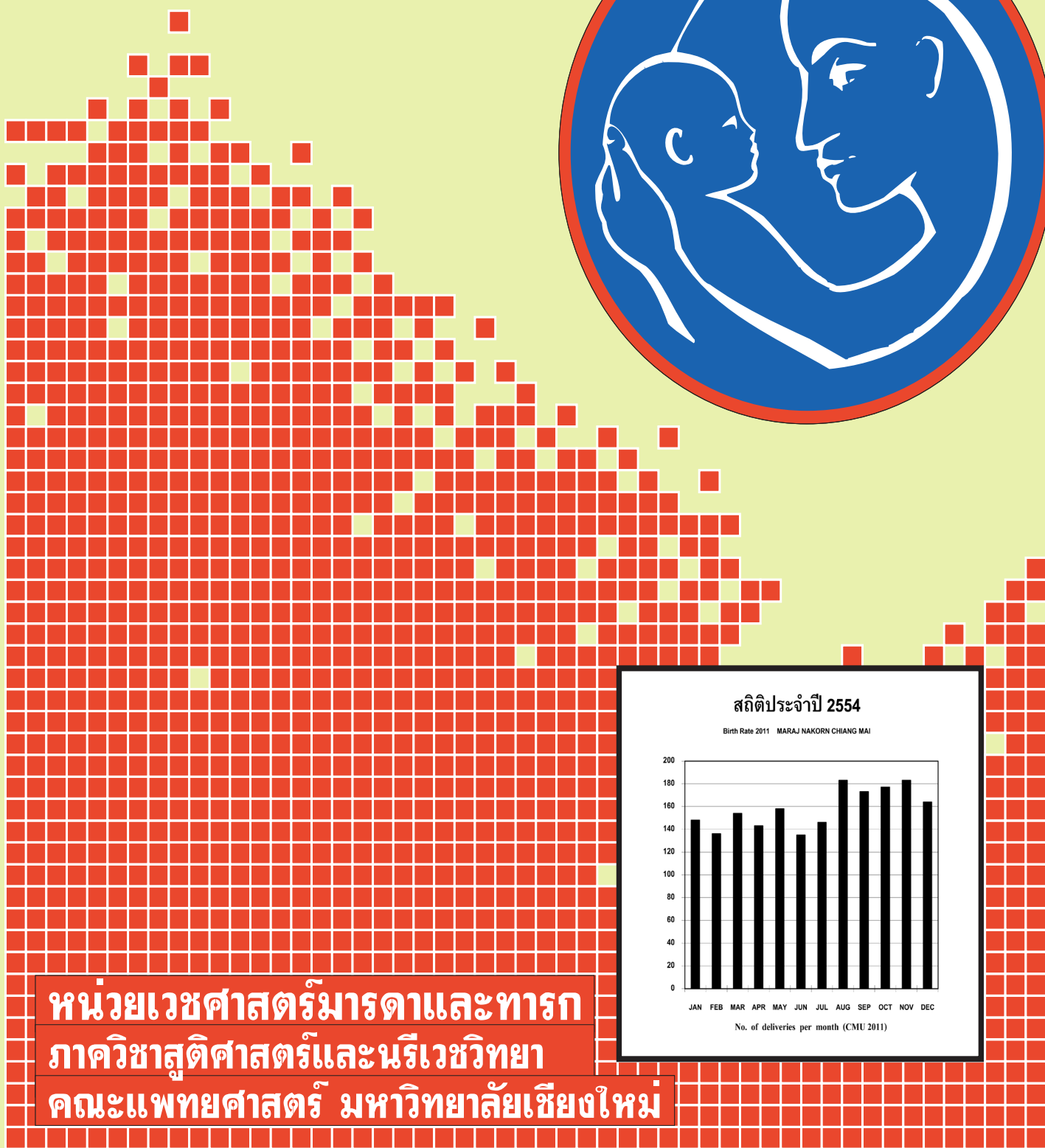
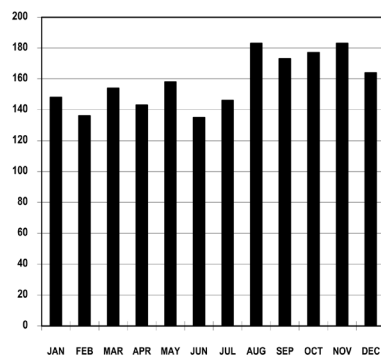


MATERNAL-FETAL MEDICINE 2011



สถิติประจำปี 2554

Birth Rate 2011 MARAJ NAKORN CHIANG MAI



No. of deliveries per month (CMU 2011)

หน่วยเวชศาสตร์มารดาและทารก

ภาควิชาสูติศาสตร์และนรีเวชวิทยา

คณะแพทยศาสตร์ มหาวิทยาลัยเชียงใหม่

ANNUAL REPORT 2011
MATERNAL-FETAL MEDICINE
DEPARTMENT OF OBSTETRICS AND GYNECOLOGY
FACULTY OF MEDICINE, CHIANG MAI UNIVERSITY
CHIANG MAI, THAILAND

MATERNAL-FETAL MEDICINE 2011

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อนุสาขาเวชศาสตร์มารดาและทารก

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รองศาสตราจารย์ นายแพทย์ ชัยรัตน์ คุณาวิภทกุล
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อัจฉราวรรณ แยมโพธิ์ใช้
อภิรดี ตรรกไพจิตร
อุบล เลี้ยวปรีชา

PREFACE

Obstetrics and Gynecology department divides into three long standing specialties: maternal fetal medicine, reproductive medicine and gynecologic oncology, and one new subspecialty which is urogynecology unit serve for three major missions which are teaching, research and service. Quality information is needs for managing to reach our mission which aims to be excellence in each field. Each subspecialty worked hard for improving their mission and has summarized the service part into the annual report. These reports are also publishing the full report on our departmental website. Please visit: <http://www.med.cmu.ac.th/dept/obgyn/>

This annual report 2011 on maternal fetal medicine has been successfully published with great contribution of Assoc. Professor Pannee and her colleagues in MFM division. It reflects our work in obstetric care and can be used for benchmarking especially for the one who involve in this field. I would like to make an appreciation and expression of thanks to my colleagues for their dedication to our department.

Finally, I am grateful for the extraordinary generosity of many individuals of our staff on their hard working. These support and gratefully acknowledge Associate Professor Pannee, chief of the MFM division and Professor Theera for their encouragement finishing this report.

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PREFACE

Thank you for taking the time to review the 2011 annual report of Maternal Fetal Medicine, the Department of Obstetrics and Gynecology at Chiang Mai University.

Our research program in Maternal-Fetal Medicine is robust and continues to gain the unit recognition at the national and international level with grant funding from Thailand Research Fund and National Research University. Our educational program continues to thrive as evidenced by the large number of residency and fellow from other institutions who chose our Division as their elective training period throughout the year. Our Division continues to serve as a resource for high risk mothers for the Northern region especially in prenatal diagnosis consultation.

Though almost information may not be markedly different from our previous years, several interesting changes should be noted and the reasons are yet to find out. For example, the prevalence of HIV in pregnancy has still been high as seen in 2010 (2.3%). This figure may signify something? Besides, in 2011 the number of deliveries among private practice in the Department has dramatically decreased in our hospital. Why?

Finally, I would like to be grateful for all our active and dedicated staff members who have contributed to this report. I hope that this annual report will serve as the best evidence for research and education for our next generations.

*Panee Sirivatanapa, M.D.
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Division of Maternal-fetal Medicine
Department of Obstetrics and Gynecology,
Faculty of Medicine, CMU. Chiang Mai, Thailand*



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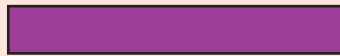
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ANNUAL REPORT



2011

MATERNAL-FETAL MEDICINE

Presentation : March 2012

DIVISION OF MATERNAL-FETAL MEDICINE

DEPARTMENT OF OBSTETRICS AND GYNECOLOGY

FACULTY OF MEDICINE, CHIANG MAI UNIVERSITY

CHIANG MAI, THAILAND

DATA SOURCE

Section I Obstetric Mortality Patient Record Charts

Section II General Obstetrics Delivery Records

Section III High-risk Pregnancies Patient Record Charts

Section IV Perinatal Investigations Statistics of the Division

Section I

OBSTETRIC MORTALITY

STILLBIRTH

Stillbirth 2011: For gestational age ≥ 22 weeks
: 54 cases of total birth = 1900 cases)

■ *Gestational age between 22-27 weeks 42 cases (77.77 %)*

	CMU	Referred	Total
Low risk	-	3	3
High risk	14	25	39
Autopsy	4	14	28

Causes of death

Causes of death	CMU	Referred	Total
1. Normally formed macerated stillbirth	1	1	2
2. Congenital malformations	6	11	17
3. Condition association with immaturity	3	4	7
4. Asphyxia developed in labor	1	-	1
5. Other specific conditions	1	-	1
6. therapeutic termination related to PND	2	12	14

Stillbirth 2011: For gestational age ≥ 22 weeks
: 54 cases of total birth = 1900 cases)

■ *Gestational age between ≥ 28 weeks 12 cases (22.22 %)*

	CMU	Referred	Total
Low risk	-	-	-
High risk	-	12	12
Autopsy	-	5	5

Causes of death

Causes of death	CMU	Referred	Total
1. Normally formed macerated stillbirth	0	1	1
2. Congenital malformations	-	8	8
3. Condition association with immaturity	-	3	3
4. Asphyxia developed in labor	-	-	-
5. Other specific conditions	-	-	-
6. therapeutic termination related to PND	-	-	-

Stillbirth rate :

Stillbirth rate = 6.31 per 1000 total births

(by old WHO definition: ≥ 28 weeks or birth weight > 1000 grams)

Stillbirth rate = 28.42 per 1000 total births

(by new WHO definition : ≥ 22 weeks or birth weight > 500 grams)

Stillbirth rate = 21.05 per 1000 total births

(by new WHO definition : ≥ 22 weeks' gestation or birth weight > 500 grams, not included therapeutic termination due to fetal malformations)

NEONATAL DEATH

Neonatal death 2011 :

16 cases (GA > 22 weeks) of total 1900 live births

- *Gestational age between 22-27 weeks 4 cases (25.0%)
(Total livebirth 1829 cases)*

	CMU	Referred	Total
Low risk	0	0	0
High risk	4	3	7
Autopsy	2	2	4

Causes of death

Causes of death	CMU	Referred	Total
1. Normally formed macerated stillbirth	-	-	-
2. Congenital malformations	-	1	1
3. Condition association with immaturity	1	-	1
4. Asphyxia developed in labor	1	-	1
5. Other specific conditions	-	1	1
6. therapeutic termination related to PND	-	-	-

Neonatal death 2011 :

16 cases (GA > 22 weeks) of total 1900 live births

- *Gestational age between ≥ 28 weeks 12 cases (75.0 %)*
(Total livebirth 2016 cases)

	CMU	Referred	Total
Low risk	1	0	1
High risk	3	8	11
Autopsy	2	4	6

Causes of death

Causes of death	CMU	Referred	Total
1. Normally formed macerated stillbirth	-	-	-
2. Congenital malformations	1	5	6
3. Condition association with immaturity	-	-	-
4. Asphyxia developed in labor	1	-	1
5. Other specific conditions	2	3	5
6. therapeutic termination related to PND	-	-	-

Early neonatal death rate 6.56 per 1,000 live births

(up to 28 week's gestation or 1000 grams and died within first 7 days of life)

Early neonatal death rate 8.74 per 1,000 live births

(≥ 22 week's gestation or 500 grams and died within first 7 days of life)

The most common cause of perinatal death was related to congenital anomalies referred for diagnosis from regional areas and terminated at Maharaj Nakorn Chiang Mai Hospital

PERINATAL DEATH

Perinatal Mortality (including the referral cases)

- Gestational age ≥ 28 weeks (stillbirths + early neonatal death)
perinatal death rate = 12.63 per 1000 total births
- Gestational age ≥ 22 weeks (stillbirths + neonatal death)
perinatal death rate = 36.84 per 1000 total births

The most common related causes were fetal anomalies and immaturity (several cases associated with self attempt termination)

MATERNAL DEATH

Total (referred cases) **1** **case**

Maternal mortality rate 0.54 per 1000 livebirths

Causes of maternal death: Maternal Japanese encephalitis : 1 case

Summary

DATA	2011
Total birth (neonates)	1930
Stillbirth	54
22-27 weeks	42
≥ 28 weeks	12
Stillbirth rate/1000 births	
> 28 weeks / birthweight >1,000 gm	6.31
> 22 weeks / birthweight >500 gm	21.05
Early neonatal death	
• Early neonatal death rate / 1000 live birth (≥ 28 weeks)	6.56
• Early neonatal death rate / 1000 live birth (≥ 22 weeks)	8.74

Section II

GENERAL OBSTETRICS

TABLE 1 Distribution of Singleton & Multifetal Pregnancies

Type of pregnancy	Number	Percent
Singleton	1862	98.0
Twins	36	1.9
Triplet	2	.1
Total	1900	100.0

TABLE 2 Categories of the Pregnant Women

	2010		2011	
	Number	Percent	Number	Percent
General Cases	1812	86.7	1755	92.4
Private Cases	277	13.3	145	7.6
Total	2089	100.0	1900	100.0

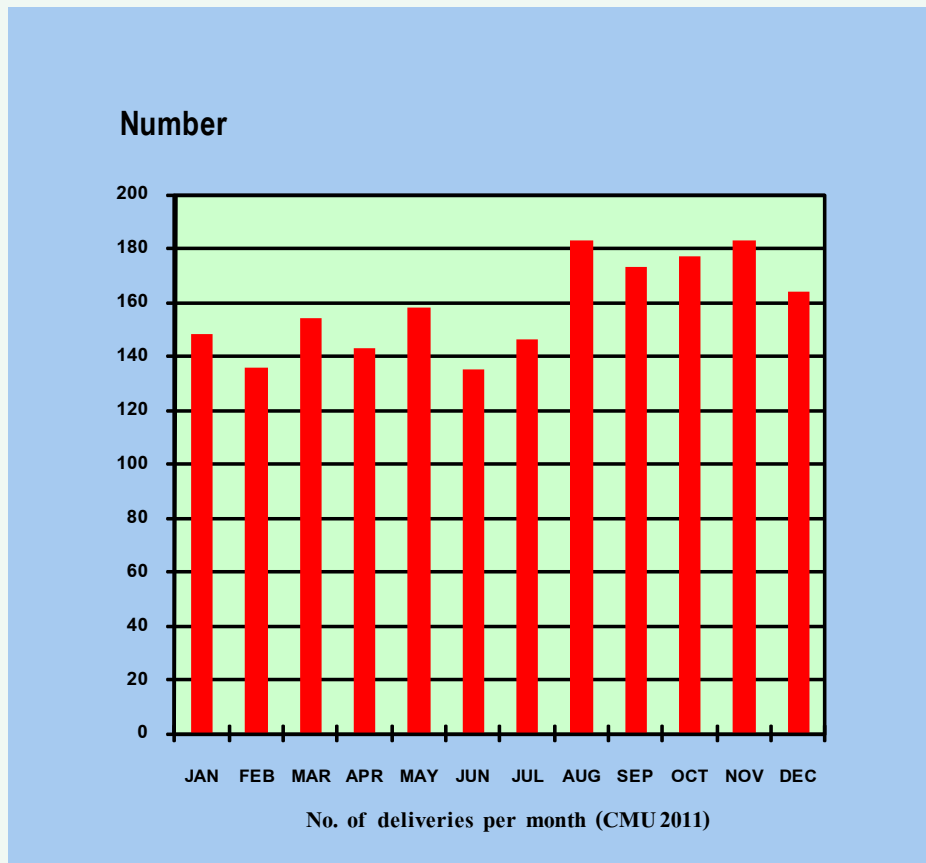
TABLE 3 Categories of the Pregnant Women

	Number	Percent
ANC at Maharaj Nakorn Chiang Mai Hospital	1213	63.8
Private Clinic	145	7.6
ANC at Other Hospitals	479	25.2
No ANC	56	2.9
Total	1893	99.6

TABLE 4 Number and Percentage of Deliveries per month

Month	Number (Mothers)	Percent
January	148	7.79
February	136	7.16
March	154	8.11
April	143	7.53
May	158	8.32
June	135	7.11
July	146	7.68
August	183	9.63
September	173	9.11
October	177	9.32
November	183	9.63
December	164	8.63
Total	1900	100.00

FIGURE 1 Histogram : Number of Deliveries from January to December 2011



Total deliveries in 2004 = 2654 cases

Total deliveries in 2005 = 2420 cases

Total deliveries in 2006 = 2013 cases

Total deliveries in 2007 = 2212 cases

Total deliveries in 2008 = 2144 cases

Total deliveries in 2009 = 2222 cases

Total deliveries in 2010 = 2089 cases

Total deliveries in 2011 = 1900 cases

TABLE 5 Number and percentage of parturients by age

Age	Number	Percent	Age	Number	Percent
13	1	0.1	30	131	6.9
14	3	0.2	31	92	4.8
15	11	0.6	32	96	5.1
16	13	0.7	33	79	4.2
17	29	1.5	34	64	3.4
18	43	2.3	35	63	3.3
19	49	2.6	36	56	2.9
20	64	3.4	37	50	2.6
21	78	4.1	38	33	1.7
22	68	3.6	39	28	1.5
23	78	4.1	40	17	0.9
24	99	5.2	41	15	0.8
25	118	6.2	42	12	0.6
26	117	6.2	43	13	0.7
27	125	6.6	44	3	0.2
28	122	6.4	45	4	0.2
29	122	6.4	47	2	0.1
Total				1898	99.9

Average age (Mean±Standard deviation) 28.11±6.1 years

TABLE 6 Number and percentage of parturients by age group

Age Group	Number	Percent
10-14	4	0.2
15-19	145	7.6
20-24	387	20.4
25-29	604	31.8
30-34	462	24.3
35-39	230	12.1
40-44	60	3.2
≥ 45	6	0.3
Total	1898	100

Summary : Age of parturients

- Adolescent Pregnancies (11-19 years) 119 (7.9 %)
 - Early Adolescent Pregnancies (≤ 16 years) 28 (1.5 %)
 - Late Adolescent Pregnancies (17-19 years) 121 (6.4 %)
- Adult Pregnancies (20-34 years) 1453 (76.6%)
- Elderly Pregnancies (≥ 35 years) 296 (15.6 %)

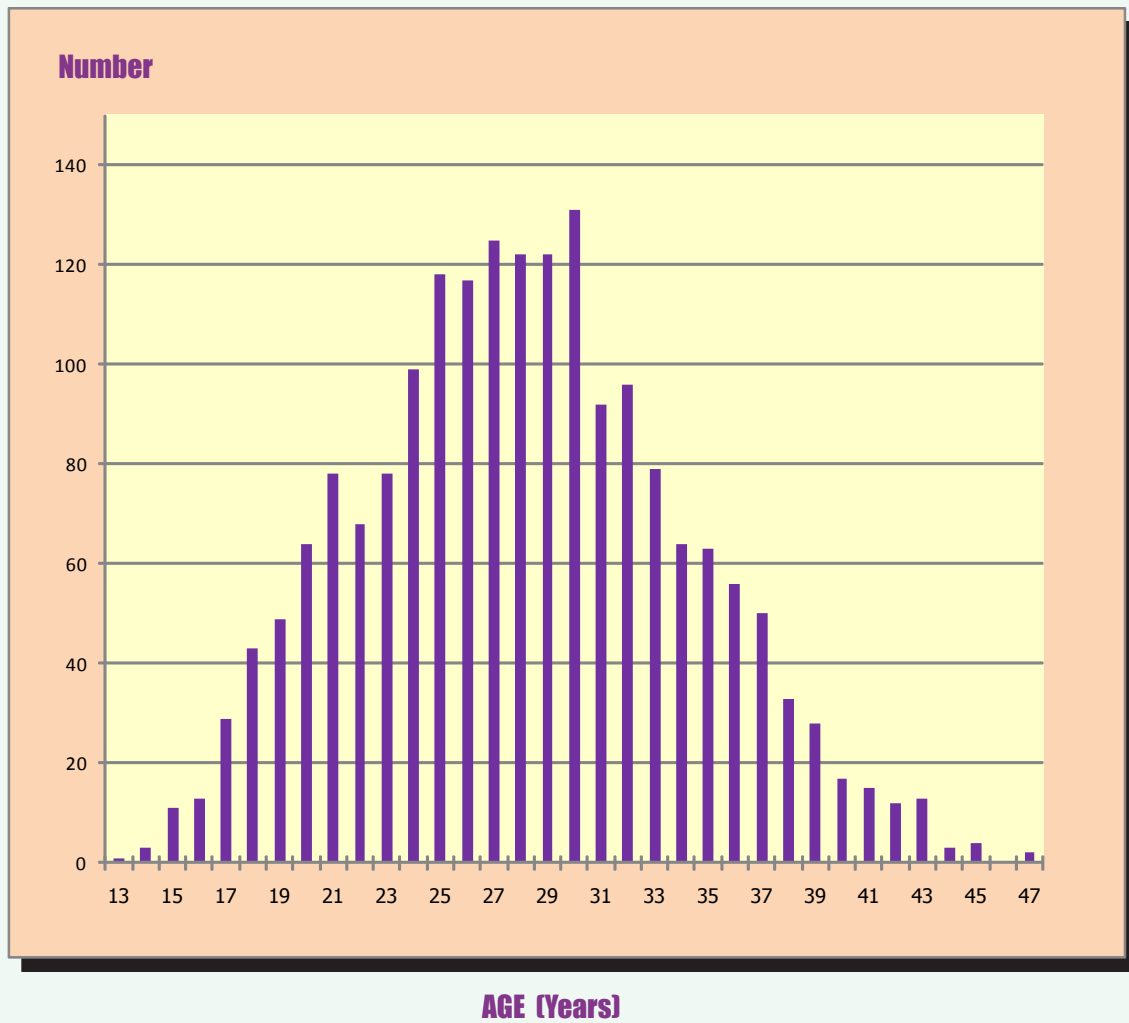
FIGURE 2 Histogram : Number of Parturients by Age

TABLE 7 Parity of parturients

Parity	Number	Percent
0	1018	53.6
1	706	37.2
2	144	7.6
3	25	1.3
4	4	0.2
5	2	0.1
6	1	0.1
Total	1900	100

Parity = Number of pregnancies reaching the stage of fetal viability (more than 20 weeks) in this report

Nulliparous 53.6 %

Multiparous 46.4 %

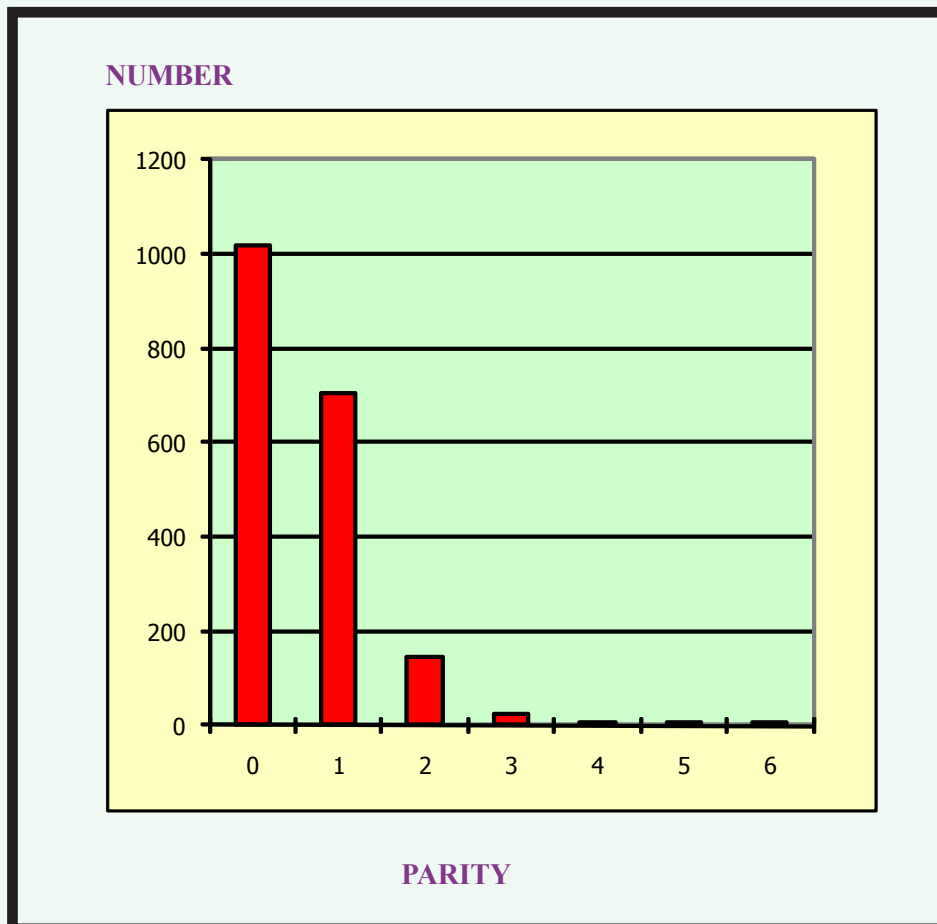
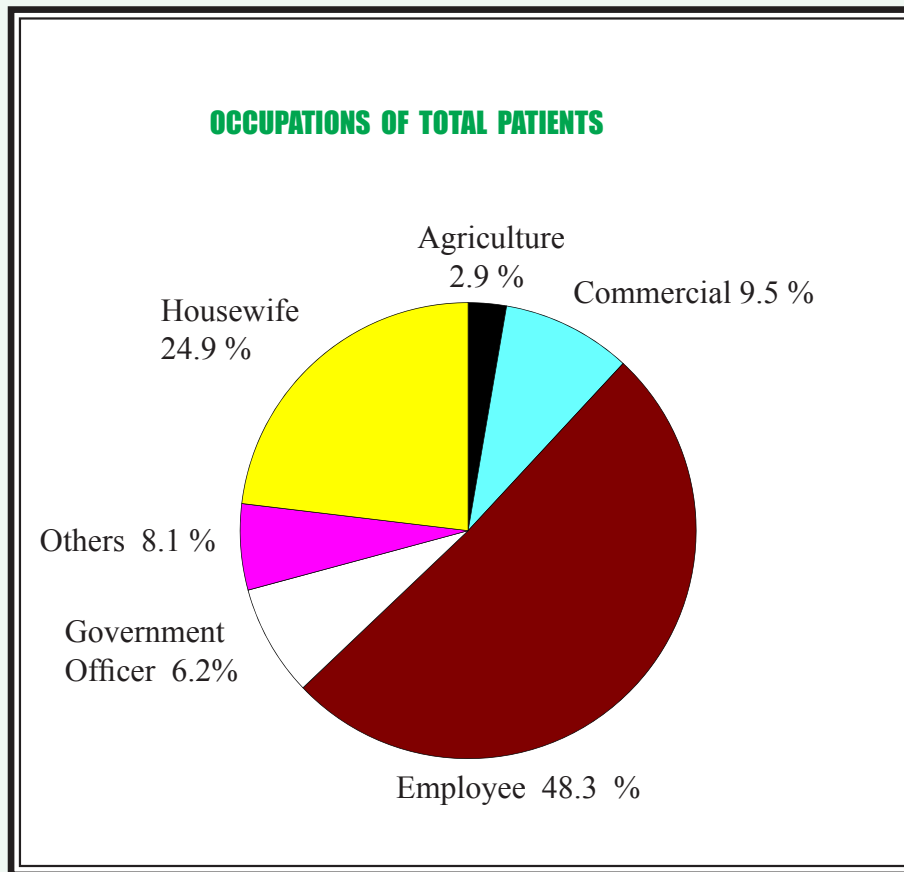
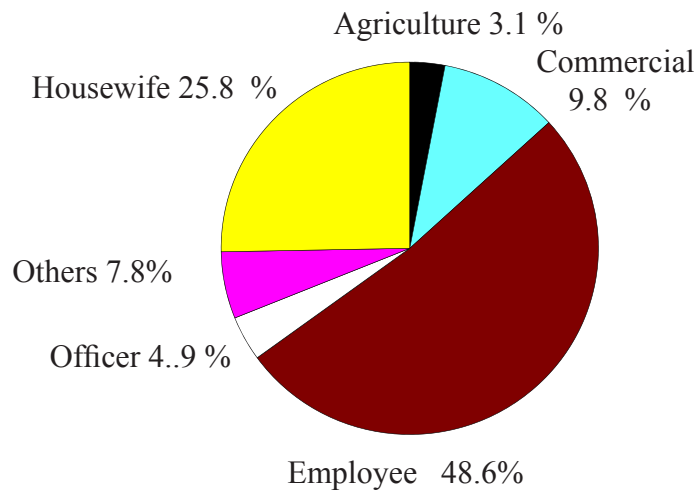
FIGURE 3 Histogram : Number of parturients by parity

TABLE 8 Distribution of the occupations of the parturients

Occupations	Total		General		Private	
	Number	Percent	Number	Percent	Number	Percent
Agriculture	55	2.9	54	3.1	1	0.7
Commercial	178	9.5	169	9.8	9	6.4
Employee	900	48.3	838	48.6	62	44.0
Government Officer	115	6.2	84	4.9	31	22.0
Private Business	51	2.7	48	2.8	3	2.1
Housewife	464	24.9	444	25.8	20	14.2
Student	64	3.4	64	3.7	-	-
State Enterprise	6	0.3	5	0.3	1	0.7
Others	32	1.7	18	1.0	14	9.9
Total	1865	100.0	1724	100.0	141	100.0

FIGURE 4 Pie : Distribution of patient's occupations

OCCUPATIONS OF THE GENERAL PATIENTS



OCCUPATIONS OF THE PRIVATE PATIENTS

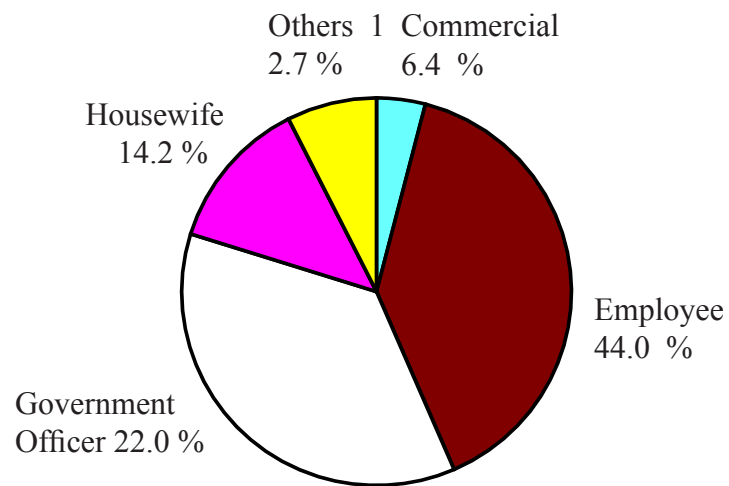
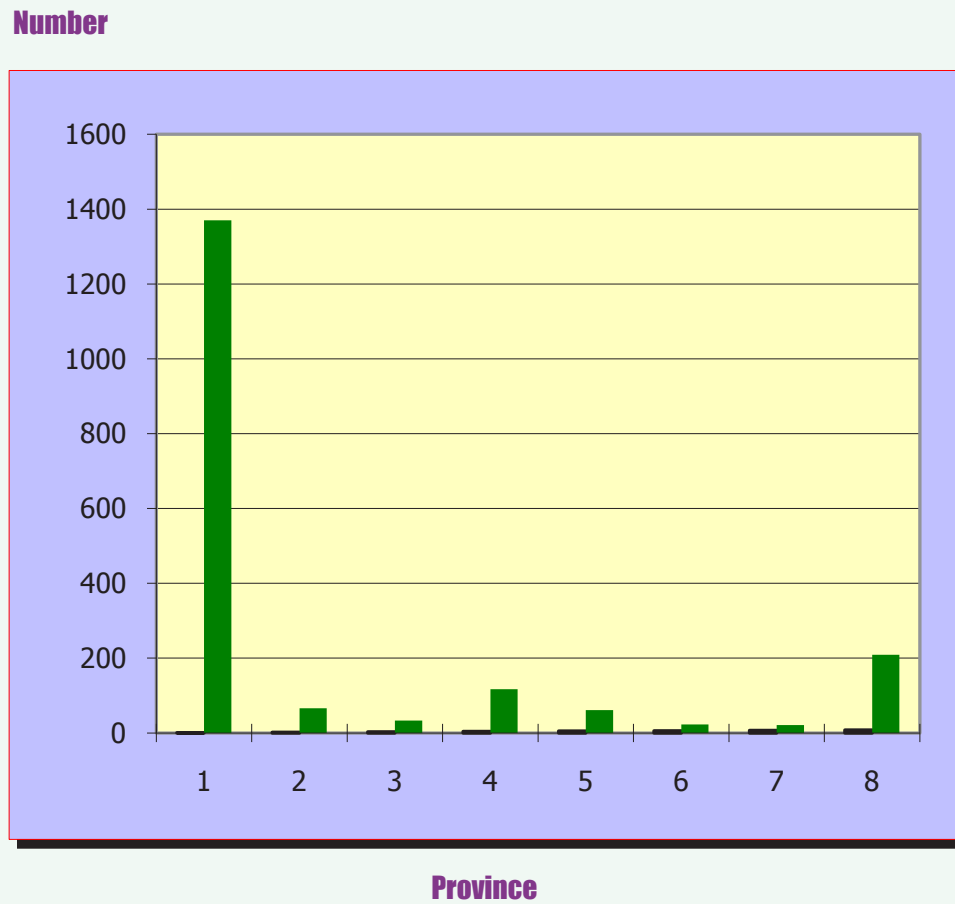


TABLE 9 Distributions of the residence (province)
of the parturients

Province	Number	Percent
Chiang Mai (เชียงใหม่)	1370	72.1
Chiang Rai (เชียงราย)	66	3.5
Lampang (ลำปาง)	33	1.7
Lamphun (ลำพูน)	117	6.2
Maehongson (แม่ฮ่องสอน)	61	3.2
Payao (พะเยา)	23	1.2
Prae (แพร่)	21	1.1
Others (อื่นๆ)	209	11.0
Total	1900	100

FIGURE 5 Histogram : Distribution of parturients by province of the parturients

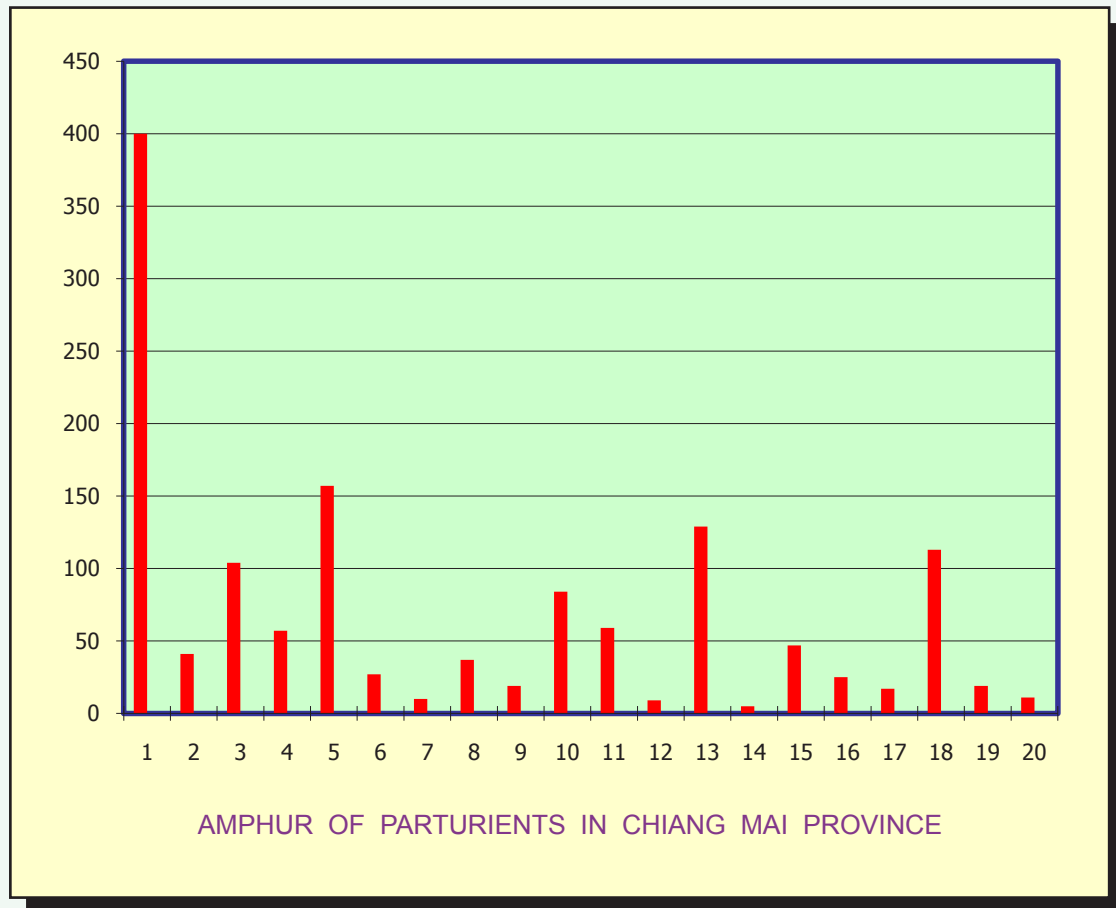


- | | |
|-----------------------------|---------------------------|
| 1. Chiang Mai (เชียงใหม่) | 2. Chiang Rai (เชียงใหม่) |
| 3. Lampang (ลำปาง) | 4. Lamphun (ลำพูน) |
| 5. Maehongsorn (แม่ฮ่องสอน) | 6. Payao (พะเยา) |
| 7. Prae (แพร่) | 8. Others (อื่นๆ) |

TABLE 10 Distributions of Amphur of the parturients in Chiang Mai province

	Amphur	Number	Percent
1.	Meung (เมือง)	400	29.2
2.	Maerim (แมริม)	41	3.0
3.	Doisaked (ดอยสะเก็ด)	104	7.6
4.	Sanpatong (สันป่าตอง)	57	4.2
5.	Hangdong (หางดง)	157	11.5
6.	Jomtong (จอมทอง)	27	2.0
7.	Mae-ai (แม่อาย)	10	0.7
8.	Prao (พร้าว)	37	2.7
9.	Hod (ฮอด)	19	1.4
10.	Sarapee (สารภี)	84	6.1
11.	Maetang (แม่แตง)	59	4.3
12.	Omkoii (อมก๋อย)	9	0.7
13.	Sankampang (สันกำแพง)	129	9.4
14.	Samoeng (สะเมิง)	5	0.4
15.	Chiangdao (เชียงดาว)	47	3.4
16.	Phang (ฝาง)	25	1.8
17.	Doitao (ดอยเต่า)	17	1.2
18.	Santrai (สันทราย)	113	8.2
19.	Maejam (แม่แจ่ม)	19	1.4
20.	Chaiprakarn (ไชยปราการ)	11	0.8
	Total	1370	100.0

FIGURE 6 Histogram: Number of parturients in each Amphur of Chiang Mai



- | | | | |
|----------------|-------------|---------------|-----------------|
| 1. Meung | 2. Maerim | 3. Doisaked | 4. Sanpatong |
| 5. Hangdong | 6. Jomtong | 7. Mae-ai | 8. Prao |
| 9. Hod | 10. Sarapee | 11. Maetang | 12. Omkoi |
| 13. Sankampang | 14. Samoeng | 15. Chiangdao | 16. Phang |
| 17. Doitao | 18. Santrai | 19. Maejam | 20. Chaiprakarn |

TABLE 11 Number and percentage of parturients by gestational age in singleton pregnancies

GA (Weeks)	Number	Percent	GA (Weeks)	Number	Percent
< 20	30	1.6	31	23	1.2
20	11	0.6	32	23	1.2
21	12	0.6	33	21	1.1
22	20	1.1	34	44	2.3
23	13	0.7	35	52	2.7
24	6	0.3	36	97	5.1
25	3	0.2	37	256	13.5
26	12	0.6	38	417	21.9
27	4	0.2	39	424	22.3
28	8	0.4	40	298	15.7
29	14	0.7	41	92	4.8
30	8	0.4	42	12	0.6
Total				1900	100

Average of Gestational Age 37.28+3.8 Weeks

FIGURE 7 Histogram : Number of parturients at various gestational age in singleton pregnancies

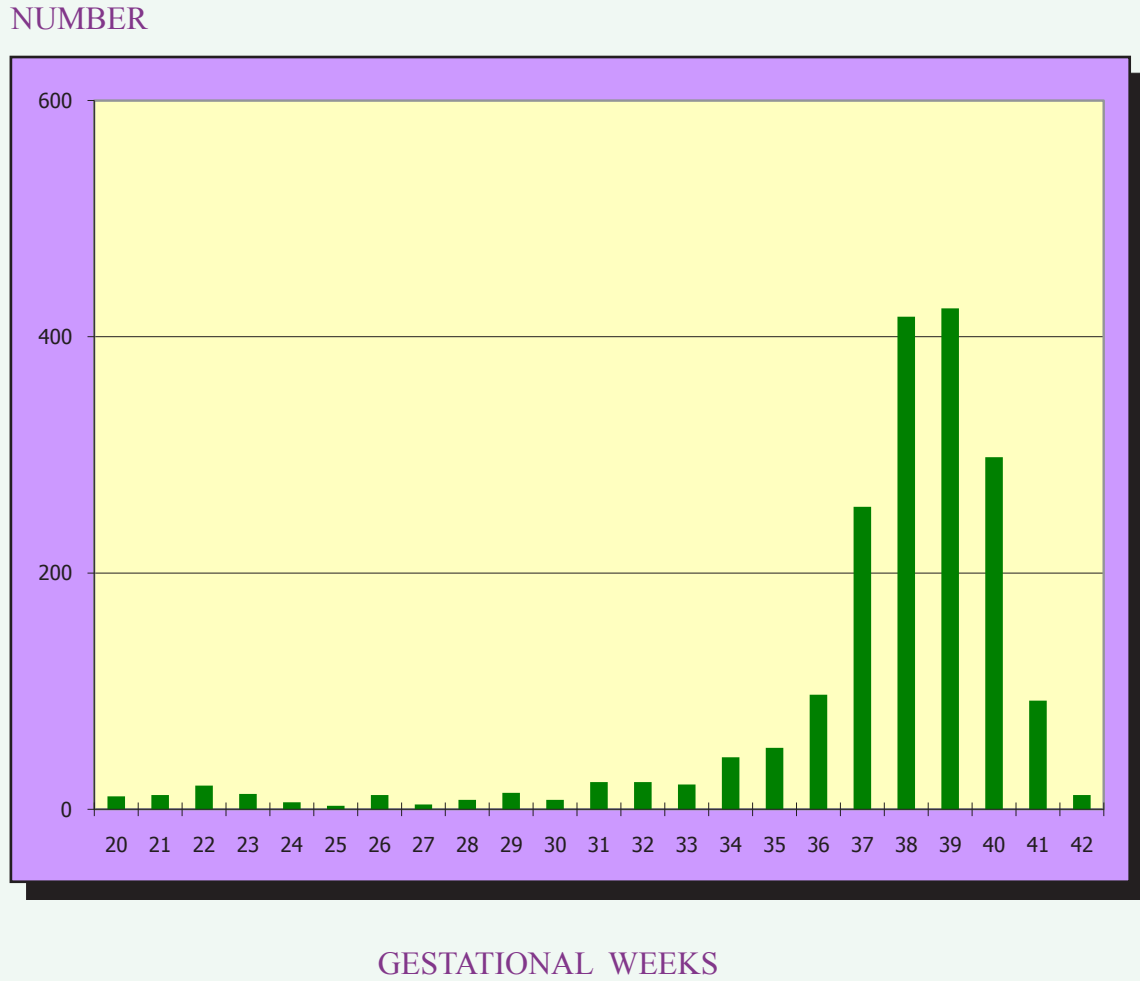


TABLE 12 Number and percentage of parturients by gestational age group in singleton pregnancies.

Gestational Age Group	Number	Percent
Abortion (< 20 weeks)	30	1.6
Immature (20-27 weeks)	81	4.3
Premature (28-36 weeks)	290	15.3
Term (37-41 weeks)	1487	78.3
Postterm (42 weeks or more)	12	0.6
Total	1900	100

Premature delivery included the referred cases

Immature cases included termination of pregnancies due to various indications especially serious anomalies.

TABLE 13 Number and percentage of parturients by gestational age in twin pregnancies

GA (Week)	Number (Twin sets)	Percent
≤ 20	4	11.1
22	1	2.8
23	1	2.8
28	1	2.8
29	2	5.6
31	1	2.8
32	4	11.1
33	1	2.8
34	1	2.8
35	6	16.7
36	5	13.9
37	3	8.3
38	3	8.3
39	3	8.3
Total	36	100

Average of Gestational Age 33.21±5.3 Weeks

FIGURE 8 Histogram : Number of parturients at various gestational week (in twin pregnancies)

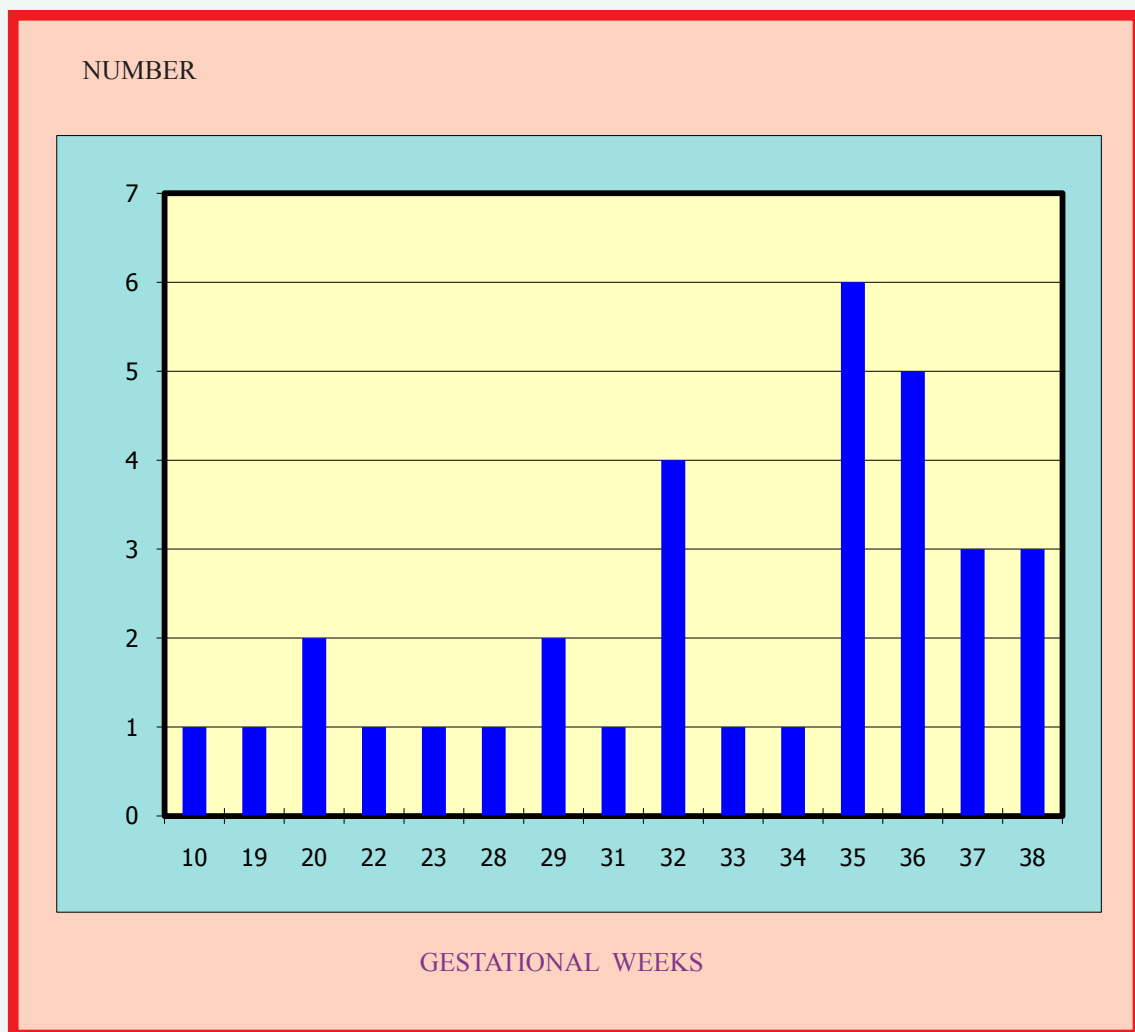


TABLE 14 Number and percentage of parturients by gestational age group in twin pregnancies.

Gestational Age Group	Number	Percent
Abort	2	5.6
Immature	4	11.1
Preterm	21	58.3
Term	9	25.0
Total	36	100

TABLE 15 Number and percentage of antenatal care attendance :
General patients (not included the patients attending at
other hospitals)

Number of ANC	Number of Parturients	Percent
0	56	3.1
1	72	3.9
2	71	3.9
3	81	4.4
4	77	4.2
5	105	5.7
6	104	5.7
7	109	5.9
8	136	7.4
9	197	10.7
10	202	11.0
11	199	10.8
12	190	10.3
13	105	5.7
14	66	3.6
15	36	2.0
16	19	1.0
17	5	0.3
18	3	0.2
19	3	0.2
Total	1836	100.0

Attending ANC at other hospitals 25.2% of total parturients

FIGURE 9 Histogram : Number of ANC attendance of general patients (excluding private patients and ANC at other hospitals)

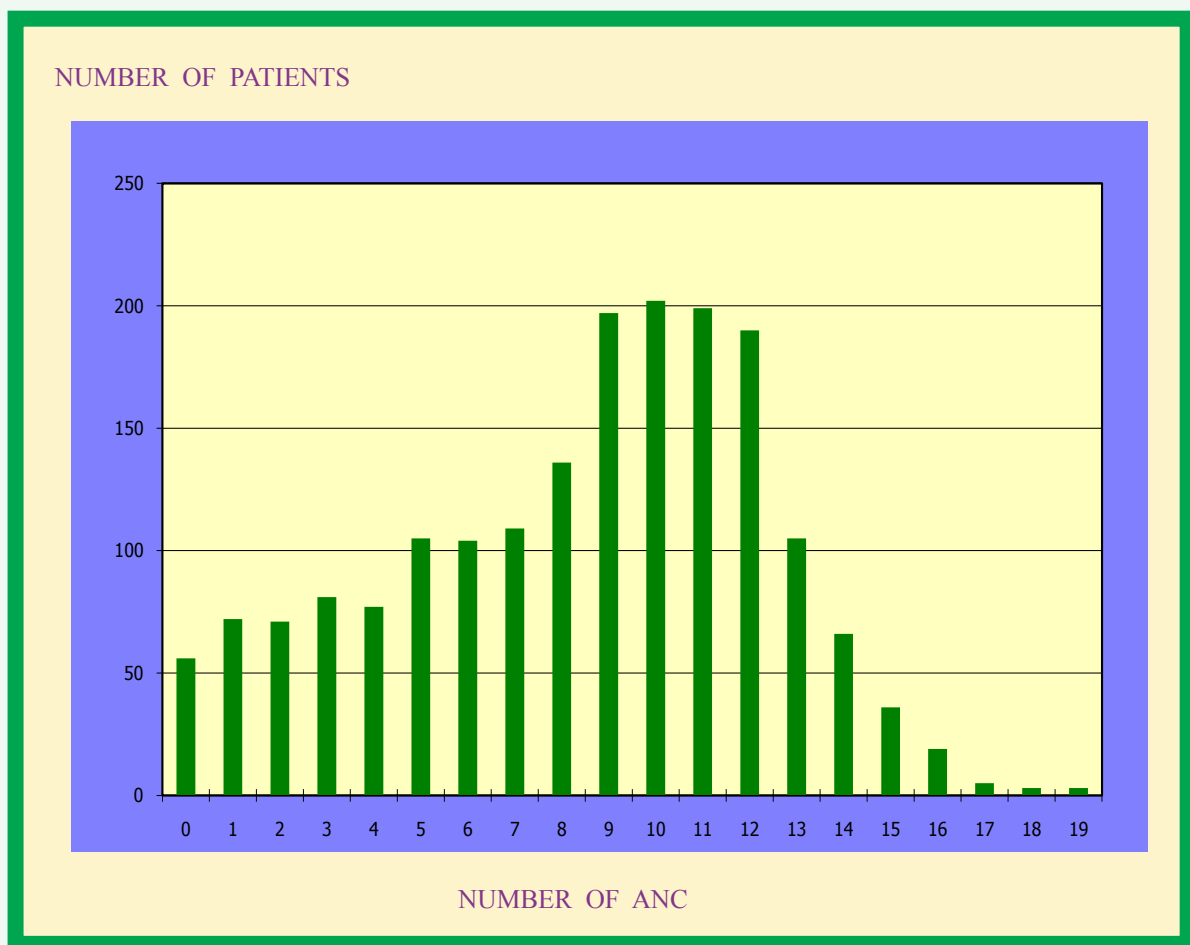


TABLE 16 Number of antenatal care attendance : General patients
(not include the patients attending ANC at other hospitals)

Number of ANC	Number of Parturients	Percent
4 or more	1556	84.7
1-3	224	12.2
No ANC	56	3.1
Total	1836	100

Note ANC less than 4 is considered to be inadequate

Inadequate ANC 15.3%

FIGURE 10 Histogram : Number of ANC attendance of general patients (excluding private patients and ANC at other hospitals)

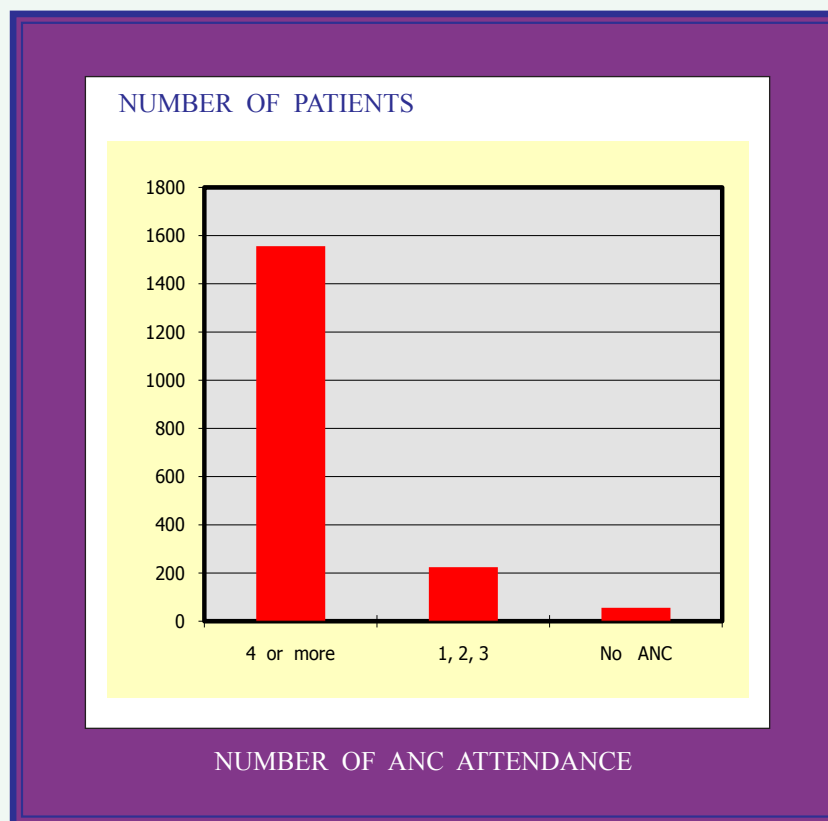
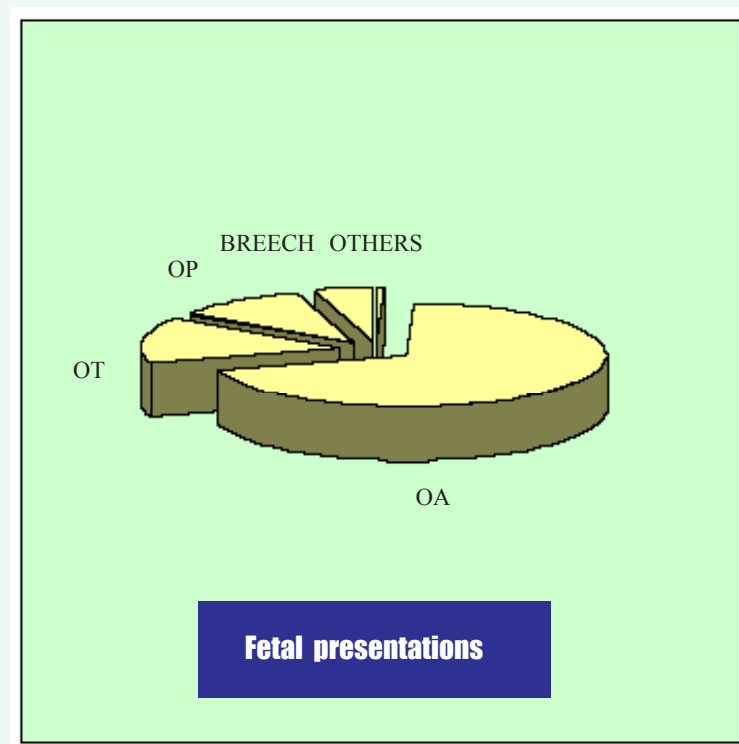


TABLE 17 Distribution of fetal presentations in labor (Singleton)

Fetal Presentation	Percent
Vertex	93.8
Breech	4.7
Transverse lie	0.2
Face	0.1
Compound	0.1

Breech Presentation was 4.7% of Total Birth

FIGURE 11 Pie: Proportion of fetal presentations during labor



OA = occiput anterior, OP = occiput posterior, OT = occiput transverse

TABLE 18 Mode of delivery: General and private patients**Singleton**

Mode of Delivery	Total		General		Private	
	Number	Percent	Number	Percent	Number	Percent
Normal Delivery	1222	66.7	1144	67.5	78	57.4
Forceps Delivery	30	1.6	27	1.6	3	2.2
Vacuum Delivery	96	5.2	87	5.1	9	6.6
Cesarean Section	438	23.9	395	23.3	43	31.6
Vaginal Breech Delivery	34	1.9	33	1.9	1	0.7
Other*	12	0.7	10	0.6	2	1.5
Total	1832	100	1696	100	136	100

* other = conduplicato corpore, hysterotomy, internal version, caul etc.

Twins

Mode of Delivery	Total		General		Private	
	Number	Percent	Number	Percent	Number	Percent
Cesarean Section	41	56.9	37	56.1	4	66.7
Vaginal Delivery	31	43.1	29	43.9	2	33.3
Total	72	100.0	66	100.0	6	100.0

FIGURE 12 Histogram : Distribution of modes of deliveries : general & private patients (Singleton)

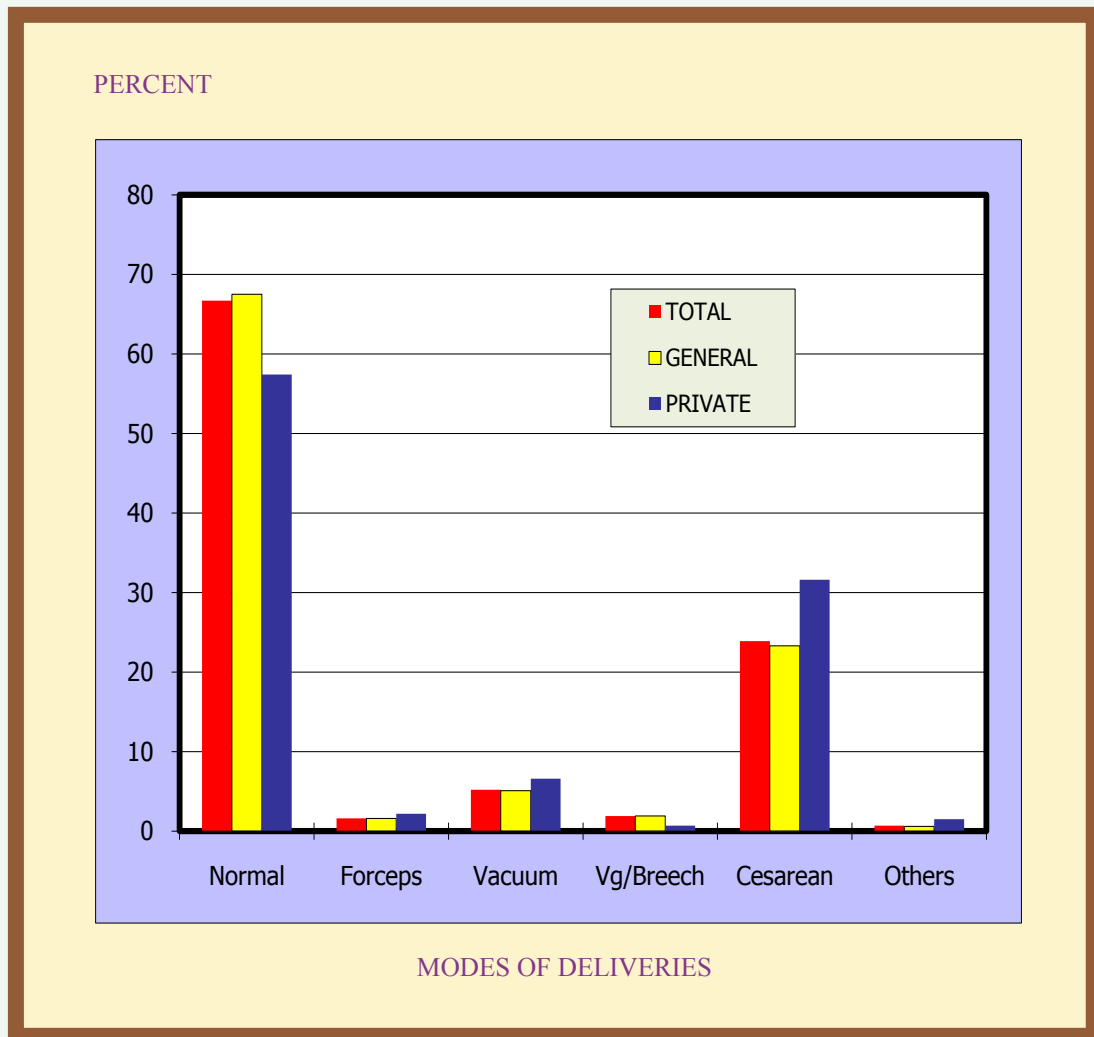


TABLE 19 Modes of deliveries in breech presentation : general and private patients (Singleton)

Mode of Deliveries	Total		General		Private	
	Number	Percent	Number	Percent	Number	Percent
Cesarean Section	68	66.7	66	66.7	2	66.7
Spontaneous Breech	1	1.0	-	-	1	33.3
Assisting Mauriceau-Smelliveit	24	23.5	24	24.2	-	-
Total Extraction Mauriceau-Smelliveit	9	8.8	9	9.1	-	-
Total	102	100	99	100	3	100

Total Cesarean Section Rate in Breech presentation 66.7%
(General patients; 66.7%, Private patients; 66.7 %)

FIGURE 13 Histogram : Distribution of modes of deliveries in breech presentation : general & private

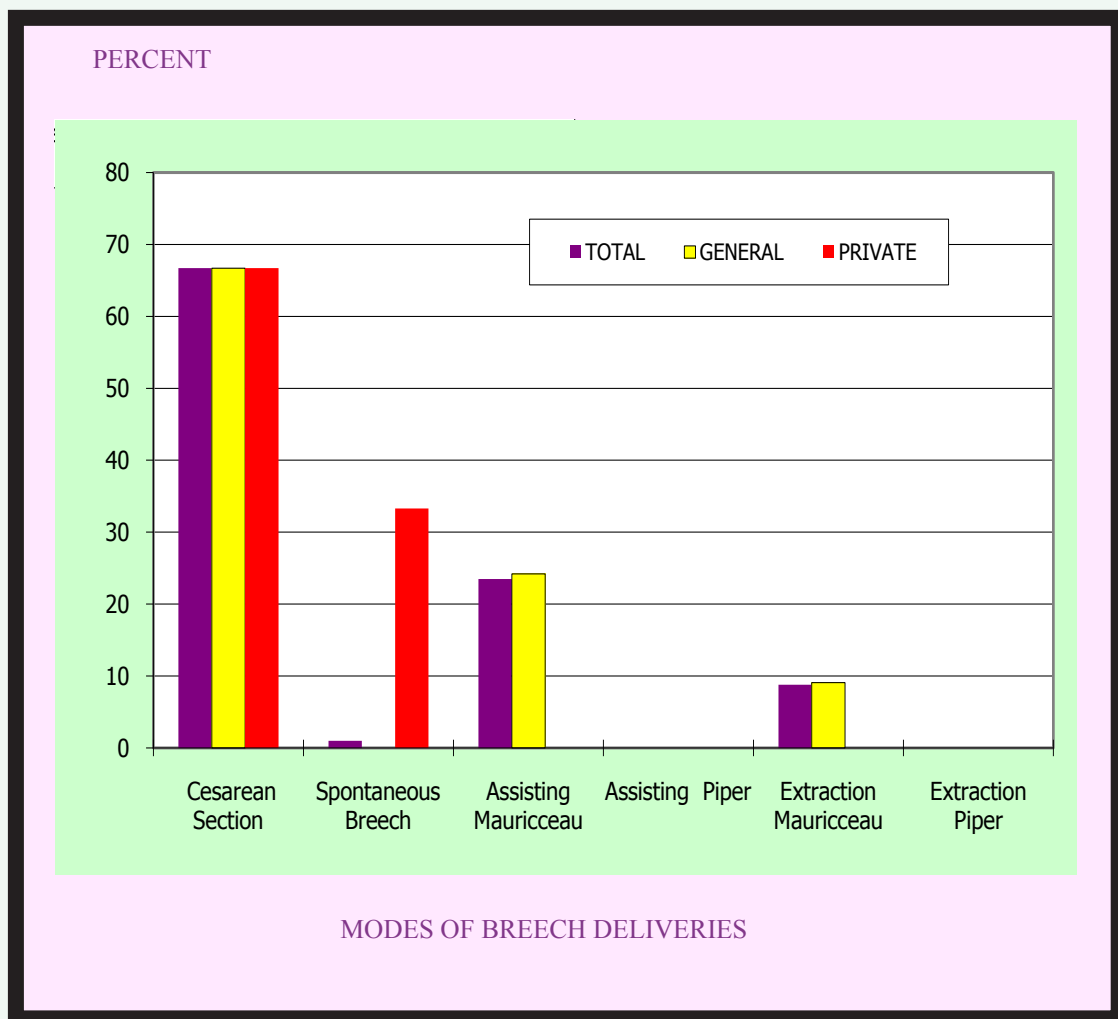


TABLE 20 Frequency of cesarean deliveries according to diagnostic indication (Singleton)

Indications	Total		General		Private	
	Number	Percent	Number	Percent	Number	Percent
1. Breech	66	15.1	63	15.9	3	7.0
2. CPD	150	34.2	135	34.2	15	34.9
3. Fetal distress	42	9.6	41	10.4	1	2.3
4. HIV +ve	1	0.2	1	0.3	0	0.0
5. Placenta previa	15	3.4	13	3.3	2	4.7
6. Previous C/S	134	30.6	113	28.6	21	48.8
7. Prolapse cord	1	0.2	1	0.3	-	-
8. Transverse lie	2	0.5	1	0.3	1	2.3
9. Others	27	6.2	27	6.8	-	-
Total	438	100	395	100	43	100

* Others = Vasa previa, IVF, Active herpes genitalis, Fetal anomalies HELLP syndrome etc.

TABLE 21 Indications of forceps deliveries : general & private patients (Singleton)

Indications	Total		General		Private	
	Number	Percent	Number	Percent	Number	Percent
Fetal distress	3	10.0	3	11.1	-	-
Expected prolonged second stage	9	30.0	9	33.3	-	-
Poor expulsive force & training	8	26.7	7	25.9	1	33.3
Maternal disease	10	33.3	8	29.6	2	66.7
Others (OPP, failed vacuum, etc)	-	-	-	-	-	-
Total	30	100	27	100	3	100.0

TABLE 22 Indications of vacuum deliveries : general & private patients (Singleton)

Indications	Total		General		Private	
	Number	Percent	Number	Percent	Number	Percent
Fetal distress	23	24.0	19	21.8	4	44.4
Expected prolonged second stage	31	32.3	31	35.6	-	-
Poor expulsive force & training	39	40.6	34	39.1	5	55.6
Maternal disease (PIH, ect)	2	2.1	2	2.3	-	-
Others (OPP, failed forceps, etc)	1	1.0	1	1.1	-	-
Total	96	100	87	100	9	100.0

TABLE 23 Sex of Fetuses (Including Multiple Pregnancies)

Sex	Number	Percent
Male	1014	52.5
Female	893	46.2
Unspecified	25	1.3
Total	1932	100.0

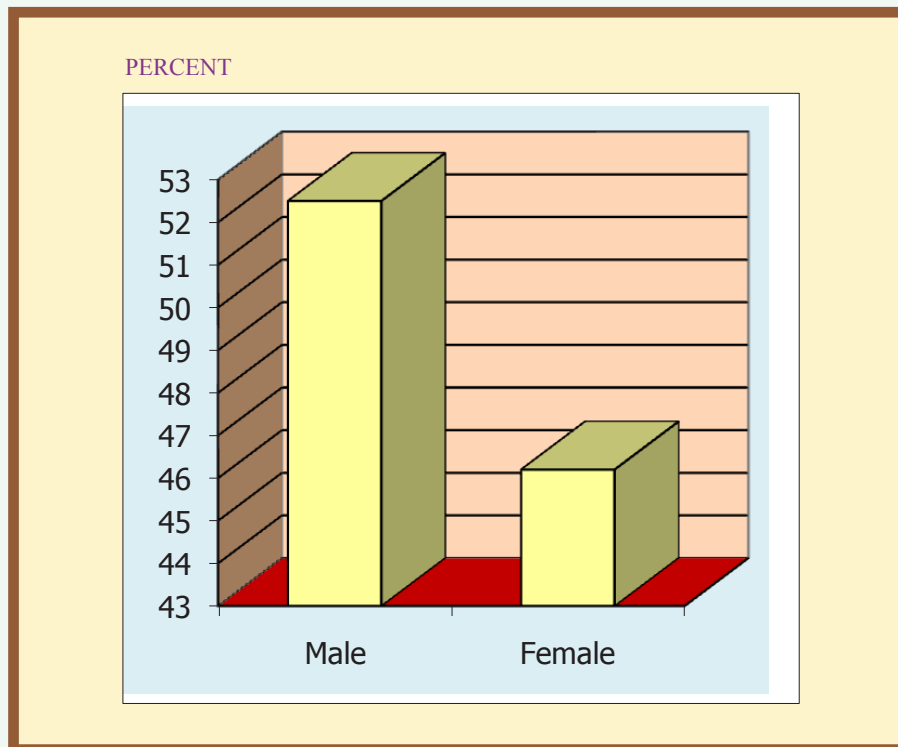
FIGURE 14 Histogram : Distribution of fetal sex (including twins)

TABLE 24 Apgar score at 1 minute of total neonates

Apgar Scores	Number	Percent
0-3 (severe depression)	162	8.4
4-6 (mild depression)	127	6.6
7-10 (no depression)	1641	84.9
Total	1934	100

TABLE 25 Apgar score at 5 minutes of total neonates

Apgar Score	Number	Percent
0-3 (severe depression)	120	6.2
4-6 (mild depression)	48	2.5
7-10 (no depression)	1762	91.1
Total	1934	100

TABLE 26 Apgar score at 1 and 5 minutes of total neonates

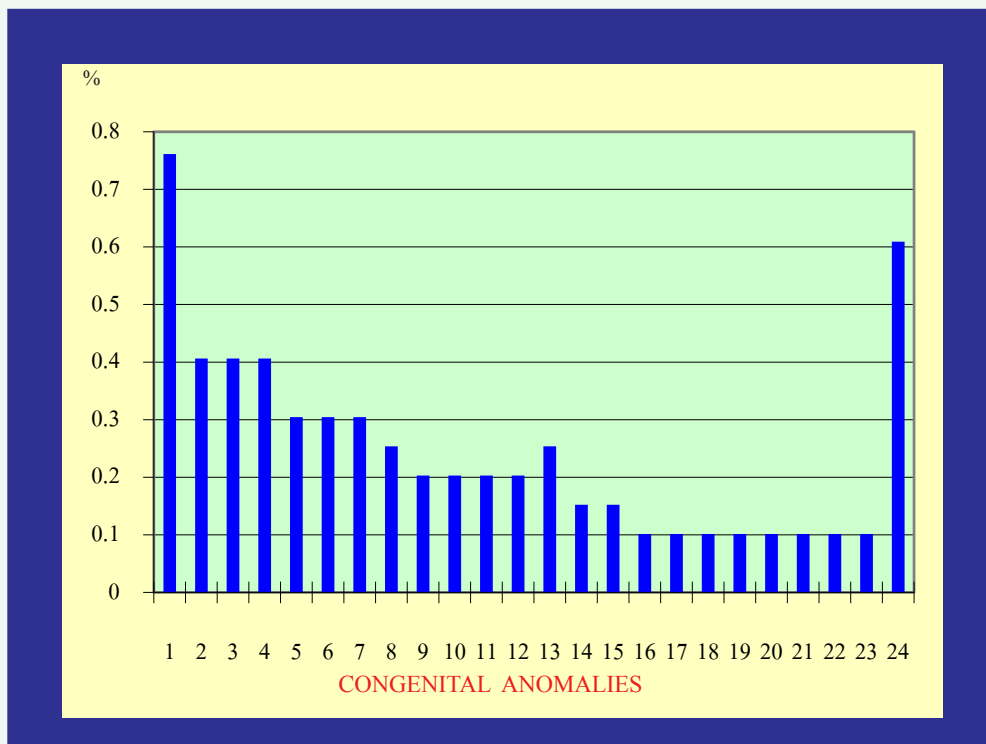
Apgar Score	1-Minute		5-Minute	
	Number	Percent	Number	Percent
0	107	5.5	108	5.6
1	20	1.0	3	0.2
2	18	0.9	-	-
3	17	0.9	9	0.5
4	33	1.7	6	0.3
5	39	2.0	16	0.8
6	55	2.8	26	1.3
7	106	5.5	32	1.7
8	214	11.1	74	3.8
9	801	41.5	335	17.4
10	520	26.9	1321	68.4
Total	1930	100	1930	100.0

TABLE 27 Prenatal sonographic diagnosis of anomalies*

	Congenital Anomalies	Number	Percent
1	Hydrops fetalis	15	0.76
2	Gastroschisis	8	0.41
3	Hb Bart's disease	8	0.41
4	Cardiac anomalies	8	0.41
5	Multiple anomalies	6	0.30
6	Trisomy 21	6	0.30
7	Trisomy 18	6	0.30
8	Cystic hygroma	5	0.25
9	Hydrocephalus	4	0.20
10	Lethal-short limb skeleton	4	0.20
11	Other abnormal chromosomes	4	0.20
12	Hydronephrosis	4	0.20
13	Omphalocele/LBWC	5	0.25
14	Hydranencephaly/porencephaly	3	0.15
15	Anencephaly/Exencephaly	3	0.15
16	Cephalocele	2	0.10
17	Cleft lips	2	0.10
18	Conjoint Twins	2	0.10
19	Exencephaly	2	0.10
20	Meningocele	2	0.10
21	CCAM	2	0.10
22	Acardiac twins	2	0.10
23	Sacrococegeous teratoma	2	0.10
24	Other abnormal chromosomes	12	0.61
		117	5.94

* Only diagnosed after 20 weeks and terminated at Maharaj Nakorn Chiang Mai, Most were referred cases

FIGURE 15 Histogram : Number of congenital anomalies (including chromosomal abnormalities with structural defects)



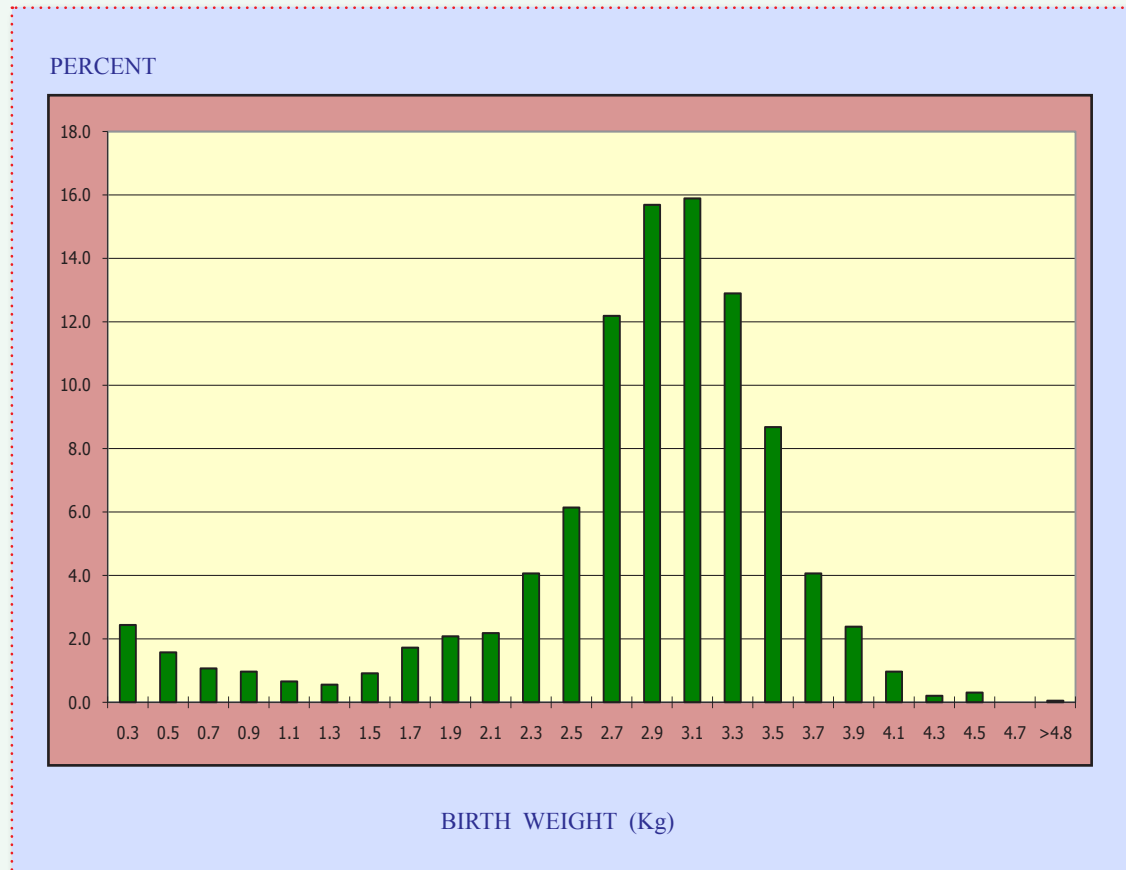
- | | |
|--------------------------------------|--|
| 1 <i>Hydrops fetalis</i> | 13 <i>Omphalocele/LBWC</i> |
| 2 <i>Gastroschisis</i> | 14 <i>Hydranencephaly/porencephaly</i> |
| 3 <i>Hb Bart's disease</i> | 15 <i>Anencephaly/Excencephaly</i> |
| 4 <i>Cardiac anomalies</i> | 16 <i>Cephalocele</i> |
| 5 <i>Multiple anomalies</i> | 17 <i>Cleft lips</i> |
| 6 <i>Trisomy 21</i> | 18 <i>Conjoint Twins</i> |
| 7 <i>Trisomy 18</i> | 19 <i>Exencephaly</i> |
| 8 <i>Cystic hygroma</i> | 20 <i>Meningocele</i> |
| 9 <i>Hydrocephalus</i> | 21 <i>CCAM</i> |
| 10 <i>Lethal-short limb skeleton</i> | 22 <i>Acardiac twins</i> |
| 11 <i>Other abnormal chromosomes</i> | 23 <i>Sacrocoegeous teratoma</i> |
| 12 <i>Hydronephrosis</i> | 24 <i>Other abnormal chromosomes</i> |

TABLE 28 Number and percentage of neonates by birth weight*

Birth Weight (grams)	Number	Percent
< 400	48	2.5
400-599	31	1.6
600-799	21	1.1
800-999	19	1.0
1000-1199	13	0.7
1200-1399	11	0.6
1400-1599	18	0.9
1600-1799	34	1.8
1800-1999	41	2.1
2000-2199	43	2.2
2200-2399	80	4.2
2400-2599	121	6.3
2600-2799	240	12.5
2800-2999	309	16.1
3000-3199	313	16.3
3200-3399	254	13.2
3400-3599	171	8.9
3600-3799	80	4.2
3800-3999	47	2.4
4000-4199	19	1.0
4200-4399	4	0.2
4400-4599	6	0.3
4600-4799	0	0.0
4800-4999	1	0.1
Total	1924	100.0

* Including therapeutic termination of pregnancy

FIGURE 16 Histogram : Percentage of neonates at various points of birth weight



** Including therapeutic termination of pregnancy*

TABLE 29 Number and percentage of neonates by birth weight group (total)

Birth Weight (grams)	Number	Percent
Extremely low birth weight (< 1000)	113	5.9
Very low birth weight (1000-1499)	37	1.9
Low birth weight (1500-2499)	244	12.7
Average birth weight (2500-3999)	1498	77.9
Macrosomia (> 4000)	32	1.7
Total	1924	100.0

** Including therapeutic termination of pregnancy*

**Average Birth Weight of Total Infants 2817+801 grams
range 150-4970 grams**

FIGURE 17 Histogram : Percentage of neonates among various birth weight groups

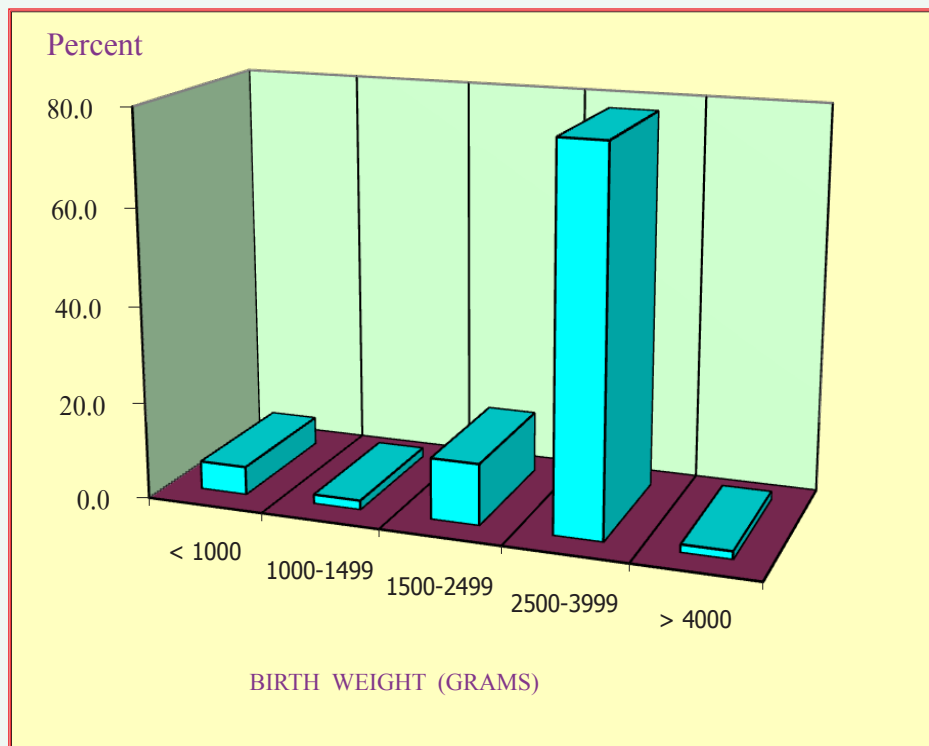


TABLE 30 Fetal weight (grams): the 10th, 50th, 90th percentile at various gestational age

Gestational Age (weeks)	Weight (grams) 10th Percentile	Weight (grams) 50th Percentile	Weight (grams) 90th Percentile
20	170	275	.
21	304	475	650
22	380	500	590
23	500	650	1000
24	400	720	.
25	780	860	.
26	515	930	1059
27	50	815	.
28	720	1000	.
29	972	1340	1889
30	950	1455	.
31	961	1700	2270
32	850	1890	2300
33	1134	1980	2769
34	1708	2220	3148
35	1736	2450	2970
36	2304	2700	3246
37	2450	2850	3356
38	2600	3100	3562
39	2700	3100	3640
40	2800	3260	3750
41	2765	3250	3785
42	2631	3125	4360

FIGURE 18 Graph : The 10th, 50th, 90th percentiles of fetal weight at various gestational age

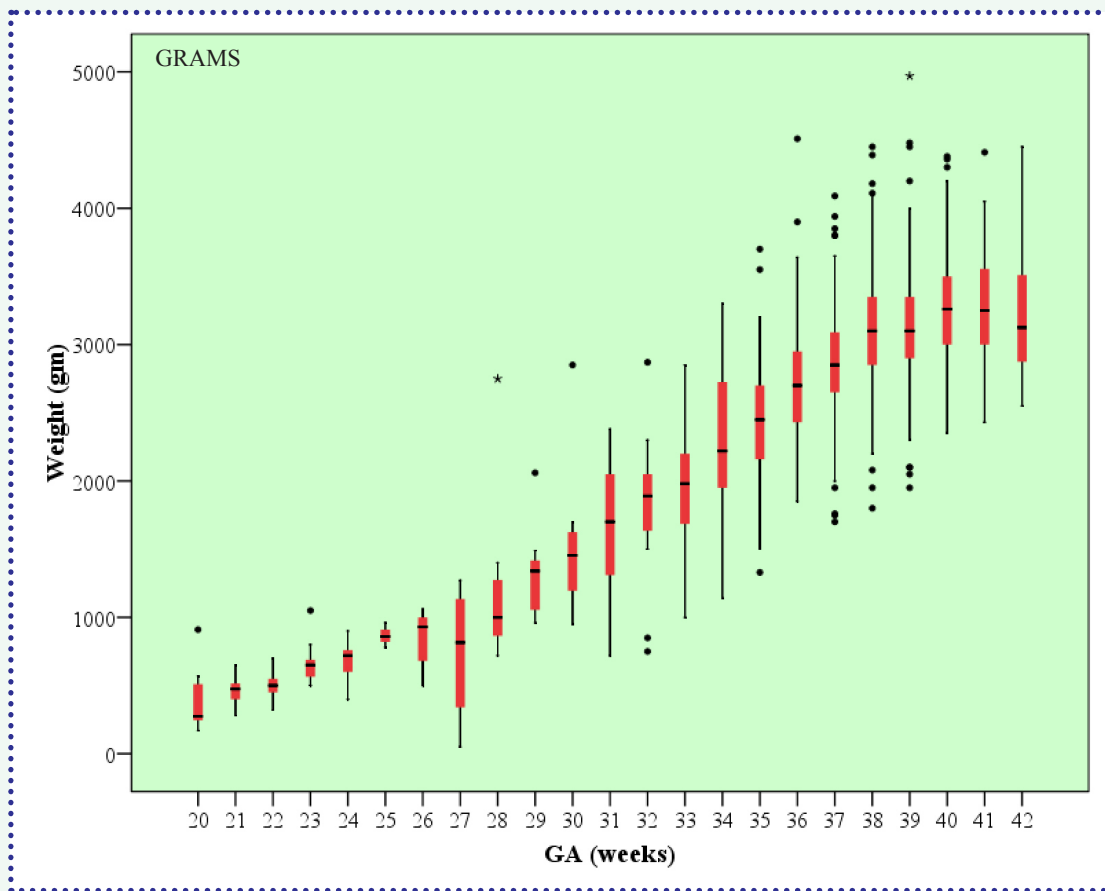


TABLE 31 Means and standard deviation of birth weight
at various gestational age (singleton)

Gestational Age (weeks)	Number of Neonates	Means (grams)	Standard Deviation
20	8	392.5	246.3
21	12	468.3	110.5
22	19	500.5	86.1
23	11	660.0	157.9
24	5	676.0	187.8
25	3	866.7	90.2
26	10	850.0	200.8
27	4	737.5	528.1
28	7	1250.0	699.6
29	12	1318.8	298.0
30	8	1543.8	590.8
31	22	1638.2	462.1
32	19	1805.3	475.6
33	20	1956.0	471.7
34	43	2299.5	516.7
35	45	2458.9	477.7
36	91	2735.3	427.4
37	253	2867.0	380.3
38	413	3091.1	392.8
39	420	3142.2	379.6
40	298	3275.4	374.3
41	92	3275.9	392.9
42	12	3270.0	565.4
Total	1827	2893.4	711.8

TABLE 32 Means and standard deviation of birth weight
at various gestational age (twins)

Gestational Age (weeks)	Number of Twin Sets	Means (grams)	Standard Deviation
19	2	350.0	70.7
20	4	437.5	154.8
22	1	280.0	.
23	2	470.0	169.7
28	2	1355.0	360.6
29	4	995.0	231.0
31	2	1520.0	0.0
32	8	1762.5	170.3
33	2	1725.0	35.4
34	2	1970.0	0.0
35	12	2059.2	168.8
36	10	1965.0	706.8
37	6	2236.7	495.3
38	6	2385.0	382.7
39	6	2670.0	213.1

TABLE 33 Comparison of birth weight (singleton & twins)

Type	Means Birth Weight	Standard Deviation	Range
Singleton	28177	801	150-4970
Twins	1782.61	738	110-2980

TABLE 34 Comparison of gestational age (singleton & twins)

Type	Means Gestational Age	Standard Deviation	Range
Singleton	37.38	3.8	19-42
Twins	33.21	5.3	17-39

TABLE 35 Early postpartum hemorrhage

Cause	Number	Percent
Uterine Atony	12	0.63
Lacerations	6	0.32
Retained Pieces of Placenta	6	0.32
Placenta Adherens	5	0.26
Uterine infection	3	0.16
Total	32	1.68

Section III

HIGH RISK PREGNANCIES

TABLE 36 Major complications during pregnancy

Complications	Numbers	Prevalence (%)
Previous cesarean section	160	8.421
Diabetes mellitus	154	8.105
Pregnancy-induced hypertension	101	5.316
HBsAg positive	94	4.947
Chronic hypertension	60	3.158
Iron def., anemia, ITP	39	2.053
HIV positive	34	1.789
Asthma	23	1.211
Placenta previa	19	1.000
Thyrotoxicosis	19	1.000
Myoma Uteri	16	0.842
Marked Obesity	15	0.789
Oligohydramnios	14	0.737
Polyhydramnios	12	0.632
Heart disease	9	0.474
Systemic lupus erythromatosus	9	0.474
Chorioamnionitis	7	0.368
Thalassemia	7	0.368
Urinary tract infection	7	0.368
Epilepsy	6	0.316
Condyloma	5	0.263
Nephrotic syndrome	4	0.211
Poliomyelitis	4	0.211
Incompetent cervix	3	0.158
Ovarian tumor	3	0.158

Pregnancy with Heart Disease

Total 9 cases (0.47 percent of total parturients)
 8 : singleton, 1 : twins
 (not included 3 cases of therapeutic abortion)

Age range 21-33 years
 average 27.3±4.0 years
 age of 35 years or more 0 cases (0.0 %)

Functional Class (At delivery 20 cases)

Class I	6	cases
Class II	1	cases
Class III	2	cases
Class IV	-	case

Gestational Age at Birth

range 14-39 weeks (not included therapeutic abortion)
 average 33.6±7.8 weeks
 premature delivery (before completed 37 weeks)
 5 cases (55.6 %)

Birth Weight

range 110-3130 grams
 average 2163±942 grams
 number of low birth weight fetus (less than 2,500 grams)
 4 cases (44.4 %)

Apgar Scores at 1 minute (less than 7) 1 cases (11.1 %)

Apgar Scores at 5 minutes (less than 7) 1 cases (11.1 %)

Small-for-gestational-age (less than 10th percentile) 2 cases (22.2 %)

Perinatal death 1 cases (11.1%) (immaturity)

Congenital Anomalies -

Other complications (No maternal death)

<i>Heart disease</i>	9 cases
<i>Premature contraction</i>	3 cases
<i>Breech presentation</i>	2 cases
<i>UTI</i>	2 cases
<i>Previous C/S</i>	1 case
<i>Twins</i>	1 case

Pregnancy with Diabetes Mellitus

Total 154 cases (8.11 percent of total parturients)

(Singleton : 152, Twins : 2)

Note : Glucose challenge test was used as a screening test only in women at risk for diabetes melitus and age > 30 yr.

Age range 18-47 years

average 32.6 ± 5.2 years

age of 35 years or more 53 cases (34.4%)

Gestational Age at Birth

range 21-41 weeks

average 37.7 ± 2.8 weeks

premature delivery (before completed 37 weeks)

26 cases (16.9%)

Birth Weight

range 280-4390 grams

average 2994 ± 617 grams

number of low birth weight fetus (less than 2,500 grams)

20 cases (13.0 %)

Apgar Scores at 1 minute (less than 7) 16 cases (10.4 %)

Apgar Scores at 5 minutes (less than 7) 6 cases (3.9 %)

Small-for-gestational-age (less than 10th percentile) 10 cases (6.5 %)

Perinatal Death 3 cases (1.9 %)

Congenital Anomalies 2 cases (1.3%) (cleft lip/palate, multiple anomalies)

Other complications

<i>Previous C/S</i>	20 cases
<i>Prolonged PROM (> 18 hours)</i>	18 cases
<i>Pregnancy-induced hypertension</i>	12 cases
<i>Chronic hypertension</i>	11 cases
<i>PROM > 18 hr.</i>	7 cases
<i>Hepatitis B antigen positive</i>	5 cases
<i>Obesity</i>	4 cases
<i>Fever (unknown cause)</i>	3 cases
<i>Thyrotoxicosis</i>	3 cases
<i>HIV positive</i>	2 cases
<i>Iron def., anemia, ITP</i>	2 cases
<i>Multiparity</i>	2 cases
<i>Myoma Uteri</i>	2 cases
<i>Condyloma</i>	1 case
<i>Epilepsy</i>	1 case
<i>Oligohydramnios</i>	1 case
<i>SLE</i>	1 case

Classifications

Pregestational DM (diagnosed before pregnancy) 26 cases (16.8 %)

<i>Chemical DM (Class A)</i>	4 cases
<i>Overt DM (Class B-T)</i>	22 cases
<i>Class B</i>	19 cases
<i>Class D, F, R</i>	3 cases

Gestational DM (diagnosed during pregnancy)	128 cases (83.1 %)
<i>Chemical DM (Class A1)</i>	<i>108 cases</i>
<i>Overt DM (Class A2)</i>	<i>19 cases</i>

Method of Glucose Control

Insulin	62 cases
Oral hypoglycemic drugs	2 cases
Oral hypoglycemic drugs & Insulin -	cases
Diet Control only	90 cases

Pregnancy with Thalassemia

Total 7 cases (0.37 percent of total parturients)

(All were singleton)

(Including only the patients with hemoglobin less than 10 gm%)

Type of Thalassemia

β -thalassemia / HbE	3 cases
alpha-thalassemia (HbH disease)	3 cases
HbH Constant spring disease)	1 case

Age range 20-36 years

average 26.4 ± 5.2 years

age of 35 years or more 1 cases (14.3 %)

Gestational Age at Birth

range 36-40 weeks

average 38.9 ± 1.5 weeks

premature delivery (before completed 37 weeks)

1 cases (14.3 %)

Birth Weight

range 2350-3480 grams

average 2875±380 grams

number of low birth weight fetus (less than 2,500 grams)

1 cases (14.3 %)

Apgar Scores at 1 minute (less than 7) 0 case (0.0 %)**Apgar Scores at 5 minutes (less than 7)** 0 case (0.0 %)**Small-for-gestational-age (less than 10th percentile)** 1 cases (14.3 %)**Perinatal death** 0 case (0.0%) associated with hydrops fetalis**Congenital Anomalies** 1 case (14.3 %) (hydrops fetalis)**Other complications***Prolonged PROM >18 hr.* 2 cases*Low lying placenta* 1 case*Pregnancy-induced hypertension* 1 case*Previous C/S* 1 case**Pregnancy with Thyrotoxicosis****Total** 19 cases (1.00 percent of total parturients)

All were singleton

Diagnosed before pregnancy 9 cases*Diagnosed during pregnancy* 10 cases

Age range 16-39 years
 average 26.5 ± 6.1 years
 age of 35 years or more 2 cases (10.5 %)

Gestational Age at Birth

range 25-40 weeks
 average 37.5 ± 3.3 weeks
 premature delivery (before completed 37 weeks)
 5 cases (26.3 %)

Birth Weight

range 780-3800 grams
 average 2935 ± 651 grams
 number of low birth weight fetus (less than 2,500 grams)
 3 cases (15.8 %)

Apgar Scores at 1 minute (less than 7) 1 case (5.3 %)

Apgar Scores at 5 minutes (less than 7) 1 case (5.3 %)

Small-for-gestational-age (less than 10th percentile) 3 cases (15.8 %)

Perinatal death 0 cases (0.0 %)

Congenital Anomalies 0 case (0.0%)

Other complications

<i>Diabetes Mellitus</i>	3 cases
<i>Chronic hypertension</i>	2 cases
<i>Pregnancy-induced hypertension</i>	2 cases
<i>Previous C/S</i>	2 cases
<i>prolonged PROM (> 18 hours)</i>	2 cases
<i>Hepatitis B surface antigen positive</i>	1 case
<i>Iron deficiency</i>	1 case
<i>Teenage preg</i>	1 case

Pregnancy with Hepatitis B Antigen Positive

Total 94 cases (4.95 percent of total parturients)
(singleton : 93; twins : 1)

Age range 15-45 years
average 28.0±6.1 years
age of 35 years or more 13 cases (13.8 %)

Gestational Age at Birth
range 14-41 weeks
average 36.6±5.1 weeks
premature delivery (before completed 37 weeks)
21 cases (22.3 %)

Birth Weight range 180-4300 grams
average 2784±869 grams
number of low birth weight fetus (less than 2,500 grams)
18 cases (19.1 %)

Apgar Scores at 1 minute (less than 7) 13 cases (13.8 %)

Apgar Scores at 5 minutes (less than 7) 9 cases (9.6 %)

Small-for-gestational-age (less than 10th percentile) 13 cases (13.8 %)

Perinatal Death 7 cases (7.4%)

Congenital Anomalies 5 cases (*Cystic hygroma, hydrocephalus, thantophoric dysplasia, trisomy21, Hb Bart's*)

Other complications

<i>Previous cesarean section</i>	7 cases
<i>Chronic hypertension</i>	6 cases
<i>Prolonged PROM (> 18 hours)</i>	6 cases
<i>Diabetes melitus</i>	5 cases
<i>HIV positive</i>	3 cases
<i>Teenage preg</i>	3 cases
<i>Pregnancy-induced hypertension</i>	3 cases
<i>Iron deficiency</i>	2 cases
<i>Polyhydramnios</i>	2 cases
<i>Asthma</i>	1 case
<i>Epilepsy</i>	1 case
<i>Low lying placenta</i>	1 case
<i>Multiparity</i>	1 case
<i>Myoma Uteri</i>	1 case
<i>Obesity</i>	1 case
<i>Thyrotoxicosis</i>	1 case

Pregnancy with Asthma

Total 23 cases (1.21 percent of total parturients)
(All were singleton)

Activity of Disease

Well-controlled	18 cases
Poorly-controlled	5 cases

Age range 14-40 years

average 26.9 ± 6.5 years

age of 35 years or more 3 cases (13.0%)

Gestational Age at Birth

range 26-40 weeks

average 37.2±3.1 weeks

premature delivery (before completed 37 weeks)

7 cases (30.4 %)

Birth Weight (not included abortion)

range 500-3600 grams

average 2826±681 grams

number of low birth weight fetus (less than 2,500 grams)

4 cases (17.4 %)

Apgar Scores at 1 minute (less than 7) 1 case (4.3%)**Apgar Scores at 5 minutes (less than 7)** 1 case (4.3 %)**Small-for-gestational-age (less than 10th percentile)** 4 cases (17.4%)**Perinatal death** 2 cases (8.6%)**Congenital Anomalies** 1 (anencephaly)**Other complications***Teenage preg* 2 cases*Dead fetus in utero* 1 case*Hepatitis B surface antigen positive* 1 case*Grand multiparity* 1 case*Pregnancy-induced hypertension* 1 case*Prolonged PROM (> 18 hours)* 1 case

Pregnancy with Chronic Hypertension

Total 60 cases (3.16 percent of total parturients)
(Singleton : 59; Twins : 1; Triplet : 1)

Severity of Hypertension

Severe (start treatment during pregnancy)	8	cases
Severe (controlled prior to pregnancy)	22	cases
Mild (no medication BP less than 160/90)	20	cases
Mild (BP less than 160/90 but treated with antihypertensive drug)	10	cases

Age range 18-47 years
average 32.1±5.9 years
age of 35 years or more 21 cases (35.0 %)

Gestational Age at Birth

range 22-42 weeks
average 36.3±3.4 weeks
premature delivery (before completed 37 weeks)
22 cases (36.7%)

Birth Weight

range 680-3860 grams
average 550±4300 grams
number of low birth weight fetus (less than 2,500 grams)
22 cases (36.7 %)

Apgar Scores at 1 minute (less than 7) 10 cases (16.7 %)

Apgar Scores at 5 minutes (less than 7) 5 cases (8.3 %)

Small-for-gestational-age (less than 10th percentile) 8 cases (13.3 %)

Perinatal death 2 cases (3.3%)

Congenital Anomalies -

Other complications

<i>Diabetes mellitus</i>	<i>11 cases</i>
<i>Pregnancy-aggravated hypertension</i>	<i>9 cases</i>
<i>Previous cesarean section</i>	<i>7 cases</i>
<i>Hepatitis B surface antigen positive</i>	<i>6 cases</i>
<i>Prolonged PROM (> 18 hours)</i>	<i>5 cases</i>
<i>Obesity</i>	<i>3 cases</i>
<i>HIV positive</i>	<i>2 cases</i>
<i>Iron deficiency</i>	<i>2 cases</i>
<i>Placenta previa</i>	<i>2 cases</i>
<i>SLE2</i>	<i>cases</i>
<i>Thyrotoxicosis</i>	<i>2 cases</i>
<i>Upper urinary tract infection</i>	<i>2 cases</i>
<i>Chorioamniitis</i>	<i>1 cases</i>
<i>Condyloma accuminata</i>	<i>1 cases</i>
<i>Grand multiparity</i>	<i>1 cases</i>
<i>Myoma Uteri</i>	<i>1 cases</i>
<i>Nephrotic syndrome</i>	<i>1 cases</i>

Pregnancy-induced Hypertension

Total 101 (5.31 percent of total parturients)

(Singleton : 100; Twins : 1)

Age range 14-43 years

average 28.8 ± 6.6 years

age of 35 years or more 20 cases (19.8 %)

Gestational Age at Birth

range 22-41 weeks

average 36.2±3.8 weeks

premature delivery (before completed 37 weeks)

41 cases (40.6 %)

Classification of PIH

Gestational hypertension 18 cases (17.8 %)

(without proteinuria)

Mild Preeclampsia 53 cases (52.4 %)

Severe Preeclampsia 20 cases (19.8 %)

Pregnancy-aggravated hypertension 9 cases (8.9 %)

Eclampsia 1 cases (0.0 %)

*First eclamptic attack before admission 1 case**First eclamptic attack after admission 0 case**No ANC at Maharaj Nakorn Chiang Mai 0 case**ANC at Maharaj Nakorn Chiang Mai 0 case***Birth Weight** range 320-4410 grams

average 2590±898 grams

number of low birth weight fetus (less than 2,500 grams)

69 cases (38.6 %)

Apgar Scores at 1 minute (less than 7) 22 cases (21.8 %)**Apgar Scores at 5 minutes (less than 7)** 10 cases (9.9 %)**Small-for-gestational-age (less than 10th percentile)** 22 cases (21.8 %)**Perinatal death** 4 cases (4.0 %)**Congenital Anomalies***Hydrops fetalis 1 case*

Other complications

<i>Diabetes Mellitus</i>	12 cases
<i>Chronic hypertension</i>	9 cases
<i>Previous cesarean section</i>	6 cases
<i>Teenage preg</i>	4 cases
<i>Urinary tract infection</i>	4 cases
<i>Hepatitis B antigen positive</i>	3 cases
<i>Iron def., anemia, ITP</i>	3 cases
<i>Prolonged ruptured membranes</i>	3 cases
<i>SLE</i>	3 cases
<i>Obesity</i>	2 cases
<i>Oligohydramnios</i>	2 cases
<i>Thyrotoxicosis</i>	2 cases
<i>Antepartum hemorrhage</i>	1 case
<i>Asthma</i>	1 case
<i>Chorioamniitis</i>	1 case
<i>Epilepsy</i>	1 case
<i>Anti-HIV positive</i>	1 case
<i>Low lying placenta</i>	1 case
<i>Placenta previa</i>	1 case
<i>Thalassemia</i>	1 case

Placenta Previa

Total 19 cases (1.00 percent of total parturients)

Singleton : 18, Twins : 1

Age range 22-47 years

average 31.5 ± 6.4 years

age of 35 years or more 5 cases (26.3 %)

Gestational Age at Birth

range 32-39 weeks
 average 36.3 ± 2.3 weeks
 premature delivery (before completed 37 weeks)
 6 cases (31.6%)

Birth Weight

range 1610-3490 grams
 average 2620 ± 587 grams
 number of low birth weight fetus (less than 2,500 grams)
 11 cases (52.4 %)

Apgar Scores at 1 minute (less than 7) 6 cases (31.6 %)

Apgar Scores at 5 minutes (less than 7) 1 case (5.3 %)

Small-for-gestational-age (less than 10th percentile) 3 cases (14.3 %)

Perinatal death - cases (0.0 %)

Congenital Anomalies - case

Other complications

<i>Pregnancy-induced hypertension</i>	4 cases
<i>Chronic hypertension</i>	2 cases
<i>Heart disease</i>	2 cases
<i>Prolonged ruptured membranes</i>	1 case
<i>Teenage preg</i>	1 case

Pregnancy with Acute Pyelonephritis

Total 7 cases (0.37 percent of total parturients)
(All were singleton)

Age range 16-40 years
average 30.6±9.1 years
age of more than 35 years 3 cases (42.9 %)

Gestational Age at Birth
range 28-39 weeks
average 34.1±4.3 weeks
premature delivery (before completed 37 weeks)
4 cases (57.1 %)

Onset

First trimester	-	case
Second trimester	3	cases
Third trimester	4	cases
Postpartum	-	case

Number of Episodes

1	5	cases
2	1	case
3	1	case

Birth Weight range 1290-2750 grams
average 1904±594 grams
number of low birth weight fetus (less than 2,500 grams)
5 cases (71.4 %)

Apgar Scores at 1 minute (less than 7)	2 cases (28.6 %)
Apgar Scores at 5 minutes (less than 7)	0 cases (0.0 %)
Small-for-gestational-age (less than 10th percentile)	1 cases (6.7 %)
Perinatal death	- case (0.0 %)
Congenital Anomalies	0 case (0.0 %)
Other complications	
<i>Pregnancy-induced hypertension</i>	3 cases
<i>Hepatitis B antigen positive</i>	3 cases
<i>Diabetes mellitus</i>	1 case
<i>Previous cesarean section</i>	1 case
<i>HIV antibody positive</i>	1 case

Small-for-Gestational-Age Fetuses

Birthweight less than 10th percentile

Total 144 (7.53 percent of total babies; 1912 fetuses)

Singleton 117 fetuses

Multiple pregnancies 27 fetuses

Age range 16-45 years

average 28.2 ± 7.9 years
 age of 35 years or more 28 cases (19.4 %)

Gestational Age at Birth

range 20-42 weeks
 average 35.0 ± 8.5 weeks
 premature delivery (before completed 37 weeks)
 26 cases (18.1 %)

Birth Weight range 140-2620 grams

average 2127 ± 852 grams
 number of low birth weight fetus (less than 2,500 grams)
 135 cases (93.7 %)

Apgar Scores at 1 minute (less than 7) 45 cases (31.3 %)

Apgar Scores at 5 minutes (less than 7) 8 cases (5.5 %)

Perinatal Death 10 in 144 cases (6.33 %)

Congenital Anomalies

<i>Twin transfusion syndrome</i>	8 cases
<i>Chromosomal abnormalities</i>	5 cases
<i>Suspected of intrauterine infection</i>	4 cases
<i>Multiple anomalies</i>	2 cases
<i>Non-specific syndrome</i>	3 cases
<i>Congenital heart disease</i>	2 cases

Other complications

<i>Medical diseases</i>	23 cases
<i>Pregnancy-induced hypertension</i>	20 cases
<i>Poor maternal weight gain</i>	24 cases

TABLE 38 Voluntary screening (2011) among pregnant women for anti-HIV antibody

Pregnant women (Counselling)	1590	cases
Voluntary screening	1558	cases
+ve anti-HIV antibody	36	cases
% positive case	2.3	%

TABLE 39 Age of pregnant women with positive HIV at Maharaj Nakorn Chiang Mai (2011)

Age (years)	No. of cases	Percent
15-19	3	8.6
20-24	7	20.0
25-29	10	28.5
30-34	7	20.0
35-39	7	20.0
40-45	1	2.9
45-49	-	-
Total	35	100

Mean age (years) 28.69

Standard deviation 6.356

Range 17-42 years

TABLE 42 Number of marriages of the pregnant women with positive HIV at Maharaj Nakorn Chiang Mai (2011)

Number	No. of cases	Percent
1	4	11.4
2	23	65.7
3	5	14.3
4	-	-
Unknown	3	8.6
Total	35	100

TABLE 43 Occupations of the pregnant women with positive HIV at Maharaj Nakorn Chiang Mai (2011)

Occupations	No. of cases	Percent
Employee	18	51.4
Housewife	12	34.3
Commercial	1	2.9
Business	2	5.7
Governor	1	2.9
Agriculture	-	-
Others	1	2.9
Total	35	100

TABLE 44 Residence (province) of the pregnant women with positive HIV at Maharaj Nakorn Chiang Mai (2011)

Province	Number	Percent
Chiang Mai (เชียงใหม่)	30	85.7
Lamphun (ลำพูน)	2	5.7
Chiang Rai (เชียงราย)	1	2.9
Maehongson (แม่ฮ่องสอน)	2	5.7
Total	40	100

TABLE 45 Complications of the pregnant women with positive HIV at Maharaj Nakorn Chiang Mai (2011)

	Cases	Percent
Without complicaiton	15	42.9
With complication	20	57.1
● Antepartum	16	
● Intrapartum	2	
● Postpartum	2	

TABLE 46 Birth weight in the pregnant women with posi-tive HIV at Maharaj Nakorn Chiang Mai (2011)

Birth weight (grams)	Number	Percent
< 1,499	1	2.9
1,500 - 1,999	1	2.9
2,000 - 2,499	11	31.4
2,500 - 2,999	13	37.1
3,000 - 3,499	8	22.8
3,500 - 3,999	1	2.9
Total	35	100

Mean birthweight (grams) 2,690
Standard deviation (grams) 511.688
Range (grams) 1490-3,910

TABLE 47 Postpartum contraception of pregnant women with positive HIV at Maharaj Nakorn Chiang Mai (2011)

Method	No. of cases	Percent
Female sterilization	21	60.0
Male sterilization	2	5.7
Combined pills	4	11.4
IUD	1	2.9
Condom	5	14.3
Unknown	2	5.7
Total	35	100

Section IV

PRENATAL INVESTIGATION

Antepartum Fetal Testing

Primary Surveillance

Fetal Movement Count: For low-risk and high-risk pregnancies

Non-stress test

or **Acoustic stimulation test** 1140 tests
(OPD, 920; LR, 148; OB2&3, 72)

Secondary Surveillance

Contraction stress test

or **Nipple stimulation test** 5 tests

Biophysical profile/ultrasonography 90 tests

Doppler velocimetry 350 tests

Prenatal Diagnosis

1. **Ultrasonography** 8,537 examinations
(~ 25 % for gynecologic and infertile examinations)
2. **Amniocentesis** 1,086 cases
3. **Cordocentesis** 460 cases
4. **Chorionic villous sampling** 81 procedures

OBSTETRIC ULTRASOUND SERVICE

Number of Patients undergoing sonographic examinations (OB&GYN) in 2,011

8,537 cases

Several examinations involved in the researches without specific indications

Indications for sonographic examination	
■ Uncertained date of gestation	7.06 %
■ Suspected intrauterine growth retardation	1.59 %
■ Bleeding in first half of pregnancy	2.65 %
■ Antepartum hemorrhage	0.83 %
■ Suspected fetal death	0.25 %
■ Rule out fetal anomalies	38.46 %
■ Fetal growth surveillance	8.17 %
■ Gynecologic ultrasound	22.46 %
■ Infertile investigation	1.71 %
■ Perinatal research	14.70 %
■ Screening in menopausal women	2.12 %

Cordocentesis (2011)

Total 460 cases

Indications	No.	%
1. Previous child with hydrops fetalis	9	2.0
2. Pregnancy at risk for Hb Bart's	66	14.3
3. Previous child with β thal major	3	0.7
4. Pregnancy at risk for β thal major	49	10.7
5. Previous child with β thal Hb/E	7	1.5
6. Pregnancy at risk for β thal Hb/E	185	40.2
7. Chromosome analysis	42	9.1
8. Combined chromosome and risk for Hb bart's , β thal major, β thal Hb/E and risk Hb bart's + β thal/E	64	13.9
9. Combined chromosome and previous child with Hb bart's , β thal major and β thal Hb/E	4	0.9
10. Uncertain OFT	2	0.4
11. Combined chromosome analysis and uncertain OFT	15	3.3
12. Repeat for chromosome confirmation	11	2.4
13. Repeat for Hb typing	2	0.4
14. Others	1	0.2
Total	460	100

Amniocentesis (2011)

Total 1,086 cases

Indications for amniocentesis	
Elderly gravida (age of more than 35 years)	1034
□ with no other obvious risk	1015
□ with previous child with Down syndrome	1
□ with fetal anomaly / sonomarkers	4
□ with high risk for Down syndrome screening	14
Pregnancy with high risk for Down syndrome screening	34
□ with Down syndrome in previous child	4
□ with history of Down syndrome in family	2
□ with fetal anomaly and sonomarkers	11
□ Maternal anxiety and Maternal request	1

Chorionic Villous Sampling (2011)

Total 81 procedures (1 set of twins)

Indications	Number
1. Fetal chromosome study	18
■ elderly gravida	7
■ Thickened nuchal translucency	6
■ Previous fetal trisomy	1
■ Fetal cystic hygroma	1
■ Elderly gravida with thickened nuchal translucency	2
■ Elderly gravida with previous trisomy 21	1
2. Risk for fetal severe thalassemia	56
■ Risk for Hb Bart's disease	29
■ Risk for beta thalassemia major	9
■ Risk for beta thalassemia/Hb E disease	17
3. Fetal chromosome study and thalassemia diagnosis	8
■ Elderly gravida with fetal risk for Hb Bart's disease	3
■ Elderly gravida with fetal risk for beta thalassemia major	1
■ Elderly gravida with beta thalassemia/Hb E disease	3
■ Thickened nuchal translucency with fetal risk for Hb Bart's disease	3

Prevention and Control Thalassemia Program

Chiang Mai strategy

- 1) Genetic counseling
- 2) Identification of pregnancy at risk
 - 2.1 Retrospective screening (history review for known risk)
 - 2.2 Prospective screening
 - Screening test
 - MCV or 2 min OF (2-minute osmotic fragility test)
 - HbE screening test (only if 2 min OF is negative)
 - Diagnostic test (if both of the couple are positive screening test)
 - HbA₂ level & PCR for α -thal1 if 2 min OF is positive
 - HbA₂ level (negative 2 min OF but positive Hb E)
- 3) Prenatal diagnosis for pregnancy at risk
 - 3.1 Prenatal counseling
 - 3.2 Cordocentesis (16-22 weeks of gestation)
 - 3.3 Fetal blood analysis (checking maternal blood with acid elution test and hemoglobin typing with HPLC)
- 4) Counseling and termination of affected pregnancy

+ve OFT = OFT < 60%, MCV +ve = ≤ 78 fl +ve % HbA₂ = HbA₂ > 4%

PROSPECTIVE SCREENING FOR THALASSEMIA PROGRAM 2011

	Number
Total number of pregnant screened	1,202
Positive OFT or Hb E	312
Number of couple at risk for thalassemia	25
■ Risk for Hb Bart's	5
■ Risk for Beta-thalassemia major	3
■ Risk for Beta thalassemia/Hb E	17
The choice which selected by couples	
■ Cordocentesis	14
■ Chorionic villus samplings	2
■ Refused PND	2
■ Advanced gestational age GA	4
■ Abortion before selection	1
■ Ultrasonography	1
■ No information	1
Result of PND	
■ Hb bart's	2
■ Beta thalassemia major	1
■ Beta thalassemia/Hb E	2

Down Syndrome Screening (2011)

Total 520 cases

Low risk : 484 cases

High risk: 34 cases

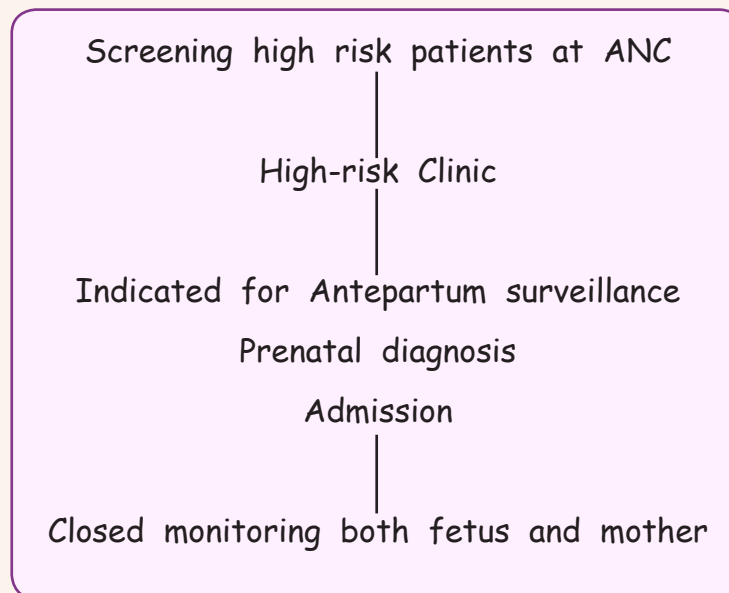
PND Results (34 cases)

PND Result	Number
Normal chromosome	28
Trisomy 21	0
Trisomy 13	2
Trisomy 18	1
45,X	3
Not PND	2
Total	34

High Risk Pregnancy

Number of patients approximately 450 cases

Management Guideline



High-risk patients at Maharaj Nakorn Chiang Mai Hospital in 2011

- | | |
|---|--------|
| 1. Elderly Gravida (age of 35 years or more) | 15.6 % |
| 2. Teenage Pregnancy (age of less than 20 years) | 7.9 % |
| <i>Early adolescence (age of less than 17 years)</i> | 1.5 % |
| <i>Late adolescence (age of 17-19 years)</i> | 6.4 % |
| 3. Pregnancy complicated with medical or obstetrical diseases | 8.5 % |

Note Some high-risk pregnancies were not included in the high-risk clinic and in this report e.g. maternal short stature, breech presentation, and previous cesarean section.