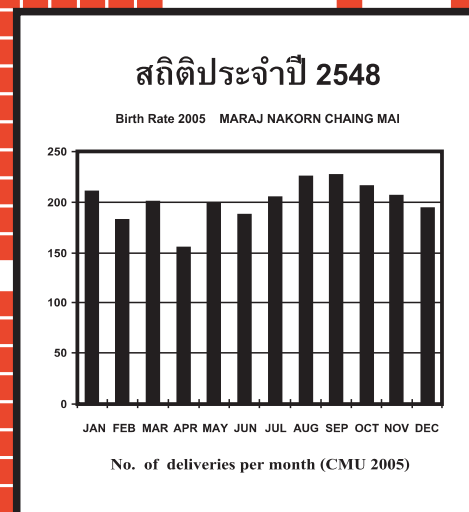


MATERNAL-FETAL MEDICINE 2005



หน่วยเวชศาสตร์มารดาและทารก
ภาควิชาสูติศาสตร์และนรีเวชวิทยา
คณะแพทยศาสตร์ มหาวิทยาลัยเชียงใหม่



ANNUAL REPORT 2005
MATERNAL-FETAL MEDICINE
DEPARTMENT OF OBSTETRICS AND GYNECOLOGY
FACULTY OF MEDICINE, CHIANG MAI UNIVERSITY
CHIANG MAI, THAILAND

MATERNAL-FETAL MEDICINE 2005

ASSOCIATE PROFESSOR CHAIRAT KUNAVIKTIKUL M.D.
ASSOCIATE PROFESSOR PANNEE SIRIVATANAPA M.D.
PROFESSOR THEERA TONGSONG M.D.
ASSOCIATE PROFESSOR CHANANE WANAPIRAK M.D.
ASSISTANT PROFESSOR Dr. WIRAWIT PIYAMONGKOL M.D.
ASSOCIATE PROFESSOR SUPATRA SIRICHOTIYAKUL M.D.
ASSOCIATE PROFESSOR PHARUHAS CHANPRAPAP M.D.
INSTRUCTOR FUANGLADA TONGPRASERT M.D.
RATANAPORN SEKARARITHI BSc.
ACHARAWAN YAMPOCHAI BSc.
APIRADEE TAGGAPICHITTI BSc.
UBOL LEOPREECHA

สถิติประจำปี 2548

อนุสาขาเวชศาสตร์มารดาและทารก
ภาควิชาสูติศาสตร์และนรีเวชวิทยา
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อนุสาขาเวชศาสตร์มารดาและทารก

รองศาสตราจารย์ นายแพทย์ ชัยรัตน์ คุณาวิภัติกุล
รองศาสตราจารย์ แพทย์หญิง พรรณี ศิริวรรณานาภา
ศาสตราจารย์ นายแพทย์ วีระ ทองสง
รองศาสตราจารย์ นายแพทย์ ชเนนทร์ วนากิรักษ์
ผู้ช่วยศาสตราจารย์ นายแพทย์ ดร. วีรวิทย์ ปิยะมงคล
รองศาสตราจารย์ แพทย์หญิง สุพัตรา ศิริโชติยะกุล
รองศาสตราจารย์ นายแพทย์ พฤษัทธ์ จันทรประภาพ
อาจารย์แพทย์หญิง เพ็ญลดา ทองประเสริฐ
รัตนภรณ์ เศรษฐฤทธิ์
อัจฉราวรรณ แยมโพธิ์ไช้
อภิรดี ตรรกไพจิตร
อุบล เลี้ยวปรีชา

PREFACE

This annual report 2005 on maternal-fetal medicine has been published with great contribution from Dr. Pannee, Dr Theera and their colleagues in the MFM division. It reflects our work and advance in obstetric care and can be used as a benchmark for medical personnels involved in this field.

I would like appreciate and express my sincere thanks to my colleagues for their hardworking and dedication to our OB & GYN Department. I gratefully acknowledge Associate Professor Sirivatanapa, Chief of the MFM Division and Professor Theera Tongsong for ongoing this report.

*Jatupol Srisomboon, M.D.
Professor & Chairman
Department of Obstetrics and Gynecology
Faculty of Medicine, Chiang Mai University
Chiang Mai 50200, Thailand*

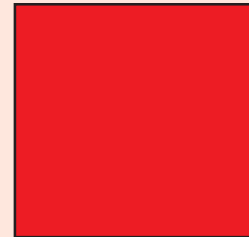
PREFACE

The 2005 annual report of Maternal-Fetal Medicine still presents various interesting data. This year our unit has established Down screening program with nuchal translucency and we are going to launch the serum marker screening program.

Of interest, the total number of delivery is still steadily decreased but the high risk patients and perinatal work-ups are continuously increased. Moreover, we conducted several researches published via pubmed in the last year.

This year, our annual report is also presented online as seen on the homepage of our department. We hope that this report can be used as a benchmark for obstetricians in providing the best care to all pregnant women.

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



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ANNUAL REPORT



2005

MATERNAL-FETAL MEDICINE

Presentation : January 2006

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 (gestational age > 22 weeks)

47 cases of total births 2,463 cases

- *Gestational age between 22-27 weeks 32 cases (61.5 %)*

	<i>CMU cases</i>	<i>Referred cases</i>	<i>Total</i>
<i>Low risk</i>	5	2	7
<i>High risk</i>	10	3	13
<i>Autopsy</i>	9	3	12

Causes of death

1. Normally formed macerated stillbirth	3	1	4	cases
2. Congenital malformations	3	4	7	cases
3. Conditions associated with immaturity	11	1	12	cases
4. Asphyxia developed in labor	-	-	-	cases
5. Other specific conditions	-	-	-	case

■ *Gestational age between ≥ 28 weeks 20 cases (38.5 %)*

	<i>CMU cases</i>	<i>Referred cases</i>	<i>Total</i>
<i>Low risk</i>	3	2	5
<i>High risk</i>	10	12	22
<i>Autopsy</i>	6	8	14

Causes of death

1. Normally formed macerated stillbirth	2	2	4	cases
2. Congenital malformations	6	9	15	cases
3. Conditions associated with immaturity	3	1	4	cases
4. Asphyxia developed in labor	1	2	3	cases
5. Other specific conditions	1	-	1	cases

Stillbirth rate :

Stillbirth rate = 19.08 per 1000 total births

(by old WHO definition : ≥ 28 weeks' gestation or birth weight > 1000 grams)
(not included therapeutic termination due to fetal malformations)

Stillbirth rate = 10.96 per 1000 total births

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

NEONATAL DEATH

Neonatal death 25 cases (GA > 22 weeks) of total 2337 live births

■ *Gestational age between 22-27 weeks 13 cases (52 %)*

	<i>CMU cases</i>	<i>Referred cases</i>	<i>Total</i>
<i>Low risk</i>	0	0	0
<i>High risk</i>	11	2	13
<i>Autopsy</i>	2	1	3

Causes of death

1. Normally formed macerated stillbirth	-	-	-	case
2. Congenital malformations	-	1	1	case
3. Conditions associated with immaturity	6	0	6	cases
4. Asphyxia developed in labor	-	-	-	case
5. Other specific conditions	5	5	6	cases

■ **Gestational age between ≥ 28 weeks 12 cases (48 %)**

	CMU cases	Referred cases	Total
Low risk	2	5	7
High risk	2	3	5
Autopsy	1	4	5

Causes of death

1. Normally formed macerated stillbirth	-	-	-	case
2. Congenital malformations	1	7	8	cases
3. Conditions associated with immaturity	1	1	2	cases
4. Asphyxia developed in labor	1	0	1	case
5. Other specific conditions	1	0	1	cases

Early neonatal death rate 10.69 per 1,000 live births

(≥ 22 week's gestation or 1000 grams and died within first 7 days of life)

Early neonatal death rate 5.13 per 1,000 live births

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

PERINATAL DEATH

Perinatal Mortality (including the referral cases)

1. Gestational age ≥ 28 weeks (stillbirths + early neonatal death)

perinatal death rate = 16.09

2. Gestational age ≥ 22 weeks (stillbirths + neonatal death)

perinatal death rate = 29.77 per 1000 total births.

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

MATERNAL DEATH

Total **2** **cases**
(Both were referred cases)

Maternal mortality rate 0.85 per 1000 livebirths

Causes of maternal death

Acute fatty liver	1 case
Fuminant hepatitis	1 case

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

Summary

DATA	2005
Total birth (neonates)	2463
Stillbirth	47
• 22-27 weeks	20
• ≥ 28 weeks	27
Stillbirth rate/1000 births	
• > 28 weeks / birthweight $> 1,000$ gm	10.96
• > 22 weeks / birthweight > 500 gm	19.08
Early neonatal death	25
• Early neonatal death rate / 1000 total birth (≥ 28 weeks)	5.13
• Early neonatal death rate / 1000 total birth (≥ 22 weeks)	10.69

Section II

GENERAL OBSTETRICS

TABLE 1 Distribution of Singleton & Multifetal Pregnancies

Type of pregnancy	Number	Percent
Singleton	2378	98.3
Twins	40	1.7
Triplet	2	0.1
Total	2420	100.0

TABLE 2 Categories of the Pregnant Women

	2004		2005	
	Number	Percent	Number	Percent
General Cases	2028	77.2	1901	78.6
Private Cases	600	22.8	519	21.4
Total	2628	100.0	2420	100.0

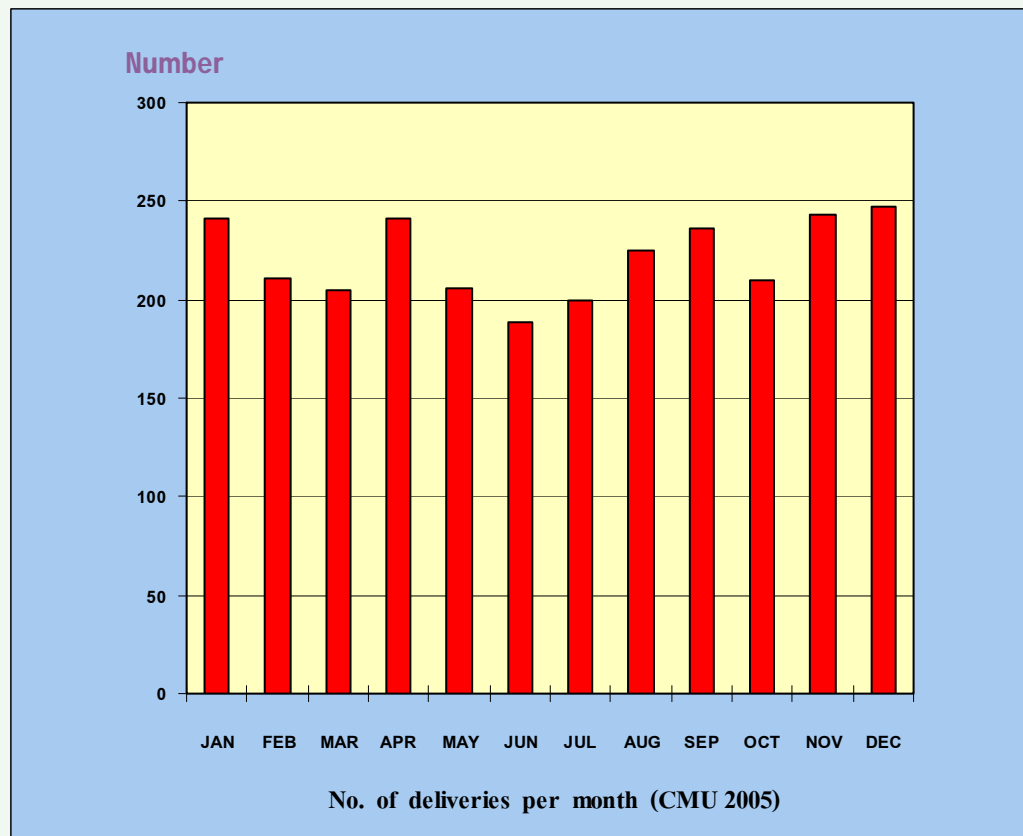
TABLE 3 Categories of the Pregnant Women

	Number	Percent
ANC at Maharaj Nakorn Chiang Mai Hospital	1388	57.4
Private Clinic	519	21.4
ANC at Other Hospitals	440	18.2
No ANC	73	3.0
Total	2420	100.0

TABLE 4 Number and Percentage of Deliveries per month

Month	Number (Neonates)	Percent
January	211	8.72
February	183	7.56
March	201	8.30
April	156	6.45
May	199	8.22
June	189	7.81
July	206	8.51
August	226	9.34
September	227	9.38
October	218	9.01
November	208	8.59
December	196	8.10
Total	2420	100.0

**FIGURE 1 Histogram : Number of Deliveries from
January to December 2005**



Total deliveries in 1999 = 3066 cases

Total deliveries in 2000 = 3105 cases

Total deliveries in 2001 = 3103 cases

Total deliveries in 2002 = 2815 cases

Total deliveries in 2003 = 2753 cases

Total deliveries in 2004 = 2654 cases

Total deliveries in 2005 = 2420 cases

TABLE 5 Number and percentage of parturients by age

Age	Number	Percent	Age	Number	Percent
13	1	0.0	30	114	4.7
15	16	0.7	31	122	5.0
16	23	1.0	32	106	4.4
17	41	1.7	33	103	4.3
18	70	2.9	34	83	3.4
19	70	2.9	35	71	2.9
20	89	3.7	36	71	2.9
21	92	3.8	37	63	2.6
22	98	4.0	38	43	1.8
23	125	5.2	39	33	1.4
24	128	5.3	40	37	1.5
25	162	6.7	41	22	0.9
26	143	5.9	42	10	0.4
27	163	6.7	43	11	0.5
28	149	6.2	44	2	0.1
29	155	6.4	45	3	0.1
			46	1	.0
Total				2420	100.0

Average age (Mean±Standard deviation) 27.77±6.1 years

TABLE 6 Number and percentage of parturients by age group

Age Group	Number	Percent
10-14	1	0.0
15-19	220	9.1
20-24	532	22.0
25-29	772	31.9
30-34	528	21.8
35-39	281	11.6
40-44	82	3.4
45-49	4	0.2
Total	2420	100.0

Summary : Age of parturients

- | | |
|---|---------------|
| 1. Adolescent Pregnancies (11-19 years) | 221 (9.2 %) |
| Early Adolescent Pregnancies (≤ 16 years) | 40 (1.7 %) |
| Late Adolescent Pregnancies (17-19 years) | 181 (7.5 %) |
| 2. Adult Pregnancies (20-34 years) | 1832 (75.7 %) |
| 3. Elderly Pregnancies (≥ 35 years) | 367 (15.2 %) |

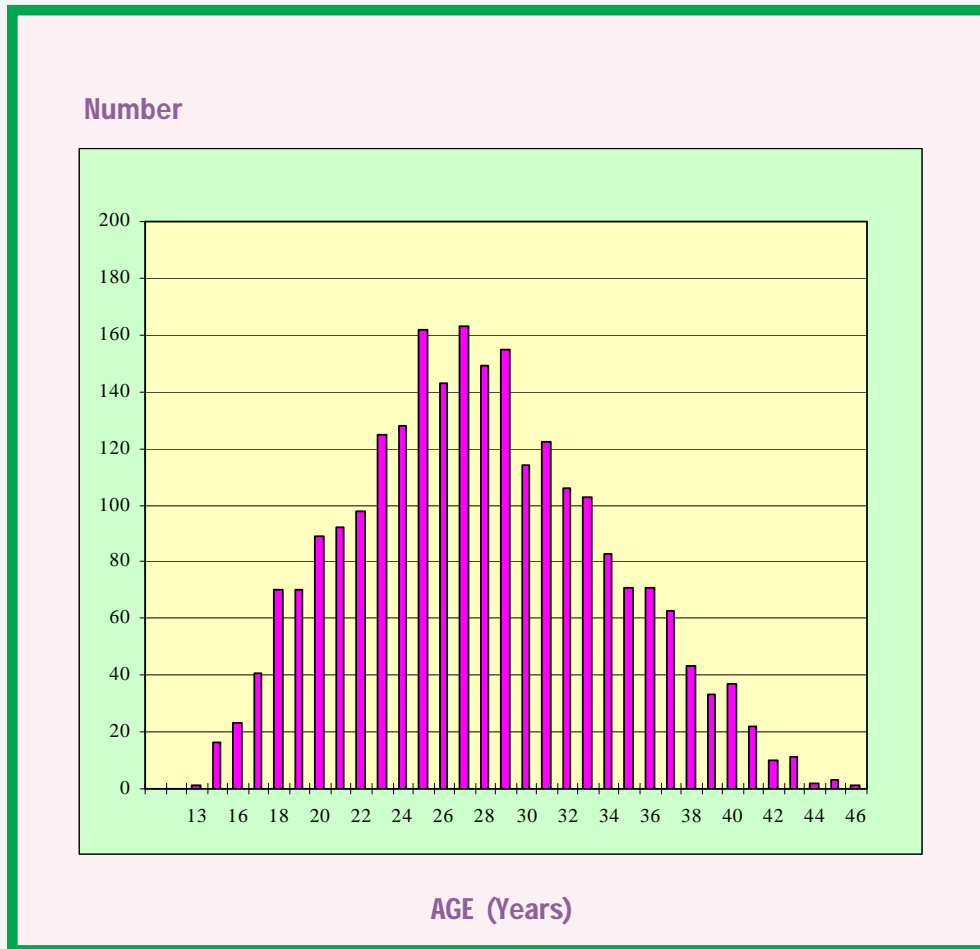
FIGURE 2 Histogram : Number of Parturients by Age

TABLE 7 Parity of parturients

Parity	Number	Percent
0	398	57.8
1	834	34.5
2	160	6.6
3	19	0.8
4	4	0.2
5	4	0.2
6	1	0.0
Total	2420	100.0

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

Nulliparous 57.8 %

Multiparous 42.2 %

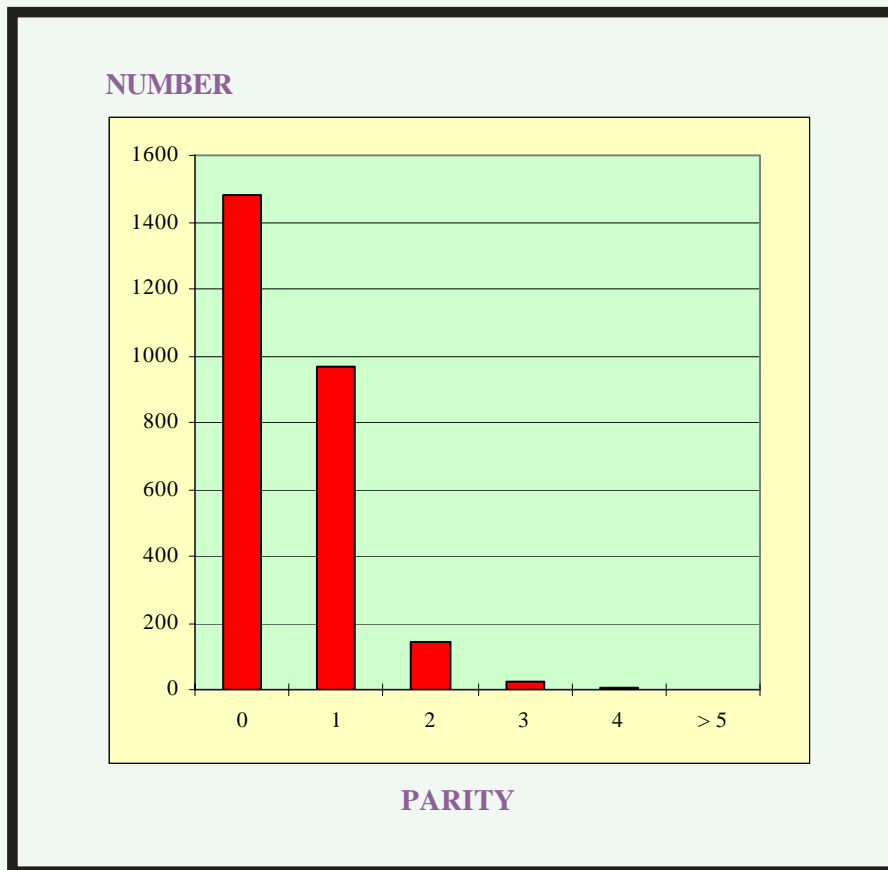
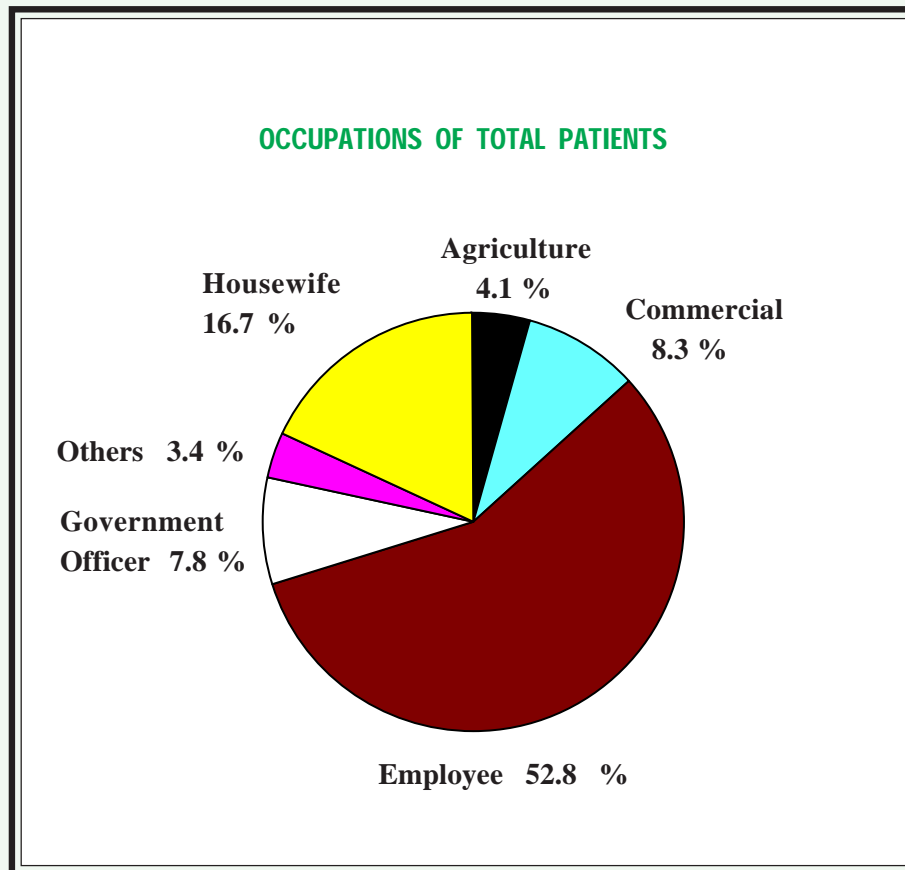
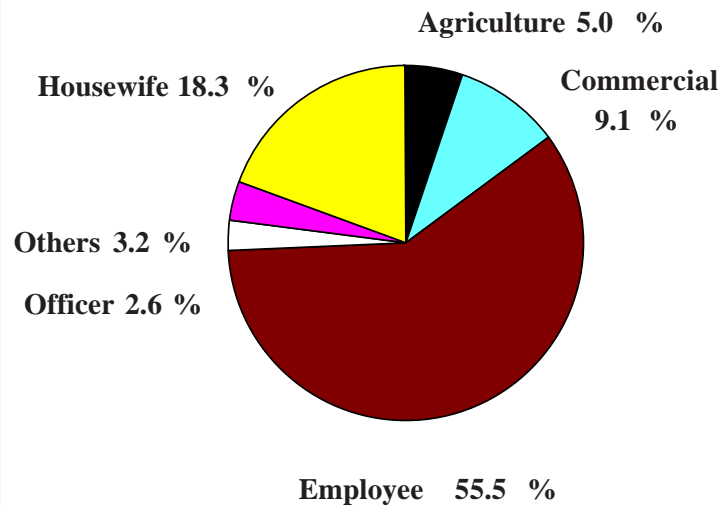
FIGURE 3 Histogram : Number of parturients by parity

TABLE 8 Distribution of the occupations of the parturients

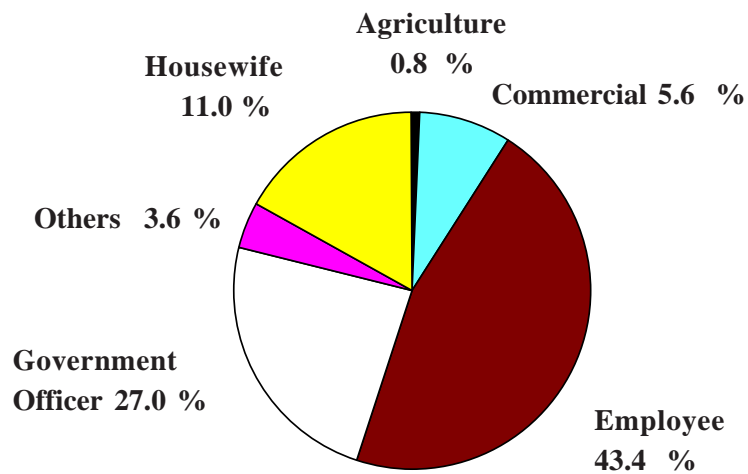
Occupations	Total		General		Private	
	Number	Percent	Number	Percent	Number	Percent
Agriculture	99	4.1	94	5.0	4	.8
Commercial	202	8.3	171	9.1	29	5.6
Employee	1277	52.8	1045	55.5	225	43.4
Government Officer	189	7.8	48	2.5	140	27.0
Private Business	33	1.4	20	1.1	12	2.3
Housewife	403	16.7	344	18.3	57	11.0
Student	31	1.3	31	1.6	0	0.0
Others	16	0.7	9	.5	7	1.3
Total	2250	100.0	1762	100.0	474	100.0

FIGURE 4 Pie : Distribution of patient's occupations

OCCUPATIONS OF THE GENERAL PATIENTS



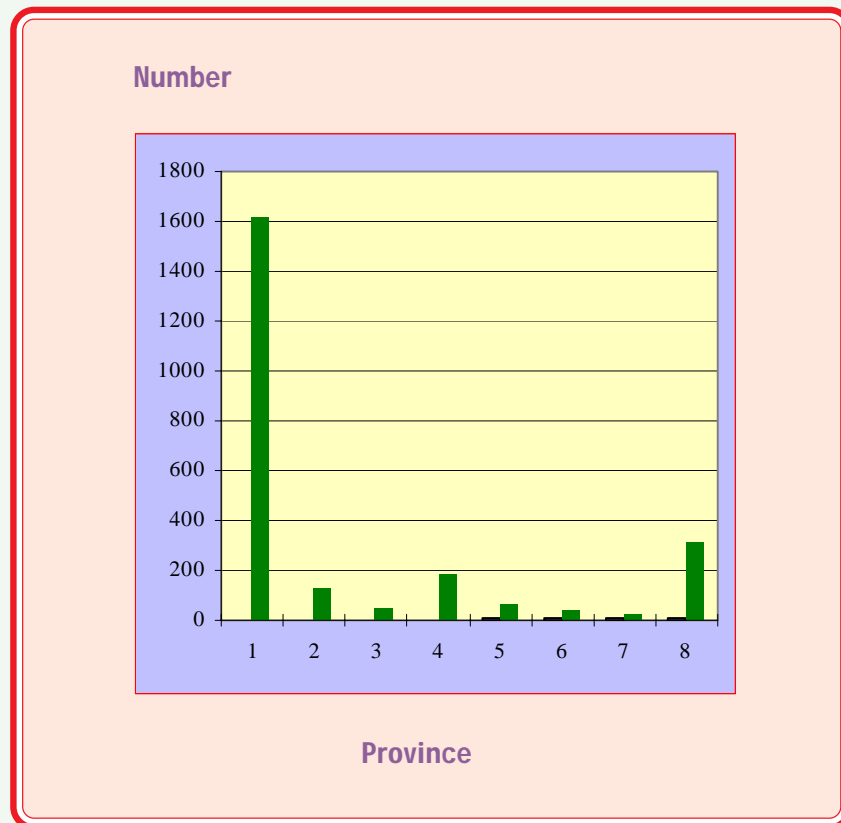
OCCUPATIONS OF THE PRIVATE PATIENTS



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

Province	Number	Percent
Chiang Mai (เชียงใหม่)	1620	66.9
Chiang Rai (เชียงราย)	131	5.4
Lampang (ลำปาง)	47	1.9
Lamphun (ลำพูน)	183	7.6
Maehongsorn (แม่ฮ่องสอน)	67	2.8
Payao (พะเยา)	37	1.5
Prae (แพร่)	21	0.9
Others (อื่นๆ)	314	13.0
Total	2420	100.0

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

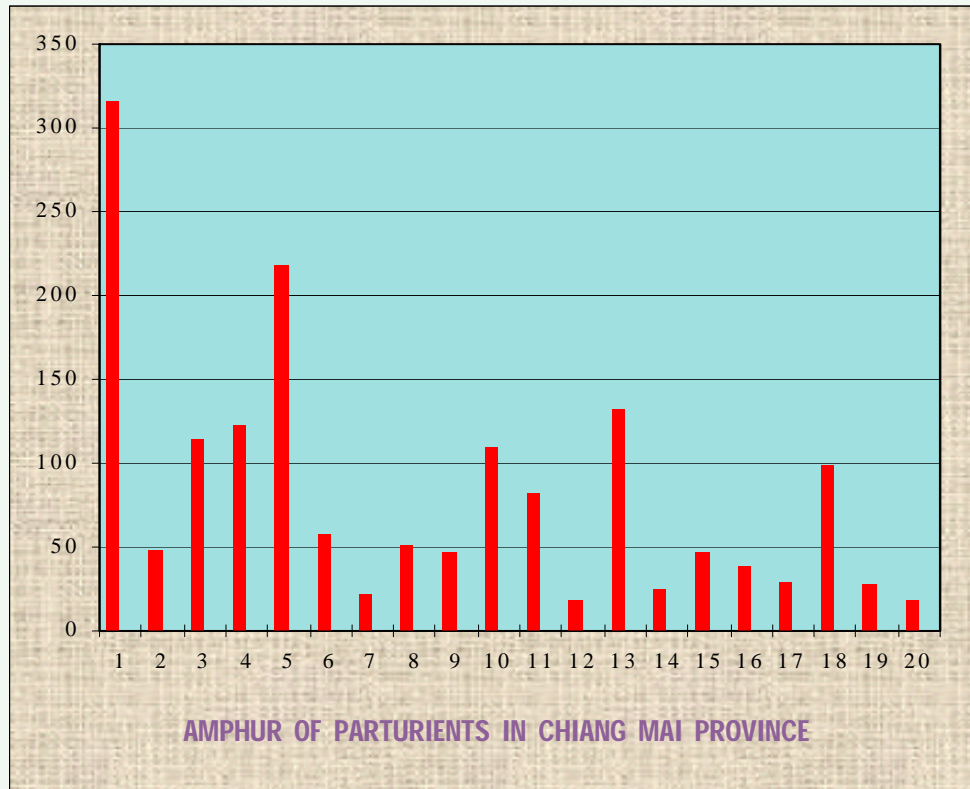


- | | |
|-----------------------------|---------------------------|
| 1. Chiang Mai (เชียงใหม่) | 2. Chiang Rai (เชียงใหม่) |
| 3. Lampang (ลำปาง) | 4. Lamphun (ลำพูน) |
| 5. Maehongsorn (แม่ฮ่องสอน) | 6. Payao (พะเยา) |
| 7. Prae (แพร่) | 8. Others (อื่นๆ) |

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

Amphur	Number	Percent
1. Meung (เมือง)	316	19.5
2. Maerim (แม่ริม)	48	3.0
3. Doisaked (ดอยสะเก็ด)	114	7.0
4. Sanpatong (สันป่าตอง)	123	7.6
5. Hangdong (หางดง)	218	13.5
6. Jomtong (จอมทอง)	57	3.5
7. Mae-ai (แม่สาย)	22	1.4
8. Prao (พร้าว)	51	3.1
9. Hod (ฮอด)	46	2.8
10. Sarapee (สารภี)	110	6.8
11. Maetang (แม่แตง)	82	5.1
12. Omkoi (อมก๋อย)	18	1.1
13. Sankampang (สันกำแพง)	132	8.1
14. Samoeng (สะเมิง)	25	1.5
15. Chiangdao (เชียงใหม่)	47	2.9
16. Phang (ฝาง)	38	2.3
17. Doitao (ดอยเต่า)	29	1.8
18. Santrai (สันทราย)	99	6.1
19. Maejam (แม่แจ่ม)	27	1.7
20. Chaiprakarn (ไชยปราการ)	18	1.1
Total	1620	100.0

FIGURE 6 Histogram : Number of parturients in each Amhur 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	13	0.5	32	17	0.7
21	9	0.4	33	36	1.5
22	7	0.3	34	35	1.5
23	8	0.3	35	61	2.6
24	7	0.3	36	123	5.2
25	15	0.6	37	336	14.1
26	18	0.8	38	574	24.1
27	14	0.6	39	520	21.9
28	18	0.8	40	367	15.4
29	27	1.1	41	124	5.2
30	18	0.8	42	9	0.4
31	18	0.8			
Total	2374	100.0			

Average of Gestational Age 37.37 ± 3.6 Weeks

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

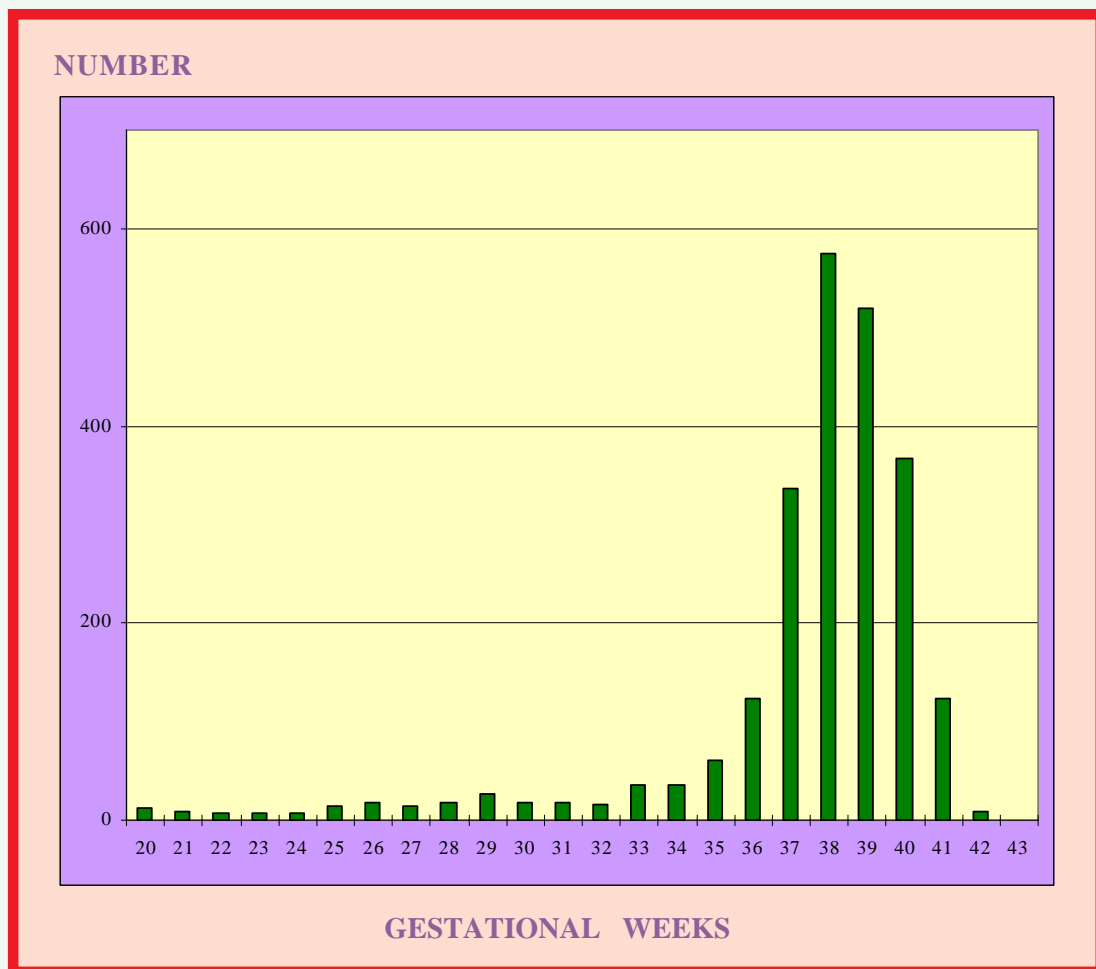


TABLE 12 Number and percentage of parturients by gestational age group in singleton pregnancies.

Gestational Age Group	Number	Percent
Immature (20-27 weeks)	91	3.8
Premature (28-36 weeks)	353	14.8
Term (37-41 weeks)	1921	80.8
Postterm (42 weeks or more)	9	0.4
Total	2378	100.0

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
21	1	2.5
24	1	2.5
26	1	2.5
27	2	5
28	3	7.5
29	1	2.5
30	2	5
31	2	5
32	4	10
33	3	7.5
34	2	5
35	3	7.5
37	11	27.5
38	2	5
39	1	2.5
40	1	2.5
Total	40	100

Average of Gestational Age 33.1 ± 4.5 Weeks

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

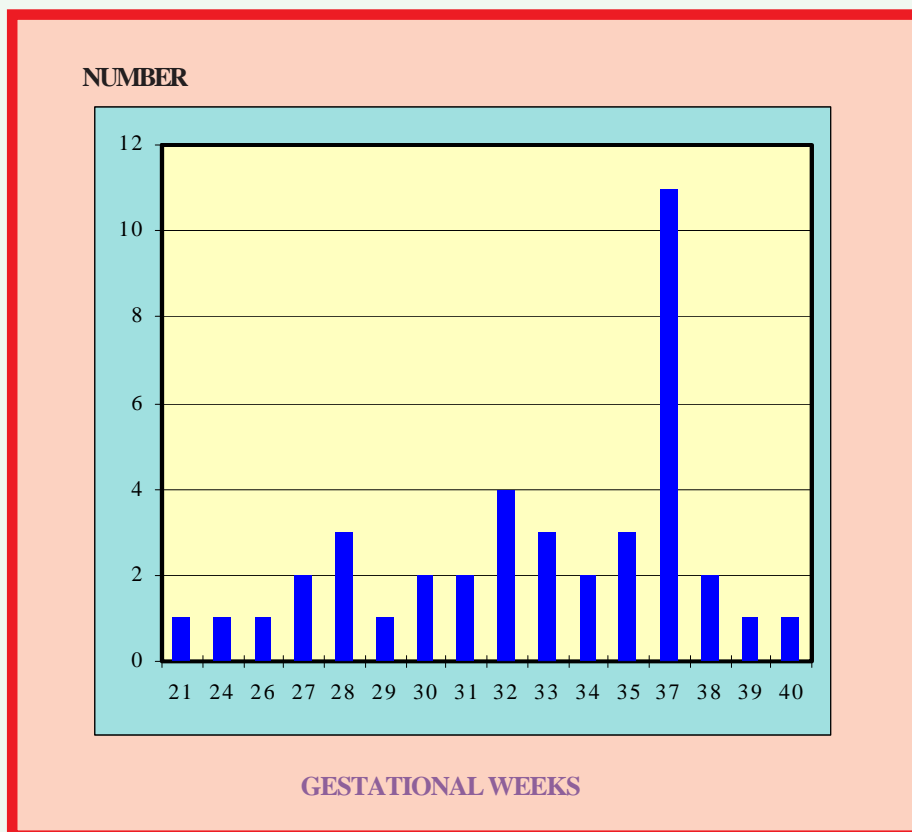


TABLE 14 Number and percentage of parturients by gestational age group in twin pregnancies.

Gestational Age Group	Number	Percent
Immature (20-27 weeks)	5	12.5
Premature (28-36 weeks)	20	50.0
Term (37-41 weeks)	15	37.5
Postterm (> 42 weeks)	0	0.0
Total	40	100.0

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	73	5.1
1	28	1.9
2	45	3.1
3	41	2.8
4	41	2.8
5	49	3.4
6	50	3.5
7	82	5.7
8	131	9.1
9	123	8.5
10	162	11.2
11	193	13.4
12	165	11.4
13	96	6.6
14	68	4.7
15	32	2.2
16	9	0.6
17	2	0.1
Unknown	54	3.7
Total	1444	100.0

Attending ANC at other hospitals 17.9 % of total parturients

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

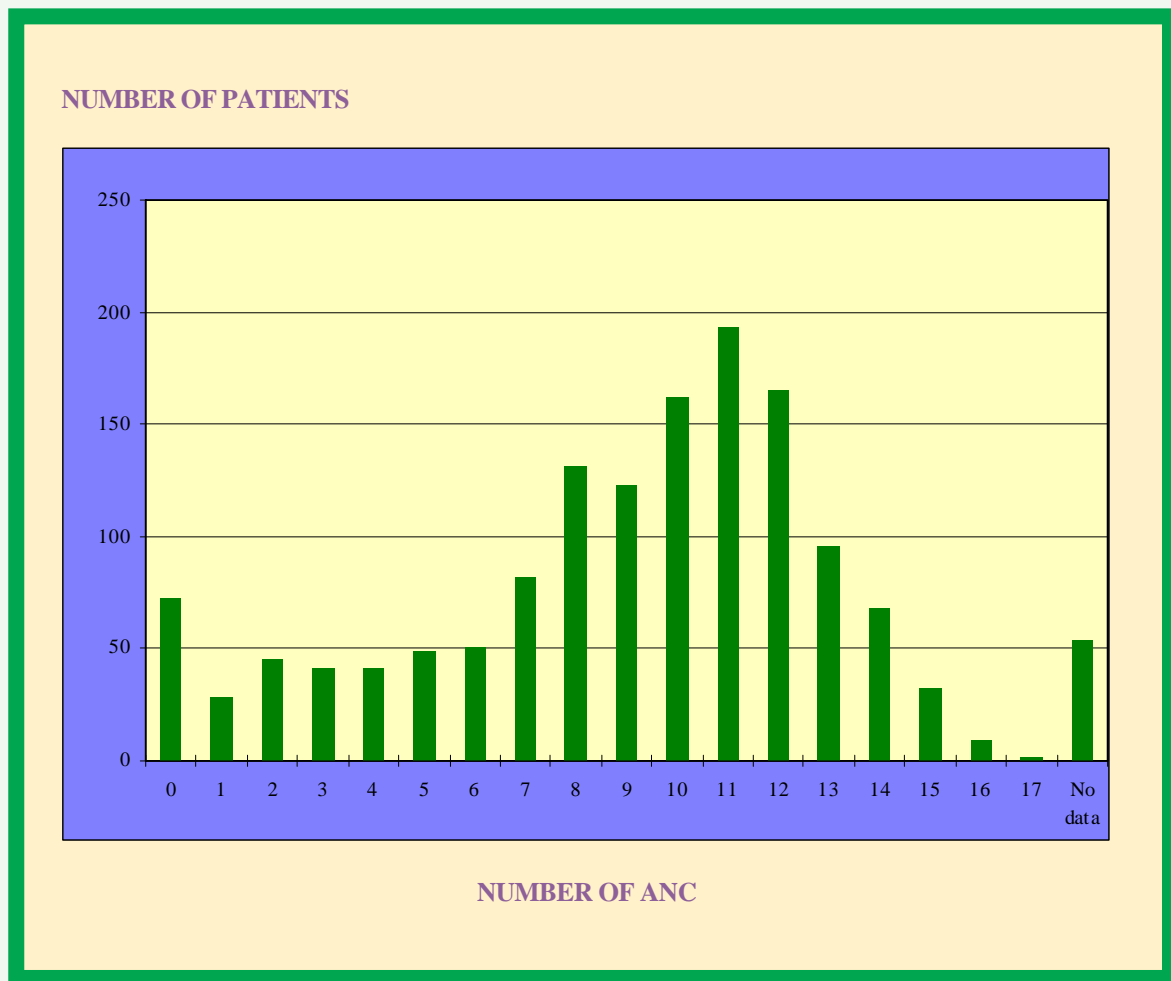


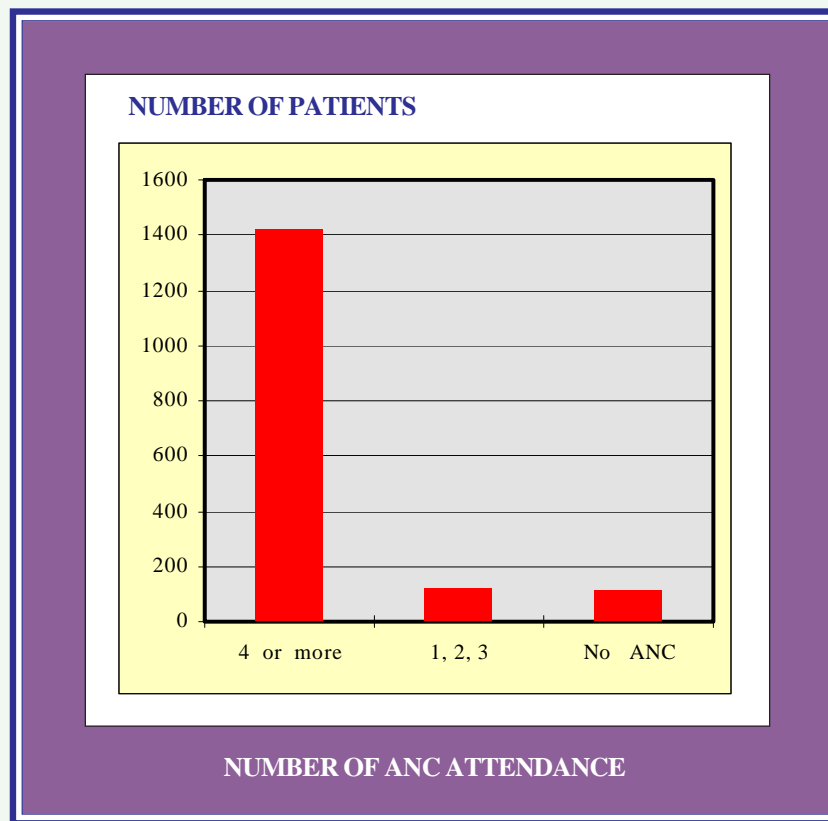
TABLE 16 Number of antenatal care attendance : General patients (not include the patients attending ANC at other hospitals)

Number of ANC	Number of Parturients	Percent
4 or more	1203	86.5
1-3	114	8.2
No ANC	73	5.3
Total	1390	100.0

Note ANC less than 4 is considered to be inadequate

Inadequate ANC 13.5 %

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

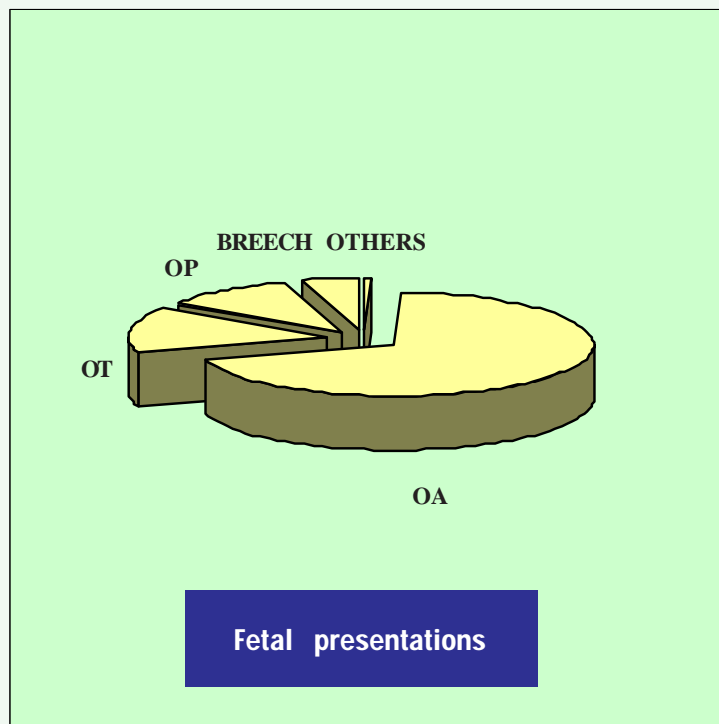


**TABLE 17 Distribution of fetal presentations in labor
(Singleton)**

Fetal Presentation	Percent
Vertex	93.8
Breech	5.9
Transverse lie	0.2
Face	0.0
Compound	0.1

Breech Presentation was 5.9 % 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**

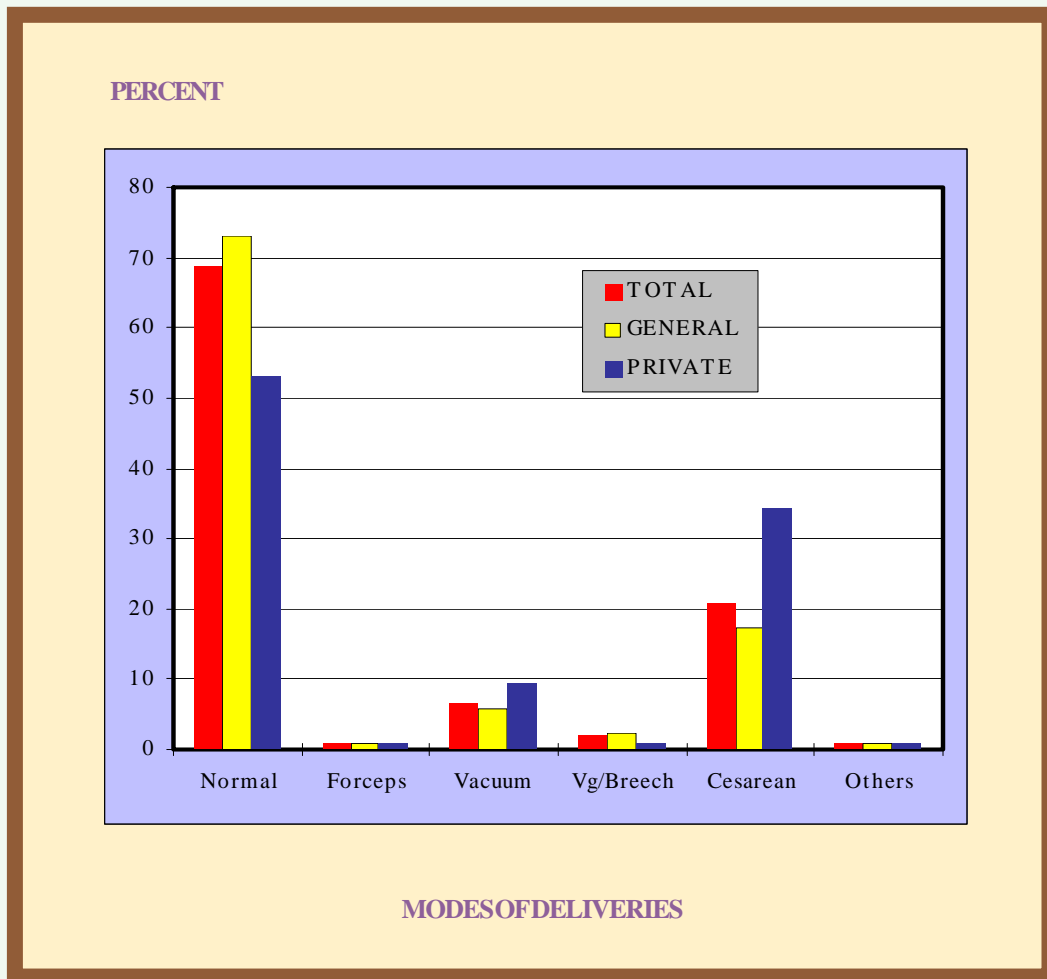
Mode of Delivery	Total		General		Private	
	Number	Percent	Number	Percent	Number	Percent
Normal Delivery	1634	68.7	1363	73.0	271	53.1
Forceps Delivery	21	0.9	16	0.9	5	1.0
Vacuum Delivery	156	6.6	107	5.7	49	9.6
Vaginal Breech Delivery	47	2.0	43	2.3	4	.8
Cesarean Section	497	20.9	321	17.2	176	34.5
Other*	23	1.0	18	1.0	5	1.0
Total	2378	100.0	1868	100.0	510	100.0

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

Twins

Mode of Delivery	Total		General		Private	
	Number	Percent	Number	Percent	Number	Percent
Cesarean Section	20	50.0	15	46.9	5	62.5
Vaginal Delivery	20	50.0	17	53.1	3	37.5
Total	40	100.0	32	100.0	8	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
1. Assisting (Mauriceau-)	31	23.8	29	28.2	2	7.4
2. Assisting (Piper Forceps)	1	.8	1	1.0	-	0.0
3. Total Extraction (Mauriceau-)	7	5.4	6	5.8	1	3.7
4. Total Extraction (Piper Forceps)	-	0.0	-	0.0	-	0.0
5. Spontaneous Breech Delivery	8	6.2	7	6.8	1	3.7
6. Cesarean Section	83	63.8	60	58.3	23	85.2
Total	130	100.0	103	100.0	29	100.0

**Total Cesarean Section Rate in Breech presentation 63.2 %
(General patients; 58.3 %, Private patients; 85.2 %)**

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

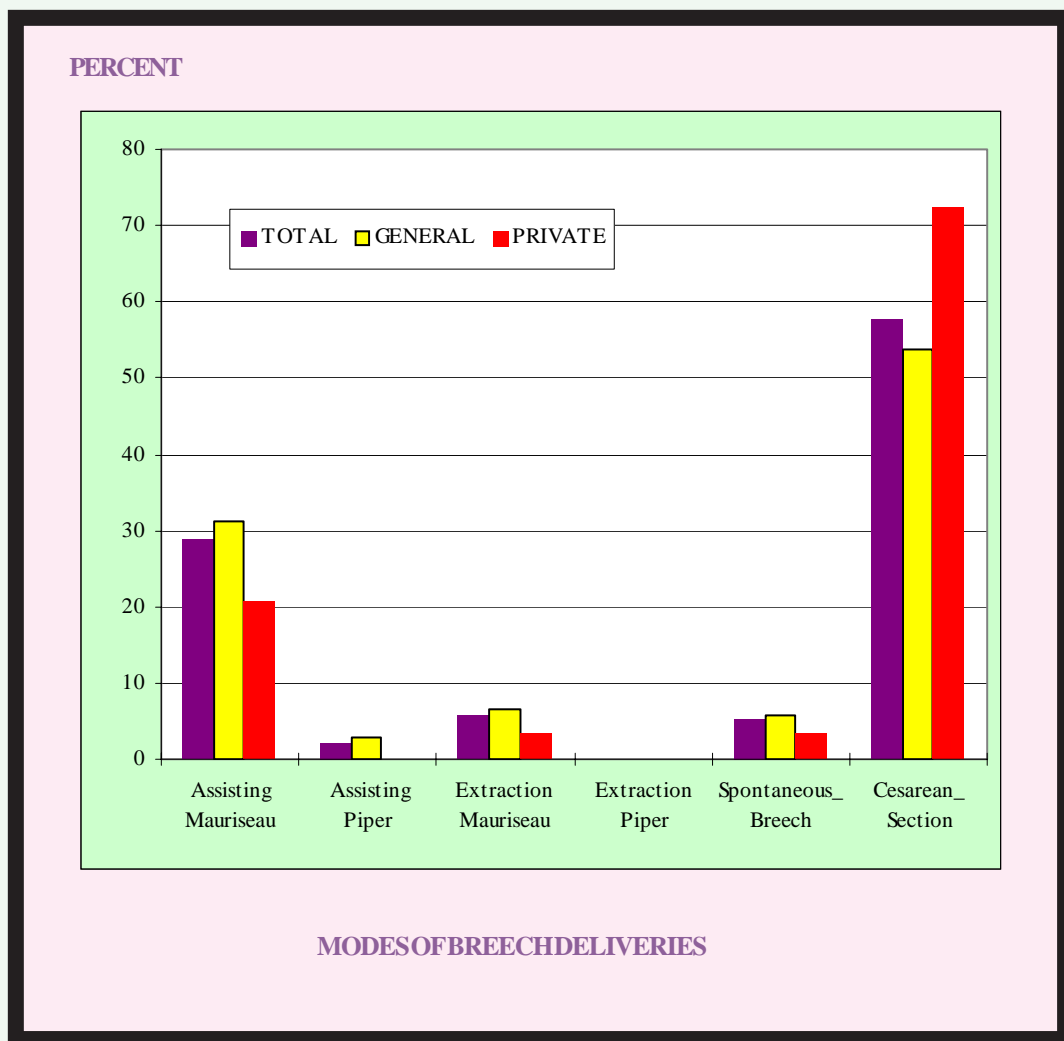


TABLE 20 Frequency of cesarean deliveries according to diagnostic indication (Singleton)

Indications	Total		General		Private	
	Number	Percent	Number	Percent	Number	Percent
1. Previous C/S	129	26.0	66	20.6	63	35.8
2. CPD	176	35.4	116	36.1	60	34.1
3. Breech	83	16.7	60	18.7	23	13.1
4. Fetal distress	42	8.5	26	8.1	16	9.1
6. Placenta previa	22	4.4	15	4.7	7	4.0
7. Transverse lie	6	1.2	4	1.2	2	1.1
8. Prolapsed cord	4	0.8	4	1.2	0	0.0
9. HIV + ve	12	2.4	12	3.7	0	0.0
10. Others*	23	4.6	18	5.6	5	2.8
Total	497	100.0	321	100.0	176	100.0

* Others = Vasa previa, IVF, Carcinoma of cervix, Failed induction, HELLP syndrome etc.

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

Indications	Total		General		Private	
	Number	Percent	Number	Percent	Number	Percent
1. Fetal distress	2	9.5	1	6.3	1	20.0
2. Expected prolonged second stage	11	52.4	9	56.3	2	40.0
3. Poor expulsive force & training	4	19.0	3	18.8	1	20.0
4. Maternal disease	2	9.5	1	6.3	1	20.0
5. Failed vacuum (PIH, etc)	2	9.5	2	12.5	0	0.0
Total	21	100.0	16	100.0	5	100.0

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

Indications	Total		General		Private	
	Number	Percent	Number	Percent	Number	Percent
1. Fetal distress	8	5.1	6	5.6	2	4.1
2. Expected prolonged second stage	26	16.7	24	22.4	2	4.1
3. Poor expulsive force & training	100	64.1	59	55.1	41	83.7
4. Maternal disease (PIH, ect)	14	9.0	12	11.2	2	4.0
5. Others (OPP, OT, etc)	7	4.4	6	4.6	1	2.0
Total	156	100.0	107	100.0	49	100.0

TABLE 23 Sex of Fetuses (Including Multiple Pregnancies)

Sex	Number	Percent
Male	1262	51.2
Female	1167	47.4
Unspecified	33	1.3
Total	2462	100.0

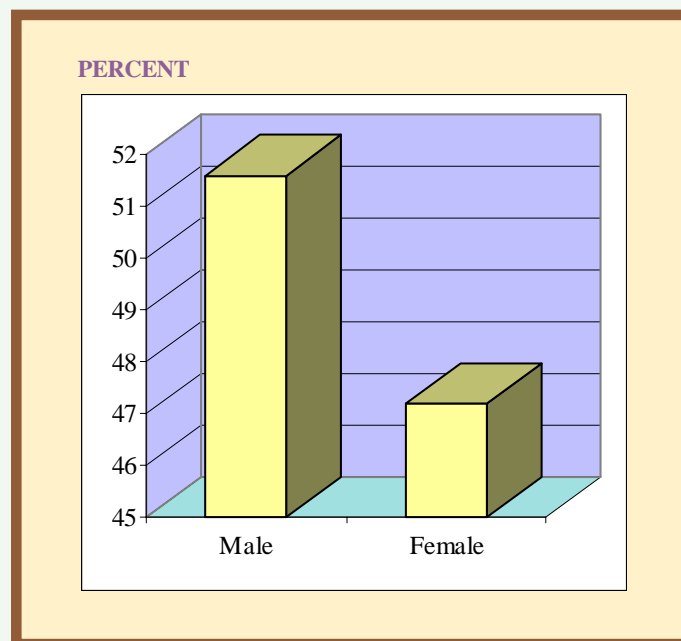
**FIGURE 14 Histogram : Distribution of fetal sex
(including twins)**

TABLE 24 Apgar score at 1 minute of total neonates

Apgar Scores	Number	Percent
0-3 (severe depression)	176	7.1
4-6 (mild depression)	103	4.2
7-10 (no depression)	2183	88.6
Total	2463	100.0

TABLE 25 Apgar score at 5 minutes of total neonates

Apgar Score	Number	Percent
0-3 (severe depression)	135	5.5
4-6 (mild depression)	30	1.2
7-10 (no depression)	2296	93.2
Total	2463	100.0

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

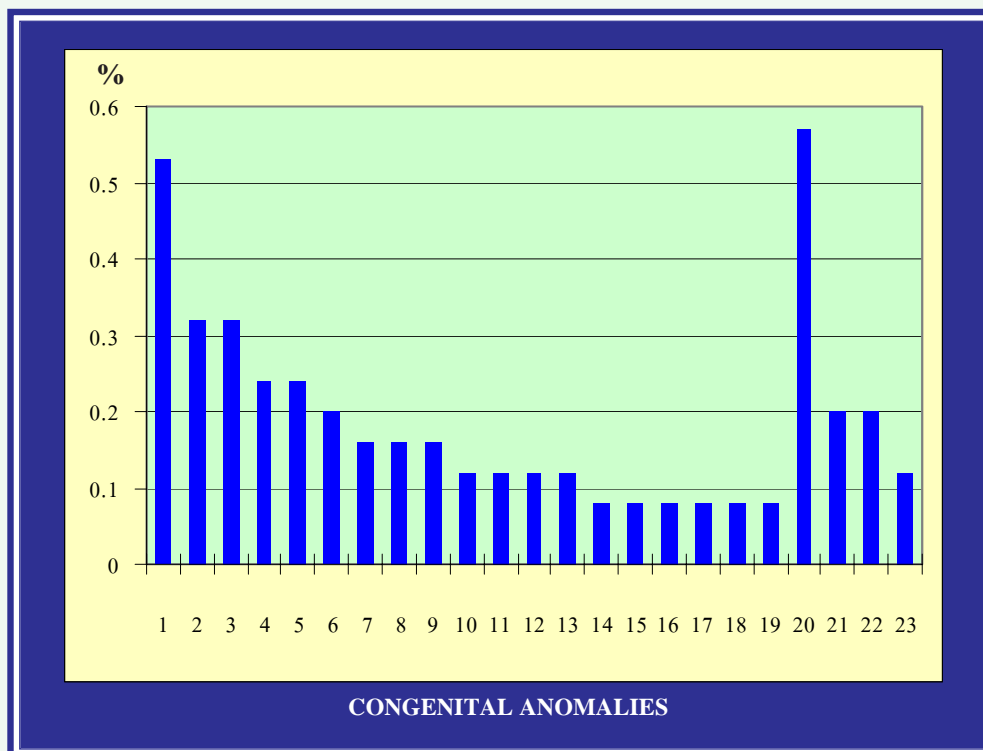
Apgar Score	1-Minute		5-Minute	
	Number	Percent	Number	Percent
0	124	5.0	123	5.0
1	25	1.0	5	0.2
2	10	0.4	5	0.2
3	17	0.7	2	0.1
4	17	0.7	3	0.1
5	33	1.3	15	0.6
6	53	2.2	12	0.5
7	103	4.2	16	0.6
8	181	7.3	38	1.5
9	754	30.6	122	5.0
10	1145	46.5	2120	86.1
Total	2462	100.0	2461	100.0

TABLE 27 Prenatal sonographic diagnosis of anomalies*

Congenital Anomalies	Number	Percent
Non chromosome-related anomaly		
1. <i>Hydrops fetalis (frank)</i>	13	0.53
<i>Hb Bart's</i>	8	
<i>Cystic hygroma</i>	3	
<i>Others (hemolysis, infection)</i>	2	
2. <i>Cystic hygroma</i>	8	0.32
3. <i>Anencephaly & exencephaly</i>	8	0.32
4. <i>Omphalocele</i>	6	0.24
5. <i>Congenital heart disease</i>	6	0.24
6. <i>Hydrocephalus</i>	5	0.20
7. <i>Abnormalities of extremities</i>	4	0.16
8. <i>Hydronephrosis (frank)</i>	4	0.16
9. <i>Isolated cleft lip, cleft palate</i>	4	0.16
10. <i>Gastroschisis</i>	3	0.12
11. <i>Multiple malformations</i>	3	0.12
12. <i>Meningocele</i>	3	0.12
13. <i>Conjoined twins</i>	3	0.12
14. <i>Duodenal atresia</i>	2	0.08
15. <i>Holoprosencephaly</i>	2	0.08
16. <i>Skeletal dysplasia (OI, Thanato)</i>	2	0.08
17. <i>Renal agenesis</i>	2	0.08
18. <i>Limb-body wall complex</i>	2	0.08
19. <i>Acardiac twins</i>	2	0.08
20. <i>Others</i>	14	0.57
Chromosome-related Anomaly (structures)		
21. <i>Trisomy 21</i>	5	0.20
22. <i>Trisomy 18</i>	5	0.20
23. <i>Trisomy 13</i>	3	0.12
Total	109	4.43

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

**FIGURE 15 Histogram : Number of fetal congenital anomalies
(not including chromosomal abnormalities)**



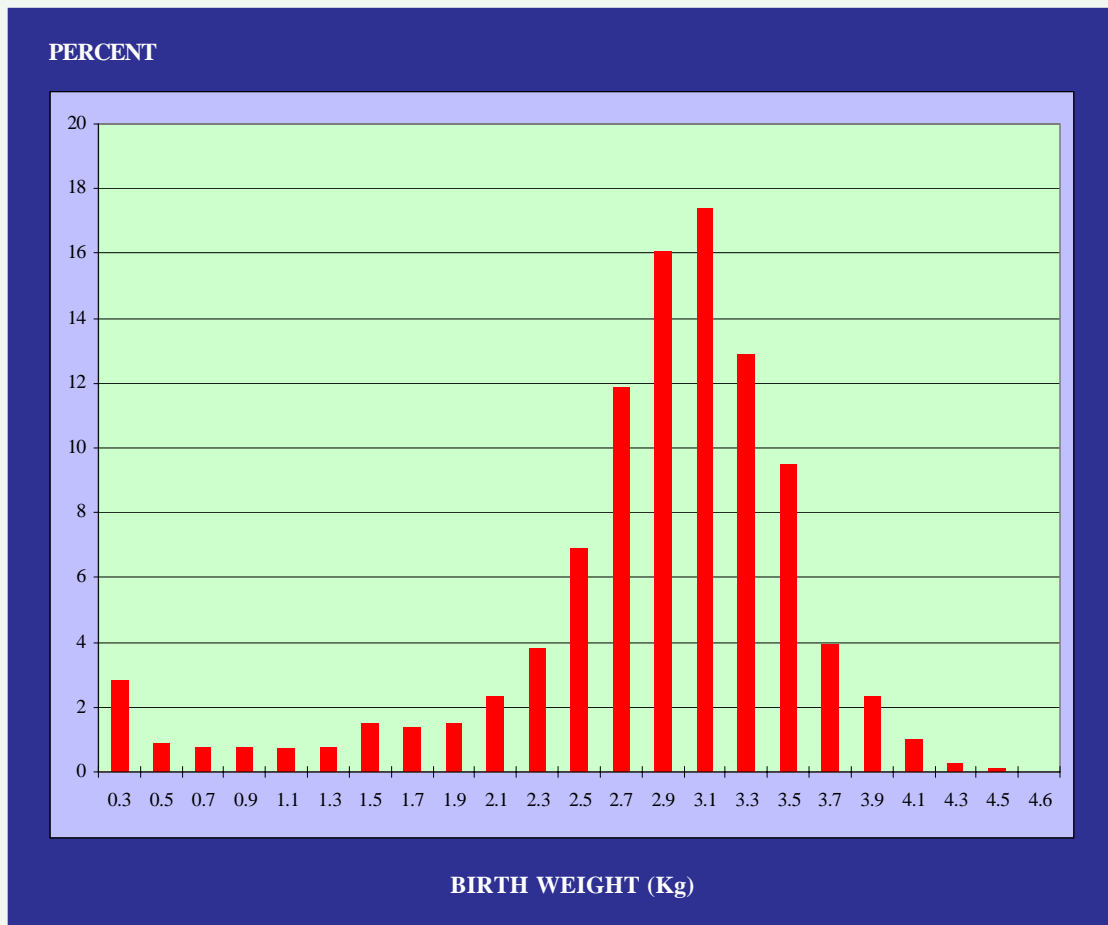
- | | |
|--|---|
| 1. <i>Hydrops fetalis (frank)</i> | 13. <i>Conjoined twins</i> |
| 2. <i>Cystic hygroma</i> | 14. <i>Duodenal atresia</i> |
| 3. <i>Anencephaly & exencephaly</i> | 15. <i>Holoprosencephaly</i> |
| 4. <i>Omphalocele</i> | 16. <i>Skeletal dysplasia (OI, Thanato)</i> |
| 5. <i>Congenital heart disease</i> | 17. <i>Renal agenesis</i> |
| 6. <i>Hydrocephalus</i> | 18. <i>Limb-body wall complex</i> |
| 7. <i>Abnormalities of extremities</i> | 19. <i>Acardiac twins</i> |
| 8. <i>Hydronephrosis (frank)</i> | 20. <i>Others</i> |
| 9. <i>Isolated cleft lip, cleft palate</i> | 21. <i>Trisomy 21</i> |
| 10. <i>Gastroschisis</i> | 22. <i>Trisomy 18</i> |
| 11. <i>Multiple malformations</i> | 23. <i>Trisomy 13</i> |
| 12. <i>Meningocele</i> | |

TABLE 28 Number and percentage of neonates by birth weight*

Birth Weight (grams)	Number	Percent
< 400	69	2.8
400-599	21	0.9
600-799	19	0.8
800-999	20	0.8
1000-1199	17	0.7
1200-1399	20	0.8
1400-1599	36	1.5
1600-1799	34	1.4
1800-1999	36	1.5
2000-2199	56	2.3
2200-2399	93	3.8
2400-2599	171	6.9
2600-2799	294	11.9
2800-2999	396	16.1
3000-3199	428	17.4
3200-3399	317	12.9
3400-3599	233	9.5
3600-3799	96	3.9
3800-3999	56	2.3
4000-4199	25	1.0
4200-4399	8	0.3
4400-4599	3	0.1
4600-4799	1	0.0
Total	2463	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)	129	5.2
Very low birth weight (1000-1499)	49	2.0
Low birth weight (1500-2499)	322	13.1
Average birth weight (2500-3999)	1912	77.6
Macrosomia (>4000)	37	1.5
Total	2463	100.0

** Including therapeutic termination of pregnancy*

Average Birth Weight of Total Infants 2799 \pm 772 grams
range 170-4750 grams

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

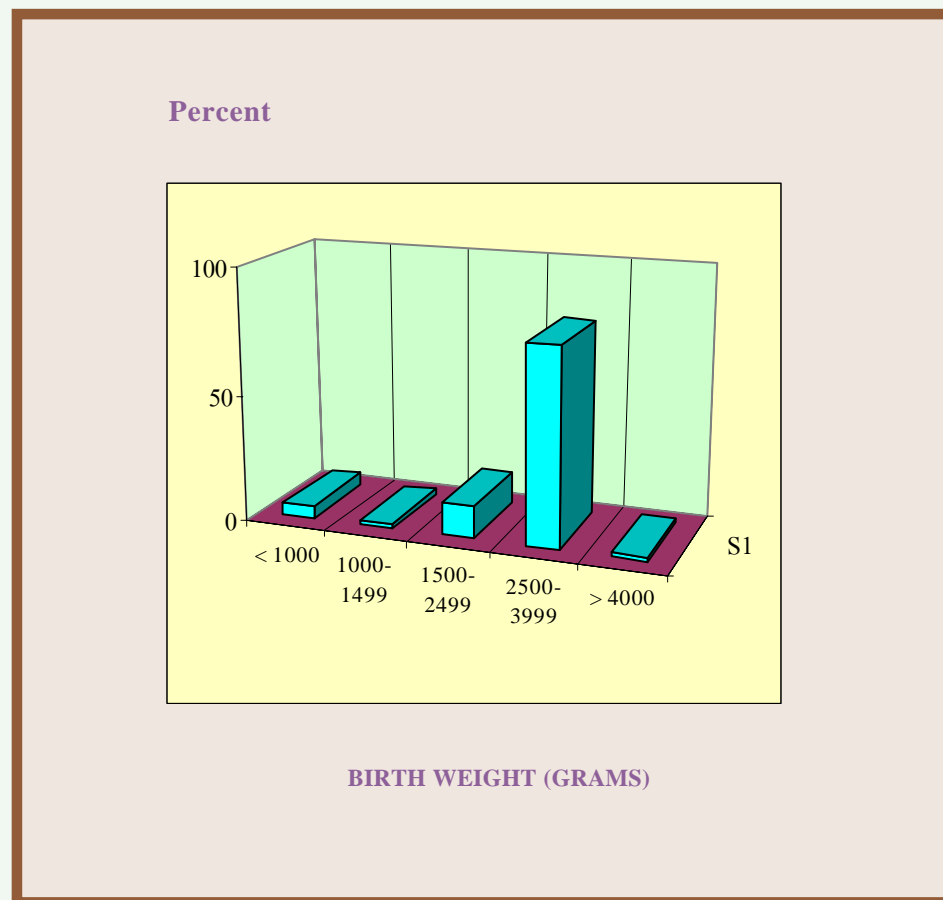
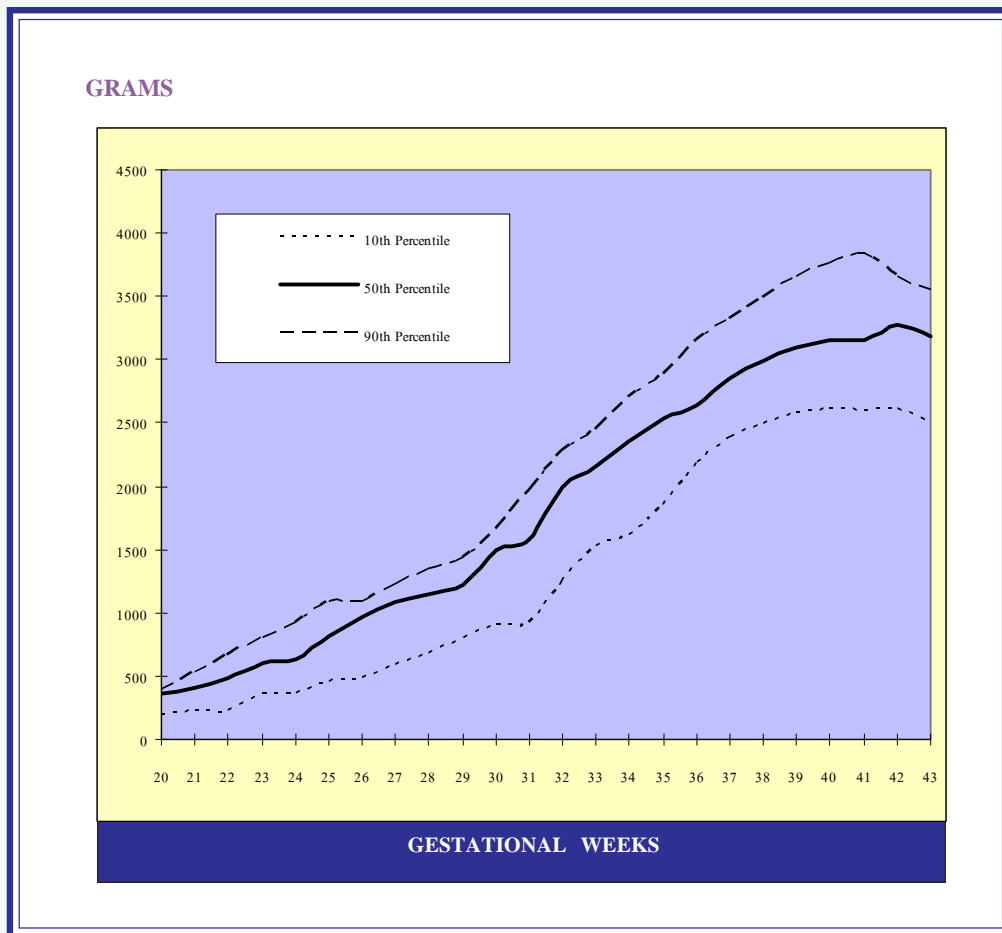


TABLE 30 Fetal weight (grams) : the 10th, 50th, 90th percentile at various gestational age

Gestational Age (weeks)	Weight (grams) 10th Percentile	Weight (grams) 50th Percentile	Weight (grams) 90th Percentile
20	200	360	400
21	220	410	530
22	230	480	660
23	360	600	800
24	360	640	920
25	460	810	1080
26	480	960	1090
27	590	1080	1220
28	680	1150	1350
29	800	1230	1430
30	910	1490	1660
31	920	1580	1960
32	1250	1990	2280
33	1530	2160	2440
34	1620	2350	2700
35	1850	2530	2880
36	2190	2650	3150
37	2390	2860	3320
38	2490	2990	3490
39	2580	3090	3660
40	2610	3150	3760
41	2600	3160	3830
42	2610	3280	3660
43	2500	3180	3550

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	13	322	106
21	9	373	89
22	7	313	255
23	8	580	322
24	7	736	261
25	15	680	400
26	18	669	454
27	14	824	557
28	18	1016	627
29	27	1138	553
30	18	1389	327
31	18	1629	474
32	17	1822	592
33	36	2115	527
34	35	2251	433
35	61	2407	457
36	123	2686	468
37	336	2860	420
38	574	3046	391
39	520	3114	374
40	367	3179	377
41	124	3220	406
42	9	2906	349

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

Gestational Age (weeks)	Number of TwinSets	Means (grams)	Standard Deviation
21	1	313	204
24	1	334	149
26	1	583	222
27	2	762	167
28	3	830	302
29	1	830	302
30	2	1380	573
31	2	1455	318
32	4	1607	298
33	3	1613	177
34	2	1930	288
35	3	2260	342
37	11	2460	456
38	1	2410	108
39	1	3112	302
40	1	2712	423

TABLE 33 Comparison of birth weight (singleton & twins)

Type	Means Birth Weight	Standard Deviation	Range
Singleton	2838	745	170-4750
Twins	1730	787	250-3150

TABLE 34 Comparison of gestational age (singleton & twins)

Type	Means Gestational Age	Standard Deviation	Range
Singleton	37.37	3.6	20-42
Twins	33.10	4.5	21-40

TABLE 35 Early postpartum hemorrhage

Cause	Number	Percent
Uterine Atony	14	1.65
Lacerations	4	0.17
Retained Pieces of Placenta	7	0.29
Placenta Adherens	3	0.12
Uterine infection	12	0.50
Total	40	1.65

Section III

HIGH RISK PREGNANCIES

TABLE 36 Major complications during pregnancy

Complications	Numbers	Prevalence (%)
Small-for-gestational Age (SGA)	188	7.63
Pregnancy-induced hypertension (PIH)	182	7.52
Previous cesarean section	166	6.86
Diabetes mellitus	167	6.90
Hepatitis B antigen positive	156	6.45
Prolonged PROM (> 24 hours)	55	2.27
Chronic Hypertension	31	1.28
Placenta previa	27	1.12
Heart Disease	27	1.12
Asthma	25	1.03
Thyrotoxicosis	24	0.99
Upper urinary tract Infection	18	0.74
Thalassemia	17	0.70
Anti-HIV positive	17	0.70
Myoma Uteri	15	0.62
Iron deficiency anemia	13	0.54
Transverse lie	8	0.33
Abruptio placentae	6	0.24
Genital tract infection	6	0.24
Epilepsy	5	0.21
Renal diseases	4	0.16
SLE	4	0.16
Placenta adherens	4	0.16
Prolapsed cord	4	0.16
Ovarian Tumor	4	0.16

Pregnancy with Heart Disease

Total	27 cases (1.12 percent of total parturients) All were singleton (not included 2 cases of therapeutic abortion)
Age	range 18-43 years average 27.5 ± 6.5 years age of 35 years or more 4 cases (14.8 %)
Functional Class	(At delivery 27 cases) Class I 15 cases Class II 8 cases Class III 4 cases Class IV - case
Gestational Age at Birth	range 21-41 weeks (not included therapeutic abortion) average 35.48 ± 4.9 weeks premature delivery (before completed 37 weeks) 10 cases (37.0 %)
Birth Weight	range 400-3650 grams average 2295 ± 733 grams number of low birth weight fetus (less than 2,500 grams) 16 cases (59.3 %)
Apgar Scores at 1 minute (less than 7)	6 cases (22.2 %)
Apgar Scores at 5 minutes (less than 7)	2 cases (7.4 %)

Small-for-gestational-age (less than 10th percentile) 4 cases (14.8 %)

Perinatal death 2 cases (7.4 %) (immaturity 1, dead fetus in utero 1)

Congenital Anomalies -

Other complications (No maternal death)

<i>Thalasemia</i>	3 cases
<i>Hepatitis B surface antigen positive</i>	3 cases
<i>Pregnancy-induced hypertension</i>	2 cases
<i>Diabetes mellitus</i>	2 cases
<i>Thyrotoxicosis</i>	1 case
<i>Ashma</i>	1 case
<i>Oligohydramnios</i>	1 case

Pregnancy with Diabetes Mellitus

Total 167 cases (6.9 percent of total parturients)
(Singleton : 161, Twins : 5, Triplet : 1)

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

Age range 22-46 years
average 32.8±5.2 years
age of 35 years or more 66 cases (39.5 %)

Gestational Age at Birth

range 30-41 weeks
average 37.7±1.7 weeks
premature delivery (before completed 37 weeks)
28 cases (16.8 %)

Birth Weight

range 1410-4750 grams
 average 3044±550 grams
 number of low birth weight fetus (less than 2,500 grams)
 24 cases (14.4 %)

Apgar Scores at 1 minute (less than 7) 9 cases (5.4 %)

Apgar Scores at 5 minutes (less than 7) 1 case (0.6 %)

Small-for-gestational-age (less than 10th percentile) 12 cases (7.2 %)

Perinatal Death 2 case (1.2 %)

Congenital Anomalies 1 case (0.6 %) (cardiac anomaly)

Other complications

<i>Previous cesarean section</i>	<i>21 cases</i>
<i>Pregnancy-induced hypertension</i>	<i>15 cases</i>
<i>Chronic hypertension</i>	<i>11 cases</i>
<i>Hepatitis B antigen positive</i>	<i>10 cases</i>
<i>Polyhydramnios</i>	<i>2 cases</i>
<i>Thalassemia</i>	<i>1 case</i>
<i>Thyrotoxicosis</i>	<i>1 case</i>
<i>HIV positive</i>	<i>1 case</i>
<i>Asthma</i>	<i>1 case</i>
<i>Prolonged PROM (> 24 hours)</i>	<i>1 case</i>
<i>Urinary tract infection (symptomatic)</i>	<i>2 cases</i>
<i>Marked obesity</i>	<i>2 cases</i>
<i>Placenta previa</i>	<i>1 case</i>
<i>Systemic lupus erythematosus</i>	<i>1 case</i>
<i>Nephrotic syndrome</i>	<i>1 case</i>

Classifications

Pregestational DM (diagnosed before pregnancy)	27 cases (16.2 %)
<i>Chemical DM (Class A)</i>	<i>2 cases</i>
<i>Overt DM (Class B-T)</i>	<i>25 cases</i>

<i>Class B</i>	<i>16 cases</i>
<i>Class D, F, R</i>	<i>9 cases</i>
Gestational DM (diagnosed during pregnancy)	140 cases (83.8 %)
<i>Chemical DM (Class A1)</i>	<i>101 cases</i>
<i>Overt DM (Class A2)</i>	<i>39 cases</i>

Method of Glucose Control

Insulin	74 cases
Oral hypoglycemic drugs	2 cases
Oral hypoglycemic drugs & Insulin	4 cases
Diet Control only	87 cases

Pregnancy with Thalassemia

Total 17 cases (0.70 percent of total parturients)
All were singleton
(Including only the patients with hemoglobin less than 10 gm%)

Type of Thalassemia

β -thalassemia/HbE	5 cases
alpha-thalassemia (HbH disease)	9 cases
HbE homozygous thalassemia	3 cases

Age range 18-38 years
average 26.8 ± 5.5 years
age of 35 years or more 2 cases (11.8 %)

Gestational Age at Birth

range 37-41 weeks
average 38.5 ± 1.2 weeks

premature delivery (before completed 37 weeks)
0 case (0.0 %)

Birth Weight

range 1780-4050 grams
average 2728±573 grams
number of low birth weight fetus (less than 2,500 grams)
7 cases (41.2 %)

Apgar Scores at 1 minute (less than 7) 1 case (5.9 %)

Apgar Scores at 5 minutes (less than 7) - case (0.0 %)

Small-for-gestational-age (less than 10th percentile) 6 cases (35.3 %)

Perinatal death -

Other complications

<i>Heart diseases</i>	2 cases
<i>Pregnancy-induced hypertension</i>	1 case
<i>Diabetes mellitus</i>	1 case

Pregnancy with Thyrotoxicosis

Total 24 cases (0.99 percent of total parturients)
All were singleton
Diagnosed before pregnancy 16 cases
Diagnosed during pregnancy 8 cases

Age range 19-40 years
 average 30.1±5.9 years
 age of 35 years or more 6 cases (25.0 %)

Gestational Age at Birth

range 29-41 weeks
 average 37.9±2.4 weeks
 premature delivery (before completed 37 weeks)
 3 cases (12.5 %)

Birth Weight

range 1300-3950 grams
 average 2952±635 grams
 number of low birth weight fetus (less than 2,500 grams)
 5 cases (20.8 %)

Apgar Scores at 1 minute (less than 7) 4 cases (16.7 %)

Apgar Scores at 5 minutes (less than 7) 1 case (4.2 %)

Small-for-gestational-age (less than 10th percentile) 3 cases (12.5 %)

Perinatal death 1 cases (4.2%) (immaturity)

Congenital Anomalies 1 case : *Esophageal atresia*

Other complications

<i>Pregnancy-induced hypertension</i>	4 cases
<i>Heart disease</i>	2 cases
<i>Previous cesarean section</i>	1 case
<i>Chronic hypertension</i>	1 case
<i>Myoma uteri</i>	1 case
<i>Polyhydramnios</i>	1 case

Pregnancy with Hepatitis B Antigen Positive

Total	156 cases (6.45 percent of total parturients) (singleton : 154; twins : 2)
Age	range 15-43 years average 27.4±6.1 years age of more than 35 years 20 cases (12.8 %)
Gestational Age at Birth	range 21-41 weeks average 37.3±3.3 weeks premature delivery (before completed 37 weeks) 32 cases (20.5 %)
Birth Weight	range 200-4750 grams average 2842±707 grams number of low birth weight fetus (less than 2,500 grams) 36 cases (23.1 %)
Apgar Scores at 1 minute (less than 7)	9 cases (5.8 %)
Apgar Scores at 5 minutes (less than 7)	6 cases (3.8 %)
Small-for-gestational-age (less than 10th percentile)	18 cases (11.5 %)
Perinatal Death	6 cases (3.8 %)
Congenital Anomalies	3 cases (<i>anencephaly, hydranencephaly, beta-thalassemia major</i>)

Other complications

<i>Diabetes melitus</i>	10 cases
<i>Pregnancy-induced hypertension</i>	9 cases
<i>Previous cesarean section</i>	8 cases
<i>Placenta previa</i>	4 cases
<i>anti-HIV positive</i>	3 cases
<i>Heart disease</i>	2 cases
<i>Asthma</i>	2 cases
<i>Iron deficiency</i>	1 case
<i>Ovarian tumor</i>	1 case
<i>Urinary tract infection</i>	1 case
<i>Chronic hypertension</i>	1 case
<i>Oligohydramnios</i>	1 case
<i>Transverse lie</i>	1 case
<i>Polyhydramnios</i>	1 case

Pregnancy with Asthma

Total 25 cases (1.03 percent of total parturients)
(Singleton : 24; Twins : 1)

Activity of Disease

Well-controlled	22 cases
Poorly-controlled	3 cases

Age

range 15-43 years
average 26.6 ± 6.9 years
age of 35 years or more 4 cases (16.0%)

Gestational Age at Birth

range 32-41 weeks
 average 38.1±2.1 weeks
 premature delivery (before completed 37 weeks)
 4 case (16.0 %)

Birth Weight(not included abortion)

range 1800-3700 grams
 average 2881±513 grams
 number of low birth weight fetus (less than 2,500 grams)
 6 cases (24.0 %)

Apgar Scores at 1 minute (less than 7) - cases (0.0%)

Apgar Scores at 5 minutes (less than 7) - case (0.0 %)

Small-for-gestational-age (less than 10th percentile) 6 cases (24.0 %)

Perinatal death - case (0.0 %)

Congenital Anomalies - case (0.0 %)

Other complications

Hepatitis B surface antigen positive 2 cases
Pregnancy-induced hypertension 2 cases
Previous cesarean section 1 case
Chorioamnionitis (prolonged PROM) 1 case
Heart disease 1 case
Diabetes mellitus 1 case

Pregnancy with Chronic Hypertension

Total 31 cases (1.28 percent of total parturients)
All were singleton pregnancy

Severity of Hypertension

Severe (start treatment during pregnancy)	6	cases
Severe (controlled prior to pregnancy)	11	cases
Mild (no medication BP less than 160/90)	12	cases
Mild (BP less than 160/90 but treated with antihypertensive drug)	2	cases

Age range 26-45 years
average 35.6±5.0 years
age of 35 years or more 17 cases (54.8 %)

Gestational Age at Birth

range 25-40 weeks
average 36.6±3.4 weeks
premature delivery (before completed 37 weeks)
10 cases (32.3 %)

Birth Weight

range 250-3900 grams
average 2578±903 grams
number of low birth weight fetus (less than 2,500 grams)
7 cases (22.6 %)

Apgar Scores at 1 minute (less than 7) 7 cases (22.6 %)

Apgar Scores at 5 minutes (less than 7) 3 cases (9.7 %)

Small-for-gestational-age (less than 10th percentile) 7 cases (22.6 %)

Perinatal death 3 (dead fetus in utero & anomaly)

Congenital Anomalies 2 (hydrocephalus & omphalocele)

Other complications

<i>Diabetes mellitus</i>	<i>11 cases</i>
<i>Pregnancy-aggravated hypertension</i>	<i>2 cases</i>
<i>Anti-HIV positive</i>	<i>1 case</i>
<i>Previous cesarean section</i>	<i>1 case</i>
<i>Thyrotoxicosis</i>	<i>1 case</i>
<i>Nephrotic syndrome</i>	<i>1 case</i>
<i>Hepatitis B surface antigen positive</i>	<i>1 case</i>
<i>Urinary tract infection</i>	<i>1 case</i>
<i>Placental abruption</i>	<i>1 case</i>

Pregnancy-induced Hypertension

Total 182 (7.52 percent of total parturients)
(Singleton : 175, Twins : 6, Triplets 1)

Age range 15-46 years
average 28.9±6.5 years
age of 35 years or more 40 cases (22.0 %)

Gestational Age at Birth
range 25-41 weeks
average 36.5±3.4 weeks
premature delivery (before completed 37 weeks)
65 cases (35.7 %)

Classification of PIH

Gestational hypertension (without proteinuria)	71 cases (39.0 %)
Mild Preeclampsia	80 cases (44.0 %)
Severe Preeclampsia	26 cases (14.3 %)
Pregnancy-aggravated hypertension	2 cases (1.1 %)
Eclampsia	3 cases (1.6 %)
<i>First eclamptic attack before admission</i>	3 cases
<i>First eclamptic attack after admission</i>	0 case
<i>No ANC at Maharaj Nakorn Chiang Mai</i>	3 cases
<i>ANC at Maharaj Nakorn Chiang Mai</i>	0 case

Birth Weight

range 460-4130 grams
average 2616±806 grams
number of low birth weight fetus (less than 2,500 grams)
64 cases (35.2 %)

Apgar Scores at 1 minute (less than 7) 36 cases (19.8 %)

Apgar Scores at 5 minutes (less than 7) 11 cases (6.0 %)

Small-for-gestational-age (less than 10th percentile) 32 cases (17.6 %)

Perinatal death 7 cases (3.8 %)

Congenital Anomalies

Hydrops fetalis 2 cases

Other complications

<i>Diabetes Mellitus</i>	15	<i>cases</i>
<i>Hepatitis B antigen positive</i>	9	<i>cases</i>
<i>Previous cesarean section</i>	5	<i>cases</i>
<i>Oligohydramnios</i>	5	<i>cases</i>
<i>Thyrotoxicosis</i>	4	<i>cases</i>
<i>Prolonged ruptured membranes</i>	4	<i>cases</i>
<i>Marked obesity</i>	3	<i>cases</i>
<i>Placenta previa</i>	3	<i>cases</i>
<i>Nephrotic syndrome</i>	3	<i>cases</i>
<i>Heart disease</i>	2	<i>cases</i>
<i>Chronic hypertension</i>	2	<i>cases</i>
<i>Systemic lupus erythematosus</i>	2	<i>cases</i>
<i>Asthma</i>	2	<i>cases</i>
<i>Urinary tract infection</i>	2	<i>cases</i>
<i>Simple goitre, hypothyroidism</i>	2	<i>cases</i>
<i>Placental abruption</i>	1	<i>case</i>
<i>Thalassemia</i>	1	<i>case</i>
<i>Hepes genitalis</i>	1	<i>case</i>
<i>Iron deficiency</i>	1	<i>case</i>
<i>Polyhydramnios</i>	1	<i>case</i>

Placenta Previa

Total	27 cases (1.12 percent of total parturients) All were singleton
Age	range 19-40 years average 30.9 ± 5.8 years age of 35 years or more 7 cases (25.9 %)

Gestational Age at Birth

range 20-39 weeks
 average 33.8±5.4 weeks
 premature delivery (before completed 37 weeks)
 18 cases (66.7 %)

Birth Weight

range 270-3540 grams
 average 2279±839 grams
 number of low birth weight fetus (less than 2,500 grams)
 15 cases (55.6 %)

Apgar Scores at 1 minute (less than 7) 9 cases (33.3 %)

Apgar Scores at 5 minutes (less than 7) 5 cases (18.5 %)

Small-for-gestational-age (less than 10th percentile) 4 cases (14.8 %)

Perinatal death 5 in 27 cases (18.5 %)

Congenital Anomalies 2 (Anencephaly & Hb Bart's hydrops fetalis)

Other complications

<i>Hepatitis B surface antigen positive</i>	4 cases
<i>Pregnancy-induced hypertension</i>	3 cases
<i>Myoma uteri</i>	1 case
<i>Diabetes melitus</i>	1 case
<i>Previous cesarean section</i>	1 case
<i>Transverse lie</i>	1 case
<i>Postpartum hemorrhage</i>	1 case
<i>Thyrotoxicosis</i>	1 case

Pregnancy with Acute Pyelonephritis

Total	18 cases (0.74 percent of total parturients) All were singleton
Age	range 15-38 years average 25.4±6.0 years age of more than 35 years 1 cases (11.1 %)
Gestational Age at Birth	range 25-41 weeks average 35.6±4.7 weeks premature delivery (before completed 37 weeks) 9 cases (50.0 %)
Onset	
First trimester	3 cases
Second trimester	6 cases
Third trimester	8 cases
Postpartum	1 case
Number of Episodes	
1	13 cases
2	4 cases
4	1 case
Birth Weight	range 250-3700 grams average 2603±926 grams number of low birth weight fetus (less than 2,500 grams) 12 cases (50.0 %)

Apgar Scores at 1 minute (less than 7)	4 cases (22.2 %)
Apgar Scores at 5 minutes (less than 7)	1 cases (5.6 %)
Small-for-gestational-age (less than 10th percentile)	2 cases (11.1 %)
Perinatal death	1 case (5.6 %)
Congenital Anomalies	1 case (gastroschisis)
Other complications	
<i>Pregnancy-induced hypertension</i>	1 case
<i>Chronic hypertension</i>	1 case
<i>Hepatitis B surface antigen positive</i>	1 case
<i>Prolonged rupture of membrane</i>	1 case
<i>Systemic lupus erythematosus</i>	1 case
<i>Polyhydramnios</i>	1 case
<i>Oligohydramnios</i>	1 case

Small-for-Gestational-Age Fetuses

Birthweight less than 10th percentile

Total	188 (7.63 percent of total babies)
Singleton	169 fetuses
Multiple pregnancies	19 fetuses

Age range 16-44 years
 average 28.1±6.7 years
 age of 35 years or more 28 cases (14.9 %)

Gestational Age at Birth

range 25-41 weeks
 average 34.5±7.7 weeks
 premature delivery (before completed 37 weeks)
 40 cases (21.3 %)

Birth Weight

range 250-2620 grams
 average 2114±568 grams
 number of low birth weight fetus (less than 2,500 grams)
 172 cases (91.5 %)

Apgar Scores at 1 minute (less than 7) 39 cases (20.7 %)

Apgar Scores at 5 minutes (less than 7) 14 cases (7.4 %)

Perinatal Death 6 in 188 cases (3.19 %)

Congenital Anomalies

<i>Chromosomal abnormalities</i>	5 cases
<i>Twin transfusion syndrome</i>	4 cases
<i>Suspected of intrauterine infection</i>	2 cases
<i>Multiple anomalies</i>	2 cases
<i>Ventriculomegaly</i>	1 case
<i>Hydronephrosis</i>	1 case
<i>Omphalocele</i>	1 case
<i>Congenital heart disease</i>	1 case

Other complications

<i>Pregnancy-induced hypertension</i>	32 cases
<i>Poor maternal weight gain</i>	30 cases
<i>Medical diseases</i>	17 cases

Pregnant women with HIV infection

Pregnant women with HIV infection at Maharaj Nakorn Chiang Mai Hospital (1989-1997) 1989-1996--> No ANC screening for anti HIV antibody 1997-now--> Voluntary screening for anti-HIV antibody among pregnant women and their husbands and AZT prescription for +ve female cases

TABLE 37 Pregnant women with positive HIV antibody at Maharaj Nakorn Chiang Mai (1995-2005)

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
No. of Deliveries	6129	5957	4817	3690	3034	3105	3103	2815	2753	2628	2420
No. of women with positive HIV Deliveries	57	64	84	90	55	36	38	25	39	29	20
Therapeutic abortion	28	38	62	79	49	35	35	25	39	26	19
Spontaneous abortion	28	26	22	10	7	1	2	-	-	3	1
Illegal abortion	-	-	-	-	-	-	1	-	-	-	-
	1	-	-	1	1	1	-	-	-	-	-

TABLE 38 Voluntary screening (2005) among pregnant women for anti-HIV antibody

Pregnant women (Counselling)	1,947 cases
Voluntary screening	1,868 cases
+ve anti-HIV antibody	23 cases
% positive case	1.23%

TABLE 39 Age of pregnant women with positive HIV at Maharaj Nakorn Chiang Mai (2005)

Age (years)	No. of cases	Percent
15-19	1	5.0
20-24	6	30.0
25-29	7	35.0
30-34	5	25.0
35-39	1	5.0
Total	20	100
<i>Mean age (years)</i>	<i>27.05</i>	
<i>Standard deviation</i>	<i>5.1</i>	
<i>Range</i>	<i>16-36 years</i>	

TABLE 40 Parity of the pregnant women with positive HIV at Maharaj Nakorn Chiang Mai (2005)

Parity	No. of cases	Percent
0	7	35.0
1	8	40.0
2	4	20.0
3	1	5.0
Total	20	100

TABLE 41 Age at first marriage of pregnant women with positive HIV at Maharaj Nakorn Chiang Mai (2005)

Age (years)	No. of cases	Percent
10-14	-	0.0
15-19	8	40.0
20-24	1	5.0
25-29	6	30.0
Unknown	5	25.0
Total	20	100
<i>Mean age (years)</i>	<i>21.0</i>	
<i>Standard deviation</i>	<i>4.9</i>	
<i>Range</i>	<i>15-28 years</i>	

TABLE 42 Number of marriages of the pregnant women with positive HIV at Maharaj Nakorn Chiang Mai (2005)

Number	No. of cases	Percent
1	6	30
2	10	50.0
3	1	5.0
Unknown	3	15.0
Total	20	100

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

Occupations	No. of cases	Percent
Employee	7	35.0
Housewife	6	30.0
Commercial	2	10.0
Acgriculture	1	5.0
Others	4	20.0
Total	20	100

TABLE 44 Residence (province) of the pregnant women with positive HIV at Maharaj Nakorn Chiang Mai (2005)

Province	Number	Percent
Chiang Mai (เชียงใหม่)	17	85.04
Lamphun (ลำพูน)	1	5.0
Chiang Rai (เชียงใหม่)	1	5.0
Others	1	5.0
Total	20	100

TABLE 45 Complications of the pregnant women with positive HIV at Maharaj Nakorn Chiang Mai (2005)

	Cases	Percent
Without complication	15	75.0
With complication	5	25.0
• Antepartum	4	
• Intrapartum	-	
• Postpartum	1	

TABLE 46 Birth weight in the pregnant women with positive HIV at Maharaj Nakorn Chiang Mai (2005)

Birth weight (grams)	Number	Percent
< 1,499	1	5.0
1,500 - 1,999	-	0.0
2,000 - 2,499	3	15.0
2,500 - 2,999	10	50.0
3,000 - 3,499	5	25.0
3,500 - 3,999	1	5.0
Total (including 2 twin pregnancies)	20	100

Mean birthweight (grams) 2,734

Standard deviation (grams) 651

Range (grams) 450-4,030

TABLE 47 Postpartum contraception of pregnant women with positive HIV at Maharaj Nakorn Chiang Mai (2005)

Method	No. of cases	Percent
Female sterilization	13	65.0
Norplant	1	5.0
DMPA	1	5.0
Contraceptive Pill	1	5.0
Unknown	4	20.0
Total	20	100

Section IV

PRENATAL INVESTIGATION

Antepartum Fetal Testing

Primary Surveillance

Fetal Movement Count	For both low-risk and high-risk pregnancies
Non-stress test or Acoustic stimulation test	1135 tests

Secondary Surveillance

Oxytocin Challenge Test or nipple stimulation test	4 tests
Biophysical profile/ultrasonography	70 tests
Doppler velocimetry	85 tests

Prenatal Diagnosis

1. Ultrasonography	7,183 examinations (30.4% for gynecologic and infertile examinations)
2. Amniocentesis	1,065 cases
3. Cordocentesis	475 cases
4. Chorionic villous sampling	66 cases

OBSTETRIC ULTRASOUND SERVICE

Number of Patients undergoing sonographic examinations (OB&GYN) in 2,005

8,058 cases

Several examinations involved in the researches without specific indications

Indications for sonographic examinations

■ Uncertained date of gestation <i>uterine size incompatible with gestational age unrecognized last menstrual period</i>	13.4 %
■ Suspected intrauterine growth retardation	3.2 %
■ Bleeding in first half of pregnancy	2.1 %
■ Antepartum hemorrhage	1.1 %
■ Suspected fetal death	0.2 %
■ Rule out fetal anomalies	33.9 %
■ Fetal growth surveillance <i>twins intrauterine growth retardation diabetic mother mother complicated with medical diseases</i>	6.7 %
■ Gynecologic ultrasound	21.3 %
■ Infertility investigation	5.1 %
■ Perinatal research	10.7 %
■ Screening in menopausal women	2.4 %

Cordocentesis (2005)

Total 475 cases

Indications

	No.	(%)
1. Previous child with hydrops fetalis	19	4.0
2. Pregnancy at risk for Hb Bart	63	13.3
3. Pregnancy with early signs of hydrops fetus	4	0.8
4. Pregnancy at risk for β thal major	44	9.3
5. Previous child with β thal/HbE	4	0.8
6. Pregnancy at risk for β thal/HbE	161	33.9
7. Pregnancy at risk of Hb Bart's & β thal/HbE	1	0.2
8. Pregnancy at risk of Hb Bart's & β thal major	1	0.2
9. Pregnancy at risk for homozygous E	1	0.2
10. Chromosome analysis	60	12.6
11. Combined chromosome analysis and risk for Hb Bart's, β thal/HbE	54	11.4
12. Combined chromosome analysis and previous child with β thal major, β thal/HbE, HbH, and hydrops fetalis	7	1.4
13. Combined chromosome analysis and uncertain OFT	43	9.1
14. Repeat for chromosome confirmation or typing	11	2.3
15. Others	2	0.4
Total	475	cases

Amniocentesis (2005)

Total 1065 cases

Indications

1. Elderly gravida (age of more than 35 years)	1040 cases
<i>with no other obvious risk</i>	1026 cases
<i>with previous child with abnormal chromosomes</i>	5 cases
<i>with previous child of congenital anomaly</i>	3 cases
<i>with sonographic finding of fetal abnormalities</i>	5 cases
<i>with history of habitual abortion</i>	1 case
2. Pregnancy with Down syndrome in previous child	2 cases
3. Pregnancy with fetal anomaly in previous child	2 cases
3. Pregnancy with abnormal chromosomes in previous child	6 cases
4. Pregnancy with sonographic abnormalities	6 cases
3. Pregnancy with history of Down syndrome in the family	4 cases
6. Pregnancy with previous child of other mental deficiency	2 cases
7. Others	3 cases

Chorionic Villous Sampling (2005)

Total 66 cases

Indications

1. Fetal chromosome study	37 cases
<i>Elderly gravida with no other obvious risk</i>	28 cases
<i>Elderly gravida with other obvious risks</i>	4 cases
<i>Thickened nuchal translucency</i>	4 cases
<i>Sonographic cystic hygroma</i>	1 cases
2. Risk for fetal severe thalassemia	28 cases
<i>Fetal risk for Hb Bart's disease</i>	4 cases
<i>Fetal risk for beta-thalassemia major</i>	5 cases
<i>Fetal risk for beta-thalassemia / Hb E disease</i>	15 cases
3. Fetal chromosome & thalassemia diagnosis	4 cases
<i>Elderly gravida with fetal risk for Hb Bart's disease</i>	1 case
<i>Elderly gravida with fetal risk for beta-thalassemia major</i>	1 case
<i>Elderly gravida with fetal risk for beta-thalassmia / Hb E</i>	2 cases
4. Fetal DNA for patient's identification (Forensic Lab)	1 case

Prevention and Control Thalassemia Program

Chiang Mai strategy

- 1) Genetic counseling
- 2) Identificaion of pregnancy at risk
 - 2.1 Retrospective screening (history review for known risk)
 - 2.2 Prospective screening
 - Screening test
 - 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%, +ve % HbA₂ = HbA₂ > 4%

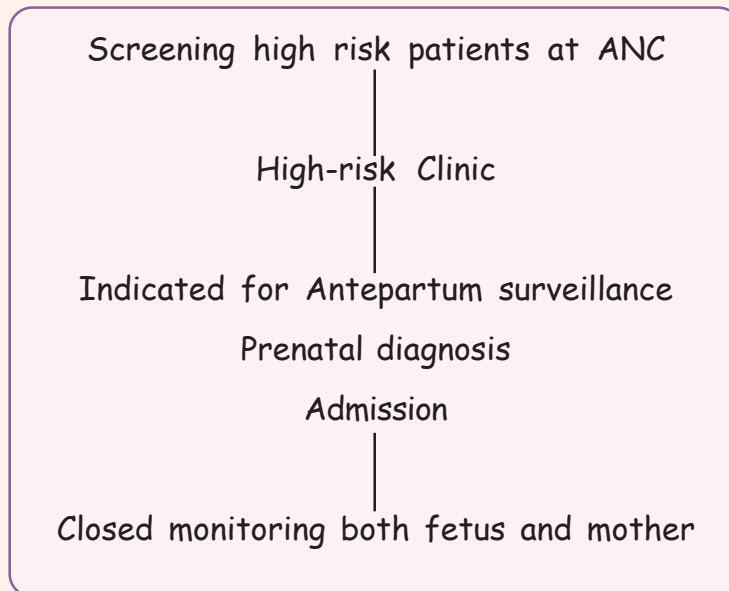
PROSPECTIVE SCREENING FOR THALASSEMIA PROGRAM 2005

■ Total number of pregnant screened	1,737	cases
■ Positive OFT or Hb E	697	cases
■ Number of couple at risk for thalassemia	47	couples
○ Risk for Hb Bart's	12	cases
○ Risk for Beta-Thalassemia major	6	cases
○ Risk for Beta-Thal HbE	29	cases
■ The choice which selected by couples		
○ Cordocentesis	24	cases
○ Chorionic villous samplings	9	cases
○ Ultrasound	1	cases
○ No PND	1	cases
○ No information	4	cases
○ Waiting for PND	2	cases
■ Result of PND		
○ Hb Bart's	5	cases
○ Beta-Thalassemia major	2	cases
○ Beta-Thal HbE	3	cases

High Risk Pregnancy

Number of patients approximately 480 cases

Management Guideline



High-risk patients at Maharaj Nakorn Chiang Mai Hospital in 2005

- | | |
|---|--------|
| 1. Elderly Gravida (age of 35 years or more) | 15.2 % |
| 2. Teenage Pregnancy (age of less than 20 years) | 9.2 % |
| <i>Early adolescence (age of less than 17 years)</i> | 1.7 % |
| <i>Late adolescence (age of 17-19 years)</i> | 7.5 % |
| 3. Pregnancy complicated with medical or obstetrical diseases | 8.3 % |

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.