009		2014	
Extremely (< 28 week)	159	0.3%	176	0.2%	178	4.6%
Very (28 – 31 weeks)	303	0.6%	348	0.4%	363	9.4%
Moderate to late (32 – 36 weeks)	2830	5.8%	4349	5.5%	3312	86.0%

PARITY OF THE PATURIENTS

	2004		2009		2014	
Para 0	1885	57.3%	2372	48.7%	2156	56.1%
Para 1	1061	32.2%	2015	41.4%	1302	33.9%
Para 2	251	7.6%	372	7.6%	281	7.3%
Para 3 & above	95	2.9%	114	2.3%	105	2.7%

MATERNAL AGE

	2004		2009		2014	
< 20 years	58	1.8%	33	0.7%	12	0.3%
20 - 24 years	299	9.1%	349	7.2%	139	3.6%
25 - 29 years	711	21.6%	912	18.7%	471	12.2%
30 - 34 years	1124	34.1%	1589	32.6%	1124	30.7%
35 - 39 years	793	24.1%	1489	30.6%	1349	35.0%
40 - 44 years	236	7.2%	433	8.9%	575	14.9%
≥ 45	9	0.3%	32	0.7%	90	2.3%
Missing data	62	1.9%	36	0.7%	35	0.9%

ASSOCIATED ANTENATAL COMPLICATIONS

	2004		2009		2014	
Antepartum haemorrhage	343	10.4%	420	8.6%	559	14.5%
<i>Placenta praevia</i>	120	35.0%	168	40.0%	154	4.0%
<i>Placenta abruptio</i>	34	9.9%	40	9.3%	67	1.7%
<i>APH of unknown origin</i>	176	51.3%	204	48.6%	330	8.6%
<i>Other causes</i>	13	3.8%	8	1.9%	8	0.2%
Diabetes mellitus (including IGT)	292	9.9%	504	10.3%	658	17.1%
Hypertension	306	9.3%	442	9.1%	536	14.0%
<i>Mild</i>	92	30.1%	113	25.6%	158	4.1%
<i>Severe</i>	162	52.9%	206	46.6%	255	6.6%
<i>Unclassified</i>	52	17.0%	123	27.8%	123	3.2%
Anaemia	135	4.1%	167	3.4%	158	4.1%
Cardiac diseases	39	1.2%	38	0.8%	41	1.1%
Surgical diseases	23	0.7%	25	0.5%	11	0.3%
Other medical diseases	163	5.0%	214	4.4%	294	7.7%

PRESENTATION AND LIE AT DELIVERY (FOR EACH BABY)

	2004		2009		2014	
Vertex	3002	84.0%	4720	86.6%	3580	83.6%
Breech	505	14.1%	654	12.0%	607	14.2%
Brow	0	0.01%	0	0.0%	0	0.0%
Face	3	0.08%	2	0.04%	1	0.02%
Oblique lie	4	0.1%	4	0.1%	5	0.1%
Transverse lie	41	1.1%	31	0.6%	41	1.0%
Compound	3	0.08%	1	0.02%	5	0.1%
Others	16	0.4%	12	0.2%	8	0.2%

Missing data in 23 (0.5%) in 2014

ONSET OF LABOUR

	2004		2009		2014	
Spontaneous	1893	57.5%	2559	52.5%	1927	50.0%
Induced labour	519	15.8%	630	12.9%	762	19.8%
No labour	880	26.7%	1681	34.5%	1164	30.2%

Missing data on mode of onset of labour in 3 (0.1%) in 2009

STATUS OF AMNIOTIC FLUID DURING LABOUR (FOR EACH BABBY)

	2014	
Clear liquor	3936	92.2%
Meconium stained liquor	183	4.3%
<i>Mild</i>	133	3.1%
<i>Moderate</i>	29	0.7%
<i>Severe</i>	21	0.5%
Blood stained liquor	123	2.9%
No liquor	28	0.7%

MODE OF DELIVERY (FOR EACH BABY)

	2004		2009		2014	
Spontaneous vertex delivery	1697	47.5%	2161	39.6%	1809	42.4%
Vacuum extraction	172	4.8%	190	3.5%	92	2.2%
Forceps delivery	45	1.3%	33	0.6%	66	1.5%
Vaginal breech delivery	66	1.8%	84	1.5%	85	2.0%
LSCS before labour	1009	28.2%	1918	35.2%	1379	32.2%
LSCS after labour	556	15.6%	980	17.8%	775	18.1%
Classical Caesarean section	28	0.8%	53	1.0%	64	1.5%
Others/Unknown	1	0.0%	33	0.6%	0	0.0%

USE OF OXYTOTICS FOR THIRD STAGE OF LABOUR

	2014	
Syntometrine	1247	32.4%
Syntocinon	1885	48.9%
Duratocin	191	5.0%
Nil	530	13.8%

POSTPARTUM COMPLICATIONS

	2004		2009		2014	
Postpartum haemorrhage*	54	1.6%	379	6.8%	157	4.0%
<i>Vaginal delivery (> 500 ml)</i>	41	2.1%	41	1.7%	53	1.4%
<i>Caesarean section (> 1,000 ml)</i>	-	-	95	3.9%	104	2.7%
Blood transfusion	-	-	36	0.7%	70	1.8%
<i>Vaginal delivery</i>	-	-	5	0.2%	26	1.3%
<i>Caesarean section</i>	-	-	30	1.2%	44	2.4%
Episiotomy#	1445	74.7%	1410	58.9%	891	44.9%
<i>Nulliparous</i>	950	50.4%	883	75.0%	845	44.1%
<i>Multiparous</i>	495	35.2%	527	43.4%	46	64.8%
Manual removal of placenta	117	3.6%	113	2.3%	68	1.8%
<i>Vaginal delivery</i>	41	2.1%	43	1.8%	39	2.0%
<i>Caesarean section</i>	76	5.6%	68	2.8%	29	1.6%
Puerperal pyrexia	28	0.9%	46	0.9%	24	0.6%
Breast abscess	1	0.03%	1	0.02%	0	0.0%
Urinary tract infection	10	0.3%	16	0.3%	10	0.3%
Genital tract infection	1	0.03%	12	0.2%	46	1.2%
Wound problem with intervention	15	0.5%	10	0.2%	10	0.3%

* Post-partum haemorrhage was defined as blood loss > 500 ml within 24 hours of delivery before 2014 and > 500 ml following vaginal delivery and > 1,000 ml following Caesarean delivery in 2014.

#Only included vaginal deliveries

Data missing in 27 (0.6%) in 2009

MATERNAL COMPLICATIONS

	2004		2009		2014	
Perineal laceration#	-	-	-	-	652	32.8%
<i>First degree tear</i>	-	-	-	-	503	25.3%
<i>Second degree tear</i>	-	-	-	-	144	7.3%
<i>Third degree tear</i>	0	0.0%	2	0.08%	5	0.3%
<i>Fourth degree tear</i>	-	-	-	-	0	0.0%
Internal iliac artery ligation	0	0.0%	0	0.0%	1	0.03%
Uterine artery embolization	0	0.0%	12	0.2%	2	0.05%
Uterine compression suture	-	-	-	-	12	0.3%
Uterine balloon tamponade	-	-	-	-	14	0.4%
Uterine rupture	0	0.0%	1	0.02%	0	0.0%
Hysterectomy	8	0.2%	16	0.3%	9	0.2%
Maternal collapse	-	-	-	-	1	0.03%
Maternal death	1	0.03%	0	0.0%	0	0.0%

#Only included vaginal deliveries

BIRTH WEIGHT AT DELIVERY

	2004		2009		2014	
< 500 gm	17	0.5%	31	0.6%	11	0.3%
500 - 999 gm	164	4.6%	188	3.4%	189	4.4%
1000 - 1499 gm	245	6.9%	310	5.7%	327	7.7%
1500 - 1999 gm	505	14.1%	715	13.1%	712	16.7%
2000 - 2499 gm	1037	29.0%	1576	28.9%	1377	32.2%
2500 - 2999gm	1132	31.7%	1810	33.2%	1262	29.6%
3000 - 3499 gm	402	11.2%	665	12.2%	294	6.9%
3500 - 3999 gm	56	1.6%	123	2.3%	24	0.6%
≥ 4000 gm and above	11	0.3%	19	0.3%	4	0.09%
Unknown	5	0.1%	15	0.3%	70	1.6%

FETAL OUTCOME

	2004		2009		2014	
Alive at 28 days	3450	96.5%	5288	97.0%	4140	97.0%
Stillbirths	79	2.2%	110	2.0%	87	2.0%
Neonatal deaths	45	1.3%	54	0.9%	43	1.0%

OTHER NEONATAL COMPLICATIONS

	2004		2009		2014	
Low Apgar score at birth						
Apgar score 0-3 at 1 minute	136	3.8%	142	2.6%	163	3.8%
Apgar score 4-6 at 1 minute	404	11.3%	389	7.1%	441	10.3%
Apgar score 0-3 at 5 minutes	80	2.2%	93	1.7%	91	2.1%
Apgar score 4-6 at 5 minutes	46	1.3%	54	1.0%	90	2.1%
Admission to neonatal ICU	1729	48.4%	1956	36.0%	2165	50.7%
Respiratory distress syndrome	17	0.5%	46	0.8%	25	0.6%
Major congenital abnormalities	31	0.9%	39	0.7%	39	0.9%
Major neonatal infection	3	0.08%	7	0.1%	6	0.1%
Congenital infection					0	0.0%
Major infection					6	0.1%
Intraventricular haemorrhage	0	0.0%	10	0.2%	22	0.5%
Necrotising enterocolitis	3	0.08%	5	0.1%	4	0.09%
Birth trauma	8	0.2%	10	0.2%	2	0.05%
Chromosomal abnormality	-	-	-	-	3	0.07%

POST-TERM DELIVERY

The incidence of post-term delivery (≥ 42 completed weeks) decreased from 1.4% in 2004, to 0.26% in 2009 and 0.06% in 2014. The significant drop was related to the widespread practice of performing dating ultrasound scan and induction of labour by 41 weeks. Induction of labour was performed in 41.2% of those post-term cases. The rate of meconium stained liquor was high at 26.5% and no liquor occurred in 5.9%. The rate of caesarean delivery was 35.5% in 2014 which was similar to the overall caesarean section rate. The incidence of birthweight ≥ 4000 gm was also high, occurring in 14.7%. There was no case with low Apgar score or other major neonatal complications, however, the number of post-term cases were very low to draw conclusion.

	2004		2009		2014	
TOTAL PREGNANCIES	673	1.4%	210	0.26%	34	0.06%
<i>Singleton</i>	672	99.9%	209	99.5%	34	100.0%
<i>Twins</i>	1	0.1%	1	0.5%	0	0.0%
<i>Triplets</i>	0	0.0%	0	0.0%	0	0.0%
TOTAL BIRTHS	674		211		34	

PARITY OF THE PATURIENTS

	2004		2009		2014	
Para 0	406	60.3%	108	51.4%	19	55.9%
Para 1	225	33.4%	80	38.1%	8	23.5%
Para 2	29	4.3%	13	6.2%	6	17.6%
Para 3 & above	13	1.9%	9	4.3%	1	2.9%

MATERNAL AGE

	2004		2009		2014	
< 20 years	5	0.7%	1	0.5%	1	2.9%
20 - 24 years	146	21.7%	27	12.9%	5	14.7%
25 - 29 years	248	36.8%	64	30.5%	4	11.8%
30 - 34 years	163	24.2%	68	32.4%	10	29.4%
35 - 39 years	95	14.1%	39	18.6%	9	26.5%
≥ 40 years	15	2.2%	11	5.3%	4	11.8%
Missing data	1	0.1%	0	0.0%	1	2.9%

ASSOCIATED ANTENATAL COMPLICATIONS

	2004		2009		2014	
Antepartum haemorrhage	2	0.3%	0	0.0%	0	0.0%
<i>Placenta praevia</i>	0	0.0%	0	0.0%	0	0.0%
<i>Placenta abruptio</i>	0	0.0%	0	0.0%	0	0.0%
<i>APH of unknown origin</i>	2	0.3%	0	0.0%	0	0.0%
<i>Other causes</i>	0	0.0%	0	0.0%	0	0.0%
Diabetes mellitus (including IGT)	14	2.1%	7	3.3%	2	5.9%
Hypertension	11	1.6%	4	1.9%	0	0.0%
<i>Mild</i>	5	45.5%	3	75.0%	0	0.0%
<i>Severe</i>	2	18.2%	0	0.0%	0	0.0%
<i>Unclassified</i>	4	36.4%	1	25.0%	0	0.0%
Anaemia	25	3.7%	6	2.9%	0	0.0%
Cardiac diseases	3	0.4%	0	0.0%	0	0.0%
Surgical diseases	0	0.0%	0	0.0%	0	0.0%
Other medical diseases	14	2.1%	3	1.4%	3	8.8%

PRESENTATION AND LIE AT DELIVERY

	2004		2009		2014	
Vertex	663	98.4%	208	98.6%	34	100.0%
Breech	11	1.6%	3	1.4%	0	0.0%
Brow	0	0.0%	0	0.0%	0	0.0%
Face	0	0.0%	0	0.0%	0	0.0%
Oblique lie	0	0.0%	0	0.0%	0	0.0%
Transverse lie	0	0.0%	0	0.0%	0	0.0%
Compound	0	0.0%	0	0.0%	0	0.0%
Others	0	0.0%	0	0.0%	0	0.0%

MODE OF ONSET OF LABOUR

	2004		2009		2014	
Spontaneous	402	59.7%	106	50.5%	17	50%
Induced labour	232	34.5%	85	40.5%	14	41.2%
No labour	39	5.8%	19	9.0%	3	8.8%

STATUS OF AMNIOTIC FLUID DURING LABOUR

	2014	
Clear liquor	23	67.6%
Meconium stained liquor	9	26.5%
<i>Mild</i>	7	20.6%
<i>Moderate</i>	1	2.9%
<i>Severe</i>	1	2.9%
Blood stained liquor	0	0.0%
No liquor	2	5.9%

MODE OF DELIVERY

	2004		2009		2014	
Spontaneous vertex delivery	430	63.8%	132	62.6%	22	64.7%
Vacuum extraction	61	9.1%	19	6.0%	0	0.0%
Forceps delivery	7	1.0%	1	0.5%	0	0.0%
Vaginal breech delivery	1	0.1%	0	0.0%	0	0.0%
LSCS before labour	39	5.8%	18	8.5%	3	8.8%
LSCS after labour	135	20.0%	37	17.5%	9	26.5%
Classical Caesarean section	1	0.1%	3	1.4%	0	0.0%
Others/Unknown	0	0.0%	1	0.5%	0	0.0%

USE OF OXYTOTICS FOR THIRD STAGE OF LABOUR

	2014	
Syntometrine	12	35.3%
Syntocinon	17	50.0%
Duratocin	0	0.0%
Nil	5	14.7%

POSTPARTUM COMPLICATIONS

	2004		2009		2014	
Postpartum haemorrhage*	26	3.9%	14	6.6%	0	0.0%
<i>Vaginal delivery (> 500 ml)</i>	23	4.6%	3	2.0%	0	0.0%
<i>Caesarean section (> 1,000 ml)</i>	-	-	3	5.3%	0	0.0%
Blood transfusion	-	-	1	0.5%	1	2.9%
<i>Vaginal delivery</i>	-	-	0	0.0%	1	4.5%
<i>Caesarean section</i>	-	-	1	1.8%	0	0.0%
Episiotomy#	424	85.0%	108	71.1%	9	40.9%
<i>Nulliparous</i>	266	65.5%	65	91.5%	6	60.0%
<i>Multiparous</i>	160	59.9%	43	53.1%	3	25.0%
Manual removal of placenta	19	2.8%	1	0.5%	0	0.0%
<i>Vaginal delivery</i>	11	2.2%	1	0.7%	0	0.0%
<i>Caesarean section</i>	8	4.6%	0	0.0%	0	0.0%
Puerperal pyrexia	4	0.6%	6	2.9%	0	0.0%
Breast abscess	0	0.0%	0	0.0%	0	0.0%
Urinary tract infection	2	0.3%	1	0.5%	0	0.0%
Genital tract infection	1	0.1%	0	0.0%	1	2.9%
Wound problem with intervention	3	0.4%	2	1.0%	0	0.0%

* Post-partum haemorrhage was defined as blood loss > 500 ml within 24 hours of delivery before 2014 and > 500 ml following vaginal delivery and > 1,000 ml following Caesarean delivery in 2014.

#Only included vaginal deliveries

MATERNAL COMPLICATIONS

	2004		2009		2014	
Perineal laceration#	-	-	-	-	4	18.2%
<i>First degree tear</i>	-	-	-	-	4	18.2%
<i>Second degree tear</i>	-	-	-	-	0	0.0%
<i>Third degree tear</i>	0	0.0%	0	0.0%	0	0.0%
<i>Fourth degree tear</i>	-	-	-	-	0	0.0%
Internal iliac artery ligation	0	0.0%	0	0.0%	0	0.0%
Uterine artery embolization	0	0.0%	1	0.5%	0	0.0%
Uterine compression suture	-	-	-	-	0	0.0%
Uterine balloon tamponade	-	-	-	-	0	0.0%
Uterine rupture	0	0.0%	0	0.0%	0	0.0%
Hysterectomy	0	0.0%	0	0.0%	0	0.0%
Maternal collapse	-	-	-	-	0	0.0%
Maternal death	0	0.0%	0	0.0%	0	0.0%

#Only included vaginal deliveries

BIRTH WEIGHT AT DELIVERY

	2004		2009		2014	
< 500 gm	1	0.1%	0	0.0%	0	0.0%
500 - 999 gm	1	0.1%	0	0.0%	0	0.0%
1000 - 1499 gm	0	0.0%	0	0.0%	0	0.0%
1500 - 1999 gm	1	0.1%	0	0.0%	1	2.9%
2000 - 2499 gm	15	2.2%	4	1.9%	2	5.9%
2500 - 2999gm	108	16.0%	32	15.2%	7	20.6%
3000 - 3499 gm	302	44.8%	101	47.9%	12	35.3%
3500 - 3999 gm	182	27.0%	56	26.5%	6	17.6%
≥ 4000 gm	64	9.5%	16	7.6%	5	14.7%

Missing data on birth weight in 2 (0.9%) cases in 2009 and 1 (2.9%) in 2014

FETAL OUTCOME

	2004		2009		2014	
Alive at 28 days	672	99.7%	211	100%	34	100.0%
Stillbirths	1	0.1%	0	0.0%	0	0.0%
Neonatal deaths	1	0.1%	0	0.0%	0	0.0%

OTHER NEONATAL COMPLICATIONS

	2004		2009		2014	
Low Apgar score at birth						
Apgar score <7 at 1 minute	30	4.5%	9	4.3%	0	0.0%
Apgar score <7 at 5 minutes	5	0.7%	2	1.0%	0	0.0%
Admission to neonatal ICU	161	23.9%	47	22.3%	8	23.5%
Major congenital abnormalities	1	0.1%	0	0.0%	0	0.0%
Major infection	1	0.1%	0	0.0%	0	0.0%
Respiratory distress syndrome	0	0.0%	0	0.0%	0	0.0%
Birth trauma	4	0.5%	3	1.4%	0	0.0%

INDUCTION OF LABOUR

Induction of labour was performed in 23.4% of parturients which was higher compared with previous audits (16-18%). Over 99% of the inductions were carried out in singleton pregnancy. Prelabour rupture of membranes remained the most common indication which accounted for 36.8% of the induction cases. Social reason became the second most common indication and the rate significantly increased from 2.5% in 2004 to 12.2% in 2009 and 21.6% in 2014. The number of induction for diabetes mellitus also increased due to the markedly increase in the incidence of diabetes mellitus in 2014. These two probably could account for the increase in the overall incidence of induction of labour. The amniotic fluid was meconium stained in 10.0% and blood stained in 1.2%. Vaginal delivery was achieved in 79.2% which were similar to previous audits. The rate of post-partum haemorrhage was 3.7%, similar to that in 2004 but lower than that in 2009. The rate of uterine rupture and hysterectomy remained very low.

	2004		2009		2014	
TOTAL PREGNANCIES	9025	18.4%	13106	16.4%	13305	23.4%
<i>Singleton</i>	8976	99.5%	13038	99.5%	13217	99.3%
<i>Twins</i>	48	0.5%	68	0.5%	88	0.7%
<i>Triplets</i>	1	0.01%	0	0.0%	0	0.0%
TOTAL BIRTHS	9075		13173		13393	

5 cases of abortus excluded

PARITY OF THE PATURIENTS

	2004		2009		2014	
Para 0	5903	65.4%	7882	60.1%	8971	67.4%
Para 1	2379	26.4%	4178	31.9%	3431	25.8%
Para 2	586	6.5%	841	6.4%	733	5.5%
Para 3 & above	157	1.7%	205	1.6%	170	1.3%

INDICATIONS (each pregnancy might have more than 1 indication)

	2004		2009		2014	
Prelabour rupture of membranes	2796	31.0%	3735	28.5%	4894	36.8%
Social reasons	230	2.5%	1596	12.2%	2873	21.6%
Prolonged pregnancy (≥ 41 weeks)	2160	23.9%	2702	20.6%	1911	14.4%
Diabetes mellitus (including IGT)	426	4.7%	719	5.5%	1238	9.3%
Hypertension	323	3.6%	443	3.4%	618	4.6%
Antepartum haemorrhage	377	4.2%	354	2.7%	552	4.1%
Suboptimal cardiotocography	662	7.3%	602	4.6%	531	4.0%
Suspected IUGR/IUGR	241	2.7%	360	2.7%	341	2.6%
Intra-uterine death	53	0.6%	79	0.6%	74	0.6%
Multiple pregnancy	36	0.4%	44	0.3%	63	0.5%
Maternal disease	38	0.4%	39	0.3%	53	0.4%
Bad obstetric history	51	0.6%	41	0.3%	40	0.3%
Fetal anomaly	20	0.2%	10	0.1%	8	0.1%
Others	1613	17.6%	2749	21.0%	562	4.2%

GESTATION AT DELIVERY

	2004		2009		2014	
< 26 weeks	14	0.2%	13	0.1%	12	0.09%
26 – 28 weeks	17	0.2%	28	0.2%	27	0.2%
29 – 32 weeks	34	0.4%	40	0.3%	38	0.3%
33 – 36 weeks	454	5.0%	549	4.2%	685	5.1%
37 – 41 weeks	8269	91.6%	12364	94.3%	12474	93.8%
≥ 42 weeks	232	2.6%	85	0.6%	14	0.1%
Missing	5	0.06%	27	0.2%	55	0.4%
Total	9025		13106		13305	

STATUS OF AMNIOTIC FLUID DURING LABOUR (FOR EACH BABY)

	2014	
Clear liquor	11774	87.9%
Meconium stained liquor	1339	10.0%
<i>Mild</i>	878	6.6%
<i>Moderate</i>	281	2.1%
<i>Severe</i>	180	1.3%
Blood stained liquor	158	1.2%
No liquor	117	0.9%

MODE OF DELIVERY (FOR EACH BABY)

	2004		2009		2014	
Spontaneous vertex delivery	5441	60.0%	8360	63.6%	8910	66.5%
Vacuum extraction	1220	13.4%	1794	13.6%	1365	10.2%
Forceps delivery	122	1.3%	115	0.9%	276	2.1%
Vaginal breech delivery	22	0.2%	28	0.1%	41	0.3%
LSCS	2268	25.0%	2813	21.4%	2775	20.7%
Classical Caesarean section	2	0.02%	60	0.5%	21	0.2%

Missing data in 3 (0.02%) cases in 2009 and 5 cases of abortus in 2014

USE OF OXYTOTICS FOR THIRD STAGE OF LABOUR

	2014	
Syntometrine	6636	49.9%
Syntocinon	5314	40.0%
Duratocin	438	3.3%
Nil	913	6.9%

POSTPARTUM COMPLICATIONS

	2004		2009		2014	
Postpartum haemorrhage*	349	3.9%	803	6.1%	498	3.7%
<i>Vaginal delivery (> 500 ml)</i>	334	4.9%	325	3.2%	432	3.2%
<i>Caesarean section (> 1,000 ml)</i>	-	-	82	2.9%	66	0.5%
Blood transfusion	-	-	83	0.6%	176	1.3%
<i>Vaginal delivery</i>	-	-	62	0.6%	143	1.4%
<i>Caesarean section</i>	-	-	21	0.7%	33	1.2%
Episiotomy#	5753	85.0%	7666	74.8%	6313	59.9%
<i>Nulliparous</i>	3776	64.0%	4929	89.3%	5071	77.8%
<i>Multiparous</i>	1993	63.8%	2737	57.9%	1244	30.9%
Manual removal of placenta	257	2.8%	224	1.7%	164	1.2%
<i>Vaginal delivery</i>	135	2.0%	148	1.4%	123	1.2%
<i>Caesarean section</i>	122	5.4%	76	2.7%	41	1.5%
Puerperal pyrexia	78	0.9%	168	1.3%	93	0.7%
Breast abscess	2	0.02%	2	0.02%	0	0.0%
Urinary tract infection	32	0.4%	30	0.2%	38	0.3%
Genital tract infection	10	0.1%	26	0.2%	122	0.9%
Wound problem with intervention	38	0.4%	45	0.3%	34	0.3%

* *Post-partum haemorrhage was defined as blood loss > 500 ml within 24 hours of delivery before 2014 and > 500 ml following vaginal delivery and > 1,000 ml following Caesarean delivery in 2014.*

#*Only included vaginal deliveries*

MATERNAL COMPLICATIONS

	2004		2009		2014	
Preterm (<37 weeks)	519	5.8%	630	4.8%	758	5.7%
<i>Singleton</i>	508	5.7%	612	4.7%	730	5.5%
<i>Multiple</i>	11	22.9%	18	26.5%	28	32.2%
Perineal laceration#	-	-	-	-	3477	33.0%
<i>First degree tear</i>	-	-	-	-	2373	22.5%
<i>Second degree tear</i>	-	-	-	-	1060	10.1%
<i>Third degree tear</i>	4	0.06%	19	0.1%	38	0.4%
<i>Fourth degree tear</i>	-	-	-	-	6	0.06%
Internal iliac artery ligation	0	0.0%	0	0.0%	0	0.0%
Uterine artery embolization	0	0.0%	3	0.02%	0	0.0%
Uterine compression suture	-	-	-	-	12	0.1%
Uterine balloon tamponade	-	-	-	-	19	0.1%
Uterine rupture	2	0.02%	0	0.0%	1	0.008%
Hysterectomy	3	0.03%	6	0.05%	3	0.02%
Maternal collapse	-	-	-	-	2	0.02%
Maternal death	1	0.01%	0	0.0%	1	0.008%

#*Only included vaginal deliveries*

FETAL OUTCOME

	2004		2009		2014	
Alive at 28 days	8999	99.2%	13083	99.3%	13303	99.4%
Stillbirths	63	0.7%	86	0.65%	79	0.6%
Neonatal deaths	13	0.1%	4	0.03%	6	0.04%
Low birth weights (< 2500 gm)	558	6.1%	812	6.2%	1010	7.5%
<i>Singleton</i>	521	93.4%	752	92.6%	922	91.3%
<i>Multiple</i>	37	6.6%	60	7.4%	88	8.7%
Macrosomia (> 4000 gm)	481	5.3%	476	3.6%	345	2.6%
Apgar score < 4 at 1 minute	74	0.8%	92	0.7%	90	0.7%
Apgar score < 4 at 5 minutes	54	0.6%	65	0.5%	55	0.4%

AUGMENTATION OF LABOUR

There was a reduction in the rate of augmentation of labour from 22.7% in 2004 and 19.6% in 2009 to 16.4% in 2014. The amniotic fluid was meconium stained in 13.9% and blood stained in 0.7%. Vaginal delivery rate following augmentation of labour remained 87-90%. Post-partum haemorrhage rate remained at 2.2-2.7%. There was no case of uterine rupture or hysterectomy.

	2004		2009		2014	
TOTAL MATERNITIES	11157	22.7%	15618	19.6%	9805	16.4%
<i>Singleton</i>	11128	99.7%	15584	99.8%	9779	99.7%
<i>Twins</i>	29	0.3%	34	0.2%	26	0.3%
<i>Triplets</i>	0	0.0%	0	0.0%	0	0.0%
TOTAL BIRTHS	11186		15652		9831	

PARITY OF THE PATIENTS

	2004		2009		2014	
Para 0	6805	61.0%	8205	52.5%	6141	62.6%
Para 1	3425	30.7%	6008	38.5%	2940	30.0%
Para 2	732	6.6%	1158	7.4%	596	6.1%
Para 3 & above	195	1.7%	247	1.6%	128	1.3%

GESTATION AT DELIVERY

	2004		2009		2014	
< 26 weeks	6	0.05%	8	0.05%	4	0.04%
26 – 28 weeks	14	0.1%	3	0.02%	7	0.07%
29 – 32 weeks	23	0.2%	28	0.2%	16	0.2%
33 – 36 weeks	384	3.5%	475	3.0%	290	3.0%
37 – 41 weeks	10498	94.3%	14955	95.8%	9387	95.7%
≥ 42 weeks	205	1.8%	70	0.4%	6	0.06%
Missing	27	0.2%	79	0.5%	95	1.0%

MODE OF ONSET OF LABOUR

	2004		2009		2014	
Spontaneous	10199	91.4%	13446	86.1%	8556	87.3%
Induced labour	938	8.4%	2074	13.3%	1219	12.4%

20 were reported to have no labour in 2004

Missing data on mode of onset of labour in 1 (0.01%) and 97 (0.6%) were reported to have no labour in 2009

30 (0.3%) were reported to have no labour in 2014

STATUS OF AMNIOTIC FLUID DURING LABOUR (FOR EACH BABY)

	2014	
Clear liquor	8337	84.8%
Meconium stained liquor	1371	13.9%
<i>Mild</i>	776	7.9%
<i>Moderate</i>	395	4.0%
<i>Severe</i>	200	2.0%
Blood stained liquor	65	0.7%
No liquor	58	0.6%

MODE OF DELIVERY FOR EACH BABY

	2004		2009		2014	
Spontaneous vertex delivery	7777	69.5%	10690	68.4%	6936	70.6%
Vacuum extraction	1908	17.1%	3169	20.3%	1727	17.6%
Forceps delivery	119	1.1%	107	0.7%	160	1.6%
Vaginal breech delivery	14	0.1%	7	0.04%	9	0.1%
LSCS before labour	12	0.1%	59	0.4%	8	0.08%
LSCS after labour	1356	12.1%	1574	10.1%	987	10.0%
Classical Caesarean section	-	-	-	-	2	0.02%
<i>2 cases of abortus in 2014</i>						

USE OF OXYTOTICS FOR THIRD STAGE OF LABOUR

	2014	
Syntometrine	4888	49.9%
Syntocinon	2370	24.2%
Duratocin	1619	16.5%
Nil	928	9.5%

POSTPARTUM COMPLICATIONS

	2004		2009		2014	
Postpartum haemorrhage*	302	2.7%	424	2.7%	218	2.2%
<i>Vaginal delivery (> 500 ml)</i>	296	3.0%	267	1.9%	202	2.3%
<i>Caesarean section (> 1,000 ml)</i>	-	-	26	1.6%	16	1.6%
Blood transfusion	-	-	66	0.4%	85	0.9%
<i>Vaginal delivery</i>	-	-	58	0.4%	72	0.8%
<i>Caesarean section</i>	-	-	8	0.5%	13	1.3%
Episiotomy#	8537	76.5%	11488	82.2%	6027	68.4%
<i>Nulliparous</i>	5298	77.9%	6408	92.6%	4605	87.5%
<i>Multiparous</i>	3239	74.4%	5080	72.0%	1422	40.1%
Manual removal of placenta	186	1.7%	221	1.4%	135	1.4%
<i>Vaginal delivery</i>	145	1.5%	179	1.3%	131	1.5%
<i>Caesarean section</i>	41	3.0%	42	2.6%	4	0.4%
Puerperal pyrexia	50	0.4%	77	0.5%	40	0.4%
Breast abscess	5	0.04%	4	0.03%	2	0.02%
Urinary tract infection	19	0.2%	26	0.2%	5	0.05%
Genital tract infection	5	0.04%	7	0.04%	22	0.2%
Wound problem with intervention	30	0.3%	40	0.3%	10	0.1%

* *Post-partum haemorrhage was defined as blood loss > 500 ml within 24 hours of delivery before 2014 and > 500 ml following vaginal delivery and > 1,000 ml following Caesarean delivery in 2014.*

#*Only included vaginal deliveries*

MATERNAL COMPLICATIONS

	2004		2009		2014	
Preterm (<37 weeks)	427	3.8%	514	3.3%	317	3.2%
<i>Singleton</i>	415	3.7%	491	3.2%	301	3.1%
<i>Multiple</i>	12	42.9%	23	67.6%	16	61.5%
Perineal laceration#	-	-	-	-	2489	28.2%
<i>First degree tear</i>	-	-	-	-	2011	22.8%
<i>Second degree tear</i>	-	-	-	-	450	5.1%
<i>Third degree tear</i>	4	0.04%	20	0.14%	27	0.3%
<i>Fourth degree tear</i>	-	-	-	-	1	0.01%
Internal iliac artery ligation	0	0.0%	0	0.0%	0	0.0%
Uterine artery embolization	0	0.0%	4	0.03%	0	0.0%
Uterine compression suture	-	-	-	-	0	0.0%
Uterine balloon tamponade	-	-	-	-	5	0.05%
Uterine rupture	1	0.009%	0	0.0%	0	0.0%
Hysterectomy	2	0.02	6	0.04%	0	0.0%
Maternal collapse	-	-	-	-	1	0.01%
Maternal death	0	0.0%	1	0.01%	0	0.0%

#*Only included vaginal deliveries*

FETAL OUTCOME

	2004		2009		2014	
Alive at 28 days	11165	99.8%	15636	99.9%	9814	99.8%
Stillbirths	17	0.2%	10	0.1%	12	0.1%
Neonatal deaths	4	0.04%	6	0.04%	3	0.03%
Low birth weights (< 2500 gm)	372	3.3%	491	3.1%	359	3.7%
<i>Singleton</i>	348	93.5%	444	90.4%	328	91.4%
<i>Multiple</i>	24	6.5%	47	9.6%	31	8.6%
Macrosomia (> 4000 gm)	409	3.7%	398	2.5%	180	1.8%
Apgar score < 4 at 1 minute	24	0.2%	19	0.1%	18	0.2%
Apgar score < 4 at 5 minutes	10	0.1%	6	0.04%	10	0.1%

EPIDURAL ANALGESIA & ANAESTHESIA

Epidural analgesia/anaesthesia rate during labour or delivery decreased from 8.4% in 2004 to 5.0% in 2009 and increased to 6.6% in 2014. Spontaneous vaginal delivery rate increased from 41.7% in 2004 and 43.4% in 2009 to 51.6% in 2014 while instrumental deliveries rate remained similar. The incidences of hypertension in the group were 7.5% in 2004, 7.2% in 2009 and 9.0% in 2014. The use of epidural for caesarean section after labour decreased from 30.1% in 2004 and 25.2% in 2009 to 21.0% in 2014. Post-partum haemorrhage rate increased from 3.9% in 2004 to 6.9% in 2009, and dropped to 2.9% in 2014.

	2004		2009		2014	
TOTAL PREGNANCIES	4111	8.4%	3962	5.0%	3913	6.6%
<i>Singleton</i>	4055	98.6%	3922	99.0%	3895	99.5%
<i>Twins</i>	56	1.4%	40	1.0%	18	0.5%
<i>Triples</i>	1	0.02%	0	0.0%	0	0.0%
TOTAL BIRTHS	4168		4002		3930	

1 case of abortus was excluded in 2014

PARITY OF THE PATURIENTS

	2004		2009		2014	
Para 0	3318	80.7%	2883	72.8%	2869	73.3%
Para 1	654	15.9%	858	21.7%	859	22.0%
Para 2	112	2.7%	187	4.7%	156	4.0%
Para 3 & above	27	0.7%	34	0.9%	29	0.7%

ANTENATAL COMPLICATIONS

	2004		2009		2014	
Diabetes mellitus (including IGT)	391	9.5%	351	8.9%	443	11.3%
Hypertension	307	7.5%	287	7.2%	354	9.0%
Anaemia	177	4.3%	139	3.5%	135	3.5%
Antepartum haemorrhage	116	2.8%	60	1.5%	60	1.5%
Cardiac diseases	44	1.1%	45	1.1%	33	0.8%
Other medical/surgical complications	761	18.5%	202	5.1%	248	6.3%
Previous Caesarean section	140	3.4%	214	5.4%	93	2.4%

GESTATION AT DELIVERY

	2004		2009		2014	
< 26 weeks	4	0.1%	3	0.08%	1	0.03%
26 – 28 weeks	6	0.1%	2	0.05%	1	0.03%
29 – 32 weeks	21	0.5%	9	0.2%	5	0.1%
33 – 36 weeks	199	4.8%	161	4.1%	174	4.4%
37 – 41 weeks	3820	92.9%	3723	94.0%	3646	93.2%
≥ 42 weeks	51	1.2%	17	0.4%	3	0.08%
Missing	10	0.2%	47	1.2%	83	2.1%
Total	4111		3915		3913	

MODE OF ONSET OF LABOUR

	2004		2009		2014	
Spontaneous	1909	46.4%	1905	48.1%	2099	53.6%
Induced labour	2131	51.8%	1867	47.1%	1793	45.8%
No labour	71	1.7%	190	4.8%	21	0.5%

STATUS OF AMNIOTIC FLUID DURING LABOUR

	2014	
Clear liquor	3400	86.5%
Meconium stained liquor	480	12.3%
<i>Mild</i>	226	5.8%
<i>Moderate</i>	162	4.1%
<i>Severe</i>	93	2.4%
Blood stained liquor	36	0.9%
No liquor	13	0.3%

MODE OF DELIVERY FOR EACH BABY

	2004		2009		2014	
Spontaneous vertex delivery	1738	41.7%	1738	43.4%	2027	51.6%
Vacuum extraction	958	23.0%	913	22.8%	917	23.3%
Forceps delivery	131	3.1%	120	3.0%	138	3.5%
Vaginal breech delivery	15	0.4%	10	0.2%	2	0.1%
LSCS before labour	72	1.7%	183	4.6%	16	0.4%
LSCS after labour	1254	30.1%	1009	25.2%	826	21.1%
Classical Caesarean section	0	0.0%	29	0.7%	4	0.1%

USE OF OXYTOTICS FOR THIRD STAGE OF LABOUR

	2014	
Syntometrine	954	24.4%
Syntocinon	1591	40.7%
Duratocin	845	21.6%
Nil	523	13.4%

POSTPARTUM COMPLICATIONS

	2004		2009		2014	
Postpartum haemorrhage*	162	3.9%	272	6.9%	114	2.9%
<i>Vaginal delivery (> 500 ml)</i>	150	5.3%	82	3.0%	95	3.1%
<i>Caesarean section (> 1,000 ml)</i>	-	-	27	2.2%	19	2.3%
Blood transfusion	-	-	15	0.4%	45	1.2%
<i>Vaginal delivery</i>	-	-	14	0.5%	35	1.1%
<i>Caesarean section</i>	-	-	1	0.08%	10	1.2%
Episiotomy#	2450	87.3%	2045	74.3%	2010	65.4%
<i>Nulliparous</i>	2028	61.1%	1616	85.5%	1634	77.7%
<i>Multiparous</i>	435	54.9%	429	49.7%	376	38.7%
Manual removal of placenta	175	4.3%	102	2.6%	48	1.2%
<i>Vaginal delivery</i>	63	2.2%	55	2.0%	42	1.4%
<i>Caesarean section</i>	112	8.6%	47	3.9%	6	0.7%
Puerperal pyrexia	58	1.4%	72	1.8%	34	0.9%
Breast abscess	1	0.02%	1	0.03%	0	0.0%
Urinary tract infection	21	0.5%	5	0.1%	8	0.2%
Genital tract infection	7	0.2%	6	0.2%	4	0.1%
Wound problem with intervention	26	0.6%	20	0.5%	12	0.3%

* *Post-partum haemorrhage was defined as blood loss > 500 ml within 24 hours of delivery before 2014 and > 500 ml following vaginal delivery and > 1,000 ml following Caesarean delivery in 2014.*

Only included vaginal deliveries

MATERNAL COMPLICATIONS

	2004		2009		2014	
Preterm (<37 weeks)	230	5.6%	175	4.4%	181	4.6%
<i>Singleton</i>	207	5.1%	156	4.0%	174	4.5%
<i>Multiple</i>	23	41.8%	19	47.5%	7	38.9%
Perineal laceration#	-	-	-	-	857	27.9%
<i>First degree tear</i>	-	-	-	-	555	18.0%
<i>Second degree tear</i>	-	-	-	-	292	9.5%
<i>Third degree tear</i>	3	0.1%	5	0.1%	10	0.3%
<i>Fourth degree tear</i>	-	-	-	-	2	0.07%
Internal iliac artery ligation	0	0.0%	0	0.0%	0	0.0%
Uterine artery embolization	0	0.0%	0	0.0%	0	0.0%
Uterine compression suture	-	-	-	-	2	0.05%
Uterine balloon tamponade	-	-	-	-	3	0.07%
Uterine rupture	2	0.05%	1	0.03%	0	0.0%
Hysterectomy	1	0.02%	1	0.03%	0	0.0%
Maternal collapse	-	-	-	-	0	0.0%
Maternal death	0	0.0%	0	0.0%	0	0.0%

Only included vaginal deliveries

FETAL OUTCOME

	2004		2009		2014	
Alive at 28 days	4147	99.5%	3994	99.8%	3919	99.7%
Stillbirths	15	0.4%	6	0.1%	8	0.2%
Neonatal deaths	6	0.1%	2	0.05%	3	0.1%
Low birth weights (<2500 gm)	251	6.0%	211	5.3%	194	4.9%
<i>Singleton</i>	193	76.9%	167	79.1%	179	92.3%
<i>Multiple</i>	58	23.1%	44	20.9%	15	7.7%
Macrosomia (>4000 gm)	198	4.8%	145	3.6%	94	2.4%
Apgar score < 4 at 1 minute	26	0.6%	12	0.3%	17	0.4%
Apgar score < 4 at 5 minutes	13	0.3%	4	0.1%	5	0.1%

DURATION OF LABOUR

The mean duration of labour in 2014 was 4.95 hours (SD 4.1 hrs) compared to 4.8 hours and 5.6 hours in 2009 and 2004. The proportion of labour lasting longer than 12 hours was 4.2% which varied slightly in previous audits (5.5% in 2004; 3.4% in 2009), while the caesarean section rate in this group remained similar with the rate of 21-24%.

The mean duration of labour was similar in those undergoing induction (4.9 ± 4.4 hrs) and those with spontaneous labour (5.0 ± 4.0 hrs). Nulliparous women (6.1 ± 4.6 hrs) had a longer duration of labour than multiparous women (3.5 ± 2.8). Parturients having epidural analgesia also had a longer duration of labour (7.4 ± 4.8 hrs).

DISTRIBUTION OF DURATION OF LABOUR BY MODE OF LABOUR ONSET (in hours)

Hours	Spontaneous labour		Induced labour		Total	
	N	%	N	%	N	%
Missing	4634	14.2%	285	2.1%	4919	10.7%
0	1063	3.3%	1513	11.4%	2576	5.6%
1	2778	8.5%	1288	9.7%	4066	8.8%
2	4374	13.4%	1725	13.0%	6099	13.3%
3	4134	12.6%	1579	11.9%	5713	12.4%
4	3506	10.7%	1409	10.6%	4915	10.7%
5	2558	7.8%	1019	7.7%	3577	7.8%
6	2396	7.3%	934	7.0%	3330	7.2%
7	1535	4.7%	677	5.1%	2212	4.8%
8	1483	4.5%	666	5.0%	2149	4.7%
9	954	2.9%	503	3.8%	1457	3.2%
10	872	2.7%	422	3.2%	1294	2.8%
11	574	1.8%	276	2.1%	850	1.8%
12	490	1.5%	261	2.0%	751	1.6%
13-24	1280	3.9%	728	5.5%	2008	4.4%
> 24	57	0.2%	20	0.2%	77	0.2%
Total	32688		13305		45993	

DISTRIBUTION OF DURATION OF LABOUR BY PARITY (in hours)

Hours	Para 0		Para 1		Para2+		Total	
Missing	7341	22.1%	3961	18.2%	675	14.1%	11977	20.1%
0	4311	13.0%	3943	18.6%	846	17.6%	9100	15.2%
1	902	2.7%	2418	11.1%	754	15.7%	4074	6.8%
2	2024	6.1%	3277	15.0%	814	16.9%	6115	10.3%
3	2491	7.5%	2652	12.2%	580	12.1%	5723	9.6%
4	2639	8.0%	1857	8.5%	425	8.8%	4921	8.3%
5	2197	6.6%	1149	5.2%	234	4.9%	3580	6.0%
6	2261	6.8%	882	4.0%	194	4.0%	3337	5.6%
7	1652	5.0%	464	2.1%	99	2.1%	2215	3.7%
8	1672	5.0%	409	1.9%	71	1.5%	2152	3.6%
9	1214	3.7%	208	0.9%	36	0.7%	1458	2.4%
10	1113	3.4%	160	0.7%	21	0.4%	1294	2.2%
11	742	2.2%	89	0.4%	19	0.4%	850	1.4%
12	670	2.0%	73	0.3%	10	0.2%	753	1.3%
13-24	1832	5.5%	154	0.7%	26	0.5%	2012	3.4%
> 24	64	0.2%	13	0.1%	0	0.0%	77	0.1%
Total	33125		21709		4804		59638	

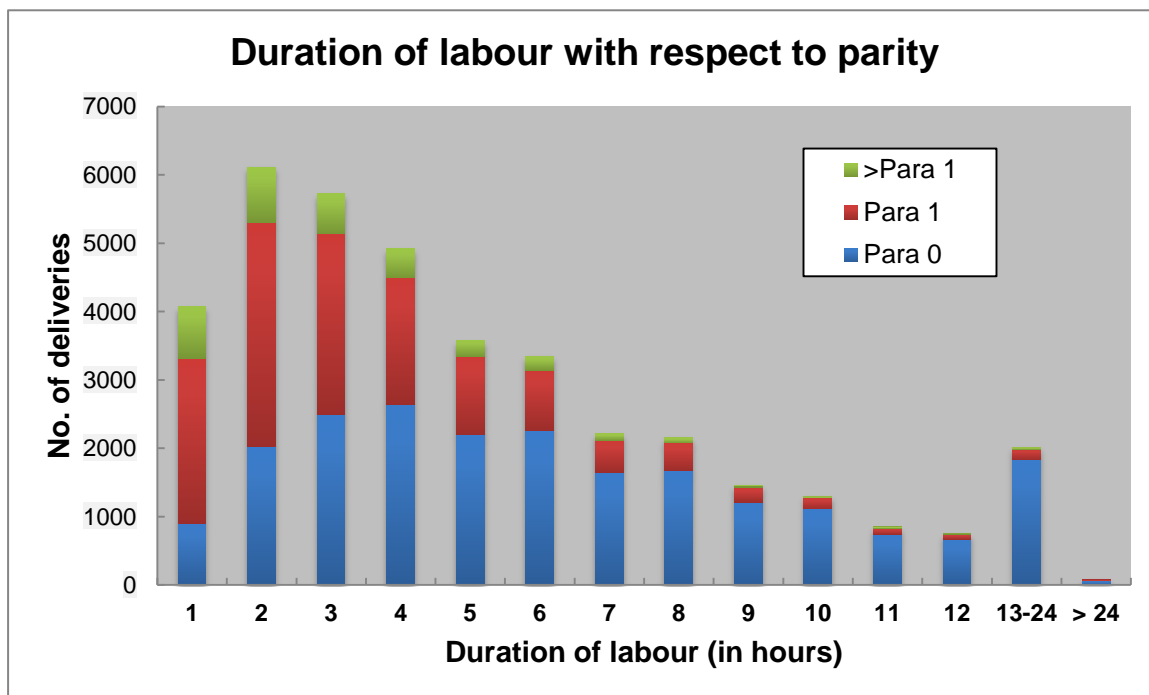


Figure O5 – Duration of labour with respect to parity

MEAN DURATION OF LABOUR (in hours)

	2004		2009		2014	
	N	Mean±SD	N	Mean±SD	N	Mean±SD
All parturients*	36712	5.6±3.8	49326	4.8±3.6	47661	4.3±4.2
Effect of onset of labour						
Spontaneous	28869	5.5±3.8	36826	4.8±3.4	28054	5.0±4.0
Induced	7843	5.8±4.0	12500	4.7±3.9	13020	4.9±4.4
Effect of parity						
Para 0	20473	6.8±4.1	25341	5.9±4.0	25784	5.5±4.7
Para 1	12811	4.0±2.8	19405	3.6±2.5	17748	2.9±2.9
Para 2 & above	3428	3.6±2.5	4580	3.3±2.3	4129	2.6±2.5
Epidural analgesia						
Yes	3420	9.2±5.0	3511	7.8±5.4	3575	7.3±4.8
No					44086	4.0±4.0

*Those parturients with no information on duration of labour were excluded

PARTURIENTS WITH DURATION OF LABOUR OVER 12 HOURS

	2004		2009		2014	
Incidence						
of all pregnancies	2018	4.1%	1853	2.3%	2089	3.5%
actually in labour	2018	5.5%	1853	3.4%	2085	4.5%
Parity						
Nulliparous	1810	6.6%	1648	6.0%	1896	5.7%
Multiparous	212	1.0%	208	0.8%	193	0.7%
Mode of onset of labour						
Spontaneous labour	1529	4.9%	1290	3.5%	1337	4.1%
Induced labour	489	5.4%	563	4.5%	748	5.6%
Mode of delivery (for the first baby)						
Spontaneous vertex delivery	954	3.3%	840	2.3%	1051	3.3%
Vacuum extraction	532	11.1%	526	7.8%	514	11.8%
Forceps delivery	62	13.6%	49	13.6%	77	11.6%
Vaginal breech delivery	2	2.5%	4	5.1%	5	4.7%
Caesarean section	468	3.2%	437	3.7%	442	1.9%

SPONTANEOUS VERTEX DELIVERY

Spontaneous vertex delivery rate decreased from 58.3% of all deliveries in 2004 to 47.5% in 2009 and increased back to 53.5% in 2014. The proportion of spontaneous vertex delivery from nulliparous women remained in the range of 44% - 50%. The amniotic fluid was meconium stained in 10.2% and blood stained in 0.9%. The rate of episiotomy performed dropped significantly from 81.0% in 2004 to 66.2% in 2009, and further down to 47.4% in 2014, of which 73.0% were nulliparous women, compared to 55-57% in previous audits. However, there was a concurrent increase in major perineal tear from 0.04% in 2004 to 0.1% in 2009 and 0.3% in 2014, though the absolute percentage was small. The stillbirth rate and neonatal mortality rate were comparable over the 10 years period.

	2004		2009		2014	
TOTAL PREGNANCIES	28839		38325		32278	
<i>Singleton</i>	28743	99.5%	38916	99.4%	32177	99.7%
<i>Multiple</i>	155	0.5%	222	0.6%	101	0.3%
TOTAL BIRTHS	28898	58.2%	38418	47.5%	32344	53.5%

BIRTH ORDER FOR THOSE BABIES FROM MULTIPLE PREGNANCY

	2004		2009		2014	
Twins	100		141		167	
<i>First baby</i>	94	94.0%	128	90.8%	101	60.4%
<i>Second baby</i>	56	56.0%	92	65.2%	66	39.6%
Triplets	2		1		0	
<i>First baby</i>	2	100%	1	100%	-	-
<i>Second baby</i>	2	100%	0	0%	-	-
<i>Third baby</i>	1	50%	1	100%	-	-

PARITY OF THE PATURIENTS

	2004		2009		2014	
Para 0	14231	49.3%	16881	44.0%	16074	49.8%
Para 1	11411	39.6%	17187	44.8%	12950	40.1%
Para 2	2515	8.7%	3482	9.1%	2621	8.1%
Para 3 & above	682	2.4%	775	2.0%	633	2.0%

GESTATION AT DELIVERY

	2004		2009		2014	
< 26 weeks	43	0.1%	49	0.1%	28	0.09%
26 – 28 weeks	65	0.2%	58	0.2%	79	0.2%
29 – 32 weeks	165	0.6%	190	0.5%	199	0.6%
33 – 36 weeks	1403	4.9%	1815	4.7%	1464	4.5%
37 – 41 weeks	26626	92.7%	35835	93.5%	30132	93.4%
≥ 42 weeks	430	1.5%	132	0.3%	22	0.07%
Total	28732		38325		31925	

Missing data in 107 (0.4%) cases in 2004, 246 (0.6%) in 2009 and 354 (1.1%) in 2014

MODE OF ONSET OF LABOUR

	2004		2009		2014	
Spontaneous	23326	80.9%	29488	76.9%	23226	72.0%
Induced labour	5419	18.8%	8335	21.8%	8881	27.5%
Inconsistent or missing information	94	0.3%	499	1.3%	171	0.5%

Missing data in 2009 in 3 (0.008%)

STATUS OF AMNIOTIC FLUID DURING LABOUR (FOR EACH BABY)

	2014	
Clear liquor	28584	88.4%
Meconium stained liquor	3300	10.2%
<i>Mild</i>	2300	7.1%
<i>Moderate</i>	705	2.2%
<i>Severe</i>	295	0.9%
Blood stained liquor	288	0.9%
No liquor	172	0.5%

USE OF OXYTOTICS FOR THIRD STAGE OF LABOUR

	2014	
Syntometrine	21668	67.1%
Syntocinon	6293	19.5%
Duratocin	1469	4.6%
Nil	2848	8.8%

POSTPARTUM COMPLICATIONS

	2004		2009		2014	
Postpartum haemorrhage*	952	3.3%	801	2.1%	850	2.6%
Blood transfusion	-	-	141	0.4%	282	0.9%
Episiotomy	23372	81.0%	25357	66.2%	15312	47.4%
<i>Nulliparous</i>	13270	93.2%	13993	82.9%	11176	69.5%
<i>Multiparous</i>	10102	69.2%	11364	53.0%	4136	25.5%
Manual removal of placenta	402	1.4%	432	1.1%	328	1.0%
Puerperal pyrexia	102	0.4%	124	0.3%	99	0.3%
Breast abscess	11	0.04%	7	0.02%	2	0.006%
Urinary tract infection	68	0.2%	64	0.2%	40	0.1%
Genital tract infection	30	0.1%	72	0.2%	155	0.5%
Wound problem with intervention	62	0.2%	58	0.2%	31	0.1%

* *Post-partum haemorrhage was defined as blood loss > 500 ml within 24 hours of delivery before 2014 and > 500 ml following vaginal delivery and > 1,000 ml following Caesarean delivery in 2014.*

MATERNAL COMPLICATIONS

	2004		2009		2014	
Preterm (<37 weeks)	1676	5.8%	2112	5.5%	1770	5.5%
<i>Singleton</i>	1629	5.7%	2046	5.4%	1709	5.3%
<i>Multiple</i>	47	52.8%	66	52.0%	61	60.4%
Perineal laceration	-	-	-	-	12949	40.1%
<i>First degree tear</i>	-	-	-	-	9482	29.4%
<i>Second degree tear</i>	-	-	-	-	3378	10.5%
<i>Third degree tear</i>	11	0.04%	34	0.09%	81	0.3%
<i>Fourth degree tear</i>	-	-	-	-	8	0.02%
Internal iliac artery ligation	0	0.0%	0	0.0%	0	0.0%
Uterine artery embolization	0	0.0%	5	0.01%	0	0.0%
Uterine compression suture	-	-	-	-	1	0.003%
Uterine balloon tamponade	-	-	-	-	21	0.07%
Uterine rupture	0	0.0%	0	0.0%	0	0.0%
Hysterectomy	3	0.01%	4	0.01%	1	0.003%
Maternal collapse	-	-	-	-	4	0.01%
Maternal death	1	0.003%	0	0.0%	0	0.0%

Missing data in Preterm (<37 weeks) was 354 (1.1%) in 2014

FETAL OUTCOME

	2004		2009		2014	
Alive at 28 days	28800	99.7%	38281	99.6%	32238	99.7%
Stillbirths	74	0.3%	100	0.3%	89	0.3%
Neonatal deaths	24	0.08%	37	0.1%	17	0.05%
Low birth weights (<2500 gm)	1454	5.0%	1969	5.1%	1925	6.0%
<i>Singleton</i>	1369	94.2%	1836	93.2%	1810	94.0%
<i>Multiple</i>	85	5.8%	133	6.8%	115	6.0%
Macrosomia (>4000 gm)	840	2.9%	861	2.2%	526	1.6%
Apgar score < 4 at 1 minute	89	0.3%	96	0.2%	104	0.3%
Apgar score < 4 at 5 minutes	63	0.2%	83	0.2%	79	0.2%
Birth trauma	110	0.4%	125	0.3%	41	0.1%

Missing data in birthweight in 411 (1.3%) in 2014

VACUUM EXTRACTION

Of all the deliveries, the rate of vacuum extraction decreased from 9.7% in 2004 and 9.1% in 2009 to 7.2% in 2014. Majority (82.1%) of vacuum extraction were performed for nulliparous women. Prolonged second stage remained the most common indication followed by fetal distress, which accounted for 35.2% and 33.2% cases respectively. The amniotic fluid was meconium stained in 13.5%, which was higher than that in spontaneous vertex delivery (10.2%), and blood stained in 0.9%. Episiotomy was performed in 86% of cases and the rate of major perineal tear increased from 0.1% in 2004 and 0.4% in 2009 to 0.7% in 2014 which was 2-folds higher than spontaneous vertex delivery (0.7% vs 0.3%). Post-partum haemorrhage rate was also higher than in spontaneous vertex delivery (4.1% vs 2.6%)

	2004		2009		2014	
TOTAL PREGNANCIES	4808		7324		4341	
<i>Singleton</i>	4795	99.4%	7310	99.7%	4327	99.5%
<i>Multiple</i>	28	0.6%	25	0.3%	14	0.5%
TOTAL BIRTHS	4823	9.7%	7335	9.1%	4349	7.2%

BIRTH ORDER FOR THOSE BABIES FROM MULTIPLE PREGNANCY

	2004		2009		2014	
Twins	20		19		22	
<i>First baby</i>	13	65.0%	14	73.7%	14	63.3%
<i>Second baby</i>	15	75.0%	11	78.6%	8	36.4%

PARITY OF THE PATURIENTS

	2004		2009		2014	
Para 0	3765	78.3%	5121	69.9%	3567	82.2%
Para 1	897	18.7%	1935	26.4%	699	16.1%
Para 2	117	2.4%	228	3.1%	67	1.5%
Para 3 & above	29	0.6%	40	0.5%	8	0.2%

GESTATION AT DELIVERY

	2004		2009		2014	
< 26 weeks	0	0.0%	0	0.0%	0	0.0%
26 – 28 weeks	0	0.0%	0	0.0%	0	0.0%
29 – 32 weeks	3	0.06%	3	0.04%	4	0.09%
33 – 36 weeks	164	3.4%	185	2.5%	86	2.0%
37 – 41 weeks	4575	95.2%	7096	96.9%	4234	97.9%
≥ 42 weeks	61	1.3%	19	0.3%	0	0.0%
Total	4803		7303		4324	

Missing data in 5 (0.1%) cases in 2004, 21 (0.3%) in 2009 and 17 (0.4%) in 2014

MODE OF ONSET OF LABOUR

	2004		2009		2014	
Spontaneous	3596	74.6%	5497	75.1%	2968	68.4%
Induced labour	1220	25.3%	1788	24.4%	1360	31.3%
Inconsistent or missing information	7	0.1%	40	0.5%	13	0.3%

Missing date in 2009 in 1 (0.01%)

STATUS OF AMNIOTIC FLUID DURING LABOUR (FOR EACH BABY)

	2014	
Clear liquor	3707	85.2%
Meconium stained liquor	589	13.5%
<i>Mild</i>	334	7.7%
<i>Moderate</i>	184	4.2%
<i>Severe</i>	71	1.6%
Blood stained liquor	40	0.9%
No liquor	13	0.3%

INDICATIONS FOR VACUUM EXTRACTION (Each baby might have more than 1 indication)

	2004		2009		2014	
Prolonged second stage	1642	34.0%	1869	25.5%	1532	35.2%
Fetal distress	1332	27.6%	1725	23.5%	1445	33.2%
Maternal distress	847	17.6%	1744	23.8%	519	11.9%
Meconium stained liquor	-	-	-	-	296	6.8%
Maternal disease	86	1.8%	110	1.5%	49	1.1%
Previous uterine scar	36	0.7%	39	0.5%	12	0.3%
Obstetric complications	11	0.2%	18	0.2%	7	0.2%
Cord prolapse	2	0.0%	2	0.03%	1	0.02%
Others	784	16.3%	1803	24.6%	646	14.9%

Missing data on indications for vacuum extraction in 298 (6.2%) in 2004, 426 (5.8%) in 2009 and 168 (3.6%) in 2014.

USE OF OXYTOTICS FOR THIRD STAGE OF LABOUR

	2014	
Syntometrine	1926	44.4%
Syntocinon	1126	25.9%
Duratocin	684	15.8%
Nil	605	13.9%

POSTPARTUM COMPLICATIONS

	2004		2009		2014	
Postpartum haemorrhage*	222	4.6%	190	2.6%	176	4.1%
Blood transfusion	-	-	48	0.7%	63	1.5%
Episiotomy	4260	88.6%	5964	81.4%	3735	86.0%
<i>Nulliparous</i>	3380	89.8%	4409	86.1%	3126	87.6%
<i>Multiparous</i>	880	84.4%	1555	70.6%	609	78.7%
Manual removal of placenta	69	1.4%	73	1.0%	63	1.5%
Puerperal pyrexia	31	0.6%	27	0.4%	19	0.4%
Breast abscess	1	0.02%	0	0.0%	0	0.0%
Urinary tract infection	21	0.4%	15	0.2%	19	0.4%
Genital tract infection	4	0.08%	6	0.1%	21	0.5%
Wound problem with intervention	28	0.6%	41	0.6%	18	0.4%

* *Post-partum haemorrhage was defined as blood loss > 500 ml within 24 hours of delivery before 2014 and > 500 ml following vaginal delivery and > 1,000 ml following Caesarean delivery in 2014.*

MATERNAL COMPLICATIONS

	2004		2009		2014	
Preterm (<37 weeks)	167	3.5%	188	2.6%	90	2.1%
<i>Singleton</i>	164	3.4%	182	2.5%	87	2.1%
<i>Multiple</i>	3	23.1%	6	42.9%	3	21.4%
Perineal laceration	-	-	-	-	491	11.3%
<i>First degree tear</i>	-	-	-	-	251	5.8%
<i>Second degree tear</i>	-	-	-	-	208	4.8%
<i>Third degree tear</i>	3	0.06%	29	0.4%	26	0.6%
<i>Fourth degree tear</i>	-	-	-	-	6	0.1%
Internal iliac artery ligation	0	0.0%	0	0.0%	0	0.0%
Uterine artery embolization	0	0.0%	3	0.04%	0	0.0%
Uterine compression suture	-	-	-	-	1	0.02%
Uterine balloon tamponade	-	-	-	-	1	0.02%
Uterine rupture	1	0.02%	0	0.0%	0	0.0%
Hysterectomy	0	0.0%	1	0.01%	1	0.02%
Maternal collapse	-	-	-	-	1	0.02%
Maternal death	0	0.0%	0	0.0%	0	0.0%

Missing data in in gestation in 17 (0.4%) cases in 2014

FETAL OUTCOME

	2004		2009		2014	
Alive at 28 days	4820	99.9%	7333	99.97%	4348	99.98%
Stillbirths	1	0.02%	1	0.01%	1	0.02%
Neonatal deaths	2	0.04%	1	0.01%	0	0.0%
Low birthweights (<2500 gm)	122	2.5%	193	2.6%	147	3.4%
<i>Singleton</i>	114	93.4%	183	94.8%	138	93.9%
<i>Multiple</i>	8	6.6%	10	5.2%	9	6.1%
Macrosomia (>4000 gm)	123	2.6%	173	2.4%	68	1.6%
Apgar score < 4 at 1 minute	24	0.5%	19	0.3%	25	0.6%
Apgar score < 4 at 5 minutes	4	0.1%	3	0.04%	7	0.2%
Birth trauma	58	1.2%	64	0.9%	20	0.5%

Missing data in in birthweight in 297 (0.7%) cases in 2014

FORCEPS DELIVERY

For instrumental delivery, forceps was still performed far less common than vacuum extraction. It accounted for only 1.1% for all deliveries, which was doubled that in 2009 but similar to that in 2004. This could be related to the reinforcement and strengthening of training in forceps deliveries by the College in recent years. Similar to vacuum extraction, the commonest indications were prolonged second stage and fetal distress. The amniotic fluid was meconium stained in 18.0% and blood stained in 2.5%, both were higher than that in vacuum extraction (13.5% and 0.9% respectively). Major perineal tear was much higher in forceps deliveries (3.3%) than vacuum extractions (0.7%) or spontaneous vertex deliveries (0.3%), and the rate had increased 8.3 folds compared with 2004. Postpartum haemorrhage rate (7.0%) was also higher than that in vacuum extraction (4.1%) or spontaneous vertex delivery (2.6%). There was 1 associated maternal death in 2014.

	2004		2009		2014	
TOTAL PREGNANCIES	456		367		664	
<i>Singleton</i>	447	96.1%	357	95.7%	657	98.9%
<i>Multiple</i>	18	3.9%	16	4.3%	7	1.1%
TOTAL BIRTHS	465	0.9%	373	0.5%	670	1.1%

BIRTH ORDER FOR THOSE BABIES FROM MULTIPLE PREGNANCY

	2004		2009		2014	
Twins	13		14		13	
<i>First baby</i>	9	69.2%	10	71.4%	7	53.8%
<i>Second baby</i>	9	69.2%	6	42.9%	6	46.2%

PARITY OF THE PATURIENTS

	2004		2009		2014	
Para 0	384	82.6%	282	76.8%	563	84.8%
Para 1	71	15.3%	76	20.7%	90	13.6%
Para 2	8	1.7%	8	2.2%	10	1.5%
Para 3 & above	2	0.4%	1	0.3%	1	0.2%

GESTATION AT DELIVERY

	2004		2009		2014	
< 26 weeks	0	0.0%	0	0.0%	0	0.0%
26 – 28 weeks	1	0.2%	0	0.0%	1	0.2%
29 – 32 weeks	3	0.7%	3	0.8%	7	1.1%
33 – 36 weeks	34	7.5%	26	7.1%	52	7.8%
37 – 41 weeks	410	90.1%	336	91.6%	604	91.0%
≥ 42 weeks	7	1.5%	1	0.3%	0	0.0%
Total	455		367		664	

Missing data in 1 (0.2%) case in 2004, 1 (0.3%) in 2009

MODE OF ONSET OF LABOUR

	2004		2009		2014	
Spontaneous	341	73.4%	253	68.9%	392	59.0%
Induced labour	122	26.2%	112	30.5%	272	41.0%
No information	2	0.4%	2	0.5%	0	0.0%

STATUS OF AMNIOTIC FLUID DURING LABOUR (FOR EACH BABY)

	2014	
Clear liquor	529	79.0%
Meconium stained liquor	121	18.0%
<i>Mild</i>	84	12.5%
<i>Moderate</i>	17	2.5%
<i>Severe</i>	20	3.0%
Blood stained liquor	17	2.5%
No liquor	3	0.4%

INDICATIONS FOR FORCEPS DELIVERY (For each baby) (may be more than 1)

	2004		2009		2014	
Prolonged second stage	172	37.0%	145	38.9%	273	41.11%
Fetal distress	171	36.8%	117	31.4%	286	43.1%
Meconium stained liquor	-	-	-	-	82	12.3%
Maternal distress	39	8.4%	12	3.2%	11	1.7%
Maternal disease	8	1.7%	6	1.6%	9	1.3%
Obstetric complications	2	0.4%	2	0.5%	4	0.6%
Previous uterine scar	1	0.2%	4	1.1%	3	0.4%
Cord prolapse	2	0.4%	1	0.3%	3	0.4%
Others	41	8.8%	84	22.5%	82	12.3

Missing data on indications for forceps delivery in 22 (5.9%) in 2009 and 4 (0.6%) in 2014

USE OF OXYTOTICS FOR THIRD STAGE OF LABOUR

	2014	
Syntometrine	339	51.1%
Syntocinon	283	42.6%
Duratocin	13	2.0%
Nil	29	4.4%

POSTPARTUM COMPLICATIONS

	2004		2009		2014	
Postpartum haemorrhage*	23	5.0%	16	4.4%	46	6.9%
Blood transfusion	-	-	7	1.9%	15	2.3%
Episiotomy	410	89.9%	341	92.9%	638	96.1%
<i>Nulliparous</i>	344	91.5%	262	92.9%	543	96.4%
<i>Multiparous</i>	66	82.5%	79	92.9%	95	94.1%
Manual removal of placenta	5	1.1%	5	1.4%	4	0.6%
Puerperal pyrexia	3	0.7%	3	0.8%	7	1.1%
Breast abscess	0	0.0%	0	0.0%	1	0.2%
Urinary tract infection	6	1.3%	3	0.8%	4	0.6%
Genital tract infection	0	0.0%	0	0.0%	0	0.0%
Wound problem with intervention	4	0.9%	2	0.5	10	1.5%

* Post-partum haemorrhage was defined as blood loss > 500 ml within 24 hours of delivery before 2014 and > 500 ml following vaginal delivery and > 1,000 ml following Caesarean delivery in 2014.

MATERNAL COMPLICATIONS

	2004		2009		2014	
Preterm (<37 weeks)	38	8.3%	29	7.9%	60	9.0%
<i>Singleton</i>	34	7.6%	21	5.9%	56	8.5%
<i>Multiple</i>	4	44.4%	8	80.0%	4	57.1%
Perineal laceration	-	-	-	-	110	16.6%
<i>First degree tear</i>	-	-	-	-	33	5.0%
<i>Second degree tear</i>	2	0.4%	4	1.1%	55	8.3%
<i>Third degree tear</i>	-	-	-	-	18	2.7%
<i>Fourth degree tear</i>	-	-	-	-	4	0.6%
Internal iliac artery ligation	0	0.0%	0	0.0%	0	0.0%
Uterine artery embolization	0	0.0%	0	0.0%	0	0.0%
Uterine compression suture	-	-	-	-	0	0.0%
Uterine balloon tamponade	-	-	-	-	3	0.5%
Uterine rupture	0	0.0%	0	0.0%	0	0.0%
Hysterectomy	0	0.0%	0	0.0%	2	0.3%
Maternal collapse	-	-	-	-	0	0.0%
Maternal death	0	0.0%	0	0.0%	1	0.2%

FETAL OUTCOME

	2004		2009		2014	
Alive at 28 days	462	99.4%	372	99.7%	669	99.9%
Stillbirths	3	0.6%	0	0.0%	0	0.0%
Neonatal deaths	0	0.0%	1	0.3%	1	0.1%
Low birth weights (<2500 gm)	37	8.0%	33	8.8%	61	9.1%
<i>Singleton</i>	22	59.5%	23	69.7%	52	85.2%
<i>Multiple</i>	15	40.5%	10	30.3%	9	14.8%
Macrosomia (>4000 gm)	14	3.0%	14	3.8%	7	1.0%
Apgar score < 4 at 1 minute	3	0.6%	2	0.5%	9	1.3%
Apgar score < 4 at 5 minutes	3	0.6%	1	0.3%	2	0.3%
Birth trauma	9	1.9%	5	1.3%	0	0.0%

VAGINAL BREECH DELIVERY

The overall incidence of vaginal breech delivery remained at 0.2% over the 10 years period. The proportion of babies in multiple pregnancy ranged from 24-28%, of which 92.5% were aftercoming babies, compared with 93-95% in previous audits. Nulliparity rate dropped from 70.4% in 2004 to 47.8% in 2009 and increased slightly to 57.5% in 2014. The high rate of preterm delivery (50-60%) could account for the high low birth weight (< 2500 gm) rate (53-63%) in vaginal breech delivery. The rate of meconium stained liquor was similar to that in spontaneous vertex delivery (9.0% vs 10.2%) but that of blood stained liquor (4.8% vs 0.9%) and no liquor (2.7% vs 0.5%) was much higher. The stillbirth rate was 17.8%, while neonatal mortality was 8.9% which were both higher than the other modes of vaginal deliveries (0-0.1%). Majority of the stillbirths occurred in the antepartum period and therefore not related to the mode of delivery. However, the high neonatal death rate could possibly be related to the mode of delivery and the high preterm delivery rate. This was further supported by the much higher rate of low Apgar score (<4) at both 1 and 5 minutes at birth in those vaginal breech deliveries. External cephalic version was not attempted in 80.1% of cases, compared to 78.7% in 2004 and 64.6% in 2009.

	2004		2009		2014	
Singleton	79	73.1%	123	76.4%	104	71.2%
Multiple	29	26.9%	38	23.6%	42	28.8%
First baby in twin	2	1.9%	2	1.2%	1	0.7%
Aftercoming baby	27	25.0%	36	22.4%	37	25.3%
Both babies in twin	-	-	-	-	4	2.8%
TOTAL BIRTHS	108	0.2%	161	0.2%	146	0.2%

PARITY OF THE PARTURIENTS FOR EACH BABY

	2004		2009		2014	
Para 0	50	70.4%	77	47.8%	84	57.5%
Para 1	40	20.4%	66	41.0%	43	29.5%
Para 2	9	8.3%	13	8.1%	16	11.0%
Para 3 & above	9	8.3%	5	3.1%	3	2.1%

EXTERNAL CEPHALIC VERSION

	2004		2009		2014	
ECV not attempted	85	78.7%	104	64.6%	117	80.1%
ECV successful	0	0.0%	0	0.0%	1	0.7%
ECV failed	2	1.9%	0	0.0%	1	0.7%
Missing/Irrelevant	21	19.4%	57	35.4%	27	18.5%

MODE OF ONSET OF LABOUR FOR EACH BABY

	2004		2009		2014	
Spontaneous onset	76	70.4%	97	60.2%	91	62.3%
Induced labour	22	20.4%	28	17.4%	41	28.1%
No labour	10	9.3%	36	22.4%	14	9.6%

GESTATION AT DELIVERY FOR EACH BABY

	2004		2009		2014	
< 26 weeks	13	16.0%	14	11.2%	23	15.8%
26 – 28 weeks	10	12.3%	15	12.0%	20	13.7%
29 – 32 weeks	10	12.3%	19	15.2%	19	13.0%
33 – 36 weeks	15	18.5%	15	12.0%	23	15.8%
37 – 41 weeks	32	39.5%	61	48.8%	61	41.8%
≥ 42 weeks	1	1.2%	0	0.0%	0	0.0%
Total	81		124		146	

Missing data in 1 (0.8%) cases in 2009

STATUS OF AMNIOTIC FLUID DURING LABOUR FOR EACH BABY

	2014	
Clear liquor	122	83.6%
Meconium stained liquor	13	9.0%
<i>Mild</i>	8	5.5%
<i>Moderate</i>	3	2.1%
<i>Severe</i>	2	1.4%
Blood stained liquor	7	4.8%
No liquor	4	2.7%

USE OF OXYTOTICS FOR THIRD STAGE OF LABOUR FOR EACH BABY

	2014	
Syntometrine	70	47.9%
Syntocinon	47	32.2%
Duratocin	4	2.8%
Nil	25	17.1%

POSTPARTUM COMPLICATIONS FOR EACH BABY

	2004		2009		2014	
Postpartum haemorrhage*	4	4.9%	4	3.2%	15	10.3%
Blood transfusion	-	-	1	0.8%	5	3.4%
Episiotomy	28	34.6%	22	17.6%	55	37.7%
<i>Nulliparous</i>	11	30.6%	11	18.6%	14	21.5%
<i>Multiparous</i>	17	37.8%	11	16.7%	16	38.1%
Manual removal of placenta	1	1.2%	11	8.8%	9	6.2%
Puerperal pyrexia	1	1.2%	1	0.8%	0	0.0%
Breast abscess	0	0.0%	0	0.0%	0	0.0%
Urinary tract infection	0	0.0%	0	0.0%	0	0.0%
Genital tract infection	0	0.0%	0	0.0%	0	0.0%
Wound problem with intervention	0	0.0%	0	0.0%	0	0.0%

* Post-partum haemorrhage was defined as blood loss > 500 ml within 24 hours of delivery before 2014 and > 500 ml following vaginal delivery and > 1,000 ml following Caesarean delivery in 2014.

MATERNAL COMPLICATIONS FOR EACH BABY

	2004		2009		2014	
Preterm (<37 weeks)	48	59.3%	63	50.4	85	58.2%
<i>Singleton</i>	47	59.5%	62	50.4%	62	59.6%
<i>Multiple</i>	1	50.0%	1	50.0%	23	54.8%
Perineal laceration	-	-	-	-	26	17.8%
<i>First degree tear</i>	-	-	-	-	16	11.0%
<i>Second degree tear</i>	-	-	-	-	9	6.2%
<i>Third degree tear</i>	0	0.0%	0	0.0%	1	0.7%
<i>Fourth degree tear</i>	-	-	-	-	0	0.0%
Internal iliac artery ligation	0	0.0%	0	0.0%	0	0.0%
Uterine artery embolization	0	0.0%	0	0.0%	0	0.0%
Uterine compression suture	-	-	-	-	0	0.0%
Uterine balloon tamponade	-	-	-	-	2	1.4%
Uterine rupture	0	0.0%	0	0.0%	0	0.0%
Hysterectomy	0	0.0%	0	0.0%	1	0.7%
Maternal collapse	-	-	-	-	0	0.0%
Maternal death	0	0.0%	0	0.0%	0	0.0%

Missing data in gestation in 1 case in 2009

FETAL OUTCOME

	2004		2009		2014	
Alive at 28 days	75	69.4%	125	77.6%	107	73.3%
Stillbirths	26	24.1%	24	14.9%	26	17.8%
<i>Antepartum</i>	21	80.8%	20	83.3%	22	84.6%
<i>Intrapartum</i>	1	3.8%	0	0.0%	0	0.0%
<i>Undetermined</i>	4	15.4%	4	16.7%	4	15.4%
Neonatal deaths	7	6.5%	12	7.4%	13	8.9%
Low birth weight (<2500 gm)	68	63.0%	86	53.4%	85	58.2%
<i>Singleton</i>	48	70.6%	59	68.6%	58	68.2%
<i>Multiple</i>	20	29.4%	27	31.4%	27	31.8%
Macrosomia (>4000 gm)	0	0.0%	3	1.9%	0	0.0%
Apgar score < 4 at 1 minute	30	27.8%	27	16.8%	31	21.2%
Apgar score < 4 at 5 minutes	26	24.1%	20	12.4%	24	16.4%
Birth trauma	0	0.0%	0	0.0%	0	0.0%

CAESAREAN SECTION

The overall Caesarean section rate increased from 30.4% in 2004 to 42.1% in 2009 and decreased back to 37.3% in 2014, 40% were performed during labour. The rate of classical Caesarean section varied from 0.1% to 0.3% in 2009. Caesarean section was performed in pre-term pregnancy in 8.5-10.4% over the past 10 years, less than a third were multiple pregnancy.

Previous uterine scar and social reasons remained the top 2 most common indications for Caesarean section as in 2009. Malpresentation/abnormal lie, cephalo-pelvic disproportion, and failed induction were the other three commonest indications for Caesarean section.

Post-partum haemorrhage rate increased from 0.7% in 2004 to 7.3% in 2009 but dropped markedly to only 2.0% in 2014, which was likely related to the change in the definition of post-partum haemorrhage. Using the new definition, the post-haemorrhage rate was actually similar in 2009 and 2014. Hysterectomy rate remained at 0.1%. Maternal collapse occurred in 0.03%. Maternal death rate dropped from 0.01% in 2004 to 0.006% in 2009 and 0.004% in 2014. Neonatal death rate remained 0.1-0.2% while birth trauma occurred in 0.06-0.1%.

	2004		2009		2014	
TOTAL PREGNANCIES	14938	30.4%	33552	42.1%	22237	37.3%
Singleton	14508	97.1%	32541	97.0%	21498	96.7%
Multiple	430	2.9%	1016	3.0%	743	3.3%
<i>Twins</i>	422	98.1%	1002	98.6%	736	99.1%
Both babies	410	97.2%	997	99.5%	732	99.5%
Second baby only	12	2.8%	5	0.5%	4	0.5%
<i>Triplets</i>	8	1.9%	14	1.44%	7	0.9%
All babies	7	87.5%	14	100%	7	100.0%
Third baby only	1	12.5%	0	0.0%	0	0.0%
TOTAL BIRTHS	15361	30.9%	34581	42.7%	22987	38.0%

PARITY OF THE PARTURIENTS FOR EACH BABY

	2004		2009		2014	
Para 0	9381	61.1%	16895	48.9%	13391	58.3%
Para 1	5027	32.7%	15490	44.8%	8115	35.3%
Para 2	804	5.2%	1941	5.6%	1241	5.4%
Para 3 & above	149	1.0%	255	0.7%	240	1.0%

MODE OF ONSET OF LABOUR FOR EACH BABY

	2004		2009		2014	
Spontaneous	4123	26.8%	6932	20.0%	6132	26.7%
Induced labour	2270	14.8%	2873	8.3%	2796	12.2%
No labour	8968	58.4%	24772	71.6%	14059	61.2%

Missing data in 4 (0.001%) in 2009

GESTATION AT DELIVERY FOR EACH BABY

	2004		2009		2014	
< 26 weeks	16	0.1%	10	0.03%	20	0.09%
26 – 28 weeks	81	0.5%	58	0.2%	86	0.4%
29 – 32 weeks	263	1.7%	338	1.0%	315	1.4%
33 – 36 weeks	1231	8.0%	2544	7.3%	1797	7.9%
37 – 41 weeks	13574	88.4%	31436	90.9%	20636	89.8%
≥ 42 weeks	175	1.1%	58	0.2%	12	0.05%
Missing	21	0.1%	136	0.4%	121	0.5%
Total	15361		34581		22987	

Missing data in 21 (0.1%) in 2004, in 133 (0.4%) in 2009 and 121 (0.5%) in 2014

STATUS OF AMNIOTIC FLUID DURING LABOUR FOR EACH BABY

	2014	
Clear liquor	21563	93.8%
Meconium stained liquor	1252	5.4%
<i>Mild</i>	731	3.2%
<i>Moderate</i>	316	1.4%
<i>Severe</i>	205	0.9%
Blood stained liquor	118	0.5%
No liquor	54	0.2%

INDICATIONS FOR CAESAREAN SECTIONS (There might be more than 1 indication)

	2004		2009		2014	
Previous uterine scar	3852	25.1%	11486	33.2%	7422	32.3%
Cephalopelvic disproportion	1937	12.6%	3140	9.1%	1561	6.8%
Malpresentation / abnormal lie	1870	12.2%	2706	7.8%	2112	9.2%
Fetal distress	1403	9.1%	1501	4.3%	1405	6.1%
No progress of labour	1027	6.7%	1159	3.4%	980	4.3%
Social reasons	1388	9.0%	6347	18.4%	3472	15.1%
Failed induction	915	6.0%	1304	3.8%	1425	6.2%
Antepartum haemorrhage/PP	750	4.9%	1250	3.6%	1115	4.9%
Contracted / unfavourable pelvis	225	1.5%	313	0.9%	370	1.6%
Suspected big baby	241	1.6%	603	1.7%	356	1.5%
Hypertension	350	2.3%	679	2.0%	585	2.5%
Elderly / infertility	304	2.0%	468	1.4%	349	1.5%
Intrauterine growth retardation	278	1.8%	460	1.3%	432	1.9%
Multiple pregnancy	771	5.0%	1935	5.6%	1498	6.5%
Diabetes mellitus (including IGT)	131	0.9%	229	0.7%	260	1.1%
Intrauterine infection	-	-	-	-	155	0.7%
Failed instrumental delivery	81	0.5%	76	0.2%	68	0.3%
Bad obstetric history	64	0.4%	113	0.3%	74	0.3%
Genital tumour / anomaly	54	0.4%	88	0.3%	46	0.2%
Maternal diseases	68	0.4%	122	0.4%	97	0.4%
Cord prolapse / cord presentation	55	0.5%	68	0.2%	57	0.2%
Others	2526	16.4%	4416	12.8%	3721	16.2%

Missing data on indication in 1020 (2.9%) in 2009

TYPE OF ANAESTHESIA FOR EACH BABY

	2014	
General anaesthesia	2073	9.0%
Spinal anaesthesia	16735	72.8%
Epidural Anaesthesia	681	3.0%
Others	107	0.5%
Missing	3391	14.8%

USE OF OXYTOTICS FOR THIRD STAGE OF LABOUR FOR EACH BABY

	2014	
Syntometrine	452	2.0%
Syntocinon	10988	47.8%
Duratocin	2650	11.5%
Nil	8897	38.7%

POSTPARTUM COMPLICATIONS

	2004		2009		2014	
Postpartum haemorrhage*	106	0.7%	2534	7.3%	451	2.0%
<i>Caesarean section (> 1,000 ml)</i>	-	-	524	1.5%	451	2.0%
Blood transfusion	-	-	175	0.5%	217	0.9%
Manual removal of placenta	580	3.8%	825	2.4%	150	0.7%
Puerperal pyrexia	168	1.1%	290	0.8%	114	0.5%
Breast abscess	4	0.02%	5	0.01%	1	0.004%
Urinary tract infection	75	0.5%	38	0.1%	29	0.1%
Genital tract infection	11	0.07%	18	0.05%	62	0.3%
Wound problem with intervention	65	0.4%	75	0.2%	38	0.2%

* Post-partum haemorrhage was defined as blood loss > 500 ml within 24 hours of delivery before 2014 and > 500 ml following vaginal delivery and > 1,000 ml following Caesarean delivery in 2014.

MATERNAL COMPLICATIONS

	2004		2009		2014	
Preterm (<37 weeks)	1593	10.4%	2951	8.5%	2218	9.6%
<i>Singleton</i>	1144	7.9%	1962	6.1%	1506	7.0%
<i>Multiple</i>	449	52.8%	989	48.6%	712	47.8%
Internal iliac artery ligation	3	0.02%	3	0.009%	2	0.009%
Uterine artery embolization	0	0.0%	19	0.05%	3	0.01%
Uterine compression suture	-	-	-	-	79	0.3%
Uterine balloon tamponade	-	-	-	-	54	0.2%
Uterine rupture	4	0.02%	6	0.02%	2	0.009%
Hysterectomy	21	0.1%	32	0.09%	20	0.1%
Maternal collapse	-	-	-	-	6	0.03%
Maternal death	2	0.01%	2	0.006%	1	0.004%

Missing data in gestation in 121 (0.5%) cases in 2014

FETAL OUTCOME

	2004		2009		2014	
Alive at 28 days	15320	99.7%	34532	99.9%	22936	99.8%
Stillbirths	13	0.1%	23	0.1%	23	0.1%
Neonatal deaths	28	0.2%	26	0.1%	28	0.1%
Low birth weight (<2500 gm)	1582	10.3%	2801	8.1%	2396	10.4%
<i>Singleton</i>	1060	67.0%	1669	59.6%	1542	64.4%
<i>Multiple</i>	522	33.0%	1132	40.4%	854	35.6%
Macrosomia (>4000 gm)	707	4.6%	1029	3.0%	563	2.4%
Apgar score < 4 at 1 minute	104	0.7%	97	0.3%	132	0.6%
Apgar score < 4 at 5 minutes	24	0.2%	29	0.1%	45	0.2%
Birth trauma	17	0.1%	35	0.1%	13	0.06%

SECOND STAGE CAESAREAN SECTION

Among the 22,987 Caesarean deliveries, 204 (0.9%) were performed at the second stage of labour which accounted for 0.9% (193/21498) and 0.7% (11/1489) of Caesarean section in singleton and multiple pregnancy respectively. These rates were similar to that in 2009. Cephalo-pelvic disproportion (36.4%) and failed instrumental delivery (21.8%) were the commonest indications for second stage Caesarean section. These rates were also similar to that in 2009. For maternal complications, the risk of post-partum haemorrhage and puerperal pyrexia were higher in second stage caesarean section. For fetal complications, the risk of macrosomia and low Apgar scores were higher in second stage Caesarean section. The same pattern was observed in 2009.

	2009		2014	
	Second Stage CS		Second Stage CS	
	No	Yes	No	Yes
TOTAL BIRTHS	34313	268	22783	204
Singleton	32292 (99.2%)	249 (0.8%)	21305 (99.1%)	193 (0.9%)
Multiple	2021 (99.1%)	19 (0.9%)	1478 (99.3%)	11 (0.7%)
<i>Twins</i>	1980	19	1457	11
<i>Triplets</i>	41	0	21	0

INDICATIONS FOR SECOND STAGE CAESAREAN SECTIONS (There might be more than 1 indication)

	2009		2014	
	Second Stage CS		Second Stage CS	
	No	Yes	No	Yes
Cephalopelvic disproportion	2929 (8.8%)	104 (39.7%)	1486 (6.5%)	75 (36.8%)
Failed instrumental delivery	19 (0.1%)	56 (21.4%)	24 (0.1%)	44 (21.6%)
Fetal distress	1457 (4.4%)	29 (11.1%)	1365 (6.0%)	40 (19.6%)
Malpresentation / abnormal lie	2642 (7.9%)	30 (11.5%)	2103 (9.2%)	11 (5.4%)
No progress of labour	1133 (3.4%)	23 (8.8%)	972 (4.3%)	10 (4.9%)
Multiple pregnancy	959 (2.9%)	16 (6.1%)	1489 (6.5%)	9 (4.4%)
Previous uterine scar	11315 (34.0%)	23 (8.8%)	7416 (32.5%)	6 (2.9%)
Contracted/ unfavourable pelvis	312 (0.9%)	1 (0.4%)	366 (1.6%)	4 (2.0%)
Antepartum haemorrhage/PP	1228 (3.7%)	1 (0.4%)	1113 (4.9%)	2 (1.0%)
Cord prolapse/presentation	66 (0.2%)	0 (0.0%)	56 (0.2%)	3 (1.5%)
Hypertension	640 (1.9%)	0 (0.0%)	584 (2.6%)	1 (0.5%)
Diabetes mellitus/IGT	226 (0.7%)	2 (0.8%)	259 (1.1%)	1 (0.5%)
Suspected big baby	603 (1.8%)	0 (0.0%)	355 (1.6%)	1 (0.5%)
Intrauterine infection	-	-	155 (0.7%)	2 (1.0%)
Maternal diseases	120 (0.4%)	1 (0.4%)	96 (0.4%)	1 (0.5%)
Social reasons	6344 (19.1%)	1 (0.4%)	3472 (15.2%)	0 (0.0%)
Failed induction	1998 (6.0%)	1 (0.4%)	1426 (6.3%)	1 (0.5%)
Intrauterine growth retardation	430 (1.3%)	0 (0.0%)	432 (1.9%)	0 (0.0%)
Elderly / infertility	464 (1.4%)	0 (0.0%)	353 (1.5%)	4 (2.0%)
Bad obstetric history	113 (0.3%)	0 (0.0%)	74 (0.3%)	0 (0.0%)
Genital tumour / anomaly	87 (0.3%)	1 (0.4%)	47 (0.2%)	1 (0.5%)
Others	4199 (12.6%)	52 (19.8%)	3659 (16.1%)	62 (30.4%)

POSTPARTUM COMPLICATIONS FPR EACH BABY

	2009		2014	
	Second Stage CS		Second Stage CS	
	No	Yes	No	Yes
Postpartum haemorrhage*	2282 (6.7%)	49 (18.3%)	436 (1.9%)	15 (7.4%)
Blood transfusion	155 (0.5%)	3 (1.2%)	210 (0.9%)	7 (3.4%)
Manual removal of placenta	794 (2.4%)	8 (3.1%)	149 (0.7%)	1 (0.5%)
Puerperal pyrexia	264 (0.8%)	5 (1.9%)	110 (0.5%)	4 (2.0%)
Breast abscess	4 (0.01%)	0 (0.0%)	1 (0.005%)	0 (0.0%)
Urinary tract infection	32 (0.1%)	3 (1.2%)	29 (0.1%)	0 (0.0%)
Genital tract infection	14 (0.04%)	0 (0.0%)	61 (0.3%)	1 (0.5%)
Wound problem with intervention	70 (0.2%)	0 (0.0%)	36 (0.2%)	2 (1.0%)

* Post-partum haemorrhage was defined as blood loss > 500 ml within 24 hours of delivery before 2014 and > 500 ml following vaginal delivery and > 1,000 ml following Caesarean delivery in 2014.

MATERNAL COMPLICATIONS FOR EACH BABY

	2009		2014	
	Second Stage CS		Second Stage CS	
	No	Yes	No	Yes
Preterm labour (<37 weeks)	2429 (7.3%)	20 (7.8%)	2200 (9.7%)	18 (8.8%)
<i>Singleton</i>	1946 (6.0%)	16 (6.4%)	1495 (7.0%)	11 (5.6%)
<i>Multiple</i>	483 (19.9%)	4 (57.1%)	705 (47.6%)	7 (63.6%)
Internal iliac artery ligation	2 (0.006%)	0 (0.0%)	2 (0.009%)	0 (0.0%)
Uterine artery embolisation	14 (0.04%)	1 (0.4%)	3 (0.01%)	0 (0.0%)
Uterine compression suture	-	-	78 (0.3%)	1 (0.5%)
Uterine balloon tamponade	-	-	53 (0.2%)	1 (0.5%)
Uterine rupture	6 (0.0%)	0 (0.0%)	2 (0.009%)	0 (0.0%)
Hysterectomy	26 (0.08%)	4 (1.6%)	19 (0.1%)	1 (0.5%)
Maternal collapse	-	-	6 (0.03%)	0 (0.0%)
Maternal death	2 (0.01%)	0 (0.0%)	1 (0.004%)	0 (0.0%)

Missing data in Gestation in 121 (0.5%) cases in 2014

FETAL OUTCOME

	2009		2014	
	Second Stage CS		Second Stage CS	
	No	Yes	No	Yes
Alive at 28 days	34264 (99.9%)	268 (100.0%)	22732 (99.8%)	204 (100.0%)
Stillbirths	23 (0.1%)	0 (0.0%)	23 (0.1%)	0 (0.0%)
<i>Antepartum</i>	21 (91.3%)	0 (0.0%)	19 (82.6%)	0 (0.0%)
<i>Intrapartum</i>	1 (4.3%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
<i>Undetermined</i>	1 (4.3%)	0 (0.0%)	4 (17.4%)	0 (0.0%)
Neonatal deaths	26 (0.1%)	0 (0.0%)	28 (0.1%)	0 (0.0%)
<i>Early</i>	21 (80.8%)	0 (0.0%)	24 (85.7%)	0 (0.0%)
<i>Late</i>	5 (19.2%)	0 (0.0%)	4 (14.3%)	0 (0.0%)
Low birth weight (<2500 gm)	2779 (8.1%)	22 (8.2%)	2384 (10.5%)	12 (5.9%)
<i>Singleton</i>	1658 (99.3%)	11 (0.7%)	1536 (99.6%)	6 (0.4%)
<i>Multiple</i>	1121 (99.0%)	11 (1.0%)	848 (99.3%)	6 (0.7%)
Macrosomia (>4000 gm)	1016 (3.0%)	13 (4.9%)	553 (2.5%)	10 (5.0%)
Apgar score < 4 at 1 minute	91 (0.3%)	6 (2.2%)	128 (0.6%)	4 (2.0%)
Apgar score < 4 at 5 minutes	28 (0.1%)	1 (0.4%)	43 (0.2%)	2 (1.0%)
Birth trauma	29 (0.1%)	6 (2.2%)	12 (0.05%)	1 (0.5%)

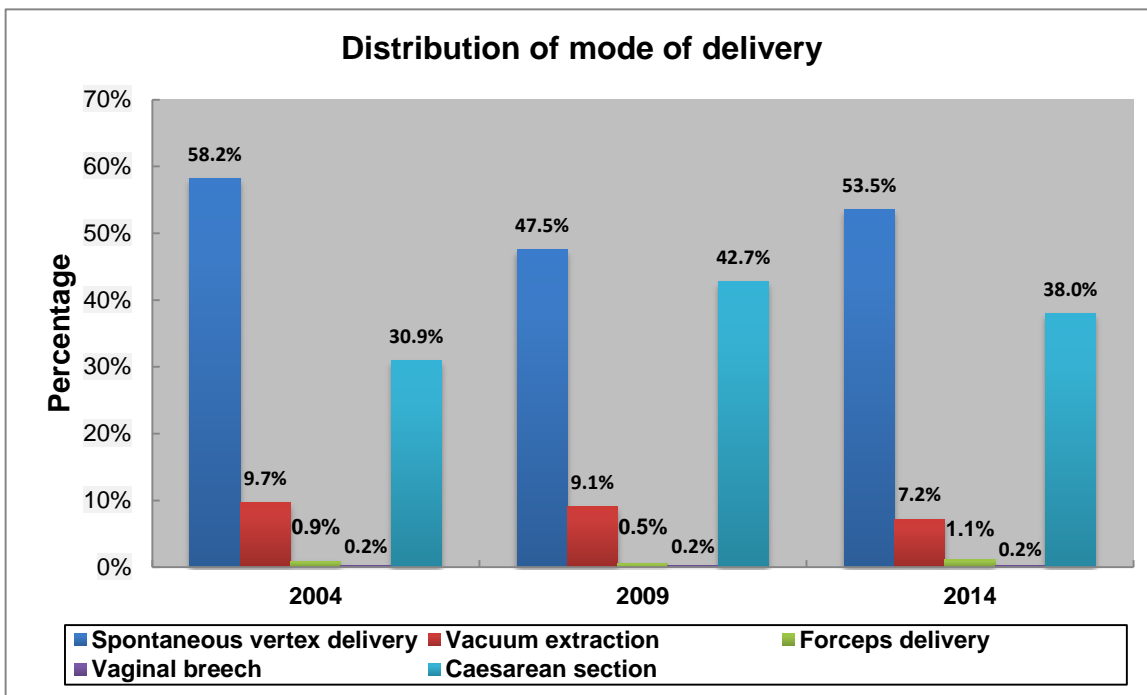


Figure O6 – Distribution of mode of delivery

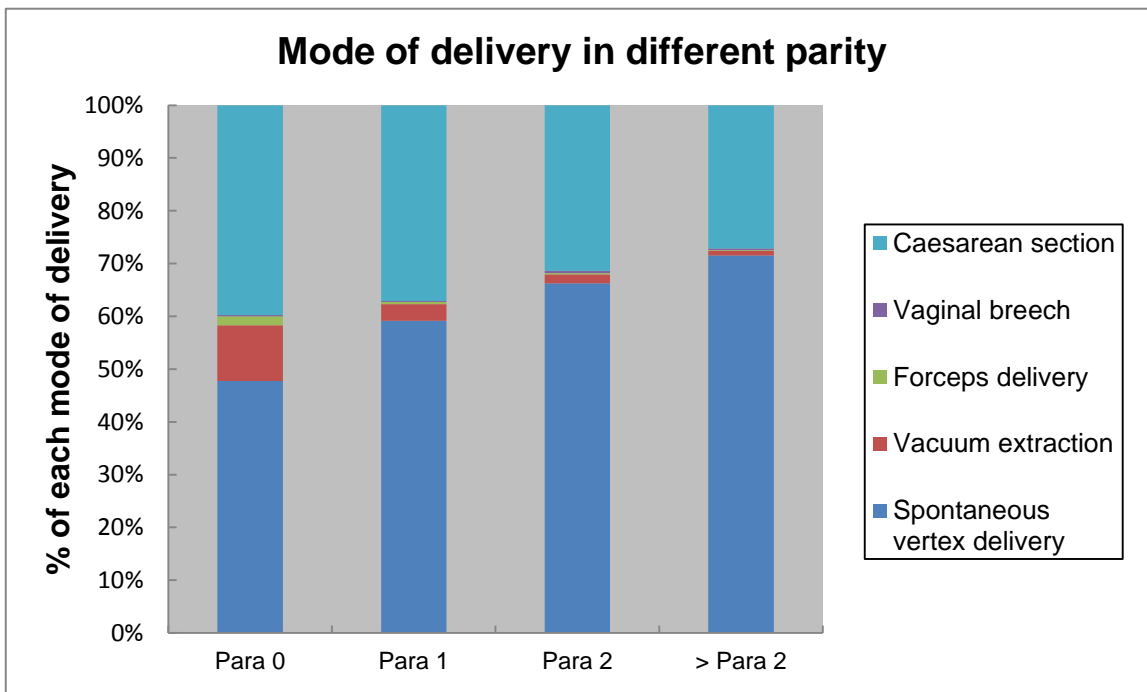


Figure O7 – Mode of delivery in different parity

POSTPARTUM HAEMORRHAGE

In previous audits before 2009, the occurrence of postpartum haemorrhage (PPH) was set as null by default and the case of PPH was counted when cause(s) of PPH was reported. In 2009, the amount of PPH was categorized and the incidence was calculated using the amount of blood loss > 500 ml regardless of the mode of delivery as defined since the first audit in 1994. In 2014, PPH was categorised by the mode of delivery and defined as blood loss > 500 ml following vaginal delivery and > 1,000 ml following Caesarean delivery.

Using the new definition, the incidence of PPH was only 2.5% in 2014. The incidence of severe PPH (blood loss > 1000 ml) was similar at 0.8%-0.9% in 2009 and 2014. The overall transfusion rate in those with PPH increased from 7.9% in 2009 to 27.8% in 2014, and the increase was more related to the increase in transfusion in those with mild PPH than severe PPH.

The cause(s) of PPH was only reported in 1,348 (90.6%) cases in 2014, compared with 1378 (41.1%) cases in 2009. Uterine atony remained the most common cause but the rate decreased from 73% in 2004 to 58% in 2009 and in 2014.

The data on the use of uterine balloon and compression suture were first reported in the current audit. There were 56 and 46 cases using these two interventions which had become the most common procedures for the control of PPH. Hysterectomy rate stayed between 0.8% and 1.0% over the 10 years period but the number of uterine artery embolisation dropped significantly from 23 in 2009 to only 2 cases in 2014. There was one maternal death associated with severe postpartum haemorrhage in each audit year over the 10 years period.

	2004		2009		2014	
TOTAL PREGNANCIES	1295		3349		1487	
<i>Singleton</i>	1274	98.4%	3137	93.7%	1421	95.6%
<i>Multiple</i>	21	1.6%	212	6.3%	66	4.4%
TOTAL BIRTHS	1316		3567		1551	

	2004		2009		2014	
Post-partum haemorrhage	1295	2.6%	3349	4.2%	1487	2.5%
<i>Mild (500 – 1000 ml)</i>	-	-	2746	3.4%	926	1.6%
<i>Moderate (1000 – 1500 ml)</i>	-	-	603	0.8%	316	0.5%
<i>Severe (> 1500 ml)</i>	-	-	-	-	245	0.4%
Mode of delivery*						
<i>Vaginal delivery</i>	1201	92.7%	1011	30.2%	1081	72.7%
<i>Caesarean delivery</i>	94	7.3%	2338	69.8%	406	27.3%
Blood transfusion	-	-	264	7.9%	414	27.8%
<i>Mild PPH</i>	-	-	109	3.3%	225	15.1%
<i>Severe PPH</i>	-	-	155	4.6%	189	12.7%

*Post-partum haemorrhage was defined as blood loss > 500 ml within 24 hours of delivery before 2014 and > 500 ml following vaginal delivery and > 1,000 ml following Caesarean delivery in 2014.

PARITY OF THE PATURIENTS

	2004		2009		2014	
Para 0	719	55.5%	1663	49.7%	840	56.5%
Para 1	477	36.8%	1389	41.5%	526	35.4%
Para 2	80	6.2%	236	7.0%	95	6.4%
Para 3 & above	19	1.5%	61	1.8%	26	1.7%

CAUSES OF PPH (there might be more than 1 cause for each case)

	2004		2009		2014	
Uterine atony	945	73.0%	807	58.5%	909	58.6%
Perineal tear	145	11.2%	127	9.2%	201	13.0%
Uterine fibroids	-	-	-	-	159	10.3%
Retained products of gestation	91	7.0%	93	6.7%	77	5.0%
Placenta previa	-	-	-	-	76	4.9%
Vaginal tear	39	3.0%	44	3.2%	41	2.6%
Cervical tear	33	2.5%	45	3.2%	32	2.1%
Genital haematoma	25	1.9%	28	2.0%	30	1.9%
Placenta accreta/precreta	-	-	-	-	17	1.1%
Disseminated intravascular coagulopathy	12	0.9%	17	1.2%	13	0.8%
Rupture of uterus	1	0.1%	5	0.4%	0	0.0%
Acute inversion of uterus	3	0.2%	0	0.0%	3	0.2%
Others	102	7.9%	213	15.4%	17	1.1%

Causes of PPH was only recorded in 1378 (41.1%) cases in 2009 and 1403 (90.5%) cases in 2014

ASSOCIATED ANTENATAL COMPLICATIONS

	2004		2009		2014	
Previous uterine scar	77	5.9%	764	22.8%	182	12.2%
<i>Caesarean scar</i>	77	5.9%	764	22.8%	154	10.4%
<i>Non-Caesarean scar</i>	-	-	-	-	33	2.2%
Hypertension	59	4.6%	161	4.8%	113	7.6%
Antepartum haemorrhage	47	3.6%	272	8.1%	140	9.4%
Multiple pregnancy	21	1.6%	212	6.3%	68	4.6%

MODE OF ONSET OF LABOUR

	2004		2009		2014	
Spontaneous	892	68.9%	1133	33.8%	707	47.5%
Induced labour	349	26.9%	803	24.0%	498	33.5%
No labour	54	4.2%	1411	42.1%	282	19.0%

AUGMENTATION OF LABOUR

	2004		2009		2014	
Augmented labour	302	23.3%	424	12.7%	218	14.7%

DURATION OF LABOUR

	2004		2009		2014	
< 2 hours	57	4.7%	1711	51.1%	384	26.9%
2 - 3 hours	298	24.6%	383	11.4%	329	22.9%
4 - 5 hours	314	25.9%	315	9.4%	246	17.2%
6 - 7 hours	189	15.6%	206	6.2%	175	12.2%
8 - 9 hours	145	12.0%	173	5.2%	110	7.7%
10 - 11 hours	83	6.9%	125	3.7%	74	5.2%
12 - 13 hours	60	5.0%	89	2.7%	48	3.4%
> 13 hours	65	5.4%	113	3.4%	65	4.5%

Missing data on duration of labour in 234 (7.0%) cases in 2009 and 57 (3.8%) cases in 2014

STATUS OF AMNIOTIC FLUID DURING LABOUR (FOR EACH BABY)

	2014	
Clear liquor	1310	84.5
Meconium stained liquor	196	12.6%
<i>Mild</i>	137	8.8
<i>Moderate</i>	34	2.2%
<i>Severe</i>	25	1.6%
Blood stained liquor	37	2.4%
No liquor	8	0.5%

MODE OF DELIVERY (FOR EACH BABY)

	2004		2009		2014	
Spontaneous vertex delivery	957	72.7%	801	23.9%	860	55.2%
Vacuum extraction	223	16.9%	190	5.7%	178	11.5%
Forceps delivery	24	1.8%	16	0.5%	47	3.0%
Vaginal breech delivery	6	0.5%	4	0.1%	15	1.0%
LSCS before labour	63	4.8%	906	27.1%	297	19.1
LSCS after labour	42	3.2%	1364	40.7%	130	8.4%
Classical Caesarean section	1	0.1%	61	1.8%	24	1.5%

Missing data on mode of delivery in 7 cases in 2009

USE OF OXYTOTICS FOR THIRD STAGE OF LABOUR

	2014	
Syntometrine	671	45.1%
Syntocinon	702	47.2%
Duratocin	24	1.6%
Nil	90	6.1%

USE OF OXYTOCICS AND POSTPARTUM HAEMORRHAGE FOR EACH BABY

	Nil	Syntometrine	Syntocinon	Duratocin	Total
Vaginal delivery	3514	24043	7782	2170	37509
PPH	47 (1.3%)	672 (2.8%)	366 (4.7%)	15 (0.7%)	1100 (2.9%)
Transfusion	18 (0.5%)	202 (0.8%)	145 (1.9%)	7 (0.3%)	372 (1.0%)
<i>Vertex vaginal</i>	2854	21701	6320	1469	32344
<i>PPH</i>	38 (1.3%)	546 (2.5%)	266 (4.2%)	10 (0.7%)	860 (2.7%)
<i>Transfusion</i>	16 (0.6%)	170 (0.8%)	98 (1.6%)	3 (0.2%)	287 (0.9%)
<i>Ventouse</i>	605	1930	1130	684	4349
<i>PPH</i>	7 (1.2%)	95 (4.9%)	71 (6.3%)	5 (0.7%)	178 (4.1%)
<i>Transfusion</i>	1 (0.2%)	25 (1.3%)	33 (2.9%)	4 (0.6%)	63 (1.4%)
<i>Forceps</i>	30	342	285	13	670
<i>PPH</i>	1 (3.3%)	23 (6.7%)	23 (8.1%)	0 (0.0%)	47 (7.0%)
<i>Transfusion</i>	1 (3.3%)	5 (1.5%)	11 (3.9%)	0 (0.0%)	17 (2.5%)
<i>Vaginal breech</i>	25	70	47	4	146
<i>PPH</i>	1 (4.0%)	8 (11.4%)	6 (12.8%)	0 (0.0%)	15 (10.3%)
<i>Transfusion</i>	1 (3.3%)	5 (1.5%)	11 (3.9%)	0 (0.0%)	17 (2.5%)
Casearean section	8897	452	10988	2650	22987
PPH	49 (0.6%)	9 (2.0%)	384 (3.5%)	9 (0.3%)	451 (2.0%)
Transfusion	44 (0.5%)	11 (2.4%)	149 (1.4%)	13 (0.5%)	217 (0.9%)
<i>LSCS</i>	8878	452	10868	2645	22843
<i>PPH</i>	47 (0.5%)	9 (2.0%)	362 (3.3%)	9 (0.3%)	427 (1.9%)
<i>Transfusion</i>	42 (0.5%)	11 (2.4%)	141 (1.3%)	13 (0.5%)	207 (0.9%)
<i>Classical CS</i>	19	0	120	5	144
<i>PPH</i>	2 (10.5%)	0 (0.0%)	22 (18.3%)	0 (0.0%)	24 (16.7%)
<i>Transfusion</i>	2 (10.5%)	0 (0.0%)	8 (6.7%)	0 (0.0%)	10 (6.9%)
Total Incidence	12411	24495	18770	4820	60496
PPH	96 (0.8%)	681 (2.8%)	75 (4.0%)	24 (0.5%)	1551 (2.6%)
Transfusion	62 (0.5%)	213 (0.9%)	294 (1.6%)	20 (0.4%)	589 (1.0%)

USE OF OXYTOCICS AND POSTPARTUM HAEMORRHAGE FOR EACH BABY

	Nil	Syntometrine	Syntocinon	Duratocin	Total
Vaginal delivery	3514	24043	7782	2170	37509
PPH	47 (1.3%)	672 (2.8%)	366 (4.7%)	15 (0.7%)	1100 (2.9%)
<i>Vertex vaginal</i>	2854	21701	6320	1469	32344
<i>PPH</i>	38 (1.3%)	546 (2.5%)	266 (4.2%)	10 (0.7%)	860 (2.7%)
<i>Ventouse</i>	605	1930	1130	684	4349
<i>PPH</i>	7 (1.2%)	95 (4.9%)	71 (6.3%)	5 (0.7%)	178 (4.1%)
<i>Forceps</i>	30	342	285	13	670
<i>PPH</i>	1 (3.3%)	23 (6.7%)	23 (8.1%)	0 (0.0%)	47 (7.0%)
<i>Vaginal breech</i>	25	70	47	4	146
<i>PPH</i>	1 (4.0%)	8 (11.4%)	6 (12.8%)	0 (0.0%)	15 (10.3%)
Casearean section	8897	452	10988	2650	22987
PPH	49 (0.6%)	9 (2.0%)	384 (3.5%)	9 (0.3%)	451 (2.0%)
<i>LSCS</i>	8878	452	10868	2645	22843
<i>PPH</i>	47 (0.5%)	9 (2.0%)	362 (3.3%)	9 (0.3%)	427 (1.9%)
<i>Classical CS</i>	19	0	120	5	144
<i>PPH</i>	2 (10.5%)	0 (0.0%)	22 (18.3%)	0 (0.0%)	24 (16.7%)
Total Incidence	12411	24495	18770	4820	60496
PPH	96 (0.8%)	681 (2.8%)	75 (4.0%)	24 (0.5%)	1551 (2.6%)

USE OF OXYTOCICS AND BLOOD TRANSFUSION FOR EACH BABY

	Nil	Syntometrine	Syntocinon	Duratocin	Total
Vaginal delivery	3514	24043	7782	2170	37509
Transfusion	18 (0.5%)	202 (0.8%)	145 (1.9%)	7 (0.3%)	372 (1.0%)
<i>Vertex vaginal</i>	2854	21701	6320	1469	32344
<i>Transfusion</i>	16 (0.6%)	170 (0.8%)	98 (1.6%)	3 (0.2%)	287 (0.9%)
<i>Ventouse</i>	605	1930	1130	684	4349
<i>Transfusion</i>	1 (0.2%)	25 (1.3%)	33 (2.9%)	4 (0.6%)	63 (1.4%)
<i>Forceps</i>	30	342	285	13	670
<i>Transfusion</i>	1 (3.3%)	5 (1.5%)	11 (3.9%)	0 (0.0%)	17 (2.5%)
<i>Vaginal breech</i>	25	70	47	4	146
<i>Transfusion</i>	1 (3.3%)	5 (1.5%)	11 (3.9%)	0 (0.0%)	17 (2.5%)
Casearean section	8897	452	10988	2650	22987
PPH	49 (0.6%)	9 (2.0%)	384 (3.5%)	9 (0.3%)	451 (2.0%)
<i>LSCS</i>	8878	452	10868	2645	22843
<i>PPH</i>	47 (0.5%)	9 (2.0%)	362 (3.3%)	9 (0.3%)	427 (1.9%)
<i>Classical CS</i>	19	0	120	5	144
<i>PPH</i>	2 (10.5%)	0 (0.0%)	22 (18.3%)	0 (0.0%)	24 (16.7%)
Total Incidence	12411	24495	18770	4820	60496
Transfusion	62 (0.5%)	213 (0.9%)	294 (1.6%)	20 (0.4%)	589 (1.0%)

USE OF OXYTOCICS AND MANUAL REMOVAL OF PLACENTA FOR EACH BABY

	Nil	Syntometrine	Syntocinon	Duratocin	Total
Vaginal delivery	3514	24043	7785	2170	37509
MROP	30 (0.9%)	263 (1.1%)	90 (1.2%)	23 (1.1%)	406 (1.1%)
<i>Vertex vaginal</i>	2854	21701	6320	1469	32344
<i>MROP</i>	27 (0.9%)	222 (1.0%)	69 (1.1%)	12 (0.8%)	330 (1.0%)
<i>Ventouse</i>	605	1930	1130	684	4349
<i>MROP</i>	1 (0.2%)	32 (1.7%)	19 (1.7%)	11 (1.6%)	63 (1.4%)
<i>Forceps</i>	30	342	285	13	670
<i>MROP</i>	1 (3.3%)	3 (0.9%)	0 (0.%)	0 (0.0%)	4 (0.6%)
<i>Vaginal breech</i>	25	70	47	4	146
<i>MROP</i>	1 (4.0%)	6 (8.6%)	2 (4.3%)	0 (0.0%)	9 (6.2%)
Caesarean section	8897	452	10988	2650	22987
MROP	6 (0.07%)	0 (0.0%)	143 (1.3%)	1 (0.04%)	150 (0.7%)
<i>LSCS</i>	8878	452	10868	2645	22843
<i>MROP</i>	6 (0.1%)	0 (0.0%)	138 (1.3%)	1 (0.1%)	145 (0.6%)
<i>Classical CS</i>	19	0	120	5	144
<i>MROP</i>	0 (0.0%)	0 (0.0%)	5 (4.2%)	0 (0.0%)	5 (3.5%)
Total Incidence	12411	24495	18770	4820	60496
PPH	36 (0.3%)	263 (1.1%)	233 (1.2%)	24 (0.5%)	556 (0.9%)

POSTPARTUM COMPLICATIONS

	2009		2014	
Episiotomy#	1084	83.7%	808	79.9%
<i>Nulliparous</i>	659	91.7%	486	89.3%
<i>Multiparous</i>	425	73.8%	322	69.0%
Manual removal of placenta	106	8.2%	142	4.2%
<i>Vaginal delivery</i>	92	7.7%	86	8.5%
<i>Caesarean section</i>	14	14.9%	56	2.4%
Puerperal pyrexia	11	0.8%	105	3.1%
Breast abscess	0	0.0%	0	0.0%
Urinary tract infection	10	0.8%	12	0.4%
Genital tract infection	22	1.7%	4	0.1%
Wound problem with intervention	1	0.08%	27	0.8%

* Post-partum haemorrhage was defined as blood loss > 500 ml within 24 hours of delivery before 2014 and > 500 ml following vaginal delivery and > 1,000 ml following Caesarean delivery in 2014.

#Include vaginal deliveries only

MATERNAL POST-PARTUM COMPLICATIONS

	2004		2009		2014	
Transfusion	-	-	264	7.9%	366	24.6%
<i>Vaginal delivery</i>	-	-	123	12.2%	251	23.2%
<i>Caesarean section</i>	-	-	141	6.0%	115	28.3%
Perineal laceration	-	-	-	-	397	36.7%
<i>First degree tear</i>	-	-	-	-	202	18.7%
<i>Second degree tear</i>	-	-	-	-	156	14.4%
<i>Third degree tear</i>	1	0.08%	8	0.2%	33	3.1%
<i>Fourth degree tear</i>	-	-	-	-	6	0.6%
Internal iliac artery ligation	3	0.2%	2	0.1%	1	0.07%
Uterine artery embolisation	0	0.0%	23	0.7%	2	0.1%
Uterine compression suture	-	-	-	-	46	3.1%
Uterine balloon tamponade	-	-	-	-	56	3.8%
Uterine rupture	1	0.08%	4	0.1%	0	0.0%
Hysterectomy	11	0.8%	35	1.0%	20	1.3%
Maternal collapse	-	-	-	-	1	0.07%
Maternal death	1	0.08%	1	0.03%	1	0.07%

FETAL OUTCOME

	2004		2009		2014	
Alive at 28 days	1308	99.4%	3547	99.4%	2536	99.0%
Stillbirths	6	0.5%	12	0.3%	10	0.6%
Neonatal deaths	2	0.2%	8	0.2%	5	0.4%
Low birth weight (<2500 gm)	46	3.5%	431	12.1%	166	10.7%
<i>Singleton</i>	24	52.4%	209	6.7%	104	6.7%
<i>Multiple</i>	22	1.9%	222	51.9%	62	4.0%
Macrosomia (>4000 gm)	97	7.4%	231	6.5%	84	5.4%
Apgar score <4 at 1 minute	10	0.8%	38	1.1%	25	1.6%
Apgar score <4 at 5 minutes	6	0.5%	12	0.3%	10	0.6%

PLACENTA PREVIA

Previous audits only reported the data of placenta previa as one of the causes of antepartum haemorrhage or postpartum haemorrhage. In 2014, placenta praevia, whether there was bleeding or not, was captured as an individual obstetric complication as well.

The incidence of placenta previa was 1.1% and 63.7% of cases were associated with antepartum haemorrhage. Majority of the cases (85.8%) were delivered by Caesarean section, of which 10% were performed after labour. Postpartum haemorrhage occurred in 21% and need for additional intervention was high, especially compression suture (4.6%), uterine balloon (3.2%) and hysterectomy (2.5%). There was no associated maternal collapse or mortality.

	2014	
TOTAL PREGNANCIES	646	1.1%
<i>Singleton</i>	621	96.1%
<i>Multiple</i>	25	3.9%
TOTAL BIRTHS	671	

PARITY OF THE PATIENTS

	2014	
Para 0	330	51.1%
Para 1	258	39.9%
Para 2	45	7.0%
Para 3 & above	13	2.0%

ANTEPARTUM HAEMORRHAGE AND UTERINE SCAR

	2014	
Antepartum haemorrhage	415	64.2%
Previous uterine scar	156	24.1%
Caesarean section	103	15.9%
<i>1 previous Caesarean section</i>	94	14.6%
<i>>1 previous Caesarean sections</i>	9	1.4%
Non-Caesarean scar	53	8.2%
<i>Open myomectomy</i>	52	8.0%
<i>Lap myomectomy</i>	1	0.2%
Both	9	1.4%

MODE OF ONSET OF LABOUR

	2014	
Spontaneous	81	12.5%
Induced labour	37	5.7%
No labour	528	81.7%

GESTATION AT DELIVERY

	2014	
< 26 weeks	0	0.0%
26 - 28 weeks	8	1.2%
29 - 32 weeks	36	5.6%
33 - 36 weeks	132	20.4%
37 - 41 weeks	470	72.8%
> 41 weeks	0	0.0%

STATUS OF AMNIOTIC FLUID DURING LABOUR

	2014	
Clear liquor	639	95.2%
Meconium stained liquor	21	3.1%
<i>Mild</i>	16	2.4%
<i>Moderate</i>	1	0.1%
<i>Severe</i>	4	0.6%
Blood stained liquor	9	1.3%
No liquor	2	0.3%

MODE OF DELIVERY FOR EACH BABY

	2014	
Spontaneous vertex delivery	47	7.0%
Vacuum extraction	8	1.2%
Forceps delivery	5	0.8%
Vaginal breech delivery	1	0.1%
LSCS before labour	519	77.3%
LSCS after labour	58	8.6%
Classical Caesarean section	33	4.9%

MODE OF DELIVERY FOR THOSE WITH POSTPARTUM HAEMORRHAGE

	2014	
TOTAL INCIDENCE	132	20.4%
<i>Vaginal delivery (>500ml)</i>	5	0.8%
<i>Caesarean delivery (>1000ml)</i>	127	19.7%

USE OF OXYTOTICS FOR THIRD STAGE OF LABOUR

	2014	
Syntometrine	37	5.7%
Syntocinon	517	80.0%
Duratocin	31	4.8%
Nil	61	9.4%

POSTPARTUM COMPLICATIONS

	2014	
Postpartum haemorrhage	132	20.4%
<i>Vaginal delivery</i>	5	8.2%
<i>Caesarean section</i>	127	21.7%
Severity of postpartum haemorrhage		
<i>Mild (500 – 1000 ml)</i>	3	0.5%
<i>Moderate (1001 – 1500 ml)</i>	52	8.0%
<i>Severe (> 1500 ml)</i>	77	11.9%
Blood transfusion	49	7.6%
<i>Vaginal delivery</i>	2	3.3%
<i>Caesarean section</i>	47	8.0%
Manual removal of placenta	6	0.9%
<i>Vaginal delivery</i>	1	1.6%
<i>Caesarean section</i>	5	0.9%
Puerperal pyrexia	3	0.5%
Breast abscess	0	0.0%
Urinary tract infection	3	0.5%
Genital tract infection	1	0.2%
Wound problem with intervention	3	0.5%

* *Post-partum haemorrhage was defined as blood loss > 500 ml within 24 hours of delivery before 2014 and > 500 ml following vaginal delivery and > 1,000 ml following Caesarean delivery in 2014.*

#*Include vaginal deliveries only*

MATERNAL COMPLICATIONS

	2014	
Preterm (<37 weeks)	176	27.2
<i>Singleton</i>	161	25.9%
<i>Multiple</i>	15	60.0%
Internal iliac artery ligation	2	0.3%
Uterine artery embolisation	1	0.2%
Uterine compression suture	30	4.6%
Uterine balloon tamponade	21	3.3%
Uterine rupture	0	0.0%
Hysterectomy	13	2.0%
Maternal collapse	0	0.0%
Maternal death	0	0.0%

FETAL OUTCOME

	2014	
Alive at 28 days	666	99.3%
Stillbirths	3	0.4%
Neonatal deaths	2	0.3%
Low birth weight (<2500 gm)	165	24.6%
<i>Singleton</i>	135	24.6%
<i>Multiple</i>	30	4.5%
Macrosomia (>4000 gm)	7	1.0%
Apgar score <4 at 1 minute	20	3.0%
Apgar score <4 at 5 minutes	4	0.6%

PUERPERAL PYREXIA

The incidence of puerperal pyrexia decreased from 0.6% in 2004 and 0.5% in 2009 to 0.4% in 2014. It was associated with Caesarean section in 49.0%; of which 63.7% were Caesarean sections after labour. Duration of labour was 12 hours or more in 9.5%. The exact causes of puerperal pyrexia were not explored in the audit and the possible associated conditions listed might not necessarily be the cause of the fever.

	2004		2009		2014	
TOTAL PREGNANCIES	294	0.6%	424	0.5%	231	0.4%
<i>Singleton</i>	281	95.9%	402	94.8%	221	95.9%
<i>Multiple</i>	13	4.4%	22	5.2%	10	4.1%
TOTAL BIRTHS	308		446		241	

PARITY OF THE PATIENTS

	2004		2009		2014	
Para 0	202	68.7%	282	66.5%	157	68.0%
Para 1	70	23.8%	113	26.7%	64	27.7%
Para 2	17	5.8%	28	6.6%	8	3.5%
Para 3 & above	5	1.7%	1	0.2%	2	0.8%

ASSOCIATED CONDITIONS OF POSTPARTUM PYREXIA (may have more than 1 cause)

	2004		2009		2014	
Manual removal of placenta	15	5.1%	10	2.4%	9	3.9%
Wound infection	19	6.5%	16	3.8%	7	3.0%
Urinary tract infection	14	4.8%	17	4.0%	7	3.0%
Genital tract infection	4	1.4%	8	1.9%	11	4.8%
Breast problems	2	0.7%	1	0.2%	0	0.0%
Hysterectomy	0	0.0%	0	0.0%	0	0.0%
Third/Fourth degree tear	0	0.0%	2	0.5%	2	0.9%

DURATION OF LABOUR

	2004		2009		2014	
< 2 hours	7	2.4%	199	46.9%	101	43.7%
2 - 3 hours	25	8.5%	35	8.3%	31	13.4%
4 - 5 hours	34	11.6%	43	10.2%	25	10.8%
6 - 7 hours	26	8.8%	30	7.1%	20	8.7%
8 - 9 hours	27	9.2%	35	8.3%	16	6.9%
10 - 11 hours	30	10.2%	31	7.3%	10	4.3%
12 - 13 hours	18	6.1%	11	2.6%	9	3.9%
> 13 hours	16	5.4%	23	5.4%	12	5.2%
Missing	111	37.8%	17	4.0%	7	3.0%
Total	294		424		231	

STATUS OF AMNIOTIC FLUID DURING LABOUR (FOR EACH BABY)

	2014	
Clear liquor	190	78.8%
Meconium stained liquor	44	18.3%
<i>Mild</i>	22	9.1%
<i>Moderate</i>	10	4.1%
<i>Severe</i>	12	5.0%
Blood stained liquor	5	2.1%
No liquor	2	0.8%

MODE OF DELIVERY (FOR EACH BABY)

	2004		2009		2014	
Spontaneous vertex delivery	102	33.1%	124	27.8%	101	41.9%
Vacuum extraction	32	10.4%	28	6.3%	19	7.9%
Forceps delivery	4	1.3%	3	0.7%	7	2.9%
Vaginal breech delivery	2	0.6%	1	0.2%	0	0.0%
LSCS before labour	63	20.5%	115	25.8%	38	15.8%
LSCS after labour	105	34.1%	169	37.9%	73	30.3%
Classical Caesarean section	0	0.0%	6	1.4%	3	1.2%

POSTPARTUM COMPLICATIONS

	2014					
Postpartum haemorrhage*	11	3.7%	105	24.8%	23	10.0%
<i>Vaginal delivery (> 500 ml)</i>	9	6.6%	17	11.0%	14	6.1%
<i>Caesarean delivery (> 1,000 ml)</i>	-	-	88	32.7%	9	3.9%
Blood transfusion	-	-	14	3.3%	14	6.1%
<i>Vaginal delivery</i>	-	-	8	5.2%	8	6.4%
<i>Caesarean delivery</i>	-	-	21	7.8%	6	5.7%
Episiotomy#	126	42.9%	124	80.0%	76	60.8%
<i>Nulliparous</i>	90	44.6%	94	91.3%	62	78.5%
<i>Multiparous</i>	36	39.1%	30	57.7%	14	30.4%
Manual removal of placenta	15	5.1%	10	2.4%	9	3.9%
<i>Vaginal delivery</i>	3	2.2%	8	5.2%	7	5.6%
<i>Caesarean delivery</i>	12	7.6%	2	0.7%	2	1.9%
Breast abscess	2	0.7%	1	0.2%	0	0.0%
Urinary tract infection	14	4.8%	17	4.0%	7	3.0%
Genital tract infection	4	1.4%	8	1.9%	7	3.0%
Wound problem with intervention	19	6.5%	16	3.8%	0	0.0%

* Post-partum haemorrhage was defined as blood loss > 500 ml within 24 hours of delivery before 2014 and > 500 ml following vaginal delivery and > 1,000 ml following Caesarean delivery in 2014.

#Include vaginal deliveries only

MATERNAL COMPLICATIONS

	2004		2009		2014	
Preterm delivery (< 37 weeks)	28	9.5%	46	(10.8%)	24	10.4%
<i>Singleton</i>	20	7.1%	35	8.7%	22	9.9%
<i>Multiple</i>	8	61.5%	11	50.0%	2	22.2%
Perineal laceration#	-	-	-	-	40	32.0%
<i>First degree</i>	-	-	-	-	25	20.0%
<i>Second degree</i>	-	-	-	-	13	10.4%
<i>Third degree</i>	0	0.0%	2	0.5%	2	1.6%
<i>Fourth degree</i>	-	-	-	-	0	0.0%
Internal iliac artery ligation	0	0.0%	0	0.0%	0	0.0%
Uterine artery embolisation	-	-	0	0.0%	0	0.0%
Uterine compression suture	-	-	-	-	2	0.9%
Uterine balloon tamponade	-	-	-	-	3	1.3%
Uterine rupture	1	0.3%	1	0.2%	0	0.0%
Hysterectomy	0	0.0%	0	0.0%	0	0.0%
Maternal collapse	-	-	-	-	0	0.0%
Maternal death	0	0.0%	0	0.0%	0	0.0%

FETAL OUTCOME

	2004		2009		2014	
Alive at 28 days	306	99.4%	440	98.7%	237	98.3%
Stillbirths	1	0.3%	3	0.7%	4	1.7%
Neonatal deaths	1	0.3%	3	0.7%	0	0.0%
Low birth weight (< 2500 gm)	42	13.6%	57	12.8%	39	16.2%
<i>Singleton</i>	11	7.9%	30	7.5%	29	12.0%
<i>Multiple</i>	31	18.5%	27	61.4%	10	4.1%
Macrosomia (>4000 gm)	14	4.5%	21	4.7%	10	4.1%
Apgar score <4 at 1 minute	1	0.3%	7	1.6%	0	0.0%
Apgar score <4 at 5 minutes	1	0.3%	2	0.4%	0	0.0%

PERINEAL LACERATION

In the past audits, perineal lacerations were categorised as first, second and third degree perineal laceration, and only third degree lacerations were reported. Revision of the categorisation with addition of fourth degree perineal laceration was introduced in 2014, consistent with the international definition. A total of 22 cases of 4th degree perineal laceration were reported and 4 from the same hospital with singleton pregnancy and Caesarean section, 3 before labour and 1 after spontaneous labour, were excluded as they were likely wrong coding. The overall incidence of laceration of the perineum was 22.8% in 2014, of which 1.1% were major (3rd & 4th degree) laceration.

	2014	
TOTAL PREGNANCIES	13579	22.8%
<i>Singleton</i>	13546	99.8%
<i>Twins</i>	33	0.2%
TOTAL BIRTHS	13612	

PERINEAL LACERATION

	2014	
TOTAL INCIDENCE	13579	22.8%
<i>First degree laceration</i>	9785	72.1%
<i>Second degree laceration</i>	3651	26.9%
<i>Third degree laceration</i>	125	0.9%
<i>Fourth degree laceration</i>	18	0.1%

MAJOR PERINEAL LACERATION

The incidence of third/fourth degree or major laceration of the perineum significantly increased from 0.03% in 2004 to 0.08% in 2009 and 0.2% in 2014. A total of 147 cases with major perineal tear were reported.

There was an increasing trend in the rate of major perineal laceration after different modes of vaginal delivery over the 10 years period. Sixty percent of the cases occurred following spontaneous vaginal delivery and the risk increased from 0.04% in 2004 to 0.1% in 2009 and 0.3% in 2014. The risk after vacuum extraction increased from 0.06% in 2004 and 0.4% in 2009, to 0.7% in 2014 while that after forceps delivery was even higher which increased from 0.4% in 2004 and 1.1% in 2009 to 3.3% in 2014.

	2004		2009		2014	
TOTAL INCIDENCE	16	0.03%	67	0.08%	143	0.2%
<i>Singleton</i>	16	100.0%	66	98.5%	142	99.3%
<i>Twins</i>	0	0.0%	1	1.5%	1	0.7%

PARITY OF THE PATURIENTS

	2004		2009		2014	
Nulliparous	6	37.5%	49	73.1%	111	77.6%
Multiparous	10	62.5%	18	26.9%	32	22.4%

DURATION OF LABOUR

	2004		2009		2014	
< 2 hours	2	12.5%	3	4.5%	10	7.0%
2 - 3 hours	4	25.0%	12	17.9%	30	21.0%
4 - 5 hours	2	12.5%	13	19.4%	26	18.2%
6 - 7 hours	3	18.8%	12	17.9%	18	12.6%
8 - 9 hours	4	25.0%	10	15.0%	22	15.4%
10 - 11 hours	1	6.3%	6	9.0%	14	9.8%
12 - 13 hours	0	0.0%	4	6.0%	5	3.5%
> 13 hours	0	0.0%	4	6.0%	14	9.8%
Missing	0	0.0%	3	4.5%	4	2.8%

MODE OF DELIVERY FOR EACH BABY

	2004		2009		2014	
Spontaneous vertex delivery	11	68.8%	34	50.7%	89	61.8%
Vacuum extraction	3	18.8%	29	43.3%	32	22.2%
Forceps delivery	2	12.5%	4	6.0%	22	15.3%
Breech	0	0.0%	0	0.0%	1	0.7%

OTHER ASSOCIATED CONDITIONS

	2004		2009		2014	
Macrosomia	3	18.8%	2	3.0%	8	5.6%
Postpartum haemorrhage*	1	6.3%	8	11.9%	39	27.3%
Rupture of uterus	0	0.0%	0	0.0%	0	0.0%
Hysterectomy	0	0.0%	0	0.0%	1	0.7%
Maternal collapse	-	-	-	-	0	0.0%
Maternal death	0	0.0%	0	0.0%	1	0.7%

*Post-partum haemorrhage was defined as blood loss > 500 ml within 24 hours of delivery before 2014 and > 500 ml following vaginal delivery and > 1,000 ml following Caesarean delivery in 2014.

UTERINE RUPTURE

The incidence of uterine rupture remained low and only 2 cases were reported in 2014 (0.003%), compared to 5-6 cases in previous audits. Both cases were associated with previous uterine scar. Labour was spontaneous in one case and induced in the other. Both cases delivered by Caesarean section with blood loss 500-1000 ml and none required a hysterectomy. There was no maternal or perinatal death.

	2004		2009		2014	
TOTAL INCIDENCE	5	0.01%	6	0.01%	2	0.003%
Nulliparous	3	60.0%	1	16.7%	0	0.0%
Multiparous	2	40.0%	5	83.3%	2	100.0%

ASSOCIATED CONDITIONS

	2004		2009		2014	
Previous uterine scar	2	40.0%	5	83.3%	2	100.0%
Postpartum haemorrhage*	1	20.0%	4	66.7%	2	100.0%
Vaginal delivery (> 500 ml)	-	-	-	-	0	0.0%
Caesarean delivery (> 1,000 ml)	-	-	-	-	0	0.0%
Hysterectomy	0	0.0%	0	0.0%	0	0.0%
Maternal collapse	-	-	-	-	0	0.0%
Maternal death	0	0.0%	0	0.0%	0	0.0%

*Post-partum haemorrhage was defined as blood loss > 500 ml within 24 hours of delivery before 2014 and > 500 ml following vaginal delivery and > 1,000 ml following Caesarean delivery in 2014.

MODE OF ONSET OF LABOUR

	2004		2009		2014	
Spontaneous	3	60.0%	3	50.0%	1	50.0%
Induced labour	2	40.0%	0	0.0%	1	50.0%
No labour	0	0.0%	3	50.0%	0	0.0%

AUGMENTATION OF LABOUR

	2004		2009		2014	
Augmented labour	1	20.0%	0	0.0%	0	0.0%

MODE OF DELIVERY

	2004		2009		2014	
Vacuum extraction	1	20.0%	0	0.0%	0	0.0%
Forceps delivery	0	0.0%	0	0.0%	0	0.0%
Caesarean section	4	80.0%	6	100%	2	100.0%
Others/Unknown	0	0.0%	0	0.0%	0	0.0%

FETAL OUTCOME

	2004		2009		2014	
Alive at 28 days	5	100.0%	6	100%	2	100.0%
Stillbirth	0	0.0%	0	0.0%	0	0.0%
Neonatal death	0	0.0%	0	0.0%	0	0.0%

HYSTERECTOMY

The incidence of hysterectomy after delivery was similar at 0.03% to 0.05%. The risk of hysterectomy was associated with the presence of placenta praevia or previous uterine scar in 43.5% cases. Majority of the hysterectomy (80%) were preceded by Caesarean section and this was similar to the previous audits. Uterine balloon and compression suture had replaced internal iliac artery ligation and uterine artery embolisation in the management of such cases. There was one maternal death in 2004, but none in the 2009 and 2014.

	2004		2009		2014	
TOTAL INCIDENCE	21	0.04%	40	0.05%	23	0.03%
<i>Nulliparous</i>	4	19.0%	5	12.5%	6	26.1%
<i>Multiparous</i>	17	81.0%	35	87.5%	17	73.9%

ASSOCIATED CONDITIONS

	2004		2009		2014	
Previous uterine scar	6	28.6%	21	52.5%	10	43.5%
Previous Non-CS uterine scar	-	-	-	-	5	21.7%
Antepartum haemorrhage	9	42.9%	14	35.0%	10	43.5%
<i>Placenta praevia</i>	9	100%	12	85.7%	10	100.0%
<i>Unknown origin</i>	0	0.0%	2	14.3%	0	0.0%
<i>Placental abruptio</i>	0	0.0%	0	0.0%	0	0.0%
Postpartum haemorrhage*	11	52.4%	35	87.5%	20	87.0%
<i>Vaginal delivery (> 500 ml)</i>	-	-	-	-	4	17.4%
<i>Caesarean delivery (> 1,000 ml)</i>	-	-	-	-	16	69.6%
Blood transfusion	-	-	14	35.0%	10	43.5%
<i>Vaginal delivery</i>	-	-	2	40.0%	2	50.0%
<i>Caesarean section</i>	-	-	12	40.0%	8	42.1%
Internal iliac artery ligation	2	9.5%	2	4.8%	0	0.0%
Uterine artery embolisation	0	0.0%	8	19.0%	0	0.0%
Uterine compression suture	-	-	-	-	5	21.7%
Uterine balloon tamponade	-	-	-	-	6	26.1%
Uterine rupture	0	0.0%	0	0.0%	0	0.0%
Maternal collapse	-	-	-	-	1	4.3%
Maternal death	1	4.2%	0	0.0%	1	4.3%

*Post-partum haemorrhage was defined as blood loss > 500 ml within 24 hours of delivery before 2014 and > 500 ml following vaginal delivery and > 1,000 ml following Caesarean delivery in 2014.

MODE OF ONSET OF LABOUR

	2004		2009		2014	
Spontaneous	7	33.3%	10	25.0%	2	8.7%
Induced labour	3	14.3%	6	15.0%	3	13%
No labour	11	52.4%	24	60.0%	18	78.3%

AUGMENTATION OF LABOUR

	2004		2009		2014	
Augmented labour	2	9.5%	6	15.0%	0	0.0%

MODE OF DELIVERY

	2004		2009		2014	
Vaginal delivery	3	14.3%	5	12.5%	4	16.0%
<i>Spontaneous</i>	3	12.5%	4	10.0%	1	4.0%
<i>Vacuum extraction</i>	0	0.0%	1	2.5%	1	4.0%
<i>Forceps delivery</i>	0	0.0%	0	0.0%	2	8.0%
Caesarean delivery	18	85.7%	30	75.0%	20	80.0%
<i>LSCS before labour</i>	8	38.1%	10	25.0%	12	48.0%
<i>LSCS after labour</i>	7	33.3%	13	32.5%	1	4.0%
<i>Classical Caesarean section</i>	3	14.3%	7	17.5%	7	28.0%
<i>Others</i>	-	-	5	12.5%	1	4.0%

FETAL OUTCOME

	2004		2009		2014	
Alive at 28 days	23	95.8%	42	100%	25	100.0%
Stillbirth	1	4.2%	0	0.0%	0	0.0%
Neonatal death	0	0.0%	0	0.0%	0	0.0%

INFORMATION ABOUT BABY

DISTRIBUTION OF GESTATIONAL AGE AT DELIVERY AND THE RESPECTIVE MEAN BIRTH WEIGHTS

The mean birth weight for all babies in 2014 was 3043 (SD 618) gm and that of all term babies (≥ 37 weeks) was 3107 (SD 566) gm, both were similar to the previous audits. The mean birth weight for all singleton term babies was 3115 (SD 565) gm. The mean birth weight increased with gestation except beyond 41 weeks and the magnitude of increase was largest between 32 and 37 weeks.

MEAN BIRTH WEIGHT (gms)

	2004	2009	2014
All babies	3167 \pm 493	3149 \pm 471	3043 \pm 618
All term babies	3231 \pm 412	3156 \pm 453	3107 \pm 566
All singleton babies	3238 \pm 407	3173 \pm 448	3064 \pm 606

BIRTHWEIGHT BY GESTATION (gms)

Gestation in weeks	2004			2009			2014		
	No.	% of total deliveries	Mean birth weight (gm)	No.	% of total deliveries	Mean birth weight (gm)	No.	% of total deliveries	Mean birth weight (gm)
> 42	244	0.49%	3280	46	0.06%	3267	10	0.02%	3056
42	430	0.87%	3434	165	0.20%	3409	24	0.04%	3291
41	4800	9.67%	3455	5031	6.22%	3449	3636	6.01%	3392
40	10468	21.08%	3362	14007	17.31%	3357	11243	18.58%	3280
39	13053	26.29%	3245	20063	24.80%	3243	15709	25.97%	3158
38	11942	24.05%	3124	25347	31.33%	3138	18977	31.37%	3005
37	4972	10.01%	2938	10386	12.84%	2967	5922	9.79%	2803
36	1526	3.07%	2723	2606	3.22%	2718	1758	2.91%	2561
35	696	1.40%	2464	1076	1.33%	2481	794	1.31%	2402
34	415	0.84%	2262	646	0.80%	2251	574	0.95%	2168
33	238	0.48%	2046	314	0.39%	1984	325	0.54%	1945
32	177	0.36%	1867	223	0.28%	1773	222	0.37%	1770
31	111	0.22%	1632	143	0.18%	1669	151	0.25%	1610
30	98	0.20%	1562	117	0.14%	1495	101	0.17%	1480
29	63	0.13%	1308	82	0.10%	1390	74	0.12%	1312
28	64	0.13%	1234	50	0.06%	1348	72	0.12%	1235
27	50	0.10%	1091	59	0.07%	962	58	0.10%	932
26	47	0.09%	941	28	0.03%	776	60	0.10%	822
< 26	84	0.17%	1001	108	0.13%	682	84	0.14%	649
Missing	178	0.36%		411	0.51%		702	1.16%	

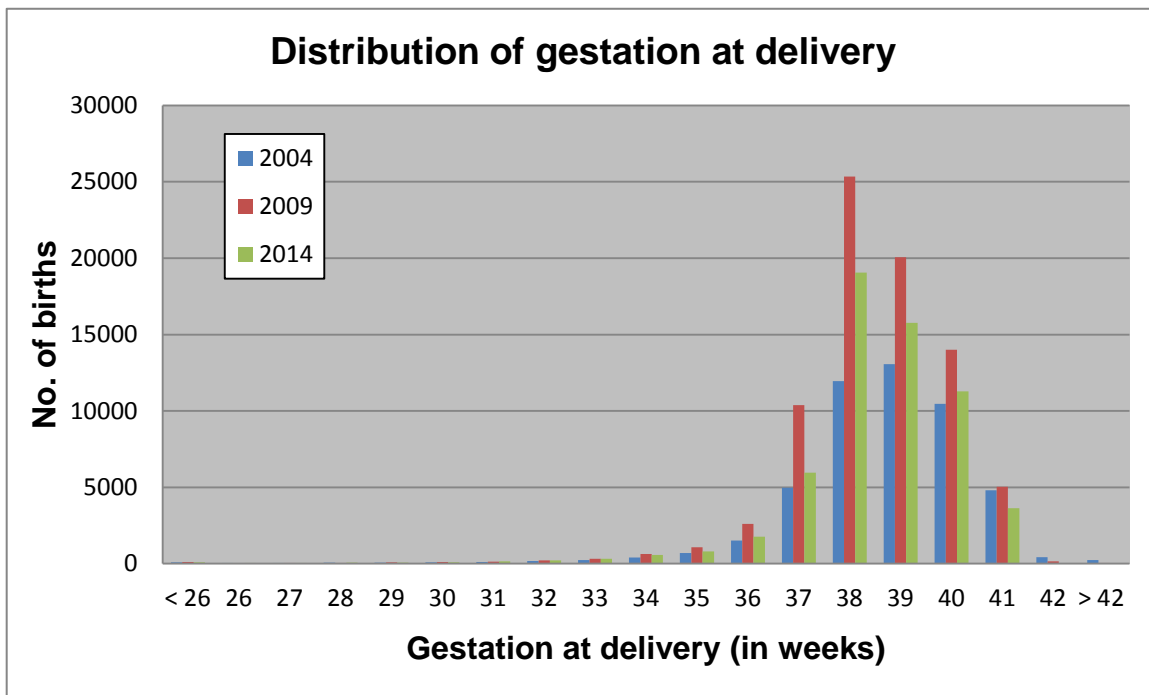


Figure O8 – Distribution of gestation at delivery

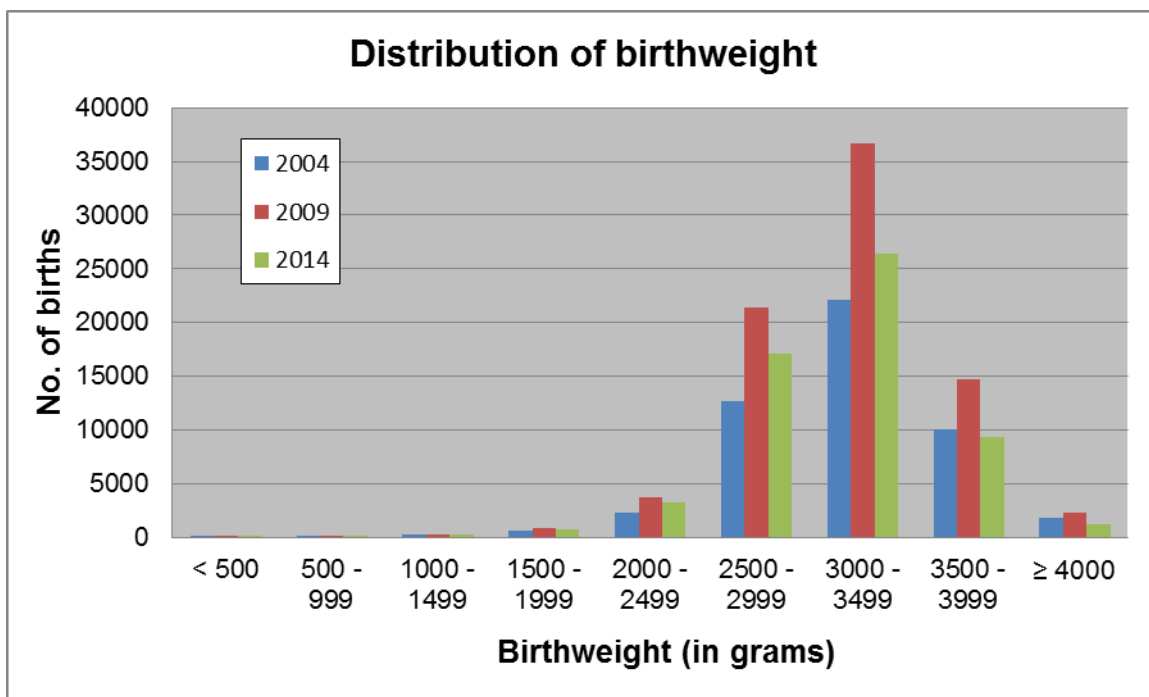


Figure O9 – Distribution of birth weight at delivery

FETAL OUTCOME WITH RESPECT TO GESTATION

As in previous audits, more than 99% of those babies born ≥ 33 weeks survived for at least 28 days. For those born < 26 weeks, survival rate increased from 59.6% to 67.4%, stillbirth rate decreased from 16.7% to 7.6%, and neonatal death rate remained at 23-25% over the past 10 years

	2004		2009		2014	
Alive at 28 days						
≥ 42 weeks	672	99.9%	211	100.0%	34	100.0%
37 - 41 weeks	45220	99.9%	74773	99.9%	55633	99.9%
33 - 36 weeks	2849	99.8%	4595	99.8%	3426	99.1%
29 - 32 weeks	424	98.3%	525	98.5%	516	94.0%
26 - 28 weeks	127	92.0%	106	93.0%	156	82.1%
< 26 weeks	50	71.4%	62	69.7%	42	64.6%
Stillbirth						
≥ 42 weeks	1	0.1%	0	0.0%	0	0.0%
37 - 41 weeks	36	0.1%	38	0.05%	51	0.09%
33 - 36 weeks	24	0.8%	36	0.8%	28	0.8%
29 - 32 weeks	18	4.0%	32	5.7%	27	4.9%
26 - 28 weeks	23	14.3%	23	16.8%	25	13.2%
< 26 weeks	14	16.7%	19	17.6%	7	7.6%
Neonatal death						
≥ 42 weeks	1	0.1%	0	0.0%	0	0.0%
37 - 41 weeks	15	0.03%	23	0.03%	16	0.03%
33 - 36 weeks	7	0.2%	11	0.2%	5	0.1%
29 - 32 weeks	7	1.6%	8	1.5%	6	1.1%
26 - 28 weeks	11	8.0%	8	7.0%	9	4.7%
< 26 weeks	20	28.6%	27	30.3%	23	35.4%

Missing data on gestation in 137 (0.3%) in 2004, 411 (0.5%) in 2009 and 492 (0.8% in 2014)

SURVIVAL RATES WITH RESPECT TO BIRTH WEIGHTS

Over the past 10 years, the survival rate, stillbirth rate and neonatal death rate all varied widely when birthweight < 500 gm, otherwise it was very similar in the other birthweight group. Overall the survival rate in live births with birth weight < 1 kg increased from 79.2% in 2004 and 80.2% in 2009 to 84.9% in 2014 irrespective of any major congenital anomalies. For those live births with birth weight between 1000-1499 gm, the survival rate was 97.7%, whereas for those with birthweight \geq 1.5 kg, the survival rate was 99.9%.

BORN ALIVE

	2004		2009		2014	
	Total	Survived 28D	Total	Survived 28D	Total	Survived 28D
< 500 gm	9	4 (44.4%)	28	22 (78.6%)	15	12 (80.0%)
500 - 999 gm	135	110 (81.5%)	139	112 (80.6%)	164	140 (85.4%)
1000 - 1499 gm	229	224 (97.8%)	296	286 (96.6%)	308	301 (97.7%)
1500 - 1999 gm	564	559 (99.1%)	803	800 (99.6%)	760	757 (99.6%)
2000 - 2499 gm	2250	2242 (99.6%)	3733	3725 (99.8%)	3299	3293 (99.8%)
2500 - 2999 gm	12726	12720 (99.9%)	21430	21419 (99.9%)	17117	17109 (99.9%)
3000 - 3499 gm	22061	22057 (99.9%)	36737	36729 (99.9%)	26383	26376 (99.9%)
3500 - 3999 gm	9666	9664 (99.9%)	14723	14721 (99.9%)	9293	9292 (99.9%)
\geq 4000 gm	1784	1783 (99.9%)	2262	2260 (99.9%)	1193	1193 (100.0%)
Total	49424	49363 (99.9%)	80151	80074 (99.9%)	58532	58473 (99.9%)

Missing data on birth weight in 115 (0.2%) in 2004, 610 (0.75%) in 2009 and 1825 (3.0%) in 2014

Survived 28D = Survived at 28 days

BORN ALIVE WITHOUT MAJOR ANOMALIES

	2004		2009		2014	
	Total	Survived 28D	Total	Survived 28D	Total	Survived 28D
< 500 gm	9	4 (44.4%)	27	21 (77.8%)	15	12 (80.0%)
500 - 999 gm	134	110 (82.1%)	137	111 (81.0%)	159	136 (85.5%)
1000 - 1499 gm	226	223 (98.7%)	292	285 (97.6%)	298	291 (97.7%)
1500 - 1999 gm	558	556 (99.6%)	799	797 (99.7%)	755	753 (99.7%)
2000 - 2499 gm	2225	2220 (99.8%)	3711	3706 (99.9%)	3281	3276 (99.8%)
2500 - 2999 gm	12670	12666 (99.9%)	21372	21364 (99.9%)	17065	17059 (99.9%)
3000 - 3499 gm	21967	21965 (99.9%)	36668	36661 (99.9%)	26319	26312 (99.9%)
3500 - 3999 gm	9628	9628 (100.0%)	14693	14691 (99.9%)	9263	9262 (99.9%)
\geq 4000 gm	1773	1772 (99.9%)	2255	2253 (99.9%)	1189	1189 (100.0%)
Total	49190	49144 (99.9%)	79954	79889 (99.9%)	58344	58290 (99.9%)

Missing data on birth weight in 115 (0.2%) in 2004, 610 (0.75%) in 2009 and 1825 (3.0%) in 2014

Survived 28D = Survived at 28 days

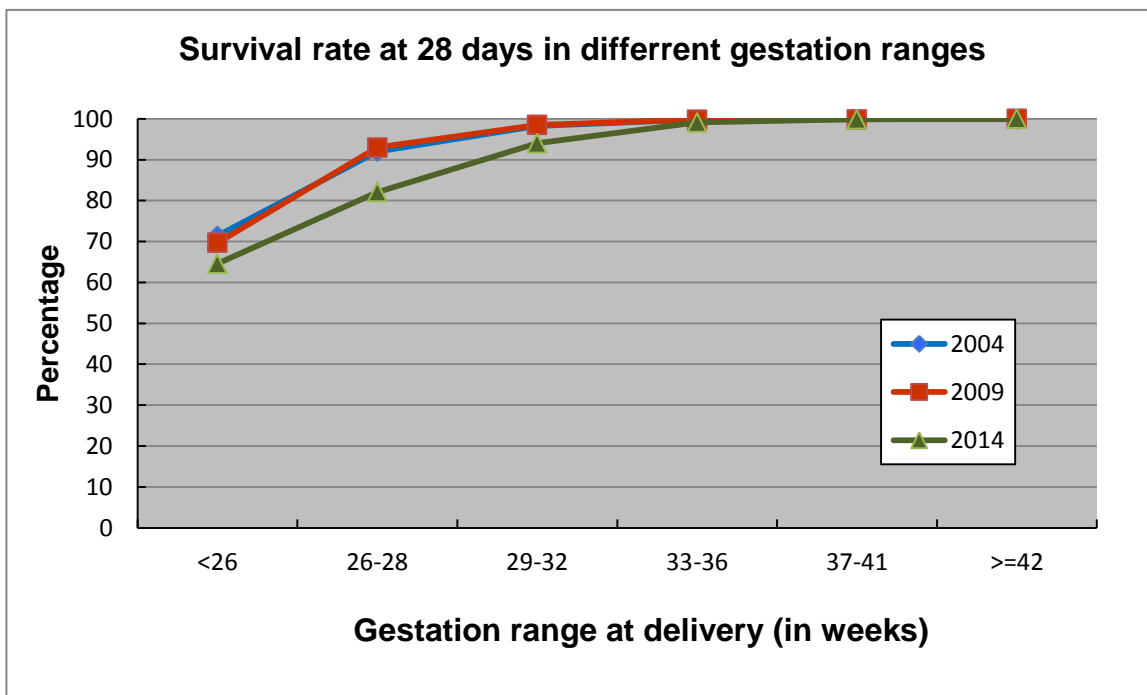


Figure O10 – Survival rate at 28 days of all live births in different gestation ranges

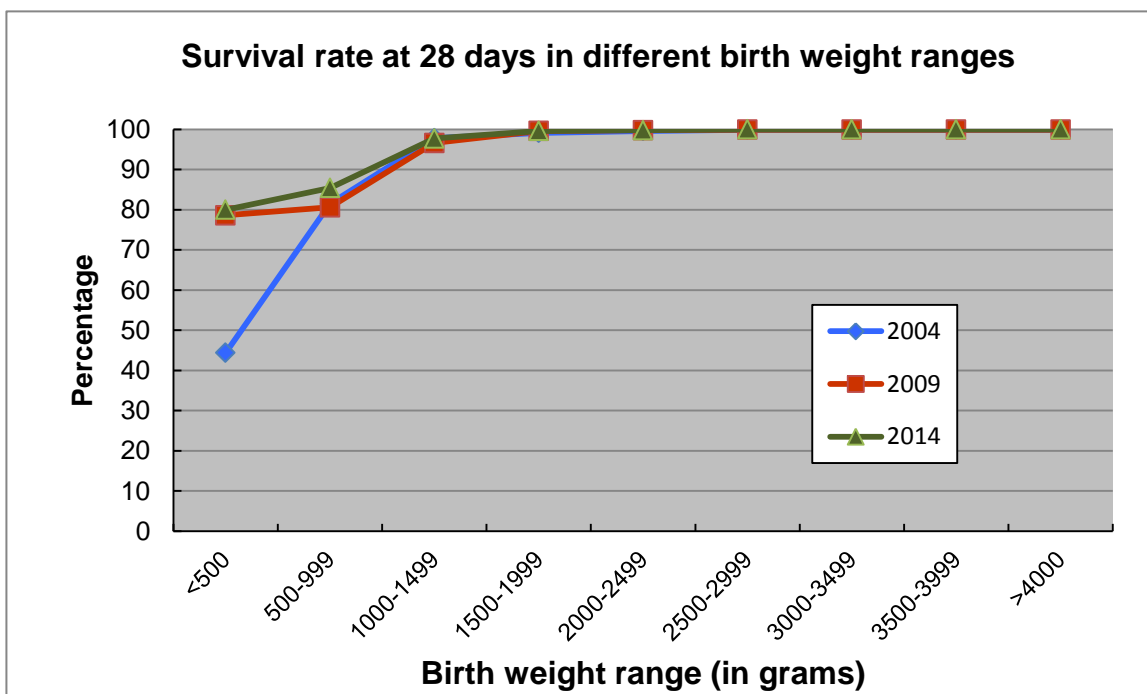


Figure O11 – Survival rate at 28 days of all live births in different birth weight ranges

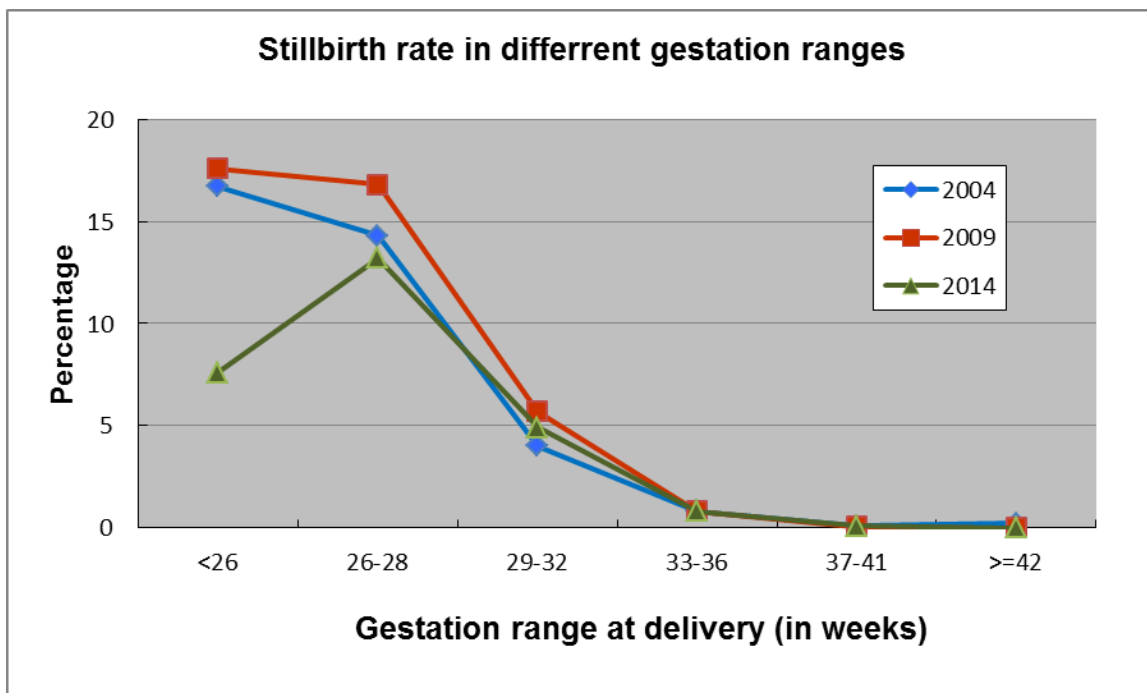


Figure O12 – Stillbirth rate of all births in different gestation ranges

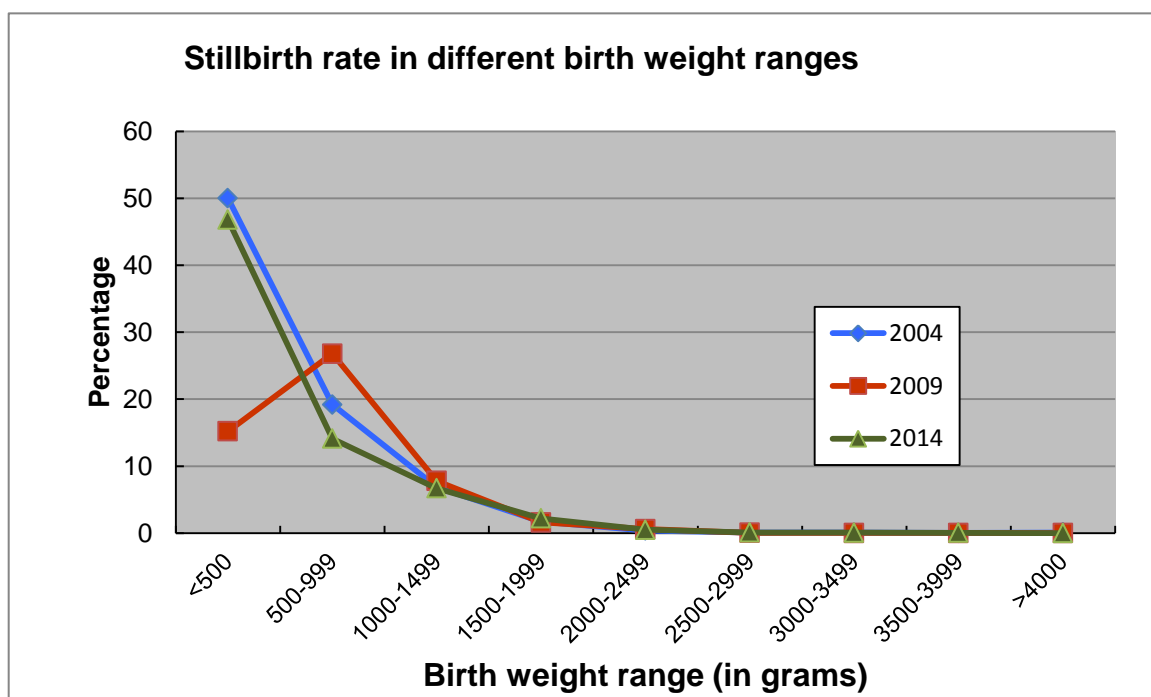


Figure O13 – Stillbirth rate of all births in different birth weight ranges

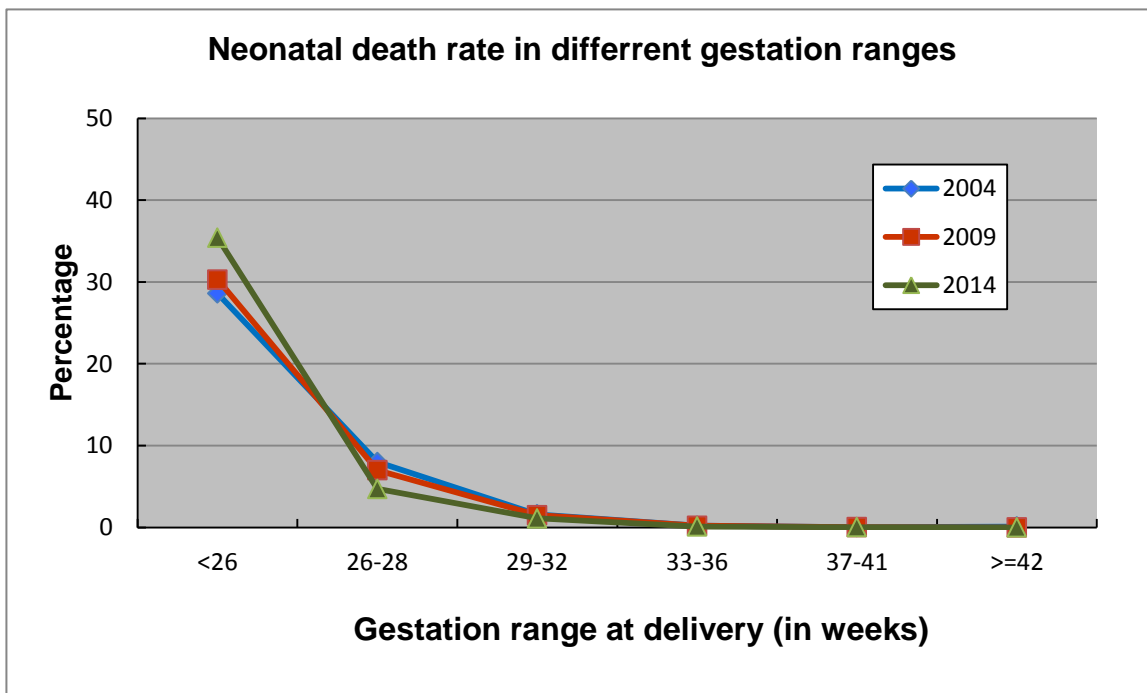


Figure O14 – Neonatal death rate of all live births in different gestation ranges

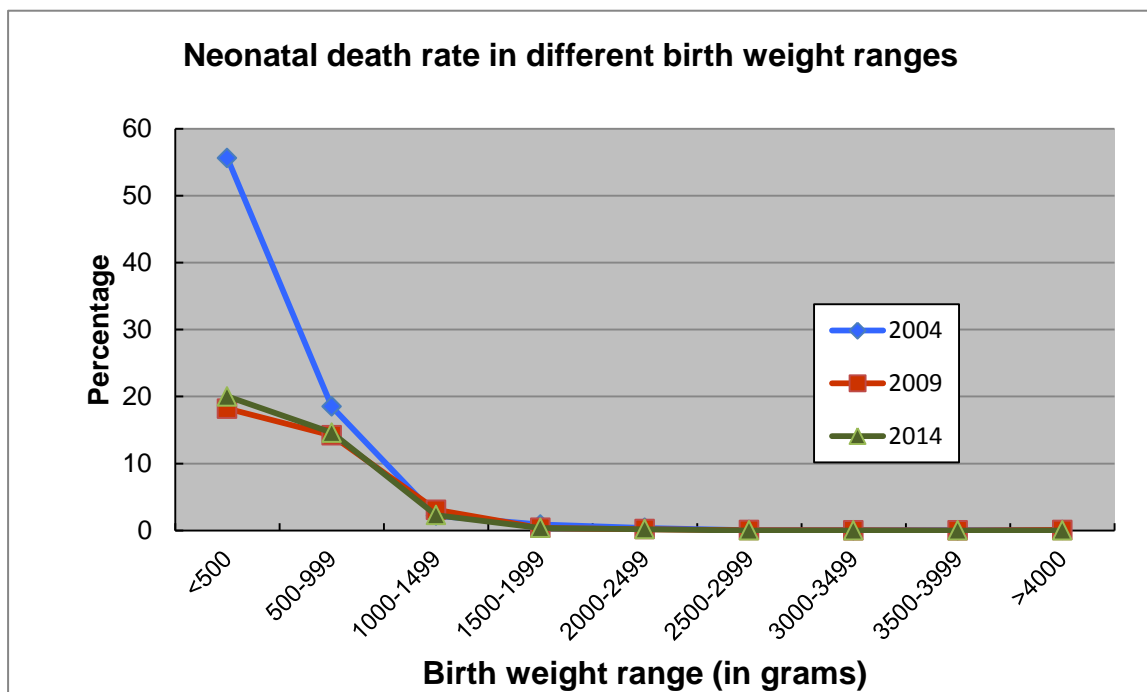


Figure O15 – Neonatal death rate of all live births in different birth weight ranges

INFANTS BORN WITH CONGENITAL ANOMALIES

Congenital anomaly was reported only if it was of major significance and apparent at or soon after birth. The overall incidence decreased from 0.5% in 2004 to 0.3% in 2009 and 2014. This might be related to the implementation and improved availability of routine morphology scan, However the possibility of under-reporting could not be excluded. Maternal age of 35 years or more, which constituted 43.4% (24.2% in 2004 and 31.6% in 2009) of all the parturients, was associated with 55.6% of the cases. The corresponding figures were 27.8% in 2004 and 37.3% in 2009.

The rates of preterm delivery (< 37 weeks) and low birth weight (< 2500 gm) were 20.1% and 22.8% respectively. The corresponding rates were 12.8% and 16.2% in 2004, and 19.2% for both in 2009. The preterm delivery and low birth rates were significantly higher than the overall rates which were 6.5% and 7.5% respectively. The stillbirth rate was 0.5% and the neonatal death rate was 2.6%. Both figures were lower compared with previous audits for this specific group of babies.

	2004		2009		2014	
TOTAL INCIDENCE	241	0.5%	204	0.3%	194	0.3%
<i>Singleton</i>	234	97.1%	192	94.1%	181	96.9%
<i>Multiple</i>	7	2.9%	12	5.9%	13	3.1%

PARITY OF THE PATURIENTS

	2004		2009		2014	
Nulliparous	145	60.2%	98	48%	110	56.7%
Multiparous	96	39.8%	106	52%	84	43.3%

AGE OF THR PATURIENS

	2004		2009		2014	
< 20 years old	2	0.8%	0	0.0%	1	0.5%
20 - 24 years	19	8.0%	7	3.4%	7	3.6%
25 - 29 years	60	24.9%	54	26.5%	19	9.8%
30 - 34years	93	38.6%	67	32.8%	59	30.4%
35 - 39 years	48	19.9%	65	31.9%	73	37.6%
≥ 40 years	13	5.4%	9	4.4%	34	17.5%
Unknown	6	2.5%	2	1.0%	1	0.5%

ANTENATAL COMPLICATIONS

	2004		2009		2014	
Anaemia	14	5.8%	6	2.9%	6	3.1%
Hypertension	8	3.3%	10	4.9%	17	8.8%
Antepartum haemorrhage	8	3.3%	6	2.9%	11	5.6%
Diabetes mellitus (including IGT)	14	5.8%	21	10.3%	32	16.5%
Cardiac disease	2	0.8%	2	1.0%	1	0.5%
Other medical/surgical diseases	10	4.1%	12	5.9%	16	8.2%

MODE OF ONSET OF LABOUR

	2004		2009		2014	
Spontaneous	136	56.4%	93	45.6%	82	42.3%
Induced labour	49	20.3%	39	19.1%	46	23.7%
No labour	56	23.2%	72	35.3%	66	34.0%

STATUS OF AMNIOTIC FLUID DURING LABOUR

	2014	
Clear liquor	164	84.5%
Meconium stained liquor	27	13.9%
<i>Mild</i>	15	7.7%
<i>Moderate</i>	11	5.7%
<i>Severe</i>	1	0.5%
Blood stained liquor	2	1.0%
No liquor	1	0.5%

PRESENTATION AND LIE AT DELIVERY

	2004		2009		2014	
Vertex	218	90.5%	189	92.6%	182	93.8%
Breech	18	7.5%	13	6.4%	11	5.7%
Oblique	0	0.0%	1	0.5%	0	0.0%
Face	1	0.4%	0	0.0%	0	0.0%
Transverse	2	0.8%	0	0.0%	1	0.5%
Others	2	0.8%	1	0.5%	0	0.0%
Unknown	0	0.0%	0	0.0%	0	0.0%

MODE OF DELIVERY FOR EACH BABY

	2004		2009		2014	
Spontaneous vertex delivery	138	57.3%	94	46.1%	81	41.8%
Vacuum extraction	16	6.6%	12	5.9%	17	8.8%
Forceps delivery	1	0.4%	2	1.0%	1	0.5%
Vaginal breech delivery	2	0.8%	3	1.5%	1	0.5%
LSCS before labour	55	22.8%	71	34.8%	66	34.0%
LSCS after labour	29	12.0%	21	10.3%	28	14.4%
Classical CS	-	-	1	0.5%	0	0.0%

GESTATION AT DELIVERY (in completed weeks)

	2004		2009		2014	
< 26 weeks	0	0.0%	2	1.0%	4	2.1%
26 - 28 weeks	4	1.7%	3	1.5%	1	0.5%
29 - 32 weeks	5	2.1%	11	5.4%	9	4.6%
33 - 36 weeks	22	9.1%	23	11.3%	25	12.9%
37 - 41 weeks	209	86.7%	165	80.9%	155	79.9%
> 41 weeks	1	0.4%	0	0.0%	0	0.0%

BIRTH WEIGHT AT DELIVERY (in grams)

	2004		2009		2014	
< 500 gm	0	0.0%	1	0.5%	5	2.6%
500 - 999 gm	4	1.7%	2	1.0%	5	2.6%
1000 - 1499 gm	3	1.2%	9	4.4%	11	5.7%
1500 - 1999 gm	7	2.9%	5	2.5%	5	2.6%
2000 - 2499 gm	25	10.4%	22	10.8%	18	9.3%
2500 - 2999 gm	58	24.0%	59	28.9%	52	26.8%
3000 - 3499 gm	94	39.0%	69	33.8%	63	32.5%
2500 – 3999	39	16.2%	30	14.7%	30	15.5%
≥ 4000 gm	11	4.6%	7	3.4%	4	2.1%
Unknown	0	0.0%	0	0.0%	1	0.5%

FETAL OUTCOME

	2004		2009		2014	
Alive at 28 days	219	90.9%	185	90.7%	188	96.9%
Stillbirths	7	2.9%	7	3.4%	1	0.5%
<i>Antepartum</i>	3	1.2%	6	2.9%	1	0.5%
<i>Intrapartum</i>	2	0.8%	1	0.5%	0	0.0%
<i>Undetermined</i>	2	0.8%	0	0.0%	0	0.0%
Neonatal deaths	15	6.2%	12	5.9%	5	2.6%
<i>Early</i>	15	6.2%	12	5.9%	5	2.6%
<i>Late</i>	0	0.0%	0	0.0%	0	0.0%

ASPHYXIA NEONATORUM

	2004		2009		2014	
Apgar score at 1 minute						
0 – 3	16	6.6%	8	4.0%	10	5.1%
4 – 6	14	5.8%	7	3.5%	16	8.3%
Apgar score at 5 minutes s						
0 – 3	10	4.1%	5	2.5%	4	2.0%
4 – 6	7	2.9%	2	1.0%	5	2.5%

OTHER NEONATAL COMPLICATIONS

	2004		2009		2014	
Admission to neonatal ICU	136	56.4%	94	46.1%	78	40.2%
Major infection	0	0.0%	2	1.0%	2	1.0%
Respiratory distress syndrome	2	0.8%	2	1.0%	6	3.1%
Intraventricular haemorrhage	1	0.4%	1	0.5%	4	2.1%
Necrotising enterocolitis	1	0.4%	1	0.5%	0	0.0%
Birth trauma	2	0.8%	2	1.0%	1	0.5%

BIRTH ASPHYXIA

The Apgar score was less than 7 at 1 and 5 minutes in 2.3% and 0.6% of babies respectively. Compared with previous audits, the incidence of low Apgar score was fluctuating at 1 minute (3.1% in 2004 and 1.6% in 2009) but similar at 5 minutes (0.4% in 2004 and 0.3% in 2009). Similar to previous audits, the incidence of low Apgar score was highest in those with vaginal breech delivery. The incidence of very low Apgar score (<4) was 21.1% at 1 minute and 6.8% at 5 minutes, these were lower than the corresponding incidences in previous audits (29.1% and 25.2% in 2004, and 16.8% and 12.4% in 2009).

	2004		2009		2014	
Apgar score at 1 minute						
0 – 3	250	0.5%	243	0.3%	301	0.5%
4 – 6	1298	2.6%	1088	1.3%	1110	1.8%
Apgar score at 5 minutes						
0 – 3	120	0.2%	138	0.2%	157	0.3%
4 – 6	123	0.2%	112	0.1%	157	0.3%

LOW APGAR SCORE AND MODE OF DELIVERY

APGAR SCORE <4 AT 1 MINUTE

	2004		2009		2014	
Spontaneous vertex delivery	89	0.3%	96	0.2%	104	0.3%
Vacuum extraction	24	0.5 %	19	0.3%	25	0.6%
Forceps delivery	3	0.6%	2	0.5%	9	1.3%
Vaginal breech delivery	30	29.1%	27	16.8%	31	21.1%
LSCS before labour	55	0.6%	48	0.2%	72	0.5%
LSCS after labour	43	0.7%	43	0.4%	48	0.5%
Classical Caesarean section	6	10.2%	6	2.6%	12	8.3%
Others/unknown	0	0.0%	2	5.0%	0	0.0%

APGAR SCORE 4-6 AT 1 MINUTE

	2004		2009		2014	
Spontaneous vertex delivery	369	1.3%	224	0.6%	243	0.8%
Vacuum extraction	214	4.4%	179	2.4%	153	3.5%
Forceps delivery	18	3.9%	14	3.8%	25	3.7%
Vaginal breech delivery	24	23.3%	27	16.8%	30	20.5%
LSCS before labour	289	3.2%	307	1.2%	352	2.5%
LSCS after labour	368	5.8%	308	3.2%	276	3.1%
Classical Caesarean section	15	25.4%	28	11.9%	31	21.5%
Others/unknown	1	100.0%	1	2.5%	0	0.0%

APGAR SCORE <4 AT 5 MINUTES

	2004		2009		2014	
Spontaneous vertex delivery	63	0.2%	83	0.2%	79	0.2%
Vacuum extraction	4	0.1%	3	0.04%	7	0.2%
Forceps delivery	3	0.6%	1	0.3%	2	0.3%
Vaginal breech delivery	26	25.2%	20	12.4%	10	6.8%
LSCS before labour	15	0.2%	19	0.1%	27	0.2%
LSCS after labour	7	0.1%	10	0.1%	15	0.2%
Classical Caesarean section	2	3.4%	0	0.0%	3	2.1%
Others/unknown	0	0.0%	2	5.0%	0	0.0%

APGAR SCORE 4-6 AT 5 MINUTES

	2004		2009		2014	
Spontaneous vertex delivery	33	0.1%	28	0.1%	36	0.1%
Vacuum extraction	19	0.4%	17	0.2%	13	0.3%
Forceps delivery	1	0.2%	1	0.3%	0	0.0%
Vaginal breech delivery	4	3.9%	5	3.1%	10	6.8%
LSCS before labour	29	0.3%	25	0.1%	55	0.4%
LSCS after labour	35	0.6%	30	0.3%	34	0.4%
Classical Caesarean section	2	3.4%	6	2.6%	9	6.3%
Others/unknown	0	0.0%	0	0.0%	0	0.0%

LOW APGAR SCORE AND STATUS OF AMNIOTIC FLUID DURING LABOUR

APGAR SCORE <4 AT 1 MINUTE

	2014	
Clear liquor	199	53.4%
Meconium stained liquor	72	19.3%
<i>Mild</i>	29	7.8%
<i>Moderate</i>	16	4.3%
<i>Severe</i>	27	7.2%
Blood stained liquor	21	5.6%
No liquor	9	2.4%

APGAR SCORE 4-6 AT 1 MINUTE

	2014	
Clear liquor	836	62.8%
Meconium stained liquor	222	16.7%
<i>Mild</i>	89	6.7%
<i>Moderate</i>	67	5.0%
<i>Severe</i>	66	5.0%
Blood stained liquor	45	3.4%
No liquor	7	0.5%

APGAR SCORE <4 AT 5 MINUTE

	2014	
Clear liquor	101	52.3%
Meconium stained liquor	36	18.7%
<i>Mild</i>	18	9.3%
<i>Moderate</i>	7	3.6%
<i>Severe</i>	11	5.7%
Blood stained liquor	13	6.7%
No liquor	7	3.6%

APGAR SCORE 4-6 AT 5 MINUTE

	2014	
Clear liquor	114	61.6%
Meconium stained liquor	28	15.1%
<i>Mild</i>	14	7.6%
<i>Moderate</i>	7	3.8%
<i>Severe</i>	7	3.8%
Blood stained liquor	12	6.5%
No liquor	3	1.6%

LOW APGAR SCORE AND FETAL OUTCOME

APGAR SCORE <4 AT 1 MINUTE

	2004		2009		2014	
Alive at 28 days	138	55.6%	119	49.0%	195	64.8%
Stillbirths	87	35.1%	99	40.7%	102	33.9%
<i>Antepartum</i>	63	25.4%	84	34.6%	71	23.6%
<i>Intrapartum</i>	4	1.6%	3	1.2%	10	3.3%
<i>Unknown</i>	20	8.1%	12	4.9%	21	7.0%
Neonatal deaths	23	9.3%	25	10.3%	4	1.3%
<i>Early</i>	23	9.3%	25	10.3%	4	1.3%
<i>Late</i>	2	0.8%	0	0.0%	0	0.0%

APGAR SCORE 4-6 AT 1 MINUTE

	2004		2009		2014	
Alive at 28 days	1279	98.8%	1054	97.4%	1091	98.6%
Stillbirths	0	0.0%	0	0.0%	0	0.0%
<i>Antepartum</i>	0	0.0%	0	0.0%	0	0.0%
<i>Intrapartum</i>	0	0.0%	0	0.0%	0	0.0%
<i>Unknown</i>	0	0.0%	0	0.0%	0	0.0%
Neonatal deaths	19	1.5%	34	3.1%	19	1.7%
<i>Early</i>	15	1.2%	28	2.6%	16	1.4%
<i>Late</i>	4	0.3%	6	0.6%	3	0.3%

APGAR SCORE <4 AT 5 MINUTE

	2004		2009		2014	
Alive at 28 days	16	13.6%	11	9.0%	58	37.4%
Stillbirths	87	73.7%	99	81.1%	80	51.6%
<i>Antepartum</i>	63	53.4%	84	68.9%	70	45.2%
<i>Intrapartum</i>	4	3.4	3	2.5%	0	0.0%
<i>Unknown</i>	20	17.0%	12	9.8%	10	6.5%
Neonatal deaths	17	14.4%	12	9.8%	19	12.3%
<i>Early</i>	15	12.7%	12	9.8%	17	11.0%
<i>Late</i>	2	1.7%	0	0.0%	2	1.3%

APGAR SCORE 4-6 AT 5 MINUTE

	2004		2009		2014	
Alive at 28 days	111	90.2%	94	84.7%	143	92.3%
Stillbirths	0	0.0%	1	0.9%	0	0.0%
<i>Antepartum</i>	0	0.0%	1	0.9%	0	0.0%
<i>Intrapartum</i>	0	0.0%	0	0.0%	0	0.0%
<i>Unknown</i>	0	0.0%	0	0.0%	0	0.0%
Neonatal deaths	12	9.8%	17	15.3%	14	9.0%
<i>Early</i>	12	9.8%	16	14.4%	12	7.7%
<i>Late</i>	0	0.0%	1	0.9%	2	1.3%

BIRTH TRAUMA

The incidence of birth trauma decreased from 0.4% in 2004 and, 0.3% in 2009 to 0.1% in 2014. However, possibility of under-reporting could not be excluded as some of the birth trauma might not be apparent soon at birth. As in previous audits, the commonest types of birth trauma were cephalohaematoma, fractures and soft tissue trauma. The absolute number of birth trauma in spontaneous vertex delivery dropped significantly in 2014 with the actual risk decreased from 0.38% in 2004 and 0.33% in 2009 to 0.13% in 2014. Caesarean section was associated with the lowest risk of birth trauma and the rate dropped from 0.11% in 2004 and 0.10% in 2009 to 0.06% in 2014. Birth trauma was more common after assisted vaginal deliveries with the rate of 0.60% in forceps delivery and 0.46% in vacuum extraction, compared to 1.94% and 1.20% in 2004, and 1.34% and 0.87% in 2009 respectively. There was no birth trauma reported following vaginal breech delivery since 2004.

	2004		2009		2014	
TOTAL INCIDENCE	194	0.4%	229	0.3%	78	0.1%
<i>Singleton</i>	193	99.5%	227	99.1%	77	98.7%
<i>Multiple</i>	1	0.5%	2	0.9%	1	1.3%

CLASSIFICATION OF BIRTH TRAUMA (might be more than 1 for each baby)

	2004		2009		2014	
Cephalhaematoma	120	61.9%	82	35.8%	15	19.2%
Fractures	59	30.4%	104	45.4%	52	66.7%
Soft tissue trauma	9	4.6%	19	8.3%	8	10.3%
Nerve injury	9	4.6%	12	5.2%	1	1.3%
Subaponeurotic haemorrhage	5	2.6%	8	7.9%	1	1.3%
Intracranial haemorrhage	1	0.5%	3	1.3%	1	1.3%
Visceral injury	0	0.0%	1	0.4%	0	0.0%

PARITY OF THE PARTURIENTS

	2004		2009		2014	
Nulliparous	131	67.5%	123	55.0%	44	56.4%
Multiparous	63	32.5%	103	45.0%	34	43.6%

MODE OF DELIVERY

	2004		2009		2014	
Spontaneous vertex delivery	110	56.7%	125	54.6%	41	52.6%
Vacuum extraction	58	29.9%	64	27.9%	20	25.6%
Forceps delivery	9	4.6%	5	2.2%	4	5.1%
Vaginal breech delivery	0	0.0%	0	0.0%	0	0.0%
LSCS before labour	3	1.5%	17	7.4%	4	5.1%
LSCS after labour	14	7.2%	18	7.9%	9	11.5%
Others/unknown	0	0.0%	0	0.0%	0	0.0%

FETAL WEIGHT DISTRIBUTION

	2004		2009		2014	
<500 gm	0	0.0%	0	0.0%	1	1.3%
500 - 999 gm	0	0.0%	0	0.0%	0	0.0%
1000 – 1499 gm	0	0.0%	0	0.0%	0	0.0%
1500 - 1999 gm	1	0.5%	0	0.0%	1	1.3%
2000 - 2499 gm	0	0.0%	5	2.2%	3	3.8%
2500 - 2999 gm	41	21.1%	30	13.1%	5	6.4%
3000 - 3499 gm	89	45.9%	104	45.4%	27	34.6%
3500 - 3999 gm	45	23.2%	69	30.1%	31	39.7%
≥ 4000 gm	18	9.3%	21	9.2%	10	12.8%

FETAL OUTCOME

	2004		2009		2014	
Alive at 28 days	194	100.0%	229	100.0%	78	100%
Stillbirths	0	0.0%	0	0.0%	0	0.0%
Neonatal deaths	0	0.0%	0	0.0%	0	0.0%
Low birth weights (<2500 gm)	1	0.5%	5	2.2%	4	5.1%
<i>Singleton</i>	0	0.0%	3	60.0%	3	75.0%
<i>Multiple</i>	1	100.0%	2	40.0%	1	25.0%
Macrosomia (>4000 gm)	18	9.3%	21	9.2%	10	12.8%
Apgar score < 4 at 1 minute	2	1.0%	3	1.3%	1	1.3%
Apgar score < 4 at 5 minutes	3	1.5%	0	0.0%	0	0.0%

MAJOR NEONATAL INFECTIONS

The incidence of major neonatal infections of all live births fluctuated from 0.04% in 2004 to 0.12% in 2009, and dropped back to 0.05% in 2014, but survival rate for at least 28 days continued to increase from 90.9% in 2004 to 97.9% in 2009 and 100% in 2014. Since the audit in 2009, only 2 categories of neonatal infections were captured, namely congenital infections and major infections. The incidence of congenital infections varied from 0.016% in 2004 and 0.067% in 2009 to 0.008% in 2014 while that of major infections were similar at 0.028% in 2004, 0.049% in 2009 and 0.043% in 2014. Although the incidence was apparently low, these infections might be diagnosed late and the babies might have been transferred to the neonatal units, or even to another hospital for management. Hence, the incidences were likely under-reported.

	2004		2009		2014	
TOTAL INCIDENCE (LIVEBIRTHS)	22	0.04%	94	0.12%	31	0.05%
<i>Singleton</i>	22	100.0%	90	95.7%	31	100%
<i>Multiple</i>	0	0.0%	4	4.3%	0	0.0%

CLASSIFICATION OF MAJOR NEONATAL INFECTIONS

	2004		2009		2014	
Congenital infection	8	36.4%	54	57.4%	5	16.1%
Major infections	14	63.6%	40	42.6%	26	83.9%

MODE OF ONSET OF LABOUR

	2004		2009		2014	
Spontaneous	16	72.7%	70	74.5%	18	58.1%
Induced labour	4	18.2%	11	11.7%	8	25.8%
No labour	2	9.1%	13	13.8%	5	16.1%

DURATION OF LABOUR

	2004		2009		2014	
< 2 hours	2	9.1%	18	19.1%	6	19.4%
2 - 3 hours	5	22.7%	11	11.7%	13	41.9%
4 - 5 hours	4	18.2%	15	16.0%	3	9.7%
6 - 7 hours	3	13.6%	14	15.0%	3	9.7%
8 - 9 hours	3	13.6%	8	8.5%	1	3.2%
10 - 11 hours	1	4.5%	7	7.4%	1	3.2%
12 - 13 hours	2	9.1%	3	3.2%	0	0.0%
> 13 hours	1	4.5%	5	5.3%	0	0.0%

Missing data on duration of labour in 2 (9.1%) in 2004, 13 (13.8%) in 2009 and 4 (12.9%) in 2014

STATUS OF AMNIOTIC FLUID DURING LABOUR

	2014	
Clear liquor	26	83.9%
Meconium stained liquor	3	9.7%
<i>Mild</i>	0	0.0%
<i>Moderate</i>	0	0.0%
<i>Severe</i>	3	9.7%
Blood stained liquor	1	3.2%
No liquor	1	3.2%

MODE OF DELIVERY

	2004		2009		2014	
Spontaneous vertex delivery	16	72.7%	55	58.5%	19	61.3%
Vacuum extraction	1	4.5%	25	26.6%	3	9.7%
Forceps delivery	0	0.0%	1	1.1%	1	3.2%
Vaginal breech delivery	0	0.0%	2	2.1%	0	0.0%
LSCS before labour	2	9.1%	13	13.8%	5	16.1%
LSCS after labour	3	13.6%	17	18.1%	3	9.7%
Classical Caesarean section	0	0.0%	1	1.1%	0	0.0%

GESTATION AT DELIVERY

	2004		2009		2014	
< 29 weeks	0	0.0%	4	4.3%	0	0.0%
29 - 32weeks	3	13.6%	1	1.1%	2	6.5%
33 - 36 weeks	0	0.0%	9	9.6%	4	12.9%
37 - 41 weeks	18	81.8%	80	85.1%	25	80.6%
> 41 weeks	1	4.5%	0	0.0%	0	0.0%

FETAL OUTCOME

	2004		2009		2014	
Alive at 28 days	20	90.9%	92	97.9%	31	100.0%
Neonatal deaths	2	9.1%	1	1.1%	0	0.0%
<i>Early</i>	2	9.1%	1	1.1%	0	0.0%
<i>Late</i>	0	0.0%	0	0.0%	0	0.0%

NEONATAL COMPLICATIONS

(Respiratory Distress Syndrome, Intraventricular Haemorrhage, Necrotising Enterocolitis)

The incidences of respiratory distress syndrome (RDS) carried between 0.05-0.08% over the past 10 years and that of intraventricular haemorrhage (IVH) increased from 0.002% to 0.04%. The fetal survival rate at 28 days of RDS dropped from 96% to 91.4%, while that of IVH dropped from 100% in 2004 to 63.6% in 2009 and 87.0% in 2014. The incidence of necrotising enterocolitis (NEC) dropped from 0.01% to 0.007% and the fetal survival rate increased from 80% to 100%. These complications especially IVH and NEC could be late complications and the data accuracy depended very much on the feedbacks from the paediatricians. Under-reporting of these complications could not be excluded.

RESPIRATORY DISTRESS SYNDROME

	2004		2009		2014	
TOTAL INCIDENCE (LIVEBIRTHS)	23	0.05%	63	0.08%	35	0.06%
<i>Singleton</i>	23	100%	59	93.7%	24	68.6%
<i>Multiple</i>	0	0.0%	4	6.3%	11	31.4%

FETAL OUTCOME

	2004		2009		2014	
Alive at 28 days	22	95.7%	61	96.8%	32	91.4%
Neonatal deaths	1	4.3%	2	3.2%	3	8.6%
<i>Early</i>	0	0.0%	2	3.2%	3	8.6%
<i>Late</i>	1	4.3%	0	0.0%	0	0.0%
Mean birth weight \pm SD (gm)	2412	\pm 766	2104	\pm 909	1798	\pm 1062

BIRTH ASPHYXIA

	2004		2009		2014	
Apgar score < 7 at 1 minute	5	21.7%	8	12.9%	18	51.4%
Apgar score < 7 at 5 minutes	2	8.7%	1	1.6%	4	11.4%

INTRAVENTRICULAR HAEMORRHAGE

	2004		2009		2014	
TOTAL INCIDENCE (LIVEBIRTHS)	1	0.002%	11	0.01%	23	0.04%
<i>Singleton</i>	1	100.0%	7	63.6%	15	65.2%
<i>Multiple</i>	0	0.0%	4	36.4%	8	34.8%

FETAL OUTCOME

	2004		2009		2014	
Alive at 28 days	1	100.0%	7	63.6%	20	87.0%
Neonatal deaths	0	0.0%	4	36.4%	3	13.0%
<i>Early</i>	0	0.0%	3	27.6%	3	13.0%
<i>Late</i>	0	0.0%	1	9.1%	0	0.0%
Mean birth weight \pm SD (gm)	3375	-	987	\pm 698	1258	\pm 478

BIRTH ASPHYXIA

	2004		2009		2014	
Apgar score < 7 at 1 minute	0	0.0%	5	45.5%	13	56.5%
Apgar score < 7 at 5 minutes	0	0.0%	2	18.2%	3	13.0%

NECROTISING ENTEROCOLITIS

	2004		2009		2014	
TOTAL INCIDENCE (LIVEBIRTHS)	5	0.01%	6	0.007%	4	0.007%
<i>Singleton</i>	4	80.0%	5	83.3%	3	75%
<i>Multiple</i>	1	20.0%	1	16.7%	1	25%

FETAL OUTCOME

	2004		2009		2014	
Alive at 28 days	4	80.0%	5	83.3%	4	100.0%
Neonatal deaths	1	20.0%	1	16.7%	0	0.0%
<i>Early</i>	0	0.0%	0	0.0%	0	0.0%
<i>Late</i>	1	20.0%	1	16.7%	0	0.0%
Mean birth weight \pm SD (gm)	2399	\pm 982	1345	\pm 1054	1294	\pm 640

BIRTH ASPHYXIA

	2004		2009		2014	
Apgar score < 7 at 1 minute	0	0.0%	2	33.3%	1	25.0%
Apgar score < 7 at 5 minutes	0	0.0%	0	0.0%	0	0.0%

STILLBIRTHS

The number of stillbirths reported in the 2014 audit was 139 (2.3 per 1,000 births). According to the data from the Census and Statistics Department of Hong Kong, the total number of stillbirths in Hong Kong in 2014 was 167 (2.7 per 1,000 births). The under-reporting rate was 16.8%.

The incidence of reported stillbirths decreased from 2.4 per 1,000 births in 2004 to 1.8 per 1,000 births in 2009 and back to 2.3 per 1,000 births in 2014. About 87% were detected during the antepartum period before the onset of labour. The incidence of low birth weight (< 2500 gm) was 69.1% in 2014 which was consistent with the proportion of stillbirths in preterm gestations. Half of the stillbirths were considered unclassifiable/miscellaneous, while the number of uninvestigated cases dropped from 12% to 4.3%. The incidence of unexplained stillbirths was 33.1% which was higher than previous years. The incidence of diabetes mellitus during pregnancy doubled over the past 10 years and that of hypertension increased from 8.5% in 2004 to 12.2% in 2009 and dropped slightly to 10.8% in 2014. The incidence of antepartum haemorrhage was stable at around 6%.

INCIDENCE

	2004		2009		2014	
TOTAL INCIDENCE (BIRTHS)	117	0.24%	148	0.18%	139	0.23%
<i>Antepartum</i>	92	78.6%	125	84.5%	121	87.1%
<i>Intrapartum</i>	4	3.4%	4	2.7%	0	0.0%
<i>Undetermined</i>	21	17.9%	19	12.8%	18	12.9%
Singleton	101	86.3%	123	83.1%	125	89.9%
Multiple	16	13.7%	25	16.9%	14	10.1%

DATA FROM CENSUS AND STATISTICS DEPARTMENT

	2004		2009		2014	
TOTAL INCIDENCE (LIVEBIRTHS)	164	0.33%	158	0.19%	167	0.27%

PARITY OF THE PARTURIENTS

	2004		2009		2014	
Nulliparous	71	60.7%	82	55.4%	125	89.9%
Multiparous	46	39.3%	66	44.6%	14	10.1%

AGE OF THE PARTURIENTS

	2004		2009		2014	
< 20 years	3	2.6%	0	0.0%	1	0.7%
20 - 24 years	18	15.4%	11	7.4%	4	2.9%
25 - 29 years	29	24.8%	33	22.3%	16	11.5%
30 - 34 years	32	27.4%	49	33.1%	38	27.3%
35 - 39 years	26	22.2%	41	27.7%	52	37.4%
≥ 40 years	8	6.8%	13	8.8%	28	20.1%
Unknown	1	0.9%	1	0.7%	0	0.0%

ASSOCIATED ANTENATAL COMPLICATIONS

	2004		2009		2014	
Anaemia	9	7.7%	5	3.4%	10	7.2%
Antepartum haemorrhage	8	6.8%	8	5.4%	9	6.5%
<i>Placenta praevia</i>	3	37.5%	3	37.5%	1	11.1%
<i>Placenta abruptio</i>	1	12.5%	2	25.0%	5	55.5%
<i>APH of unknown origin</i>	4	50.0%	3	37.5%	3	33.3%
Hypertension	10	8.5%	18	12.2%	15	10.8%
<i>Mild</i>	2	20.0%	6	33.3%	4	26.7%
<i>Severe</i>	5	50.0%	8	44.4%	8	53.3%
<i>Unclassified</i>	3	30.0%	4	22.2%	3	20.0%
Diabetes mellitus (including IGT)	7	6.0%	13	8.8%	18	12.9%
Other medical/surgical diseases	0	0.0%	16	10.8%	13	9.4%

MAIN CAUSES FOR STILLBIRTHS

	2004		2009		2014	
Unclassifiable / Miscellaneous	47	40.2%	88	59.5%	70	50.4%
Uninvestigated	14	12.0%	18	12.2%	6	4.3%
Unexplained	27	23.1%	29	19.6%	46	33.1%
Congenital anomalies	16	13.7%	5	3.4%	4	2.9%
Mechanical	3	2.6%	2	1.4%	1	0.7%
Maternal disorders	2	1.7%	2	1.4%	1	0.7%
Pregnancy-induced hypertension	2	1.7%	2	1.4%	1	0.7%
Antepartum haemorrhage	1	0.9%	2	1.4%	4	2.9%
Unknown	5	4.3%	0	0.0%	6	4.3%

MODE OF DELIVERY

	2004		2009		2014	
Spontaneous vertex delivery	74	63.2%	100	67.6%	89	64.0%
Vacuum extraction	1	0.9%	1	0.7%	1	0.7%
Forceps delivery	3	2.6%	0	0.0%	0	0.0%
Vaginal breech delivery	26	22.2%	24	16.2%	26	18.7%
LSCS before labour	9	7.7%	18	12.2%	13	9.4%
LSCS after labour	3	2.6%	5	3.8%	9	6.5%
Classical Caesarean section	1	0.9%	0	0.0%	1	0.7%

GESTATION AT DELIVERY

	2004		2009		2014	
< 26 weeks	14	12.0%	19	12.8%	7	5.0%
26 - 28 weeks	23	19.7%	23	15.5%	25	18.0%
29 - 32 weeks	18	15.4%	32	21.6%	27	19.4%
33 - 36 weeks	24	20.5%	36	24.3%	28	20.1%
37 - 41 weeks	36	30.8%	38	25.7%	51	36.7%
> 41 weeks	1	0.9%	0	0.0%	0	0.0%
Unknown	1	0.9%	0	0.0%	1	0.7%

BIRTH WEIGHT AT DELIVERY

	2004		2009		2014	
< 500 gm	9	7.7%	5	3.4%	13	9.4%
500 - 999 gm	32	27.4%	51	34.5%	27	19.4%
1000 - 1499 gm	17	14.5%	25	16.9%	22	15.8%
1500 - 1999 gm	10	8.5%	13	8.8%	17	12.2%
2000 - 2499 gm	9	7.7%	22	14.9%	17	12.2%
2500 - 2999 gm	18	15.4%	13	8.8%	17	12.2%
3000 - 3499 gm	16	13.7%	13	8.8%	20	14.4%
3500 - 3999 gm	4	3.4%	5	3.4%	6	4.3%
≥ 4000 gm	2	1.7%	0	0.0%	0	0.0%
Unknown	0	0.0%	1	0.7%	0	0.0%

NEONATAL DEATHS

The number of neonatal deaths reported in the 2014 audit was 59 (1.0 per 1,000 live births). The total number of neonatal deaths in 2014 reported by the Census and Statistics Department of Hong Kong was 66 (1.1 per 1,000 live births) and the under-reporting rate was 10.6%.

The neonatal death rate decreased from 1.2 to 1.0 per 1,000 live births. The causes of deaths were unclassifiable and uninvestigated in 33.9% and 18.6% respectively. The most common identifiable cause was congenital anomaly which accounted for 20.3%. This was lower than the incidence reported in previous audits (31.2% - 32.8%). The incidence of antepartum complications reported were very low and the possibility of under-reporting cannot be excluded.

INCIDENCE

	2004		2009		2014	
TOTAL INCIDENCE (LIVEBIRTHS)	61	0.12%	77	0.10%	59	0.10%
Early neonatal deaths	50	0.1%	66	0.08%	47	0.08%
Late neonatal deaths	11	0.02%	11	0.01%	12	0.02%
Singleton	49	80.3%	59	76.6%	52	88.1%
Multiple	12	19.7%	18	23.4%	7	11.9%

DATA FROM CENSUS AND STATISTICS DEPARTMENT

	2004		2009		2014	
TOTAL INCIDENCE (LIVEBIRTHS)	76	0.16%	77	0.09%	66	0.11%
Early neonatal deaths	60	0.12%	62	0.07%	49	0.08%
Late neonatal deaths	16	0.03%	15	0.02%	17	0.03%

PARITY OF THE PARTURIENTS

	2004		2009		2014	
Nulliparous	40	65.6%	45	58.4%	40	67.8%
Multiparous	21	34.4%	32	41.6%	19	32.2%

AGE OF THE PARTURIENTS

	2004		2009		2014	
< 20 years	2	3.3%	1	1.3%	1	1.7%
20 - 24 years	7	11.5%	5	6.5%	3	5.1%
25 - 29 years	9	14.8%	15	19.5%	10	16.9%
30 - 34 years	22	36.1%	17	22.1%	16	27.1%
35 - 39 years	18	29.5%	29	37.7%	22	37.3%
≥ 40 years	3	4.9%	9	11.7%	7	11.9%
Unknown	1	0.9%	1	1.3%	0	0.0%

ANTENATAL COMPLICATIONS

	2004		2009		2014	
Anaemia	5	8.2%	5	6.5%	3	5.1%
Antepartum haemorrhage	8	13.1%	3	3.9%	14	23.7%
<i>Placenta praevia</i>	1	12.5%	0	0.0%	2	14.3%
<i>Placenta abruptio</i>	0	0.0%	1	33.3%	1	7.1%
<i>APH of unknown origin</i>	7	87.5%	2	66.6%	11	78.6%
<i>Other causes</i>	0	0.0%	0	0.0%	0	0.0%
Hypertension	5	8.2%	6	7.8%	3	5.1%
<i>Mild</i>	2	40.0%	3	50.0%	1	33.3%
<i>Severe</i>	3	60.0%	2	33.3%	1	33.3%
<i>Unclassified</i>	0	0.0%	1	16.7%	1	33.3%
Diabetes mellitus (including IGT)	4	6.6%	10	13.0%	5	8.5%
Other medical/surgical diseases	2	3.3%	12	15.6%	3	5.1%

MAIN OBSTETRIC CAUSES ACCOUNTING FOR THE NEONATAL DEATHS

	2004		2009		2014	
Congenital anomalies	20	32.8%	24	31.2%	12	20.3%
Unclassifiable / Miscellaneous	20	32.8%	34	44.2%	20	33.9%
Uninvestigated	6	9.8%	13	16.9%	11	18.6%
Unexplained	7	11.5%	4	5.2%	9	15.3%
Mechanical	0	0.0%	1	1.3%	5	8.5%
Maternal disorder	0	0.0%	0	0.0%	1	1.7%
Antepartum haemorrhage	2	3.3%	1	1.3%	0	0.0%
Pregnancy induced hypertension	1	1.6%	0	0.0%	0	0.0%
Unknown	5	8.2%	0	0.0%	1	1.7%

MODE OF DELIVERY

	2004		2009		2014	
Spontaneous vertex delivery	24	39.3%	37	48.1%	17	28.8%
Vacuum extraction	2	3.3%	1	1.3%	0	0.0%
Forceps delivery	7	11.5%	1	1.3%	1	1.7%
Vaginal breech delivery	0	0.0%	12	15.6%	13	22.0%
LSCS before labour	13	21.3%	21	27.3%	14	23.7%
LSCS after labour	13	21.3%	4	5.2%	10	16.9%
Classical Caesarean section	2	3.3%	1	1.3%	4	6.8%
Unknown	0	0.0%	0	0.0%	0	0.0%

GESTATION AT DELIVERY

	2004		2009		2014	
< 26 weeks	20	32.8%	27	35.1%	23	39.0%
26 - 28 weeks	11	18.0%	8	10.4%	9	15.3%
29 - 32 weeks	7	11.5%	8	10.4%	6	10.2%
33 - 36 weeks	7	11.5%	11	14.3%	5	8.5%
37 - 41 weeks	15	24.6%	23	29.9%	16	27.1%
> 41 weeks	1	1.6%	0	0.0%	0	0.0%
Unknown	0	0.0%	0	0.0%	0	0.0%

BIRTH WEIGHT AT DELIVERY

	2004		2009		2014	
< 500 gm	5	8.2%	6	7.8%	3	5.1%
500 - 999 gm	25	41.0%	27	35.1%	24	40.7%
1000 - 1499 gm	5	8.2%	10	13.0%	7	11.9%
1500 - 1999 gm	5	8.2%	3	3.9%	3	5.1%
2000 - 2499 gm	8	13.1%	8	10.4%	6	10.2%
2500 - 2999 gm	6	9.8%	11	14.3%	8	13.6%
3000 - 3499 gm	4	6.6%	8	10.4%	7	11.9%
3500 - 3999 gm	2	3.3%	2	2.6%	1	1.7%
≥ 4000 gm	1	1.6%	2	2.6%	0	0.0%
Unknown	0	0.0%	0	0.0%	0	0.0%

MATERNAL COLLAPSE

Maternal collapse is a new maternal complication captured in the current audit. It is defined as **an acute event involving the cardiorespiratory systems and/or brain, resulting in a reduced or absent conscious level (and potentially death), at any stage in pregnancy and up to six weeks after delivery**. There were 11 cases maternal collapse in 2014, giving an incidence of 0.02%. All cases were singleton pregnancy and 10 were delivered at term and 1 late pre-tem. Six (54.6%) cases were delivered by Caesarean section, 1 by ventouse extraction and 4 by normal vaginal delivery. Four cases of maternal collapse were caused by major haemorrhage, 2 for obstetric haemorrhage, 1 for massive intra-abdominal haemorrhage likely related to venous plexus surrounding the uterus and 1 vaginal hematoma following a ventouse extraction for poor maternal effect and big baby (3500 gm). Two cases were associated with eclampsia, 1 with severe pre-eclampsia and 2 with HELLP syndrome. One patient had a Caesarean section before labour for previous uterine scar with severe post-partum haemorrhage (> 1500 ml) associated with uterine atony, disseminated intra-vascular coagulopathy and hysterectomy. There were no maternal deaths. All babies were alive without asphyxia but one (with maternal collapse due to anaphylaxis) required ICU admission.

PREGNANCY

	2014	
TOTAL INCIDENCE	11	0.02%
<i>Singleton</i>	11	100%
<i>Multiple</i>	0	0.0%

CAUSES OF MATERNAL COLLAPSE

	2014	
Major haemorrhage	4	36.4%
<i>Major obstetric haemorrhage</i>	2	18.2%
<i>Major intra-abdominal bleeding*</i>	1	9.1%
<i>Vaginal hematoma after ventouse</i>	1	9.1%
HELLP syndrome	2	18.2%
Septic shock	2	18.2%
Anaphylaxis	1	9.1%
Hyponatraemia with convulsion	1	9.1%
Not clearly stated	1	9.1%

*Not PPH

PARITY OF PARTURIENTS

	2014	
Para 0	6	54.5%
Para 1	3	27.3%
Para 2	1	9.1%
Para 3 & above	1	9.1%

AGE OF THE PARTURIENTS

	2014	
<20 years	0	0.0%
20 - 24 years	1	9.1%
25 - 29 years	1	9.1%
30 - 34 years	3	27.3%
35 - 39 years	3	27.3%
≥ 40 years	1	9.1%
Unknown	2	18.2%

ASSOCIATED ANTENATAL COMPLICATIONS

	2014	
Antepartum haemorrhage	0	0.0%
Diabetes mellitus (GDM)	1	9.1%
Hypertension	3	27.3%
<i>Severe PET</i>	1	9.1%
<i>Eclampsia</i>	2	18.2%
Anaemia	0	0.0%
Cardiac diseases	0	0.0%
Surgical diseases	0	0.0%
Other medical diseases	0	0.0%

MODE OF ONSET OF LABOUR

	2014	
Spontaneous	5	45.5%
Induced labour	2	18.2%
No labour	4	36.4%

GESTATION AT DELIVERY

	2004	2009	2014	
< 26 weeks			0	0.0%
26 - 28 weeks			0	0.0%
29 - 32 weeks			0	0.0%
33 - 36 weeks			1	9.1%
37 - 41 weeks			10	90.9%
> 41 weeks			0	0.0%

STATUS OF AMNIOTIC FLUID DURING LABOUR

	2014	
Clear liquor	11	100%
Meconium stained liquor	0	0%
Blood stained liquor	0	0%
No liquor	0	0%

MODE OF DELIVERY

	2014	
Spontaneous vertex delivery	4	36.4%
Vacuum extraction	1	9.1%
LSCS before labour	4	36.4%
LSCS after labour	2	18.2%

INDICATIONS FOR ASSISTED DELIVERY

	2014	
Vacuum extraction	1	9.1%
<i>Poor maternal effort and big baby</i>	1	9.1%
LSCS before labour	4	36.4%
<i>Previous uterine scar</i>	2	18.2%
<i>Hypertension</i>	1	9.1%
<i>IUGR</i>	1	9.1%
LSCS after labour	2	18.2%
<i>Sepsis</i>	1	9.1%
<i>Social reason</i>	1	9.1%

POST-PARTUM COMPLICATION

	2014	
INCIDENCE	2	18.2%
Blood loss		
Vaginal delivery	2	18.2%
> 1,500 ml	1	9.1%
501 – 1000 ml	0	0.0%
≤ 500 ml	3	27.2%
Caesarean section		
> 1,500 ml	1	9.1%
501 – 1000 ml	2	18.2%
≤ 500 ml	3	27.2%
Blood transfusion	3	27.2%
Vaginal delivery	1	20.0%
Caesarean delivery	2	33.3%
Associated conditions		
Uterine atony	3	27.2%
Uterine venous plexus bleeding	1	9.1%
DIC	1	9.1%
Septic shock	1	9.1%

* Post-partum haemorrhage was defined as blood loss > 500 ml within 24 hours of delivery before 2014 and > 500 ml following vaginal delivery and > 1,000 ml following Caesarean delivery in 2014.

MATERNAL COMPLICATIONS

	2014	
Puerperal pyrexia	0	0.0%
Manual removal of placenta	0	0.0%
Internal iliac artery ligation	0	0.0%
Uterine artery embolisation	0	0.0%
Uterine compression suture	0	0.0%
Uterine balloon tamponade	0	0.0%
Uterine rupture	0	0.0%
Hysterectomy	1	9.1%
Maternal death	0	0.0%

BIRTH WEIGHT AT DELIVERY

	2014	
< 500 gm	0	0.0%
500 - 999 gm	0	0.0%
1000 - 1499 gm	0	0.0%
1500 - 1999 gm	0	0.0%
2000 - 2499 gm	1	9.1%
2500 - 2999gm	3	27.3%
3000 - 3499 gm	4	36.4%
3500 - 3999 gm	1	9.1%
≥ 4000 gm	0	0.0%
Unknown	2	18.2%

FETAL OUTCOME

	2014	
Alive at 28 days	11	100%
Stillbirths	0	0.0%
Neonatal deaths	0	0.0%
Low birth weight (<2500 gm)	1	9.1%
Macrosomia (>4000 gm)	0	0.0%
Apgar score <4 at 1 minute	0	0.0%
Apgar score <4 at 5 minutes	0	0.0%

MATERNAL DEATHS

Maternal death in the previous audits was defined as death from conception up to 1 year after delivery. In 2014, the definition was revised according to the ICD-10, in line with that used by the Census and Statistics Department. It is defined as **the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes.** The exact cause of maternal death was not captured in the audit exercise and the information was obtained from individual hospital. The maternal mortality ratios (MMR) were 6.1, 2.5 and 3.3 per 100,000 live births in 2004, 2009 and 2014 respectively. The official reported figures from the Census and Statistics Department were 4.1, 2.5 and 3.3 per 100,000 registered live births respectively.

INCIDENCE

	2004	2009	2014
Number	3	2	2
MMR (per 100,000 live births)	6.1	2.5	3.3

CAUSES OF MATERNAL DEATH

	2004	2009	2014
Amniotic fluid embolism	0	1	0
Hepatic failure	1	1	0
Suicide	1	0	0
Pneumonia	0	0	0
Pulmonary embolism	0	0	0
Ruptured vertebral artery aneurysm	0	0	0
Massive Post-partum Haemorrhage	1	0	1
No cause identified	0	0	1(Accident)

DATA FROM CENSUS AND STATISTICS DEPARTMENT

	2004	2009	2014
Number	2	2	2
MMR (per 100,000 reg live births)	4.1	2.5	3.3
Disease Group			
<i>Obstetrical pulmonary embolism</i>	-	-	-
<i>Pregnancy with abortive outcome</i>	0	0	-
<i>Other direct obstetric deaths</i>	2	2	2
<i>Remainder of pregnancy, childbirth and the puerperium</i>	0	0	0
<i>Indirect obstetric deaths</i>	0	0	0

Maternal death is defined as the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes (ICD-10).

Maternal mortality ratio refers to the number of maternal deaths in a calendar year per hundred thousand live births of that year.

PREGNANCY

	2004		2009		2014	
Singleton	3	100.0%	1	50.0%	2	100.0%
Multiple	0	0.0%	1	50.0%	0	0.0%

PARITY OF PARTURIENTS

	2004		2009		2014	
Nulliparous	2	66.7%	1	50.0%	1	50.0%
Multiparous	1	33.3%	1	50.0%	1	50.0%

AGE OF THE PARTURIENTS

	2004		2009		2014	
20 - 24 years	0	0.0%	0	0.0%	0	0.0%
25 - 29 years	1	33.3%	0	0.0%	0	0.0%
30 - 34 years	1	33.3%	1	50.0%	0	0.0%
35 - 39 years	1	33.3%	0	0.0%	2	100%
≥ 40 years	0	0.0%	1	50.0%	0	0.0%

ASSOCIATED COMPLICATIONS

	2004		2009		2014	
Hypertension	0	0.0%	0	0.0%	0	0.0%
Antepartum haemorrhage	0	0.0%	0	0.0%	0	0.0%
Cardiac disease	0	0.0%	0	0.0%	0	0.0%
Anaemia	1	33.3%	0	0.0%	0	0.0%
Diabetes mellitus	1	33.3%	0	0.0%	0	0.0%
Post-partum haemorrhage*	1	33.3%	1	50.0%	1	50.0%
<i>Vaginal delivery (> 500 ml)</i>	-	-	-	-	1	50.0%
<i>Caesarean delivery (> 1,000 ml)</i>	-	-	-	-	0	0.0%
Internal iliac artery ligation	0	0.0%	0	0.0%	0	0.0%
Uterine artery embolisation	0	0.0%	0	0.0%	0	0.0%
Uterine compression suture	-	-	-	-	0	0.0%
Uterine balloon tamponade	-	-	-	-	1	50.0%
Hysterectomy	1	33.3%	0	0.0%	1	50.0%

There might be more than 1 complication in each parturient

**Post-partum haemorrhage was defined as blood loss > 500 ml within 24 hours of delivery before 2014 and > 500 ml following vaginal delivery and > 1,000 ml following Caesarean delivery in 2014.*

MODE OF ONSET OF LABOUR

	2004		2009		2014	
Spontaneous	1	33.3%	1	50.0%	0	0.0%
Induced labour	1	33.3%	0	0.0%	1	50.0%
No labour	1	33.3%	1	50.0%	1	50.0%

GESTATION AT DELIVERY

	2004		2009		2014	
26 - 28 weeks	1	33.3%	0	0.0%	0	0.0%
29 - 32 weeks	0	0.0%	0	0.0%	0	0.0%
33 - 36 weeks	0	0.0%	0	0.0%	0	0.0%
37 - 41 weeks	2	66.7%	2	100%	2	100%
≥ 42 weeks	0	0.0%	0	0.0%	0	0.0%

MODE OF DELIVERY

	2004		2009		2014	
Normal spontaneous delivery	1	33.3%	0	0.0%	0	0.0%
Vacuum extraction	0	0.0%	0	0.0%	0	0.0%
Forceps delivery	0	0.0%	0	0.0%	1	50.0%
LSCS before labour	1	33.3%	1	50.0%	0	0.0%
LSCS after labour	1	33.3%	1	50.0%	0	0.0%
Classical Caesarean section	0	0.0%	0	0.0%	1	50.0%

USE OF OXYTOTICS FOR THIRD STAGE OF LABOUR

	2014	
Syntometrine	4	36.4%
Syntocinon	2	18.2%
Duratocin	1	36.4%
Nil	4	9.1%

BIRTH WEIGHT AT DELIVERY (FOR EACH BABY)

	2004		2009		2014	
< 500 gm	0	0.0%	0	0.0%	0	0.0%
500 - 999 gm	0	0.0%	0	0.0%	0	0.0%
1000 - 1499 gm	1	33.3%	0	0.0%	0	0.0%
1500 - 1999 gm	0	0.0%	0	0.0%	0	0.0%
2000 - 2499 gm	0	0.0%	1	33.3%	0	0.0%
2500 - 2999 gm	0	0.0%	1	33.3%	0	0.0%
3000 - 3499 gm	0	0.0%	1	33.3%	1	50.0%
3500 - 3999 gm	1	33.3%	0	0.0%	1	50.0%
≥ 4000 gm	1	33.3%	0	0.0%	0	0.0%
Unknown	0	0.0%	0	0.0%	0	0.0%

One of the maternal deaths was a twin pregnancy with one intrauterine death and one livebirth in 2009

FETAL OUTCOME

	2004		2009		2014	
Alive at 28days	2	66.6%	2	100.0%	2	66.6%
Intrauterine death (unborn)	1	33.3%	0	0.0%	1	33.3%
Neonatal death	0	0.0%	0	0.0%	0	0.0%

One of the maternal deaths was a twin pregnancy with one intrauterine death and one livebirth in 2009

MULTIPLE PREGNANCIES

The incidence of multiple pregnancies increased from 1.1% to 1.7% and most of them were twins. The proportion of triplets among the multiple pregnancies decreased from 1.7% to 0.8%. Higher multiple pregnancy was reported once in 1994, but not thereafter. There was an overall increase in maternal age with the incidence of age between 35-39 increased from 28.9% to 41.5% and ≥ 40 increased from 7.4% to 21.1%. The incidence diabetes mellitus doubled from 11.0% to 22.5% over the 10 years and that of hypertension increased from 9.9% to 12.8%. The incidence of post-partum haemorrhage following vaginal delivery increased dramatically from 7.5% to 16.8% and was much higher than that following Caesarean section.

Caesarean section before labour was the most common mode of delivery for multiple pregnancy with the rate of 69.7% which was similar to that in 2009. Overall, only 14% of the babies from multiple pregnancies were delivered vaginally, among those, six babies required second stage Caesarean section. The stillbirth rate slightly decreased from 1.5% to 0.8% and the neonatal death rate dropped from 1.1% to 0.4%.

	2004		2009		2014	
TOTAL PREGNANCIES	537	1.1%	1167	1.5%	867	1.7%
<i>Twin pregnancy</i>	528	98.3%	1152	98.7%	860	99.2%
<i>Triplet pregnancy</i>	9	1.7%	15	1.3%	7	0.8%
TOTAL BIRTHS	1083	2.2%	2343	2.9%	1741	3.0%

Status of 6 babies in 2009 and 177 in 2014 were unknown, 8 abortuses were included in this chapter for analysis

PARITY OF PARTURIENTS

	2004		2009		2014	
Para 0	344	64.1%	656	56.2%	596	68.7%
Para 1	154	28.7%	414	35.5%	223	25.7%
Para 2	29	5.4%	87	7.5%	37	4.3%
Para 3 & above	10	1.9%	10	0.9%	11	1.3%

AGE OF THE PARTURIENTS

	2004		2009		2014	
< 20 years	4	0.7%	6	0.3%	0	0.0%
20 - 24 years	41	7.6%	89	3.8%	9	1.0%
25 - 29 years	100	18.6%	390	16.6%	63	7.3%
30 - 34 years	180	33.5%	802	34.2%	252	29.1%
35 - 39 years	155	28.9%	850	36.3%	359	41.5%
≥ 40 years	42	7.4%	186	7.9%	183	21.1%
Unknown	15	2.8%	20	0.9%	1	0.1%

ANTENATAL COMPLICATIONS

	2004		2009		2014	
Anaemia	31	5.8%	39	3.3%	39	3.9%
Antepartum haemorrhage	33	6.1%	31	2.7%	59	6.0%
<i>Placenta praevia</i>	7	21.2%	7	22.6%	21	35.6%
<i>Placenta abruptio</i>	0	0.0%	1	3.2%	4	6.8%
<i>APH of unknown origin</i>	25	75.8%	22	71.0%	34	57.6%
<i>Other causes</i>	1	3.0%	1	3.2%	0	0.0%
Hypertension	53	9.9%	97	8.3%	127	12.8%
<i>Mild</i>	24	45.3%	32	33.0%	51	40.2%
<i>Severe</i>	20	37.7%	25	25.8%	38	29.9%
<i>Unclassified</i>	9	17.0%	40	41.2%	38	29.9%
Diabetes mellitus (including IGT)	59	11.0%	159	13.6%	223	22.5%
Other medical/surgical diseases	26	4.8%	70	6.0%	77	7.8%

POSTPARTUM COMPLICATIONS

	2004		2009		2014	
Postpartum haemorrhage*	21	3.9%	212	18.2%	66	7.6%
<i>Vaginal delivery (> 500 ml)</i>	9	7.5%	18	11.6%	21	16.8%
<i>Caesarean delivery (> 1,000 ml)</i>	-	-	194	19.2%	45	6.1%
Blood transfusion	-	-	17	1.5%	27	3.1%
<i>Vaginal delivery</i>	-	-	1	0.6%	9	7.2%
<i>Caesarean section</i>	-	-	16	1.6%	18	2.4%
Manual removal of placenta	28	5.2%	28	2.4%	13	1.5%
<i>Vaginal delivery</i>	5	4.2%	6	3.9%	5	4.0%
<i>Caesarean section</i>	23	5.5%	22	2.2%	8	1.1%
Puerperal pyrexia	13	2.4%	22	1.9%	10	1.2%
Breast abscess	0	0.0%	1	0.1%	0	0.0%
Urinary tract infection	2	0.4%	3	0.3%	2	0.2%
Genital tract infection	0	0.0%	4	0.3%	7	0.8%
Wound problem with intervention	6	1.1%	4	0.3%	6	0.7%

* Post-partum haemorrhage was defined as blood loss > 500 ml within 24 hours of delivery before 2014 and > 500 ml following vaginal delivery and > 1,000 ml following Caesarean delivery in 2014.

MATERNAL COMPLICATIONS

	2014					
Preterm (<37 weeks)	273	50.9%	569	48.8%	425	49.0%
Internal iliac artery ligation	0	0.0%	1	0.1%	0	0.0%
Uterine artery embolization	0	0.0%	3	0.3%	0	0.0%
Uterine compression suture	-	-	-	-	10	1.2%
Uterine balloon tamponade	-	-	-	-	13	1.5%
Uterine rupture	0	0.0%	0	0.0%	0	0.0%
Hysterectomy	2	0.4%	2	0.2%	2	0.2%
Maternal collapse	-	-	-	-	0	0.0%
Maternal death	0	0.0%	0	0.0%	0	0.0%

MODE OF ONSET OF LABOUR

	2004		2009		2014	
Spontaneous	175	32.6%	297	25.4%	170	19.6%
Induced labour	49	9.1%	68	5.8%	88	10.1%
No labour	313	58.3%	801	68.6%	609	70.2%

Missing data on mode of onset of labour in 1 case (0.1%) in 2009.

GESTATION AT DELIVERY

	2004		2009		2014	
< 26 weeks	9	1.3%	12	1.0%	10	1.0%
26-28 weeks	13	1.7%	7	0.6%	16	1.8%
29 - 32 weeks	49	9.3%	79	6.8%	56	6.5%
33 - 36 weeks	194	36.7%	471	40.4%	343	39.6%
37 - 41 weeks	255	48.3%	591	50.6%	442	51.0%
> 41 weeks	1	0.2%	1	0.09%	0	0.0%
Unknown	7	1.3%	6	0.5%	0	0.0%

STATUS OF AMNIOTIC FLUID DURING LABOUR (FOR EACH BABY)

	2014	
Clear liquor	1672	96.0%
Meconium stained liquor	52	2.9%
<i>Mild</i>	46	2.6%
<i>Moderate</i>	4	0.2%
<i>Severe</i>	2	0.1%
Blood stained liquor	17	1.0%
No liquor	0	0.0%

PRESENTATION AND LIE (FOR EACH BABY)

	2004		2009		2014	
Vertex	776	71.7%	1791	76.4%	1165	66.9%
Breech	276	25.5%	523	22.3%	487	28.0%
Transverse lie	19	1.8%	17	0.7%	24	1.4%
Oblique lie	2	0.2%	4	0.2%	2	0.1%
Compound	1	0.1%	0	0.0%	1	0.06%
Others	9	0.8%	6	0.3%	4	0.2%
Unknown	0	0.0%	2	0.1%	58	3.3%

MODE OF DELIVERY (FOR EACH BABY)

	2004		2009		2014	
Spontaneous vertex delivery	155	14.3%	222	9.5%	167	9.6%
Vacuum extraction	28	2.6%	25	1.1%	22	1.3%
Forceps delivery	18	1.7%	16	0.7%	13	0.7%
Vaginal breech delivery	29	2.7%	38	1.6%	42	2.4%
LSCS before labour	619	57.2%	1599	68.2%	1214	69.7%
LSCS after labour	232	21.4%	430	18.4%	269	15.5%
Classical Caesarean section	2	0.2%	11	0.5%	6	0.3%
Others	0	0.0%	0	0.0%	0	0.0%
Unknown	0	0.0%	2	0.1%	0	0.0%
Abortion	0	0.0%	0	0.0%	8	0.5%

USE OF OXYTOTICS FOR THIRD STAGE OF LABOUR

	2014	
Syntometrine	74	8.5%
Syntocinon	641	73.9%
Duratocin	36	4.2%
Nil	116	13.4%

BIRTH WEIGHT AT DELIVERY

	2004		2009		2014	
< 500 gm	7	0.6%	7	0.3%	3	0.2%
500 - 999 gm	43	4.0%	42	1.8%	45	2.6%
1000 - 1499 gm	61	5.6%	99	4.2%	78	4.5%
1500 - 1999 gm	176	16.3%	311	13.3%	240	13.8%
2000 - 2499 gm	363	33.5%	855	36.5%	651	37.4%
2500 - 2999 gm	356	32.9%	827	35.3%	608	34.9%
3000 - 3499 gm	60	5.5%	176	7.5%	96	5.5%
3500 - 3999 gm	2	0.2%	14	0.6%	7	0.4%
≥ 4000 gm	0	0.0%	0	0.0%	0	0.0%
Unknown	15	1.4%	12	0.5%	12	0.7%

FETAL OUTCOME

	2004		2009		2014	
Alive at 28days	1054	97.4%	2300	98.2%	1712	98.3%
Stillbirths	16	1.5%	25	1.1%	14	0.8%
<i>Antepartum</i>	12	75.0%	21	84%	12	85.7%
<i>Unknown</i>	4	25.0%	4	16%	2	14.3%
Neonatal death	12	1.1%	18	0.8%	7	0.4%
<i>Early</i>	9	75.0%	13	72.2%	7	100.0%
<i>Late</i>	3	25.0%	5	27.8%	0	0.0%
<i>Abortion</i>	0	0.0%	0	0.0%	8	0.5%

OTHER NEONATAL COMPLICATIONS

	2004		2009		2014	
Apgar score <4 at 1 minute	30	2.8%	29	1.2%	30	1.7%
Apgar score 4-6 at 1 minute	99	9.1%	122	5.2%	127	7.3%
Apgar score <4 at 5 minutes	17	1.6%	15	0.6%	9	0.5%
Apgar score 4-6 at 5 minutes	7	0.6%	15	0.6%	25	1.4%
Admission to neonatal ICU	464	42.8%	681	29.1%	672	38.6%
Major congenital abnormalities	8	0.7%	12	0.5%	13	0.7%
Respiratory distress syndrome	0	0.0%	4	0.2%	11	0.6%
Intraventricular haemorrhage	0	0.0%	4	0.2%	8	0.5%
Necrotising enterocolitis	1	0.1%	1	0.03%	1	0.1%
Birth trauma	1	0.1%	2	0.09%	1	0.06%
Major infection	0	0.0%	0	0.0%	0	0.0%
Congenital infection	0	0.0%	4	0.2%	0	0.0%
Chromosomal abnormalities	-	-	-	-	0	0.0%

FETAL REDUCTION

In 2014, fetal reduction was included as one of the new audit item. There were only 5 parturients reported to have undergone fetal reduction in 2014, which was likely to be under reported. Two had IVF pregnancy, one was reduced to a twin pregnancy and the other to singleton pregnancy. The other 3 non-IVF pregnancies were reduced to singleton. All of them were delivered by Caesarean section, the 2 IVF pregnancies went into labour spontaneously and were delivered at 36 weeks while the other 3 were delivered at 38 weeks before labour. There were no other maternal or fetal morbidity or mortality.

PREGNANCIES WITH NORMAL AND ABNORMAL ANTENATAL COURSE

The parturients were divided into two groups according to whether they had any antenatal complications. Parturient was considered to have normal antenatal course if all of the following criteria were satisfied:

1. age less than 35
2. a singleton pregnancy in vertex presentation
3. no medical/surgical disease
4. no obstetrical complications
5. no previous uterine scar

The proportion of parturients with normal antenatal course dramatically decreased from 54.3% in 2004 and 52.1% in 2009 to only 23.5% in 2014. The decrease in incidence might be explained by a higher proportion of parturients with advanced maternal age (increased from 24.2% to 41.6%) and previous Caesarean sections (increased from 8.9% to 12.7%). The overall complication rates (any maternal or fetal complications) were 10.7% and 22.1% in those with normal and abnormal antenatal course respectively.

	2004		2009		2014	
TOTAL INCIDENCE	49110		79732		59638	
<i>Normal antenatal course</i>	26664	54.3%	41517	52.1%	13994	23.5%
<i>Abnormal antenatal course</i>	22446	45.7%	38215	47.9%	45644	76.5%

STATUS OF AMNIOTIC FLUID DURING LABOUR

Meconium stained liquor occurred in 12.8% of babies in parturients with a normal antenatal as compared to 7.5% in those with an abnormal antenatal course.

	2014	
NORMAL ANTENATAL COURSE		
Clear liquor	12007	85.8%
Meconium stained liquor	1786	12.8%
<i>Mild</i>	1227	8.8%
<i>Moderate</i>	387	2.8%
<i>Severe</i>	172	1.2%
Blood stained liquor	92	0.7%
No liquor	109	0.8%
ABNORMAL ANTENATAL COURSE		
Clear liquor	42513	91.4%
Meconium stained liquor	3489	7.5%
<i>Mild</i>	2230	4.8%
<i>Moderate</i>	838	1.8%
<i>Severe</i>	421	0.9%
Blood stained liquor	379	0.8%
No liquor	137	0.3%

MODE OF DELIVERY

Nearly 90% of the parturients with a normal antenatal course delivered vaginally as compared with only 50% for those with an abnormal antenatal course. There was a trend of increasing Caesarean section rate in parturients with both a normal and an abnormal antenatal course. The Caesarean section rate in those with an abnormal antenatal course was about 46.4% compared with 9.8% in those with a normal antenatal course.

	2004		2009		2014	
NORMAL ANTENATAL COURSE						
Spontaneous vertex delivery	18465	69.3%	23085	55.6%	11448	81.8%
Vacuum extraction	2897	10.9%	4904	11.8%	958	6.8%
Forceps delivery	252	0.9%	194	0.5%	221	1.6%
Vaginal breech delivery	6	0.02%	-	-	-	-
LSCS	5039	18.9%	13248	31.9%	1357	9.7%
<i>LSCS before labour</i>	2099	7.8%	8580	20.7%	299	2.1%
<i>LSCS after labour</i>	2940	11.0%	4668	11.2%	1058	7.6%
Classical Caesarean section	5	0.02%	66	0.2%	10	0.1%
Others / unknown	0	0.0%	19	0.05%	0	0.0%
ABNORMAL ANTENATAL COURSE						
Spontaneous vertex delivery	10433	45.4%	15333	38.9%	20896	44.9%
Vacuum extraction	1926	8.4%	2431	6.2%	3391	7.3%
Forceps delivery	213	0.9%	179	0.5%	449	1.0%
Vaginal breech delivery	102	0.4%	161	0.4%	146	0.3%
LSCS	10262	45.7%	21098	53.6%	21435	46.9%
<i>LSCS before labour</i>	6824	30.4%	16105	40.9%	13626	29.8%
<i>LSCS after labour</i>	3438	15.3%	4993	12.7%	7809	17.1%
Classical Caesarean section	55	0.2%	169	0.4%	134	0.3%
Others / unknown	1	0.004%	20	0.1%	50	0.1%

PRETERM DELIVERIES AND LOW BIRTHWEIGHT

The rates of preterm delivery in parturients with normal antenatal course was 3.4%, which was much lower than the rate for the abnormal group (6.9%). While the low birth weight rate was 4.6% in parturients with normal antenatal course which was significantly lower than those with an abnormal antenatal course of 7.8%.

MATERNAL COMPLICATIONS (PARTURIENTS)

	2004		2009		2014	
NORMAL						
Preterm labour (<37 weeks)	1056	4.0%	1464	3.5%	482	3.4%
<i>Singleton</i>	1056	4.0%	1464	3.5%	482	3.4%
<i>Multiple</i>	-	-	-	-	-	-
Postpartum haemorrhage*	0	0	912	2.2%	390	2.8%
<i>Vaginal delivery (> 500 ml)</i>	-	-	-	-	349	2.5%
<i>Caesarean delivery (> 1,000 ml)</i>	-	-	-	-	41	0.3%
Blood transfusion	-	-	-	-	134	1.0%
Puerperal pyrexia	124	0.5%	170	0.4%	74	0.5%
Internal iliac artery ligation	0	0.0%	0	0.0%	0	0.0%
Uterine artery embolisation	0	0.0%	7	0.02%	0	0.0%
Uterine compression suture	-	-	-	-	10	0.1%
Uterine balloon tamponade	-	-	-	-	12	0.1%
Uterine rupture	1	0.004%	0	0.0%	0	0.0%
Hysterectomy	0	0.0%	8	0.02%	0	0.0%
Maternal collapse	-	-	-	-	1	0.01%
Maternal death	0	0.0%	1	0.002%	0	0.0%
ABNORMAL						
Preterm labour (<37 weeks)	2236	10.0%	3409	9.1%	2718	6.0%
<i>Singleton</i>	1651	7.6%	2840	7.7%	1783	4.0%
<i>Multiple</i>	301	56.9%	569	49.0%	453	45.7%
Postpartum haemorrhage*	1295	5.8%	2437	6.4%	1098	2.4%
<i>Vaginal delivery (> 500 ml)</i>	-	-	-	-	732	1.6%
<i>Caesarean delivery (> 1,000 ml)</i>	-	-	-	-	366	0.8%
Blood transfusion	-	-	-	-	429	0.9%
Puerperal pyrexia	170	0.8%	254	0.7%	157	0.3%
Internal iliac artery ligation	3	0.01%	2	0.01%	2	0.004%
Uterine artery embolisation	0	0.0%	17	0.04%	3	0.007%
Uterine compression suture	-	-	-	-	61	0.1%
Uterine balloon tamponade	-	-	-	-	57	0.1%
Uterine rupture	4	0.02%	6	0.02%	2	0.004%
Hysterectomy	21	0.1%	32	0.08%	23	0.05%
Maternal collapse	-	-	-	-	10	0.02%
Maternal death	3	0.01%	1	0.003%	2	0.004%

*Post-partum haemorrhage was defined as blood loss > 500 ml within 24 hours of delivery before 2014 and > 500 ml following vaginal delivery and > 1,000 ml following Caesarean delivery in 2014.
Missing data on gestation in 411 (0.5%) in 2009

FETAL OUTCOME

The rates of asphyxiation (Apgar score <4 at 5 minutes for live births), stillbirth and neonatal death were significantly higher in those with an abnormal antenatal course. However, there was an improvement in the fetal outcome in terms of the stillbirth and neonatal death rates since 1994 and the improvement was more marked in those with abnormal antenatal course. The rates of very low Apgar score (<4) at 5 minutes in both cases with normal and abnormal antenatal course were lower in 2014 than that in previous audits.

FETAL OUTCOME (BABIES)

	2004		2009		2014	
NORMAL						
Alive at 28 days	26639	99.9%	41463	99.9%	13963	99.8%
Stillbirths	10	0.04%	45	0.1%	23	0.2%
Neonatal deaths	15	0.06%	9	0.02%	8	0.06%
Low birth weight (<2500 gm)	963	3.6%	1354	3.3%	650	4.6%
<i>Singleton</i>	963	3.6%	1354	3.3%	650	4.6%
<i>Multiple</i>	-		-		-	
Macrosomia (>4000 gm)	825	3.1%	969	2.4%	283	2.0%
Apgar score < 4 at 1 minute	52	0.2%	73	0.2%	28	0.2%
Apgar score < 4 at 5 minutes	19	0.1%	44	0.1%	9	0.06%
Birth trauma	117	0.4%	110	0.3%	18	0.1%
ABNORMAL						
Alive at 28 days	22839	99.3%	39220	99.6%	46334	99.6%
Stillbirths	107	0.5%	103	0.3%	116	0.3%
Neonatal deaths	46	0.2%	68	0.2%	51	0.1%
Low birth weight (<2500 gm)	2301	10.0%	3761	9.6%	4546	9.8%
<i>Singleton</i>	1651	7.6%	2447	6.6%	3489	7.8%
<i>Multiple</i>	650	60.9%	1314	56.4%	1057	58.3%
Macrosomia (>4000 gm)	859	3.7%	1111	2.8%	1193	2.6%
Apgar score < 4 at 1 minute	198	0.9%	170	0.4%	192	0.4%
Apgar score < 4 at 5 minutes	101	0.4%	94	0.2%	68	0.15%
Birth trauma	77	0.3%	119	0.3%	60	0.1%

Missing data on birth weight in 610 (0.75%) in 2009

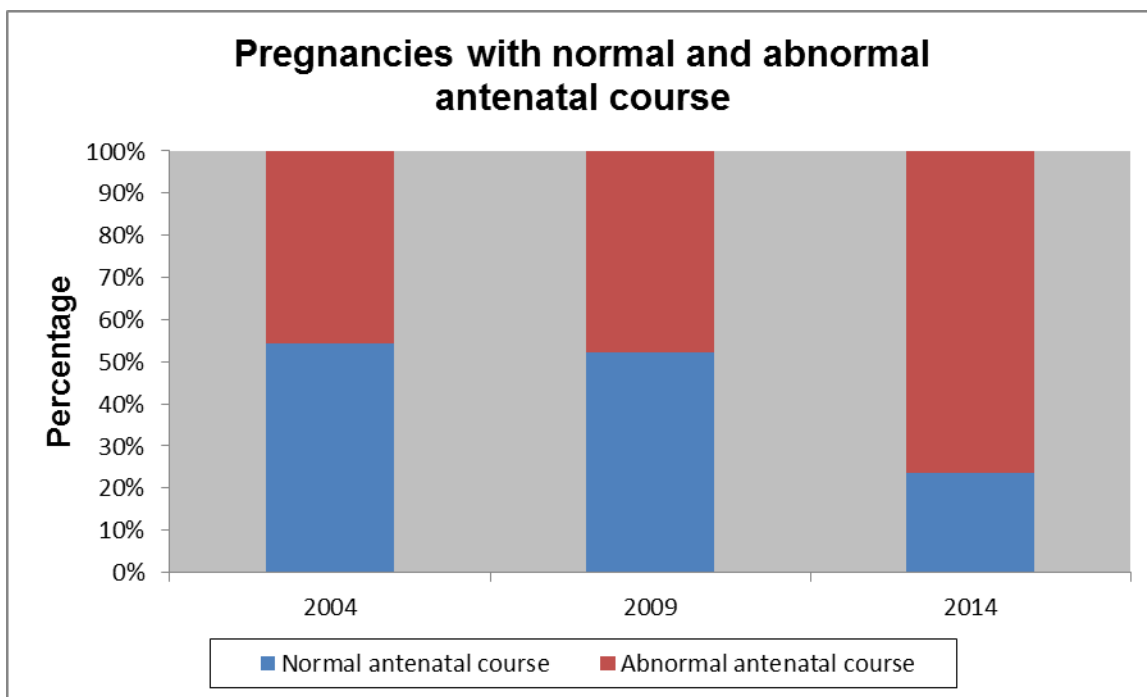


Figure O16 – Normal and abnormal antenatal course

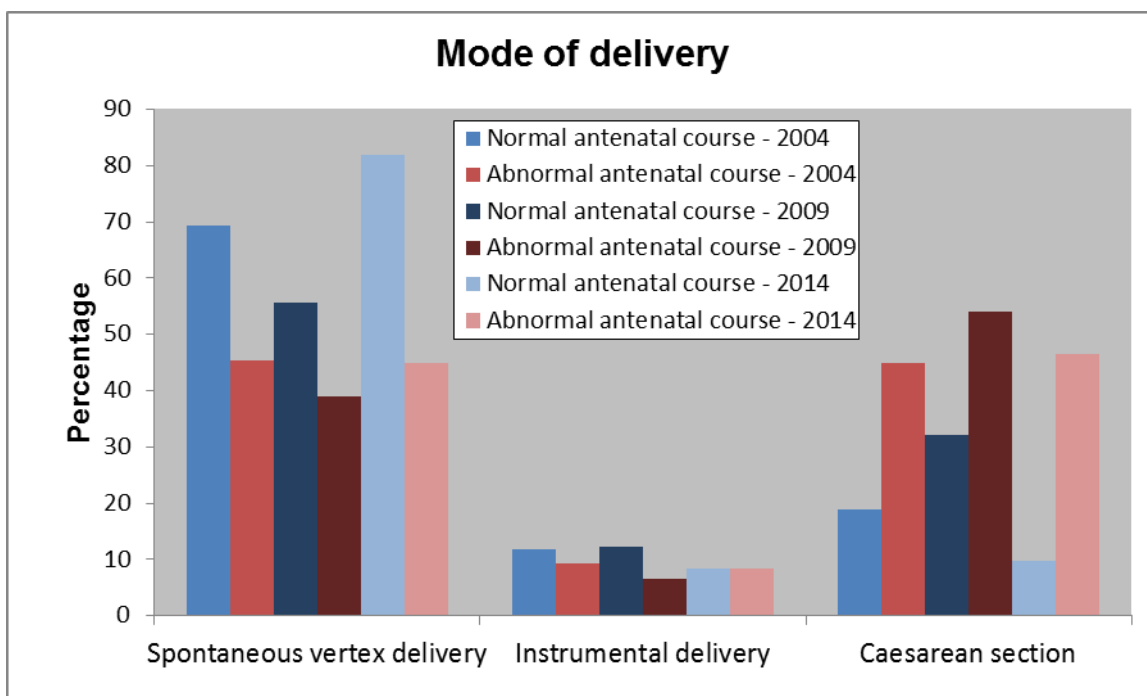


Figure O17 – Mode of delivery

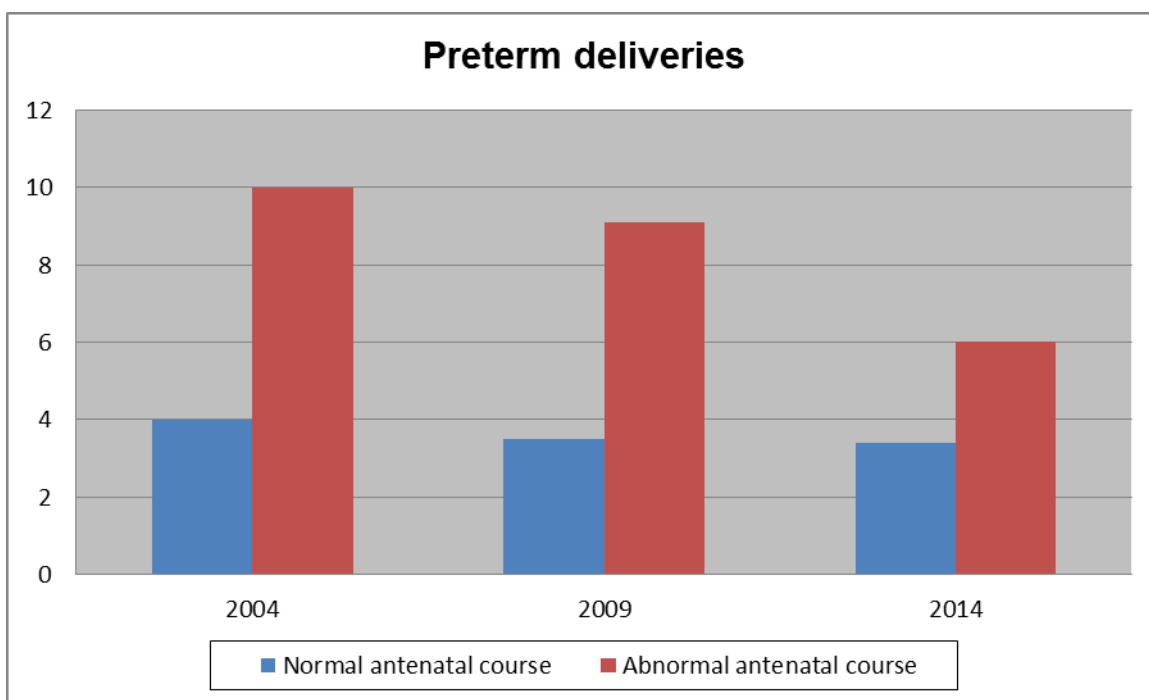


Figure O18 – Preterm deliveries

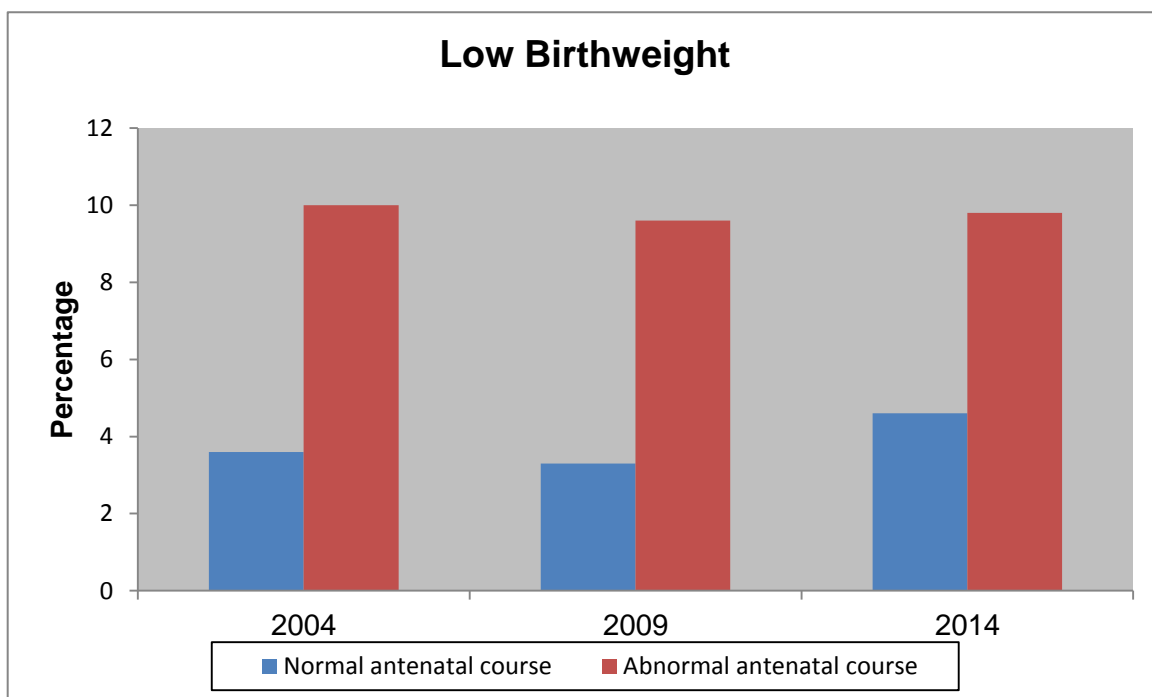


Figure O19 – Low birth weight

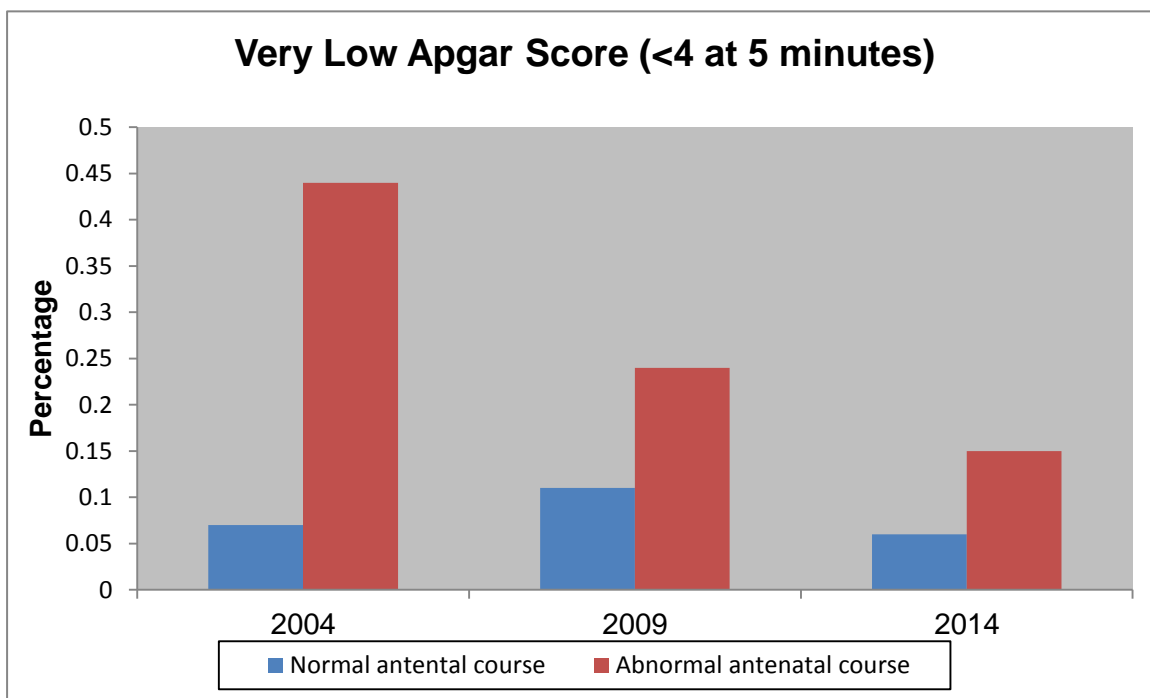


Figure O20 – Very low Apgar score

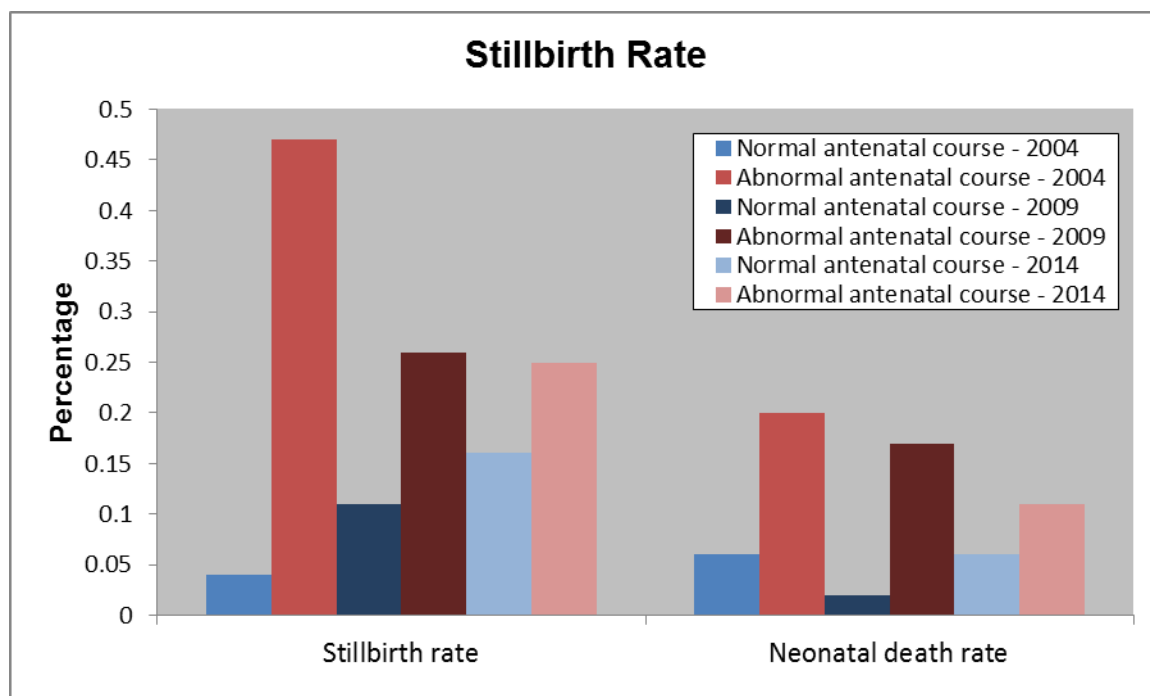


Figure O21 – Stillbirth and neonatal death rate

PREGNANCIES IN RESIDENTS AND NON-RESIDENTS

Back to the last audit in 2009, there has been an influx of parturients from the mainland China delivering babies in Hong Kong, and a significant proportion (44.5%) of these “non-entitled persons” (NEP) were not Hong Kong residents. The maternal characteristics were significantly affected and different from the previous audits. In 2013, the government implemented a number of measures and policy to limit the number of NEP to deliver in Hong Kong. Thereafter, the proportion of NEP as referred to “non-residents” decreased dramatically to 8.6% in 2014.

In 2014, there were higher proportions of parturients with advance maternal age and were nulliparous when compared with those figures in last audit. The incidence of born before arrival remained low for both non-residents and residents (0.2%). The residents were more likely to have a spontaneous vaginal delivery and less likely to require a caesarean section. The Caesarean Section rate for the non-residents was 54.3% compared with 36.4% for local residents. There was no major difference in maternal complications except the postpartum haemorrhage rate was lower in the non-residents (1.5% vs 5.4%). The neonatal outcomes were similar in both groups.

	2004		2009		2014	
	R	NR	R	NR	R	NR
TOTAL PREGNANCIES	39401	9709	44258	35474	54488	5150
	80.2%	19.8%	55.5%	44.5%	91.4%	8.6%
<i>Singleton</i>	38956	9617	43560	35005	53685	5113
	98.9%	99.1%	98.4%	98.7%	98.5%	99.3%
<i>Twins</i>	437	91	686	466	823	37
	1.1%	1.1%	1.6%	1.3%	1.5%	0.7%
<i>Triplets</i>	8	1	12	3	7	0
	0.02%	0.01%	0.03%	0.01%	0.01%	0.01%
TOTAL BIRTHS	39854	9802	44963	35945	55326	5186
	80.3%	19.7%	55.6%	44.4%	91.4%	8.6%

R: Residents, NR: Non-Residents

PARITY OF THE PATURIENTS

	2004		2009		2014	
	R	NR	R	NR	R	NR
Para 0	21399	6101	24230	14434	29773	3352
	54.3%	62.8%	54.7%	40.7%	54.6%	65.1%
Para 1	14179	3134	16127	18271	20211	1498
	36.0%	32.3%	36.4%	51.5%	37.1%	29.1%
Para 2	3038	395	3130	2471	3679	250
	7.7%	4.1%	7.1%	7.0%	6.8%	4.9%
Para 3 & above	785	79	771	298	825	50
	2.0%	0.8%	1.7%	0.8%	1.5%	1.0%

R: Residents, NR: Non-Residents

AGE OF THE PATURIENTS

	2004		2009		2014	
	R	NR	R	NR	R	NR
< 20 years	334	61	170	207	97	28
20 - 24 years	3297	2061	1952	4578	1724	836
25 - 29 years	8606	3958	7510	11811	7495	2074
30 - 34 years	15255	2504	17036	10495	20148	1348
35 - 39 years	8877	795	13804	6725	17895	556
40 – 44 years	1976	151	3277	1172	5709	106
≥ 45 years	103	3	201	46	580	7
Missing	953	176	308	440	840	155

R: Residents, NR: Non-Residents

CHARACTERISTICS OF THE PATURIENTS

	2014			
	R		NR	
Ethnic				
<i>Chinese</i>	52306	96.0%	5010	97.3%
<i>Non-Chinese</i>	2182	4.0%	140	2.7%
Conception				
<i>Natural pregnancy</i>	53157	97.6%	5084	98.7%
<i>IVF pregnancy</i>	1331	4.0%	66	1.3%
Previous uterine scar	7099	13.0%	631	12.3%
<i>Caesarean scar</i>	6881	12.6%	620	12.0%
<i>Non-Caesarean scar</i>	260	0.5%	13	0.3%

R: Residents, NR: Non-Residents

DOWN'S SCREENING/TESTING

	2014			
	R		NR	
Non-fetal DNA screening	24525	45.0%	2922	56.7%
<i>1st Trimester (T1)</i>	22130	40.7%	2427	47.7%
<i>2nd Trimester (T2)</i>	2379	4.4%	495	9.7%
<i>Combined T1 & T2</i>	16	0.03%	0	0.0%
Fetal DNA (F-DNA)	1181	2.2%	148	2.8%
<i>Screening</i>	1087	2.0%	141	11.5%
<i>Testing (high risk cases)</i>	94	0.2%	7	0.1%
Both tests	454	0.8%	76	1.5%
<i>T1 + F-DNA (Screening)</i>	369	0.7%	51	1.0%
<i>T1 + F-DNA (Testing)</i>	67	0.1%	19	10.4%
<i>T2 + F-DNA (Screening)</i>	16	0.03%	5	0.1%
<i>T2 + F-DNA (Testing)</i>	2	0.004%	1	0.02%

R: Residents, NR: Non-Residents

ANTENATAL COMPLICATIONS

	2004		2009		2014	
	R	NR	R	NR	R	NR
Diabetes mellitus	3016	92	4590	638	7038	153
<i>Pre-existing DM</i>	68	2	74	29	159	5
<i>GDM</i>	719	35	1095	220	6879	148
<i>IGT</i>	2229	55	3421	389	-	-
Hypertensive disorder	1097	153	1021	368	2152	92
<i>Mild</i>	503	59	518	166	907	38
<i>Severe</i>	280	54	275	120	412	19
<i>Unclassified</i>	314	40	228	82	833	35
Cardiac diseases	352	27	404	66	421	10
Anaemia	1705	251	1726	553	2431	63
Renal diseases	113	5	110	18	113	2
Liver diseases	25	1	32	23	104	5
Respiratory diseases	308	8	444	16	761	1
GI /biliary tract diseases	30	2	33	5	37	1
Epilepsy	64	5	60	6	108	1
Psychiatric diseases	255	5	484	9	920	3
Immunological diseases	59	10	83	9	135	2
Thyroid diseases	608	27	786	10	1169	22
Surgical diseases	201	17	199	51	89	0
Pelvic mass	-	-	-	-	1705	34
<i>Ovarian cysts</i>	-	-	-	-	353	10
No antenatal surgery	-	-	-	-	279	3
Antenatal surgery	-	-	-	-	74	7
<i>Uterine fibroids</i>	-	-	-	-	1387	24

R: Residents, NR: Non-Residents

OBSTETRIC COMPLICATIONS

	2004		2009		2014	
	R	NR	R	NR	R	NR
Preterm delivery (<37 weeks)	2797	495	3074	1799	3589	264
<i>Extremely (<28 weeks)</i>	142	17	160	16	172	6
<i>Very (28 – 31 weeks)</i>	277	26	276	72	344	19
<i>Moderate to late (32 – 36 weeks)</i>	2378	452	2638	1711	3073	239
Post-term delivery (≥42 weeks)	365	308	78	133	27	7
Breech presentation (parturients)	1708	373	1889	973	1992	146
Antepartum haemorrhage	896	88	957	213	1405	44
<i>Placenta praevia</i>	255	35	507	96	401	11
<i>Placenta abruptio</i>	64	8	354	101	91	12
<i>APH of unknown origin</i>	534	43	58	15	851	20
<i>Other causes</i>	43	2	38	1	62	1
Born before arrival	126	49	88	66	101	16

R: Residents, NR: Non-Residents

* Singleton or multiple pregnancies with first baby in breech presentation

MODE OF ONSET OF LABOUR

	2004		2009		2014	
	R	NR	R	NR	R	NR
Spontaneous	24444	6875	24355	17682	29534	3154
Induced labour	7480	1545	8782	4324	12854	451
No labour	7477	1289	11116	13465	12100	1545

R: Residents, NR: Non-Residents

Missing data on onset of labour in 8 cases in 2009

GESTATION AT DELIVERY

	2004		2009		2014	
	R	NR	R	NR	R	NR
< 26 weeks	65	6	87	8	70	4
26-28 weeks	135	11	118	13	167	5
29 - 32 weeks	348	46	360	123	463	30
33 - 36 weeks	2249	430	2509	1655	2889	225
37 - 41 weeks	36118	8896	40901	33345	50440	4819
≥ 42 weeks	365	308	78	132	27	7
Unknown	121	10	205	198	432	60

R: Residents, NR: Non-Residents

STATUS OF AMNIOTIC FLUID DURING LABOUR

	2014	
	R	NR
Clear liquor	49589	4931
Meconium stained liquor	5040	235
<i>Mild</i>	3319	138
<i>Moderate</i>	1150	75
<i>Severe</i>	571	22
Blood stained liquor	454	17
No liquor	243	3

R: Residents, NR: Non-Residents

MODE OF DELIVERY FOR EACH BABY

	2004		2009		2014	
	R	NR	R	NR	R	NR
Spontaneous delivery	22520	6378	23842	14576	30563	1781
Vacuum extraction	3902	921	3907	3428	3795	554
Forceps delivery	373	92	284	89	657	13
Vaginal breech delivery	81	27	106	55	129	17
LSCS before labour	7624	1299	11285	13397	12404	1521
LSCS after labour	5299	1079	5322	4339	7584	1283
Classical CS before labour	40	5	66	24	92	2
Classical CS after labour	14	1	112	32	49	1
Others/Missing	0	0	33	3	0	0

R: Residents, NR: Non-Residents

Missing data on mode of delivery in 36 cases in 2009

USE OF OXYTOCICS FOR THIRD STAGE OF LABOUR

	2014	
	R	NR
Syntometrine	23713	718
Syntocinon	17320	806
<i>Duratocin</i>	3530	1254
<i>Nil</i>	9925	2372

R: Residents, NR: Non-Residents

BIRTH WEIGHT AT DELIVERY

	2004		2009		2014	
	R	NR	R	NR	R	NR
< 500 gm	16	2	28	5	21	4
500 - 999 gm	154	13	172	18	183	9
1000 - 1499 gm	229	17	259	62	315	15
1500 - 1999 gm	485	89	605	211	743	34
2000 - 2499 gm	1897	362	2509	1246	3108	208
2500 - 2999gm	10428	2316	12659	8784	15802	1332
3000 - 3499 gm	17504	4573	19909	16841	24079	2324
3500 - 3999 gm	7612	2058	7551	7177	8493	806
≥ 4000 gm	1419	367	1080	1182	1112	82
Unknown	110	5	191	419	1470	372

R: Residents, NR: Non-Residents

POSTPARTUM COMPLICATIONS

	2004		2009		2014	
	R	NR	R	NR	R	NR
Postpartum haemorrhage*	1024	271	2447	900	1442	45
<i>Vaginal delivery (> 500 ml)</i>	943	258	705	306	1053	28
<i>Caesarean delivery (> 1,000 ml)</i>	-	-	347	130	389	17
Blood transfusion	-	-	249	107	535	28
<i>Vaginal delivery</i>	-	-	150	47	347	16
<i>Caesarean delivery</i>	-	-	98	60	188	12
Episiotomy#	21715	6355	19879	11903	18453	1295
<i>Nulliparous</i>	21660	6331	12629	6112	13950	932
<i>Multiparous</i>	5	24	7250	5791	4503	363
Manual removal of placenta	837	196	691	632	518	4
<i>Vaginal delivery</i>	385	92	344	177	378	2
<i>Caesarean delivery</i>	452	104	347	455	140	2
Puerperal pyrexia	239	55	324	100	225	6
Breast abscess	15	1	7	4	4	0
Urinary tract infection	144	24	104	13	90	0
Genital tract infection	34	11	86	6	230	4
Wound problem with intervention	132	21	143	29	86	5

* Post-partum haemorrhage was defined as blood loss > 500 ml within 24 hours of delivery before 2014 and > 500 ml following vaginal delivery and > 1,000 ml following Caesarean delivery in 2014.

#Include vaginal deliveries only

MATERNAL COMPLICATIONS

	2004		2009		2014	
	R	NR	R	NR	R	NR
Perineal laceration#	-	-	-	-	13145	421
<i>First degree</i>	-	-	-	-	9443	332
<i>Second degree</i>	-	-	-	-	3560	88
<i>Third degree</i>	12	4	50	17	124	1
<i>Fourth degree</i>	-	-	-	-	18	0
Internal iliac artery ligation	2	1	2	0	2	0
Uterine artery embolisation	-	-	18	6	3	0
Uterine compression suture	-	-	-	-	70	1
Uterine balloon tamponade	-	-	-	-	61	8
Uterine rupture	4	1	4	2	2	0
Hysterectomy	20	1	31	9	23	0
Maternal collapse	-	-	-	-	11	0
Maternal death	3	0	1	1	2	0

R: Residents, NR: Non-Residents

*Post-partum haemorrhage was defined as blood loss > 500 ml within 24 hours of delivery before 2014 and > 500 ml following vaginal delivery and > 1,000 ml following Caesarean delivery in 2014.

FETAL OUTCOME

	2004		2009		2014	
	R	NR	R	NR	R	NR
Alive at 28 days	39172	9766	44780	35903	55123	5175
Stillbirths	92	25	120	28	131	8
<i>Antepartum</i>	73	19	104	21	116	5
<i>Intrapartum</i>	4	0	1	3	0	0
<i>Undetermined</i>	15	6	15	4	15	3
Neonatal deaths	50	11	63	14	56	3
<i>Early</i>	40	10	53	13	45	2
<i>Late</i>	10	1	10	1	11	1
Low birth weight (<2500 gm)	2781	483	3573	1542	4349	266
<i>Singleton</i>	533	117	2697	1104	3372	229
<i>Multiple</i>	2248	366	876	438	977	37
Macrosomia (>4000 gm)	1342	342	1080	1182	1112	82
Apgar score <4 at 1 minute	197	53	202	41	283	18
Apgar score <4 at 5 minutes	91	29	113	25	147	10

R: Residents, NR: Non-Residents

OTHER NEONATAL COMPLICATIONS

	2004		2009		2014	
	R	NR	R	NR	R	NR
Admission to NICU	7408	1545	6265	1702	7917	96
Major Congenital abnormalities	201	40	122	82	185	9
RDS	20	3	38	25	35	0
IVH	1	0	9	2	22	1
Necrotising enterocolitis	4	1	6	0	3	1
Birth trauma	13	6	150	79	72	6
Congenital infection	5	3	34	20	4	1
Major infection	13	1	29	11	25	1
Chromosomal abnormalities	-	-	-	-	14	1

R: Residents, NR: Non-Residents

MCA- Major congenital abnormalities; RDS- Resp distress syndrome; IVH -Intraventricular haemorrhage

PREGNANCIES IN CHINESE AND NON-CHINESE

In 2014, majority of the parturients were Chinese (96.1%), while non-Chinese accounted for only 3.9%. There were no differences in the background characteristics between the two groups. The Chinese parturients were more likely to undergo the non-fetal DNA Down's syndrome screening test (47% vs 25.6%) while the non-Chinese were more likely to have the fetal DNA Down's syndrome screening test (4.2 % vs 2.1%). The non-Chinese group had slightly higher rate of gestational hypertension (5.3% vs 3.7%) but there were no differences in the other antenatal and obstetrics complications between the two groups.

The non-Chinese parturients were more likely to have normal spontaneous delivery (57.7% vs 53.3%) and less likely to have episiotomy (23.6% vs 33.4%). This might be related to the higher incidence of multiparous parturients. However, they were more likely to have perineal lacerations (27.0% vs 22.6%) including 3rd to 4th degree tear (0.49% vs 0.23%). This might be partly due to the higher incidence of macrosomic babies (3.2% vs 1.9%). The incidence of NICU admissions was also lower in the non-Chinese group (8.4% vs 13.4%).

	2014			
	Chinese		Non-Chinese	
Total no. of maternities	57316	96.1%	2322	3.9%
<i>Singleton</i>	56499	98.6%	2272	97.8%
<i>Twins</i>	810	1.4%	50	2.2%
<i>Triplets</i>	7	0.02%	0	0.0%
Total no. of babies	58140	96.1%	2372	3.9%

PARITY OF THE PATURIENTS

	2014			
	Chinese		Non-Chinese	
Para 0	32005	55.8%	1120	48.2%
Para 1	20949	36.6%	760	32.7%
Para 2	3627	6.3%	302	13.0%
Para 3 & above	735	1.3%	140	6.0%

AGE OF THE PATURIENTS

	2014			
	Chinese		Non-Chinese	
< 20 years	122	0.2%	3	0.2%
20 - 24 years	2492	4.3%	68	2.9%
25 - 29 years	9287	16.2%	282	12.1%
30 - 34 years	20678	36.1%	818	35.2%
35 - 39 years	17671	30.8%	780	33.6%
40 – 44 years	5520	9.6%	295	12.7%
≥ 45 years	546	1.0%	41	17.7%
Unknown	1000	1.5%	35	1.5%

CHARACTERISTICS OF THE PATURIENTS

	2014			
	Chinese		Non-Chinese	
Resident				
<i>Hong Kong</i>	52306	91.3%	5010	94.0%
<i>Non-Hong Kong</i>	2182	8.7%	140	6.0%
Conception				
<i>Natural pregnancy</i>	55979	97.7%	2262	97.4%
<i>IVF pregnancy</i>	1337	2.3%	60	2.6%
Previous uterine scar				
<i>Caesarean scar</i>	7400	12.9%	329	14.2%
<i>Non-Caesarean scar</i>	7177	12.5%	324	14.0%
<i>Non-Caesarean scar</i>	267	0.5%	6	0.3%

DOWN'S SCREENING/TESTING

	2014			
	Chinese		Non-Chinese	
Non-fetal DNA screening	26852	47.0%	595	25.6%
<i>1st Trimester</i>	24047	42.1%	510	22.0%
<i>2nd Trimester</i>	2789	1.9%	85	3.7%
<i>Combined</i>	16	0.02%	0	0.0%
Fetal DNA	1232	2.1%	97	4.2%
<i>Screening</i>	1133	2.0%	95	4.1%
<i>Testing (high risk cases)</i>	99	0.2%	2	0.1%
Both tests	488	0.9%	42	1.8%
<i>T1 + F-DNA (Screening)</i>	379	0.7%	41	1.8%
<i>T1 + F-DNA (High risk)</i>	71	0.1%	1	0.04%
<i>T2 + F-DNA (Screening)</i>	35	0.06%	0	0.0%
<i>T2 + F-DNA (High risk)</i>	3	0.005%	0	0.0%

Fetal DNA testing could be performed as a primary screening test or test for high risk parturients

ANTENATAL COMPLICATIONS

	2014			
	Chinese		Non-Chinese	
Diabetes mellitus	6942	12.1%	249	10.7%
<i>Pre-existing DM</i>	156	0.3%	8	0.3%
<i>GDM</i>	6786	11.8%	241	10.4%
Hypertension	2122	3.7%	122	5.3%
<i>Mild</i>	886	1.5%	59	2.5%
<i>Severe</i>	409	0.7%	22	0.9%
<i>Unclassified</i>	827	1.4%	41	1.8%
Cardiac diseases	415	0.7%	16	0.7%
Anaemia	2389	4.2%	105	4.5%
Renal diseases	112	0.2%	3	0.1%
Liver diseases	95	0.2%	14	0.6%
Respiratory diseases	731	1.3%	31	1.3%
GI /biliary tract diseases	34	0.1%	4	0.2%
Epilepsy	104	0.2%	5	0.2%
Psychiatric diseases	905	1.6%	18	0.8%
Immunological diseases	130	0.2%	7	0.3%
Thyroid diseases	1141	2.0%	50	2.2%
Surgical diseases	84	0.1%	5	0.2%
Pelvic mass	1698	3.0%	41	1.8%
<i>Ovarian cysts</i>	357	0.6%	6	0.3%
No antenatal surgery	277	77.6%	5	83.3%
Antenatal surgery	80	22.4%	1	16.7%
<i>Uterine fibroids</i>	1376	2.4%	35	1.5%

OBSTETRIC COMPLICATIONS

	2014			
	Chinese		Non-Chinese	
Antepartum haemorrhage	1403	2.4%	46	2.0%
<i>Placenta praevia</i>	404	0.7%	8	0.3%
<i>Placenta abruptio</i>	96	0.2%	7	0.3%
<i>APH of unknown origin</i>	840	1.5%	31	1.3%
<i>Other causes</i>	63	0.1%	0	0.0%
Placenta praevia	359	0.6%	12	0.5%
Threatened preterm labour	374	0.7%	23	1.0%
Preterm (<37 weeks)	3698	6.4%	184	7.9%
<i>Singleton</i>	3268	5.7%	161	6.9%
<i>Multiple</i>	430	0.7%	23	1.0%
Breech presentation	2041	3.6%	97	4.2%

* *Singleton or multiple pregnancies with first baby in breech presentation*

MODE OF ONSET OF LABOUR

	2014			
	Chinese		Non-Chinese	
Spontaneous	31485	54.9%	1203	51.8%
Induced labour	12660	22.1%	645	27.8%
No labour	13171	23.0%	474	20.4%

GESTATION AT DELIVERY

	2014			
	Chinese		Non-Chinese	
< 26 weeks	67	0.1%	7	0.3%
26 - 28 weeks	162	0.3%	10	0.4%
29 - 32 weeks	469	0.8%	24	1.1%
33 - 36 weeks	2975	5.2%	139	6.2%
37 - 41 weeks	53192	93.5%	2067	91.7%
≥ 42 weeks	28	0.05%	6	0.3%
Unknown	423	0.7%	69	3.0%

STATUS OF AMNIOTIC FLUID DURING LABOUR

	2014			
	Chinese		Non-Chinese	
Clear liquor	52430	90.2%	2090	88.1%
Meconium stained liquor	5026	8.6%	249	10.5%
<i>Mild</i>	3325	5.7%	132	5.6%
<i>Moderate</i>	1162	2.0%	63	2.7%
<i>Severe</i>	539	0.9%	54	2.3%
Blood stained liquor	450	0.8%	21	0.9%
No liquor	234	0.4%	12	0.5%

MODE OF DELIVERY FOR EACH BABY

	2014			
	Chinese		Non-Chinese	
Spontaneous delivery	30982	53.3%	1362	57.7%
Vacuum extraction	4191	7.2%	158	6.7%
Forceps delivery	627	1.1%	43	1.8%
Vaginal breech delivery	135	0.2%	11	0.5%
LSCS before labour	13470	23.2%	495	20.9%
LSCS after labour	8583	14.8%	295	12.4%
Classical CS before labour	93	0.2%	1	0.04%
Classical CS after labour	47	0.1%	3	0.1%
Unknown	12	0.02%	4	0.2%

USE OF OXYTOCICS FOR THIRD STAGE OF LABOUR

	2014			
	Chinese		Non-Chinese	
Syntometrine	23573	41.1%	858	37.0%
Syntocinon	17197	30.0%	929	40.0%
Duratocin	4672	8.2%	112	4.8%
Nil	11874	20.7%	423	18.2%

BIRTH WEIGHT AT DELIVERY

	2014			
	Chinese		Non-Chinese	
< 500 gm	24	0.04%	1	0.04%
500 - 999 gm	181	0.3%	11	0.5%
1000 - 1499 gm	317	0.6%	13	0.6%
1500 - 1999 gm	740	1.3%	37	1.6%
2000 - 2499 gm	3186	5.5%	130	5.7%
2500 - 2999 gm	16593	28.8%	541	23.5%
3000 - 3499 gm	25395	44.1%	1008	43.9%
3500 - 3999 gm	8851	15.4%	448	19.5%
≥ 4000 gm	1119	1.9%	75	3.3%
Unknown	1734	3.0%	108	4.6%

POSTPARTUM COMPLICATIONS

	2014			
	Chinese		Non-Chinese	
Postpartum haemorrhage*	1435	2.5%	52	2.2%
<i>Vaginal delivery (> 500 ml)</i>	1047	2.9%	34	2.2%
<i>Caesarean delivery (> 1,000 ml)</i>	388	1.1%	18	2.4%
Blood transfusion	542	0.9%	21	0.9%
<i>Vaginal delivery</i>	353	1.0%	10	0.6%
<i>Caesarean delivery</i>	189	0.9%	11	1.5%
Episiotomy#	19166	33.4%	549	23.6%
<i>Nulliparous</i>	14469	74.1%	390	52.0%
<i>Multiparous</i>	4697	28.8%	159	19.5%
Manual removal of placenta	529	0.9%	14	0.6%
<i>Vaginal delivery</i>	392	1.1%	9	0.6%
<i>Caesarean delivery</i>	137	0.6%	5	0.7%
Puerperal pyrexia	213	0.4%	18	0.8%
Breast abscess	4	0.007%	0	0.0%
Urinary tract infection	84	0.1%	6	0.3%
Genital tract infection	225	0.4%	9	0.4%
Wound problem with intervention	86	0.2%	5	0.2%

MATERNAL COMPLICATIONS

	2014			
	Chinese		Non-Chinese	
Born before arrival	101	0.2%	16	0.7%
Perineal laceration#	12940	36.1%	626	27.0%
<i>First degree</i>	9385	26.2%	390	24.9%
<i>Second degree</i>	3423	9.6%	225	14.4%
<i>Third degree</i>	116	0.3%	9	0.6%
<i>Fourth degree</i>	16	0.04%	2	0.1%
Internal iliac artery ligation	2	0.003%	0	0.0%
Uterine artery embolisation	3	0.005%	0	0.0%
Uterine compression suture	67	0.1%	4	0.2%
Uterine balloon tamponade	68	0.1%	1	0.04%
Uterine rupture	2	0.003%	0	0.0%
Hysterectomy	22	0.04%	1	0.04%
Maternal collapse	11	0.02%	0	0.0%
Maternal death	2	0.003%	0	0.0%

*Post-partum haemorrhage was defined as blood loss > 500 ml within 24 hours of delivery before 2014 and > 500 ml following vaginal delivery and > 1,000 ml following Caesarean delivery in 2014.

FETAL OUTCOME

	2014			
	Chinese		Non-Chinese	
Alive at 28 days	57950	99.7%	2348	99.0%
Stillbirths	128	0.22%	11	0.5%
<i>Antepartum</i>	114	0.2%	7	0.3%
<i>Intrapartum</i>	0	0.0%	0	0.0%
<i>Undetermined</i>	14	0.02%	4	0.2%
Neonatal deaths	50	0.12%	9	0.4%
<i>Early</i>	40	0.1%	7	0.3%
<i>Late</i>	10	0.02%	2	0.08%
Low birth weight (<2500 gm)	4424	7.6%	191	8.1%
<i>Singleton</i>	3459	6.1%	142	6.3%
<i>Multiple</i>	965	58.8%	49	49.0%
Macrosomia (>4000 gm)	1119	1.9%	75	3.2%
Apgar score <4 at 1 minute	270	0.5%	31	1.3%
Apgar score <4 at 5 minutes	139	0.2%	18	0.8%

OTHER NEONATAL COMPLICATIONS

	2014			
	Chinese		Non-Chinese	
Admission to NICU	7814	13.5%	199	8.4%
Major congenital abnormality	182	0.3%	12	0.5%
RDS	33	0.06%	2	0.08%
IVH	21	0.04%	2	0.08%
Necrotising enterocolitis	4	0.007%	0	0.0%
Birth trauma	75	0.1%	3	0.1%
Major neonatal infection	26	0.04%	5	0.2%
Congenital infection	5	0.009%	0	0.0%
Major infection	21	0.04%	5	0.2%
Chromosomal abnormality	13	0.02%	2	0.08%

RDS- Respiratory distress syndrome; IVH -Intraventricular haemorrhage

PREGNANCIES WITH DIFFERENT CONCEPTIONS

In 2014, 2.3% of parturients were conceived by IVF. Majority of the IVF parturients were at advanced maternal age (72.5%) and they were usually nulliparous (78.2%). It is obvious for IVF group to have more twins (22.2% vs 0.9%) and triplets (0.3% vs 0.01%) babies. More IVF parturients underwent fetal DNA Down's screening test (9.1% vs 2.1%) and there were more positive screening results (4.9% vs 0.8%) among them because of the higher maternal age.

Concerning IVF group, there were more antenatal, obstetrics and postnatal complications. IVF parturients carried a higher incidence in diabetes mellitus (21.6% vs 11.8%), hypertension (7.7% vs 3.7%), uterine fibroids (5.6% vs 2.3%), antepartum hemorrhage (4.4% vs 2.4%) especially placenta previa (2.1% vs 0.7%) and postpartum hemorrhage (5.3% vs 2.4%). They were also more likely to have caesarean section (72% v.s. 37%) as mode of delivery. There were more preterm labour (18.6% vs 6.2%), low birth weight babies (25.9% vs 7.1%) and a higher rate of admission to NICU (23.3% vs 12.9%).

	2014			
	Natural		IVF	
Total no. of maternities	58241	97.6%	1397	2.3%
<i>Singleton</i>	57688	99.1%	1083	77.5%
<i>Twins</i>	550	0.9%	310	22.2%
<i>Triplets</i>	3	0.01%	4	0.3%
Total no. of babies	58797	97.2%	1715	2.8%

PARITY OF THE PATURIENTS

	2014			
	Natural		IVF	
Para 0	32033	55.0%	1092	78.2%
Para 1	21449	36.8%	260	18.6%
Para 2	3888	6.7%	41	2.9%
Para 3 & above	871	1.5%	4	0.3%

AGE OF THE PATURIENTS

	2014			
	Natural		IVF	
< 20 years	124	0.2%	1	0.1%
20 - 24 years	2557	4.4%	4	0.3%
25 - 29 years	9522	16.3%	52	3.7%
30 - 34 years	21186	36.4%	321	22.8%
35 - 39 years	17872	30.7%	593	42.1%
40 - 44 years	5452	9.4%	363	26.0%
≥ 45 years	526	0.9%	61	4.4%
Unknown	1023	1.8%	13	0.9%

CHARACTERISTICS OF THE PATURIENTS

	2014	
	Natural	IVF
Resident		
<i>Hong Kong</i>	53157	1331
<i>Non-Hong Kong</i>	5084	66
Ethnic		
<i>Chinese</i>	55979	1337
<i>Non-Chinese</i>	2262	60
Previous uterine scar	7578	151
<i>Caesarean scar</i>	7369	132
<i>Non-Caesarean scar</i>	254	19

DOWN'S SCREENING/TESTING

	2014			
	Natural		IVF	
Non-fetal DNA screening	26728	45.9%	719	51.5%
<i>1st Trimester</i>	23906	41.2%	651	46.8%
<i>2nd Trimester</i>	2807	4.8%	67	4.8%
<i>Combined</i>	15	0.03%	1	0.07%
Fetal DNA*	1202	2.1%	127	9.1%
<i>Screening</i>	1120	1.9%	108	7.7%
<i>Testing (high risk cases)</i>	82	0.1%	19	1.4%
Both tests	462	0.8%	68	4.9%
<i>T1 + F-DNA (Screening)</i>	362	0.6%	58	4.2%
<i>T1 + F-DNA (High risk)</i>	62	0.1%	10	0.8%
<i>T2 + F-DNA (Screening)</i>	35	0.06%	0	0.0%
<i>T2 + F-DNA (High risk)</i>	3	0.005%	0	0.0%

Fetal DNA testing could be performed as a primary screening test or test for high risk parturients

ANTENATAL COMPLICATIONS

	2014			
	Natural		IVF	
Diabetes mellitus	6889	11.8%	302	21.6%
<i>Pre-existing DM</i>	156	0.3%	8	0.6%
<i>GDM</i>	6733	11.6%	294	21.0%
Hypertension	2136	3.7%	108	7.7%
<i>Mild</i>	900	1.5%	45	3.2%
<i>Severe</i>	397	0.7%	33	2.4%
<i>Unclassified</i>	839	1.4%	29	2.1%
Cardiac diseases	419	0.7%	12	0.9%
Anaemia	2436	4.2%	58	4.1%
Renal diseases	113	0.2%	2	0.1%
Liver diseases	106	0.2%	3	0.2%
Respiratory diseases	750	1.3%	12	0.9%
GI /biliary tract diseases	38	0.07%	0	0.0%
Epilepsy	109	0.2%	0	0.0%
Psychiatric diseases	914	1.6%	9	0.6%
Immunological diseases	128	0.2%	9	0.6%
Thyroid diseases	1155	2.0%	36	2.6%
Surgical diseases	85	0.1%	4	0.3%
Pelvic mass	1649	2.8%	90	6.4%
<i>Ovarian cysts</i>	351	0.6%	12	0.0%
No antenatal surgery	275	0.5%	7	0.5%
Antenatal surgery	76	0.1%	5	0.4%
<i>Uterine fibroids</i>	1333	2.3%	78	5.6%

OBSTETRIC COMPLICATIONS

	2014			
	Natural		IVF	
Previous uterine scar	7578	13.0%	151	10.8%
<i>Caesarean scar</i>	7369	12.7%	132	9.4%
<i>Non-Caesarean scar</i>	254	0.4%	19	1.4%
Antepartum haemorrhage	1388	2.4%	61	4.4%
<i>Placenta praevia</i>	382	0.7%	30	2.1%
<i>Placenta abruptio</i>	96	0.2%	7	0.5%
<i>APH of unknown origin</i>	848	1.5%	23	1.6%
<i>Other causes</i>	62	0.1%	1	0.07%
Placenta praevia	349	0.6%	22	1.6%
Threatened preterm labour	378	0.6%	19	1.4%
Preterm (<37 weeks)	3620	6.2%	262	18.6%
<i>Singleton</i>	3315	5.6%	114	8.1%
<i>Multiple</i>	305	0.5%	148	10.5%
Breech presentation	2025	3.5%	113	8.1%

* *Singleton or multiple pregnancies with first baby in breech presentation*

MODE OF ONSET OF LABOUR

	2014			
	Natural		IVF	
Spontaneous	32178	55.2%	510	36.5%
Induced labour	13064	22.4%	241	17.3%
No labour	12999	22.3%	646	46.2%

GESTATION AT DELIVERY

	2014			
	Natural		IVF	
< 26 weeks	72	0.1%	2	0.1%
26 - 28 weeks	154	0.3%	18	1.3%
29 - 32 weeks	465	0.8%	28	2.0%
33 - 36 weeks	2906	5.0%	208	14.9%
37 - 41 weeks	54124	92.9%	1135	81.2%
> 41 weeks	34	0.1%	0	0.0%
Unknown	486	0.8%	6	0.4%

STATUS OF AMNIOTIC FLUID DURING LABOUR

	2014			
	Natural		IVF	
Clear liquor	52905	90.0%	1615	94.2%
Meconium stained liquor	5192	0.09%	83	4.8%
<i>Mild</i>	3401	5.8%	56	3.3%
<i>Moderate</i>	1207	2.1%	18	1.0%
<i>Severe</i>	584	1.0%	9	0.5%
Blood stained liquor	456	0.8%	15	0.9%
No liquor	244	0.4%	2	0.1%

MODE OF DELIVERY FOR EACH BABY

	2014			
	Natural		IVF	
Spontaneous delivery	31960	54.4%	384	22.4%
Vacuum extraction	4278	7.3%	71	4.1%
Forceps delivery	658	1.1%	12	0.7%
Vaginal breech delivery	134	0.2%	12	0.7%
LSCS before labour	13114	22.3%	851	49.6%
LSCS after labour	8501	14.5%	377	22.0%
Classical CS before labour	87	0.1%	7	0.4%
Classical CS after labour	49	0.1%	1	0.06
Unknown/Missin3	16	0.03	0	0.0%

OXYTOCIC FOR THIRD STAGE OF LABOUR

	2014			
	Natural		IVF	
Syntometrine	24141	41.5%	290	20.8%
Syntocinon	17545	30.1%	581	41.6%
Duratocin	4597	7.9%	187	13.4%
Nil	11958	20.5%	339	24.3%

BIRTH WEIGHT AT DELIVERY

	2014			
	Natural		IVF	
< 500 gm	23	0.04%	2	0.1%
500 - 999 gm	166	0.3%	26	1.5%
1000 - 1499 gm	302	0.5%	28	1.6%
1500 - 1999 gm	682	1.2%	95	5.6%
2000 - 2499 gm	3020	5.1%	296	17.3%
2500 - 2999gm	16605	28.2%	529	30.8%
3000 - 3499 gm	25889	44.0%	514	30.0%
3500 - 3999 gm	9140	15.5%	159	9.3%
≥ 4000 gm	1171	2.0%	23	1.3%
Unknown	1799	3.1	43	2.5%

POSTPARTUM COMPLICATIONS

	2014			
	Natural		IVF	
Postpartum haemorrhage*	1413	2.4%	74	5.3%
<i>Vaginal delivery (> 500 ml)</i>	1049	2.0%	32	7.2%
<i>Caesarean delivery (> 1,000 ml)</i>	364	1.7%	42	4.4%
Blood transfusion	531	0.9%	32	2.3%
<i>Vaginal delivery</i>	351	1.0%	12	2.7%
<i>Caesarean delivery</i>	180	0.8%	20	2.1%
Episiotomy#	19422	33.3%	293	21.0%
<i>Nulliparous</i>	14596	73.3%	263	76.5%
<i>Multiparous</i>	4826	28.4%	30	29.4%
Manual removal of placenta	521	0.9%	23	1.6%
<i>Vaginal delivery</i>	390	1.1%	11	2.5%
<i>Caesarean delivery</i>	130	0.6%	12	1.3%
Puerperal pyrexia	222	0.4%	9	0.6%
Breast abscess	3	0.005%	1	0.07%
Urinary tract infection	86	0.1%	4	0.3%
Genital tract infection	225	0.4%	9	0.6%
Wound problem with intervention	88	0.2%	3	0.2%

MATERNAL COMPLICATIONS

	2014			
	Natural		IVF	
Born before arrival	2025	3.5%	113	8.1%
Perineal laceration#	13438	36.4%	128	28.7%
<i>First degree</i>	9692	26.2%	83	18.6%
<i>Second degree</i>	3605	9.8%	43	9.6%
<i>Third degree</i>	124	0.3%	1	0.2%
<i>Fourth degree</i>	17	0.05%	1	0.2%
Internal iliac artery ligation	1	0.002%	1	0.07%
Uterine artery embolisation	3	0.005%	0	0.0%
Uterine compression suture	59	0.1%	12	0.9%
Uterine balloon tamponade	61	0.1%	8	0.6%
Uterine rupture	2	0.003%	0	0.0%
Hysterectomy	21	0.04%	2	0.1%
Maternal collapse	9	0.02%	0	0.0%
Maternal death	2	0.003%	0	0.0%

*Post-partum haemorrhage was defined as blood loss > 500 ml within 24 hours of delivery before 2014 and > 500 ml following vaginal delivery and > 1,000 ml following Caesarean delivery in 2014.

FETAL OUTCOME

	2014			
	Natural		IVF	
Alive at 28 days	58593	99.7%	1704	99.4%
Stillbirths	132	0.2%	7	0.4%
<i>Antepartum</i>	115	0.2%	6	0.4%
<i>Intrapartum</i>	0	0.0%	0	0.0%
<i>Undetermined</i>	17	0.03%	1	0.1%
Neonatal deaths	56	0.1%	3	0.2%
<i>Early</i>	44	0.1%	3	0.2%
<i>Late</i>	12	0.02%	0	0.0%
Low birth weight (<2500 gm)	4170	7.1	445	25.9%
<i>Singleton</i>	3487	6.0%	114	10.5%
<i>Multiple</i>	683	61.6%	331	52.4%
Macrosomia (>4000 gm)	1171	2.0%	23	1.3%
Apgar score <4 at 1 minute	285	0.5%	16	0.9%
Apgar score <4 at 5 minutes	152	0.3%	5	0.3%

OTHER NEONATAL COMPLICATIONS

	2014			
	Natural		IVF	
Admission to NICU	7614	13.0%	399	23.4%
Major congenital abnormality	190	0.3%	4	0.2%
RDS	33	0.06%	2	0.1%
IVH	23	0.04%	0	0.0%
Necrotising enterocolitis	4	0.007%	0	0.0%
Birth trauma	75	0.1%	3	0.2%
Major neonatal infection	30	0.05%	1	0.06%
Congenital infection	4	0.007%	1	0.06%
Major infection	26	0.04%	0	0.0%
Chromosomal abnormality	15	0.03%	0	0.0%

RDS- Respiratory distress syndrome; IVH -Intraventricular haemorrhage

The Gynaecological Report

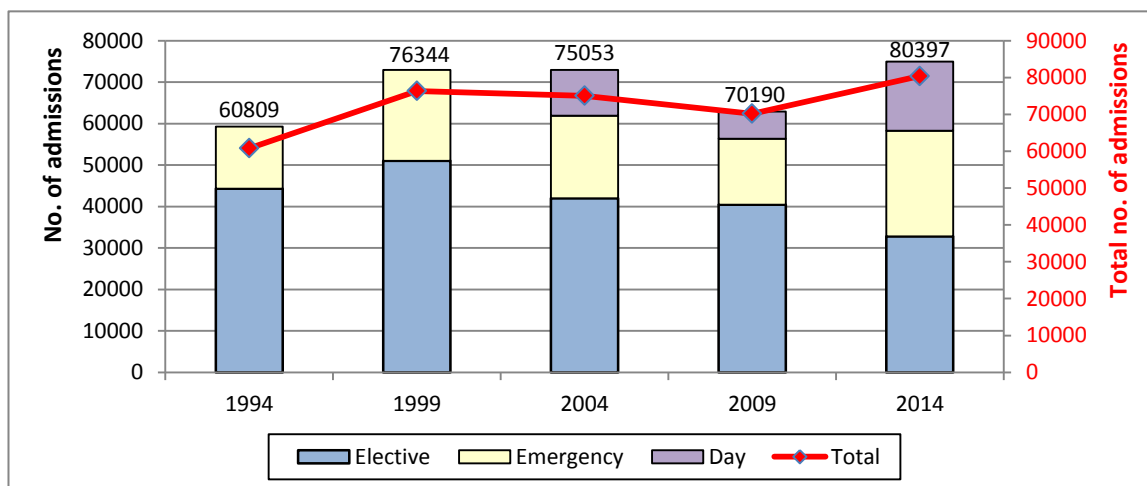
2014

GENERAL GYNAECOLOGICAL STATISTICS

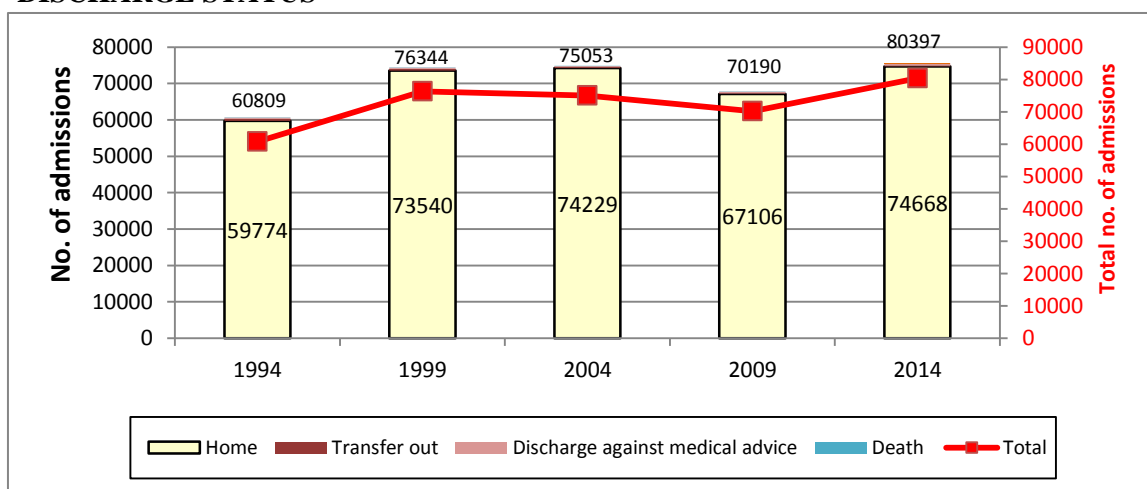
BACKGROUND INFORMATION OF THE RETURNED GYNAECOLOGICAL DATA

	2004		2009		2014	
Total number of records analyzed	75053		70190		80397	
<i>Records with complete data</i>	73865	98.4%	65157	92.8%	75172	93.5%
<i>Records with incomplete data</i>	1188	1.6%	5033	7.2%	5225	6.5%
Missing data on age	231	0.3%	908	1.3%	0	0.0%
Missing data on both admission/discharge date	621	0.8%	1469	2.1%	0	0.0%
Missing data on admission/discharge status	233	0.3%	2689	3.8%	5209	6.5%
No diagnosis recorded	325	0.43%	101	1.4%	2	0.002%
No procedure recorded	385	0.51%	174	2.5%	16	0.02%
No diagnosis and procedure recorded	295	0.39%	533	7.6%	0	0.0%

ADMISSION STATUS



DISCHARGE STATUS



STATUS AT ADMSSION

The total number of gynaecological admissions decreased from 75,053 in 2004 to 70,190 in 2009 and increased back to 80,397 in 2014. This represented a 14.5% increase from 2009 and a 7.1% increase over the 10 years period. The number of emergency admissions decreased from 19,906 in 2004 to 15,919 in 2009 and increased dramatically by 60% to 25,514 in 2014. The number of scheduled (elective and day) admissions dropped from 53,066 in 2004 to 46,989 in 2009 and increased back to 49,457 in 2014. The number of day admissions fluctuated widely from 11,071 in 2004 down to 6,553 only in 2009, and increased by 2.5 folds to 16,695 in 2014. It is important to note that the number of missing data also significantly increased over the 10 years period, constituting 5.3% of all admissions in 2014.

	2004		2009		2014	
Emergency admissions	19906	26.5%	15919	27.8%	25514	31.7%
Elective admissions	41996	56.0%	40436	57.5%	32762	40.8%
Day admissions	11071	14.7%	6553	9.3%	16695	20.8%
Unplanned readmissions	895	1.2%	663	0.9%	538	0.7%
Transfer in from other specialties	973	1.3%	823	1.2%	556	0.7%
Missing data	212	0.3%	2286	3.3%	4332	5.4%
Total no. of admissions	75053		70190		80397	

STATUS AT DISCHARGE

Majority of the cases were discharged home but the rate continued to drop from 98.9% in 2004 to 95.6% in 2009 and 92.9% in 2014. This may be partly due to the increase in the number of missing data. The number of discharge against medical advice continued to increase from 275 in 2004 to 454 in 2009 and 700 in 2014, constituting about 1% of all admissions. The number of transfer to other specialties remained low. The number of deaths remained very low (22-23 cases per year) and constituted only 0.03% of all admissions.

	2004		2009		2014	
Home	74229	98.9%	67106	95.6%	74668	92.9%
Transfer to convalescence hospitals	63	0.08%	43	0.1%	42	0.1%
Transfer to other specialties	247	0.3%	114	0.2%	178	0.2%
Discharge against medical advice	275	0.4%	454	0.6%	700	0.9%
Death	22	0.03%	23	0.03%	22	0.03%
Missing data	217	0.3%	2450	3.5%	4787	6.0%
Total no. of admissions	75053		70190		80397	

SUMMARY OF DISTRIBUTION OF VARIOUS DIAGNOSES

For each admission, there might be more than one diagnosis under different or same category. Disorders of pregnancy and reproduction remained the most common condition for admission but the number dropped from 36,211 in 2004 to 32,817 in 2009 and increased back to 36,408 in 2014. Uterine pathology and menstrual disorders remained the second and third indications for admission. The number of admissions for uterine pathology continued to increase from 11,615 to 12,717 in 2009 and 13,633 in 2014 while that for menstrual disorders decreased from 9,235 in 2004 to 8,000 in 2009 and increased back to 12,531 in 2014. The number of admissions for broad ligaments & pelvic peritoneum pathology dropped from 957 in 2004 to 906 in 2009 and 573 in 2014 and became the least common indication for admission.

Classification of diagnoses	2004		2009		2014	
Vulva, perineum and urethra	1882	2.5%	1727	2.5%	1987	2.5%
Vagina	486	0.7%	441	0.6%	605	0.8%
Cervix	5240	7.0%	4351	6.2%	5941	7.4%
Uterus	11615	15.5%	12717	18.1%	13633	17.0%
Fallopian tubes	1742	2.3%	1397	2.0%	1630	2.0%
Ovaries	7508	10.0%	7267	10.4%	6250	7.8%
Broad ligaments & pelvic peritoneum	957	1.3%	906	1.3%	573	0.7%
Genital displacement / urinary disorders	2129	2.8%	2766	3.9%	2326	2.9%
Menstrual disorders	9235	12.3%	8000	11.4%	12531	15.6%
Pregnancy and reproductive disorders	36211	48.3%	32817	46.8%	36408	45.3%
Non-obstetric diseases in pregnancy	1909	2.5%	2161	3.1%	1745	2.2%
Other gynaecological diseases	2542	3.4%	1771	2.5%	1637	2.0%
Other non-gynaecological diseases	2251	3.0%	1890	2.7%	2898	3.6%
Total no. of admissions	75053		70190		80397	

TEN COMMONEST DIAGNOSES

First trimester termination of pregnancy used to be the most common diagnosis for admission since the first audit in 1994. The rate continued to drop from 19.4% in 2004 to 12.2% in 2009 and 9.1% in 2014, and became the third most common diagnosis for admission. Silent/spontaneous miscarriage and threatened miscarriage became the first and second most common diagnosis for admission, accounting for 11.8% and 10.0% of all admissions in 2014 respectively. Post-menopausal bleeding became one of the top 10 diagnoses for the first time and ranked the 6th, accounted for 5.2% of all admissions.

Diagnoses	2004		2009		2014	
	Ranking	%	Ranking	%	Ranking	%
Silent /spontaneous miscarriage	2	9.7	2	10.8	1	11.8
Threatened miscarriage	4	6.7	5	7.9	2	10.0
First trimester TOP	1	19.4	1	12.2	3	9.1
Fibromyoma	3	9.6	3	9.8	4	8.2
Subfertility	5	6.6	4	9.3	5	6.7
Post-menopausal bleeding	-		-		6	5.2
Menorrhagia	10	3.2	7	3.8	7	5.1
Endometrial polyp	-	2.0	9	3.3	8	5.0
Dysfunctional uterine bleeding	6	6.0	6	4.1	9	4.7
Cervical intra-epithelial neoplasia	7	4.0	10	3.3	10	3.8

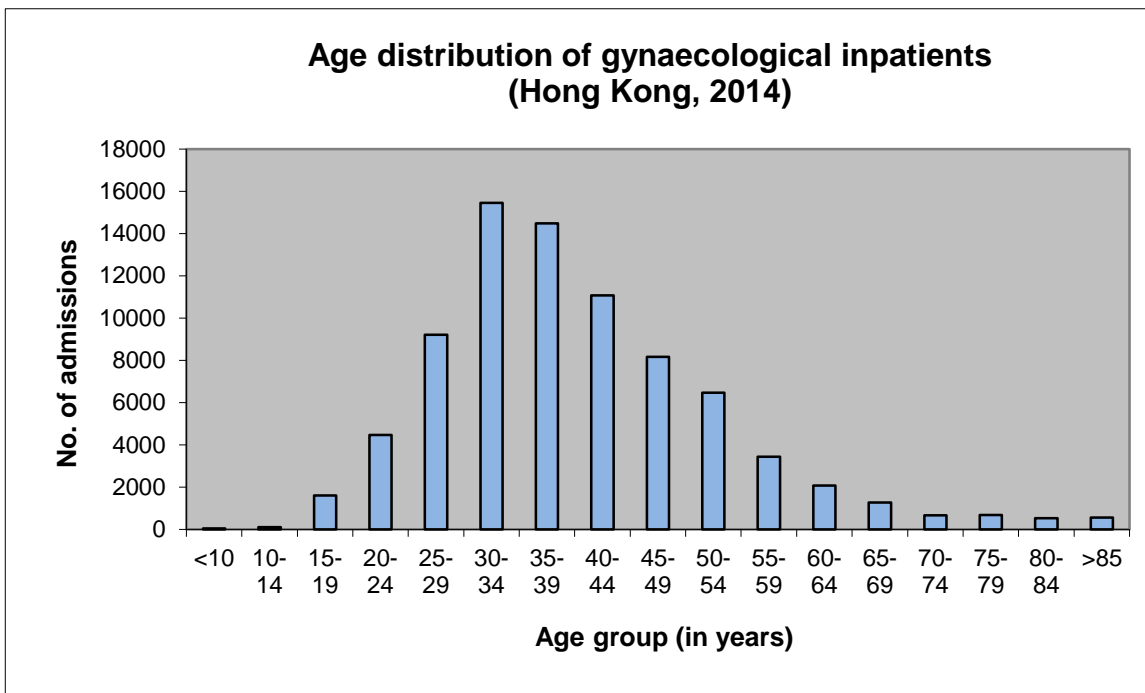


Figure G1 – Age distribution of gynaecological inpatients admission

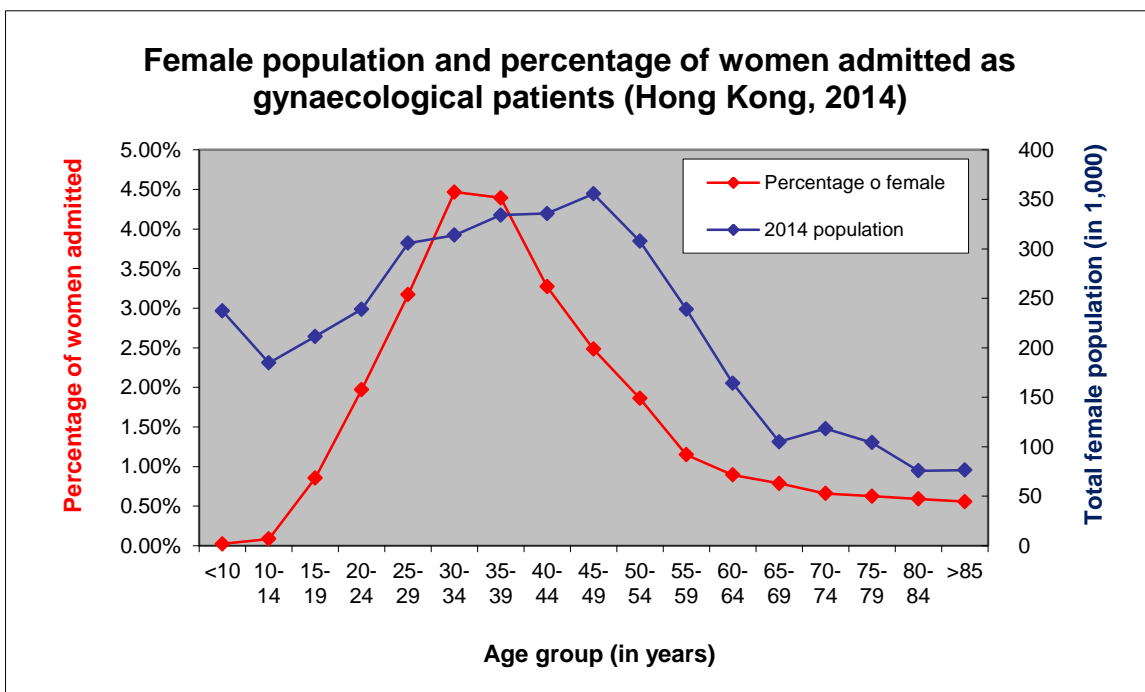


Figure G2 – Percentage of women admitted

DETAILED BREAKDOWN OF INDIVIDUAL DIAGNOSIS

DISEASES OF VULVA, PERINEIUM AND URETHRA

The number of admissions for this category of diseases varied from 1715 to 1987 with the overall rate remained at 2.5% over the 10 years period. While most of the diagnoses in the category decreased, the number of infection in 2014 increased by 14.8% compared with 2004. The number of miscellaneous conditions also increased by 56.7%, accounting for 13.5% of the admissions under this category in 2014.

	2004		2009		2014	
Infection	767	41.2%	890	51.9%	1113	56.0%
Retention cyst	331	17.8%	198	11.5%	159	8.0%
Benign neoplasm	168	9.0%	144	8.4%	153	7.7%
Vulval dystrophy	166	8.9%	110	6.4%	109	5.5%
Trauma	148	7.9%	75	4.4%	91	4.6%
Malignant neoplasm	87	4.7%	91	5.3%	79	4.0%
Congenital anomalies	22	1.2%	14	0.8%	17	0.9%
Urethral lesions	17	0.9%	17	1.0%	11	0.6%
Miscellaneous	171	9.2%	188	11.0%	268	13.5%
Total no. of admissions	1862	(2.4%)	1715	(2.4%)	1987	(2.5%)

The percentage of individual diagnosis refers to the percentage under this disease category while that of the total no. of admissions refers to the percentage of all admissions.

DISEASES OF VAGINA

The number of admissions for vaginal diseases increased from 479 in 2004 and 438 in 2009 to 605 in 2014. This represented an overall 20.8% increase over the 10 years period. The number of atrophic vaginitis in 2014 significantly increased by 5 folds compared with 2004 and 2009. The number of malignant neoplasms decreased by 59.4% and that of benign neoplasms and vaginal intra-epithelial neoplasia increased by 64.1% and 27.1% respectively. The number of miscellaneous conditions significantly increased by 63.6%, accounting for 14.9% of the admissions under this category.

	2004		2009		2014	
Vaginal intra-epithelial neoplasia	96	20.0%	93	21.2%	122	20.2%
Infection	99	20.7%	71	16.2%	105	17.4%
Atrophic vaginitis	18	3.8%	19	4.3%	98	16.2%
Benign neoplasm	39	8.1%	34	7.8%	64	10.6%
Trauma	47	9.8%	47	10.7%	47	7.8%
Malignant neoplasm	64	13.4%	47	10.7%	26	4.3%
Retention cyst	35	7.3%	27	6.2%	24	4.0%
Congenital anomalies	24	5.0%	20	4.6%	22	3.6%
Fistula	9	1.9%	10	2.3%	9	1.5%
Miscellaneous	55	11.5%	73	16.7%	90	14.9%
Total no. of admissions	479	(0.6%)	438	(0.6%)	605	(0.8%)

The percentage of individual diagnosis refers to the percentage under this disease category while that of the total no. of admissions refers to the percentage of all admissions.

DISEASES OF UTERINE CERVIX

The number of admissions for cervical diseases decreased from 5,187 in 2004 to 4,319 in 2009 and increased back to 5941 in 2014. This represented an overall 14.5% increase over the 10 years period. The number of cervical intra-epithelial neoplasia dropped by 23.2% from 2004 to 2009 and increased back by 32.7% from 2009 to 2014, while that of carcinoma of cervix increased by 12.2% initially and decreased by 42.1% afterwards. The number of miscellaneous conditions increased by 3.2 folds in 2014, accounting for 9.3% of the admissions under this category.

	2004		2009		2014	
Cervical intra-epithelial neoplasia	3016	58.1%	2309	53.5%	3064	51.6%
Infection	146	2.8%	112	2.6%	1055	18.8%
Benign neoplasm	890	17.2%	662	15.3%	962	16.2%
Carcinoma of cervix	951	18.3%	1067	24.7%	618	10.4%
Congenital anomalies	22	0.4%	16	0.4%	41	0.7%
Trauma	20	0.4%	8	0.2%	24	0.4%
Other malignancies of cervix	29	0.6%	23	0.5%	12	0.2%
Miscellaneous	171	3.3%	154	3.6%	551	9.3%
Total no. of admissions	5187	(6.9%)	4319	(6.2%)	5941	(7.4%)

The percentage of individual diagnosis refers to the percentage under this disease category while that of the total no. of admissions refers to the percentage of all admissions.

DISEASES OF UTERINE BODY

The number of admissions for uterine diseases increased from 11,044 in 2004 to 12,024 in 2009 and 13,633 in 2014. This represented an overall 23.4% increase over the 10 years period. The number of endometrial polyps increased by 2.7 folds, while that of endometrial hyperplasia increased by 1.9 folds. The number of fibroids decreased by 8.3% and that of adenomyosis increased by 8.2%. The number of carcinoma of corpus increased by 22.1%. The number of miscellaneous conditions increased by 3.0 folds, accounting for 2% of the admissions under this category.

	2004		2009		2014	
Fibromyoma	7190	65.1%	6908	57.5%	6596	48.4%
Endometrial polyp	1512	13.7%	2310	19.2%	4013	29.4%
Carcinoma of corpus	983	8.9%	1249	10.4%	1200	8.8%
Adenomyosis	959	8.7%	1025	8.5%	1038	7.6%
Endometrial hyperplasia	365	3.3%	552	4.6%	702	5.2%
Infection	267	2.4%	211	1.8%	225	1.7%
Atrophic endometritis	32	0.3%	38	0.3%	82	0.6%
Other malignancy of the uterine body	92	0.8%	151	1.3%	80	0.6%
Congenital anomalies	66	0.6%	77	0.6%	73	0.5%
Myohyperplasia	34	0.3%	12	0.1%	28	0.2%
Trauma	26	0.2%	24	0.2%	20	0.2%
Miscellaneous	89	0.8%	160	1.3%	271	2.0%
Total no. of admissions	11044	(14.7%)	12024	(17.3%)	13633	(17.0%)

The percentage of individual diagnosis refers to the percentage under this disease category while that of the total no. of admissions refers to the percentage of all admissions.

DISEASES OF FALLOPIAN TUBES

The number of admissions for tubal diseases decreased from 1,722 in 2004 to 1,386 in 2009 and increased to 1,630 in 2014. This represented an overall 5.3% drop over the 10 years period. The number of benign neoplasms increased by 3.1 times. The number of acute pelvic inflammatory diseases dropped by 25.5% in 2009 and rose back to 1,066 in 2014, while that of the chronic form dropped by 23.0% over the 10 years period.

	2004		2009		2014	
Acute pelvic inflammatory disease	1129	65.6%	841	60.7%	1066	65.4%
Chronic pelvic inflammatory disease	440	25.6%	365	26.3%	339	20.8%
Benign neoplasm	54	3.1%	60	4.3%	166	10.2%
Tuberculosis salpingitis	14	0.8%	19	1.4%	14	0.9%
Malignant neoplasm	37	2.1%	17	1.2%	11	0.7%
Miscellaneous	68	3.9%	95	6.9%	51	3.1%
Total no. of admissions	1722	(2.3%)	1386	(2.0%)	1630	(2.0%)

The percentage of individual diagnosis refers to the percentage under this disease category while that of the total no. of admissions refers to the percentage of all admissions.

DISEASES OF OVARY

The number of admissions for ovarian diseases decreased from 7,381 in 2004 to 7,090 in 2009 and 6250 in 2014. This represented an overall 15.3% decrease over the 10 years period. The number of benign ovarian tumours, including dermoid cysts, increased by 20.9% while that of endometriotic cysts decreased by 30.9%. The number of primary epithelial malignant tumours decreased by 51.4% and that of primary non-epithelial malignant tumour increased by 67.2% from 2004 to 2009 and dropped 57.6% from 2009 to 2014. The number of borderline malignant tumour fluctuated between 101 to 116 cases per year.

	2004		2009		2014	
Benign tumour/benign cyst	2701	36.6%	2410	34.0%	2620	41.9%
Endometriotic cyst	2426	32.9%	2106	29.7%	1676	26.8%
Primary malignant tumour – epithelial	1526	20.7%	1336	18.8%	742	11.9%
Dermoid cyst	-	-	526	7.4%	648	10.4%
Retention/functional cyst	462	6.3%	346	4.9%	216	3.5%
Borderline malignant tumour	101	1.4%	125	1.8%	116	1.9%
Primary malignant tumour – non-epithelial	137	1.9%	229	3.2%	97	1.6%
Polycystic ovarian disease	-	-	48	0.7%	45	0.7%
Secondary malignant tumour	41	0.6%	45	0.6%	27	0.4%
Miscellaneous	114	1.5%	96	1.4%	191	3.1%
Total no. of admissions	7381	(9.8%)	7090	(10.1%)	6250	(7.8%)

The percentage of individual diagnosis refers to the percentage under this disease category while that of the total no. of admissions refers to the percentage of all admissions.

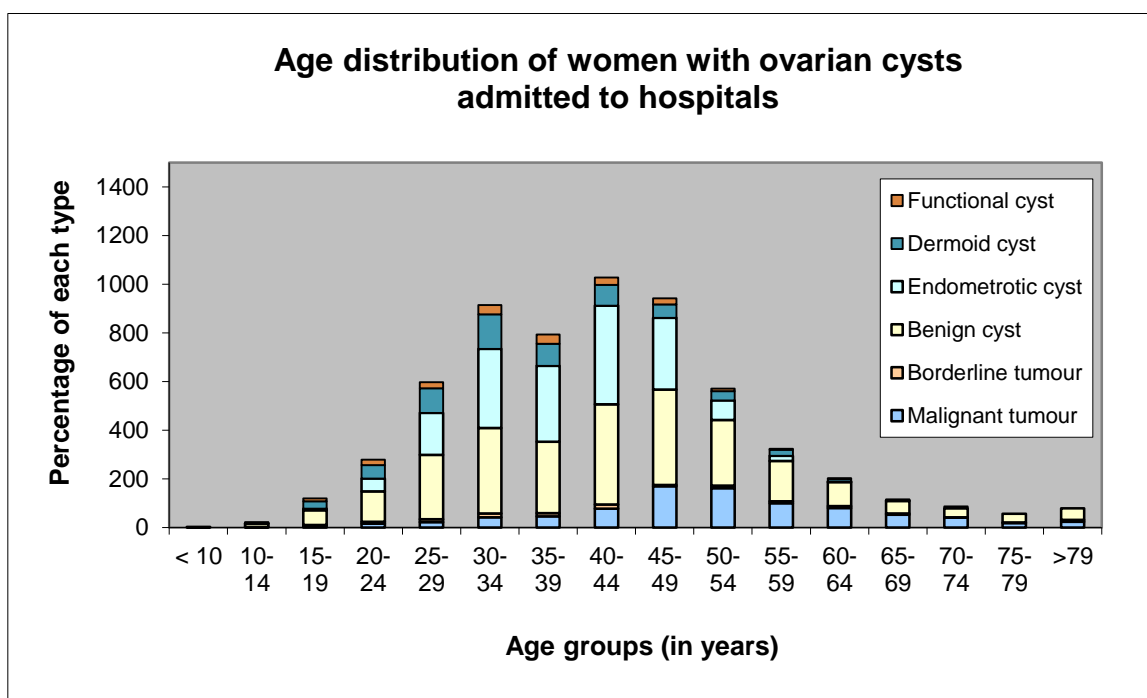


Figure G3 – Ovarian tumour: age distribution in number

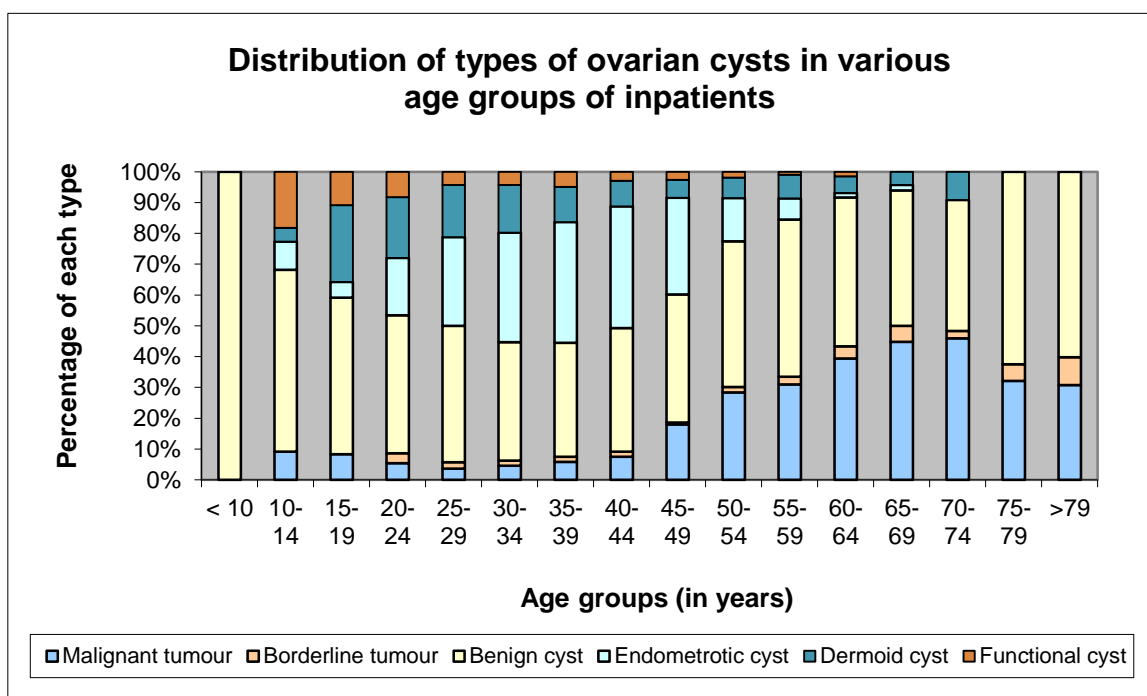


Figure G4 – Ovarian tumour: age distribution in percentage

DISEASES OF BROAD LIGAMENTS AND PELVIC PERITONEUM

The number of admissions for this category of diseases decreased from 940 in 2004 to 875 in 2009 and 573 in 2014. This represented an overall 39.0% decrease over the 10 years period. The number of para-ovarian/tubal cysts decreased by 65% and that of pelvic endometriosis decreased by 50.7%. Peritoneal carcinoma and recto-vaginal endometriosis were items included in 2009 and the number decreased by 56.1% and remained 18-21 cases per year respectively.

	2004		2009		2014	
Pelvic endometriosis	681	72.4%	465	53.1%	336	58.6%
Peritoneal carcinoma	-	-	194	22.2%	85	14.8%
Paraovarian/paratubal cyst	140	14.9%	120	13.7%	49	8.6%
Recto-vaginal endometriosis	-	-	18	2.1%	21	3.7%
Bowel endometriosis	-	-	-	-	3	0.5%
Miscellaneous	136	14.5%	109	12.5%	95	16.6%
Total no. of admissions	940	(1.3%)	875	(1.2%)	573	(0.7%)

The percentage of individual diagnosis refers to the percentage under this disease category while that of the total no. of admissions refers to the percentage of all admissions.

GENITAL DISPLACEMENT/URINARY DISORDERS

The number of admissions for this category of disorders increased from 1,505 in 2004 to 1,953 in 2009 and 2326 in 2014. This represented an overall 54.6% increase over the 10 years period. Since 2009 vaginal prolapse was divided into anterior and posterior compartment, rather than grouping them together as cystocele/rectocele/enterocele and the number increased by 38.9%. Anterior vaginal prolapse only increased by 40.3% (from 387 in 2009 to 543 in 2014), posterior prolapse only increased by 7.9% (from 38 in 2009 to 41 in 2014) and both compartment prolapse increased by 47.2% (from 127 in 2009 to 187 in 2014). The number of uterine prolapse increased by 44.4% and that of vault prolapse increased by 2.4 times. The number of stress incontinence steadily increased by 1.9 folds over the 10 years period. The number of miscellaneous conditions increased by 7.7 folds, accounting for 8.6% of the admissions under this category.

	2004		2009		2014	
Uterine prolapse	854	56.7%	964	49.4%	1233	53.0%
Genuine stress incontinence	327	21.7%	541	27.7%	628	27.0%
Cystocele/rectocele/enterocele	555	36.9%	552	28.3%	771	33.1%
Anterior vaginal prolapse	-	-	514	26.3%	730	31.4%
Posterior vaginal prolapse	-	-	165	8.4%	228	9.8%
Detrusor instability	77	5.1%	92	4.7%	120	5.2%
Voiding difficulty	114	7.6%	78	4.0%	120	5.2%
Vault prolapse	31	2.1%	61	3.1%	74	3.2%
Sensory urgency	41	2.7%	28	1.4%	29	1.3%
Detrusor hyperreflexia	4	0.3%	8	0.4%	5	0.2%
Other urinary disorders	100	6.6%	239	12.2%	81	3.5%
Miscellaneous	26	1.7%	76	3.9%	200	8.6%
Total no. of admissions	1505	(2.0%)	1953	(2.8%)	2326	(2.9%)

The percentage of individual diagnosis refers to the percentage under this disease category while that of the total no. of admissions refers to the percentage of all admissions.

DISORDERS OF MENSTRUATION

The number of admissions for menstrual disorders decreased from 9,122 in 2004 to 7,882 in 2009 and rebounded to 12,531 in 2014. This represented an overall 37.4% increase over the 10 years period. The number of dysfunctional uterine bleeding decreased by 15.7% while that of menorrhagia increased by 70.3%. The number of admissions for postmenopausal bleeding significantly increased by 2.3 folds. The number of miscellaneous conditions increased by 3.7 folds, accounting for 2.7% of the admissions under this category.

	2004		2009		2014	
Post-menopausal bleeding	1816	19.9%	1906	24.2%	4138	33.0%
Menorrhagia	2396	26.3%	2696	34.2%	4080	32.6%
Dysfunctional uterine bleeding	4515	49.5%	2887	36.6%	3806	30.4%
Dysmenorrhea	299	3.3%	201	2.6%	264	2.1%
Primary amenorrhoea	30	0.3%	19	0.2%	53	0.4%
Secondary amenorrhoea	83	0.9%	35	0.4%	46	0.4%
Miscellaneous	91	1.0%	255	3.2%	339	2.7%
Total no. of admissions	9122	(12.2%)	7882	(11.3%)	12531	(15.6%)

The percentage of individual diagnosis refers to the percentage under this disease category while that of the total no. of admissions refers to the percentage of all admissions.

DISORDERS OF PREGNANCY AND REPRODUCTION

The number of admissions for this category of disorders decreased from 35,903 in 2004 to 32,646 in 2009 and increased back to 36,407 in 2014, with an overall 1.4% increase over the 10 years period. Spontaneous/silent miscarriage and threatened miscarriage increased by 30.4% and 61.1% over the 10 years period respectively. The number of first trimester termination of pregnancies decreased by 50.1% while that of second trimester termination of pregnancies fluctuated between 966 and 1129. The number of ectopic pregnancies increased by 28.6%, with 87.5% being tubal and 12.5% being non-tubal ectopic pregnancy. The marked increase in molar pregnancy/trophoblastic diseases in 2009 (45.5%) was no longer seen in 2014, resulting in an overall increase of 27.7% only. The number of subfertility increased by 8.0%. The number of tubal occlusion/sterilization continued to decrease by 80.0% over the 10 years period. The number of miscellaneous conditions increased by 3.6 folds accounting for 4.6% of the admissions under this category.

	2004		2009		2014	
Spontaneous/Silent miscarriage	7272	20.3%	7564	23.2%	9486	26.1%
Threatened miscarriage	4994	13.9%	5563	17.0%	8046	22.1%
First trimester TOP	14584	40.6%	8582	26.3%	7275	20.0%
Subfertility	4974	13.9%	6500	19.9%	5370	14.8%
Ectopic pregnancy	1049	2.9%	1164	3.6%	1349	3.7%
Tubal ectopic pregnancy	-	-	-	-	1180	3.2%
Non-tubal ectopic pregnancy	-	-	-	-	171	0.5%
Second trimester TOP	1098	3.1%	966	3.0%	1129	3.1%
Hyperemesis gravidarum	539	1.5%	599	1.8%	812	2.2%
Failure after med abortion/evacuate	-	-	-	-	397	1.1%
Secondary postpartum haemorrhage	147	0.4%	220	0.7%	366	1.0%
Other postpartum complications	188	0.5%	282	0.9%	302	0.8%
Molar pregnancy/trophoblastic dis	213	0.6%	310	0.9%	270	0.8%
For tubal occlusion / sterilization	677	1.9%	242	0.7%	136	0.4%
Miscellaneous	458	1.3%	875	2.7%	1667	4.6%
Total no. of admissions	35903	(47.8%)	32646	(46.5%)	36407	(45.3%)

The percentage of individual diagnosis refers to the percentage under this disease category while that of the total no. of admissions refers to the percentage of all admissions.

NON-OBSTETRIC COMPLICATIONS IN PREGNANCY

The number of admissions for this category of disorders increased from 1,902 in 2004 to 2,139 in 2009 and decreased to 1,745 in 2014. This represented an overall 8.3% decrease over the 10 years period. The number of non-specific abdominal pain complicating pregnancy fluctuated between 1,254 and 1,360 cases per year. The number of medical diseases in pregnancy decreased by 46.2% while that of surgical diseases increased by 54.8%, but the number remained small. The number of malignant tumours of the genital tract during pregnancy fluctuated between 9 and 32 while that of benign tumours fluctuated between 57 and 91 cases per year.

	2004		2009		2014	
Non-specific abdominal pain	1254	65.9%	1360	63.6%	1328	76.1%
Medical diseases	524	27.5%	662	30.9%	282	16.2%
Surgical diseases	42	2.2%	38	1.8%	65	3.7%
Benign tumour of the genital tract	57	3.0%	91	4.3%	59	3.4%
Malignant tumour of the genital tract	32	1.7%	9	0.4%	20	1.2%
Total no. of admissions	1902	(2.5%)	2139	(3.0%)	1745	(2.2%)

The percentage of individual diagnosis refers to the percentage under this disease category while that of the total no. of admissions refers to the percentage of all admissions.

MISCELLANEOUS GYNAECOLOGICAL CONDITIONS

The number of admissions for this category of conditions decreased from 2,509 in 2004 to 1,766 in 2009 and 1,637 in 2014. This represented an overall 34.8% drop over the 10 years period. The number of complications subsequent to previous treatment decreased by 42.2% (from 1209 in 2004 to 699 in 2014) and the proportion occurred in the same hospital remained at 62-69%. The overall rate of abdominal pain of unknown cause decreased by 45.1%.

	2004		2009		2014	
Complications subsequent to previous treatment in same hospital	813	32.4%	551	31.2%	480	29.3%
Abdominal pain of unknown cause	861	34.3%	457	25.9%	473	28.9%
Retained IUCD	328	13.1%	262	14.8%	274	16.7%
Complications subsequent to previous treatment in other hospitals	396	15.8%	339	19.2%	219	13.4%
Translocated IUCD	10	0.4%	15	0.9%	30	1.8%
Miscellaneous	134	5.3%	147	8.3%	180	11.0%
Total no. of admissions	2509	(3.3%)	1766	(2.5%)	1637	(2.0%)

The percentage of individual diagnosis refers to the percentage under this disease category while that of the total no. of admissions refers to the percentage of all admissions.

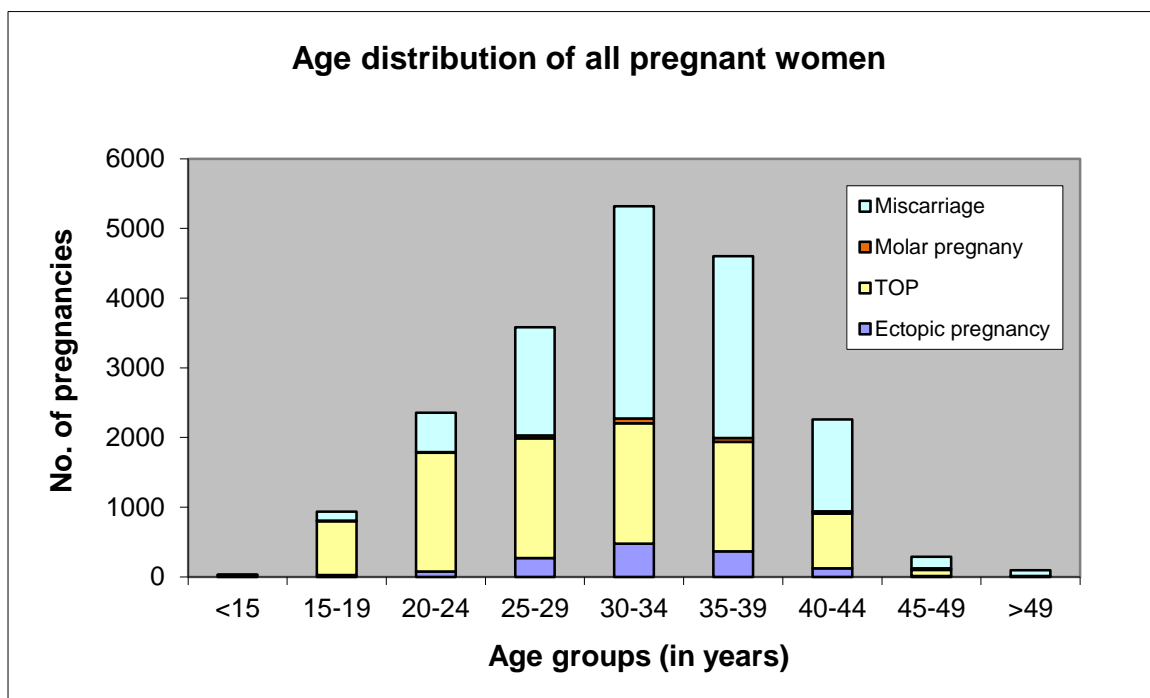


Figure G5 – Age distribution of all pregnant women

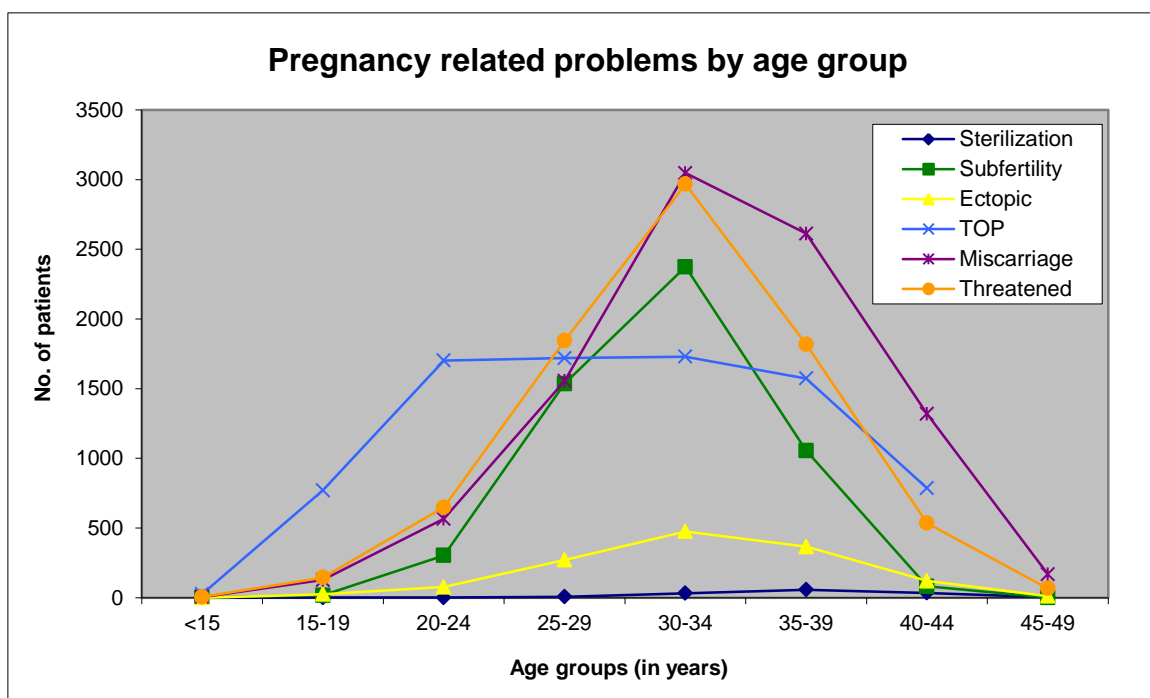


Figure G6 – Pregnancy related problems by age groups

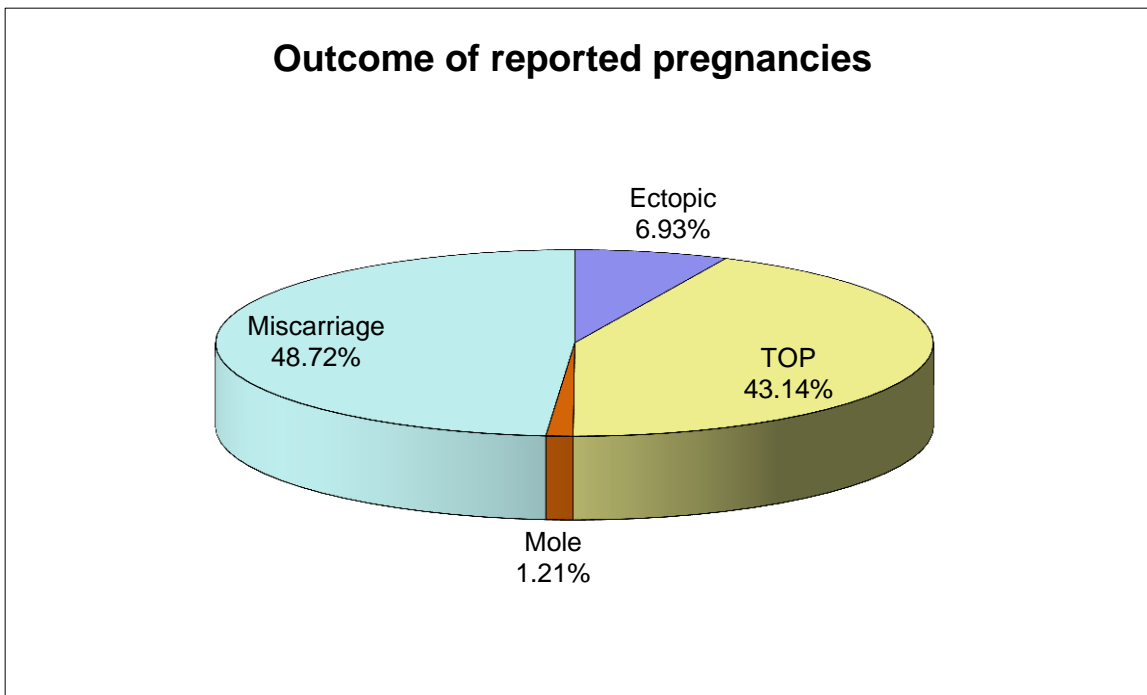


Figure G7 – Abnormal outcome of reported pregnancies

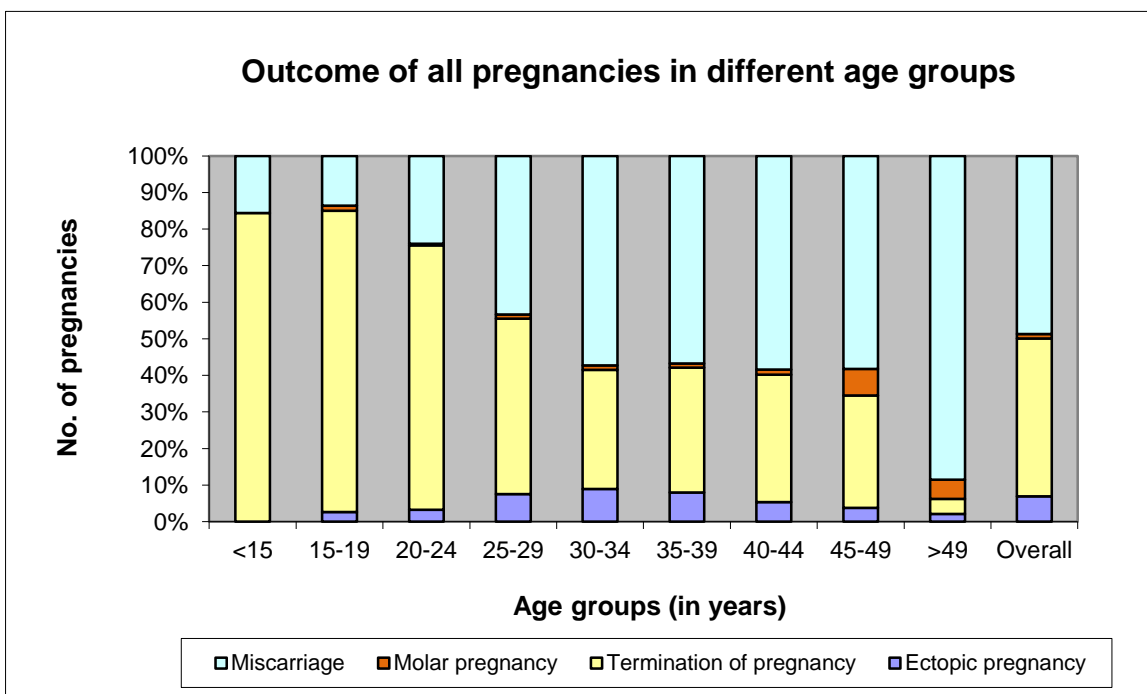


Figure G8 – Abnormal outcome of all pregnancies in different age groups

MISCELLANEOUS NON-GYNAECOLOGICAL CONDITIONS

The number of admissions for this category of conditions decreased from 2,199 in 2004 to 1,810 in 2009 and increased to 2,898 in 2014. This represented an overall 31.8% increase over the 10 years period. The number of 'no diagnosis' increased from 230 in 2004 and 225 in 2009 to 710 in 2014, accounting almost 25% of the admission in this category. Diseases of the urinary tract remained the most common condition followed by blood disease and gastrointestinal tract disease.

	2004		2009		2014	
Urinary tract disease	374	17.0%	311	17.2%	458	15.8%
Gastrointestinal tract disease	279	12.7%	251	13.9%	322	11.1%
Blood disease	231	10.5%	209	11.5%	383	13.2%
Cardiovascular disease	201	9.1%	189	10.4%	220	7.6%
Musculocutaneous disease	114	5.2%	100	5.5%	135	4.7%
Breast disease	305	13.9%	88	4.9%	130	4.5%
Endocrine disease	126	5.7%	88	4.9%	130	4.5%
Respiratory disease	49	2.2%	78	4.3%	86	3.0%
Central nervous system disease	61	2.8%	52	2.9%	75	2.6%
No diagnosis	230	10.5%	225	12.4%	710	24.5%
Miscellaneous	281	12.8%	299	16.5%	433	14.9%
Total no. of admissions	2199	(2.9%)	1810	(2.6%)	2898	(3.6%)

The percentage of individual diagnosis refers to the percentage under this disease category while that of the total no. of admissions refers to the percentage of all admissions.

In most of the disease categories, the number of miscellaneous conditions increased significantly over the past 5-10 years. This was especially in genital displacements and urinary disorders in which the number increased by 7.7 times. In the current audit, data from the public hospitals was extracted from the CMS system of the Hospital Authority which was mapped from their own diagnosis and treatment clinical database. Those from the private hospitals were produced by individual hospital and the data was input into a new database system developed by the College. The possibility of wrong coding is likely. Another possibility was inadequacy in the diagnosis coding which was less likely to be the main cause.

Miscellaneous Conditions in different disease categories

Disorders	2004		2009		2014	
Vulva	171	9.2%	188	11.0%	268	13.5%
Vagina	55	11.5%	73	16.7%	90	14.9%
Cervix	171	3.3%	154	3.6%	551	9.3%
Uterus	89	0.8%	160	1.3%	271	2.0%
Fallopian Tube	68	3.9%	95	6.9%	51	3.1%
Ovary	114	1.5%	96	1.4%	191	3.1%
Broad Ligaments and Pelvic Peritoneum	136	14.5%	109	12.5%	95	16.6%
Genital Displacement and Urinary Disorder	26	1.7%	76	3.9%	200	8.6%
Menstruation	91	1.0%	255	3.2%	339	2.7%
Pregnancy and Reproduction	458	1.3%	875	2.7%	1667	4.6%
Gynaecological Conditions	134	5.3%	147	8.3%	180	11.0%
Non-Gynaecological Conditions	281	12.8%	299	16.5%	433	14.9%

SUMMARY OF DISTRIBUTION OF TREATMENT

The data represented the actual outcome procedure performed, not according to the original intention approach. For each admission, there may be more than one form of treatment/procedure under the same or different category. Same as 2009, non-operative treatment remained the most common form of treatment with the number increased by 60% over the 10 years period. Minor vaginal/vulval operations were the second most common treatment but the number dropped by 22.0%. The number of endoscopic operations continued to rise by 34.6% and was the third most common form of treatment. The number of laparoscopic procedures increased by 9.7% and that of hysteroscopic procedures increased dramatically by 73.0%. The number of major abdominal operations decreased by 17.7%. While the major abdominal operations for benign conditions decreased by 36.9%, that for malignant conditions increased by 57.2% and that for major vaginal operations increased by 49.4%. The number of assisted reproduction procedures also increased by 46.8% over the 10 years period.

	2004		2009		2014	
Major abdominal operations	8061	10.7%	8569	12.2%	6632	8.3%
Major abdominal operations (benign)	6418	8.6%	5863	8.4%	4049	5.0%
Major abdominal operations (malignant)	1643	2.2%	2706	3.8%	2583	3.2%
Major vaginal operations	972	1.3%	1008	1.5%	1452	1.8%
Major vulval operations	103	0.1%	128	0.2%	121	0.2%
Endoscopic operations	13842	18.4%	14436	20.6%	18630	23.2%
Laparoscopic operations	7604	10.1%	7895	11.2%	8340	10.4%
Hysteroscopic operations	5949	7.9%	6155	8.8%	10290	12.8%
Colposcopic related procedures	3102	4.1%	2497	3.6%	4681	5.8%
Assisted reproduction procedures	3464	4.6%	5059	7.2%	5086	6.3%
Minor abdominal operations	210	0.3%	140	0.2%	146	0.2%
Minor vaginal/vulval operations	28798	38.4%	21910	31.2%	22456	27.9%
Radiotherapy	183	0.2%	149	0.2%	81	0.1%
Non-operative treatment	27282	36.4%	30342	43.2%	43665	54.3%
Total no. of admissions	75053		70190		80397	

Number and percentage refers to total number of procedures and percentage of all admissions

TEN COMMONEST TREATMENT MODALITIES

Observations and investigations remained the most common treatment modality with the rate increased from 24.3% to 37.3% over the 10 years period. Diagnostic hysteroscopy ranked the second and the rate increased from 6.5% to 8.9%. Suction termination of pregnancy became the third and its rate dropped from 19.4% to 8.1%. The rate of D&C/polypectomy remained around 6%, and ranked the 4th. The rate of endometrial biopsy in 2014 was similar to that of D&C/polypectomy and became one of the top 10 for the first time. The rate of prostaglandins treatment increased from 1.9% to 5.7% while that of evacuation of uterus after miscarriage decreased from 6.9% to 3.9%. This reflected the shift from surgical to medical evacuation of uterus for miscarriage. None of the intra-abdominal procedures was in the top 10 procedures.

Treatment Modalities	2004		2009		2014	
	Ranking	%	Ranking	%	Ranking	%
Observations and investigations	1	24.3	1	27.5	1	37.3
Diagnostic hysteroscopy	4	6.5	4	6.7	2	8.9
Suction termination of pregnancy	2	19.4	2	12.3	3	8.1
D&C/polypectomy	5	6.0	3	6.8	4	5.9
Endometrial biopsy	10	0.4	13	2.3	5	5.8
Prostaglandins	13	1.9	9	3.2	6	5.7
Evacuation of uterus after miscarriage	3	6.9	5	5.6	7	3.9
Colposcopy – miscellaneous	30	0.09	27	0.9	8	3.5
Embryo transfer	12	2.3	6	3.9	9	3.3
Hysteroscopic polypectomy	29	0.1	24	1.2	10	3.1

DETAILED BREAKDOWN OF INDIVIDUAL TREATMENT

MAJOR ABDOMINAL OPERATIONS

In the current audit, coding for Major Abdominal Operations for "Benign and Pre-malignant Conditions" and that for "Malignant Conditions" were combined, same as the laparoscopic operations. The differentiation between benign and malignant conditions was based on the coding for "Diagnosis", coding under the section for "Oncology Cases" and the coding for pathology under "Intra-abdominal Operation" which was an ad hoc audit in the 2014 exercise.

The number of admissions for this category of treatment decreased significantly from 7,111 in 2004 to 5,679 in 2009 and 3,593 in 2014. This represented an overall 49.5% decrease over the 10 years period. Most of the major abdominal procedures showed a reduction in numbers except for pelvic and para-aortic lymphadenectomy which increased by 2 and 2.5 folds respectively. Salpingo-oophorectomy was separated from total and subtotal hysterectomy as an individual procedure in 2009, which resulted in a dramatic increase in the number of this procedure in that year (from 580 to 2,048) and the number dropped to 1,666 in 2014. The number of abdominal hysterectomies, myomectomies and ovarian cystectomies reduced by 50%. Abdominal operations for stress incontinence and genital prolapse were uncommonly performed in 2014. These changes reflected that minimal invasive surgery had replaced traditional laparotomy and became the standard operative approach in most of the gynaecological pelvic procedures.

	2004		2009		2014	
Total hysterectomy ^a	4371	61.5%	3400	59.9%	2212	61.6%
Salpingo-oophorectomy/oophorectomy	580	8.2%	2048	36.1%	1710 ^b	47.6%
<i>Oophorectomy</i>	-	-	-	-	44	1.2%
Myomectomy	1142	16.1%	887	15.6%	572	15.9%
Pelvic lymphadenectomy	255	3.6%	428	7.5%	404	11.2%
Ovarian cystectomy	760	10.7%	530	9.3%	370	10.3%
Omentectomy	-	-	303	5.3%	314	8.7%
Tuboplasty/adhesiolysis	59	0.8%	109	1.9%	170 ^c	4.7%
Salpingectomy	153	2.2%	138	2.4%	154	4.3%
Para-aortic lymphadenectomy	59	0.8%	110	1.9%	151	4.2%
Debulking operation	177	2.5	122	2.2%	144	4.0%
Radical hysterectomy	130	1.8%	99	1.7%	90	2.5%
Bowel resection / anastomosis / stoma	-	-	41	0.7%	39	1.1%
Subtotal hysterectomy ^a	70	1.0%	37	0.7%	33	0.9%
Salpingotomy/Salpingostomy	24	-	24	0.4%	26	0.7%
Excision of para-adnexal/fimbrial cysts	-	-	-	-	18	0.5%
Laparotomy alone ± biopsy	31	0.4%	28	0.5%	17	0.5%
Drainage of pelvic abscess	23	0.3%	13	0.2%	14	0.4%
Extended hysterectomy	23	0.3%	27	0.5%	11	0.3%
Pelvic exenteration	10	0.1%	7	0.1%	8	0.2%
Resection of pelvic endometriosis	-	-	-	-	7	0.2%
Surgery for genital prolapse	-	-	20	0.4%	7	0.2%
Surgery for stress incontinence	31	0.4%	2	0.04%	6	0.2%
Trachelectomy	-	-	2	0.04%	5	0.1%
Ablation of endometriosis	-	-	-	-	5	0.1%
Resection of bowel endometriosis	-	-	-	-	3	0.08%
Repair of urinary fistula	6	0.08%	8	0.1%	3	0.08%
Ureteric repair	-	-	8	0.1%	2	0.06%
Miscellaneous	146	2.1%	177	3.1%	107	3.0%
Total no. of admissions	7111	(9.5%)	5679	(8.1%)	3593	(4.5%)

Excision of para-adnexal/fimbrial cysts = Excision of para-ovarian / para-tubal / fimbrial cysts

a - Total hysterectomy ± SO or Subtotal hysterectomy ± SO in 2004

b - Included 44 oophorectomy

c - Included tubal re-anastmosis and 1 neo-salpingostomy

Major Abdominal Operations For Bening/Pre-Malignant Conditions

The number of admissions for this category of treatment decreased from 6,137 in 2004 to 4,413 in 2009 and 2733 in 2014. This represented an overall 55.5% decrease over the 10 years period. The number of abdominal total hysterectomies decreased by 57.3%. Subtotal hysterectomy accounted for only 1.5% of all simple hysterectomies and its number decreased by 62.1%. The number of abdominal myomectomies dropped by 50.6% and that of ovarian cystectomies decreased by 53.5%. Adenomyomectomy was a new coding in this exercise and the number was small (25).

	2004		2009		2014	
Total hysterectomy	3761	61.3%	2666	60.4%	1606	58.6%
Salpingo-oophorectomy/oophorectomy	436	7.1%	1314	29.8%	1009 ^a	36.9%
Ovarian cystectomy	760	12.4%	530	12.0%	354	13.0%
Myomectomy	1142	18.6%	887	20.1%	564	20.6%
Salpingectomy	153	2.5%	138	3.1%	140	5.1%
Tuboplasty/adhesiolysis	59	1.0%	109	2.5%	107	3.9%
<i>Adhesiolysis</i>	-	-	-	-	97	3.6%
<i>Tubal re-anastomosis</i>	-	-	-	-	10	0.4%
Subtotal hysterectomy	66	1.1%	33	0.7%	25	0.9%
Adenomyomectomy	-	-	-	-	25	0.9%
Salpingotomy/Salpingostomy	24	0.4%	24	0.5%	24	0.9%
Extra-ovarian cystectomy	-	-	-	-	18	0.7%
Surgery for genital prolapse	-	-	20	0.5%	6	0.2%
Drainage of pelvic abscess	23	0.4%	13	0.3%	13	0.5%
Extended hysterectomy	-	-	6	0.1%	3	0.1%
Repair of urinary fistula	6	0.1%	7	0.2%	3	0.1%
Bowel resection / anastomosis / stoma	-	-	3	0.07%	14	0.5%
Ureteric repair	-	-	3	0.07%	2	0.07%
Operations for stress incontinence	31	0.5%	2	0.05%	6	0.2%
Miscellaneous	101	1.6%	108	2.5%	72	2.6%
Total no. of admissions	6137	(8.2%)	4413	(6.3%)	2733	(3.4%)

* Total hysterectomy ± SO or Subtotal hysterectomy* ± SO in 2004

a- including 33 oophorectomy

Major Abdominal Operations For Malignant Conditions

The number of admissions for this category of treatment increased from 974 in 2004 to 1,266 in 2009 and dropped back to 860 in 2014. This represented an overall 11.7% drop over the 10 years period. The number of abdominal total hysterectomies increased from 610 in 2004 to 734 in 2009 and dropped back to 606 in 2014. The number of radical hysterectomies decreased from 130 in 2004 to 99 in 2009 and 84 in 2014 with an overall drop of 35.4%. The number of extended hysterectomies also dropped from 23 in 2004 and 21 in 2009 to only 8 in 2014.

The number of debulking operations in 2004 was 177 cases. In 2009, the definition of debulking operation was standardized (removal of gross tumour from sites other than uterus, tubes and ovaries, i.e. beyond a hysterectomy and salpingo-oophorectomy), the number decreased to 122 in 2009 and remained 138 in 2014. The number of pelvic lymphadenectomy increased by 1.6 folds while that of para-aortic lymphadenectomy increased by 2.5 folds. There was only 1 case of trachelectomy which was performed for carcinoma of cervix together with primary ovarian epithelial malignancy (stage 3) in a 40 years old woman. She also underwent debulking operation, para-aortic lymph nodes dissection and omentectomy.

	2004		2009		2014	
Total hysterectomy*	610	62.6%	734	61.7%	606	70.5%
Salpingo-oophorectomy / Oophorectomy	-	-	734	61.7%	690/11	81.5%
Pelvic lymphadenectomy	255	26.2%	428	36.0%	397	46.2%
Omentectomy	-	-	303	25.5%	297	34.5%
Para-aortic lymphadenectomy	59	6.1%	110	9.2%	150	17.4%
Debulking operation	177	18.2%	122	10.3%	138	16.1%
Radical hysterectomy	130	13.3%	99	8.3%	84	9.8%
Bowel resection / anastomosis / stoma	-	-	38	3.2%	25	2.9%
Laparotomy alone ± biopsy	31	3.2%	28	2.4%	8	0.9%
Extended hysterectomy	23	2.4%	21	1.8%	8	0.9%
Subtotal hysterectomy*	4	0.4%	4	0.3%	8	0.9%
Pelvic exenteration	10	1.0%	7	0.6%	7	0.8%
Ureteric repair/ reimplantation	-	-	5	0.4%	0	0.0%
Trachelectomy	-	-	2	0.2%	1	0.1%
Repair of urinary fistulae	-	-	1	0.08%	0	0.0%
Miscellaneous	45	4.6%	69	5.8%	35	4.1%
Total no. of admissions	974	(1.3%)	1266	(1.8%)	860	(1.1%)

* Total hysterectomy ± SO or Subtotal hysterectomy ± SO in 2004

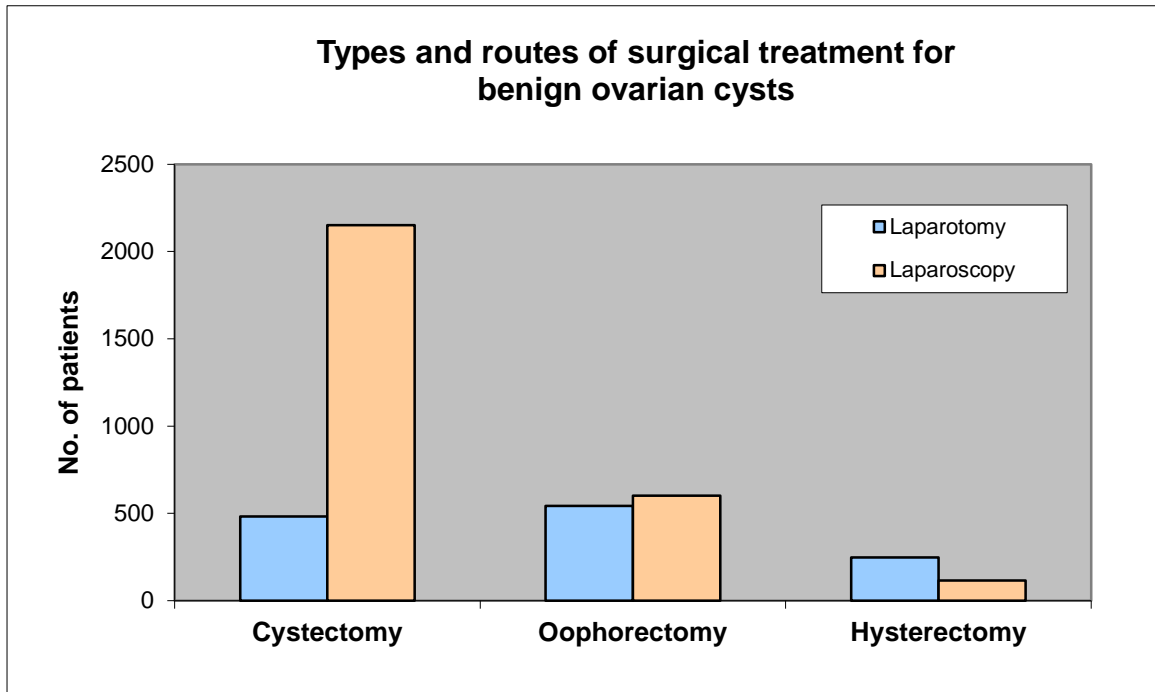


Figure G9 – Types and routes of surgical treatment for benign ovarian cysts

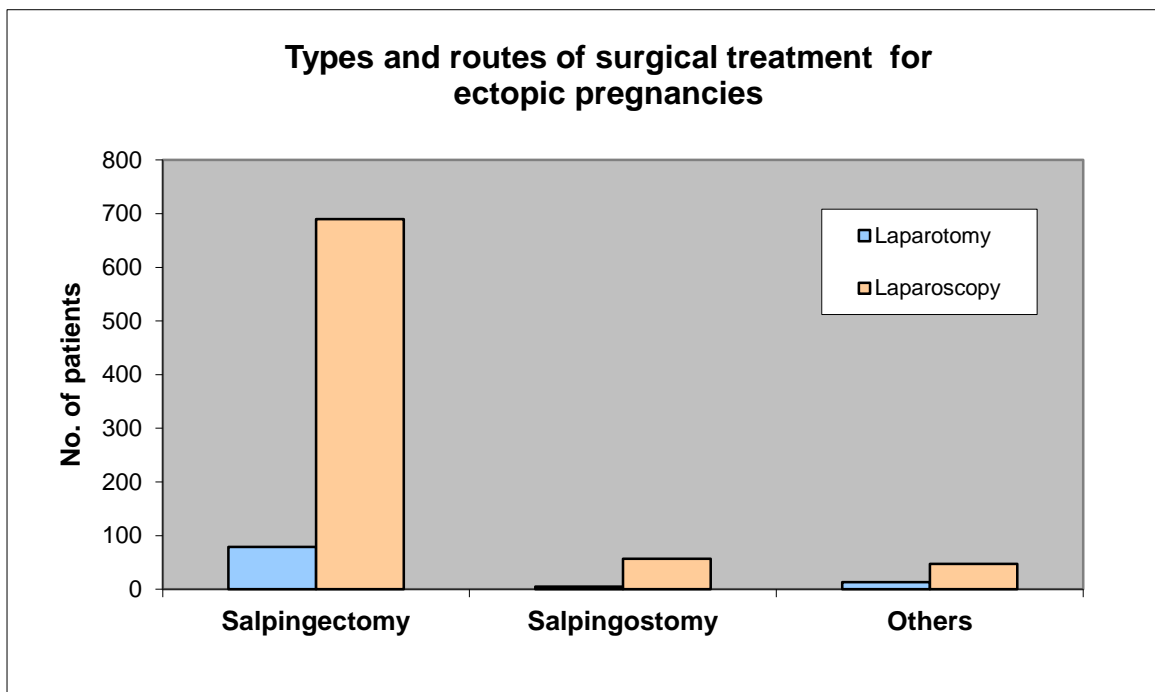


Figure G10 – Types and routes of surgical treatment for ectopic pregnancies

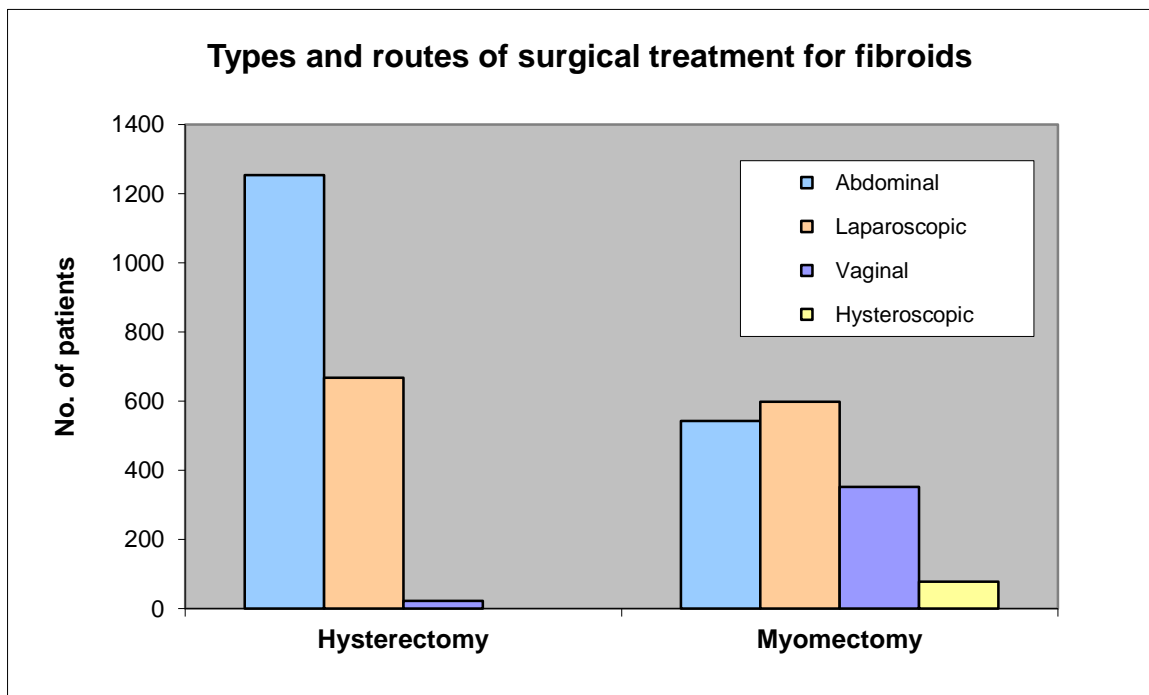


Figure G11 – Types and routes of surgical treatment for fibroids
 (3 robotic hysterectomy and 2 robotic myomectomy were included under laparoscopic procedures)

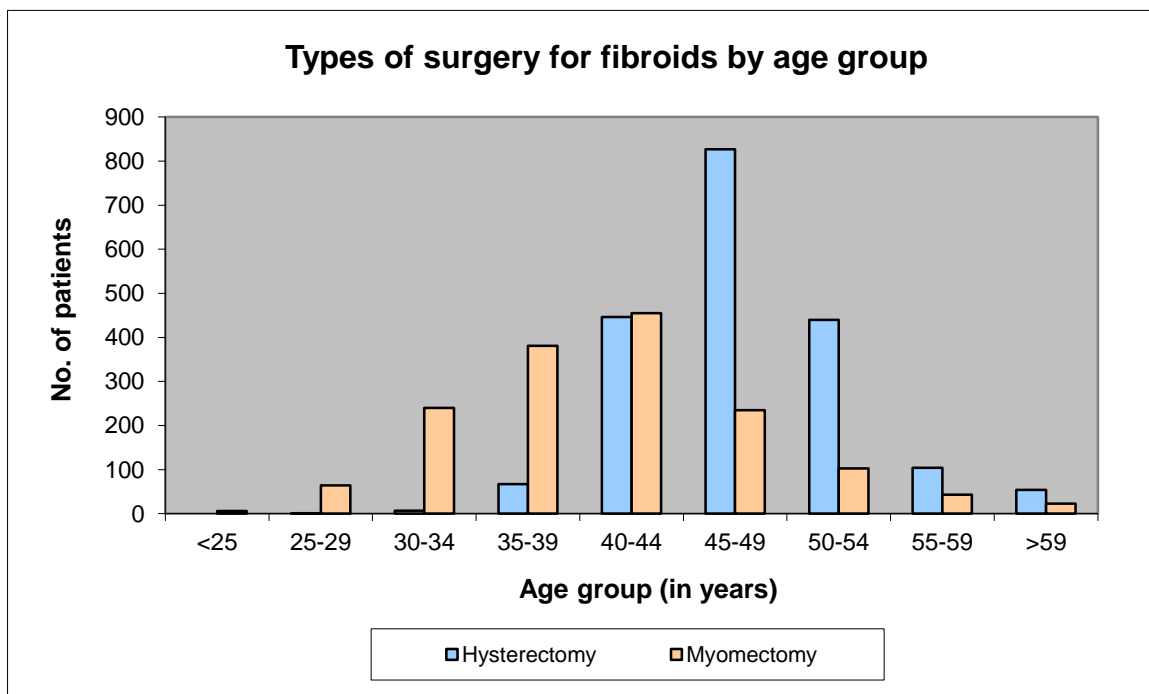


Figure G12 – Types of surgery for fibroids by age groups

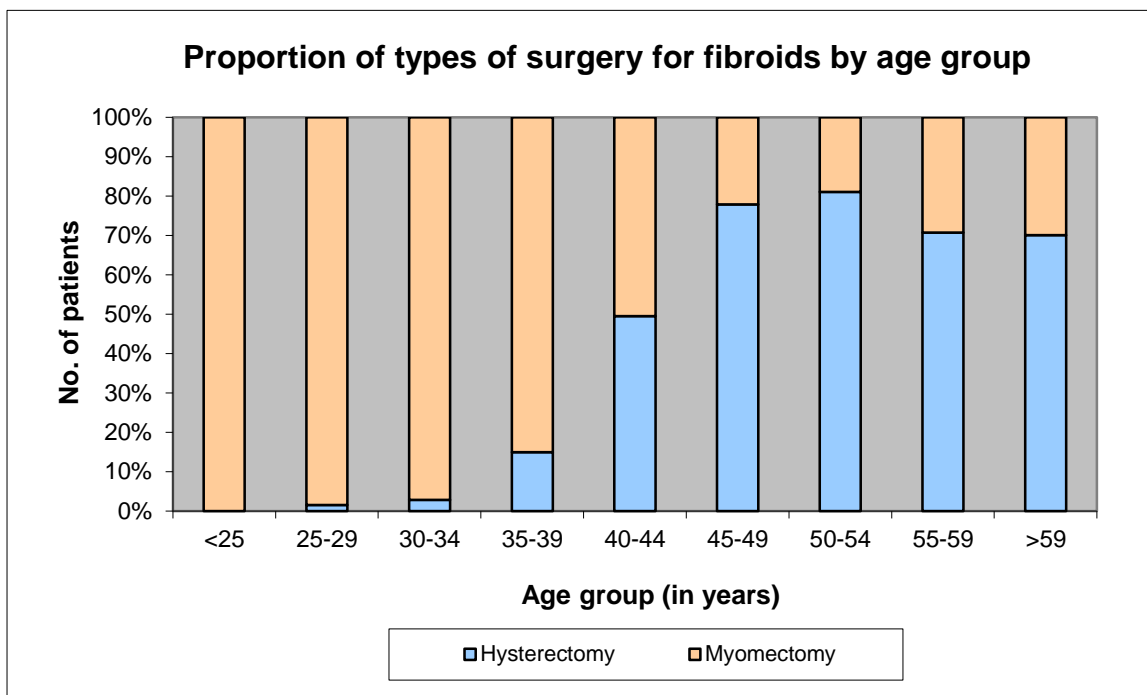


Figure G13 – Surgical treatment of uterine fibroid: age distribution in percentage

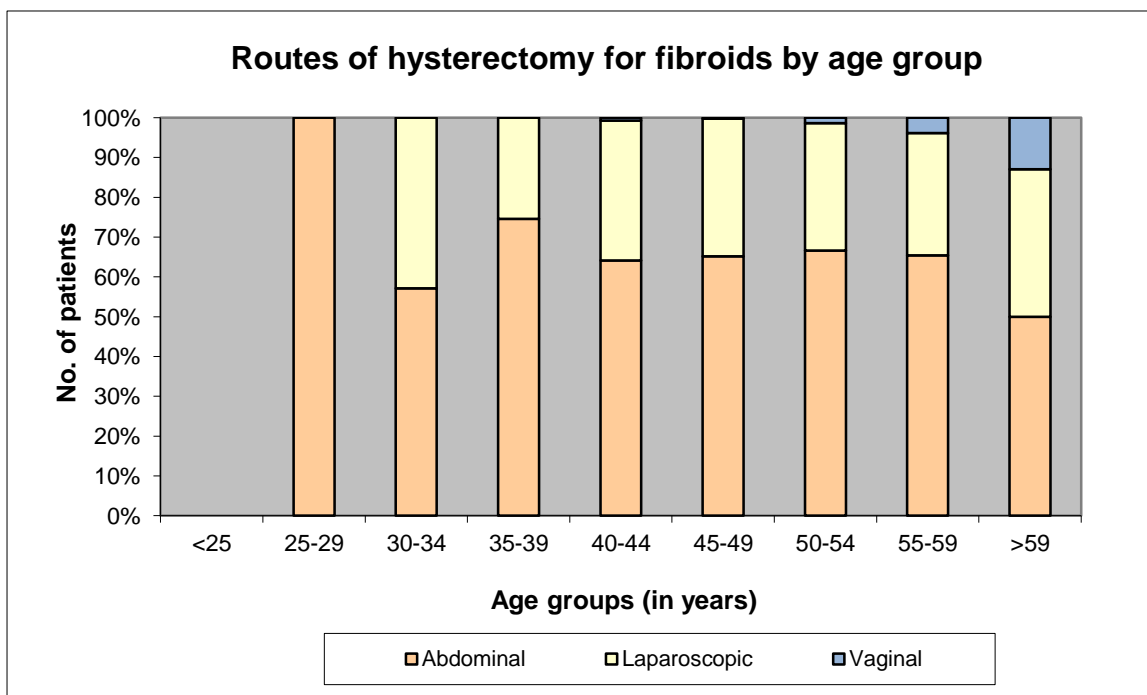


Figure G14 – Routes of hysterectomy for fibroids: age distribution in percentage

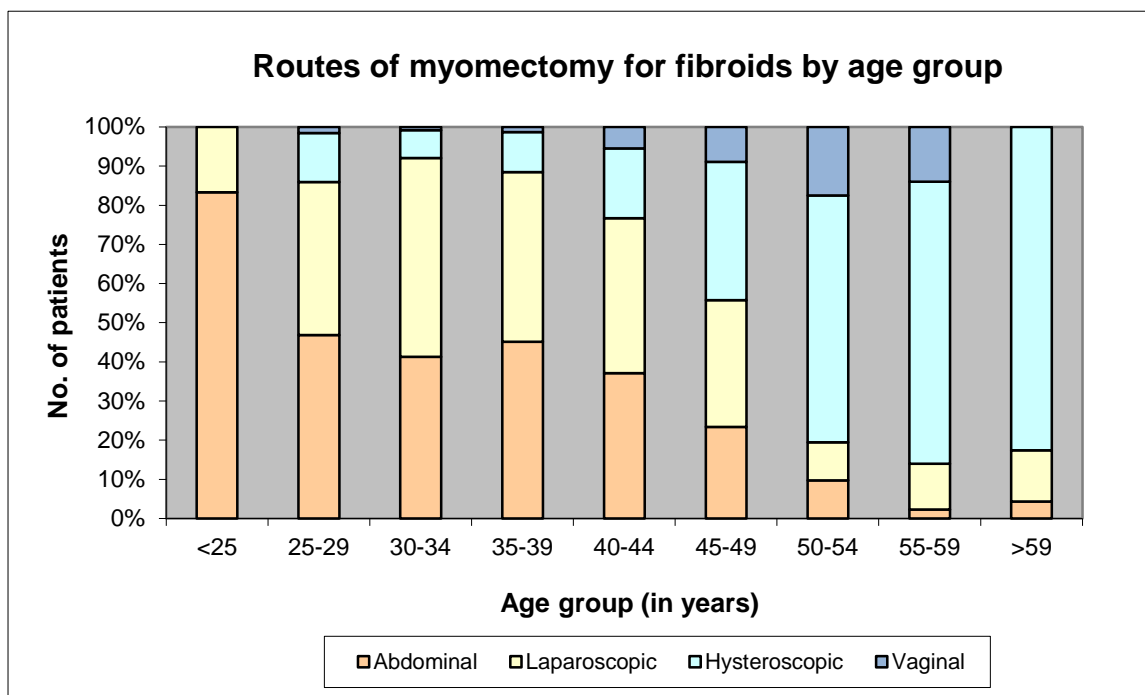


Figure G15 – Routes of myomectomy for fibroids: age distribution in percentage

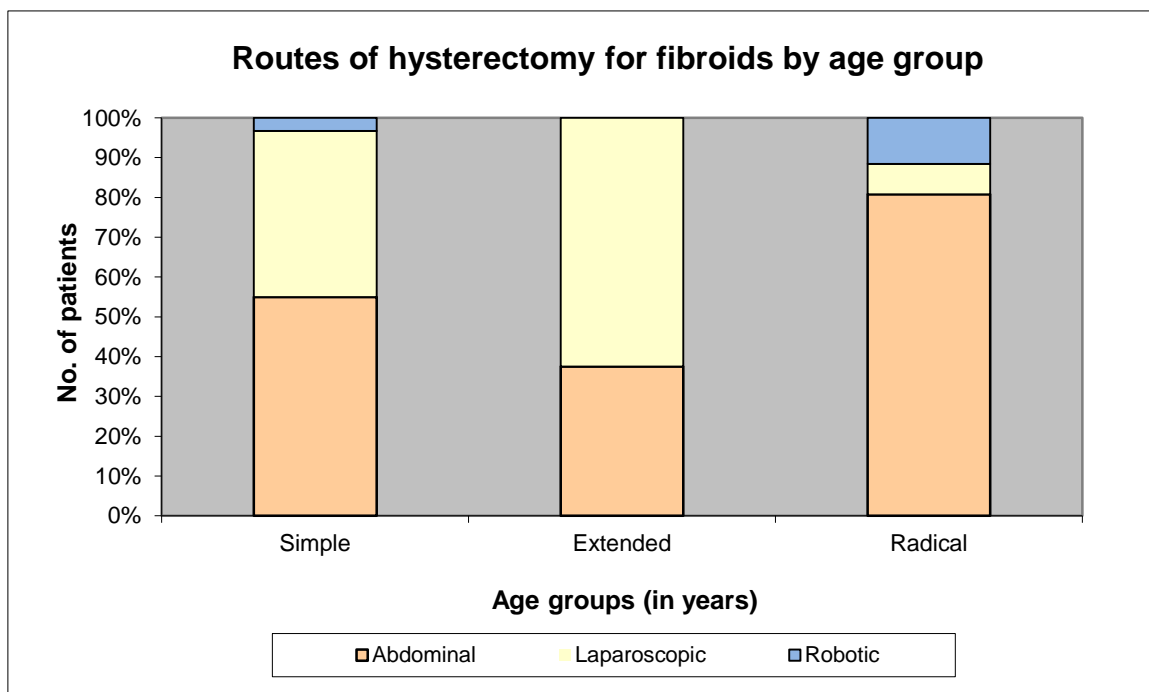


Figure G16 – Types and routes of hysterectomy for carcinoma of corpus

MAJOR VAGINAL OPERATIONS

The number of admissions for this category of treatment increased from 872 in 2004 and 899 in 2009 to 962 in 2014. This represented an overall 10.3% increase over the 10 years period. The number of vaginal hysterectomies with or without pelvic floor repair fluctuated between 460 and 507 cases per year. Of the 480 vaginal hysterectomies reported in 2014, 21 (4.4%) were performed in the absence of genital prolapse (no coding for uterine and/or vaginal wall prolapse under the diagnosis). The rate continued to drop as compared to 6.1% in 2009 and 7.7% in 2004. There was a dramatic increase in the number of pelvic floor repair in 2014, 86.6% were performed without using mesh. The number of admissions for vaginal operation for urinary incontinence dropped significantly in 2009 and 2014. The number of tension-free-vaginal tape procedures was introduced in 2009 and the number increased from 219 to 259, equivalent to an 18% increase.

	2004		2009		2014	
Vaginal hysterectomy	507	58.1%	460	51.2%	480	49.9%
with pelvic floor repair	420	48.2%	388	43.2%	350	36.4%
without pelvic floor repair	87	10.0%	72	8.0%	130	13.5%
Pelvic floor repair	133	15.3%	89	9.9%	469	48.8%
with mesh	-	-	-	-	60	6.2%
without mesh	-	-	-	-	409	42.5%
TVT-O / TVT / TOT	-	-	219	24.4%	259	26.9%
Vaginal myomectomy	94	10.8%	81	9.0%	90	9.4%
Repair of vault prolapse	-	-	23	2.6%	28	2.9%
Vaginal operation for urinary incontinence	165	18.9%	24	2.7%	21	2.2%
Vaginal stripping	-	-	13	1.4%	13	1.4%
Vaginectomy	-	-	-	-	11	1.1%
Vaginal reconstruction	-	-	3	0.3%	9	0.9%
Repair of urinary fistula	2	0.2%	2	0.2%	0	0.0%
Miscellaneous	66	7.6%	80	8.9%	72	7.5%
Total no. of admissions	872	(1.2%)	899	(1.3%)	962	(1.2%)

MAJOR VULVAL OPERATIONS

The number of admissions for this category of treatment was stable and varied between 101 and 116 over the 10 years period. The number of radical vulvectomies remained at 14 in 2004 and 2009 but more than double in 2014. The number of wide local excisions dropped from 26 to 15 and back to 25 cases per years while that of simple vulvectomies continued to drop from 13 to 9 and 5 cases per year. Groin node dissection was first coded in 2009 and the number dropped from 54 to 26 cases.

	2004		2009		2014	
Groin node dissection	-	-	54	46.6%	26	23.2%
Wide local excision	26	25.7%	15	12.9%	25	22.3%
Radical vulvectomy	14	13.9%	14	12.1%	30	26.8%
Simple vulvectomy	13	12.9%	9	7.8%	5	4.5%
Miscellaneous	50	49.5%	36	31.0%	35	31.2%
Total no. of admissions	101	(0.1%)	116	(0.2%)	112	(0.1%)

ENDOSCOPIC PROCEDURES

The number of admissions for all endoscopic procedures increased from 11,765 in 2004 and 11,922 in 2009 to 15,128 in 2014. This represented an overall 28.6% increase over the 10 years period. The total number of laparoscopic procedures increased from 7,604 in 2004 and 7,854 in 2009 to 8,342 in 2014, representing an increase of 9.7%. Both the number of diagnostic laparoscopy and laparoscopic sterilization/tubal occlusion continued to decrease over the 10 years period, resulting in the proportion of operative procedures (excluding sterilization/tubal occlusion) to increase from 82.0% in 2004 and 90.4% in 2009 to 94.6% in 2014. The number of hysteroscopic procedures increased from 5949 in 2004 to 6,155 in 2009 and 9,613 in 2014, with an overall increase of 61.6%. The number of diagnostic hysteroscopy increased by 1.3 folds and that of operative hysteroscopy increased by 2.9 folds, resulting in the proportion of operative procedures to increase from 18.5% in 2004 to 24.1% in 2009 and 32.9% in 2014.

	2004		2009		2014	
Diagnostic laparoscopy +/- Dye	756	6.4%	529	4.4%	317	2.1%
Lap. sterilization/tubal occlusion	611	5.2%	222	1.9%	133	0.9%
Other laparoscopic operative procedures	6237	53.0%	7103	59.6%	7892	52.2%
Diagnostic hysteroscopy	4847	41.2%	4673	39.2%	6455	47.2%
Other hysteroscopic procedures	1102	9.4%	1482	12.4%	3158	15.8%
Total no. of admissions	11765	(15.7%)	11922	(17.0%)	15128	(18.8%)

**HYSTEROSCOPIC PROCEDURES
(excluding diagnostic procedures)**

The number of admissions for operative hysteroscopic procedures increased from 1,017 in 2004 and 1,391 in 2009 to 3,074 in 2014. This represented an overall 3 folds increase over the 10 years period. Polypectomy remained the most common procedure performed and the number increased by 4.8 folds. The number of myomectomy also increased by 61.0% while that of endometrial resection/ablation remained around 170 cases per year. Division of adhesions and uterine septum, and proximal tubal cannulation were new coding introduced in 2014 and the number was all less than 50 per year for the former and less than 25 for the latter 2.

	2004		2009		2014	
Polypectomy	514	50.5%	834	60.0%	2468	80.3%
Myomectomy	236	23.2%	274	19.7%	380	12.4%
Endometrial resection/ablation	187	18.4%	167	12.0%	164	5.3%
Division of adhesion	-	-	-	-	50	1.6%
Proximal tubal cannulation	-	-	-	-	25	0.8%
Division of uterine septum	-	-	-	-	23	0.7%
Miscellaneous	165	16.2%	207	14.9%	57	1.9%
Total no. of admissions	1017	(1.4%)	1391	(2.0%)	3075	(3.8%)

LAPAROSCOPIC PROCEDURES

(excluding diagnostic procedures and sterilization/tubal occlusion alone, and including robotic procedures)

The number of admissions for operative laparoscopy, including robotic procedures, increased from 5,336 in 2004 to 6,088 in 2009 and remained at 5,998 in 2014. This represented an overall 12.4% increase over the 10 years period. Among all operative procedures, ovarian cystectomy remained the most common procedure but the number dropped by 11.6%. The number of hysterectomy increased by 70.7% while that of myomectomy increased by 74.4%. The number of salpingo-oophorectomy/oophorectomy increased by 90.3% and that of salpingectomy and salpingotomy remained unchanged. The number of lymphadenectomy increased by 4.6 folds, with pelvic lymphadenectomy increased by 2 folds and para-aortic lymphadenectomy remained at 25-27 cases per year in the past 5 years. The number of ablation of endometriosis dropped by 41.5% and that of resection of endometriosis remained at 75-77 cases per year. Laparoscopic radical hysterectomy increased from 25 to 30 over the past 5 years.

	2004		2009		2014	
Laparoscopic ovarian cystectomy	2313	43.3%	2296	37.7%	2044	34.1%
Laparoscopic oophorectomy/SO	720	13.5%	1060	17.4%	1370	22.9%
Laparoscopic hysterectomy	798	15.0%	1091	17.9%	1362	22.7%
<i>Total lap hysterectomy (TLH)</i>	-	-	428	7.0%	939	15.7%
<i>Lap assisted vaginal hysterectomy (LAVH)</i>	-	-	524	8.6%	212	3.5%
<i>Lap hysterectomy (LHa)</i>	-	-	79	1.3%	63	1.1%
<i>Unspecified total hysterectomy</i>	-	-	-	-	103	1.7%
<i>Lap assisted subtotal hysterectomy (LASH)</i>	-	-	60	1.0%	45	0.8%
Laparoscopic salpingectomy	872	16.3%	846	13.9%	885	14.8%
Laparoscopic myomectomy	355	6.7%	572	9.4%	619	10.3%
Laparoscopic adhesiolysis	462	8.7%	450	7.4%	505	8.4%
Laparoscopic lymphadenectomy	41	0.8%	103	1.7%	187	3.1%
<i>Pelvic lymphadenectomy</i>	-	-	78	1.3%	160	2.7%
<i>Para-aortic lymphadenectomy</i>	-	-	25	0.4%	27	0.5%
Laparoscopic salpingotomy	183	3.4%	179	2.9%	165	2.8%
Laparoscopic extra-ovarian cystectomy	-	-	-	-	110	1.8%
Laparoscopic ablation of endometriosis	176	3.3%	131	2.2%	103	1.7%
Laparoscopic resection of endometriosis	-	-	77	1.3%	75	1.3%
Laparoscopic drainage of abscess	39	0.7%	37	0.6%	54	0.9%
Laparoscopic radical hysterectomy	-	-	25	0.4%	30	0.5%
Laparoscopic ovarian drilling	54	1.0%	32	0.5%	28	0.5%
Laparoscopic repair of prolapse	-	-	8	0.1%	28	0.5%
Laparoscopic adenomyomectomy	-	-	-	-	22	0.4%
Laparoscopic trachelectomy	-	-	-	-	2	0.03%
Laparoscopic extended hysterectomy	-	-	-	-	6	0.1%
Laparoscopic colposuspension	4	0.1%	5	0.08%	0	0.00%
Laparoscopic myolysis	16	0.3%	28	0.5%	0	0.00%
Robot-assisted surgery	-	-	41	0.7%	65	1.1%
Miscellaneous	198	3.7%	163	2.7%	107	1.8%
Total no. of admissions	5336	(8.3%)	6088	(8.7%)	5989	(7.5%)

Laparoscopic Procedures for Benign/Pre-Malignant Conditions

The data for laparoscopic procedures were not broken down into benign and malignant diseases in the previous audits and therefore there were no data for comparison. There were a total of 5,521 admissions for 6,763 laparoscopic procedures for benign diseases, accounting for 92.2% of all admissions for laparoscopic surgery. Ovarian cystectomy was the most common laparoscopic procedure, followed by salpingo-oophorectomy/oophorectomy and hysterectomy. Total laparoscopic hysterectomy was the most common form of laparoscopic hysterectomy, accounting for 67.1% of the cases while subtotal hysterectomy only accounted for 4.3% of all hysterectomies. There were 610 cases of myomectomy for uterine leiomyomas, in contrast to only 22 cases of adenomyomectomy for adenomyosis.

	2014	
Laparoscopic ovarian cystectomy	1999	36.2%
Laparoscopic oophorectomy/SO	1042	18.8%
Laparoscopic hysterectomy	1038	18.8%
<i>Total lap hysterectomy (TLH)</i>	697	12.6%
<i>Lap assisted vaginal hysterectomy (LAVH)</i>	186	3.4%
<i>Lap hysterectomy (LHa)</i>	51	0.9%
<i>Lap total hysterectomy (Unspecified)</i>	59	1.1%
<i>Lap assisted subtotal hysterectomy (LASH)</i>	45	0.8%
Laparoscopic salpingectomy	859	15.5%
Laparoscopic myomectomy	610	11.0%
Laparoscopic adhesiolysis	476	8.6%
Laparoscopic salpingotomy	164	3.0%
Laparoscopic extra-ovarian cystectomy	107	1.9%
Laparoscopic ablation of endometriosis	101	1.8%
Laparoscopic resection of endometriosis	75	1.4%
<i>Pelvic endometriosis</i>	73	1.3%
<i>Bowel endometriosis</i>	2	0.04%
Laparoscopic drainage of abscess	52	0.9%
Laparoscopic repair of prolapse	28	0.5%
Laparoscopic ovarian drilling	27	0.5%
Laparoscopic adenomyomectomy	22	0.4%
Laparoscopic neo-salpingostomy	9	0.2%
Laparoscopic repair of urinary fistulae	7	0.1%
Laparoscopic tubal re-anastomosis	5	0.09%
Lap. surgery for stress incontinence	5	0.09%
Lap. bowel resection /anastomosis / stoma	4	0.07%
Lap. ureteric repair / reimplantation	1	0.02%
Lap. other procedures	23	0.4%
Robot-assisted surgery	14	0.3%
Miscellaneous	97	1.8%
<i>Total no. of admissions</i>	5521	6.9%
<i>The numbers of procedures included robotic procedures</i>		

Laparoscopic Procedures for Malignant Conditions

Laparoscopic procedures were performed in 468 cases of malignant diseases, involving 1,137 procedures and constituted 13.4% of all malignant cases. Laparoscopic oophorectomy/salpingo-oophorectomy and hysterectomy were the 2 most common procedures performed, accounting for 67-70% of the cases. Laparoscopic lymphadenectomy was performed in 185 cases, 145 were pelvic lymphadenectomy only, 12 were para-aortic only and 14 were both. There were 30 cases of radical hysterectomy, 10 cases of debulking operation and 2 cases of trachelectomy.

	2014	
Laparoscopic oophorectomy/SO	326	69.7%
Laparoscopic hysterectomy	313	66.8%
<i>Total lap hysterectomy (TLH)</i>	231	49.4%
<i>Lap assisted vaginal hysterectomy (LAVH)</i>	26	5.6%
<i>Lap hysterectomy (LHa)</i>	12	2.6%
<i>Unspecified total hysterectomy</i>	44	9.4%
<i>Lap assisted subtotal hysterectomy (LASH)</i>	0	0
Laparoscopic lymphadenectomy	185	39.5%
<i>Pelvic lymphadenectomy</i>	159	34.0%
<i>Para-aortic lymphadenectomy</i>	26	5.6%
Laparoscopic omenectomy	55	11.8%
Laparoscopic ovarian cystectomy	39	8.3%
Laparoscopic radical hysterectomy	30	6.4%
Laparoscopic adhesiolysis	29	6.2%
Laparoscopic salpingectomy	26	5.6%
Laparoscopy +/- biopsy	17	3.6%
Laparoscopic trachelectomy	2	0.4%
Laparoscopic debulking operation	10	2.1%
Laparoscopic myomectomy	9	1.9%
Laparoscopic extended hysterectomy	4	0.9%
Laparoscopic resection of endometriosis	2	0.4%
<i>Pelvic endometriosis</i>	2	0.4%
<i>Bowel endometriosis</i>	0	0
Laparoscopic ablation of endometriosis	2	0.4%
Bowel resection /anastomosis / stoma	2	0.4%
Laparoscopic salpingostomy	1	
Laparoscopic drainage of abscess	2	0.4%
Laparoscopic extra-ovarian cystectomy	3	0.6%
Laparoscopic repair of prolapse	0	0.6%
Lap. other procedures	19	4.1%
Robot-assisted surgery	51	10.9%
Miscellaneous	10	2.1%
<i>Total no. of admissions</i>	468	0.6%

The numbers of procedures included robotic procedures

Robot-assisted Procedures

The audit of robot-assisted surgery was introduced in 2009 and the number of admissions increased from 41 in 2009 to 65 in 2014, accounting for only 0.7% and 1.1% of all laparoscopic surgery respectively. Majority (51 or 78.5%) of robot-assisted surgery was performed for malignant diseases. These included 35 cases of oophorectomy/salpingo-oophorectomy, all except 3 were performed together with concurrent hysterectomy. There were 26 simple hysterectomies, 18 radical hysterectomies and 2 trachelectomies with concurrent pelvic lymphadenectomy. There were 4 conversions, 2 to laparoscopy, 1 for carcinoma of cervix (radical hysterectomy, pelvic and para-aortic lymphadenectomy) and 1 for carcinoma of corpus (radical hysterectomy, salpingo-oophorectomy and pelvic lymphadenectomy), and 2 to laparotomy (both for primary ovarian epithelial malignancy with total hysterectomy, salpingo-oophorectomy, pelvic lymphadenectomy and omentectomy, 1 with para-aortic lymphadenectomy and the other with debulking operation).

Of the 14 cases performed for benign conditions, simple hysterectomy was performed in 11 cases, 9 with concurrent salpingo-oophorectomy, and 1 case was converted to laparoscopy. One case was coded as salpingo-oophorectomy only but the patient was 65 years old with a diagnosis of uterine fibroid, so hysterectomy should have been performed at the same time. There were 2 cases of myomectomy.

	2009		2014	
Oophorectomy/SO	24	58.5%	47	72.3%
Hysterectomy	16	39.0%	39	56.9%
Pelvic lymphadenectomy	20	48.8%	33	50.8%
Radical hysterectomy	15	36.6%	18	27.7%
Para-aortic lymphadenectomy	3	7.3%	12	18.5%
Omentectomy	0	0.0%	9	13.9%
Adhesiolysis	1	2.4%	6	9.2%
Trachelectomy	0	0.0%	2	3.1%
Myomectomy	1	2.4%	2	3.1%
Salpingectomy	0	0.0%	2	3.6%
Debulking	0	0.0%	1	1.5%
Repair of prolapse	1	2.4%	0	0.0%
Miscellaneous	2	4.9%	2	3.1%
<i>Total no. of admissions</i>	41	0.06%	65	0.08%

COLPOSCOPIC RELATED PROCEDURES

The number of admissions for colposcopic procedures dropped from 3,029 in 2004 to 2,415 in 2009 and increased to 4,197 in 2014. This represented an overall 38.6% increase over the 10 years period. Loop diathermy excision remained the most common procedure but the number decreased by 24.5%. There was a dramatic increase in the miscellaneous condition from 500-600 to 2,791 cases per year, equivalent to an almost 6 folds increase.

	2004		2009		2014	
Loop diathermy excision	2007	66.3%	1525	63.1%	1515	36.1%
Cervical cautery	283	9.3%	158	6.5%	169	4.0%
Cone biopsy	252	8.3%	161	6.7%	160	3.8%
Laser vaporization	58	1.9%	34	1.4%	37	0.9%
Laser cone	24	0.8%	15	0.6%	9	0.2%
Miscellaneous	478	15.8%	604	25.0%	2791	66.5%
Total no. of admissions	3029	(4.0%)	2415	(3.4%)	4197	(5.2%)

ASSISTED REPRODUCTIVE PROCEDURES

The number of admissions for assisted reproductive procedures increased from 3,184 in 2004 to 5,043 in 2009 and 4,970 in 2014. This represented an overall 56.1% increase over the 10 years period. This was mostly related to embryo transfer and oocyte retrieval. The number of embryo transfer increased by 66.6% to 2,860 in 2014, of which 91.5% were fresh embryo transfer. The number of oocyte retrievals increased by 24.1% to 1683 in 2014.

	2004		2009		2014	
Embryo transfer	1716	53.9%	2734	54.2%	2860	57.6%
Fresh	-	-	-	-	2616	53.3%
Frozen-thaw	-	-	-	-	244	5.0%
USG guided oocyte retrieval	1356	42.6%	1913	37.9%	1683	34.3%
Intrauterine insemination	-	-	324	6.4%	396	8.1%
Controlled ovarian hyperstimulation	-	-	-	-	132	2.7%
Gamete intra-fallopian transfer	3	0.1%	3	0.06%	2	0.04%
Intra-cytoplasmic sperm injection	-	-	-	-	2	0.04%
Laparoscopic oocyte retrieval	32	1.0%	1	0.02%	1	0.02%
Pronuclear stage tubal transfer	3	0.1%	2	0.04%	0	0.00%
Miscellaneous	354	11.1%	79	1.6%	10	0.2%
Total no. of admissions	3184	(4.2%)	5043	(7.2%)	4970	(6.2%)

MINOR ABDOMINAL OPERATIONS

The number of admissions for minor abdominal operations remained low and between 139 and 145 cases per year. The number of open tubal ligation/occlusion decreased significantly by 52.7%. Of all the admissions for sterilization, laparoscopic sterilization/tubal occlusion was performed in 88%, compared with 83% in 2004 and 65% in 1999.

	2004		2009		2014	
Resuturing of gapped abdominal wound	68	48.2%	79	56.8%	61	42.01%
Tubal ligation/occlusion	112	79.4%	31	22.3%	53	36.6%
Removal of abdominal translocated IUCD	-	-	-	-	11	7.6%
Miscellaneous	30	21.3%	30	21.6%	21	14.5%
Total no. of admissions	141	(0.2%)	139	(0.2%)	145	(0.2%)

OTHER MINOR VAGINAL/VULVAL OPERATIONS

The number of admissions for this category of treatment dropped from 28,008 in 2004 to 21,343 in 2009 and 21,507 in 2014. This represented an overall 23.2% decrease over the 10 years period. The number of therapeutic abortions and evacuation of uterus after miscarriage dropped by 55.4% and 39.3.0% respectively over the 10 years period. Admission for D&C/polypectomy fluctuated between 4519 and 4775, and that for endometrial biopsy increased from 1,975 in 2004 and 1,596 in 2009 to 4621 in 2014 respectively. Insertion of Mirena for non-contraceptive purpose was introduced in 2009 and was performed in 118 cases which increased by 61.8% to 191 in 2014.

	2004		2009		2014	
Therapeutic abortions	14589	52.1%	8640	40.5%	6502	30.2%
D&C/polypectomy	4519	16.1%	4775	22.4%	4761	22.1%
Endometrial biopsy	1975	7.1%	1596	7.5%	4621	21.5%
Evacuation of uterus after miscarriage	5139	18.3%	3930	18.4%	3120	14.5%
Insertion / removal of IUCD	726	2.6%	539	2.5%	785	3.7%
Other vulval surgery	589	2.1%	594	2.8%	701	3.3%
Marsupialisation	711	2.5%	673	3.2%	657	3.1%
Insertion of Mirena (non-contraception)	-	-	118	0.6%	191	0.9%
Examination under anaesthesia	118	0.4%	150	0.7%	124	0.6%
Cervical cerclage	22	0.1%	43	0.2%	26	0.1%
Miscellaneous	410	1.5%	852	4.0%	657	3.1%
Total no. of admissions	28008	(37.3%)	21343	(30.4%)	21507	(26.8%)

RADIOTHERAPY

The number of admissions for radiotherapy decreased from 181 in 2004 and 147 in 2009 to 80 in 2014 in the 10 years period. The number was low and dropping as most of these patients were mainly managed under the Department of Radiotherapy and Oncology instead of Gynaecology.

	2004		2009		2014	
External radiation therapy	68	37.6%	123	83.7%	32	40.0%
Intracavitary radiation therapy	35	19.3%	17	11.6%	32	40.0%
Miscellaneous	79	43.6%	9	6.1%	17	21.3%
Total no. of admissions	181	(0.2%)	147	(0.2%)	80	(0.1%)

NON-OPERATIVE TREATMENT

The number of admissions for non-operative treatment increased from 26,381 in 2004 and 28,377 in 2009 to 39,423 in 2014. This represented an overall 49.4% increase over the 10 years period. Most of the management modalities increased over the 10 years period except for the use of hormones and chemotherapy, which showed a drop of 59.2% and 57.9% respectively. The number of admission for prostaglandins treatment increased by 3.2 folds, probably reflected an increase in its use for abortions and miscarriages. The number of pre-anaesthetic assessment increased by 4.3 folds from 388 in 2004 to 1,354 in 2009 and 1,679 in 2014. The number of uterine artery embolisation increased from 13 in 2009 to 48 in 2014 and that of focused ultrasound therapy dropped from 8 in 2009 to 5 in 2014. These data were not captured before 2009.

	2004		2009		2014	
Observation and investigations	18208	69.0%	19298	68.0%	29940	75.9%
Prostaglandins	1438	5.5%	2240	7.9%	4555	11.6%
Antibiotic (as primary treatment)	2042	7.7%	1930	6.8%	2113	5.4%
Other medications	874	3.3%	465	1.6%	1783	4.5%
Pre-anaesthetic assessment	388	1.5%	1354	4.8%	1679	4.3%
Hormones	1909	7.2%	1557	5.5%	778	2.0%
Chemotherapy	992	3.8%	1394	4.9%	417	1.1%
Uterine artery embolisation	-	-	13	0.05%	48	0.1%
High intensity/focused ultrasound therapy	-	-	8	0.03%	5	0.01%
Miscellaneous	1415	5.4%	2083	7.3%	231	6.0%
Total no. of admissions	26381	35.1%	28377	40.4%	39423	(49.0%)

COMPLICATIONS

Complications were counted according to the intention to treat, not the actual procedure performed. Conversion from initially intended surgical approach to other approach was counted as complication. There might be more than one complication for each admission, and there might be more than one complication for each operative procedure performed. When the complication was associated with multiple procedures, it was considered to have occurred with each individual procedure.

A trend of reduction of the overall complication rate was observed over the 10 years period. The overall complication rate was 0.79%, which was lower than the 1.00% in 2009 and 1.15% in 2004. In the current audit, complications were divided into intra-operative and post-operative complications and the overall rate was 0.24% and 0.58% respectively.

The most common complication was re-admission within 28 days of surgery. This was first reported in the current audit and the rate was 0.08%. Febrile morbidity, defined as fever $>38^{\circ}\text{C}$ at least 4 hours apart 24 hours after operations with no identifiable cause, was the second most common complication and the rate reduced from 0.30-0.35% to 0.08%. There was also a trend of reduction in haemorrhage. The rate reduced from 0.23-0.25% to 0.14%. The reduction was mainly due to reduction in intra-operative haemorrhage which reduced from 0.18-0.20% to 0.10% while post-operative haemorrhage remained at 0.04-0.05%.

The incidence of inadvertent organ injury reduced from 0.13-0.16% to 0.09%. Bowel injury was the most common visceral injury and the rate was 0.04%, of which 84.4% were diagnosed during operation. Uterine injury (essentially perforation of uterus) was the second most common organ injury and the rate was 0.03%. Bladder injury occurred in 0.02%, of which 85% were diagnosed during operation. Ureteric injury occurred in 0.01% and only 50% were diagnosed during operation. Vascular injury occurred in 0.007%, of which 83.3% were major vascular injury.

Thrombo-embolic complication included deep vein thrombosis (DVT) and pulmonary embolism (PE), the latter was introduced in the current audit. The overall thrombo-embolic complication rate was 0.01%. The incidence of DVT reduced by 10 folds from 0.03-0.04% to 0.004% while that of PE increased by 3 folds from 0.003% in 2009 to 0.009% in 2014.

Conversion to laparotomy occurred in 0.15% in 2014 which was much higher than the 0.09% in both 2004 and 2009. There were another 2 cases of conversion from robotic to laparoscopic surgery and 1 case from vaginal to laparoscopic surgery.

	2004		2009		2014	
Intra-operative complications						
Injury to the bowels	15	0.02%	18	0.03%	27	0.03%
Injury to the bladder	59	0.08%	38	0.05%	17	0.02%
Injury to the ureter					6	0.007%
Injury to the uterus	39	0.06%	38	0.05%	23	0.03%
Major vascular injury	2	0.003%	2	0.003%	5	0.006%
Inferior epigastric artery injury	-	-	-	-	1	0.001%
Surgical emphysema	-	-	-	-	4	0.005%
Fluid overload	-	-	-	-	4	0.005%
Operative blood loss with transfusion	142	0.20%	128	0.18%	83	0.10%
Intra-operative cardiopulmonary arrest	2	0.003%	0	0	0	0.00%
Conversion to laparotomy	60	0.09%	62	0.09%	122	0.15%
Conversion to laparoscopy	-	-	-	-	3	0.004%
Others	88	0.13%	73	0.10%	26	0.03%
Subtotal no. of admissions					197	0.24%
Post-operative complications						
Febrile morbidity*	247	0.35%	211	0.30%	62	0.08%
Bladder injury/fistula	-	-	-	-	3	0.004%
Ureteric injury/fistula	-	-	-	-	6	0.007%
Bowel injury/fistula	-	-	-	-	5	0.006%
Chest infection	7	0.01%	6	0.009%	0	0.00%
Urinary tract infection	126	0.18%	106	0.15%	49	0.06%
Wound complication	153	0.22%	84	0.12%	62	0.08%
Pelvic hematoma/abscess	-	-	-	-	23	0.03%
Postoperative blood loss with transfusion	36	0.05%	36	0.05%	32	0.04%
Deep vein thrombosis	26	0.04%	22	0.03%	3	0.004%
Pulmonary embolism	-	-	2	0.003%	7	0.009%
Post-operative cardiopulmonary arrest	1	0.001%	2	0.003%	0	0.00%
Cerebro-vascular accident	-	-	-	-	2	0.002%
Unplanned re-operation before discharge	23	0.03%	16	0.02%	42	0.05%
Re-admission within 28 days of surgery	-	-	-	-	68	0.08%
Others	-	-	-	-	182	0.23%
Subtotal no. of admissions					477	0.58%
Total no. of admissions	862	1.15%	707	1.00%	639	0.79%

*Febrile morbidity - Fever >38°C at least 4 hours apart 24 hours after operations with no cause identified
There were 2 cases of pulmonary embolism and 1 case of air embolism reported in 2009

COMPLICATION RATES IN RELATION WITH COMMON TYPES OF OPERATIONS

The percentage reflected the incidence of all complications of an individual operation.

There could be more than one complication for each operation. Radical hysterectomy was associated with the highest morbidity and the risk was highest with the laparoscopic approach, followed by the robotic approach. In the current audit, the risk of abdominal radical hysterectomy was reduced to almost the same level as simple hysterectomy for malignant conditions. The morbidity associated with simple hysterectomy for benign conditions was lower than that for malignant conditions (5.3% vs 6.7% for abdominal approach and 4.3% vs 6.3% for laparoscopic approach). The overall morbidity of vaginal hysterectomy was further reduced from 6.9% in 2004 to 6.4% in 2009 and 5.0% in 2014, and it was lower than the laparoscopic approach. For myomectomy, the complication rate was lowest with the hysteroscopic approach (0.5%) and highest with the abdominal approach (3.5%).

	2004		2009		2014	
	N	%	N	%	N	%
Abdominal operations						
Benign						
Total hysterectomy ± SO (benign)	3840	7.7	2683	6.2	1606	5.3
Ovarian cystectomy	758	3.2	514	5.1	374	3.7
Salpingo-oophorectomy/oophorectomy	426	7.3	286	5.6	1705	6.7
Myomectomy	1139	2.6	886	3.6	567	3.5
Salpingectomy	145	8.3	89	4.5	66	9.1
Malignant						
Total hysterectomy ± SO (malignant)	534	7.5	729	8.4	600	6.7
Radical hysterectomy	127	15.7	92	10.9	84	7.1
Vaginal operations						
Hysterectomy ± pelvic floor repair	507	6.9	456	6.4	477	5.0
Myomectomy	94	0	81	2.5	90	2.2
Laparoscopic operations						
Diagnostic laparoscopy	756	4.0	529	5.9	317	3.5
Laparoscopic sterilization	611	0.8	222	1.4	133	3.0
Common laparoscopic procedure						
<i>Ovarian cystectomy</i>	2312	1.9	2242	1.7	2039	1.8
<i>Salpingectomy</i>	880	2.3	848	1.9	885	1.9
<i>SO/oophorectomy</i>	720	3.2	585	3.1	1368	2.6
<i>Hysterectomy (benign)</i>	724	5.7	970	5.4	1064	4.3
<i>Hysterectomy (malignant)</i>	76	6.6	143	6.3	303	6.3
<i>Salpingotomy</i>	186	4.3	178	1.7	167	1.2
<i>Myomectomy</i>	358	2.0	573	2.1	624	2.9
<i>Radical hysterectomy</i>	1	100	22	13.6	12	25.0
Robotic operations						
Hysterectomy (malignant)					23	21.7
Radical hysterectomy					18	16.7

	2004		2009		2014	
	N	%	N	%	N	%
Hysteroscopic operations						
Diagnostic hysteroscopy	4846	0.5	4673	0.8	7134	0.5
Hysteroscopic procedure						
<i>Endometrial resection</i>	<i>187</i>	<i>1.1</i>	<i>167</i>	<i>0</i>	<i>163</i>	<i>0</i>
<i>Polypectomy</i>	<i>514</i>	<i>0.8</i>	<i>834</i>	<i>0.1</i>	<i>2458</i>	<i>0.4</i>
<i>Myomectomy</i>	<i>236</i>	<i>2.5</i>	<i>274</i>	<i>2.2</i>	<i>380</i>	<i>0.5</i>
D&C/evacuation of uterus	24122	0.2	17326	0.2	7882	1.0

COMPLICATIONS OF TUBAL SURGERY

Salpingectomy referred to those performed for benign conditions and without concurrent hysterectomy. Except for open salpingectomy, the complication rate of laparoscopic salpingectomy, open and laparoscopic salpingostomy for benign conditions were all higher in 2014 than 2009. The rate of intra-operative haemorrhage for both salpingectomy and salpingostomy was 10 times higher in open procedures. Conversion to laparotomy was the most common complication in laparoscopic approach with the rate being 1.85% and 2.96% in 2014 compared with less than 1% in 2009. There were 2 cases of pulmonary embolism reported in laparoscopic salpingostomy and 1 case of DVT in laparoscopic salpingectomy, but none in open procedures.

	Salpingectomy		Salpingostomy	
	Open (n=66)	Lap (n=811)	Open (n=18)	Lap (n=169)
Intra-operative				
Bladder injury	0 (0.00%)	0 (0.00%)	0 (0.00%)	1 (0.59%)
Ureteric injury	0 (0.00%)	1 (0.12%)	0 (0.00%)	0 (0.00%)
Bowel injury	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Perforation of uterus	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Major vascular injury	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Inferior epigastric artery injury	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Surgical emphysema	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Fluid overload	0 (0.00%)	1 (0.12%)	0 (0.00%)	0 (0.00%)
Haemorrhage requiring transfusion	2 (3.03%)	3 (0.37%)	1(5.56%)	1(0.59%)
Cardiopulmonary arrest	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Conversion to laparotomy	-	15(1.85%)	-	5(2.96%)
Anaesthetic complications	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Others	0 (0.00%)	1 (0.12%)	0 (0.00%)	0 (0.00%)
Subtotal no. of admissions	2 (3.03%)	20(2.47%)	1(5.56%)	6(3.56%)
Post-operative				
Fever >38°C after first 24 hours	0 (0.00%)	2 (0.25%)	0 (0.00%)	1(0.59%)
Bladder injury/fistula	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Ureteric injury/fistula	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Bowel injury/fistula	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Chest infection	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Urinary tract infection	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Wound complications	0 (0.00%)	1 (0.12%)	2(11.11%)	0 (0.00%)
Pelvic hematoma/abscess	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Postoperative haemorrhage requiring re-operation or transfusion	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Deep vein thrombosis	0 (0.00%)	1 (0.12%)	0 (0.00%)	0 (0.00%)
Pulmonary embolism	0 (0.00%)	0 (0.00%)	0 (0.00%)	2(1.18%)
Cardiopulmonary arrest	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Cerebro-vascular accident	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Unplanned re-operation before discharge	0 (0.00%)	1 (0.12%)	0 (0.00%)	0 (0.00%)
Re-admission within 28 days of surgery	0 (0.00%)	1 (0.12%)	0 (0.00%)	0 (0.00%)
Others	0 (0.00%)	1 (0.12%)	0 (0.00%)	0 (0.00%)
Subtotal no. of admissions	0 (0.00%)	7 (0.86%)	2(11.12%)	2(1.18%)
Total no. of admissions	2 (3.03%)	27(3.33%)	3(16.67%)	7(4.14%)

COMPLICATIONS OF OVARIAN SURGERY

Complication rate of ovarian cystectomy for benign conditions and salpingo-oophorectomy without concurrent hysterectomy in the current audit was similar to that in 2009. Ovarian cystectomy was associated with a 50% lower complication rate than that of salpingo-oophorectomy irrespective of the operative approach. Laparoscopic approach was associated with a 50% lower complication rate than the open procedure, with conversion to laparotomy being the most common complication. The rate of bowel injury reported was higher in open approach than laparoscopic approach. There were two urinary tract injury reported in the laparoscopic approach but none in the open procedure, a ureteric injury diagnosed intra-operatively with laparoscopic ovarian cystectomy and a bladder injury diagnosed post-operatively with laparoscopic salpingo-oophorectomy.

	Ovarian Cystectomy		Salpingo-oophorectomy	
	Open (n=339)	Lap (n=2021)	Open (n=194)	Lap (n=641)
Intra-operative				
Bladder injury	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Ureteric injury	0 (0.00%)	1 (0.05%)	0 (0.00%)	0 (0.00%)
Bowel injury	2 (0.59%)	3 (0.15%)	5 (2.58%)	0 (0.00%)
Perforation of uterus	0 (0.00%)	0 (0.00%)	0 (0.00%)	1 (0.16%)
Major vascular injury	0 (0.00%)	1 (0.05%)	0 (0.00%)	0 (0.00%)
Inferior epigastric artery injury	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Surgical emphysema	0 (0.00%)	2 (0.10%)	0 (0.00%)	1 (0.16%)
Fluid overload	0 (0.00%)	1 (0.05%)	0 (0.00%)	0 (0.00%)
Haemorrhage requiring transfusion	4 (1.18%)	2 (0.10%)	1 (0.52%)	1 (0.16%)
Cardiopulmonary arrest	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Conversion to laparotomy	-	21 (1.03%)	-	11 (1.72%)
Anaesthetic complications	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Others	2 (0.59%)	0 (0.00%)	1 (0.52%)	1 (0.16%)
Subtotal	4(1.18%)	26(1.29%)	6(3.09%)	13 (2.03%)
Post-operative				
Fever >38°C after first 24 hours	3 (0.88%)	6 (0.30%)	1 (0.52%)	4 (0.62%)
Bladder injury/fistula	0 (0.00%)	0 (0.00%)	0 (0.00%)	1 (0.16%)
Ureteric injury/fistula	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Bowel injury/fistula	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Chest infection	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Urinary tract infection	1 (0.29%)	2 (0.10%)	0 (0.00%)	3 (0.46%)
Wound complications	0 (0.00%)	2 (0.10%)	6 (3.09%)	2 (0.31%)
Pelvic hematoma/abscess	0 (0.00%)	2 (0.10%)	0 (0.00%)	1 (0.16%)
Postoperative haemorrhage requiring re-operation or transfusion	1 (0.29%)	3 (0.15%)	1 (0.52%)	1 (0.16%)
Deep vein thrombosis	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Pulmonary embolism	0 (0.00%)	1 (0.05%)	1 (0.52%)	1 (0.16%)
Cardiopulmonary arrest	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Cerebro-vascular accident	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Unplanned re-operation before discharge	2 (0.59%)	0 (0.00%)	2 (1.03%)	2 (0.31%)
Re-admission within 28 days of surgery	0 (0.00%)	1 (0.05%)	2 (1.03%)	0 (0.00%)
Others	1 (0.29%)	2 (0.10%)	2 (1.03%)	3 (0.46%)
Subtotal	8(2.36%)	17 (0.84%)	9(4.63%)	11(1.72%)
Total no. of admissions	12(3.54%)	35 (1.73%)	14(7.22%)	23(3.59%)

COMPLICATIONS OF MYOMECTOMY

In the current audit, complication rate of laparoscopic myomectomy was 2 times higher and that of hysteroscopic myomectomy was 4 times lower than that in 2009, but that of open and vaginal myomectomy was similar. The risk of hysterectomy in open myomectomy and vaginal myomectomy was 0.35% (n=2) and 1.12% (n=1) respectively, but 0% in laparoscopic and hysteroscopic myomectomy.

	Myomectomy			
	Open (n=567)	Lap (n=624)	Hys (n=380)	Vaginal (n=90)
Intra-operative				
Bladder injury	2 (0.35%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Ureteric injury	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Bowel injury	0 (0.00%)	0 (0.00%)	1 (0.26%)	0 (0.00%)
Perforation of uterus	0 (0.00%)	1 (0.16%)	1 (0.26%)	0 (0.00%)
Major vascular injury	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Inferior epigastric artery injury	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Surgical emphysema	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Fluid overload	1 (0.18%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Haemorrhage requiring transfusion	9 (1.59%)	2 (0.32%)	0 (0.00%)	0 (0.00%)
Cardiopulmonary arrest	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Conversion	-	10 (1.60%)	0 (0.00%)	1 (1.12%)
Hysterectomy*	2 (0.35%)	0	0	1 (1.12%)
Anaesthetic complications	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Others	0 (0.00%)	1 (0.16%)	0 (0.00%)	0 (0.00%)
Subtotal no. of admissions	13(2.29%)	13 (2.08%)	1(0.26%)	2 (2.22%)
Post-operative				
Fever >38°C after first 24 hours	5 (0.88%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Bladder injury/fistula	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Ureteric injury/fistula	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Bowel injury/fistula	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Chest infection	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Urinary tract infection	2 (0.35%)	1 (0.16%)	0 (0.00%)	0 (0.00%)
Wound complications	1 (0.18%)	1 (0.16%)	0 (0.00%)	0 (0.00%)
Pelvic hematoma/abscess	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Postoperative haemorrhage requiring re-operation or transfusion	3 (0.53%)	1 (0.16%)	0 (0.00%)	0 (0.00%)
Deep vein thrombosis	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Pulmonary embolism	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Cardiopulmonary arrest	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Cerebro-vascular accident	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Unplanned re-operation before discharge	0 (0.00%)	1 (0.16%)	0 (0.00%)	0 (0.00%)
Re-admission within 28 days of surgery	0 (0.00%)	1 (0.16%)	1 (0.26%)	0 (0.00%)
Others	1 (0.18%)	2 (0.32%)	0(0.00%)	0(0.00%)
Subtotal no. of admissions	9(1.59%)	5(0.8%)	1(0.26%)	0(0.00%)
Total no. of admissions	20(3.53%)	18 (2.88%)	2 (0.53%)	2 (2.22%)

2 cases of robotic myomectomy were put under laparoscopic myomectomy

*2 cases with no diagnosis of fibroid were excluded

Open myomectomy was associated with the highest complication rate than the other approaches and significant haemorrhage was the most common complication, occurring in 1.59% (n=9) intra-operatively and 0.53% (n=3) post-operatively. Conversion to laparotomy was the most common complication in laparoscopic myomectomy. There were 2 cases of bladder injury in open myomectomy, and 1 case of bowel injury with another case of uterine perforation in the hysteroscopic approach.

There were 5 cases of hysterectomy associated with myomectomy reported, of which 4 cases were abdominal hysterectomy associated with abdominal myomectomy. One with abdominal myomectomy, hysterectomy, bilateral salpingo-oophorectomy, pelvic lymph node dissection and omentectomy for primary ovarian malignancy but there was no diagnosis coding for uterine fibroid. One with abdominal myomectomy, hysterectomy, salpingo-oophorectomy and debulking operation for carcinoma of cervix and secondary ovarian malignancy but again there was no diagnosis coding for fibroid. Two cases with abdominal myomectomy and hysterectomy, one for uterine fibroid (uterine size 14-16 weeks with blood loss 500 ml) and another for fibroid with endometriosis (uterine size 18-20 weeks with blood loss 1750 ml). There were 1 case of laparoscopic hysterectomy and bilateral salpingo-oophorectomy associated with a vaginal myomectomy for submucosal fibroid (uterine size 10-12 weeks). So there should only be 2 cases of abdominal myomectomy and 1 case of vaginal myomectomy required hysterectomy.

COMPLICATIONS OF HYSTERECTOMY FOR BENIGN CONDITIONS

Overall complication rate of the 3 different approaches for benign conditions in 2014 was similar to that in 2009. Vaginal hysterectomy without prolapse was associated with 2 times higher complication rate than vaginal hysterectomy with prolapse and other approaches, but the complications were mild in nature with no excessive haemorrhage or organ injury. Intra-operative haemorrhage and febrile morbidity occurred more common in the open approach. Inadvertent organ injury occurred in 0.94% (10 injuries in 9 patients) after laparoscopic hysterectomy, 0.42% (n=2) after vaginal and 0.93% (15 injuries in 14 patients) after open hysterectomy. The corresponding figures in 2009 were 0.41%, 0.44% and 0.64% respectively.

	Simple Hysterectomy			
	Open (n=1606)	Lap (n=1064)	Vaginal + prolapse (n=458)	Vaginal - prolapse (n=19)
Intra-operative				
Bladder injury	5 (0.31%)	4 (0.36%)	1 (0.22%)	0 (0.00%)
Ureteric injury	2 (0.12%)	1 (0.09%)	1 (0.22%)	0 (0.00%)
Bowel injury	4 (0.25%)	3 (0.28%)	0 (0.00%)	0 (0.00%)
Perforation of uterus	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Major vascular injury	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Inferior epigastric artery injury	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Surgical emphysema	0 (0.00%)	1 (0.09%)	0 (0.00%)	0 (0.00%)
Fluid overload	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Haemorrhage requiring transfusion	20 (1.25%)	8 (0.75%)	2 (0.44%)	0 (0.00%)
Cardiopulmonary arrest	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Conversion to laparotomy	-	26 (2.44%)	0 (0.00%)	0 (0.00%)
Anaesthetic complications	0 (0.00%)	1 (0.09%)	0 (0.00%)	0 (0.00%)
Others	6 (0.37%)	2 (0.19%)	0 (0.00%)	0 (0.00%)
Subtotal no. of admissions	29(1.81%)	35 (3.29%)	4(0.87%)	0 (0.00%)
Post-operative				
Fever >38°C after first 24 hours	16 (1.00%)	2 (0.19%)	5 (1.09%)	0 (0.00%)
Bladder injury/fistula	1 (0.06%)	1 (0.09%)	0 (0.00%)	0 (0.00%)
Ureteric injury/fistula	2 (0.12%)	1 (0.09%)	0 (0.00%)	0 (0.00%)
Bowel injury/fistula	1 (0.06%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Chest infection	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Urinary tract infection	10 (0.62%)	1 (0.09%)	10 (2.18%)	1 (5.26%)
Wound complications	12 (0.75%)	2 (0.19%)	2 (0.44%)	1 (5.26%)
Pelvic hematoma/abscess	8 (0.50%)	0 (0.00%)	1 (0.22%)	0 (0.00%)
Postoperative haemorrhage requiring re-operation or transfusion	6 (0.37%)	2 (0.19%)	0 (0.00%)	0 (0.00%)
Deep vein thrombosis	1 (0.06%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Pulmonary embolism	1 (0.06%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Cardiopulmonary arrest	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Cerebro-vascular accident	1 (0.06%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Unplanned re-operation before discharge	2 (0.12%)	5 (0.47%)	1 (0.22%)	0 (0.00%)
Re-admission within 28 days of surgery	4 (0.24%)	3 (0.28%)	0 (0.00%)	1 (5.26%)
Others	10 (0.62%)	2 (0.19%)	3 (0.66%)	0 (0.00%)
Subtotal no. of admissions	62(3.86%)	16(1.50%)	18(3.93%)	2(10.53%)
Total no. of admissions	85(5.29%)	46(4.32%)	22(4.80%)	2(10.53%)

COMPLICATIONS OF HYSTERECTOMY FOR MALIGNANT CONDITIONS

In the current audit, complication of open and laparoscopic hysterectomy for malignant conditions was similar to that in 2009. Robotic hysterectomy was associated with 3-4 times higher complication rate, both intra- and post-operatively, despite the much smaller number in that group. Inadvertent organ injury occurred in 0.99% (3 injuries in 2 patients) after laparoscopic approach and 1.17% (n=7) after abdominal approach. Conversion to laparotomy rate was over 2 times higher in the robotic than laparoscopic approach. Febrile morbidity and haemorrhage were the most common complication in open hysterectomy.

	Simple Hysterectomy		
	Open (n=600)	Lap (n=303)	Robot (n=23)
Intra-operative			
Bladder injury	2 (0.33%)	0 (0.00%)	0 (0.00%)
Ureteric injury	0 (0.00%)	1 (0.33%)	0 (0.00%)
Bowel injury	3 (0.67%)	1 (0.33%)	0 (0.00%)
Perforation of uterus	0 (0.00%)	0 (0.00%)	0 (0.00%)
Major vascular injury	1 (0.17%)	0 (0.00%)	1 (4.35%)
Inferior epigastric artery injury	0 (0.00%)	0 (0.00%)	0 (0.00%)
Surgical emphysema	0 (0.00%)	0 (0.00%)	0 (0.00%)
Fluid overload	0 (0.00%)	0 (0.00%)	0 (0.00%)
Haemorrhage requiring transfusion	13 (2.17%)	0 (0.00%)	0 (0.00%)
Cardiopulmonary arrest	0 (0.00%)	0 (0.00%)	0 (0.00%)
Anaesthetic complications	0 (0.00%)	0 (0.00%)	0 (0.00%)
Conversion to laparotomy	-	12 (3.96%)	2 (8.70%)
Others	1 (0.17%)	0 (0.00%)	1 (4.35%)
Subtotal no. of admissions	21(3.50%)	14 (4.62%)	4 (17.4%)
Post-operative			
Fever >38°C after first 24 hours	6 (1.00%)	0 (0.00%)	0 (0.00%)
Bladder injury/fistula	0 (0.00%)	0 (0.00%)	0 (0.00%)
Ureteric injury/fistula	1 (0.17%)	0 (0.00%)	0 (0.00%)
Bowel injury/fistula	0 (0.00%)	1 (0.33%)	0 (0.00%)
Chest infection	0 (0.00%)	0 (0.00%)	0 (0.00%)
Urinary tract infection	1 (0.17%)	1 (0.33%)	0 (0.00%)
Wound complications	4 (0.67%)	1 (0.33%)	0 (0.00%)
Pelvic hematoma/abscess	1 (0.17%)	0 (0.00%)	0 (0.00%)
Postoperative haemorrhage requiring re-operation or transfusion	4 (0.67%)	0 (0.00%)	0 (0.00%)
Deep vein thrombosis	1 (0.17%)	0 (0.00%)	0 (0.00%)
Pulmonary embolism	1 (0.17%)	1 (0.33%)	1 (4.35%)
Cardiopulmonary arrest	0 (0.00%)	0 (0.00%)	0 (0.00%)
Cerebro-vascular accident	1 (0.17%)	0 (0.00%)	0 (0.00%)
Unplanned re-operation before discharge	2 (0.33%)	0 (0.00%)	0 (0.00%)
Re-admission within 28 days of surgery	0 (0.00%)	1 (0.33%)	0 (0.00%)
Others	2 (0.33%)	1 (0.33%)	0 (0.00%)
Subtotal no. of admissions	21(3.50%)	5(1.65%)	1(4.35%)
Total no. of admissions	40 (6.67%)	19 (6.27%)	5 (21.74%)

COMPLICATIONS OF RADICAL HYSTERECTOMY

In the current audit, complication rate of laparoscopic radical hysterectomy was almost 4 times higher than that in 2009 while that of open approach was similar. Laparoscopic approach carried a 2 folds and 2.5 folds higher complication rate than the robotic and abdominal approach respectively, however it was all due to conversion to laparotomy and there were no other complications reported. One organ injury (bowel injury) was reported in the open approach but none in the laparoscopic and robotic approach. Conversion rate was 2 times higher in laparoscopic than robotic approach. Apart from 1 case of intra-operative haemorrhage in robotic approach, no other complication was reported with laparoscopic and robotic approach but the number of cases was small. Haemorrhage was the most common complication in open radical hysterectomy.

	Radical Hysterectomy		
	Open (n=84)	Lap (n=12)	Robot (n=18)
Intra-operative			
Bladder injury	0 (0.00%)	0 (0.00%)	0 (0.00%)
Ureteric injury	0 (0.00%)	0 (0.00%)	0 (0.00%)
Bowel injury	1 (1.19%)	0 (0.00%)	0 (0.00%)
Perforation of uterus	0 (0.00%)	0 (0.00%)	0 (0.00%)
Major vascular injury	0 (0.00%)	0 (0.00%)	0 (0.00%)
Inferior epigastric artery injury	0 (0.00%)	0 (0.00%)	0 (0.00%)
Surgical emphysema	0 (0.00%)	0 (0.00%)	0 (0.00%)
Fluid overload	0 (0.00%)	0 (0.00%)	0 (0.00%)
Haemorrhage requiring transfusion	3 (3.57%)	0 (0.00%)	1 (5.56%)
Cardiopulmonary arrest	0 (0.00%)	0 (0.00%)	0 (0.00%)
Anaesthetic complications	0 (0.00%)	0 (0.00%)	0 (0.00%)
Conversion to laparotomy	-	3(25.0%)	0 (0.00%)
Conversion to laparoscopy	-	-	2 (11.11%)
Others	0 (0.00%)	0 (0.00%)	0 (0.00%)
Subtotal no. of admissions	4(4.76%)	3 (25.0%)	2(11.11%)
Post-operative			
Fever >38°C after first 24 hours	2 (2.38%)	0 (0.00%)	0 (0.00%)
Bladder injury/fistula	0 (0.00%)	0 (0.00%)	0 (0.00%)
Ureteric injury/fistula	0 (0.00%)	0 (0.00%)	0 (0.00%)
Bowel injury/fistula	0 (0.00%)	0 (0.00%)	0 (0.00%)
Chest infection	0 (0.00%)	0 (0.00%)	0 (0.00%)
Urinary tract infection	0 (0.00%)	0 (0.00%)	0 (0.00%)
Wound complications	0 (0.00%)	0 (0.00%)	0 (0.00%)
Pelvic hematoma/abscess	0 (0.00%)	0 (0.00%)	0 (0.00%)
Postoperative haemorrhage requiring re-operation or transfusion	1 (1.19%)	0 (0.00%)	0 (0.00%)
Deep vein thrombosis	0 (0.00%)	0 (0.00%)	0 (0.00%)
Pulmonary embolism	0 (0.00%)	0 (0.00%)	0 (0.00%)
Cardiopulmonary arrest	0 (0.00%)	0 (0.00%)	0 (0.00%)
Cerebro-vascular accident	0 (0.00%)	0 (0.00%)	0 (0.00%)
Unplanned re-operation before discharge	0 (0.00%)	0 (0.00%)	0 (0.00%)
Re-admission within 28 days of surgery	0 (0.00%)	0 (0.00%)	0 (0.00%)
Others	1 (1.19%)	0 (0.00%)	0 (0.00%)
Subtotal no. of admissions	3(3.57%)	0 (0.00%)	0 (0.00%)
Total no. of admissions	6(7.14%)	3(25.00%)	2(11.11%)

ANALYSIS ON HYSTERECTOMY

MODES AND TYPES OF HYSTERECTOMY

Abdominal route was still the main approach for hysterectomies with laparoscopic approach being employed in 33.7% (23.5% in 2009 and 14.3% in 2004) and 30.3% (16.6% in 2009 and 9.4% in 2004) of benign and malignant conditions respectively. Vaginal route was used in about 15% of benign conditions and 0.3% of malignant conditions.

	By Intention		
	2004	2009	2014
Benign condition	5058	4131	3159
<i>Abdominal hysterectomy</i>	3819 (75.5%)	2696 (65.2%)	1606 (50.8%)
<i>Laparoscopic hysterectomy</i>	724 (14.3%)	970 (23.5%)	1064 (33.7%)
<i>Vaginal hysterectomy</i>	505 (10.0%)	456 (11.0%)	477 (15.1%)
<i>Robotic hysterectomy</i>	-	-	9 (0.3%)
<i>Extended hysterectomy</i>	10 (0.2%)	9 (0.2%)	3 (0.09%)
Malignant condition	834	996	1055
<i>Abdominal hysterectomy</i>	613 (72.7%)	716 (71.9%)	600 (56.9%)
<i>Extended hysterectomy</i>	13 (1.6%)	19 (1.9%)	7 (0.7%)
<i>Radical hysterectomy</i>	130 (15.6%)	92 (9.2%)	84 (8.0%)
<i>Laparoscopic hysterectomy</i>	76 (9.1%)	143 (14.4%)	303 (28.7%)
<i>Lap extended hysterectomy</i>	-	-	5 (0.5%)
<i>Lap radical hysterectomy</i>	2 (0.2%)	22 (2.2%)	12 (1.1%)
<i>Robotic hysterectomy</i>	-	-	23 (2.2%)
<i>Robotic radical hysterectomy</i>	-	-	18 (1.7%)
<i>Vaginal hysterectomy</i>	0 (0.0%)	4 (0.4%)	3 (0.3%)

	By outcome		
	2004	2009	2014
Benign condition	5058	4131	3159
<i>Abdominal hysterectomy</i>	3830 (75.7%)	2716 (65.7%)	1632 (51.7%)
<i>Laparoscopic hysterectomy</i>	715 (14.1%)	952 (23.0%)	1038 (32.9%)
<i>Vaginal hysterectomy</i>	503 (9.9%)	454 (11.0%)	477 (15.1%)
<i>Robotic hysterectomy</i>	-	-	9 (0.3%)
<i>Extended hysterectomy</i>	10 (0.2%)	9 (0.2%)	3 (0.09%)
Malignant condition	834	996	1055
<i>Abdominal hysterectomy</i>	614 (73.6%)	724 (72.7%)	614 (58.2%)
<i>Extended hysterectomy</i>	13 (1.6%)	19 (1.9%)	7 (0.7%)
<i>Radical hysterectomy</i>	130 (15.6%)	92 (9.2%)	87 (8.2%)
<i>Laparoscopic hysterectomy</i>	75 (9.0%)	135 (13.6%)	291 (27.6%)
<i>Lap extended hysterectomy</i>	-	-	5 (0.5%)
<i>Lap radical hysterectomy</i>	0 (0.0%)	22 (2.2%)	11 (1.0%)
<i>Robotic hysterectomy</i>	-	-	21 (2.0%)
<i>Robotic radical hysterectomy</i>	-	-	16 (1.5%)
<i>Vaginal hysterectomy</i>	2 (0.2%)	4 (0.4%)	3 (0.3%)

CONDITIONS ASSOCIATED WITH SIMPLE HYSTERECTOMY

The top 10 commonest conditions associated with abdominal and laparoscopic approach to simple hysterectomy were similar. Fibroid, carcinoma of corpus and adenomyosis were the top 3 most common conditions for both abdominal and laparoscopic approach. The number of fibroids and adenomyosis were both dropping over the 10 years period in the abdominal approach but increasing in the laparoscopic approach. The number of carcinoma of corpus reduced slightly in the abdominal group but increased significantly in the laparoscopy group. There were 566 malignancies being managed by abdominal route, of which 283 were carcinoma of corpus, 183 for epithelial carcinoma of ovary. In contrast, only 280 malignancies were managed by laparoscopy, of which 217 were carcinoma of corpus, 21 carcinoma of cervix and 19 epithelial carcinoma of ovary.

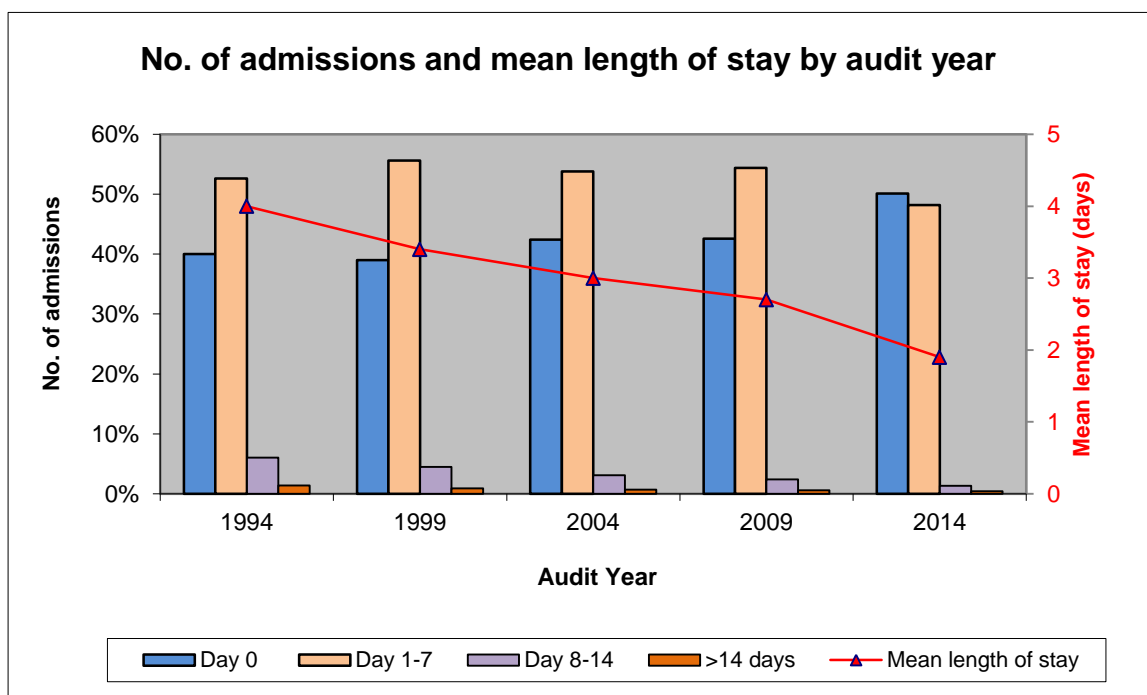
	2004	2009	2014
Abdominal hysterectomy			
Fibromyoma	2801 (61.1%)	2037 (59.7%)	1244 (56.3%)
Carcinoma of corpus	329 (7.2%)	370 (10.8%)	283 (12.8%)
Adenomyosis	564 (12.3%)	416 (12.2%)	242 (11.0%)
Carcinoma of ovary (epithelial)	167 (3.6%)	182 (5.3%)	183 (8.3%)
Benign ovarian tumour	350 (7.6%)	256 (7.5%)	172 (7.8%)
Endometriotic cyst	395 (8.6%)	215 (6.3%)	123 (5.6%)
Menorrhagia/DUB	145 (3.2%)	104 (3.0%)	118 (5.3%)
Endometrial hyperplasia	-	102 (3.0%)	69 (3.1%)
Pelvic endometriosis	127 (2.8%)	81 (2.4%)	41 (1.86%)
Endometrial polyp	-	-	40 (1.8%)
Laparoscopic hysterectomy			
Fibromyoma	456 (56.6%)	591 (51.9%)	664 (48.6%)
Carcinoma of corpus	59 (7.1%)	99 (8.7%)	217 (15.9%)
Adenomyosis	108 (13.4%)	166 (14.6%)	194 (14.2%)
Endometrial hyperplasia	41 (5.1%)	100 (8.8%)	103 (7.5%)
Benign ovarian tumour	41 (5.1%)	48 (4.2%)	85 (6.2%)
Endometriotic cyst	49 (6.1%)	77 (6.8%)	74 (5.4%)
Menorrhagia / DUB	70 (8.7%)	107 (9.4%)	72 (5.3%)
CIN	47 (5.8%)	53 (4.7%)	64 (5.4%)
Post-menopausal bleeding	-	43 (3.8%)	35 (2.6%)
Endometrial polyp	-	-	31 (2.3%)

LENGTH OF HOSPITAL STAY

The length of hospital stay was calculated from the time of admission till discharge. Pre-operative assessment, in principle, would have been included. The length of hospital stay was divided into 3 groups and the grouping varies according to different types of procedure. Over the years, there was a downward trend in the length of hospital stay. In the current exercise, 50% of the admissions were discharged on the same day, 48% stayed within 7 days and less than 2% were discharged after 1 week. For those who stayed overnight in hospital, the mean duration of stay was 1.9 day and this was again shorter than previous years.

	Mean* (days)	S.D. (days)	Day 0	Day 1-7	Day 8-14	>14 days
1994	4.0	4.8	40.0%	52.6%	6.0%	1.4%
1999	3.4	4.3	39.0%	55.6%	4.5%	0.9%
2004	3.0	3.5	42.4%	53.8%	3.1%	0.7%
2009	2.7	3.1	42.6%	54.4%	2.4%	0.6%
2014	1.9	2.8	50.1%	48.2%	1.3%	0.4%

* Excluding those with no information and day patients.



LENGTH OF STAY FOR MAJOR ABDOMINAL SURGERY

The length of stay after major abdominal surgery was shorter than that in 2009 and generally shorter for benign conditions compared with malignant conditions. The mean length of stay for benign conditions was 5.1 (SD 7.0) days, compared to 7.9 (SD 6.3) days for malignant conditions. Overall 90% and 61% of all major abdominal surgeries were discharged within 7 days when performed for benign conditions and malignant conditions respectively, compared to 85% and 55% in 2009.

Overall	Total no. of admissions	Mean (days)	S.D. (days)	1-7 days	8-14 days	>14 days
TAH	2211	6.0	5.9	1804	334	73
Subtotal hysterectomy ± BSO	33	5.2	2.7	29	4	0
Extended hysterectomy	10	6.6	4.1	6	4	0
Radical hysterectomy	90	8.3	5.0	45	36	9
Myomectomy	572	4.1	2.5	552	18	2
Adenomyomectomy	29	5.0	2.4	26	3	0
Salpingo-oophorectomy/oophorectomy	1708	6.4	5.3	1302	330	76
- excluding concurrent hysterectomy	301	6.3	6.5	240	47	14
Ovarian cystectomy	373	5.4	12.9	336	31	6
Excision of para-ovarian/tubal cyst	18	3.9	1.8	16	2	0
Salpingectomy	154	4.6	3.2	133	18	3
- excluding concurrent hysterectomy	82	4.2	3.2	74	6	2
Salpingotomy	23	7.4	13.8	19	2	2
Tuboplasty/adhesiolysis	105	6.7	9.4	85	3	7
Drainage of abscess	14	14.9	9.3	2	6	6
Ablation of endometriosis	6	3.8	1.5	6	0	0
Resection of pelvic endometriosis	7	6.6	3.2	4	3	0
Resection of bowel endometriosis	3	7.7	1.2	2	1	0
Debulking	144	8.7	5.7	69	62	13
Pelvic LND	403	7.7	4.8	235	146	22
Para-aortic LND	151	8.2	3.3	70	78	3
Omentectomy	312	7.9	5.6	177	119	16
Laparotomy alone ± biopsy	17	9.6	10.1	10	3	4
Pelvic exenteration	8	23.1	17.8	1	3	4
Trachelectomy	2	7.5	0.7	1	1	0
Bowel resection / anastomosis / stoma	39	16.0	17.7	9	20	10
Abdominal surgery for stress incontinence	6	4.8	3.5	5	1	0
Operation for urinary fistula	2	11.5	4.2	0	2	0
Ureteric repair	2	11.5	3.5	0	2	0
Miscellaneous	108	6.68	6.714	83	17	8
Total	2733	5.1	7.0	2453	227	53

Benign Conditions	Total no. of admissions	Mean (days)	S.D. (days)	1-7 days	8-14 days	>14 days
TAH	1606	5.2	5.7	1426	151	29
Subtotal hysterectomy \pm BSO	25	4.3	2.0	24	1	0
Extended hysterectomy	3	6.7	3.5	2	1	0
Myomectomy	564	4.1	2.5	546	16	2
Adenomyomectomy	25	4.6	2.4	23	2	0
Ovarian cystectomy	373	5.4	12.9	336	31	6
Excision of para-ovarian/tubal cyst	18	3.9	1.8	16	2	0
Salpingo-oophorectomy/oophorectomy	1007	5.5	4.7	870	112	25
- excluding concurrent hysterectomy	203	6.3	7.4	167	26	10
Salpingectomy	140	4.3	2.7	125	13	2
- excluding concurrent hysterectomy	79	4.2	3.2	71	6	2
Salpingotomy	23	7.4	13.8	19	2	2
Tuboplasty/adhesiolysis	105	6.7	9.4	85	3	7
Drainage of abscess	13	13.9	8.9	2	6	5
Operation for urinary fistula	2	11	4.2	0	2	0
Bowel resection / anastomosis / stoma	14	10.8	13.0	5	7	2
Abdominal surgery for stress incontinence	6	4.8	3.5	5	1	0
Ureteric repair	2	11.5	3.5	0	2	0
Miscellaneous	72	66	6.7	56	10	6
Total	2733	5.1	7.0	2453	227	53

CHECK TOTAL

Malignant Conditions	Total no. of admissions	Mean (days)	S.D. (days)	1-7 days	8-14 days	>14 days
TAH	605	7.9	6.0	378	183	44
Salpingo-oophorectomy/oophorectomy	701	7.8	5.7	43	218	51
- excluding concurrent hysterectomy	98	6.3	3.9	73	21	4
Subtotal hysterectomy	8	7.9	2.9	5	3	0
Extended hysterectomy	7	6.6	4.6	4	3	0
Radical hysterectomy	84	8.6	5.1	40	35	9
Salpingectomy	14	8.0	4.9	8	5	1
- excluding concurrent hysterectomy	3	4.0	2.0	3	0	0
Debulking	138	8.9	5.7	65	60	13
Pelvic LND	396	7.6	4.7	231	144	21
Para-aortic LND	150	8.2	3.3	70	77	3
Omentectomy	296	7.9	4.9	165	116	15
Bowel resection / anastomosis / stoma	25	18.9	20.3	4	13	8
Laparotomy alone \pm biopsy	8	9.0	6.1	4	2	2
Pelvic exenteration	7	26.0	17.2	0	3	4
Trachelectomy	2	7.5	0.7	1	1	0
Miscellaneous	36	6.8	6.9	27	7	2
Total	860	7.9	6.3	526	269	65

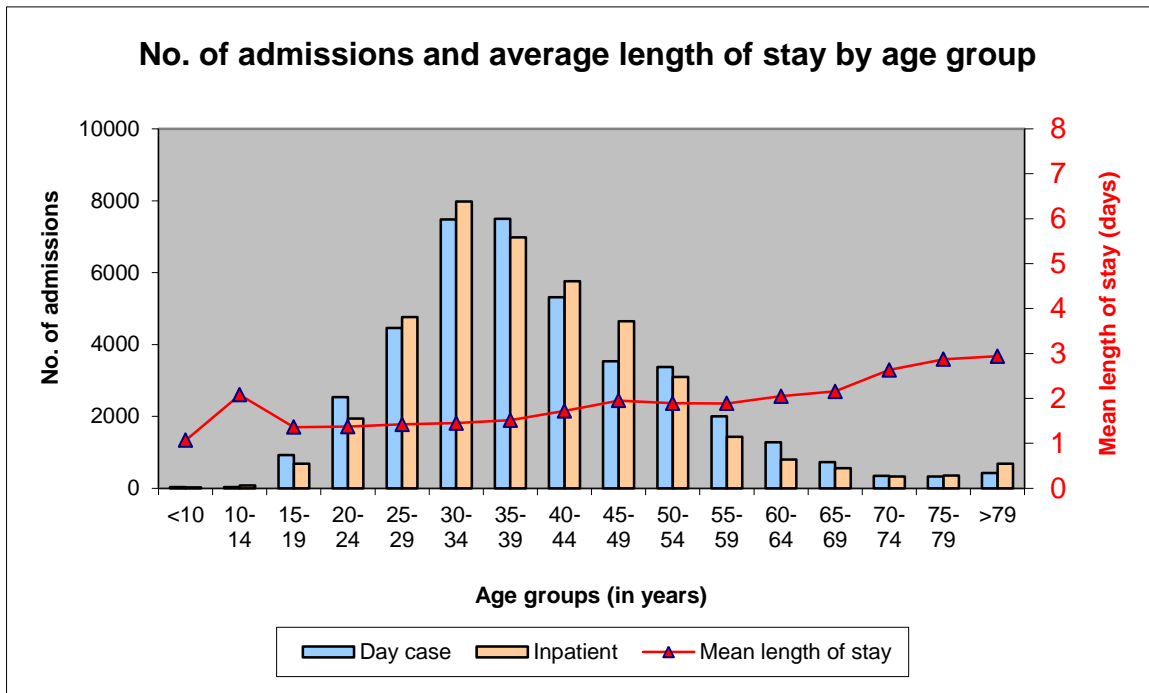


Figure G16 – No. of admissions and average length of stay by age groups

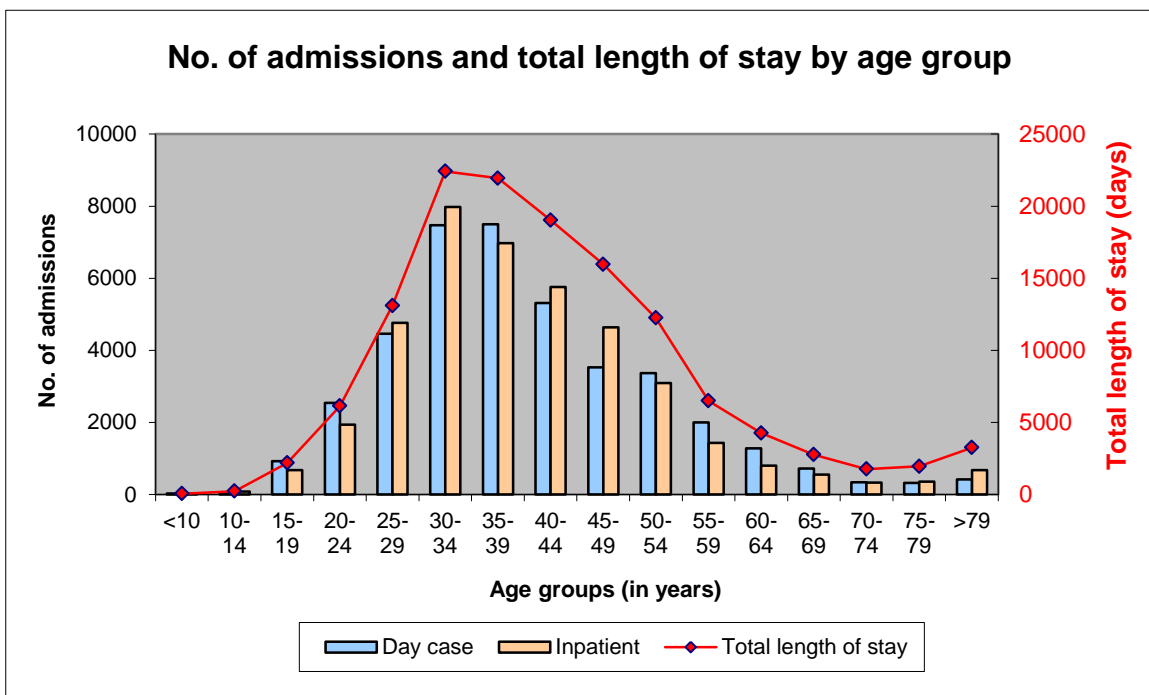


Figure G17 – No. of admissions and total length of stay by age groups

LENGTH OF STAY FOR MAJOR VAGINAL AND VUVLAL SURGERY

Over 90% of the major vaginal procedures were discharged within 7 days, compared with about 80-90% in 2004 and 2009. Length of stay for vaginal hysterectomy with or without pelvic floor repair was similar but 1 day longer when compared with pelvic floor repair only. Mesh was used for pelvic floor repair alone in 30% of the cases but only 7% for those with concurrent vaginal hysterectomy. There was no difference in the length of stay whether mesh was used or not. The pattern was different from that in 2009 & 2004. About 79% of the vulval procedures were discharged within 7 days, compared to 66% in 2009 and 74% in 2004. Similar to 2009 & 2004, wide local excision was associated with a much shorter hospital stay than radical and simple vulvectomy.

Vaginal Surgery	Total no. of admissions	Mean (days)	S.D. (days)	1-7 days	8-14 days	>14 days
Vaginal hysterectomy with PFR	350	4.2	3.3	323	20	7
Without mesh	325	4.2	3.3	300	19	6
With mesh	25	4.5	3.4	23	1	1
TVT-O / TVT / TOT	259	2.7	2.2	249	9	1
Pelvic floor repair	116	3.3	2.3	109	6	1
Without mesh	81	3.2	1.9	78	3	0
With mesh	35	3.5	3.0	31	3	1
Vaginal hysterectomy	130	4.2	3.4	116	10	4
Vaginal myomectomy	90	2.0	3.5	89	1	0
Vaginal surgery for SI	21	2.7	2.0	20	1	0
Vault prolapse repair	28	5.8	7.1	22	4	2
Vaginectomy	11	3.3	3.3	10	1	0
Vaginal stripping	13	3.8	4.3	11	1	1
Vaginal reconstruction	9	2.6	1.5	9	0	0
Repair of urinary fistula	0	0	0	0	0	0
Miscellaneous vaginal surgery	72	3.1	3.9	65	5	2
Total	962	3.4	3.2	897	51	14

Vulval Surgery	Total no. of admissions	Mean (days)	S.D. (days)	1-7 days	8-14 days	>14 days
Wide local excision	25	6.2	7.2	18	4	3
Simple vulvectomy	5	15.4	9.8	2	3	0
Radical vulvectomy	30	13.0	20.3	19	4	7
Groin node dissection	26	8.1	13.3	18	4	4
Miscellaneous vulval surgery	35	2.2	2.4	33	2	0
Total	112	6.6	1.2	88	10	14

LENGTH OF STAY FOR MINOR VAGINAL AND VULVAL SURGERY

The length of stay under this category was similar to that reported in previous audits. Suction termination of pregnancy was mainly performed as a day procedure (90.8%) but the rate was lower than in 2009 (94%). Evacuation of uterus following abortion however was associated with a longer length of stay and only 32.3% were discharged on the same day. The mean length of stay for cervical cerclage was 3.1 days in 2014, shorter than the 4.7 days in 2009 and 4.1 days in 2004.

	Total no. of admissions	Mean (days)	S.D. (days)	Same day discharge	1-3 days	>3 days
Suction termination of pregnancy	6502	1.1	1.0	5904	563	35
Evacuation of uterus	3120	1.6	1.7	1009	1961	150
D&C	4762	1.3	1.3	1959	2670	133
Marsupialisation	657	1.3	0.8	211	435	11
Other vulval surgery	701	1.5	1.9	323	339	39
Insertion/Removal IUCD/Mirena	970	1.2	0.9	578	365	27
Cervical cerclage	26	3.1	2.4	3	14	9
Miscellaneous	966	1.5	1.6	698	208	60

LENGTH OF STAY FOR HYSTEROSCOPIC SURGERY

Only 47% of the diagnostic hysteroscopy were performed as a day procedure, compared with 56% in 2009 and 60% in 2004. The mean length of stay for all other hysteroscopic procedures was 1.2 days compared with 1.5 days in 2009 and 1.6 days in 2004. The hospital stay was within 3 days in 98% of the cases and it was higher than the 95% in 2009 and 75% in 2004.

	Total no. of admissions	Mean (days)	S.D. (days)	Same day discharge	1-3 days	>3 days
Diagnostic hysteroscopy	7134	1.2	1.4	4691	2309	134
Endometrial resection/ablation	163	1.4	1.2	57	98	8
Hysteroscopic polypectomy	2456	1.2	0.9	1336	1062	58
Hysteroscopic myomectomy	380	1.4	0.9	125	243	12
Hysteroscopic division of septum	23	1.1	0.5	8	15	0
Hysteroscopic adhesiolysis	50	1.3	1.0	32	15	3
Proximal tubal cannulation	25	1.2	0.7	9	15	1
Miscellaneous	57	1.5	1.5	27	26	4
Total	9522	1.2	1.3	5816	3507	199

LENGTH OF STAY FOR LAPAROSCOPIC SURGERY

The mean length of stay following laparoscopic surgery was 2.9 days and 76.2% of the length of stay was within 3 days, which was higher than the 72.5% in 2009 and 70% in 2004. Laparoscopic extended hysterectomy was associated with the longest hospital stay followed by laparoscopic radical hysterectomy, but the number of both procedures was small. The mean length of stay for laparoscopic total hysterectomy was similar to that of laparoscopic subtotal hysterectomy, but length of stay was within 3 days occurred in 62.4% of total hysterectomy, compared with only 55.6% in subtotal hysterectomy. The mean length of stay for myomectomy was shorter than adenomyomectomy, but the number of the latter was small. Hospital stay was longer for laparoscopic pelvic lymphadenectomy than para-aortic lymphadenectomy.

Overall	Total no. of admissions	Mean (days)	S.D. (days)	≤3 days	4-7 days	>7 days
Laparoscopic total hysterectomy	1286	3.4	2.9	802	448	36
<i>TLH</i>	911	3.3	2.6	607	280	24
<i>LAVH</i>	212	3.6	1.6	108	99	5
<i>LH(a)</i>	63	3.6	1.6	33	28	2
<i>Unspecified</i>	100	4.2	6.3	54	41	5
Laparoscopic subtotal hysterectomy	45	3.5	1.9	25	19	1
Laparoscopic extended hysterectomy	5	7.5	2.6	0	2	3
Laparoscopic radical hysterectomy	24	4.7	3.2	12	11	1
Laparoscopic myomectomy	617	2.9	1.8	481	132	4
Laparoscopic adenomyomectomy	22	3.3	1.2	14	8	0
Laparoscopic cystectomy	2121	2.6	2.2	1723	369	29
<i>Ovarian cystectomy</i>	2042	2.7	2.2	1653	360	29
<i>Para-ovarian cystectomy</i>	109	2.3	1.4	92	17	0
Laparoscopic SO/oophorectomy	1333	3.3	2.7	907	385	41
Laparoscopic salpingectomy	887	2.6	2.1	721	146	20
Laparoscopic salpingotomy	167	3.3	4.2	127	30	10
Laparoscopic lymphadenectomy						
<i>Laparoscopic pelvic lymphadenectomy</i>	135	4.4	5.3	62	65	8
<i>Laparoscopic para-aortic</i>	19	4.4	2.9	8	9	2
Laparoscopic adhesiolysis	509	2.8	2.4	372	119	18
Laparoscopic ablation of endometriosis	102	2.3	1.3	81	21	0
Laparoscopic resection of endometriosis	75	2.6	1.6	64	9	2
Laparoscopic drainage of abscess	54	7.5	9.4	11	27	16
Laparoscopic ovarian drilling	28	1.4	0.9	26	2	0
Laparoscopic repair of genital prolapse	28	2.5	1.8	23	5	0
Laparoscopic sterilization/tubal occlusion	133	1.8	2.2	122	8	3
Diagnostic laparoscopy ± Dye	317	2.4	2.6	263	40	14
Miscellaneous	107	3.5	3.0	67	30	10
Total	5997	2.9	2.6	4571	1284	142

For benign conditions, the mean hospital stay was 2.8 (S D2.3) days and 55.3% were discharged within 3 days. Laparoscopic drainage of abscess and resection of endometriosis were associated with the longest hospital stay, while laparoscopic ovarian drilling was associated with the shortest stay.

Benign Conditions	Total no. of admissions	Mean (days)	S.D. (days)	≤3 days	4-7 days	>7 days
Laparoscopic total hysterectomy	994	3.3	2.5	639	333	22
<i>TLH</i>	698	3.1	1.7	481	202	15
<i>LAVH</i>	186	3.6	1.6	92	90	4
<i>LH(a)</i>	51	3.3	1.4	31	19	1
<i>Unspecified</i>	59	4.3	8.1	35	22	2
Laparoscopic subtotal hysterectomy	45	3.5	1.9	25	19	1
Laparoscopic myomectomy	608	2.9	1.8	473	132	4
Laparoscopic adenomyomectomy	22	3.2	1.2	14	8	0
Laparoscopic cystectomy	2121	2.6	2.2	1723	369	29
<i>Ovarian cystectomy</i>	2006	2.7	2.2	1629	351	26
<i>Para-ovarian cystectomy</i>	107	2.3	1.4	90	17	0
Laparoscopic SO/oophorectomy	1037	3.0	2.1	742	270	25
Laparoscopic salpingectomy	861	2.6	2.1	708	134	17
Laparoscopic salpingotomy	166	3.2	4.2	127	29	10
Laparoscopic adhesiolysis	478	2.7	1.4	358	103	17
Laparoscopic ablation of endometriosis	100	2.2	1.3	80	20	0
Laparoscopic resection of endometriosis	2	4.5	5.0	1	0	1
Laparoscopic drainage of abscess	52	6.3	4.3	11	26	15
Laparoscopic ovarian drilling	27	1.3	0.8	23	1	0
Laparoscopic repair of genital prolapse	28	2.5	1.8	23	5	0
Laparoscopic surgery for SI	5	1.6	0.5	5	0	0
Laparoscopic sterilization/tubal occlusion	130	1.8	2.3	119	8	3
Diagnostic laparoscopy ± Dye	300	2.2	2.1	257	35	8
Miscellaneous	107	3.5	3.0	67	30	10
Total	5529	2.8	2.3	4318	1106	105

For malignant conditions, the mean hospital stay was 4.3 (S D 4.8) days and 54.1% were discharged within 3 days. Laparoscopic extended hysterectomy and radical hysterectomy was associated with the longest hospital stay, while laparoscopic debulking was associated with the shortest hospital stay.

Malignant Conditions	Total no. of admissions	Mean (days)	S.D. (days)	≤3 days	4-7 days	>7 days
Laparoscopic total hysterectomy	292	3.9	3.8	163	115	14
<i>TLH</i>	213	3.9	4.3	126	78	9
<i>LAVH</i>	26	3.4	1.3	16	9	1
<i>LH(a)</i>	12	4.9	2.0	2	9	1
<i>Unspecified</i>	41	4.0	2.5	19	19	3
Laparoscopic subtotal hysterectomy						
Laparoscopic extended hysterectomy	5	7.5	2.6	0	2	3
Laparoscopic radical hysterectomy	13	5.8	2.1	1	11	1
Laparoscopic myomectomy	9	2.7	0.9	8	1	0
Laparoscopic cystectomy	40	3.3	1.9	28	10	2
<i>Ovarian cystectomy</i>	38	3.3	1.9	26	10	2
<i>Para-ovarian cystectomy</i>	3	2.3	0.6	3	0	0
Laparoscopic SO/oophorectomy	296	4.0	4.0	165	115	16
Laparoscopic salpingectomy	24	4.5	3.0	13	8	3
Laparoscopic salpingotomy	1	4.0	-	0	1	0
Laparoscopic lymphadenectomy	138	4.4	5.2	66	64	8
<i>Laparoscopic pelvic lymphadenectomy</i>	134	4.4	5.3	62	64	8
<i>Laparoscopic paraaortic lymphadenectomy</i>	18	4.4	2.9	7	9	2
Laparoscopic debulking	10	3.1	2.0	8	2	0
Laparoscopic adhesiolysis	25	4.1	2.3	10	14	1
Miscellaneous	292	3.9	3.8	163	115	14
Total	468	4.3	4.8	253	178	37

Robotic surgery was mainly performed for malignant conditions (78.5%) and the mean hospital stay was 4.7 (SD 2.9) days. Robotic surgery was associated with a longer hospital stay than the laparoscopic counterpart except for para-aortic lymphadenectomy. Robotic radical hysterectomy was associated with the longest hospital stay.

Robotic	Total no. of admissions	Mean (days)	S.D. (days)	≤3 days	4-7 days	>7 days
Robotic hysterectomy	31	4.4	2.9	16	12	3
Robotic radical hysterectomy	17	6.2	3.4	3	11	3
Robotic myomectomy	2	3.0	1.4	1	1	0
Robotic lymphadenectomy	26	4.8	2.3	9	15	2
<i>Robotic pelvic lymphadenectomy</i>	26	4.8	2.3	9	15	2
<i>Robotic para-aortic lymphadenectomy</i>	11	3.6	1.8	2	3	6
Total	65	4.7	2.9	25	33	7

LENGTH OF STAY FOR LAPAROTOMY VERSUS LAPAROSCOPY

Irrespective of the magnitude of the procedures and benign or malignant nature of the pathology, laparoscopic surgery was associated with a shorter hospital stay than open surgery, with a mean difference of 2.7 days (range 0.8-5.8 days), compared to 2.1 days (range 1.0-2.9 days) in 2009 and 2.3 days (range 1.3-4.3 days) in 2004.

	Laparotomy Days \pm SD	Laparoscopy Days \pm SD
Total hysterectomy \pm salpingo-oophorectomy (malignant)	7.9 \pm 5.7	3.9 \pm 3.8
Total hysterectomy \pm salpingo-oophorectomy (benign)	5.2 \pm 5.7	3.3 \pm 2.5
Subtotal hysterectomy \pm salpingo-oophorectomy (benign)	4.3 \pm 2.0	3.5 \pm 1.9
Radical hysterectomy	8.6 \pm 5.1	5.8 \pm 2.1
Debulking	8.9 \pm 5.7	3.1 \pm 2.0
Myomectomy	4.1 \pm 2.5	2.9 \pm 1.8
Adenomyomectomy	4.6 \pm 2.4	3.2 \pm 1.2
Salpingo-oophorectomy/oophorectomy	5.9 \pm 3.5	3.0 \pm 2.1
Ovarian cystectomy	5.4 \pm 12.9	2.6 \pm 2.2
Salpingotomy	7.4 \pm 13.8	3.2 \pm 4.2
Salpingectomy	4.3 \pm 2.7	2.6 \pm 2.1

The Special Audit Report
On
Intra-abdominal Gynaecological
Operations

2014

INTRA-ABDOMINAL OPERATIONS

In 2014, a special audit on intra-abdominal operations was included. All admissions with intra-abdominal operations performed via laparotomy or laparoscopy were required to record the operation information on date and nature of the operation, operating time, estimated blood loss, primary operative approach, need for conversion, primary trocar insertion or wound incision, disease information and final histo-pathology.

A total of 9,912 admissions required intra-abdominal operations accounting for 12.3% of all admissions. These included 5,953 laparoscopy, 3,546 laparotomy and 45 both, Intra-abdominal data were provided in 8,893 cases and therefore 89.7% of all intra-abdominal operations were audited. More than 75% of the operations were elective procedures and 12% were emergency operation.

	All	Audited
No. of laparoscopy operations	5888 59.4%	5147 57.9%
No. of laparotomy operations	3546 35.8%	3274 36.8%
No. of robotic operations	65 0.7%	63 0.7%
No. of laparotomy and laparoscopy	45 0.5%	42 0.5%
Missing data	368 3.7%	367 4.1%
Total no. of admissions with operations	9912	8893

Data extracted from the treatment codes

NATURE OF OPERATION

	Laparotomy	Laparoscopic	Robotic	Total
Elective operation	2625 (83.8%)	3773 (73.8%)	59 (93.6%)	6457 (77.7%)
Emergency operation	145 (4.6%)	867 (17.0%)	0	1012 (12.2%)
Unplanned re-operation	2 (0.06%)	3 (0.06%)	0	5 (0.06%)
Missing data	360 (11.5%)	468 (9.2%)	4 (6.4%)	832 (10.0%)
No. of admissions	3132	5111	63	8306

Missing data on surgical approach: 587

Laparoscopy was the most common primary surgical approach, constituting almost 60% of the procedures performed.

PRIMARY SURGICAL APPROACH

	Total
Laparoscopy	5111 57.5%
Laparotomy	3132 35.2%
Robotic	63 0.7%
Unspecified	587 6.6%
No. of admissions	8893

Conversion from intentional operative approach to other approach was reported in 125 procedures. Risk of conversion was higher for robotic surgery (7.9%), compared with laparoscopy (2.3%) and slightly higher when the operation was performed for malignant conditions.

CONVERSION

	Conversion	Total
Laparoscopy to laparotomy	120 (2.3%)	5111
Robotic to laparoscopy	3 (4.8%)	63
Robotic to laparotomy	2 (3.2%)	63
Total no. of admissions	125 (1.5%)	8306

PATHOLOGY IN CONVERSION CASES

	Benign		Malignant		Total	
Conversion	87	1.4%	18	1.7%	105	1.4%
<i>Laparoscopy to laparotomy</i>	86	1.3%	14	1.4%	100	1.3%
<i>Robotic to laparotomy</i>	0	0.0%	2	0.2%	2	0.03%
<i>Robotic to laparoscopy</i>	1	0.02%	2	0.2%	3	0.04%
No conversion	6318	98.6%	1018	98.3%	7336	98.6%
No. of admissions	6405		1036		7441	

Pathology was missing in 1452 cases and 20 in those with conversion

For laparoscopic surgery, closed method was the most commonly used technique for primary trocar entry, constituting 63.6% of all the laparoscopic procedures, in contrast to only 38.1% in robotic surgery. Open method was the second and was used in about 23.7% in laparoscopy but 31.8% in robotic surgery. Visual guide trocar entry was used in about 5% and direct trocar entry in less than 2%.

PRIMARY TROCAR ENTRY TECHNIQUE IN LAPAROSCOPY

	Primary Surgical Approach					
	Laparoscopy		Robotic		All cases	
Close method	3252	63.6%	24	38.1%	3390	38.1%
Open method	1209	23.7%	20	31.8%	1273	14.3%
Visual guided trocar entry	272	5.3%	9	14.3%	286	3.2%
Direct trocar entry	84	1.6%	9	14.3%	96	1.1%
Not specified	294	5.8%	1	1.6%	3848	43.3%
No. of admissions	5111		63		8893	

The most common incision made in open procedure was suprapubic transverse (46.9%) followed by the midline incision (36.0%).

ABDOMINAL INCISION IN LAPAROTOMY

	Laparotomy	
Suprapubic transverse	1468	46.9%
Midline	1127	36.0%
Para-median	41	1.3%
Not specified	496	15.8%
No. of admissions	3132	

Most of the procedures (about 70%) were performed for benign pathology whilst only about 10% were performed for malignant pathology. Over 70% of robotic surgery and about 20% of laparotomy were performed for malignant pathology, compared with only 5% in laparoscopy.

PATHOLOGY

	Laparotomy		Laparoscopic		Robotic		Total	
Benign	1961	62.6%	4141	81.0%	11	17.5%	6283	70.6%
Pre-malignant	34	1.1%	80	1.6%	3	4.8%	122	1.4%
Borderline malignant	64	2.0%	22	0.4%	0	0.0%	90	1.0%
In-situ carcinoma	9	0.3%	10	0.2%	1	1.6%	22	0.3%
Malignant	598	19.1%	250	4.9%	45	71.4%	924	10.4%
Not specified	466	14.9%	608	11.9%	3	4.8%	1452	16.3%
No. of admissions	3132		5111		63		8893	

The techniques of primary trocar entry in laparoscopy were similar for benign and malignant pathology. However, closed method was the predominant primary trocar entry technique for benign pathology in robotic surgery while closed and open techniques were roughly equally employed for malignant pathology. Midline incision was much more commonly used in laparotomy for malignant pathology.

PRIMARY SURGICAL APPROACH

		Pathology			
		Benign		Malignant	
Laparoscopy	Closed	2754	67.4%	171	62.9%
	Open	1028	25.2%	84	30.8%
	Visual guided trocar entry	235	5.8%	13	4.8%
	Direct trocar entry	69	1.7%	4	1.5%
	Total	4086		272	
Robotic	Closed	10	71.4%	22	39.3%
	Open	2	14.3%	19	33.9%
	Visual guided trocar entry	2	14.3%	8	14.3%
	Direct trocar entry	0	0	7	12.5%
	Total	14		56	
Laparotomy	Suprapubic transverse	1225	67.8%	108	18.6%
	Midline	566	31.3%	449	77.4%
	Para-median	15	0.8%	23	4.0%
	Total	1806		580	

Adhesion in the pelvis was encountered in about 30-40% of the procedures. Most of the adhesions were described as filmy, avascular, and followed by a similar proportion described as dense, vascular. In about 6-9% of procedures, the adhesions were described as cohesive. Cohesive adhesions in Pouch of Douglas (POD) were found in 8% with complete obliteration occurred in about 3-4%.

PELVIC ADHESIONS GRADING / POD OBLITERATION

	Grade	Pelvic Adhesions				POD			
		Rt Adnexa		Lt Adnexa		Adhesion		Obliteration	
Laparoscopy (n = 5111)	0	1627	65.7%	1512	62.0%	1759	68.0%	4417	86.4%
	1	403	16.3%	413	16.9%	348	13.5%	320	6.3%
	2	298	12.0%	335	13.7%	260	10.1%	173	3.4%
	3	150	6.1%	180	7.4%	220	8.5%	201	3.9%
Laparotomy (n = 3132)	0	770	72.9%	723	69.1%	827	73.6%	2861	91.4%
	1	109	10.3%	134	12.8%	93	8.3%	101	3.2%
	2	102	9.7%	110	10.5%	106	9.4%	79	2.5%
	3	76	7.2%	80	7.6%	98	8.7%	91	2.9%
Robotic (n = 63)	0	31	100%	26	89.3%	33	100%	62	98.4%
	1	0	0	2	7.1%	0	0	1	1.6%
	2	0	0	1	3.6%	0	0	0	0
	3	0	0	0	0.0%	0	0	0	0
Total (n = 8893)	0	2489	68.2%	2323	64.5%	2691	70.1%	7909	88.9%
	1	523	14.3%	559	15.5%	450	11.7%	428	4.8%
	2	410	11.2%	453	12.6%	371	9.7%	257	2.9%
	3	229	6.3%	265	7.4%	326	8.5%	299	3.4%

Adhesion grade: 0 = None, 1 = Filmy, avascular, 2 = Dense and/or vascular, 3 = Cohesive

POD obliteration grade: 0 = None, 1 = <50%, 2 = ≥ 50%, 3 = 100%

Conversion from intentional surgical approach was associated with higher median blood loss, presence of more and higher grade of adhesion, and longer length of hospital stay.

	No conversion	Conversion
Median age (years)	42 [35-49]	41 [34-48]
Median OT Time (mins)	90 [60-125]	130 [90-208.75]
Median blood loss /ml	100.0 [20-262.5]	300 [100-600]
Median length of stay (days)	3.0 [2-4]	5 [4-7]
Total no. of admissions	9787	125

Missing data in OT time and blood loss was 7 & 8 in those with conversion and 1524 & 1669 in those without conversion

	Grade	No conversion		Conversion	
Right adnexal adhesion	None	2460	68.5%	29	48.3%
	Filmy and avascular	518	14.4%	5	8.3%
	Dense and/or vascular	399	11.1%	11	18.3%
	Cohesive	214	6.0%	15	25.0%
Left adnexal adhesion	None	2298	65.0%	25	40.3%
	Filmy and avascular	550	15.5%	9	14.5%
	Dense and/or vascular	441	12.5%	12	19.4%
	Cohesive	249	7.0%	16	25.8%
POD adhesion	None	2659	70.4%	32	50.8%
	Filmy and avascular	445	11.8%	5	7.9%
	Dense and/or vascular	362	9.6%	9	14.3%
	Cohesive	309	8.2%	17	27.0%
POD obliteration	None	7816	89.1%	93	74.4%
	<50%	421	4.8%	7	5.6%
	≥ 50%	251	2.9%	6	4.8%
	100%	280	3.2%	19	15.2%

SIMPLE HYSTERECTOMY FOR BENIGN CONDITIONS

Simple hysterectomy for benign conditions was performed mainly through laparotomy, accounting for 59.4%. Median operating time was longer while median blood loss and length of stay were both less in the laparoscopic approach. Laparoscopic approach was more commonly used for uterine size up to 12 weeks and only 8% was larger than 16 weeks size compared with 28.9% in the laparotomy approach.

	No conversion		Conversion	
Median age (years)	48	[44-51]	46	[43-50]
Median OT Time (mins)	110	[90-140]	169	[120-218]
Median blood loss /ml	200	[100-400]	400	[180-1000]
Median length of stay (days)	4.0	[3-5]	5	[4-6]
Total no. of admissions	2644		26	

Missing data in OT Time and OT blood loss was 332 & 267 respectively in no conversion group and 1 in OT blood loss in conversion group

	Simple Hysterectomy			
	Open		Laparoscopic*	
Number of admissions	1438	[IQR] / %	983	[IQR] / %
Median age (years)	48	[44-51]	47	[44-51]
Median OT Time (mins)	99	[80-120]	122	[100-170]
Median blood loss /ml	300	[195-450]	100	[78-300]
Median length of stay (days)	4.0	[4-6]	3	[2-4]
Primary trocar entry				
Closed			648	65.9%
Open			230	23.4%
Visual guided			47	4.8%
Direct trocar entry			14	1.4%
Not specified			44	4.5%
Incision				
Suprapubic transverse	787	54.7%		
Midline	410	28.5%		
Para-median	13	0.9%		
Not specified	228	15.9%		
Uterine size				
Normal size	126	8.8%	131	13.3%
≤ 8 weeks	91	6.3%	159	16.2%
10-12 weeks	240	16.7%	264	26.9%
14-16 weeks	475	33.0%	206	21.0%
18-20 weeks	297	20.7%	63	6.4%
20-24 weeks	73	5.1%	15	1.5%
> 24 weeks	44	3.1%	1	0.1%
Not specified	92	6.4%	144	14.6%

* Including 1 robotic approach

	Grade	Laparotomy		Laparoscopic*	
Right adnexal adhesion	None	362	25.2%	288	29.3%
	Filmy and avascular	46	3.2%	48	4.9%
	Dense and/or vascular	37	2.6%	39	4.0%
	Cohesive	31	2.2%	19	1.9%
	Not specified	962	66.9%	589	59.9%
Left adnexal adhesion	None	329	22.9%	262	26.7%
	Filmy and avascular	67	4.7%	56	5.7%
	Dense and/or vascular	42	2.9%	44	4.5%
	Cohesive	35	2.4%	28	2.8%
	Not specified	965	67.1%	593	60.3%
POD adhesion	None	381	26.5%	296	30.1%
	Filmy and avascular	46	3.2%	36	3.7%
	Dense and/or vascular	42	2.9%	46	4.7%
	Cohesive	51	3.5%	40	4.1%
	Not specified	918	63.8%	565	57.5%
POD obliteration	None	1315	91.4%	873	88.8%
	<50%	46	3.2%	49	5.0%
	≥ 50%	33	2.3%	28	2.8%
	100%	44	3.1%	33	3.4%

* Including 1 robotic approach

SIMPLE HYSTERECTOMY FOR MALIGNANT CONDITIONS

Simple hysterectomy for malignant conditions was performed mainly through laparotomy, accounting for 67.3%. There was no difference in the median operating time between laparotomy and laparoscopy but median blood loss and length of stay were both less in laparoscopy. The uterine size was larger for open procedure and no cases were larger than 16 weeks size in the laparoscopic approach.

	No conversion		Conversion	
Median age (years)	54	[47-61]	48	[41-60]
Median OT Time (mins)	140	[112-180]	260	[165-281]
Median blood loss /ml	200	[100-400]	400	[300-725]
Median length of stay (days)	5	[4-8]	8	[4-12]
Total no. of admissions	891		12	

Missing data in OT Time and OT blood loss was 71 & 59 respectively in no conversion group

	Simple Hysterectomy			
	Open		Laparoscopic*	
Number of admissions	565	[IQR] / %	274	[IQR] / %
Median age (years)	54	[48-61]	54	[47-60]
Median OT Time (mins)	141	[110-180]	142	[120-180]
Median blood loss /ml	300	[200-578]	100	[50-200]
Median length of stay (days)	7	[8-9]	3	[3-4]
Primary trocar entry				
Closed			177	64.6%
Open			75	27.4%
Visual guided			10	3.6%
Direct trocar entry			3	1.1%
Not specified			9	3.3%
Incision				
Suprapubic transverse	86	15.2%		
Midline	367	65.0%		
Para-median	16	2.8%		
Not specified	96	17.0%		
Uterine size				
Normal size	248	43.9%	128	46.7%
≤ 8 weeks	104	18.4%	86	31.4%
10-12 weeks	60	10.6%	29	10.6%
14-16 weeks	34	6.0%	3	1.1%
18-20 weeks	14	2.5%	0	0.0%
20-24 weeks	6	1.1%	0	0.0%
> 24 weeks	3	0.5%	0	0.0%
Not specified	96	17.0%	28	10.2%

** Including 5 robotic approach*

	Grade	Laparotomy		Laparoscopic*	
Right adnexal adhesion	None	147	26.0%	78	28.5%
	Filmy and avascular	20	3.5%	10	3.6%
	Dense and/or vascular	32	5.7%	5	1.8%
	Cohesive	12	2.1%	2	0.7%
	Not specified	354	62.7%	179	65.3%
Left adnexal adhesion	None	137	24.2%	76	27.7%
	Filmy and avascular	28	5.0%	9	3.3%
	Dense and/or vascular	29	5.1%	6	2.2%
	Cohesive	18	3.2%	3	1.1%
	Not specified	353	62.5%	180	65.7%
POD adhesion	None	151	26.7%	89	32.5%
	Filmy and avascular	19	3.4%	6	2.2%
	Dense and/or vascular	24	4.2%	4	1.5%
	Cohesive	20	3.5%	1	0.4%
	Not specified	351	62.1%	174	63.5%
POD obliteration	None	22	3.9%	9	3.3%
	<50%	13	2.3%	2	0.7%
	≥ 50%	22	3.9%	0	0.0%
	100%	508	89.9%	263	96.0%

* Including 5 robotic approach

RADICAL HYSTERECTOMY

Radical hysterectomy was performed mainly through laparotomy, accounting for 76.7%. Median operating time was much longer but median blood loss and length of stay were both less in the laparoscopic approach. Laparoscopic approach was performed mainly for uterine size up to 8 weeks.

	No conversion		Conversion	
Median age (years)	48	[41-55]		
Median OT Time (mins)	200	[173-287]		
Median blood loss /ml	330	[200-600]		
Median length of stay (days)	6.5	[4-10]		
Total no. of admissions	124		0	

Missing data in OT Time and OT blood loss was 23 & 22 respectively in no conversion group

	Radical Hysterectomy			
	Open		Laparoscopic*	
Number of admissions	79	[IQR] / %	24	[IQR] / %
Median age (years)	49	[41-54]	47	[42-58]
Median OT Time (mins)	192	[150-232]	347	[274-393]
Median blood loss /ml	400	[200-800]	200	[138-400]
Median length of stay (days)	8.0	[5-11]	5.5	[4-7]
Primary trocar entry				
Closed			9	37.5%
Open			12	50.0%
Visual guided			0	0.0%
Direct trocar entry			2	8.3%
Not specified			1	4.2%
Incision				
Suprapubic transverse	28	35.4%		
Midline	34	43.0%		
Para-median	1	1.3%		
Not specified	16	20.3%		
Uterine size				
Normal size	29	36.7%	10	41.7%
≤ 8 weeks	18	22.8%	8	33.3%
10-12 weeks	6	7.6%	2	8.3%
14-16 weeks	5	6.3%	1	4.2%
18-20 weeks	2	2.5%	0	0.0%
Not specified	19	24.1%	3	12.5%

** Including 14 robotic approach*

	Grade	Laparotomy		Laparoscopic*	
Right adnexal adhesion	None	14	17.7%	10	42.1%
	Filmy and avascular	0	0.0%	1	4.1%
	Dense and/or vascular	0	0.0%	0	0.0%
	Cohesive	0	0.0%	0	0.0%
	Not specified	65	82.3%	13	55.8%
Left adnexal adhesion	None	14	17.7%	10	41.7%
	Filmy and avascular	0	0.0%	0	0.0%
	Dense and/or vascular	0	0.0%	0	0.0%
	Cohesive	0	0.0%	0	0.0%
	Not specified	65	82.3%	14	58.3%
POD adhesion	None	13	16.5%	11	45.8%
	Filmy and avascular	1	1.3%	0	0.0%
	Dense and/or vascular	1	1.3%	0	0.0%
	Cohesive	1	1.3%	0	0.0%
	Not specified	63	79.7%	13	54.2%
POD obliteration	None	75	94.9%	24	100.0%
	<50%	2	2.5%	0	0.0%
	≥ 50%	1	1.3%	0	0.0%
	100%	1	1.3%	0	0.0%

* Including 14 robotic approach

MYOMECTOMY

Myomectomy were reported in 1,190 admissions in the special audit but only 1,124 admissions in the general audit. A total of 1,032 cases were reported to have myomectomy in both audits. There were 158 cases reported to have myomectomy in the special audit but not in the general audit, of which 132 were hysterectomy with only 4 reported to have conversions. The remaining 26 cases were not reported to have myomectomy or hysterectomy. Therefore 154 cases were excluded from being myomectomy in the special audit. In 92 cases not reported to have myomectomy in the special audit but in the general audit, 39 had abdominal myomectomy, 34 had laparoscopic myomectomy (1 with concurrent hysteroscopic myomectomy), 14 had hysteroscopic myomectomy and 5 had vaginal myomectomy. Therefore another 73 cases of myomectomy were included in the special audit. At the end, the number of intra-abdominal myomectomy included for analysis was 1,109 (1032 + 4 + 73).

The number of myomectomy performed through laparotomy and laparoscopy were similar. The median operating times were 88.5 minutes versus 120 minutes, and blood loss were 150 versus 100 ml respectively. There were 5 conversions in 571 laparoscopic myomectomy. The uterine size was larger for open procedure. The median size of largest fibroid and the median number of fibroids were larger in open myomectomy.

	No conversion	Conversion
Median age (years)	39 [34-43]	39 [34-43]
Median OT Time (mins)	97 [75-128]	120 [90-161]
Median blood loss /ml	100 [50-200]	200 [50-600]
Median length of stay (days)	3 [3-4]	4 [3-5]
Total no. of admissions	1094	15

Missing data in OT Time and OT blood loss was 11 & 8 respectively

	Myomectomy			
	Open		Laparoscopic*	
Number of admissions	521	[IQR] / %	544	[IQR] / %
Median age (years)	39	[34-42]	39	[34-43]
Median OT Time (mins)	88.5	[61-108]	120	[90-151]
Median blood loss /ml	150	[100-300]	100	[50-200]
Median length of stay (days)	4.0	[3-5]	3	[2-3]
Primary trocar entry				
Closed			323	59.4%
Open			157	28.9%
Visual guided			30	5.5%
Direct trocar entry			9	1.7%
Not specified			25	4.6%
Incision				
Suprapubic transverse	406	77.9%		
Midline	47	9.0%		
Para-median	1	0.2%		
Not specified	67	12.9%		
Uterine size				
Normal size	19	3.3%	23	4.0%
≤ 8 weeks	32	5.5%	131	23.0%
10-12 weeks	128	22.1%	168	29.5%
14-16 weeks	197	34.0%	150	26.4%
18-20 weeks	109	18.8%	27	4.7%
20-24 weeks	32	5.5%	8	1.4%
> 24 weeks	15	2.6%	2	0.4%
Not specified	48	8.3%	60	10.5%
Fibroid numbers and size				
Median number of fibroids	3	[1-6]	2	[1-4]
Largest number of fibroids	100		24	
Median largest fibroid size (cm)	8	[6-10]	6	[5-8]
Largest fibroid size (cm)	20		20	
Largest fibroid type				
Pedunculated	28	5.4%	54	9.9%
Subserosal	131	25.1%	191	35.1%
Intramural	256	49.1%	210	38.6%
Submucosal	23	4.4%	29	5.3%
Not specified	83	15.9%	60	11.0%
Largest fibroid location				
Anterior	168	32.2%	191	35.1%
Posterior	140	26.9%	153	28.1%
Fundal	100	19.2%	110	20.2%
Broad ligament	21	4.0%	28	5.1%
Anterior cervical	2	0.4%	4	0.7%
Posterior cervical	2	0.4%	7	1.3%
Not specified	88	16.9%	51	9.4%

* Including 2 robotic approach

	Grade	Laparotomy		Laparoscopic*	
Right adnexal adhesion	None	102	19.6%	123	22.6%
	Filmy and avascular	20	3.8%	14	2.6%
	Dense and/or vascular	5	1.0%	13	2.4%
	Cohesive	4	0.8%	2	0.4%
	Not specified	390	74.9%	392	72.1%
Left adnexal adhesion	None	101	19.4%	106	19.5%
	Filmy and avascular	15	2.9%	16	2.9%
	Dense and/or vascular	5	1.0%	15	2.8%
	Cohesive	4	0.8%	4	0.7%
	Not specified	396	76.0%	403	74.1%
POD adhesion	None	120	23.0%	132	24.3%
	Filmy and avascular	13	2.5%	10	1.8%
	Dense and/or vascular	12	2.3%	11	2.0%
	Cohesive	3	0.6%	11	2.0%
	Not specified	373	71.6%	380	69.9%
POD obliteration	None	500	96.0%	513	94.3%
	<50%	10	1.9%	13	2.4%
	≥ 50%	8	1.5%	10	1.8%
	100%	3	0.6%	8	1.5%

* Including 2 robotic approach

OVARIAN SURGERY

Ovarian surgery was reported in 3,588 cases in the special audit, 2,734 had unilateral disease and 854 had bilateral disease. Unilateral ovarian cystectomy (OC) was performed in 1,859 cases, 85 had concurrent contra-lateral salpingo-oophorectomy (SO), of which 12 were without disease and therefore likely without contra-lateral ovary. Bilateral OC was performed in 567 cases. Unilateral SO was performed in 506 cases and while bilateral SO was performed in 741 cases, of which 527 were performed for unilateral disease only or without contra-lateral ovary. Concurrent hysterectomy was performed in 842 cases (244 undergoing OC, of which 6 were likely with absent contra-lateral ovary, 585 SO and 13 both) and they were excluded from the analysis. As a result, 2,169 cases were included in the OC group and 637 cases in the SO group for analysis.

	Without hysterectomy		With hysterectomy		Total	
Total no. of admissions	2746	[IQR]/%	842	[IQR]/%	3588	[IQR]/%
Median age (years)	37	[31-44]	49	[45-54]	41	[32-48]
Median OT Time (mins)	75	[60-101]	131	[100-180]	89	[60-120]
Median blood loss /ml	50	[10-100]	300	[150-569]	50	[10-200]
Median length of stay (days)	3	[2-4]	5	[4-7]	3	[2-4]
Ovarian cyst						
Unilateral	2116	77.1%	618	73.4%	2734	76.2%
Bilateral	630	22.9%	224	26.6%	854	23.8%
Right ovarian cyst	1714		536		2250	
≤ 5 cm	886	51.7%	245	45.7%	1131	50.3%
6-10 cm	626	36.5%	131	24.4%	757	33.6%
11-15 cm	86	5.0%	61	11.4%	147	6.5%
> 15 cm	74	4.3%	69	12.9%	143	6.4%
Not specified	42	2.5%	30	5.6%	72	3.2%
Left ovarian cyst	1662		530		2192	
≤ 5 cm	886	53.3%	280	52.8%	1166	53.2%
6-10 cm	575	34.6%	110	20.8%	685	31.3%
11-15 cm	83	5.0%	49	9.2%	132	6.0%
> 15 cm	69	4.2%	56	10.6%	125	5.7%
Not specified	49	2.9%	35	6.6%	84	3.8%
Operative procedure						
UOC	1609	58.6%	177	21.0%	1786	49.8%
USO	322	11.7%	99	11.8%	421	11.7%
UOC + USO	60	2.2%	13	1.5%	73	2.0%
BOC	500	18.2%	67	8.0%	567	15.8%
BSO	255	9.3%	486	57.7%	741	20.7%
<i>Unilateral disease</i>	<i>185</i>		<i>342</i>		<i>527</i>	
<i>Bilateral disease</i>	<i>70</i>		<i>144</i>		<i>214</i>	
Operative approach						
Laparotomy	438	16.0%	584	69.4%	1022	28.5%
Laparoscopy*	2308	84.0%	258	30.6%	2566	71.5%

U – unilateral; B – bilateral; OC – ovarian cystectomy; SO – salpingo-oophorectomy

*Including 5 robotic surgeries in concurrent hysterectomy

Pathology	Without hysterectomy		With hysterectomy		Total	
N	2746		842		3588	
Benign*	2443		410		2853	
Dermoid cyst	429	17.6%	32	7.8%	461	16.2%
Endometriotic cyst	1042	42.7%	166	40.5%	1208	42.3%
Others	979	40.1%	210	51.2%	1189	41.7%
Functional	66	2.7%	8	2.0%	74	2.6%
Malignant*	103		242		345	
Borderline	39	37.9%	43	17.8%	82	23.8%
Epithelial	41	39.8%	171	70.7%	212	61.4%
Non-epithelial	22	21.4%	24	9.9%	46	13.3%
Secondary	1	1.0%	7	2.9%	8	13.3%

*No. of cases with pathology available

The number of ovarian surgery without concurrent hysterectomy were performed more laparoscopically, the difference was larger for cystectomy. The median operation time and blood loss were both less for procedures performed laparoscopically. The number of conversions were very small, 0.2% for laparoscopic cystectomy and 0.3% for laparoscopic oophorectomy/salpingo-oophorectomy. The size of the adnexal cysts tended to be larger for open procedures.

OVERALL

	No conversion	Conversion
Median age (years)	37 [31-44]	41 [33.5-45.5]
Median OT Time (mins)	75 [60-100]	120 [90-166]
Median blood loss /ml	40 [10-100]	400 [162.5-587.5]
Median length of stay (days)	3 [2-3]	5 [4-7]
Total no. of admissions	2709	37

Missing data in OT Time and OT blood loss in 162 & 286 in no conversion group and 4 & 1 in conversion group respectively

OVARIAN CYSTECTOMY

	No conversion	Conversion
Median age (years)	35 [30-41]	37 [31.5-43.5]
Median OT Time (mins)	75 [60-100]	120 [89-155.5]
Median blood loss /ml	50 [10-100]	400 [200-650]
Median length of stay (days)	2 [2-3]	5 [4-7]
Total no. of admissions	2144	25

Missing data in OT Time and OT blood loss in 132 & 225 in no conversion group and 4 & 0 in conversion group respectively

SALPINGO-OOPHORECTOMY

	No conversion	Conversion
Median age (years)	47 [38-53]	42 [37-54]
Median OT Time (mins)	80 [60-110]	148 [101-189]
Median blood loss /ml	30 [10-100]	450 [50-750]
Median length of stay (days)	3 [2-4]	5 [4-9]
Total no. of admissions	622	15

Missing data in OT Time and OT blood loss in 35 & 65 in no conversion group and 1 & 1 in conversion group respectively

	Cystectomy		Salpingo-oophorectomy	
	Open	Lap	Open	Lap
n	268	1901	199	438
Bilateral disease	63 (23.5%)	437 (23.0%)	67 (33.7%)	188 (42.9%)
Median age (years)	35 [29-42]	35 [30-42]	42 [31-51]	48 [42-53]
Median OT time (min)	88 [60-110]	72 [60-99]	90 [60-120]	79 [60-108]
Median blood loss (ml)	100 [50-275]	20 [10-100]	100 [50-300]	20 [10-50]
Median length of stay (days)	4 [3-6]	2 [2-3]	5 [4-7]	2 [2-3]

Incision

Suprapubic transverse	133 (49.6%)	37 (18.6%)
Midline	86 (32.1%)	128 (64.3%)
Para-median	3 (1.1%)	6 (3.0%)
Not specified	46 (17.2%)	28 (14.1%)

Primary trocar entry

Close	1148(60.4%)	257 (58.7%)
Open	462 (24.3%)	114 (26.0%)
Visual guided	114 (6.0%)	25 (5.7%)
Direct	32 (1.7%)	9 (2.1%)
Not specified	145 (7.6%)	33 (7.5%)

Right ovarian cyst

	198	1200	117	259
n	191	1173	116	249
<=5 cm	75 (39.3%)	694 (59.2%)	27 (23.3%)	123 (49.4%)
6-10 cm	75 (39.3%)	439 (37.4%)	27 (23.3%)	98 (39.4%)
11-15 cm	20 (10.5%)	32 (2.7%)	22 (19.0%)	19 (7.6%)
>15 cm	21 (11.0%)	8 (0.7%)	40 (34.5%)	9 (3.6%)
Not specified	7	27	1	10

Left ovarian cyst

	162	1169	129	262
n	157	1140	124	247
<=5 cm	70 (44.6%)	697 (61.1%)	19 (15.3%)	125 (50.6%)
6-10 cm	49 (31.2%)	411 (36.1%)	37 (29.8%)	96 (38.9%)
11-15 cm	20 (12.7%)	25 (2.2%)	24 (19.4%)	19 (7.7%)
>15 cm	18 (11.5%)	7 (0.6%)	44 (35.5%)	7 (2.8%)
Not specified	5	29	5	15

Ovary removed

Right	16	13	133	303
Left	15	21	133	320

	Grade	Cystectomy		Salpingo-oophorectomy	
		Open	Lap	Open	Lap
Right adnexal adhesion	None	68 (25.4%)	470 (24.7%)	52 (26.1%)	132(30.1%)
	Filmy and avascular	9 (3.4%)	155 (8.2%)	9 (4.5%)	35 (8.0%)
	Dense and/or vascular	9 (3.4%)	166 (8.7%)	11 (5.5%)	29 (6.6%)
	Cohesive	17 (6.3%)	78 (4.1%)	13 (6.5%)	21 (4.8%)
	Not specified	165(61.6%)	1032(54.3%)	114(57.3%)	221(50.5%)
Left adnexal adhesion	None	65 (24.3%)	429 (22.6%)	56 (28.1%)	119(27.2%)
	Filmy and avascular	11 (4.1%)	153 (8.0%)	5 (2.5%)	33 (7.5%)
	Dense and/or vascular	10 (3.7%)	184 (9.7%)	15 (7.5%)	38 (8.7%)
	Cohesive	15 (5.6%)	89 (4.7%)	9 (4.5%)	27 (6.2%)
	Not specified	167(62.3%)	1046 (55.0%)	114(57.3%)	221(50.5%)
POD adhesion	None	70 (26.1%)	499 (26.2%)	66 (33.2%)	144(32.9%)
	Filmy and avascular	11 (4.1%)	143 (7.5%)	5 (2.5%)	32 (7.3%)
	Dense and/or vascular	10 (3.7%)	148 (7.8%)	9 (4.5%)	30 (6.8%)
	Cohesive	18 (6.7%)	133 (7.0%)	7 (3.5%)	23 (5.3%)
	Not specified	159(59.3%)	978 (51.4%)	112(56.3%)	209(47.7%)
POD obliteration	None	235(87.7%)	1527(80.3%)	173(86.9%)	360(82.2%)
	<50%	9 (3.4%)	144 (7.6%)	10 (5.0%)	32 (7.3%)
	≥ 50%	10 (3.7%)	103 (5.4%)	9 (4.5%)	20 (4.6%)
	100%	14 (5.2%)	127 (6.7%)	7 (3.5%)	26 (5.9%)

	Cystectomy		Salpingo-oophorectomy	
	Open	Lap	Open	Lap
n	268	1901	199	438
Benign*	225	1746	131	388
Dermoid cyst	42 (18.7%)	312 (17.9%)	13 (9.9%)	66 (17.0%)
Endometriotic cyst	82 (36.4%)	834 (47.8%)	34 (26.0%)	114 (29.4%)
Others	103 (45.8%)	603 (34.5%)	88 (67.1%)	206 (53.1%)
Functional	7 (3.1%)	54 (3.1%)	1 (0.8%)	5 (1.3%)
Malignant*	18	19	51	22
Borderline	7 (38.9%)	9 (47.4%)	19 (37.3%)	9 (40.9%)
Epithelial	7 (38.9%)	6 (31.6%)	18 (35.3%)	11 (50.0%)
Non-epithelial	3 (16.7%)	4 (21.1%)	14 (27.5%)	2 (9.1%)
Secondary	1 (5.6%)	0 (0.0%)	0 (0.0%)	0 (0.0%)

*No. of cases with pathology available

ECTOPIC PREGNANCY OPERATION

Tubal ectopic pregnancy accounted for 98 % of the cases. Most of the procedures (96.0% or 557 out of 580) for ectopic pregnancy were managed laparoscopically but the number of conversion (17 out of 594 or 2.9%) was higher compared with myomectomy and ovarian surgery. The median operating time was 57 minutes and the median blood loss was 50 ml. Laparoscopic approach was associated with shorter operating time, blood loss and length of stay.

	No conversion	Conversion
Median age (years)	33 [29-37]	34 [28-36]
Median OT Time (mins)	57 [44-75]	76 [64-118]
Median blood loss /ml	50 [10-200]	285 [87-800]
Median length of stay (days)	2 [1-3]	4 [3-6]
Total no. of admissions	577	17

Ectopic pregnancy site	n
Tubal	582
<i>Whole tube</i>	242
<i>Ampullary</i>	236
<i>Isthmus</i>	50
<i>Cornual</i>	28
<i>Fimbrial</i>	18
<i>Interstitial</i>	8
Ovarian	10
Caesarean scar	1
Abdominal	1
Cervical	0

	Open		Laparoscopic	
Number of admissions	23	[IQR] / %	557	[IQR] / %
Median age (years)	34	[31-37]	33	[29-37]
Median OT Time (mins)	72	[59-80]	57	[45-75]
Median blood loss /ml	900	[175-2025]	50	[10-200]
Median length of stay (days)	4	[2-4]	2	[1-3]

Primary trocar entry

Closed	391	70.2%
Open	99	17.8%
Visual guided	38	6.8%
Direct trocar entry	5	0.9%
Not specified	24	4.3%

Incision

Suprapubic transverse	11	47.8%
Midline	6	26.1%
Para-median	0	0.0%
Not specified	6	26.1%

Surgical approach was missing in 14 (2.4%) cases

Ectopic pregnancy site	Open		Laparoscopic	
Tubal	22		546	
<i>Whole tube</i>	11	47.8%	225	40.4%
<i>Ampullary</i>	2	8.7%	228	40.9%
<i>Isthmus</i>	4	17.4%	45	8.1%
<i>Cornual</i>	3	13.0%	25	4.5%
<i>Fimbrial</i>	1	4.3%	16	2.9%
<i>Interstitial</i>	1	4.3%	7	1.3%
Ovarian	0	0.0%	10	1.8%
Caesarean scar	1	4.3%	0	0
Abdominal	0	0	1	0.2%
Cervical	0	0	0	0

Grade		Laparotomy		Laparoscopic*	
Right adnexal adhesion	None	16	69.6%	373	67.0%
	Filmy and avascular	2	8.7%	95	17.1%
	Dense and/or vascular	0	0.0%	27	4.8%
	Cohesive	0	0.0%	6	1.1%
	Not specified	5	21.7%	56	10.1%
Left adnexal adhesion	None	13	56.5%	367	65.9%
	Filmy and avascular	3	13.0%	99	17.8%
	Dense and/or vascular	1	4.3%	21	3.8%
	Cohesive	0	0.0%	9	1.6%
	Not specified	6	26.1%	61	11.0%
POD adhesion	None	17	73.9%	411	73.8%
	Filmy and avascular	0	0.0%	81	14.5%
	Dense and/or vascular	0	0.0%	12	2.2%
	Cohesive	0	0.0%	2	0.4%
	Not specified	6	26.1%	51	9.2%
POD obliteration	None	22	95.7%	506	90.8%
	<50%	1	4.3%	41	7.4%
	≥ 50%	0	0.0%	6	1.1%
	100%	0	0.0%	4	0.7%

Appendix 1. List of Participating Hospitals/Institutes and Co-ordinators

Hospital / Institute	Coordinator
Alice Ho Miu Ling Nethersole Hospital	Dr LAW Lai Wa
Canossa Hospital	Dr CHOW Wing Mei May
Caritas Medical Centre	Dr LEE Lee
Evangel Hospital	Dr KWOK Chi Yeung
Family Planning Association of Hong Kong	Dr WONG Ching Yin Grace
Hong Kong Adventist Hospital	Dr STEVESON Robert
Hong Kong Baptist Hospital	Dr FUNG Tak Yuen
Hong Kong Sanatorium & Hospital Ltd.	Dr YUEN Pong Mo
Kwong Wah Hospital	Dr LAU Wai Lam
Matilda International Hospital	Dr SCHRADER Hans
North District Hospital	Dr LAW Lai Wa
Our Lady of Maryknoll Hospital	Dr CHAN Kit Sheung
Pamela Youde Nethersole Eastern Hospital	Dr LEUNG Kit Tong
Pok Oi Hospital	Dr YIP Chiu Shan
Precious Blood Hospital	Dr KWOK Chi Wai
Prince of Wales Hospital	Dr LAW Lai Wa
Princess Margaret Hospital	Dr LEE Lee
Queen Elizabeth Hospital	Dr CHAN Chung Sum
Queen Mary Hospital	Dr PUN Ting Chung / Dr MA Wai Sze Paulin
St. Paul's Hospital	Dr FONG Mun Ho
St. Teresa's Hospital	Dr. YOU Yeung
Tseung Kwan O Hospital	Dr TSANG Sing Wing
Tsuen Wan Adventist Hospital	Dr SO Kon Ping
Tuen Mun Hospital	Dr TSE Hio Meng
Union Hospital	Dr WONG To
United Christian Hospital	Dr HO Yau Bong Winson

Appendix 2. Lists of Committee and Subcommittee

Working Group on HKCOG Territory-wide Audit 2014

	Year of membership	Remarks
Dr. CHEUK Kwan Yiu	2013	
Dr. LAW Lai Wa	2013	
Dr. MA Wai Sze Paulin	2013	
Dr. NG Pui Shan	2013	
Dr. PUN Ting Chung	2013	
Dr. YUEN Pong Mo	2013	Co-ordinator

Clinical Audit Subcommittee 2020

	Year of membership	Remarks
Dr. CHEUK Kwan Yiu	2020	
Dr. LAM Yuk Ki	2020	
Dr. LAW Lai Wa	2020	
Dr. MA Wai Sze Paulin	2020	
Dr. NG Pui Shan	2020	
Dr. TSE Wing Ting	2020	
Dr. WONG Daniel	2020	
Dr. YUEN Pong Mo	2020	Chairman

Clinical Audit Subcommittee 2004-2019

	Year of membership	Remarks
Dr. CHAN Yuk May, May	2004 – 2005	
Dr. TSE Hei Yee, Lowina	2004 – 2005	
Dr. TSANG Sing Wing	2004 – 2007	
Dr. WONG Shu Pong	2004 – 2007	
Dr. PUN Ting Chung	2004 – 2019	
Dr. LEUNG Wing Cheong	2006 – 2009	
Dr. TO Wing Kee, William	2006 – 2012	
Dr. SUM Tak Keung	2008 – 2009	
Dr. Ng Pui Shan	2008 – 2020	
Dr. FAN Tak Chung	2010 – 2012	
Dr. LAW Lai Wa	2011 – 2020	
Dr. CHEUK Kwan Yiu	2013 – 2020	
Dr. MA Wai Sze Paulin	2013 – 2020	
Dr. LAM Wai Cheung	2015 – 2018	
Dr. WONG Sze Wai Alyssa	2015 – 2012	
Dr. TSE Wing Ting	2018 – 2012	
Dr. LAM Yuk Ki	2019 – 2020	
De. WONG Daniel	2020	
Dr. YUEN Pong Mo	2004 – 2020	Chairman (2004 – 2010)

Quality Assurance Committee 2000 – 2020

	Year of membership	Remarks
Dr. AU-YEUNG Kam Chuen, Sidney	2013 – 2020	
Dr. CHAN Chong Pun	2010 – 2020	
Dr. CHAN Chung Sum, Sammy	2004–2006; 2010–2015	
Prof. CHAN Kar Loen, Karen	2016 – 2018	
Dr. CHAN Kuen Ting	2007– 2015	
Dr. CHAN Lin Wai, Daniel	2010 – 2015	
Dr. CHAN Woon Tong, Joseph	2000 – 2020	
Dr. CHAN Yuk May, May	2001 – 2008	
Dr. CHEON Willy, Cecilia	2008 – 2009	
Dr. CHEUNG Kai Bun	2000 – 2018	
Dr. CHEUNG Tak Hong	2000 – 2015	
Dr. ChEUNG Yau Kar Rachel	2016 – 2019	
Dr. CHU Wai Yee	2000 – 2015	
Prof. CHUNG Kwok Hung, Tony	2004 – 2009	Chairman (2004 - 2006)
Dr. DOO Alexander Kenneth	2010 – 2013	
Dr. FOK Lai Ling, Nancy	2001 – 2009	
Dr. FUNG Tak Yuen	2011 – 2015	
Prof. HAINES Christopher	2000 – 2001	
Dr. HO Lau Cheung	2000 – 2003	Chairman (2000)
Prof. HO Pak Chung	2000	
Prof. LAO Tzu Hsi, Terence	2000 – 2005	
Prof. LAU Tze Kin	2010 – 2011	
Dr. LAU Woon Chung	2010 – 2015	
Dr. LAW Chiu Fung	2000 – 2009	
Dr. LEE Kai Wan	2009, 2012 – 2015	
Dr. LEUNG Kwok Ling, Ares	2007 – 2015	Chairman (2010 - 2015)
Dr. LEUNG Kwok Yin	2004 – 2009	
Prof. LEUNG Tak Yeung	2012 – 2020	
Dr. LEUNG Tse Ngong	2019 – 2020	Chairman (2019 – 2020)
Dr. LEUNG Wing Cheong	2007 – 2018	
Dr. LI Fuk Him, Dominic	2004 – 2006	
Dr. LI Wai Hon	2009	
Dr. LIAUW Linna	2013 – 2015, 2019-2020	
Dr. LO Wing Kit, Keith	2010 – 2012	
Dr. MOK Ka Ming, Charles	2001–2009, 2013–2015	
Dr. NG Tai Keung	2000 – 2008	
Prof. NGAN Yuen Sheung, Hextan	2000 – 2015	Chairman (2007- 2009)
Dr. SIU King Sang, Catherine	2001 – 2003	
Dr. SO Wai Ki, William	2000 –2003	
Dr. TANG Chang Hung, Lawrence	2001 – 2006	Chairman (2001- 2003)
Dr. TANG Kwok Hung	2000	
Dr. TSANG Sing Wing	2003	
Dr. TSE Ka Yu	2019 – 2020	
Dr. WONG Shu Pong	2002 – 2006	
Prof. WONG TAAM Chi Woon, Vivian	2000	
Dr. YAU Hon Wai	2000	
Prof. YIP Shing Kai Alexander	2007	
Dr. YEUNG Po Chi, Anita	2009	
Dr. YEUNG Tim Wing	2013 – 2015	
Dr. YU Kai Man	2002–2009, 2013–2015	
Dr. YUEN Pong Mo	2004 – 2020	

Appendix 3. Obstetric Audit Form

OBSTETRICS AUDIT FORM – HKCOG 2014

Hospital: _____ Form No. _____

NAME :	_____ (initials)	Date of Delivery :	_____ (dd/mm/yy)
AGE :	_____	Resident Status :	* HK Resident / Non-HK Resident
ID. No :	_____ X(X) (at least 5 digits)	Chinese Ethnic :	* Yes / No

ANTENATAL COMPLICATIONS	INFORMATION ABOUT LABOUR	LABOUR COMPLICATIONS
Cardiac Disease * 1. No 2. Rheumatic heart disease 3. Congenital heart disease 4. MVP 5. Arrhythmia 6. Others Diabetes * No / Pre-existing / GDM Ovarian cyst (Pathological) * No / No surgery / AN surgery Fibroids * No / Yes Anaemia * No / Yes Renal Disease * No / Yes Liver Disease * No / Yes Respiratory Disease * No / Yes GI / Biliary Disease * No / Yes Epilepsy * No / Yes Psychiatric Disease * No / Yes Immunological Disease * No / Yes Thyroid Disease * No / Yes Surgical Disease * No / Yes	Onset of Labour * Spontaneous / Induced / No Labour Duration of Labour _____ hours Indication for Induction (at most 3) *1. No / irrelevant 2. DM / GDM 3. Maternal disease 4. Bad obstetrical history 5. Prolonged pregnancy (≥ 41 wks) 6. Hypertension 7. PROM \pm Intrauterine Infection 8. APH 9. Multiple pregnancy 10. Suspected IUGR / IUGR 11. IUD 12. Fetal anomaly 13. Suboptimal CTG / fetal distress 14. Social reasons 15. Others _____	Amniotic fluid * 1. Clear 2. Meconium stained - Mild 3. Meconium stained - Moderate 4. Meconium stained - Severe 5. Blood stained 6. No liquor Syntocinon Augmentation * No / Yes Epidural Analgesia * No / Yes Episiotomy * No / Yes Perineal Tear * 1. Nil 2. 1st degree (involving skin only) 3. 2nd degree (involving perineal muscle) 4. 3rd degree (involving anal sphincter) 5. 4th degree (involving anal mucosa) Oxytocics for 3rd stage * 1. Nil 2. Syntometrine 3. Syntocinon 4. Duratocin
OBS HISTORY & COMPLICATIONS Parity * 0 / 1 / 2 / 3 / 4 / 5 / 5+ IVF pregnancy * No / Yes No. of fetuses * 1 / 2 / 3 / 3+ Previous C/S * 0 / 1 / 2 / 3 / 3+ Other uterine scar * No / Open myomectomy / Lap myomectomy / Hysterotomy / Others Hypertension Severity * No / Mild / Severe Classification * 1. Irrelevant 2. Eclampsia 3. Gestational hypertension 4. Gestational proteinuria 5. Gest. Proteinuric HT (PET) 6. Chr. HT – no proteinuria 7. Chr. HT – with PET 8. Unclassified Antepartum Haemorrhage * 1. No 2. APH of ? origin 3. Placenta praevia 4. Placental abruption 5. Others ECV * 1. Irrelevant 2. No ECV 3. Successful ECV 4. Failed ECV Placenta praevia * No / Yes Threatened Preterm Labour * No / Yes Use of tocolytic * No / Yes Use of steroid * No / Yes	Down's Screening * No / 1 st / 2 nd / Both Trimester Fetal DNA Testing * No / Screening / High risk Feto-reduction * Irrelevant / No / Yes POSTNATAL COMPLICATIONS Postpartum Haemorrhage (ml) * ≤ 500 / 501-1000 / 1001-1500 / >1500 PPH requiring transfusion * No / Yes PPH Causes (at most 3) * 1. No 2. Uterine atony 3. Retained POG 4. Rupture of uterus 5. Cervical tear 6. Vaginal tear 7. Perineal wound 8. Genital haematoma 9. Acute inversion of uterus 10. DIC 11. Placenta praevia 12. Placenta accreta/precreta 13. Uterine fibroids 14. Others _____ Puerperal Pyrexia * No / Yes Breast Abscess * No / Yes UTI * No / Yes Genital Tract Infection * No / Yes	Wound Problem with Intervention * No / Yes MROP * No / Yes Uterine Rupture/Scar Dehiscence * No / Yes Myomectomy * No / Yes Ovarian cystectomy / SO * No / Yes Hysterectomy * No / Yes Internal iliac artery ligation * No / Yes Uterine artery embolisation * No / Yes Uterine compression sutures * No / Yes Uterine balloon tamponade * No / Yes Maternal Collapse Causes * 1. No / irrelevant 2. Major obstetric haemorrhage 3. Thrombo-embolism 4. Amniotic fluid embolism 5. Acute fatty liver 6. HELLP syndrome 7. Eclampsia 8. Myocardial infarction 9. Cardiomyopathy 10. Aortic dissection 11. Septic shock 12. Intra-cranial haemorrhage 13. Drug toxicity / overdose 14. Anaphylaxis 15. Others _____ Maternal Death * No / Yes (Specify) _____ _____ _____ _____

* represents the default value

INFORMATION ABOUT DELIVERY – BABY *1 / 2 / 3		
Mode of Delivery * 1. NSD 2. V/E 3. Forceps 4. Breech 5. LSCS 6. Classical CS 7. Unknown Second stage CS * No / Yes Presentation / Lie at Birth * 1. Vertex 2. Breech 3. Brow 4. Face 5. Oblique 6. Transverse 7. Compound 8. Others _____	Born Before Arrival * No / Yes Indication for VE / Forceps (at most 3) *1. No / irrelevant 2. Maternal disease 3. Maternal distress 4. Previous CS/Uterine scar 5. Obstetric complication 6. Fetal distress/Suboptimal CTG 7. Cord prolapse 8. Prolonged 2 nd stage 9. Meconium stained liquor 10. Others _____ Anaesthesia for CS *1. No / irrelevant 2. GA 3. Spinal 4. Epidural	Indication for C/S (at most 3) *1. No / irrelevant 2. DM / GDM 3. Maternal disease 4. Previous uterine scar 5. Bad obs. History 6. APH / placenta praevia 7. Hypertension 8. Multiple pregnancy 9. Fetal distress/suboptimal CTG 10. Cord prolapse / presentation 11. Suspected IUGR / IUGR 12. Malpresentation / lie 13. No/Poor progress of labour 14. Cephalopelvic disproportion 15. Contracted / unfavourable pelvis 16. Failed instrumental delivery 17. Genital tumour / anomaly 18. Failed induction 19. Elderly / infertility 20. Suspected macrosomia 21. Intrauterine infection 22. Social reason 23. Others
INFORMATION ABOUT BABY – BABY *1 / 2 / 3		
Gestation _____ weeks Birth Weight _____ gm Apgar Score at 1 min _____ Apgar Score at 5 min _____ Admission to NICU * No / Yes Congenital Anomalies * No / Yes Chromosomal Anomalies * No / Yes Birth Trauma (at most 3) *1. No 2. Cephalhaematoma 3. Soft tissue trauma 4. Subaponeurotic haemorrhage 5. Intracranial haemorrhage 6. Fractures 7. Nerve injury 8. Visceral injury Congenital Infection * No / Yes Major Infections * No / Yes RDS * No / Yes IVH * No / Yes NEC * No / Yes	Fetal Outcome * 1. Alive 2. SB – antepartum 3. SB – intrapartum 4. SB – unknown 5. NND – first week 6. NND – 2 to 4 week 7. Abortion – IJFD <24 wk (only for multiple pregnancy) Cause of *Stillbirth (circle 1 only) * 1. Irrelevant 2. Congenital anomaly 3. Isoimmunisation 4. PIH 5. APH 6. Mechanical 7. Maternal disorder 8. Others 9. Unexplained 10. Uninvestigated	Cause of NND (circle 1 only) * 1. Irrelevant 2. Congenital anomaly 3. Isoimmunisation 4. PIH 5. APH 6. Mechanical 7. Maternal disorder 8. Others 9. Unexplained 10. Uninvestigated Contributory Factor to NND Congenital anomaly * None / major / attributable Haemolytic disease * None / major / attributable Hypoxia * None / major / attributable Birth trauma * None / major / attributable RDS * None / major / attributable Intracranial haemorrhage * None / major / attributable Infection * None / major / attributable Miscellaneous * None / major / attributable Unclassifiable * None / major / attributable

* represents the default value

Appendix 4. Gynaecology Audit Form

GYNAECOLOGY AUDIT FORM – HKCOG 2014

Name: _____ (initials)

Age: _____

ID No. _____ ()
(at least 5 digits)

Hospital : _____

Form No. _____

Date of Admission: _____ Date of Discharge: _____

Admission Status : Routine / Emergency / Day case/ Transfer in / Unplanned readmission (within 28 days of last admission)

Discharge Status : Home / Transfer for convalescence / Transfer (referral) / DAMA / Death

DIAGNOSIS (in code) _____

TREATMENT (in code) _____

For ONCOLOGY cases

Old case / New case Stage of Disease : Recurrent / Unstaged / Stage I / Stage II / Stage III / Stage IV

For Intra-abdominal Operation ONLY (circle as appropriate)

Date of operation: _____ Elective / Emergency / Unplanned re-operation

Operating time (min): _____ Estimated Blood loss (ml) _____

Primary approach by intention for intra-abdominal procedure : Laparotomy / Laparoscopic / Robotic

Conversion to other route : No / Laparotomy / Laparoscopy

Primary trocar entry : Not relevant / Close / Open / Direct trocar entry / Visual guided trocar entry

Laparotomy incision : Not relevant / Suprapubic transverse / Midline / Para-median

Pathology: Benign / Pre-malignant / Borderline malignant / In-situ carcinoma / Malignant (the worse pathology)

Uterine size: Normal / ≤ 8 weeks / 10-12 weeks / 14-16 weeks / 18-20 weeks / > 20-24 weeks / > 24 weeks

For myomectomy: Number of fibroids removed _____ Largest fibroid size: _____ cm

Largest fibroid type: Pedunculated/ Subserosal/ Intramural/ Submucosal

Largest fibroid location: Anterior / Posterior / Fundal / Broad ligament / Anterior Cervical / Posterior Cervical

Right ovarian cyst/tumour: No / Yes Size: ≤ 5 cm / 6-10 cm / 11-15 cm / > 15 cm Ovary removed: No / Yes

Left ovarian cyst/tumour: No / Yes Size: ≤ 5 cm / 6-10 cm / 11-15 cm / > 15 cm Ovary removed: No / Yes

Ectopic pregnancy site: Tubal/Fimbrial/Ampullary/Isthmus/Interstitial/Cornual/ Ovarian/Abdominal/Cervical/ Caesarean scar

Adnexal adhesion grade: Right: 0 / 1/ 2/ 3 Left : 0/ 1/ 2/ 3

POD adhesion grade: 0 / 1/ 2/ 3 Obliteration: None / <50% / ≥ 50% / 100%

Grade : 0 - none; 1 - filmy, avascular;
2 - dense and/or vascular; 3 - cohesive

COMPLICATIONS

Intra-operative/procedural

1. Bladder injury
2. Ureteric injury
3. Bowel injury
4. Perforation of uterus
5. Major vascular injury
6. Inferior epigastric artery injury
7. Surgical emphysema
8. Fluid overload
9. Haemorrhage requiring transfusion
10. Cardiopulmonary arrest
11. Anaesthetic complications (Specify): _____
12. Others (Specify): _____

Post-operative/procedural

1. Fever >38°C after first 24 hours (readings at least 4 hours apart)
2. Bowel injury/ fistula
3. Bladder injury/ fistula
4. Ureteric injury/ fistula
5. Chest infection
6. Urinary tract infection (requiring antibiotics)
7. Wound complications (Dehiscence, haematoma, ecchymosis)
8. Pelvic hematoma/abscess
9. Postoperative haemorrhage requiring re-operation or transfusion
10. Deep vein thrombosis
11. Pulmonary embolism
12. Cardiopulmonary arrest
13. Cerebro-vascular accident
14. Unplanned re-operation before discharge (specify): _____
14. Re-admission within 28 days of surgery (specify): _____
16. Others (specify): _____

In case of death, main cause(s):

Appendix 5. HKCOG Audit Guidelines For Coding (2014 Version)

GENERAL INSTRUCTIONS

Study period for 2014 audit: 1 January 2014 to 31 December 2014.

Cases for audit:

OBSTETRICS – all deliveries with date of delivery within the study period

GYNAECOLOGY – all episodes of hospitalization with date of admission within the study period

IMPORTANT : Patient's I.D. number must be entered. The last two characters may be omitted e.g. A12345X(X).

OBSTETRICS AUDIT FORM - HKCOG 2014

EXPLANATORY NOTES ON DATA ENTRY

Patient Identification

Name

I.D. No

Date of Delivery dd/mm/yy

Age Number with 2 digits in completed years

Resident Status Resident / Non-Resident

Chinese Ethnic Yes / No

Antenatal, Medical / Surgical Complications

- | | |
|-------------------|--|
| Cardiac disease | <ol style="list-style-type: none"> 1. No disease 2. Rheumatic valvular disease 3. Congenital heart disease 4. Mitral valve prolapse 5. Arrhythmia requiring treatment or regular cardiac treatment 6. Others |
| Diabetes mellitus | <ol style="list-style-type: none"> 1. No disease 2. Pre-existing DM – known DM before the indexed pregnancy disregarding treatment was instituted or not 3. Gestational DM – DM diagnosed during pregnancy or postpartum by an OGTT |
| Ovarian cyst | Abnormal and/or persistent ovarian cyst during pregnancy with or without surgery in the antenatal period |
| Fibroids | Presence of uterine fibroids during pregnancy |
| Anaemia | Hb level <10g/dl at any time of gestation (thalassaemia without anaemia is EXCLUDED) |
| Renal disease | Disease of the urinary tract during pregnancy either <ol style="list-style-type: none"> a. with symptoms or b. with impaired renal function or c. requiring treatment d. asymptomatic bacteriuria is EXCLUDED |

Liver disease	Liver diseases during pregnancy with impaired liver function
Respiratory disease	Only those requiring treatment during pregnancy or with impaired respiratory function Upper respiratory tract infection is EXCLUDED
Gastrointestinal biliary disease	Include only those requiring hospitalization and treatment
Epilepsy	Only those requiring treatment during pregnancy
Psychiatric disease	Only those requiring treatment during pregnancy
Immunological disease	Only those requiring treatment during pregnancy
Thyroid disease	Only those requiring treatment during pregnancy
Surgical disease	Major surgical conditions / laparotomy or major operations that require general anaesthesia during pregnancy or puerperium (except PPS)

Obstetric History & Complications

Parity	Including liveborns and stillbirths after 24 weeks or over 500gm
Conception	Spontaneous or IVF pregnancy
Previous CS	Including lower segment and classical Caesarean section
Other Uterine scar	Including open or laparoscopic myomectomy / hysterotomy / plastic operation / perforation of uterus requiring repair
Hypertension / eclampsia	<p>Severity :</p> <ol style="list-style-type: none"> 1. No 2. Mild-DBP < 110mmHg AND no proteinuria 3. Severe-DBP \geq 110 mmHg AND / OR proteinuria <p>Classification :</p> <ol style="list-style-type: none"> 1. Irrelevant 2. Eclampsia 3. Gestational hypertension <ul style="list-style-type: none"> - BP normal before 20 weeks and no previous history of hypertension - DBP \geq110mmHg on any 1 occasion or \geq90mmHg on 2 or more occasions at 4 hours apart <p>Classification :</p> <ol style="list-style-type: none"> 4. Gestational proteinuria (proteinuria \geq300 mg/24 hours; or 2 MSU / CSU collected \geq4 hours apart with 1 g/1; or 2+ or more on reagent strips 5. Gestational proteinuric hypertension 6. Chronic hypertension with proteinuria 7. Chronic hypertension with superimposed preeclampsia – proteinuria developing for the first time during pregnancy 8. Unclassified – BP unknown before 20 weeks

Antepartum haemorrhage	Bleeding per vaginum from the 24th week to the time of delivery <ol style="list-style-type: none"> 1. No 2. APH of unknown origin – including those with “show” but not going into labour within 72 hours 3. Placenta praevia with bleeding 4. Accidental haemorrhage – including those with no revealed bleeding 5. Other causes
Placenta praevia	Including those with or without bleeding
ECV	Performance of external cephalic version
Threatened preterm labour	Diagnosed or suspected to have labour before 37 weeks of gestation which does not proceed to delivery either spontaneously or after tocolytic therapy
Use of tocolytics	Use of tocolytic agent(s) to suppress preterm labour
Use of steroid	Use of antenatal steroid to enhance fetal lung maturity
Down's screening	Down's screening in first trimester (OSCAR) or second trimester (Biochemical) or combined
Fetal DNA screening	Non-invasive fetal DNA testing for trisomy
Fetal reduction	Fetal reduction for high multiple pregnancy

Information About Labour

Onset of labour	Definition - a retrospective diagnosis <ul style="list-style-type: none"> -regular contractions with cervix at least 3cm dilated or there is progressive cervical effacement or dilatation over 4 hours
Induction of labour	An obstetric procedure designed to pre-empt the natural process of labour by initiating its onset artificially before this occurs spontaneously <p>Indications :</p> <ol style="list-style-type: none"> 1. Maternal diseases / conditions <ol style="list-style-type: none"> (I) DM / GDM (II) Maternal medical / surgical condition 2. Bad obstetric history 3. Antenatal / obstetric complications <ol style="list-style-type: none"> (I) Prolonged pregnancy (II) Hypertensive disease (III) PROM / intrauterine infection (IV) Antepartum haemorrhage (V) Multiple pregnancy 4. Fetal and cord conditions <ol style="list-style-type: none"> (I) Suspected IUGR / IUGR (II) Intrauterine death (III) Severe fetal abnormality (IV) Suboptimal antepartum cardiotocography

	5. Others
Augmentation of labour	The use of synthetic oxytocin to accelerate labour process after it is already begun and that its quality of progress is unsatisfactory – use of amniotomy is NOT counted as augmentation
Duration of labour	Summation of first stage and second stage (if any) of labour to the closest number of hours. Enter 1 if duration <1 hour

Postnatal Complications

PPH (choose at most 3)	<p>Blood loss of > 500 ml following vaginal delivery or > 1000 ml following Caesarean delivery</p> <p>Causes</p> <ol style="list-style-type: none"> 1. Uterine atony 2. Retained POG 3. Injuries to genital tract <ul style="list-style-type: none"> - ruptured uterus - cervical tear - vaginal tear - perineal wound 4. Genital haematoma 5. Uterine inversion 6. DIC 7. Placenta praevia/accreta/percreta 8. Others
Amniotic fluid	<p>Status of the amniotic fluid during labour</p> <ol style="list-style-type: none"> 1. Clear 2. Meconium stained 3. Blood stained 4. No liquor seen
Perineal tear	<ol style="list-style-type: none"> 1. 1st degree tear - where the fourchette and vaginal mucosa are damaged and the underlying muscles are exposed, but not torn 2. 2nd degree tear - the posterior vaginal walls and perineal muscles, but the anal sphincter is intact. 3. 3rd degree tear - extend to the anal sphincter that is torn, but the rectal mucosa is intact 4. 4th degree tear - where the anal canal is opened, and the tear may spread to the rectum
Uterine rupture / scar dehiscence	Includes dehiscence of previous scar with no PPH
Hysterectomy	Include those performed up to 6 weeks postpartum
Puerperal pyrexia	Temperature >38 degree C within 14 days of delivery
Maternal collapse	An acute event involving the cardiorespiratory systems and/or brain, resulting in a reduced or absent conscious level (and potentially death), at any stage in pregnancy and up to six weeks after delivery.
Maternal death	The death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the

pregnancy or its management but not from accidental or incidental causes.

Information About Delivery

Mode of delivery	<ol style="list-style-type: none"> 1. Spontaneous vertex delivery 2. Ventouse extraction 3. Forceps delivery 4. Breech delivery 5. Lower segment Caesarean section 6. Classical Caesarean section 7. Unknown
Second stage CS	Caesarean section performed at second stage of labour
BBA	Birth before arrival
Presentation / lie at delivery	<ol style="list-style-type: none"> 1. Vertex 2. Breech 3. Brow 4. Face 5. Oblique lie 6. Transverse lie 7. Compound presentation 8. Others
Indications for instrumental delivery (maximum 3 indications)	<ol style="list-style-type: none"> 2. Maternal diseases / conditions <ul style="list-style-type: none"> - maternal disease complicating pregnancy - maternal distress 3. Past obstetrical history <ul style="list-style-type: none"> - previous Caesarean section 4. Antenatal / obstetric complications e.g. hypertension 5. Fetal and cord conditions <ul style="list-style-type: none"> - fetal distress (except cord prolapse) - cord prolapse / presentation 6. Labour and delivery problems <ul style="list-style-type: none"> - prolonged second stage - after-coming head of breech is EXCLUDED 7. Others
Indications for Caesarean section (maximum 3 indications)	<ol style="list-style-type: none"> 1. Maternal disease / conditions <ul style="list-style-type: none"> - GDM / DM - maternal disorders 2. Past obstetrical history <ul style="list-style-type: none"> - previous sections / uterine scar - bad obstetrical history 3. Antenatal / obstetric complications <ul style="list-style-type: none"> - antepartum haemorrhage - hypertensive disorders - multiple pregnancy

4. Fetal and cord conditions
 - fetal distress
 - cord prolapse / presentation
 - suspected IUGR / IUGR
 - suspected macrosomia
5. Labour and delivery problems
 - abnormal lie / presentation
 - failure to progress
 - cephalopelvic disproportion
 - contracted / unfavourable pelvis
 - failed instrumental delivery
 - tumour / congenital anomaly of genital tract
 - failed induction – cervix fails to reach 3cm
6. Others
 - elderly mother / infertility
 - social reason
 - others

Information About the Baby

Gestation	In completed weeks according to best estimate
Birth weight	Weight in grams
Apgar score	Range 0 – 10, or unknown
Fetal outcome	<ol style="list-style-type: none"> 1. Alive and no neonatal death 2. Stillbirth (fetus born without sign of life at or after 24 weeks of gestation, or with birth weight over 500 gm when gestation is uncertain) <ul style="list-style-type: none"> - antepartum - intrapartum - undetermined – mother is already in labour on admission and fetal heart not detected (evidence of fetal viability is accepted only if obtained by a medical / midwifery staff) 3. Neonatal death <ul style="list-style-type: none"> - early (up to 6 days 23 hours 59 minutes) - later (form 7 days to 27 days 23 hours 59 minutes) 4. Abortion - for multiple pregnancy with IUD
Cause of stillbirth / NND	Choose only one of the following <ol style="list-style-type: none"> 1. Congenital anomaly 2. Isoimmunisation 3. Pregnancy-induced hypertension 4. Antepartum haemorrhage 5. Mechanical 6. Maternal disorder 7. Others 8. Unexplained 9. Uninvestigated

Contributory factor to NND	<ol style="list-style-type: none"> 1. Congenial anomaly 2. Haemolytic disease of newborn 3. Intrauterine hypoxia / birth asphyxia 4. Birth trauma 5. Respiratory distress / conditions 6. Intracranial haemorrhage 7. Infection 8. Miscellaneous 9. Unclassifiable
Congenital anomalies	Only include those significant ones detected before discharge
Birth trauma (choose at most 3)	<ol style="list-style-type: none"> 1. Cephalhaematoma 2. Soft tissue trauma e.g. laceration 3. Subaponeurotic haemorrhage 4. Intracranial haemorrhage 5. Fractures 6. Nerve injuries 7. Visceral injuries
Major infections	<ol style="list-style-type: none"> 1. Meningitis 2. Pneumonia 3. Septicaemia 4. Other major infections
RDS	Respiratory distress syndrome
IVH	Intraventricular haemorrhage
NEC	Necrotising enterocolitis

GYNAECOLOGY AUDIT FORM 2014

I. Principles in coding diagnosis

1. If an operation was performed on the patient, the pathological diagnosis should be coded. If an operation was not performed, the MOST PROBABLE clinical diagnosis should be coded.
2. Significant changes in the diagnosis noted after the audit form had been filled can be amended by submitting a second audit form marked with the patient's name, I.D. number, date of admission, the correct diagnosis code and remark" AMENDED FORM'
3. Minor incidental finding which was asymptomatic and did not require treatment SHOULD NOT be coded.
4. Non-gynaecological conditions which were not related to the cause of admission SHOULD NOT be coded.
5. Cases of malignancy should be denoted as NEW or OLD case for each episode of hospitalization.
6. If intra-abdominal operation was performed, the information under "Intra-abdominal Operation" SHOULD be recorded.
7. Complications which occurred as a result of treatment in the same unit should be coded separately from complications of treatment performed in another unit.

II. Definition of diagnosis

1. Disseminated malignancies and the primary site could not be confirmed, the diagnosis would be coded as L2.
2. For diagnoses under Disorders of Menstruation, known causes should be coded as well if found.
3. Primary amenorrhoea should be coded as I3 and secondary amenorrhoea (duration of amenorrhoea more than 6 months) as I4 irrespective of the cause. If there was a known cause, it should also be coded e.g. primary amenorrhoea due to vaginal atresia should be coded as I3 and B3; secondary amenorrhoea due to tuberculous endometritis should be coded as I4 and D5.
4. Postmenopausal bleeding is defined as genital tract bleeding occurred 1 year after the last menstrual period. If there is an organic cause, it should also be coded as well, e.g post-menopausal bleeding with endometrial polyp should be coded as I6 and D10.
5. Genital warts should be quoted as infection of the organ involved, e.g. vulval warts should be coded as A5 and cervical warts as C5
6. Dysfunctional uterine bleeding is defined as heavy, prolonged or frequent bleeding of uterine origin in the absence of demonstrable pelvic disease, complications of pregnancy or systematic disease. Menorrhagia is defined as heavy and prolonged menstruation at regular intervals.

Diagnosis

- A. Diseases of Vulva, Perineum and Urethra
 - 2. Miscellaneous
 - 3. Congenital abnormality
 - 4. Trauma
 - 5. Infection (including Bartholin's abscess)
 - 6. Benign neoplasm
 - 7. Malignant neoplasm
 - 8. Retention cyst
 - 9. Vulval dystrophy (hypertrophic or non-hypertrophic dystrophy, intraepithelial neoplasia)
 - 10. Urethral lesions

- B. Diseases of Vagina
 - 2. Miscellaneous
 - 3. Congenital abnormality
 - 4. Trauma (excluding fistula)
 - 5. Infection
 - 6. Benign neoplasm
 - 7. Malignant neoplasm
 - 8. Retention cyst
 - 9. Fistula
 - 10. Intraepithelial neoplasia
 - 11. Atrophic vaginitis

- C. Diseases of Uterine Cervix
 - 2. Miscellaneous
 - 3. Congenital abnormality
 - 4. Trauma
 - 5. Infection
 - 6. Benign neoplasm including polyp
 - 7. Carcinoma of cervix
 - 8. Other malignant neoplasm
 - 9. Intraepithelial neoplasia

- D. Diseases of Uterine Body
 - 2. Miscellaneous
 - 3. Congenital abnormality
 - 4. Trauma including perforation of uterus
 - 5. Infection
 - 6. Fibromyoma
 - 7. Carcinoma of corpus uteri
 - 8. Other malignant neoplasm
 - 9. Myohyperplasia of uterus
 - 10. Endometrial polyp
 - 11. Adenomyosis
 - 12. Hyperplasia of endometrium

13. Atrophic endometritis

E. Diseases of Fallopian Tubes

2. Miscellaneous
3. Acute pelvic inflammatory disease (acute salpingitis, acute salpingo-oophoritis, pyosalpinx and tubo-ovarian abscess)
4. Chronic pelvic inflammatory disease (chronic salpingitis, chronic salpingo-oophoritis, hydrosalpinx and tubo-ovarian cyst)
5. Tuberculous salpingitis
6. Benign neoplasm including para-tubal and fimbrial cysts
7. Malignant neoplasm

F. Diseases of Ovary

2. Miscellaneous
3. Retention cysts, follicular / corpus luteal cyst
4. Endometriotic cyst
5. Benign ovarian tumour / cyst
6. Primary malignant neoplasm – epithelial
7. Primary malignant neoplasm – non-epithelial
8. Secondary malignant neoplasm
9. Borderline malignant neoplasm
10. Dermoid cyst
11. Polycystic ovarian disease / syndrome

G. Diseases of Broad Ligaments and Pelvic Peritoneum

2. Miscellaneous
3. Pelvic endometriosis, including utero-sacral endometriosis
4. Paraovarian cyst
5. Peritoneal carcinoma
6. Recto-vaginal endometriosis
7. Bowel endometriosis

H. Genital displacement / Urinary Disorders

2. Miscellaneous
3. Prolapse of uterus
4. Anterior vaginal wall prolapse (Cystocele, urethrocele, paravaginal defect)
5. Posterior vaginal wall prolapse (enterocele, rectocele perineal deficiency)
6. Vault prolapse
7. Genuine stress incontinence
8. Detrusor instability
9. Detrusor hyperreflexia
10. Sensory urgency
11. Voiding difficulty
12. Other urinary disorders

I. Disorders of Menstruation (*Causes should be coded as well if found*)

2. Miscellaneous
3. Primary amenorrhoea

4. Secondary amenorrhoea
 5. Dysfunctional uterine bleeding
 6. Postmenopausal bleeding
 7. Dysmenorrhoea
 8. Menorrhagia
- J. Disorders of Pregnancy & Reproduction
2. Miscellaneous
 3. Subfertility
 4. Vomiting in pregnancy
 5. Threatened miscarriage
 6. Spontaneous / Silent / Incomplete miscarriage
 7. Complete hydatidiform mole
 8. Partial hydatidiform mole
 9. Residual trophoblastic disease
 10. Metastatic malignant trophoblastic neoplasia, chorioepithelioma, placental site trophoblastic tumour
 11. Secondary postpartum haemorrhage
 12. Other postpartum complications
 13. Tubal ectopic pregnancy
 14. Conditions leading to termination of pregnancy – 1st trimester (≤ 12 weeks)
 15. Conditions leading to termination of pregnancy – 2nd trimester (> 12 weeks)
 16. Conditions leading to sterilization/tubal occlusion
 17. Pregnancy after sterilization/tubal occlusion
 18. Conditions leading to tubal reversal
 19. Failed/Incomplete miscarriage after medical abortion/evacuation
 20. Non-tubal ectopic pregnancy
 21. Ovarian hyperstimulation syndrome
- K. Disease Complications in Pregnancy
2. Benign neoplasm of genital tract
 3. Malignant neoplasm of genital tract
 4. Medical disease
 5. Surgical disease
 6. Non-specific abdominal pain complicating pregnancy
- L. Miscellaneous Gynaecological Conditions
2. Miscellaneous
 3. Retained IUCD
 4. Abdominal or pelvic pain of unknown cause
 5. Complication of previous treatment / procedure performed in the same unit (outpatient or inpatient)
 6. Complication of previous treatment / procedure performed outside the unit
 7. Translocated IUCD
- M. Miscellaneous Conditions
1. No disease identified

2. Miscellaneous
3. Diseases of breasts
4. Diseases of urinary tract
5. Diseases of gastrointestinal tract
6. Diseases of cardiovascular system
7. Diseases of respiratory system
8. Diseases of central nervous system
9. Diseases of endocrine
10. Diseases of blood
11. Diseases of skin / musculoskeletal system

III. Coding for operations / treatment

1. Coding for Major Abdominal Operations for "Benign and Pre-malignant Conditions" and that for "Malignant Conditions" are combined.
2. Laparoscopic and hysteroscopic procedures are separately coded.
3. All operative procedures should be coded e.g. salpingectomy after diagnostic laparoscopy should be coded as B33 and A13.
4. Medical treatment for ectopic pregnancy using methotrexate should be coded as K7. If subsequent surgery (e.g. laparoscopic salpingectomy) is also required, the exact procedure should also be quoted (K7 and B13).
5. Medical treatment for miscarriage using prostaglandins should be coded as K5. If subsequent evacuation of uterus is also required, the treatment should be quoted as K5 and I5.
6. Dilatation and Curettage (D&C) or obtaining endometrium with a curette should be quoted as I3. Any other form of endometrial biopsy using special designed device such as endometrial sampler or Vabra aspirator should be quoted as I10.
7. Salpingo-oophorectomy, oophorectomy or salpingectomy performed at the time of hysterectomy should be quoted separately.
8. Debulking operation (A24) is defined as removal of gross tumour from sites other than uterus, tubes and ovaries (i.e. beyond a hysterectomy and salpingo-oophorectomy). Removal of tumour bulk in POD in addition to a TAHBSO should be coded as A24, A3 & A12. Omentectomy (A27) for gross tumour in the omentum however should be coded as both B7 & A27.
9. For laparoscopic surgery for endometriosis, if the disease, including ovarian cyst wall, is cauterised with electrosurgery or vapourised with laser, it should be coded as laparoscopic ablation of endometriosis (B20). If the disease is excised, it should be coded as laparoscopic resection of endometriosis (B22) or laparoscopic ovarian cystectomy in case of endometriotic cyst (E14).
10. For laparoscopic hysterectomy, **TLH (B3a)** (Total laparoscopic hysterectomy) refers to entire operation performed laparoscopically, including suturing of the vaginal vault. **LAVH (B3b)** (Laparoscopic-assisted vaginal hysterectomy) refers to a combined laparoscopic and vaginal approach with division of uterine artery performed vaginally. **LHa (B3c)** (Laparoscopic hysterectomy) refers to a combined laparoscopic and vaginal approach with laparoscopic division of the uterine artery; the remainder of the procedure is completed vaginally.
11. Robotic assisted surgery is considered as laparoscopic surgery and should be

coded as B1 together with the exact procedure performed. For example, robotic assisted radical hysterectomy and pelvic lymph node dissection should be coded as B1, B6, B25.

12. If LNG-LUS is inserted for treatment of menorrhagia, adenomyosis or endometriosis, i.e, for non-contraceptive purpose, it should be coded as I12. However, if LNG-LUS is inserted for contraceptive purpose, it should be coded as I11.

Treatment

A. Major Abdominal Operations (Laparotomy)

2. Miscellaneous
3. Total hysterectomy
4. Subtotal hysterectomy
5. Extended hysterectomy
6. Radical hysterectomy
7. Myomectomy
8. Adenomyomectomy
9. Trachelectomy
10. Ovarian cystectomy / excision of ovarian lesions
11. Oophorectomy
12. Salpingo-oophorectomy
13. Salpingectomy
14. Salpingotomy / Salpingostomy
15. Neo-salpingostomy
16. Tubal re-anastomosis
17. Excision of para-ovarian / paratubal / fimbrial cysts
18. Adhesiolysis
19. Drainage of pelvic abscess
20. Ablation of endometriosis
21. Resection of pelvic endometriosis
22. Resection of bowel endometriosis
23. Pelvic exenteration
24. Debulking operation
25. Pelvic lymphadenectomy / lymph node sampling
26. Para-aortic lymphadenectomy / lymph node sampling
27. Omentectomy
28. Surgery for genital prolapse
29. Surgery for stress incontinence
30. Repair of urinary fistulae
31. Ureteric repair / reimplantation
32. Bowel resection /anastomosis / stoma
33. Laparotomy alone +/- biopsy

B. Laparoscopic Operations (including Robotic assisted)

1. Robotic surgery (the exact procedures need to be coded as well)
2. Miscellaneous

3. Total hysterectomy
 - a. TLH (Total laparoscopic hysterectomy)
 - b. LAVH (Laparoscopic-assisted vaginal hysterectomy)
 - c. LHa (Laparoscopic hysterectomy)
 4. Subtotal hysterectomy
 5. Extended hysterectomy
 6. Radical hysterectomy
 7. Myomectomy
 8. Adenomyomectomy
 9. Trachelectomy
 10. Ovarian cystectomy / excision of ovarian lesions
 11. Oophorectomy
 12. Salpingo-oophorectomy
 13. Salpingectomy
 14. Salpingotomy / Salpingostomy
 15. Neo-salpingostomy
 16. Tubal re-anastomosis
 17. Excision of para-ovarian / paratubal / fimbrial cysts
 18. Adhesiolysis
 19. Drainage of pelvic abscess
 20. Ablation of endometriosis
 21. Resection of pelvic endometriosis
 22. Resection of bowel endometriosis
 23. Pelvic exenteration
 24. Debulking operation
 25. Pelvic lymphadenectomy / lymph node sampling
 26. Para-aortic lymphadenectomy / lymph node sampling
 27. Omentectomy
 28. Surgery for genital prolapse
 29. Surgery for stress incontinence
 30. Repair of urinary fistulae
 31. Ureteric repair / reimplantation
 32. Bowel resection /anastomosis / stoma
 33. Diagnostic laparoscopy +/- biopsy +/- chromotubation
 34. Laparoscopic ovarian drilling
 35. Laparoscopic myolysis
 36. Laparoscopic tubal occlusion/sterilization
- C. Major Vaginal Operations
2. Miscellaneous
 3. Surgery for urinary incontinence
 4. Vaginal hysterectomy
 5. Repair of prolapse without using mesh
 6. Repair of prolapse using mesh
 7. Repair of vault prolapse
 8. Vaginal myomectomy
 9. Vaginectomy

10. Vaginal stripping
 11. Vaginal reconstruction
 12. Repair of urinary fistulae
 13. TVT-O/TVT/TOT
- D. Major Vulval Operations
2. Miscellaneous
 3. Radical vulvectomy
 4. Simple vulvectomy
 5. Wide local excision
 6. Groin node dissection
- E. Hysteroscopic Procedures
2. Miscellaneous
 3. Diagnostic hysteroscopy
 4. Proximal tubal cannulation
 5. Endometrial resection / ablation
 6. Hysteroscopic polypectomy
 7. Hysteroscopic myomectomy
 8. Hysteroscopic division of uterine septum
 9. Hysteroscopic division of adhesion
- F. Colposcopy Related Procedures
2. Miscellaneous (including cervical biopsy)
 3. Cervical cautery / cryotherapy / cold coagulation
 4. Laser vaporization of cervical / vaginal / vulval lesions
 5. Laser cone
 6. Loop electro-surgical excision procedure (LEEP)
 7. Cone biopsy
- G. Assisted Reproduction Procedures
2. Miscellaneous
 3. Ultrasound guided oocyte retrieval
 4. Laparoscopic oocyte retrieval
 5. Gamete intrafallopian transfer
 6. Pronuclear stage tubal transfer
 7. Fresh embryo transfer
 8. Frozen-thawed embryo transfer
 9. Controlled ovarian hyperstimulation
 10. Intrauterine insemination
 11. Intra-cytoplasmic sperm injection
- H. Minor Abdominal Operation
2. Miscellaneous
 3. Tubal ligation /occlusion
 4. Resuturing of abdominal wound
 5. Removal of abdominal/pelvic translocated IUCD

- I. Other Minor Operations
 - 2. Miscellaneous
 - 3. Diagnostic curettage (including avulsion of polyp)
 - 4. Therapeutic abortions (suction evacuation)
 - 5. Evacuation of retained products of conception (including suction evacuation of silent / incomplete miscarriage, post-medical evacuation)
 - 6. Marsupialization
 - 7. Cervical cerclage
 - 8. Other minor vulval operations (including evacuation of vulval haematoma, vulval biopsy)
 - 9. E.U.A.
 - 10. Endometrial biopsy
 - 11. Insertion / Removal of IUCD
 - 12. Insertion of LNG-IUS for non-contraceptive purpose

- J. Radiotherapy
 - 2. Miscellaneous
 - 3. Intracavitary radium / cesium
 - 4. External irradiation

- K. Other Forms of Treatment
 - 2. Miscellaneous
 - 3. Observation and investigation
 - 4. Antibiotic as primary treatment
 - 5. Prostaglandins
 - 6. Hormones (O.C. progestogens, danazol, GnRHa)
 - 7. Chemotherapy
 - 8. Other medication
 - 9. Pre-anaesthetic assessment
 - 10. Uterine artery embolization
 - 11. High intensity / focused ultrasound therapy

