

# NATIONAL OBSTETRICS REGISTRY

**2018**  
**2020**

**6<sup>th</sup>** Report of  
National  
Obstetrics  
Registry



**Editors:**

**Ravichandran Jeganathan  
Shamala Devi Karalasingam**

A publication of National Obstetrics Registry,  
Institute Clinical Research, and Health Informatic Center,  
Ministry of Health Malaysia



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**6<sup>th</sup> REPORT**

**JAN 2018 – DEC 2020**

**Editors:**

Ravichandran Jeganathan  
Shamala Devi Karalasingam





## **August 2021© National Obstetrics Registry**

Publisher:

Jointly published by the National Obstetrics Registry and the Institute Clinical Research (IRC), Health Informatic center, Ministry of Health Malaysia.

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### **Suggested citation:**

Ravichandran Jeganathan, Shamala Devi Karalasingam. 6th Report of National Obstetrics Registry, Jan 2018 – Dec 2020. National Obstetrics Registry.

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### **Electronic version**

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### **Funding**

The National Obstetrics Registry is funded with grants from the Ministry of Health Malaysia (MOH)

ISSN No

ISSN 2231-7058



9 772231 705009

## ACKNOWLEDGEMENT

The National Obstetrics Registry (NOR) team would like to give its grateful appreciation to everyone who has helped make this report possible.

We would especially like to thank the following:

- Director General of Health Malaysia for the support and approval to publish this report
- Our source data providers for their timely data collection and hard work.
- Steering committee members and governance board for their tireless effort and expertise dedicated to this registry
- Institute Clinical Research for its leadership, supervision and technical support.
- Health Informatic Center for its technical support.
- The registry coordinating team for their commitment and contribution in preparing this report.

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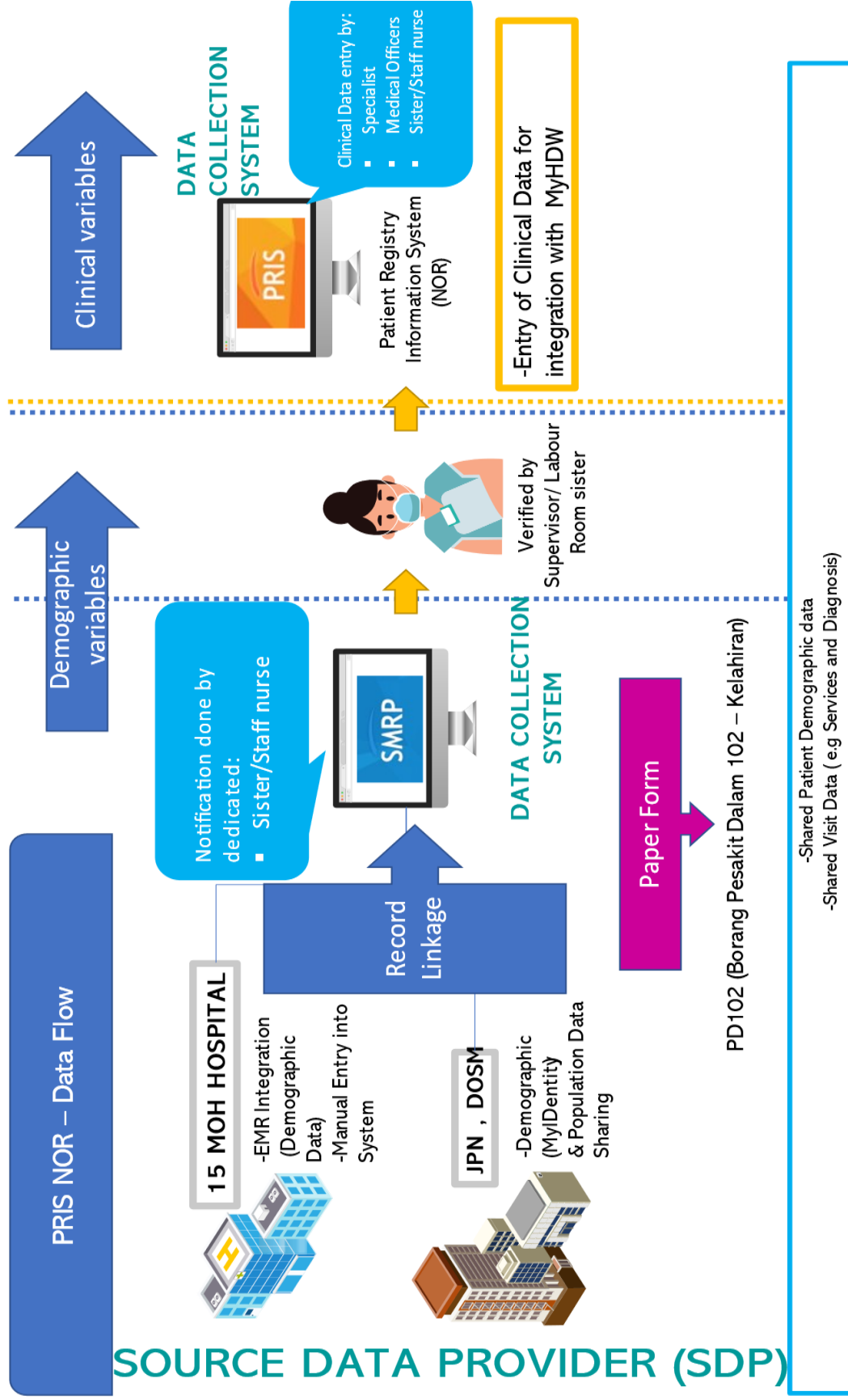
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# PRIS NOR DATA FLOW



## LETTER FROM THE PRINCIPAL INVESTIGATOR

NOR has delivered yet again.

This is the 6<sup>th</sup> Report of the National Obstetrics Registry 2018-2020. I am very proud of the dedicated team who have relentlessly continued to contribute to this sustained success of NOR. The real champions are our nursing colleagues at the O&G Departments, who have been collecting data tirelessly, over and above their very demanding core duties. Despite the trials and tribulations that has been thrown at us by the Pandemic, we have not wavered and the production of this report is in itself an outstanding achievement.

NOR is the first patient registry that has been selected to migrate to the Patient Registry Information System (PRIS-NOR). This is a glowing testament to the success of this registry, and as of 2018 it is parked under the National Data Warehouse. This is the first report produced since this migration. The system is still in its infancy stage and there has been a few hiccups despite which the participating hospitals have successfully managed to collect data to generate this report. Only 10 out of 15 hospitals were included in this report as data capture is still ongoing due to interruptions faced at the respective hospitals due to the increased workload caused by the pandemic.

NOR takes pride to inform that we are collaborating with the London School of Hygiene and Tropical medicine. We are a part of 22 countries involved in the Vulnerable New born Measurement Collaboration which aims to close the gap for both small and large vulnerable newborns.

A total of 295,581 deliveries were analysed in this report using the Ad hoc query system develop by MIMOS/ Health Informatic Centre (HIC) and NOR. In this report the focus is on “Diabetes in Pregnancy” since it is a emerging issue among our Malaysian pregnant mothers that increases the risk of mortality and morbidity to mother and baby.

I would like to take this opportunity to thank Dato Dr Rohaizat, Dato Dr Hisham Shah, Dr Nordin and Dr Muhammad Hafizuddin Hamdan who have assisted NOR in obtaining access to this data. My heartfelt gratitude to the Director General of Health and Institute Clinical Research for their unrelenting guidance and support for the National Obstetrics Registry which is currently an important source of information on Obstetric performance in Malaysia.

Best Wishes,

Dr J. Ravichandran R. Jeganathan  
Principal Investigator NOR  
National Service Head O&G  
Ministry of Health, Malaysia.

## ABBREVIATIONS

<b>BMI</b>	Body Mass Index
<b>CS</b>	Caesarean section
<b>DM</b>	Diabetes Mellitus
<b>FSB</b>	Fresh Stillbirth
<b>HPP</b>	Pulau Pinang Hospital
<b>HWKK</b>	Hospital Wanita and Kanak Kanak
<b>HRPZ</b>	Raja Perempuan Zainab II Hospital
<b>HSNZ</b>	Sultanah Nur Zahirah Hospital
<b>HSA</b>	Sultanah Aminah Hospital
<b>HSB</b>	Sultanah Bahiyah Hospital
<b>HTAR</b>	Tengku Ampuan Rahimah Hospital
<b>HTAA</b>	Tengku Ampuan Afzan Hospital
<b>HTF</b>	Tengku Fauziah Hospital
<b>HTJ</b>	Tuanku Jaafar Hospital
<b>HYPT</b>	Hypertension
<b>IUD</b>	Intrauterine Death
<b>IUGR</b>	Intrauterine Growth Restriction
<b>MAS</b>	Meconium aspiration syndrome
<b>MO</b>	Medical Officer
<b>MSB</b>	Macerated Stillbirth
<b>NA</b>	Not Available
<b>OA</b>	Orang Asli
<b>OI</b>	Other Indigenous
<b>O&amp;G</b>	Obstetrics and Gynaecology
<b>PE</b>	Preeclampsia
<b>SB</b>	Stillbirth
<b>SDP</b>	Site Data Provider
<b>TTN</b>	Transient tachypnoea of newborn



## TABLE OF CONTENTS

### CHAPTER 1 : DIABETES IN PREGNANCY

Table 1.1	: Incidence of Diabetes in pregnancy by Hospital 2018-2020	2
Table 1.2	: Incidence of Type of Diabetes by Hospital 2018-2020	4
Table 1.3	: Incidence of type of Gestational Diabetes Mellitus by Hospital 2018-2020	7
Table 1.4a	: Incidence of Diabetes by Mode of delivery and by Hospitals 2018-2019	9
Table 1.4	: Incidence of Diabetes by Mode of Delivery and by Hospitals 2020 10	
Table 1.5a	: Diabetes in pregnancy by ethnicity 2018-2019	11
Table 1.5b	: Diabetes in pregnancy by Ethnicity 2020	13
Table 1.6	: Diabetes in relation to Maternal Age 2018-2020	14
Table 1.7	: GDM in relation to maternal age 2018-2020	15
Table 1.8	: Diabetes in relation to Parity 2018-2020	16
Table 1.9	: Type of Gestational Diabetes Mellitus by Parity 2018-2020	17
Table 1.10	: Incidence of GDM in relation to Previous GDM 2018-2020	18
Table 1.11	: GDM and Stillbirth rate 2018-2020	19
Table 1.12	: Birthweight in relation to Pre-existing DM and GDM 2018-2020	19
Table 1.13	: Birthweight in relation to GDM on diet and GDM on insulin 2018-2020	21
Table 1.14	: Distribution of Diabetes in pregnancy by Age and Parity 2018-2020	22
Table 1.15a	: Distribution of Diabetes in Pregnancy by Age and Ethnicity 2018-2020	23
Table 1.15b	: Distribution of Diabetes in Pregnancy by Age and Ethnicity 2018-2020	24
Table 1.15c	: Distribution of Diabetes in Pregnancy by Age and Ethnicity 2018-2020	25
Table 1.15d	: Distribution of Diabetes in Pregnancy by Age and Ethnicity 2018-2020	26
Table 1.15e	: Distribution of Diabetes in Pregnancy by Age and Ethnicity 2018-2020	27
Table 1.16	: Diabetes in pregnancy in relation to risk level at booking 2018-2019	28
Table 1.17	: Distribution of Diabetes in pregnancy by POA 2018-2020	29
Table 1.18	: Preterm labour in relation to Diabetes in pregnancy 2018-2020	29
Table 1.19	: Complication in baby in Pregestational Diabetes 2018-2020	30
Table 1.20	: Complication in baby in GDM 2018-2020	30
Table 1.21	: Diabetes in pregnancy in relation to Baby Apgar 2018-2020	32
Table 1.22	: 1st trimester USG in Diabetes in Pregnancy 2018-2020	33
Table 1.23	: Type of pregnancy and Diabetes in pregnancy 2018-2020	33
Table 1.24	: Use of Hypoglycemic agents in GDM on medications 2018-2020	33

### CHAPTER 2 : TYPE OF DELIVERY

Table 2.1	: Distribution of Delivery by Hospitals 2018-2020	38
Table 2.2	: Distribution of Delivery type 2018-2020	38
Table 2.3	: Delivery type by Risk level at Booking 2018-2020	39
Table 2.4a	: Delivery type by Ethnicity 2018-2019	40
Table 2.4b	: Delivery type by Ethnicity 2020	41
Table 2.5	: Delivery type by Maternal Age 2018-2020	42
Table 2.6	: Delivery type by Parity 2018-2020	43
Table 2.7	: Delivery by Birthweight 2018-2019	44

### CHAPTER. 3 : CAESAREAN SECTION

Table 3.1	: LSCS rates by Hospital 2018-2020	46
Table 3.2	: Elective and Emergency LSCS rates by Hospital 2018-2020	47
Table 3.3	: LSCS rate by Ethnicity 2018-2020	48
Table 3.4	: LSCS rate by Maternal Age 2018-2020	50
Table 3.5	: LSCS rate by Parity 2018-2020	50
Table 3.6	: LSCS by Accoucheur 2018-2020	51
Table 3.7	: LSCS and Risk level at Booking 2018-2020	51
Table 3.8	: LSCS rate in relation to Apgar score 2018-2020	51
Table 3.9	: LSCS rate by Distribution of Medical Disorders 2018-2020	52
Table 3.10	: LSCS rate by Diabetes in Pregnancy 2018-2020	52
Table 3.11	: LSCS rate by period of gestation 2018-2020	53
Table 3.12	: LSCS rate in relation to Birthweight 2018-2020	53
Table 3.13	: LSCS rate in relation to indication 2018-2020	54

## CHAPTER. 4: BREECH

Table 4.1	:	Distribution of Breech Delivery by Hospitals 2018-2020	56
Table 4.2a	:	Distribution of Breech Delivery by Ethnicity 2018-2019	57
Table 4.2b	:	Distribution of Breech Delivery by Ethnicity 2020	58
Table 4.3	:	Distribution of Breech Delivery by Maternal Age 2018-2020	59
Table 4.4	:	Distribution of breech delivery by birthweight 2018-2020	60
Table 4.5	:	Distribution of Vaginal Breech by complication 2018-2020	61
Table 4.6	:	Vaginal breech delivery in relation to Apgar score 2018-2020	61

## CHAPTER. 5: PREMATURITY

Table 5.1	:	Distribution of Preterm births by Hospital 2018-2020	63
Table 5.2	:	Distribution of preterm by Risk level at Booking 2018-2019	63
Table 5.3a	:	Distribution of Preterm by Ethnicity 2018-2019	64
Table 5.3b	:	Distribution of Preterm by Ethnicity 2018-2019	64
Table 5.4	:	Distribution of Preterm by Age 2018-2020	65
Table 5.5	:	Distribution of Preterm by Parity 2018-2020	65
Table 5.6	:	Distribution of Preterm by Type of Pregnancy 2018-2019	65
Table 5.7	:	Distribution of Preterm by Medical Disorders 2018-2019	66
Table 5.8	:	Distribution of Preterm with Diabetes in Pregnancy 2018-2019	66
Table 5.9	:	Distribution of Preterm by Apgar score 2018-2020	67
Table 5.10	:	Prematurity and birthweight 2018-2020	67
Table 5.11	:	Preterm and stillbirth rate per 1000 livebirths 2018-2020	67
Table 5.12	:	Distribution of Preterm by Mode of Delivery 2018-2020	68

## CHAPTER.6 : STILLBIRTH

Table 6.1	:	Trends in Stillbirth by Hospitals 2018-2020	70
Table 6.2	:	Stillbirth rate in relation to Risk levels at Booking 2018-2020	70
Table 6.3	:	Stillbirth rate by Ethnicity 2018-2020	71
Table 6.4	:	Stillbirth rate by Maternal Age 2018-2020	71
Table 6.5	:	Stillbirth rate by Parity 2018-2020	72
Table 6.6	:	Stillbirth in relation to Birthweight 2018-2020	72
Table 6.7	:	Stillbirth rate by period of gestation 2018-2020	72
Table 6.8	:	FSB and MSB in relation to birthweight 2018-2020	73
Table 6.9	:	Stillbirth rate in relation to and medical disorders in pregnancy 2018-2020	74
Table 6.10	:	Stillbirth rate by type of pregnancy 2018-2020	74

## CHAPTER.7 : HYPERTENSIVE DISORDER

Table 7.1	:	Distribution of Hypertension in pregnancy by Hospital 2018-2020	76
Table 7.2a	:	Distribution of Hypertensive disorders by Hospitals 2018-2019	77
Table 7.2b	:	Distribution of Hypertensive disorders by Hospital 2020	78
Table 7.3	:	Distribution of Hypertension in Pregnancy by Ethnicity 2018-2020	79
Table 7.4a	:	Distribution of Hypertensive disorders by Ethnicity 2018	80
Table 7.4b	:	Distribution of Hypertensive disorders by Ethnicity 2019	81
Table 7.4c	:	Distribution of Hypertensive disorders by Ethnicity 2020	82
Table 7.5	:	Distribution of Hypertensive disorders by Age 2018-2020	83
Table 7.6	:	Distribution of Hypertensive disorder by Birthweight 2018-2020	84
Table 7.7	:	Distribution of Hypertensive disorders by Parity 2018-2020	85
Table 7.8	:	Distribution of Hypertensive by Mode of delivery 2018-2020	85
Table 7.9	:	Distribution of Types of Gestational Hypertension by Mode of delivery 2018-2020	86
Table 7.10	:	Distribution of birthweight by Hypertensive disorders in pregnancy 2018-2020	87
Table 7.11	:	Distribution of Birthweight by Types of Gestational hypertension 2018-2020	88

Fig 1.1	:	Incidence of Diabetes in Pregnancy by Hospitals 2018-2020	3
Fig 1.3	:	Trends of Diabetes in Pregnancy 2016-2020	5
Fig 1.4	:	Incidence of Pre-Gestational DM and GDM by Hospitals 2018-2020	5
Fig 1.5	:	Diabetes in Pregnancy 2020	6
Fig 1.6	:	GDM on diet and Insulin 2020	8

Fig 1.7	: GDM by Mode of Delivery 2018-2020	10
Fig 1.8	: GDM by Ethnicity 2018-2020	12
Fig:1.9	: GDM by 3 main ethnicity 2018-2020	13
Fig 1.10	: GDM by indigenous group 2018-2019	13
Fig 1.11	: Incidence of GDM by Age 2018-2019	16
Fig 1.12	: Incidence of GDM by Parity 2018-2020	17
Fig 1.13	: GDM in relation to previous history of GDM 2018-2020	18
Fig 1.14	: GDM and birthweight 2018	20
Fig 1.15	: GDM and birthweight 2019	20
Fig 1.16	: GDM and birthweight 2020	20
Fig 1.17	: Complications in new born in relation to GDM 2018-2020	31
Fig 3.1	: Trends of LSCS from 2016-2020	46
Fig 3.2	: LSCS trends in 3 main ethnic groups 2018-2020	49
Fig 3.3	: LSCS trends in indigenous group 2018-2020	49

# **DIABETES IN PREGNANCY**

## Introduction

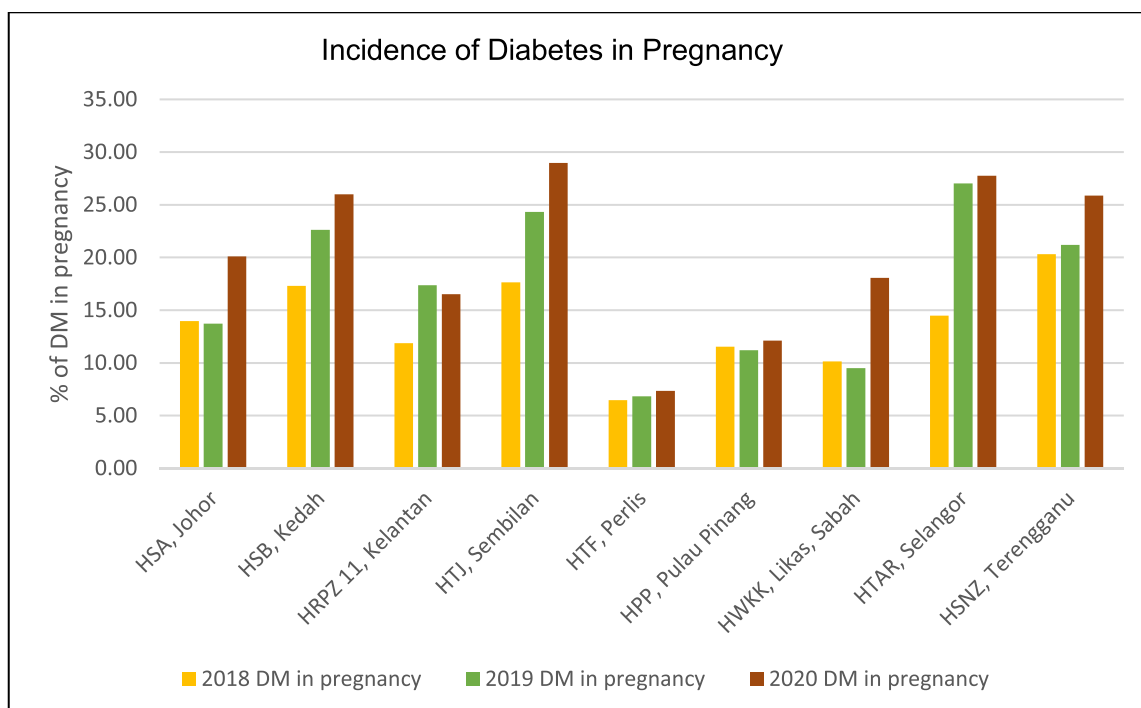
Diabetes is a common endocrine disorder in pregnancy. There are 2 categories of Diabetes in pregnancy which is Pre-Gestational Diabetes Mellitus and Gestational Diabetes Mellitus (GDM). GDM is a metabolic disorder defined as glucose intolerance of variable severity with onset or first recognition during pregnancy. Diabetic pregnancy is associated with maternal and fetal morbidity and mortality. In Asian countries, the prevalence of GDM varies from 2-5% in Korea to 6.8% in China. In Singapore, about 15-20% of all pregnancies are complicated by GDM. The Preliminary report of the National Obstetrics Registry, Malaysia reported the incidence of Diabetes in pregnancy at 11.1% in 2009 from Malaysian tertiary hospitals. GDM rate was at 9.5% in 2009 and the rate has remained around the same at 9.28% in 2017 and this was reported in the 5<sup>th</sup> Report of the National Obstetrics Registry. The National Health and Morbidity Survey (NHMS) reported that the prevalence of obesity in Malaysian women aged  $\geq 18$  years old increased from 5.7% in 1996 to 17.6% in 2011. Women in the reproductive age are overweight or obese hence they are at risk of being prediabetics or GDM. In this report we are unable to show the correlation of maternal obesity and GDM.

**Table 1.1: Incidence of Diabetes in pregnancy by Hospital 2018-2020**

SDP	2018			2019			2020		
	Total Delivery	Diabetes		Total Delivery	Diabetes		Total Delivery	Diabetes	
	n	n	%	n	n	%	n	n	%
HSA, Johor	11403	1591	13.95	12174	1670	13.72	13904	2795	20.10
HSB, Kedah	9888	1710	17.29	9636	2179	22.61	7760	2017	25.99
HRPZ 11, Kelantan	11499	1366	11.88	10864	1887	17.37	11696	1931	16.51
HTJ, N.Sembilan	9057	1597	17.63	10184	2476	24.31	9385	2719	28.97
HTF, Perlis	3927	254	6.47	4137	282	6.82	3771	277	7.35
HPP, Pulau Pinang	3774	435	11.53	3788	424	11.19	3956	479	12.11
HWKK, Likas, Sabah	9664	980	10.14	13660	1297	9.49	12826	2318	18.07
HTAR, Selangor	8542	1236	14.47	10296	2783	27.03	11856	3289	27.74
HSNZ, Terengganu	15715	3194	20.32	16517	3502	21.20	16970	4392	25.88
TOTAL	83469	12363	14.81	91256	16500	18.08	92124	20217	21.95

Among the 9 tertiary hospitals included in this chapter, in 2018 of the 83,469 deliveries captured 12363 women (14.81%) had Diabetes in pregnancy. We see an increasing trend in 2019 and in 2020 of the 92124 deliveries captured, 20217 women (21.95%) had Diabetes which translates to 1 in 5 pregnant women with Diabetes in pregnancy. We are seeing a rise due to the recommendation of Universal screening for Diabetes in all pregnant women. In 2020 the highest incidence of Diabetes in pregnancy was seen from Hospital Tuanku Jaafar, Negeri Sembilan followed by Hospital Tengku Ampuan Rahimah Klang.

**Fig 1.1: Incidence of Diabetes in Pregnancy by Hospitals 2018-2020**



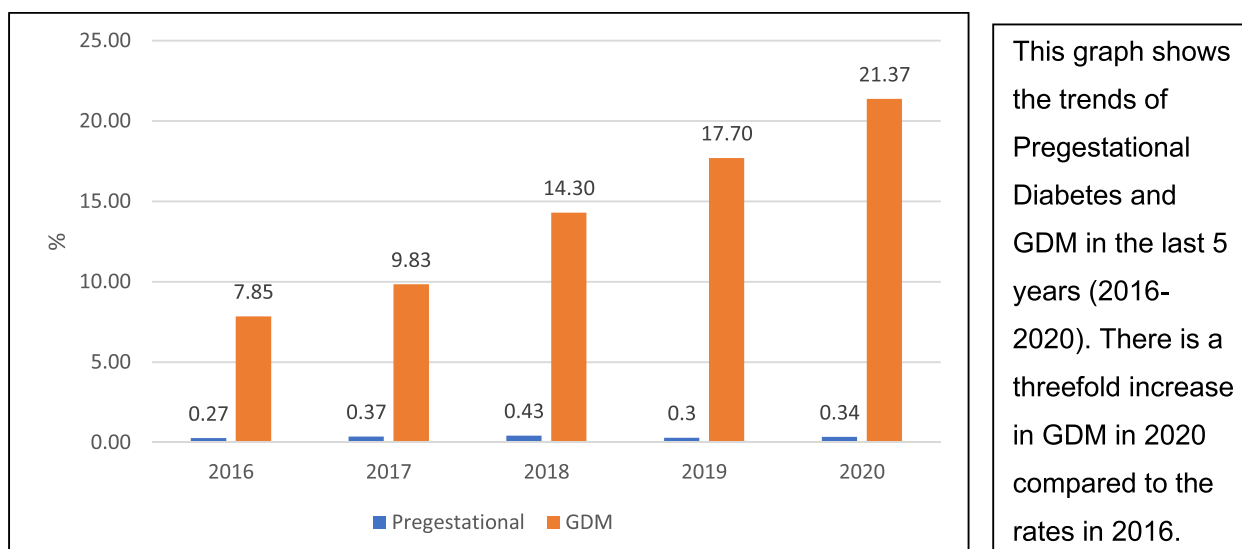
In 8 out of 9 hospitals the incidence of Diabetes in pregnancy in 2020 was higher than the previous years with the highest rise from Hospital Tuanku Jaafar Seremban followed by Hospital Sultanah Nur Zahirah Terengganu.

**Table 1.2: Incidence of Type of Diabetes by Hospital 2018-2020**

SDP	2018						
	Total Delivery	Pre-Gestational Diabetes		Gestational Diabetes		NA	
	n	n	%	n	%	n	%
HSA, Johor	11403	50	0.44	1540	13.51	1	0.01
HSB, Kedah	9888	56	0.57	1643	16.62	11	0.11
HRPZ 11, Kelantan	11499	39	0.34	1327	11.54	0	0.00
HTJ, Sembilan	9057	19	0.21	1578	17.42	0	0.00
HTF, Perlis	3927	32	0.81	219	5.58	3	0.08
HPP, Pulau Pinang	3774	17	0.45	414	10.97	4	0.11
HWKK, Likas, Sabah	9664	13	0.13	928	9.60	39	0.40
HTAR, Selangor	8542	4	0.05	1229	14.39	3	0.04
HSNZ, Terengganu	15715	131	0.83	3060	19.47	3	0.02
TOTAL	83469	361	0.43	11938	14.30	64	0.08
	2019						
HSA, Johor	12174	27	0.22	1642	13.49	1	0.01
HSB, Kedah	9636	44	0.46	2128	22.08	7	0.07
HRPZ 11, Kelantan	10864	25	0.23	1862	17.14	0	0.00
HTJ, Sembilan	10184	20	0.20	2456	24.12	0	0.00
HTF, Perlis	4137	16	0.39	265	6.41	1	0.02
HPP, Pulau Pinang	3788	13	0.34	409	10.80	2	0.05
HWKK, Likas, Sabah	13660	18	0.13	1240	9.08	39	0.29
HTAR, Selangor	10296	2	0.02	2761	26.82	20	0.19
HSNZ, Terengganu	16517	110	0.67	3390	20.52	2	0.01
TOTAL	91256	275	0.30	16153	17.70	72	0.08
	2020						
HSA, Johor	13904	46	0.33	2716	19.53	33	0.24
HSB, Kedah	7760	35	0.45	1961	25.27	21	0.27
HRPZ 11, Kelantan	11696	48	0.41	1882	16.09	1	0.01
HTJ, Sembilan	9385	10	0.11	2709	28.87	0	0.00
HTF, Perlis	3771	47	1.25	228	6.05	2	0.05
HPP, Pulau Pinang	3956	22	0.56	453	11.45	4	0.10
HWKK, Likas, Sabah	12826	26	0.20	2182	17.01	110	0.86
HTAR, Selangor	11856	14	0.12	3239	27.32	36	0.30
HSNZ, Terengganu	16970	67	0.39	4321	25.46	4	0.02
TOTAL	92124	315	0.34	19691	21.37	211	0.23

The overall incidence of Pre-gestational Diabetes was less than 1%. The high incidence of Diabetes in pregnancy in the tertiary hospitals was due to GDM.

**Fig 1.3: Trends of Diabetes in Pregnancy 2016-2020**



**Fig 1.4: Incidence of Pre-Gestational DM and GDM by Hospitals 2018-2020**

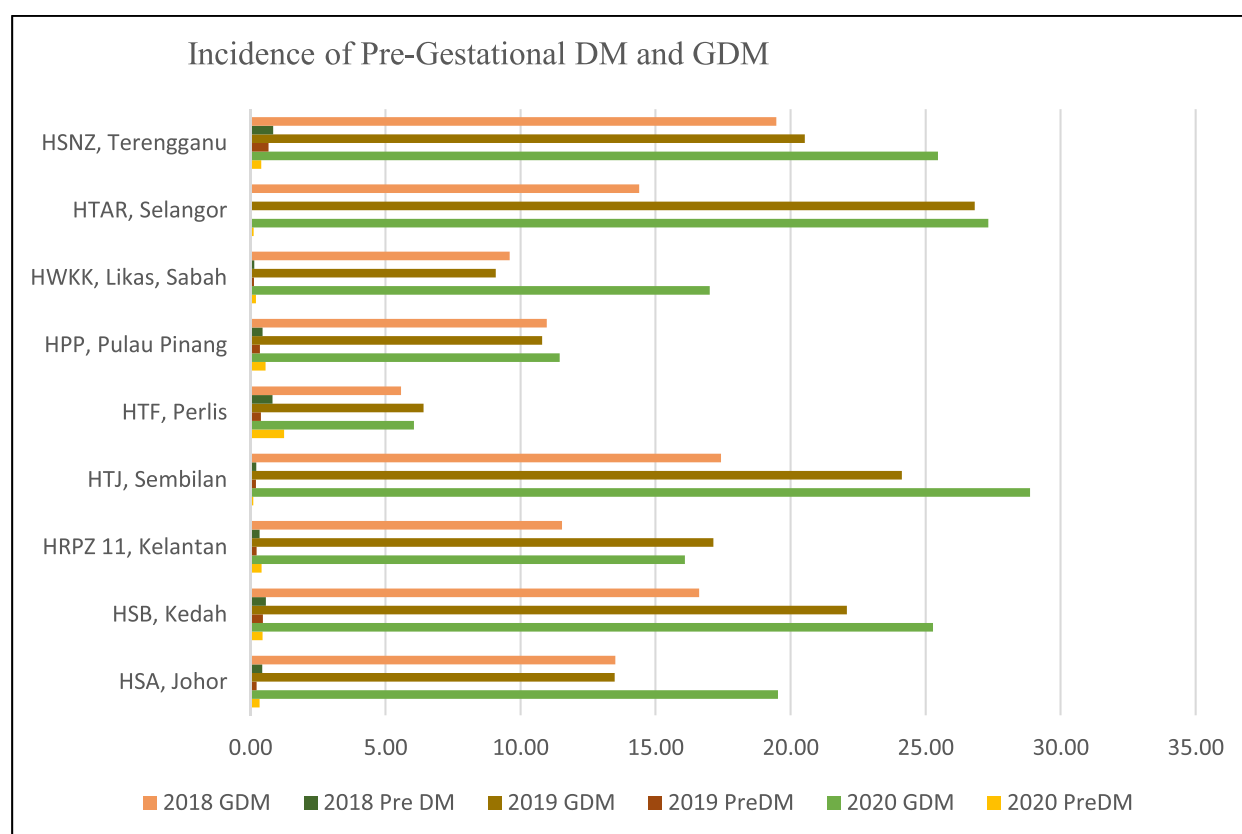
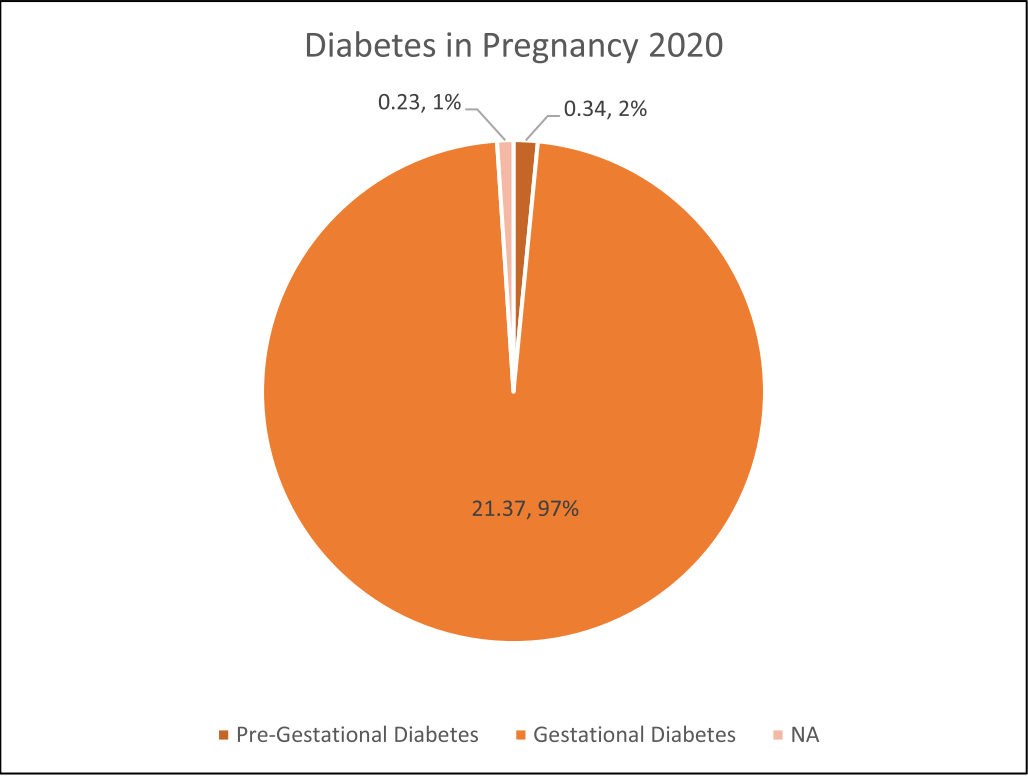




Figure 1.5 Diabetes in Pregnancy 2020

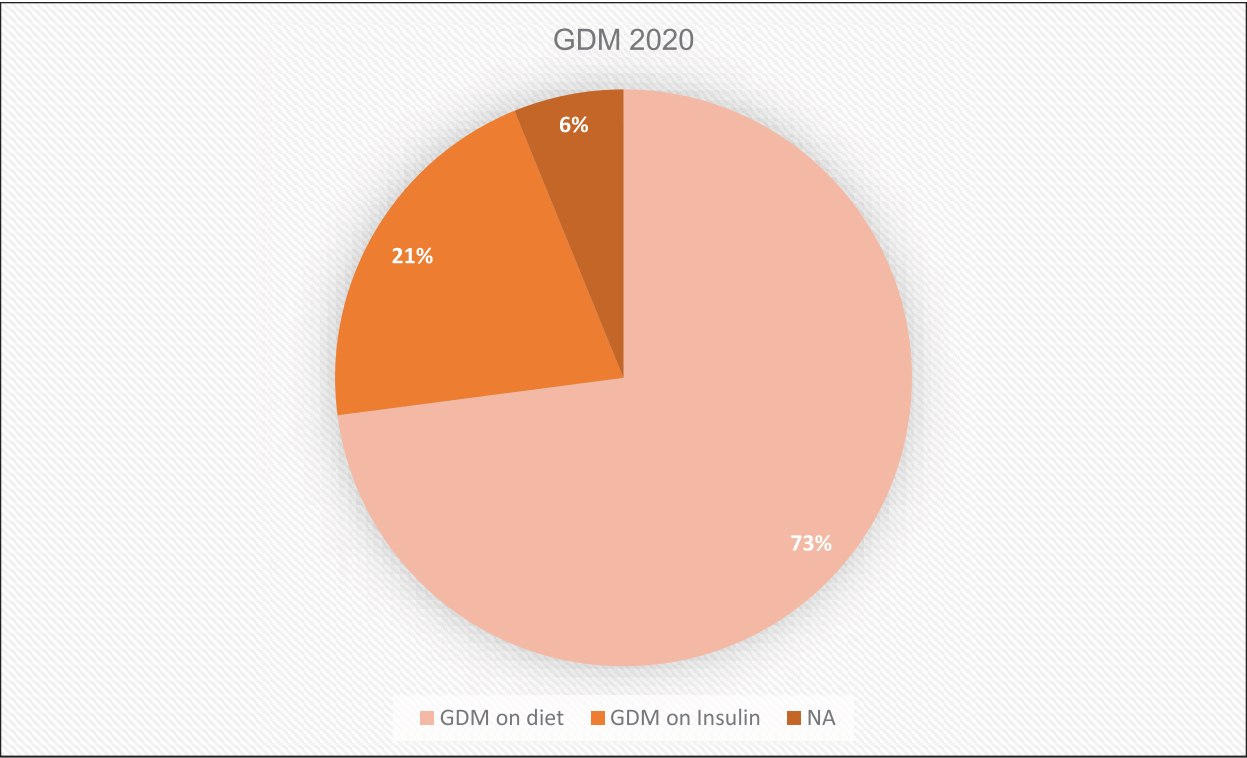


In 2020, GDM contributed to 97% of all cases of Diabetes in pregnancy while Pregestational Diabetes accounted for 2% of all cases of Diabetic pregnancy

**Table 1.3: Incidence of type of Gestational Diabetes Mellitus by Hospital 2018-2020**

SDP	2018						
	GDM	GDM on diet		GDM on medication		NA	
	n	n	%	n	%	n	%
HSA, Johor	1537	1332	86.66	197	12.82	8	0.52
HSB, Kedah	1,643	1,444	87.89	192	11.69	7	0.43
HRPZ 11, Kelantan	1484	1249	84.16	232	15.63	3	0.20
HTJ, Sembilan	1579	1048	66.37	530	33.57	1	0.06
HTF, Perlis	219	154	70.32	52	23.74	13	5.94
HPP, Pulau Pinang	414	340	82.13	74	17.87	0	0.00
HWKK, Likas, Sabah	939	705	75.08	98	10.44	136	14.48
HTAR, Selangor	1230	852	69.27	366	29.76	12	0.98
HSNZ, Terengganu	3059	2504	81.86	547	17.88	8	0.26
TOTAL	12104	9628	79.54	2288	18.90	188	1.55
	2019						
HSA, Johor	1642	1340	81.61	284	17.30	18	1.10
HSB, Kedah	2128	1816	85.34	268	12.59	44	2.07
HRPZ 11, Kelantan	1861	1629	87.53	228	12.25	4	0.21
HTJ, Sembilan	2455	1478	60.20	967	39.39	10	0.41
HTF, Perlis	265	196	73.96	51	19.25	18	6.79
HPP, Pulau Pinang	409	333	81.42	54	13.20	22	5.38
HWKK, Likas, Sabah	1249	867	69.42	68	5.44	314	25.14
HTAR, Selangor	2763	2088	75.57	501	18.13	174	6.30
HSNZ, Terengganu	3388	2671	78.84	698	20.60	19	0.56
TOTAL	16160	12418	76.84	3119	19.30	623	3.86
	2020						
HSA, Johor	2716	2237	82.36	441	16.24	38	1.40
HSB, Kedah	1961	1532	78.12	311	15.86	118	6.02
HRPZ 11, Kelantan	1882	1584	84.17	285	15.14	13	0.69
HTJ, Sembilan	2708	1687	62.30	1021	37.70	0	0.00
HTF, Perlis	228	182	79.82	42	18.42	4	1.75
HPP, Pulau Pinang	454	381	83.92	41	9.03	32	7.05
HWKK, Likas, Sabah	2201	1426	64.79	275	12.49	500	22.72
HTAR, Selangor	3242	2201	67.89	581	17.92	460	14.19
HSNZ, Terengganu	4321	3145	72.78	1124	26.01	52	1.20
TOTAL	19713	14375	72.92	4121	20.90	1217	6.17

Fig 1.6 GDM on Diet and Insulin 2020



Among the pregnant women with Gestational Diabetes approximately 7 out of 10 were on diet modification while the rest were on hypoglycaemic agents.

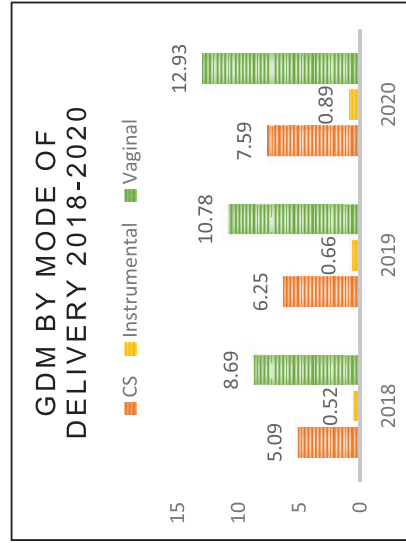
**Table 1.4a: Incidence of Diabetes by Mode of delivery and by Hospitals 2018-2019**

SDP		2018																			
		CS						Instrumental						Vaginal							
		Total Delivery		Pre-Gestational DM		GDM		NA		Pre-Gestational DM		GDM		NA		Pre-Gestational DM		GDM		NA	
n	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	
HSA, Johor	11403	34	0.30	628	5.51	1	0.01	1	0.01	1	0.01	98	0.86	0	0.00	15	0.13	814	7.14	0	0.00
HSB, Kedah	9888	36	0.36	569	5.75	11	0.11	2	0.02	91	0.92	0	0.00	18	0.18	983	9.94	0	0.00	0	0.00
HRPZ 11, Kelantan	11499	38	0.33	492	4.28	0	0.00	0	0.00	0	0.00	21	0.18	0	0.00	1	0.01	814	7.08	0	0.00
HTJ, Sembilan	9057	11	0.12	728	8.04	0	0.00	1	0.01	47	0.52	0	0.00	7	0.08	803	8.87	0	0.00	0	0.00
HTF, Perlis	3927	21	0.53	90	2.29	3	0.08	0	0.00	2	0.05	0	0.00	11	0.28	127	3.23	0	0.00	0	0.00
HPP, Pulau Pinang	3774	13	0.34	148	3.92	3	0.08	0	0.00	13	0.34	0	0.00	4	0.11	253	6.70	1	0.03	0	0.00
HWKK, Likas, Sabah	9664	9	0.09	298	3.08	17	0.18	0	0.00	16	0.17	0	0.00	4	0.04	614	6.35	22	0.23	0	0.00
HTAR, Selangor	8542	2	0.02	524	6.13	2	0.02	0	0.00	86	1.01	1	0.01	2	0.02	619	7.25	0	0.00	0	0.00
HSNZ, Terengganu	15715	55	0.35	772	4.91	1	0.01	4	0.03	62	0.39	0	0.00	72	0.46	2226	14.16	2	0.01	0	0.00
TOTAL	83469	219	0.26	4249	5.09	38	0.05	8	0.01	436	0.52	1	0.00	134	0.16	7253	8.69	25	0.03	0	0.00
2019																					
HSA, Johor	12174	19	0.16	667	5.48	1	0.01	0	0.00	98	0.80	0	0.00	8	0.07	877	7.20	0	0.00	0	0.00
HSB, Kedah	9636	29	0.30	685	7.11	6	0.06	2	0.02	109	1.13	1	0.01	13	0.13	1334	13.84	0	0.00	0	0.00
HRPZ 11, Kelantan	10864	21	0.19	690	6.35	0	0.00	0	0.00	27	0.25	0	0.00	4	0.04	1145	10.54	0	0.00	0	0.00
HTJ, Sembilan	10184	15	0.15	1160	11.39	0	0.00	0	0.00	73	0.72	0	0.00	5	0.05	1223	12.01	0	0.00	0	0.00
HTF, Perlis	4137	13	0.31	101	2.44	1	0.02	0	0.00	4	0.10	0	0.00	3	0.07	160	3.87	0	0.00	0	0.00
HPP, Pulau Pinang	3788	12	0.32	161	4.25	2	0.05	0	0.00	13	0.34	0	0.00	1	0.03	235	6.20	0	0.00	0	0.00
HWKK, Likas, Sabah	13660	11	0.08	480	3.51	17	0.12	1	0.01	28	0.20	0	0.00	6	0.04	732	5.36	22	0.16	0	0.00
HTAR, Selangor	10296	1	0.01	810	7.87	18	0.17	0	0.00	203	1.97	2	0.02	1	0.01	1748	16.98	0	0.00	0	0.00
HSNZ, Terengganu	16517	68	0.41	954	5.78	2	0.01	0	0.00	51	0.31	0	0.00	42	0.25	2385	14.44	0	0.00	0	0.00
TOTAL	91256	189	0.21	5708	6.25	47	0.05	3	0.00	606	0.66	3	0.00	83	0.09	9839	10.78	22	0.02	0	0.00

Table 1.4b: Incidence of Diabetes by Mode of Delivery and by Hospitals 2020

SDP	2020														
	Total Delivery			CS						Instrumental					
				Pre-Gestational DM		GDM		NA		Pre-Gestational DM		GDM		NA	
	n	n	%	n	%	n	%	n	%	n	%	n	%	n	%
HSA, Johor	13904	36	0.26	1109	7.98	18	0.13	2	0.01	194	1.40	1	0.01	8	0.06
HSB, Kedah	7760	23	0.30	728	9.38	12	0.15	0	0.00	106	1.37	0	0.00	12	0.15
HRPZ 11, Kelantan	11696	39	0.33	812	6.94	0	0.00	1	0.01	31	0.27	0	0.00	8	0.07
HTJ, Sembilan	9385	9	0.10	1249	13.31	0	0.00	0	0.00	95	1.01	0	0.00	1	0.01
HTF, Perlis	3771	33	0.88	97	2.57	1	0.03	2	0.05	2	0.05	0	0.00	12	0.32
HPP, Pulau Pinang	3956	18	0.46	186	4.70	3	0.08	0	0.00	21	0.53	0	0.00	4	0.10
HWKK, Likas, Sabah	12826	18	0.14	847	6.60	46	0.36	0	0.00	63	0.49	3	0.02	8	0.06
HTAR, Selangor	11856	8	0.07	812	6.85	18	0.15	0	0.00	213	1.80	2	0.02	6	0.05
HSNZ, Terengganu	16970	35	0.21	1121	6.61	1	0.01	3	0.02	91	0.54	0	0.00	29	0.17
TOTAL	92124	219	0.24	6961	7.56	99	0.11	8	0.01	816	0.89	6	0.01	88	0.10
														11914	12.93
														106	0.12

Fig 1.7 GDM by Mode of Delivery 2018-2020



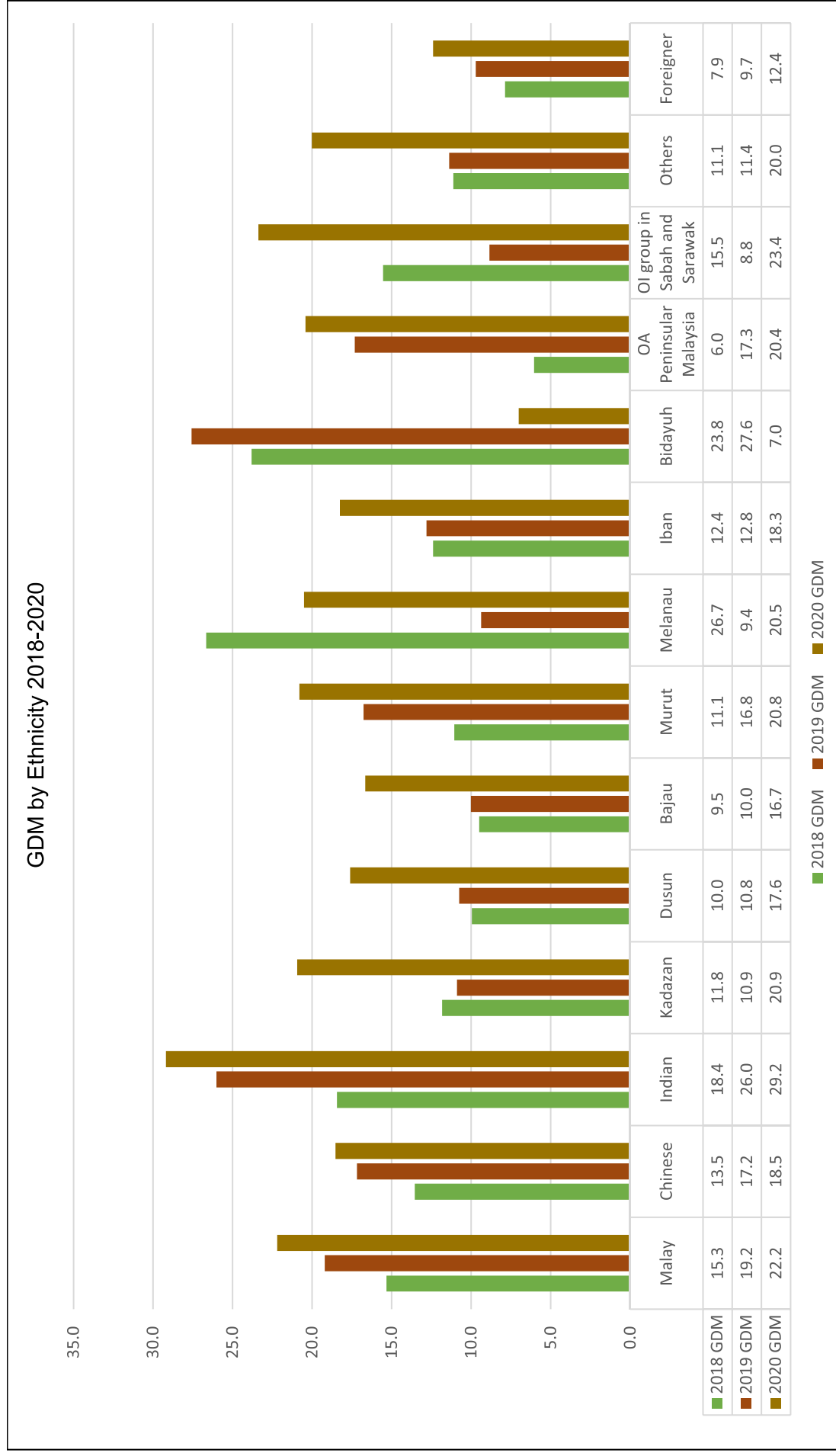
The incidence of vaginal delivery was higher than CS for patients with GDM. There is a rising CS rate in these women seen from 2018 to 2020.

**Table 1.5a: Diabetes in pregnancy by ethnicity 2018-2019**

Ethnicity	2018						2019					
	Total Delivery		Pre-Gestational DM		GDM		NA		Total Delivery		Pre-Gestational DM	
	n	%	n	%	n	%	n	%	n	%	n	%
Malay	63100	318	0.50	9670	15.32	33	0.05	65659	232	0.35	12614	19.21
Chinese	3381	11	0.33	458	13.55	1	0.03	4011	7	0.17	689	17.18
Indian	3385	14	0.41	624	18.43	1	0.03	3633	12	0.33	945	26.01
Kadazan	1411	0	0.00	167	11.84	8	0.57	1762	4	0.23	192	10.90
Dusun	1616	2	0.12	161	9.96	5	0.31	2277	2	0.09	245	10.76
Bajau	1758	3	0.17	167	9.50	4	0.23	2347	0	0.00	235	10.01
Murut	244	0	0.00	27	11.07	2	0.82	352	0	0.00	59	16.76
Melanau	30	0	0.00	8	26.67	0	0.00	32	0	0.00	3	9.38
Iban	242	0	0.00	30	12.40	1	0.41	289	0	0.00	37	12.80
Bidayuh	42	0	0.00	10	23.81	0	0.00	58	0	0.00	16	27.59
OA Peninsular Malaysia	149	0	0.00	9	6.04	0	0.00	179	0	0.00	31	17.32
Ol group in Sabah and Sarawak	148	0	0.00	23	15.54	0	0.00	260	0	0.00	23	8.85
Others	3677	10	0.27	409	11.12	12	0.33	4980	14	0.28	567	11.39
Foreigner	4204	2	0.05	331	7.87	4	0.10	4900	5	0.10	476	9.71
NA	88	1	1.14	10	11.36	0	0.00	232	0	0.00	28	12.07

In 2018 among the 3 major ethnic groups in Malaysia, the Indian women had the highest incidence of GDM at 18.43% followed by Malay women at 15.32%. In 2019 the rates were much higher with the Indians having the highest incidence. Among the indigenous population in 2018, Melanau women had the highest incidence of GDM at 26.67%. In 2019, slightly more than a quarter of Bidayuh women had GDM.

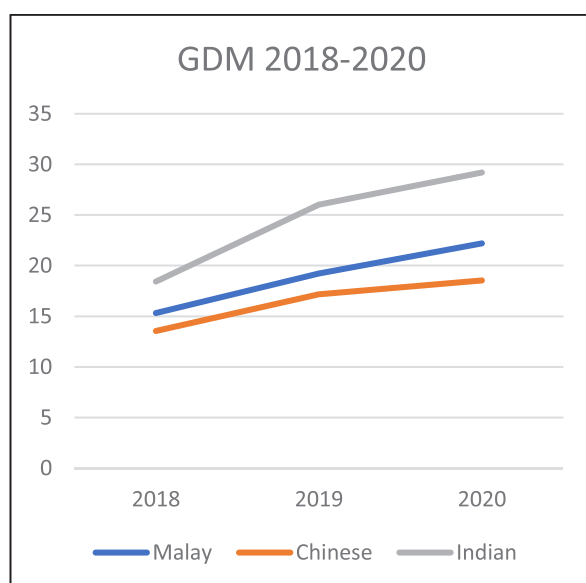
**Fig 1.8 GDM by Ethnicity 2018-2020**



**Table 1.5 b: Diabetes in pregnancy by Ethnicity 2020**

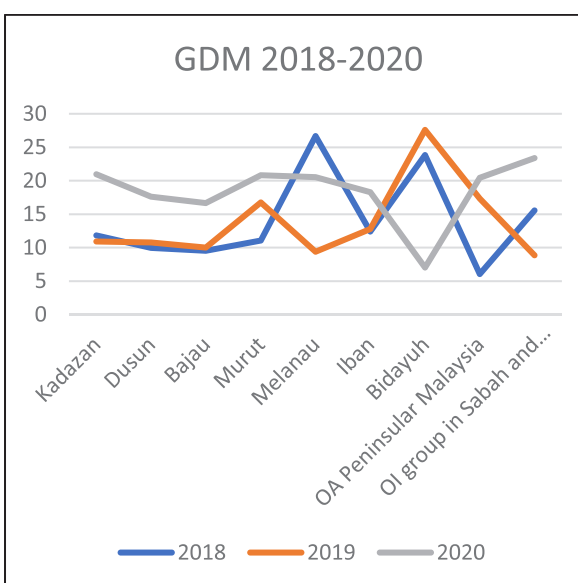
Ethnicity	2020						
	Total Delivery	Pre-Gestational DM		GDM		NA	
	n	n	%	n	%	n	%
Malay	66685	256	0.38	14807	22.20	70	0.10
Chinese	3695	7	0.19	685	18.54	11	0.30
Indian	3778	14	0.37	1103	29.20	16	0.42
Kadazan	1762	6	0.34	369	20.94	16	0.91
Dusun	2277	2	0.09	401	17.61	20	0.88
Bajau	2347	5	0.21	391	16.66	18	0.77
Murut	327	0	0.00	68	20.80	3	0.92
Melanau	39	0	0.00	8	20.51	0	0.00
Iban	345	3	0.87	63	18.26	2	0.58
Bidayuh	57	0	0.00	4	7.02	0	0.00
OA Peninsular Malaysia	191	0	0.00	39	20.42	0	0.00
OI group in Sabah and Sarawak	201	0	0.00	47	23.38	3	1.49
Others	4934	16	0.32	988	20.02	34	0.69
Foreigner	5410	5	0.09	671	12.40	17	0.31
NA	236	1	0.42	55	23.31	1	0.42

**Fig. 1.9: GDM by 3 main ethnicity 2018-2020**



Among the Malay, Chinese and Indians the incidence of GDM has been on the rise since 2018.

**Fig 1.10: GDM by indigenous group 2018-2020**



Among the indigenous group the incidence of GDM varied from 2018-2020.



**Table 1.6: Diabetes in relation to Maternal Age 2018-2020**

Age (years)	2018						
	Total Delivery	Pre-Gestational DM		GDM		NA	
	n	n	%	n	%	n	%
15-19	2314	1	0.04	67	2.90	0	0.00
20-24	13,339	19	0.14	928	6.96	4	0.03
25-29	28,348	65	0.23	3518	12.41	9	0.03
30-34	23,973	118	0.49	4011	16.73	25	0.10
35-39	12,199	113	0.93	2709	22.21	26	0.21
40-44	2,995	40	1.34	807	26.94	8	0.27
45-49	209	5	2.39	52	24.88	2	0.96
50-54	7	0	0.00	2	28.57	0	0.00
NA	46	0	0.00	10	21.74	0	0.00
	2019						
10-14	47	0	0.00	1	2.13	0	0.00
15-19	2,671	0	0.00	94	3.52	2	0.07
20-24	14,561	10	0.07	1383	9.50	28	0.19
25-29	30,447	59	0.19	4675	15.35	77	0.25
30-34	25,909	97	0.37	5360	20.69	104	0.40
35-39	13,921	72	0.52	3637	26.13	82	0.59
40-44	3,460	39	1.13	1034	29.88	19	0.55
45-49	219	1	0.46	75	34.25	0	0.00
50-54	5	0	0.00	0	0.00	0	0.00
55-59	1	0	0.00	1	100.00	0	0.00
NA	15	0	0.00	4	26.67	0	0.00
	2020						
15-19	2668	1	0.04	145	5.43	3	0.11
20-24	14383	22	0.15	1664	11.57	18	0.13
25-29	30836	59	0.19	5777	18.73	59	0.19
30-34	26338	102	0.39	6491	24.64	66	0.25
35-39	14313	90	0.63	4413	30.83	59	0.41
40-44	3443	40	1.16	1134	32.94	15	0.44
45-49	224	1	0.45	92	41.07	0	0.00
50-54	7	0	0.00	1	14.29	0	0.00
NA	20	0	0.00	2	10.00	0	0.00

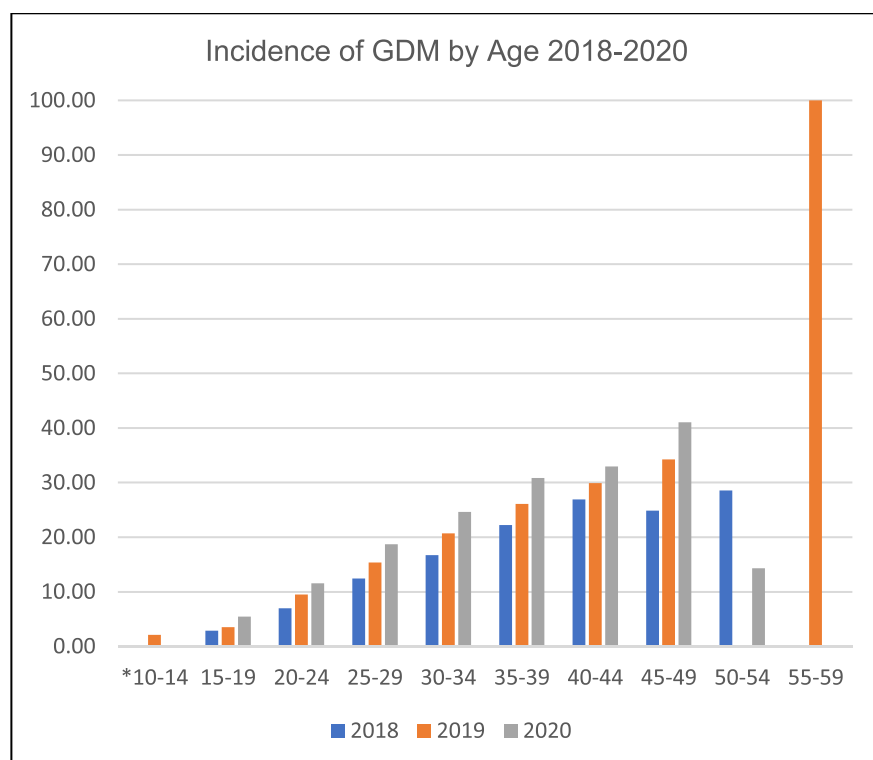
Increasing age has been associated with increased risk of GDM. Higher the maternal age, higher is the incidence of Pregestational Diabetes. Incidence of GDM in all 3 years is also seen to be higher with advancing maternal age.

**Table 1.7: GDM in relation to maternal age 2018-2020**

Age (years)	2018						
	GDM	GDM Diet		GDM Medication		NA	
	n	n	%	n	%	n	%
15-19	67	53	79.10	10	14.93	4	5.97
20-24	928	752	81.03	162	17.46	14	1.51
25-29	3518	2904	82.55	568	16.15	46	1.31
30-34	4011	3224	80.38	724	18.05	63	1.57
35-39	2709	2063	76.15	601	22.19	45	1.66
40-44	807	591	73.23	201	24.91	15	1.86
45-49	52	30	57.69	21	40.38	1	1.92
50-54	2	2	100.00	0	0.00	0	0.00
	2019						
*10-14	1	1	100.00	0	0.00	0	0.00
15-19	94	81	86.17	12	12.77	1	1.06
20-24	1371	1063	77.53	254	18.53	54	3.94
25-29	4657	3702	79.49	789	16.94	166	3.56
30-34	5320	4121	77.46	1010	18.98	189	4.59
35-39	3608	2655	73.59	799	22.15	154	4.27
40-44	1030	740	71.84	234	22.72	56	5.44
45-49	74	50	67.57	21	28.38	3	4.05
55-59	1	1	100.00	0	0.00	0	0.00
	2020						
15-19	145	95	65.52	37	25.52	13	8.97
20-24	1664	1228	73.80	344	20.67	92	5.53
25-29	5772	4437	76.87	1015	17.58	320	5.54
30-34	6489	4785	73.74	1327	20.45	377	5.81
35-39	4414	3036	68.78	1058	23.97	320	7.25
40-44	1134	732	64.55	313	27.60	89	7.85
45-49	92	60	65.22	26	28.26	6	6.52
50-54	1	0	0.00	1	100.00	0	0.00

Women aged 45-54 have a higher incidence of GDM in insulin compared to GDM on diet as seen in 2018 and 2020.

**Fig 1.11 Incidence of GDM by Age 2018-2019**



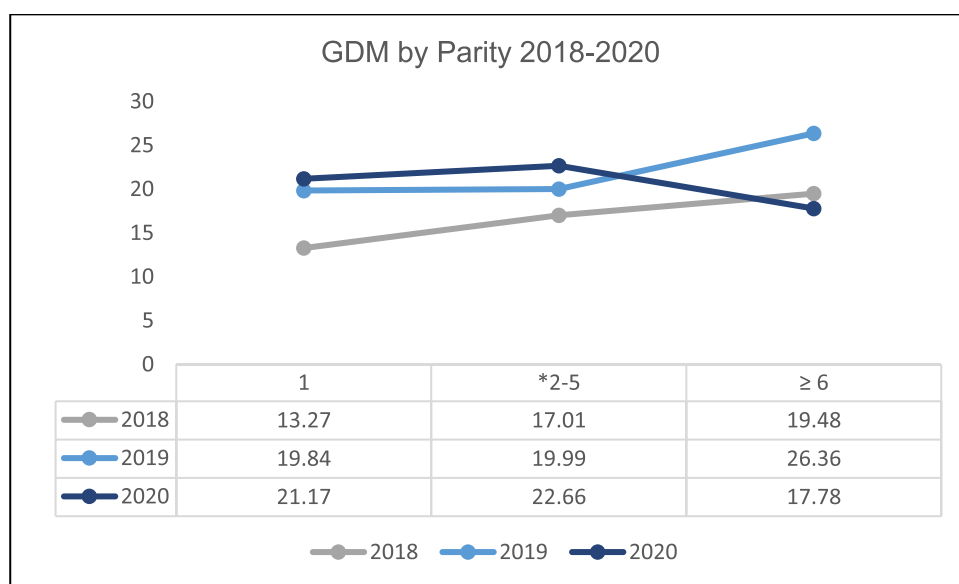
**Table 1.8: Diabetes in relation to Parity 2018-2020**

Parity	2018						
	Total Delivery	Pre-Gestational DM		GDM		NA	
	n	n	%	n	%	n	%
1	22547	82	0.36	2993	13.27	4	0.02
2-5	31966	155	0.48	5436	17.01	25	0.08
≥ 6	1566	18	1.15	305	19.48	1	0.06
NA	27,396	106	0.39	3370	12.30	9	0.03
2019							
1	22937	75	0.33	3986	17.38	30	0.13
2-5	34036	120	0.35	6975	20.49	82	0.24
≥ 6	1593	13	0.82	387	24.29	9	0.56
NA	32691	68	0.21	4812	14.72	112	0.34
2020							
1	23287	89	0.38	4820	20.70	17	0.07
2-5	34073	137	0.40	8449	24.80	43	0.13
≥ 6	1524	7	0.46	427	28.02	11	0.72
NA	33400	82	0.25	6003	17.97	39	0.12

**Table 1.9: Type of GDM by Parity 2018-2020**

Parity	2018						
	GDM	GDM Diet		GDM Medication		NA	
	n	n	%	n	%	n	%
1	2993	2425	81.02	532	17.77	36	1.20
2-5	5436	4229	77.80	1106	20.35	101	1.86
≥ 6	305	213	69.84	86	28.20	6	1.97
2019							
1	3986	3093	77.60	791	19.84	102	2.56
2-5	6975	5322	76.30	1394	19.99	259	3.71
≥ 6	387	258	66.67	102	26.36	27	6.98
2020							
1	4823	3564	73.90	1021	21.17	238	4.93
2-5	8456	6042	71.45	1916	22.66	498	5.89
≥ 6	6006	268	4.46	1068	17.78	44	0.73

**Fig 1.12: Incidence of GDM by Parity 2018-2020**

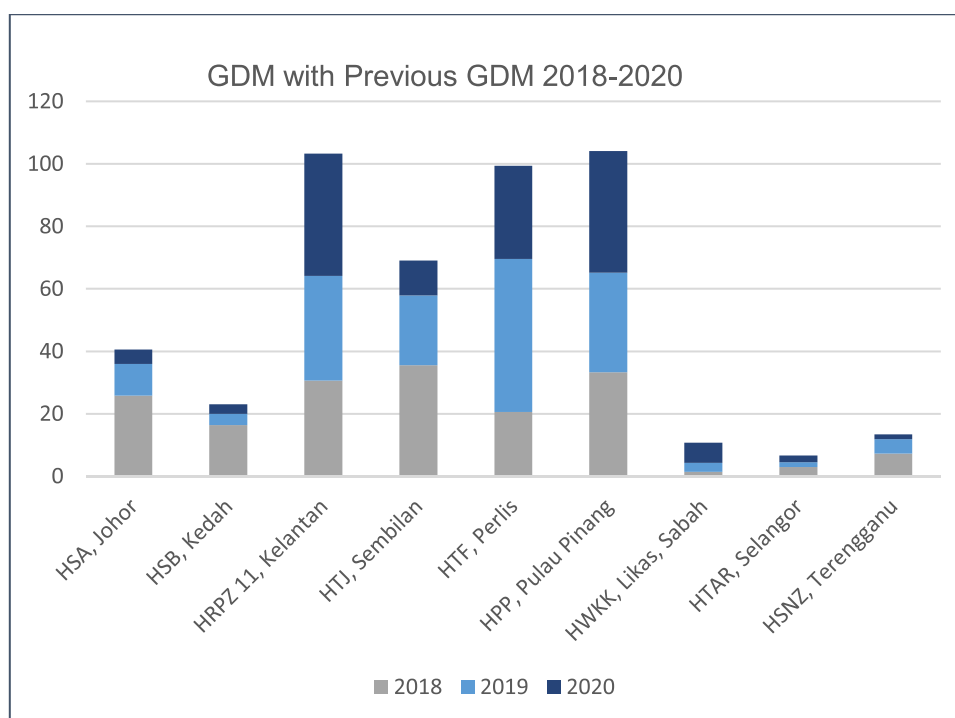


Higher the parity higher the incidence of GDM was seen in 2018 and 2019 whilst in 2020 the incidence was higher in Para 1 and Para 2-5 compared to Para 6 and more.

**Table 1.10: Incidence of GDM in relation to Previous GDM 2018-2020**

SDP	2018			2019			2020		
	GDM	Previous GDM		GDM	Previous GDM		GDM	Previous GDM	
	n	n	%	n	n	%	n	n	%
HSA, Johor	1537	396	25.76	1642	168	10.23	2716	124	4.57
HSB, Kedah	1643	270	16.43	2128	75	3.52	1961	61	3.11
HRPZ 11, Kelantan	1484	455	30.66	1861	623	33.48	1882	736	39.11
HTJ, Sembilan	1579	561	35.53	2455	549	22.36	2708	302	11.15
HTF, Perlis	219	45	20.55	265	130	49.06	228	68	29.82
HPP, Pulau Pinang	414	138	33.33	409	130	31.78	454	177	38.99
HWKK, Likas, Sabah	12104	177	1.46	16160	458	2.83	19713	1268	6.43
HTAR, Selangor	1230	36	2.93	2763	44	1.59	3242	69	2.13
HSNZ, Terengganu	3059	223	7.29	3388	154	4.55	4321	66	1.53

**Fig 1.13: GDM in relation to previous history of GDM 2018-2020**



HTAR Selangor, HWKK, Likas and HSNZ, Terengganu had a lower incidence of women with GDM in current pregnancy with a previous history of GDM.

**Table 1.11: GDM and Stillbirth rate 2018-2020**

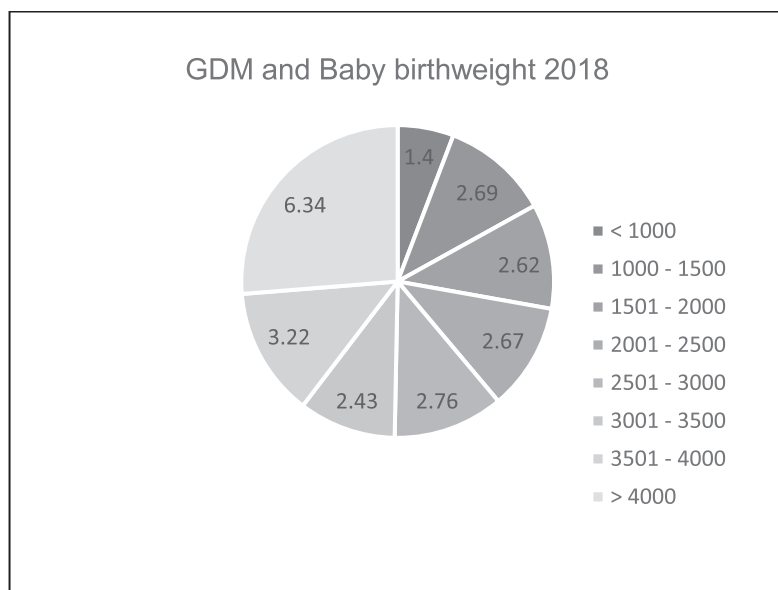
<b>GDM and Stillbirth</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>
Total Delivery	83469	91256	92124
Stillbirth in GDM	541	571	683
Stillbirth rate (per 1000 livebirths)	6.48	6.26	7.41

Stillbirth rates in women with GDM was 6.48 per 1000 livebirths in 2018. The rates were higher in 2020 at 7.41 per 1000 livebirths in 2020.

**Table 1.12: Birthweight in relation to Pre-Gestational DM and GDM 2018-2020**

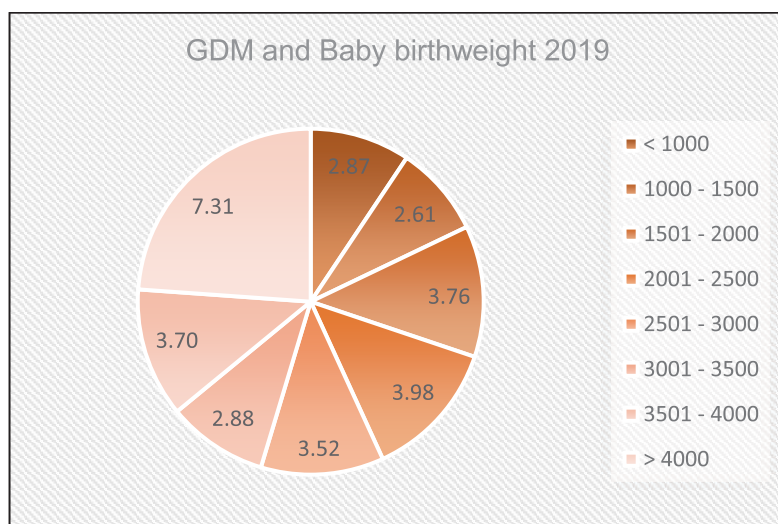
<b>Birthweight (grams)</b>	<b>2018</b>						
	<b>Total Delivery</b>	<b>Pre- Gestational DM</b>		<b>GDM</b>		<b>NA</b>	
	<b>n</b>	<b>n</b>	<b>%</b>	<b>n</b>	<b>%</b>	<b>n</b>	<b>%</b>
< 1000	645	9	1.40	9	1.40	2	0.31
1000 - 1500	891	4	0.45	24	2.69	0	0.00
1501 - 2000	2136	9	0.42	56	2.62	2	0.09
2001 - 2500	9103	30	0.33	243	2.67	26	0.29
2501 - 3000	30422	106	0.35	839	2.76	77	0.25
3001 - 3500	30267	110	0.36	734	2.43	57	0.19
3501 - 4000	9346	59	0.63	301	3.22	25	0.27
> 4000	1499	35	2.33	95	6.34	1	0.07
	<b>2019</b>						
< 1000	662	6	0.91	19	2.87	4	0.60
1000 - 1500	918	9	0.98	24	2.61	5	0.54
1501 - 2000	2396	19	0.79	90	3.76	15	0.63
2001 - 2500	10345	31	0.30	412	3.98	83	0.80
2501 - 3000	33671	84	0.25	1184	3.52	281	0.83
3001 - 3500	32795	75	0.23	946	2.88	169	0.52
3501 - 4000	9926	40	0.40	367	3.70	57	0.57
> 4000	1437	15	1.04	105	7.31	12	0.84
	<b>2020</b>						
< 1000	699	1	0.14	27	3.86	2	0.29
1000 - 1500	997	3	0.30	44	4.41	11	1.10
1501 - 2000	2479	9	0.36	103	4.15	31	1.25
2001 - 2500	9992	29	0.29	504	5.04	155	1.55
2501 - 3000	33701	90	0.27	1565	4.64	546	1.62
3001 - 3500	33652	97	0.29	1318	3.92	381	1.13
3501 - 4000	10267	59	0.57	458	4.46	90	0.88
> 4000	1471	28	1.90	137	9.31	7	0.48

**Fig 1.14: GDM and birthweight 2018**

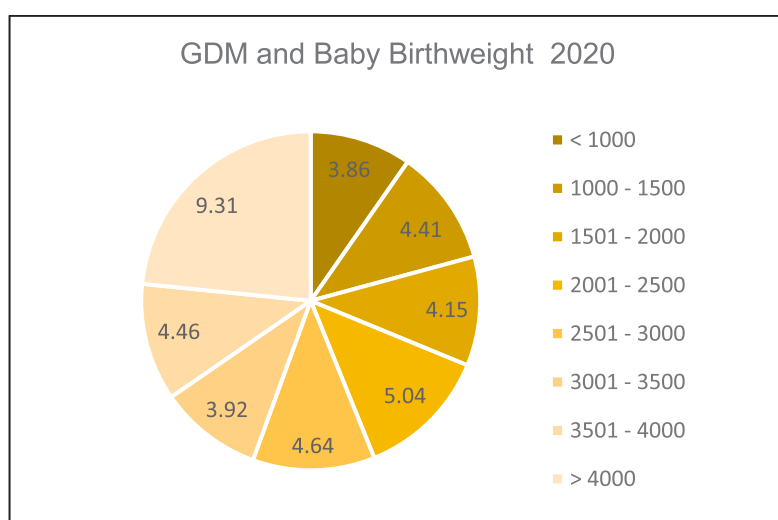


6.34% of babies weighing more than 4kg were seen in women with GDM in 2018. In 2020 the rates of macrosomic babies were higher at 9.31% in women with GDM. While pregestational Diabetic mothers had a lower rate of babies weighing more than 4kg

**Fig 1.15: GDM and birthweight 2019**



**Fig 1.16: GDM and birthweight 2020**



**Table 1.13: Birthweight in relation to GDM on Diet and GDM on Medication 2018-2020**

Birthweight (grams)	2018						
	GDM	GDM Diet		GDM Medication		NA	
	n	n	%	n	%	n	%
< 1000	56	45	80.36	9	16.07	2	3.57
1000 - 1500	99	75	75.76	24	24.24	0	0.00
1501 - 2000	295	237	80.34	56	18.98	2	0.68
2001 - 2500	1207	938	77.71	243	20.13	26	2.15
2501 - 3000	4264	3348	78.52	839	19.68	77	1.81
3001 - 3500	4389	3598	81.98	734	16.72	57	1.30
3501 - 4000	1555	1229	79.04	301	19.36	25	1.61
> 4000	355	259	72.96	95	26.76	1	0.28
	2019						
< 1000	72	49	68.06	19	26.39	4	5.56
1000 - 1500	128	99	77.34	24	18.75	5	3.91
1501 - 2000	376	271	72.07	90	23.94	15	3.99
2001 - 2500	1753	1258	71.76	412	23.50	83	4.73
2501 - 3000	5823	4358	74.84	1184	20.33	281	4.83
3001 - 3500	5834	4719	80.89	946	16.22	169	2.90
3501 - 4000	1977	1553	78.55	367	18.56	57	2.88
> 4000	345	228	66.09	105	30.43	12	3.48
	2020						
< 1000	93	64	68.82	27	29.03	2	2.15
1000 - 1500	179	124	69.27	44	24.58	11	6.15
1501 - 2000	490	356	72.65	103	21.02	31	6.33
2001 - 2500	2131	1472	69.08	504	23.65	155	7.27
2501 - 3000	7133	5022	70.41	1565	21.94	546	7.65
3001 - 3500	7183	5484	76.35	1318	18.35	381	5.30
3501 - 4000	2284	1736	76.01	458	20.05	90	3.94
> 4000	426	282	66.20	137	32.16	7	1.64

7 out of 10 babies of women with GDM on diet had birthweight 4kg and more while 3 out of 10 babies of women on hypoglycaemic agents had a birthweight of 4kg and more in 2018-2020



**Table 1.14: Distribution of Diabetes in pregnancy by Age and Parity 2018-2020**

Age (years)	Parity	2018						2019						2020					
		Total Delivery		Pre-Gestational DM		GDM		Total Delivery		Pre-Gestational DM		GDM		Total Delivery		Pre-Gestational DM		GDM	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
15-19	1	349	0	0.00	11	3.15	343	0	0.00	15	4.37	335	0	0.00	18	5.37			
	2-5	37	0	0.00	2	5.41	24	0	0.00	2	8.33	41	0	0.00	1	2.44			
	≥6	0	0	0.00	0	0.00	0	0	0.00	0	0.00	0	0	0.00	0	0.00			
	NA	1,928	1	0.05	54	2.80	2,304	0	0.00	77	3.34	2,292	1	0.04	126	5.50			
20-24	1	3,631	6	0.17	199	5.48	3,707	4	0.11	314	8.47	3,596	9	0.25	403	11.21			
	2-5	1,321	4	0.30	89	6.74	1,375	0	0.00	105	7.64	1,271	1	0.08	127	9.99			
	≥6	1	0	0.00	0	0.00	1	0	0.00	0	0.00	0	0	0.00	1	100.00			
	NA	8,386	9	0.11	640	7.63	9,478	6	0.06	952	10.04	9,515	12	0.13	1133	11.91			
25-29	1	9,830	16	0.16	143	1.45	9,720	23	0.24	280	2.88	9,724	24	0.25	265	2.73			
	2-5	6,432	12	0.19	90	1.40	6,774	8	0.12	151	2.23	6,842	6	0.09	173	2.53			
	≥6	37	0	0.00	0	0.00	45	0	0.00	2	4.44	49	0	0.00	1	2.04			
	NA	12,049	37	0.31	227	1.88	13,908	28	0.20	317	2.28	14,221	29	0.20	360	2.53			
30-34	1	6,769	37	0.55	1137	16.80	6,958	29	0.42	1489	21.40	7,218	40	0.55	1815	25.15			
	2-5	13,138	45	0.34	2087	15.89	13,669	45	0.33	2686	19.65	13,605	41	0.30	3244	23.84			
	≥6	246	0	0.00	29	11.79	277	2	0.81	47	16.97	257	0	0.00	53	20.62			
	NA	3,820	36	0.94	758	19.84	5,005	20	0.40	2686	53.67	5,258	21	0.40	1377	26.19			
35-39	1	1,707	20	1.17	398	23.32	1,933	14	0.72	560	28.97	2,051	12	0.59	662	32.28			
	2-5	8,870	70	0.79	1949	21.97	9,732	42	0.43	2518	25.87	9,938	62	0.62	3079	30.98			
	≥6	649	4	0.62	119	18.34	651	7	1.08	150	23.04	608	4	0.66	165	27.14			
	NA	973	19	1.95	243	24.97	1,605	9	0.56	380	23.68	1,716	12	0.70	508	29.60			
40-44	1	239	3	1.26	64	26.78	257	4	1.56	74	28.79	348	4	1.15	119	34.20			
	2-5	2,040	22	1.08	562	27.55	2,335	25	1.07	686	29.38	2,249	26	1.16	748	33.26			
	≥6	551	12	2.18	132	23.96	545	4	0.73	167	30.64	531	3	0.56	171	32.20			
	NA	165	3	1.82	49	29.70	323	5	1.55	103	31.89	315	7	2.22	96	30.48			
45-49	1	7	0	0.00	1	14.29	12	1	8.33	4	33.33	9	0	0.00	4	44.44			
	2-5	106	2	1.89	29	27.36	119	0	0.00	52	43.70	116	1	0.86	48	41.38			
	≥6	74	6	8.11	20	27.03	72	0	0.00	17	23.61	75	0	0.00	32	42.67			
	NA	22	1	4.55	2	9.09	16	0	0.00	1	6.25	24	0	0.00	8	33.33			

**Table 1.15a: Distribution of Diabetes in Pregnancy by Age and Ethnicity 2018-2020**

Age (years)	Ethnicity	2018						2019						2020					
		Total Delivery		Pre- Gestational DM		GDM		Total Delivery		Pre- Gestational DM		GDM		Total Delivery		Pre- Gestational DM		GDM	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
15-19	Malay	1402	1	0.07	44	3.14	1426	0	0.00	52	3.65	1381	1	0.07	82	5.94			
	Chinese	108	0	0.00	6	5.56	143	0	0.00	8	5.59	153	0	0.00	10	6.54			
	Indian	111	0	0.00	4	3.60	119	0	0.00	14	11.76	104	0	0.00	13	12.50			
	Kadazan	52	0	0.00	0	0.00	71	0	0.00	0	0.00	82	0	0.00	3	3.66			
	Dusun	108	0	0.00	4	3.70	118	0	0.00	2	1.69	121	0	0.00	5	4.13			
	Bajau	98	0	0.00	4	4.08	124	0	0.00	1	0.81	122	0	0.00	7	5.74			
	Murut	12	0	0.00	0	0.00	17	0	0.00	1	5.88	16	0	0.00	2	12.50			
	OA Peninsular Malaysia	22	0	0.00	1	4.55	34	0	0.00	3	8.82	40	0	0.00	4	10.00			
	OI group in Sabah and Sarawak	7	0	0.00	0	0.00	15	0	0.00	1	6.67	14	0	0.00	1	7.14			
	Others	156	0	0.00	2	1.28	232	0	0.00	7	3.02	201	0	0.00	10	4.98			
	Foreigner	222	0	0.00	2	0.90	349	0	0.00	4	1.15	399	0	0.00	8	2.01			
20-24	Malay	9762	17	0.17	734	7.52	10270	9	0.09	1084	10.56	10051	21	0.21	1252	12.46			
	Chinese	527	1	0.19	45	8.54	577	0	0.00	62	10.75	519	0	0.00	64	12.33			
	Indian	467	0	0.00	44	9.42	458	0	0.00	67	14.63	480	0	0.00	80	16.67			
	Kadazan	164	0	0.00	10	6.10	198	0	0.00	14	7.07	173	0	0.00	15	8.67			
	Dusun	322	0	0.00	15	4.66	354	0	0.00	13	3.67	387	0	0.00	36	9.30			
	Bajau	320	0	0.00	16	5.00	471	0	0.00	18	3.82	405	1	0.25	32	7.90			
	Murut	48	0	0.00	4	8.33	76	0	0.00	4	5.26	77	0	0.00	10	12.99			
	Melanau	5	0	0.00	1	20.00	4	0	0.00	0	0.00	6	0	0.00	0	0.00			
	Iban	42	0	0.00	0	0.00	73	0	0.00	5	6.85	58	0	0.00	0	0.00			
	Bidayuh	5	0	0.00	0	0.00	11	0	0.00	1	9.09	13	0	0.00	9	0.00			
	OA Peninsular Malaysia	39	0	0.00	0	0.00	41	0	0.00	0	0.00	49	0	0.00	7	14.29			
	OI group in Sabah and Sarawak	36	0	0.00	3	8.33	38	0	0.00	3	7.89	36	0	0.00	2	5.56			
	Others	640	0	0.00	32	5.00	854	1	0.12	54	6.32	828	0	0.00	86	10.39			
	Foreigner	949	1	0.11	24	2.53	1108	0	0.00	45	4.06	1281	0	0.00	70	5.46			
	NA	13	0	0.00	0	0.00	28	0	0.00	1	3.57	17	0	0.00	1	5.88			

**Table 1.15 b: Distribution of Diabetes in Pregnancy by Age and Ethnicity 2018-2020**

Age (years)	Ethnicity	2018						2019						2020					
		Total Delivery		Pre- Gestational DM		GDM		Total Delivery		Pre- Gestational DM		GDM		Total Delivery		Pre- Gestational DM		GDM	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
25-29	Malay	22311	55	0.25	2870	12.86	22998	50	0.22	3753	16.32	23500	49	0.21	4464	19.00			
	Chinese	1025	2	0.20	110	10.73	1191	3	0.25	172	14.44	1044	1	0.10	177	16.95			
	Indian	1071	4	0.37	177	16.53	1166	1	0.09	258	22.13	1213	3	0.25	323	26.63			
	Kadazan	358	0	0.00	41	11.45	455	2	0.44	43	9.45	0	0	0.00	0	0.00			
	Dusun	492	1	0.20	60	12.20	726	2	0.28	69	9.50	694	0	0.00	117	16.86			
	Bajau	539	0	0.00	48	8.91	735	0	0.00	68	9.25	686	0	0.00	90	13.12			
	Murut	64	0	0.00	7	10.94	115	0	0.00	18	15.65	83	0	0.00	18	21.69			
	Melanau	6	0	0.00	0	0.00	12	0	0.00	2	16.67	9	0	0.00	3	33.33			
	Iban	80	0	0.00	8	10.00	82	0	0.00	6	7.32	112	0	0.00	21	18.75			
	Bidayuh	12	0	0.00	4	33.33	0	0	0.00	0	0.00	16	0	0.00	1	6.25			
	OA Peninsular Malaysia	50	0	0.00	3	6.00	51	0	0.00	11	21.57	40	0	0.00	8	20.00			
	OI group in Sabah and Sarawak	36	0	0.00	6	16.67	84	0	0.00	8	9.52	65	0	0.00	14	21.54			
	Others	1142	1	0.09	112	9.81	1489	1	0.07	128	8.60	1466	2	0.14	276	18.83			
	Foreigner	1128	1	0.09	69	6.12	1247	0	0.00	105	8.42	1387	2	0.14	177	12.76			
	NA	34	1	2.94	3	8.82	84	0	0.00	14	16.67	87	0	0.00	14	16.09			

**Table 1.15c: Distribution of Diabetes in Pregnancy by Age and Ethnicity 2018-2020**

Age (years)	Ethnicity	2018						2019						2020					
		Total Delivery		Pre- Gestational DM		GDM		Total Delivery		Pre- Gestational DM		GDM		Total Delivery		Pre- Gestational DM		GDM	
		n		n	%	n	%	n		n	%	n	%	n		n	%	n	%
30-34	Malay	18191	101	0.56	3202	17.60	18571	79	0.43	4088	22.01	19072	75	0.39	4821	25.28			
	Chinese	1056	6	0.57	151	14.30	1274	1	0.08	236	18.52	1188	4	0.34	227	19.11			
	Indian	1131	5	0.44	238	21.04	1248	4	0.32	365	29.25	1281	8	0.62	417	32.55			
	Kadazan	475	1	0.21	57	12.00	572	2	0.35	65	11.36	580	3	0.52	133	22.93			
	Dusun	415	0	0.00	36	8.67	705	0	0.00	81	11.49	639	2	0.31	137	21.44			
	Bajau	462	0	0.00	48	10.39	624	0	0.00	70	11.22	604	1	0.17	137	22.68			
	Murut	77	0	0.00	12	15.58	92	0	0.00	0	0.00	92	0	0.00	22	23.91			
	Melanau	10	0	0.00	3	30.00	8	0	0.00	0	0.00	18	0	0.00	2	11.11			
	Iban	70	0	0.00	11	15.71	68	0	0.00	13	19.12	98	2	2.04	19	19.39			
	Bidayuh	12	0	0.00	3	25.00	15	0	0.00	4	26.67	12	0	0.00	1	8.33			
	OA Peninsular Malaysia	19	0	0.00	2	10.53	32	0	0.00	3	9.38	37	0	0.00	15	40.54			
	OI group in Sabah and Sarawak	42	0	0.00	6	14.29	66	0	0.00	5	7.58	46	0	0.00	11	23.91			
	Others	1020	5	0.00	141	13.82	1398	8	0.57	200	14.31	1388	6	0.43	321	23.13			
	Foreigner	970	0	0.00	98	10.10	1169	2	0.17	157	13.43	1202	1	0.08	202	16.81			
	NA	23	0	0.00	3	13.04	67	0	0.00	18	26.87	81	0	0.00	24	29.63			

**Table 1.15 d: Distribution of Diabetes in Pregnancy by Age and Ethnicity 2018-2020**

Age (years)	Ethnicity	2018						2019						2020					
		Total Delivery		Pre- Gestational DM		GDM		Total Delivery		Pre- Gestational DM		GDM		Total Delivery		Pre- Gestational DM		GDM	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
35-39	Malay	9022	103	0.00	2137	23.69	9776	60	0.61	2779	28.43	10110	76	0.75	3265	32.29			
	Chinese	577	4	0.00	121	20.97	693	3	0.43	176	25.40	663	2	0.30	165	24.89			
	Indian	521	3	0.00	135	25.91	545	5	0.92	190	34.86	594	3	0.51	222	37.37			
	Kadazan	267	0	0.00	38	14.23	397	0	0.00	48	12.09	382	1	0.26	120	31.41			
	Dusun	206	0	0.00	32	15.53	364	0	0.00	63	17.31	336	0	0.00	86	25.60			
	Bajau	257	1	0.39	39	15.18	384	0	0.00	49	12.76	411	1	0.24	99	24.09			
	Murut	34	0	0.00	3	8.82	34	0	0.00	15	44.12	47	0	0.00	13	27.66			
	Melanau	5	0	0.00	3	60.00	6	0	0.00	1	16.67	4	0	0.00	3	75.00			
	Iban	32	0	0.00	8	25.00	36	0	0.00	9	25.00	47	1	2.13	12	25.53			
	Bidayuh	10	0	0.00	3	30.00	14	0	0.00	7	50.00	11	0	0.00	2	18.18			
	OA Peninsular Malaysia	10	0	0.00	2	20.00	17	0	0.00	7	41.18	15	0	0.00	5	33.33			
	OI group in Sabah and Sarawak	17	0	0.00	4	23.53	52	0	0.00	5	9.62	37	0	0.00	17	45.95			
	Others	566	2	0.35	83	14.66	796	3	0.38	138	17.34	796	0	0.00	223	28.02			
	Foreigner	663	0	0.00	97	14.63	762	1	0.13	116	15.22	829	1	0.12	171	20.63			
40-44	Malay	2259	36	1.59	636	28.15	2459	34	1.38	797	32.41	2409	33	1.37	850	35.28			
	Chinese	83	0	0.00	25	30.12	126	0	0.00	34	26.98	115	0	0.00	39	33.91			
	Indian	79	0	0.00	26	32.91	93	1	1.08	50	53.76	102	0	0.00	47	46.08			
	Kadazan	84	0	0.00	21	25.00	115	0	0.00	21	18.26	98	0	0.00	28	28.57			
	Dusun	58	1	1.72	11	18.97	111	0	0.00	15	13.51	89	0	0.00	21	23.60			
	Bajau	75	1	1.33	12	16.00	118	0	0.00	26	22.03	107	2	1.87	28	26.17			
	Murut	8	0	0.00	1	12.50	17	0	0.00	3	17.65	8	0	0.00	1	12.50			
	Melanau	2	0	0.00	1	50.00	1	0	0.00	0	0.00	1	0	0.00	0	0.00			
	Iban	6	0	0.00	3	50.00	11	0	0.00	4	36.36	6	0	0.00	2	33.33			
	OA Peninsular Malaysia	5	0	0.00	1	20.00	3	0	0.00	0	0.00	7	0	0.00	2	28.57			
	OI group in Sabah and Sarawak	10	0	0.00	2	20.00	5	0	0.00	1	20.00	3	0	0.00	3	100.00			
	Others	132	2	1.52	36	27.27	191	1	0.52	36	18.85	239	4	1.67	72	30.13			
	Foreigner	187	0	0.00	30	16.04	201	2	1.00	42	20.90	244	1	0.41	39	15.98			

**Table 1.15e: Distribution of Diabetes in Pregnancy by Age and Ethnicity 2018-2020**

Age (years)	Ethnicity	2018						2019						2020					
		Total Delivery		Pre- Gestational DM		GDM		Total Delivery		Pre- Gestational DM		GDM		Total Delivery		Pre- Gestational DM		GDM	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
45-49	Malay	129	5	3.88	44	34.11		140		0	0.00	58	41.43	142	1	0.70		73	51.41
	Chinese	2	0	0.00	0	0.00		6		0	0.00	0	0.00	8	0	0.00		3	37.50
	Indian	3	0	0.00	0	0.00		3		1	33.33	1	33.33	2	0	0.00		1	50.00
	Kadazan	11	0	0.00	0	0.00		4		0	0.00	1	25.00	9	0	0.00		2	22.22
	Dusun	10	0	0.00	3	30.00		10		0	0.00	2	20.00	9	0	0.00		2	22.22
	Bajau	4	0	0.00	0	0.00		6		0	0.00	3	50.00	8	0	0.00		1	12.50
	Murut	1	0	0.00	0	0.00		0		0	0.00	0	0.00	4	0	0.00		3	75.00
	Others	17	0	0.00	3	17.65		12		0	0.00	4	33.33	11	0	0.00		3	27.27
	Foreigner	30	0	0.00	2	6.67		36		0	0.00	5	13.89	31	0	0.00		4	12.90

There is an increase incidence of GDM in all ethnic groups in Malaysia in all age groups. The incidence is much higher in advanced maternal age.

**Table 1.16: Diabetes in pregnancy in relation to risk level at booking 2018-2019**

Risk level at booking	2018						
	Total Delivery	Pre-Gestational DM		GDM		NA	
	n	n	%	n	%	n	%
Red	1196	21	1.76	204	17.06	0	0.00
Yellow	11553	175	1.51	2787	24.12	36	0.31
Green	64379	159	0.25	8891	13.81	32	0.05
White I	1916	4	0.21	90	4.70	1	0.05
White II	491	0	0.00	23	4.68	0	0.00
No Code	2044	2	0.10	150	7.34	1	0.05
NA	1896	5	0.26	131	6.91	4	0.21
	2019						
Red	1184	10	0.84	243	20.52	4	0.34
Yellow	13971	155	1.11	3939	28.19	151	1.08
Green	69303	109	0.16	11691	16.87	145	0.21
White I	1754	0	0.00	103	5.87	2	0.11
White II	505	0	0.00	28	5.54	0	0.00
No Code	1703	5	0.29	95	5.58	0	0.00
NA	2837	3	0.11	165	5.82	10	0.35
	2020						
Red	1345	13	0.97	337	25.06	4	0.30
Yellow	14195	176	1.24	5191	36.57	132	0.93
Green	70600	131	0.19	13784	19.52	77	0.11
White I	1568	0	0.00	81	5.17	1	0.06
White II	365	0	0.00	22	6.03	1	0.27
No Code	1734	0	0.00	127	7.32	2	0.12
NA	2477	3	0.12	177	7.15	3	0.12

Approximately 50 % patients with GDM were on follow up with a medical officer or specialist

**Table 1.17: Distribution of Diabetes in pregnancy by POA 2018-2020**

POA	2018						
	Total Delivery	Pre-Gestational DM		GDM		NA	
	n	n	%	n	%	n	%
22 - <37 weeks	4676	29	0.62	766	16.38	0	0.00
37 - 40 weeks	37341	115	0.31	5961	15.96	9	0.02
>40 - 42 weeks	1938	6	0.31	93	4.80	0	0.00
NA	39520	211	0.53	5284	13.37	62	0.16
	2019						
22 - <37 weeks	4751	34	0.72	923	19.43	4	0.08
37 - 40 weeks	40752	87	0.21	8282	20.32	40	0.10
>40 - 42 weeks	1628	1	0.06	56	3.44	0	0.00
NA	44126	154	0.35	6899	15.63	259	0.59
	2020						
22 - <37 weeks	4952	39	0.79	1148	23.18	14	0.28
37 - 40 weeks	40636	97	0.24	9535	23.46	39	0.10
>40 - 42 weeks	1434	0	0.00	51	3.56	1	0.07
NA	45262	179	0.40	8979	19.84	157	0.35

2 out of 10 preterm babies were born to women with Gestational Diabetes Mellitus in 2018-2020.

**Table1.18: Preterm labour in relation to Diabetes in pregnancy 2018-2020**

Preterm labour	2018				
	Total Delivery	Pre-Gestational DM		GDM	
	n	n	%	n	%
Induced preterm labour	305	5	1.64	61	20.00
Spontaneous preterm labour	1174	8	0.68	183	15.59
	2019				
Induced preterm labour	295	10	3.39	59	20.00
Spontaneous preterm labour	839	12	1.43	157	18.71
	2020				
Induced preterm labour	284	4	1.41	77	27.11
Spontaneous preterm labour	1616	9	0.56	314	19.43

20-27% of all induced preterm deliveries were in women with Gestational Diabetes Mellitus.



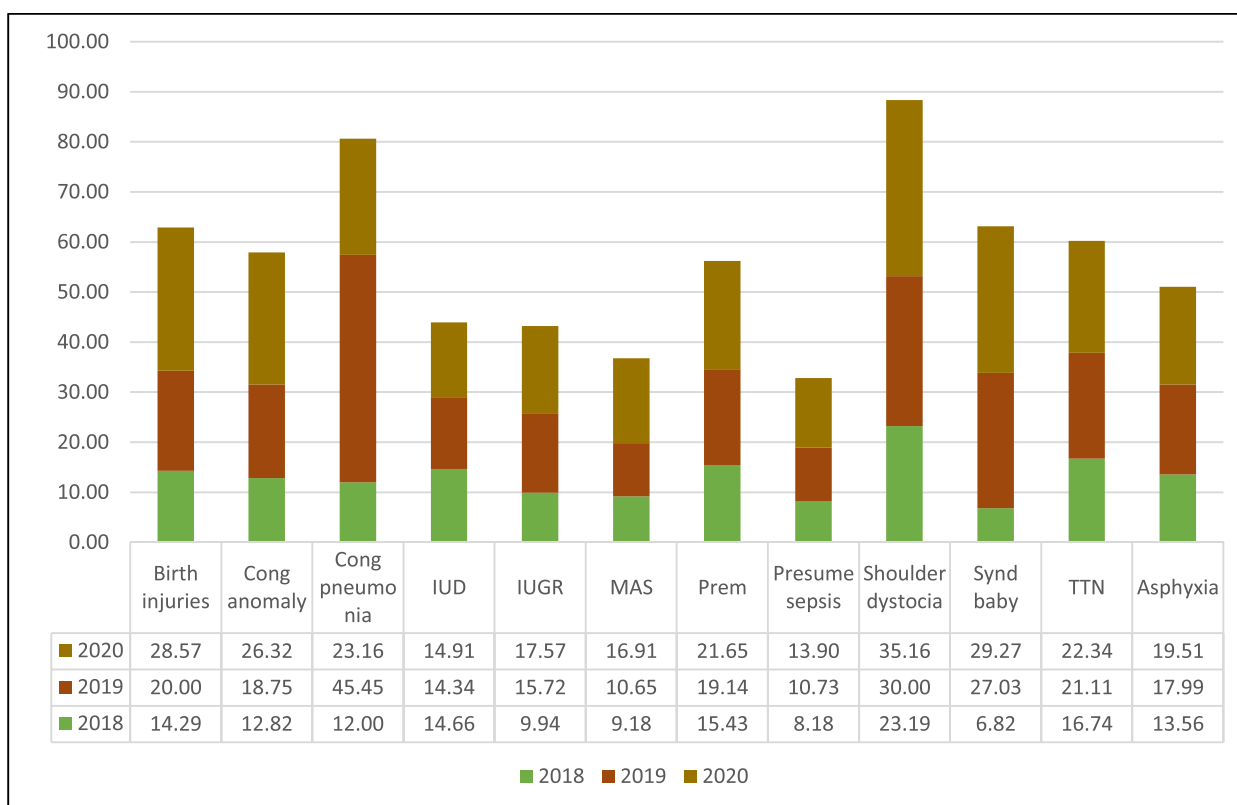
**Table 1.19: Complication in baby in Pregestational Diabetes 2018-2020**

Baby complications	2018			2019			2020		
	Total Delivery	Pre-Gestational DM		Total Delivery	Pre-Gestational DM		Total Delivery	Pre-Gestational DM	
	n	n	%	n	n	%	n	n	%
None	57345	154	0.27	66134	132	0.20	65716	143	0.22
Birth injuries	21	0	0.00	20	0	0.00	7	0	0.00
Congenital anomaly	78	1	1.28	48	9	18.75	76	4	5.26
Congenital pneumonia	275	2	0.73	542	0	0.00	462	1	0.22
IUD	232	4	1.72	286	2	0.70	322	3	0.93
IUGR	322	2	0.62	318	3	0.94	370	0	0.00
MAS	1133	3	0.26	1164	1	0.09	1538	2	0.13
Prematurity	1925	24	1.25	1855	26	1.40	2296	16	0.70
Presumed sepsis	1369	2	0.15	1146	6	0.52	1050	4	0.38
Shoulder dystocia	69	1	1.45	90	2	2.22	91	2	2.20
Syndromic baby	44	1	2.27	37	0	0.00	41	1	2.44
TTN	3328	17	0.51	3572	13	0.36	3734	21	0.56
Asphyxia	494	5	1.01	578	4	0.69	610	6	0.98
Others	20492	174	0.85	19054	117	0.61	19998	149	0.75

**Table 1.20: Complication in baby in GDM 2018-2020**

Baby complications	2018			2019			2020		
	Total Delivery	GDM		Total Delivery	GDM		Total Delivery	GDM	
	n	n	%	n	n	%	n	n	%
None	57345	7399	12.90	66134	10326	15.61	65716	12378	18.84
Birth injuries	21	3	14.29	20	4	20.00	7	2	28.57
Congenital anomaly	78	10	12.82	48	9	18.75	76	20	26.32
Congenital pneumonia	275	33	12.00	275	125	45.45	462	107	23.16
IUD	232	34	14.66	286	41	14.34	322	48	14.91
IUGR	322	32	9.94	318	50	15.72	370	65	17.57
MAS	1133	104	9.18	1164	124	10.65	1538	260	16.91
Prematurity	1925	297	15.43	1855	355	19.14	2296	497	21.65
Presumed sepsis	1369	112	8.18	1146	123	10.73	1050	146	13.90
Shoulder dystocia	69	16	23.19	90	27	30.00	91	32	35.16
Syndromic baby	44	3	6.82	37	10	27.03	41	12	29.27
TTN	3328	557	16.74	3572	754	21.11	3734	834	22.34
Asphyxia	494	67	13.56	578	104	17.99	610	119	19.51
Others	20492	4180	20.40	19054	5059	26.55	19998	6234	31.17

**Fig 1.17: Complications in new born in relation to GDM 2018-2020**



Diabetes in pregnancy exposes the fetus to increased adverse outcomes. In 2018 the high incidence of complications seen in babies of mothers with GDM included birth injuries, IUD, Prematurity, Shoulder dystocia, TTN and asphyxia. In 2019 highest incidence of congenital pneumonia, shoulder dystocia and Syndromic babies were seen in women with GDM. In 2020 birth injuries, congenital anomalies, shoulder dystocia and Syndromic babies were the most common complications in women with GDM.

**Table 1.21: Diabetes in pregnancy in relation to Baby Apgar 2018-2020**

Apgar 1 min	2018						
	Total Delivery	Pre-gestational DM		GDM		NA	
	n	n	%	n	%	n	%
≤7	1196	49	4.10	653	54.60	3	0.25
>7	64698	306	0.47	11432	17.67	68	0.11
NA	17624	6	0.03	31	0.18	0	0.00
<b>Apgar 5 min</b>							
≤7	1195	32	2.68	767	64.18	13	1.09
>7	67782	243	0.36	15385	22.70	289	0.43
NA	22348	1	0.00	23	0.10	1	0.00
<b>Apgar 1 min</b>	2019						
≤7	1195	33	2.76	886	74.14	13	1.09
>7	68403	281	0.41	18799	27.48	197	0.29
NA	22758	1	0.00	39	0.17	1	0.00
<b>Apgar 5 min</b>							
≤7	1196	16	1.34	180	15.05	0	0.00
>7	64698	289	0.45	9955	15.39	31	0.05
NA	17624	56	0.32	1975	11.21	40	0.23
<b>Apgar 1 min</b>	2020						
≤7	1195	11	0.92	202	16.90	4	0.33
>7	67782	223	0.33	13366	19.72	83	0.12
NA	22348	42	0.19	2596	11.62	216	0.97
<b>Apgar 5 min</b>							
≤7	1195	6	0.50	221	18.49	3	0.25
>7	68403	250	0.37	15264	22.31	93	0.14
NA	22758	59	0.26	4226	18.57	115	0.51

In 2018 more than half of GDM babies were birth asphyxiated. In 2019 about ¾ of GDM babies were birth asphyxiated at 1 min of birth. In 2020 approximately 1 out of 10 babies of GDM mothers were birth asphyxiated.

**Table 1.22: 1<sup>st</sup> trimester USG in Diabetes in Pregnancy 2018-2020**

1 <sup>st</sup> trimester USG	TD	Pregestational Diabetes		GDM	
	n	n	%	n	%
2018	62107	284	0.46	8998	14.49
2019	70000	22	0.03	13093	18.70
2020	68403	26	0.04	14965	21.88

In 2018 about 15 % of GDM patients had a 1<sup>st</sup> trimester USG. In 2020, 1 in every 5 GDM patient had a 1<sup>st</sup> trimester USG.

**Table 1.23: Type of pregnancy and Diabetes in pregnancy 2018-2020**

Type of pregnancy	2018				
	Total Delivery	Pregestational Diabetes		GDM	
	n	n	%	n	%
Singleton	82662	360	0.44	11994	14.51
Twins	791	1	0.13	104	13.15
Triplets	22	0	0.00	6	27.27
	2019				
Singleton	90382	273	0.30	16015	17.72
Twins	859	3	0.35	142	16.53
Triplets	15	0	0.00	3	20.00
	2020				
Singleton	91327	314	0.34	19510	21.36
Twins	940	1	0.11	200	21.28
Triplets	17	0	0.00	3	17.65

In 2018 and 2019 higher the order of pregnancy higher the incidence of GDM

**Table 1.24 Use of Hypoglycemic agents in GDM on medications 2018-2020**

Year	GDM	Insulin		Metformin		NA	
	n	n	%	n	%	n	%
2018	2288	887	38.77	192	8.39	1209	52.84
2019	3119	1775	56.91	756	24.24	588	18.85
2020	4121	2378	57.70	810	34.06	933	22.64

Approximately 50 % of patients with GDM on treatment are on insulin. Use of metformin is on the rise of metformin

## **KEY FINDINGS**

### **Diabetic pregnancy by hospital**

Among the 9 tertiary hospitals included in this chapter, HSNZ, Terengganu had the highest incidence of Diabetes in pregnancy in 2018 while in 2019 the highest incidence was from HTAR, Selangor and in 2020 from HTJ, N.Sembilan. The lowest incidence in 2018-2020 was from HTF, Perlis. In 2020, a quarter of the obstetric population in HSB Kedah, HTJ N.Sembilan, HTAR Selangor and HSNZ Terengganu were diagnosed with Diabetes in Pregnancy.

### **Incidence of Diabetes in pregnancy**

Incidence of Diabetes in pregnancy is increasing. There is a threefold increase in GDM in 2020 compared to the rates in 2016.

### **GDM with previous GDM**

3 out of 10 patients from HRPZ 11 Kelantan and HPP, Pulau Pinang with GDM had history of previous GDM.

## **DIABETES IN PREGNANCY BY MATERNAL CHARACTERS**

### **Colour coding**

50% of patients with Diabetes in pregnancy were seen by specialist and medical officers. A quarter of patients with GDM had shared care between primary and tertiary care

### **Ethnicity**

GDM is seen in all ethnic groups. Among the 3 main ethnic group, Indians had the highest incidence in 2018-2020. Among the indigenous group the highest incidence of GDM was seen in Melanau in 2018, Bidayuh in 2019 and in OI groups in Sabah and Sarawak in 2020. Chinese women had a lower incidence of GDM compared to Indians and Malay.

### **Maternal Age**

The older the maternal age, the risk of pregestational Diabetes Mellitus and GDM is higher.

### **Parity**

GDM was high in multiparous women.

### **Mode of delivery**

Overall babies of mothers with GDM were delivered vaginally ore compared to CS. In HTJ N.Sembilan the CS rates in women with GDM were higher than the overall average.

## **DIABETES IN PREGNANCY BY BABY CHARACTERS**

### Period of Gestation

2 out of 10 babies of mothers with GDM were preterm. Induced preterm labour was higher than spontaneous preterm in GDM.

### Birth weight

Incidence of macrosomia was highest among mothers with GDM compared to Pregestational Diabetes Mellitus. Macrosomia was 2-fold higher in GDM on diet compared to GDM on hypoglycaemic agents.

### Type of pregnancy

Increased incidence of GDM in higher order pregnancies.

### Complications

Incidence of congenital anomalies were high among pregestational Diabetes Mellitus. Complications in babies of GDM mothers include birth injuries, birth asphyxia, congenital anomalies, congenital pneumonia, prematurity, shoulder dystocia and TTN.

### Outcomes

Stillbirth rate on the rise with GDM since 2018.

### Conclusion

Incidence of Diabetes in pregnancy in Malaysian tertiary hospitals in 2018 was 14.81%. In 2019 it was 18.08% and in 2020 the rates have increase to 21.95% which was mostly contributed by GDM. GDM rates have increased 3 folds in the last 5 years. The issues that need attention:

- i) Persistent hyperglycaemia during pregnancy can lead to adverse outcomes for mother and baby. Women with Diabetes should plan all their pregnancies. To have HbA1C under control before they embark on pregnancy.
- ii) Older multiparous and women with increased BMI should have pre pregnancy counselling and screening for prediabetes.
- iii) Avoid unplanned pregnancies at advanced maternal age.
- iv) Women with pregestational Diabetes Mellitus and history of GDM in previous pregnancies should have early booking and follow up.
- v) Women should have a healthy BMI when they embark on pregnancy as obese women have a higher risk of GDM which in turn has a higher adverse outcome to both mother and baby.

- vi) Women with Diabetes in pregnancy should seek advice from a nutritionist to manage their diet. They should choose food with low glycaemic index.
- vii) Stay active as this helps reduce insulin resistance.
- viii) Monitor blood sugar regularly. Fluctuations in blood glucose levels have a poor fetal outcome.

### **Limitations**

The National Obstetrics Registry collects data from 14 tertiary hospitals and 1 district hospital in Malaysia. In this Chapter only 9 hospitals were included. This report does not look at BMI and its correlation to Diabetes in pregnancy as the system Ad hoc query used to analyse the data from the Data warehouse did not capture this variable.

### **References**

- 1.Diabetes and pregnancy CDC.
- 2.Gestational Diabetes NHS

# **TYPE OF DELIVERY**



**Table 2.1: Distribution of Delivery by Hospitals 2018-2020**

SDP	2018		2019		2020	
	n	%	n	%	n	%
HSA, Johor	11403	12.29	12174	12.09	13904	13.60
HSB, Kedah	9888	10.66	9636	9.57	7760	7.59
HRPZ 11, Kelantan	11499	12.40	10864	10.79	11696	11.44
Hospital Melaka	9262	9.98	9411	9.34	10059	9.84
HTJ, Sembilan	9057	9.76	10184	10.11	9385	9.18
HTF, Perlis	3927	4.23	4137	4.10	3771	3.69
HPP, Pulau Pinang	3774	4.06	3788	3.76	3956	3.87
HWKK, Likas, Sabah	9664	10.42	13660	13.56	12826	12.55
HTAR, Selangor	8542	9.21	10296	10.22	11856	11.60
HSNZ, Terengganu	15715	16.94	16517	16.4	16970	16.60
<b>TOTAL</b>	92,731	100.00	100,667	100.00	102,183	100.00

**Table 2.2: Distribution of Delivery type 2018-2020**

Delivery	2018		2019		2020	
	n	%	n	%	n	%
CS	26377	28.43	29102	28.89	30223	29.56
Instrumental	3586	3.86	4139	4.11	4434	4.33
Vaginal	62670	67.56	67282	66.81	67423	65.95
Others	52	0.05	57	0.05	64	0.06
NA	72	0.07	123	0.12	80	0.07

**Table 2.3: Delivery type by Risk level at Booking 2018-2020**

Risk level at booking	2018									
	CS		Instrumental		Vaginal		Other		NA	
	n	%	n	%	n	%	n	%	n	%
Red	569	44.10	37	2.86	681	52.79	0	0.00	3	0.23
Yellow	4449	35.41	474	3.77	7623	60.67	6	0.04	11	0.08
Green	19874	27.56	2825	3.91	49335	68.41	30	0.04	44	0.06
White I	346	16.6	55	2.63	1676	80.42	3	0.14	4	0.19
White II	99	18.23	22	4.05	420	77.34	0	0.00	2	0.36
No Code	561	26.02	100	4.63	1483	68.78	10	0.46	2	0.09
NA	479	23.79	73	3.62	1452	72.13	3	0.14	6	0.29
2019										
Red	584	46.94	47	3.77	611	49.11	1	0.08	1	0.08
Yellow	5519	36.43	600	3.96	8986	59.32	11	0.07	31	0.2
Green	21382	27.73	3207	4.15	52397	67.96	35	0.04	76	0.09
White I	245	12.78	57	2.97	1609	83.93	0	0.00	6	0.31
White II	58	10.23	20	3.53	489	86.24	0	0.00	0	0.00
No Code	476	26.50	98	5.46	1219	67.87	3	0.17	0	0.00
NA	838	28.55	110	3.75	1971	67.16	7	0.24	9	0.31
2020										
Red	708	49.82	53	0.34	655	46.09	4	0.23	1	0.25
Yellow	6148	38.87	677	4.28	8965	56.68	6	0.35	21	5.22
Green	21824	27.80	3401	4.33	53191	67.76	37	0.05	46	0.06
White I	308	17.75	69	3.98	1357	78.21	1	0.06	0	0.00
White II	66	16.42	13	3.23	323	80.35	0	0.00	0	0.00
No Code	480	26.29	109	5.97	1227	67.20	8	0.44	2	0.11
NA	689	27.30	112	4.44	1705	67.55	8	0.32	10	0.40

**Table 2.4a: Delivery type by Ethnicity 2018-2019**

Ethnicity	2018									
	CS		Instrumental		Vaginal		Others		NA	
	n	%	n	%	n	%	n	%	n	%
Malay	19142	27.02	2683	0.96	48964	69.12	29	0.04	11	0.01
Chinese	1310	32.81	203	5.08	2471	61.89	5	0.12	3	0.07
Indian	1579	41.68	226	5.96	1977	52.19	6	0.15	0	0.00
Kadazan	475	35.21	37	2.74	831	61.06	0	0.00	6	0.44
Dusun	564	34.83	34	2.10	1006	62.13	1	0.06	14	0.86
Bajau	546	31.02	55	3.12	1147	65.17	0	0.00	12	0.68
Murut	80	31.62	10	3.95	162	64.03	0	0.00	1	0.39
Melanau	6	19.35	1	3.22	24	77.41	0	0.00	0	0.00
Iban	81	28.42	9	3.15	195	68.42	0	0.00	0	0.00
Bidayuh	17	31.48	2	3.70	35	64.81	0	0.00	0	0.00
OA Peninsular Malaysia	55	30.05	4	2.18	124	67.75	0	0.00	0	0.00
OI group in Sabah and Sarawak	42	27.63	6	3.94	104	68.42	0	0.00	0	0.00
Others	1171	31.16	111	2.95	2459	65.43	1	0.02	16	0.42
Foreigner	1246	27.43	200	4.40	3076	67.73	10	0.22	9	0.19
NA	37	43.02	3	3.40	46	53.48	0	0.00	0	0.00
2019										
Malay	20345	27.71	2913	3.96	50110	68.26	26	0.03	7	0.00
Chinese	1501	32.20	336	7.20	2818	60.45	1	0.02	5	0.10
Indian	1631	40.36	261	6.47	2143	53.03	6	0.14	0	0.00
Kadazan	599	35.00	39	2.27	1061	62.01	2	0.11	10	0.58
Dusun	836	34.78	61	2.53	1483	61.71	2	0.08	21	0.87
Bajau	652	26.22	88	3.53	1724	69.34	2	0.08	20	0.08
Murut	103	29.01	14	3.94	235	66.19	0	0.00	3	0.84
Melanau	8	22.22	3	8.33	25	69.44	0	0.00	0	0.00
Iban	90	27.35	5	1.51	233	70.82	0	0.00	1	0.30
Bidayuh	23	33.82	1	1.47	44	64.70	0	0.00	0	0.00
OA Peninsular Malaysia	82	37.70	8	3.68	127	58.52	0	0.00	0	0.00
OI group in Sabah and Sarawak	80	30.10	12	4.52	172	64.90	0	0.00	1	0.37
Others	1634	31.62	159	3.07	3330	64.45	3	0.05	40	0.77
Foreigner	1408	27.00	222	4.25	3555	68.19	15	0.28	13	0.24
NA	71	31.00	12	5.24	146	63.75	0	0.00	0	0.00
Others	1614	31.72	186	3.65	3274	64.36	2	0.03	11	0.21
Foreigner	1551	27.00	302	5.26	3856	67.11	19	0.33	12	0.20
NA	84	34.71	16	6.61	140	57.85	1	0.41	1	0.41

**Table 2.4b: Delivery type by Ethnicity 2020**

Ethnicity	2020									
	CS		Instrumental		Vaginal		Others		NA	
	n	%	n	%	n	%	n	%	n	%
Malay	21279	28.35	3081	4.10	50624	67.46	28	0.03	20	0.02
Chinese	1388	35.27	300	7.62	2239	56.89	2	0.05	6	0.15
Indian	1756	41.71	295	7.00	2152	51.11	6	0.14	1	0.02
Kadazan	567	34.87	50	3.07	1000	61.50	1	0.06	8	0.49
Dusun	830	36.61	73	3.20	1351	59.59	1	0.04	12	0.52
Murut	109	33.13	11	3.34	206	62.61	0	0.00	3	0.91
Bajau	738	31.29	76	3.18	1539	64.42	2	0.08	3	0.12
Melanau	14	31.11	1	2.22	30	66.66	0	0.00	0	0.00
Iban	111	29.13	16	4.19	251	65.87	2	0.52	1	0.26
Bidayuh	14	18.67	6	8.00	55	73.33	0	0.00	0	0.00
OA Pen	61	26.75	5	2.19	162	71.05	0	0.00	0	0.00
OI group in Sabah and Sarawak	57	28.07	13	6.40	133	65.51	0	0.00	0	0.00
Others	1614	31.72	186	3.65	3274	64.36	2	0.03	11	0.21
foreigner	1551	27.00	302	5.26	3856	67.11	19	0.33	12	0.20
NA	84	34.71	16	6.61	140	57.85	1	0.41	1	0.41

**Table 2.5: Delivery type by Maternal Age 2018-2020**

Age (years)	2018									
	CS		Instrumental		Vaginal		Others		NA	
	n	%	n	%	n	%	n	%	n	%
10-14	10	6.49	3	1.94	35	22.72	0	0.00	0	0.00
15-19	424	5.09	126	1.51	1973	23.7	1	0.01	5	0.06
20-24	3283	7.02	787	1.68	10733	22.96	10	0.02	13	0.02
25-29	8310	8.34	1551	1.55	21641	21.73	17	0.01	17	0.01
30-34	8113	9.57	776	0.91	17844	21.06	11	0.01	22	0.02
35-39	4899	10.95	288	0.64	8314	18.59	9	0.02	14	0.03
40-44	1227	11.49	54	0.50	1962	18.38	3	0.02	1	0.00
45-49	92	13.33	1	0.14	129	18.69	1	0.14	0	0.00
50-54	3	15.78	0	0.00	4	21.05	0	0.00	0	0.00
55-59	0	0.00	0	0.00	1	50	0	0.00	0	0.00
NA	16	17.97	0	0.00	33	37.07	0	0.00	0	0.00
2019										
10-14	6	3.89	7	4.54	37	24.02	0	0.00	0	0.00
15-19	495	5.94	175	2.10	2241	26.92	4	0.04	10	0.12
20-24	3619	7.74	953	2.03	11435	24.47	16	0.03	18	0.03
25-29	9054	9.09	1725	1.73	22873	22.97	13	0.01	35	0.03
30-34	8901	10.50	885	1.04	18880	22.28	14	0.01	32	0.03
35-39	5483	12.26	319	0.71	9483	21.20	7	0.01	20	0.04
40-44	1450	13.58	64	0.59	2182	20.44	3	0.02	8	0.07
45-49	87	12.6	10	1.44	136	19.71	0	0.00	0	0.00
50-54	2	10.52	0	0.00	3	15.78	0	0.00	0	0.00
55-59	0	0.00	0	0.00	1	50.00	0	0.00	0	0.00
NA	5	5.61	1	1.12	10	11.23	0	0.00	0	0.00
2020										
10-14	9	5.84	3	1.94	44	28.57	0	0.00	0	0.00
15-19	552	6.27	164	1.97	2143	25.75	4	0.04	5	0.06
20-24	3653	7.81	1005	2.15	11174	23.87	19	0.04	10	0.02
25-29	9312	9.35	1873	1.88	23102	23.2	16	0.01	29	0.02
30-34	9215	10.87	966	1.44	19016	22.44	18	0.02	23	0.02
35-39	5885	13.15	345	0.77	9641	21.55	6	0.01	9	0.02
40-44	1500	14.05	70	0.65	2143	20.08	1	0.00	4	0.03
45-49	86	12.46	7	1.01	141	20.43	0	0.00	0	0.00
50-54	3	15.78	0	0.00	4	21.05	0	0.00	0	0.00
55-59	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
NA	8	8.98	1	1.12	15	16.85	0	0.00	0	0.00

**Table 2.6: Delivery type by Parity 2018-2020**

Parity	2018									
	CS		Instrumental		Vaginal		Others		NA	
	n	%	n	%	n	%	n	%	n	%
1	6639	26.59	17508	70.13	17508	70.13	12	0.04	21	0.08
2-5	9314	26.27	25693	72.48	25693	72.48	21	0.05	26	0.07
≥ 6	418	25.10	1227	73.69	1227	73.69	3	0.18	3	0.18
NA	10006	32.61	18242	59.45	18242	59.45	16	0.05	22	0.07
2019										
1	7006	27.68	17496	69.14	17496	69.14	16	0.06	21	0.08
2-5	9924	26.41	27201	72.40	27201	72.40	17	0.04	40	0.10
≥ 6	417	24.37	1279	74.75	1279	74.75	1	0.05	3	0.17
NA	11755	32.54	21306	58.98	21306	58.98	23	0.06	59	0.16
2020										
1	7,320	28.28	17,682	68.30	17,682	68.30	15	0.05	19	0.07
2-5	10343	27.33	26974	71.27	26974	71.27	26	0.06	24	0.06
≥ 6	430	26.59	1178	72.85	1178	72.85	1	0.06	3	0.18
NA	12130	32.88	21589	58.52	21589	58.52	22	0.05	34	0.09

**Table 2.7: Delivery by Birthweight 2018-2019**

Birthweight (grams)	2018									
	CS		Instrumental		Vaginal		Others		NA	
	n	%	n	%	n	%	n	%	n	%
< 1000	235	33.10	6	0.85	460	64.79	7	0.99	2	0.28
1000 - 1500	624	62.84	0	0.00	361	36.35	4	0.40	4	0.40
1501 - 2000	1279	52.08	26	1.06	1146	46.66	3	0.12	2	0.08
2001 - 2500	3660	34.91	294	2.80	6511	62.11	8	0.08	10	0.10
2501 - 3000	8594	25.21	1362	4.10	24088	70.66	16	0.99	27	0.08
3001 - 3500	8278	24.93	1518	4.57	23377	70.41	11	0.03	18	0.05
3501 - 4000	3300	32.65	361	3.57	6430	63.63	4	0.04	11	0.11
> 4000	911	56.51	30	1.80	671	40.17	0	0.00	0	0.00
2019										
< 1000	253	34.75	0	0.00	466	64.01	4	0.55	5	0.69
1000 - 1500	633	62.18	4	0.39	373	36.64	2	0.20	6	0.59
1501 - 2000	1512	55.08	31	1.13	1190	43.35	8	0.29	4	0.15
2001 - 2500	4297	36.23	345	2.91	7189	60.61	8	0.07	22	0.19
2501 - 3000	9820	26.21	1661	4.43	25938	69.22	18	0.05	35	0.09
3001 - 3500	8844	24.80	1678	4.70	25107	70.40	18	0.05	45	0.05
3501 - 4000	3478	32.77	401	3.78	6729	63.40	0	0.00	6	0.06
> 4000	871	56.93	23	1.50	633	41.37	1	0.07	2	0.13
2020										
< 1000	250	32.98	8	1.06	497	65.57	3	0.40	0	0.00
1000 - 1500	666	60.82	3	0.27	418	38.17	6	0.55	2	0.18
1501 - 2000	1467	52.24	40	1.42	1291	45.98	6	0.21	4	0.14
2001 - 2500	4279	37.13	352	3.05	6859	59.51	22	0.19	13	0.11
2501 - 3000	10249	27.11	1775	4.70	25726	68.05	26	0.07	27	0.07
3001 - 3500	9326	25.39	1805	4.91	25557	69.59	16	0.04	23	0.06
3501 - 4000	3704	33.63	431	3.91	6868	62.36	0	0.00	10	0.09
> 4000	900	57.36	34	2.17	634	40.41	0	0.00	1	0.06

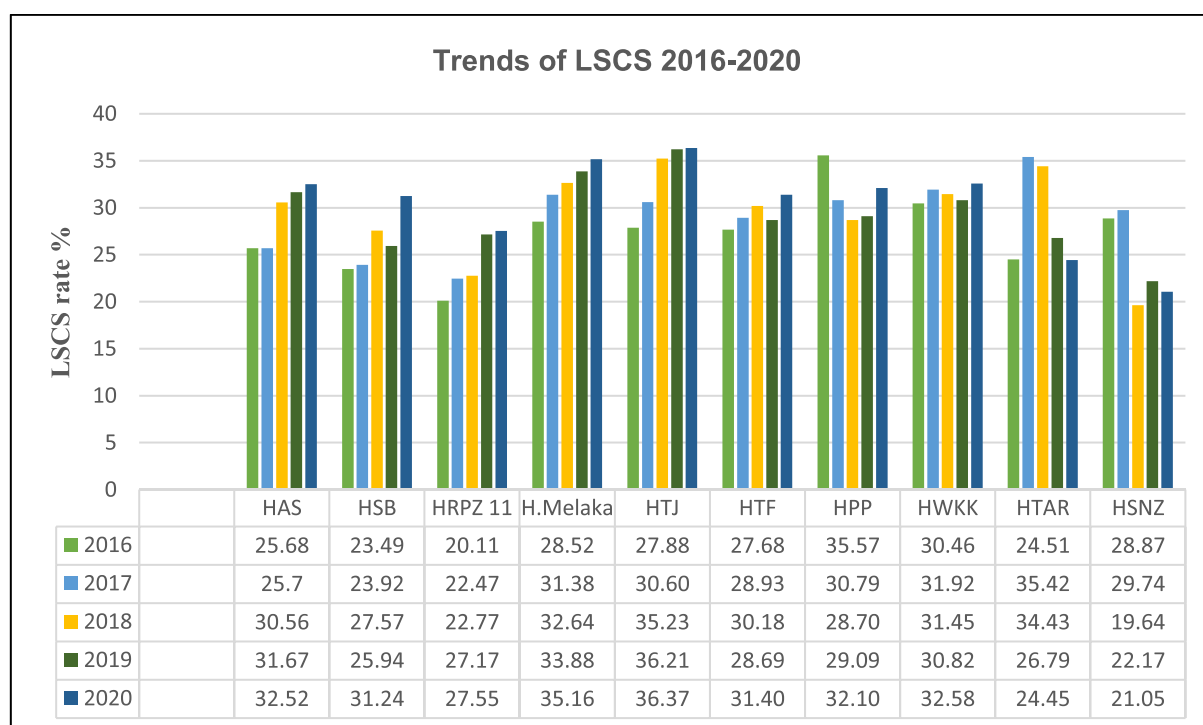
# **CAESAREAN SECTION**



**Table 3.1: LSCS rates by Hospital 2018-2020**

SDP	2018			2019			2020		
	Total Delivery	CS		Total Delivery	CS		Total Delivery	CS	
	n	n	%	n	n	%	n	n	%
HSA, Johor	11403	3485	30.56	12174	3856	31.67	13904	4522	32.52
HSB, Kedah	9888	2726	27.57	9636	2500	25.94	7760	2424	31.24
HRPZ 11, Kelantan	11499	2618	22.77	10864	2952	27.17	11696	3222	27.55
Hospital Melaka	9262	3023	32.64	9411	3188	33.88	10059	3537	35.16
HTJ, Sembilan	9057	3191	35.23	10184	3688	36.21	9385	3413	36.37
HTF, Perlis	3927	1185	30.18	4137	1187	28.69	3771	1184	31.40
HPP, Pulau Pinang	3774	1083	28.70	3788	1102	29.09	3956	1270	32.10
HWKK, Likas, Sabah	9664	3039	31.45	13660	4210	30.82	12826	4179	32.58
HTAR, Selangor	8542	2941	34.43	10296	2758	26.79	11856	2899	24.45
HSNZ, Terengganu	15715	3086	19.64	16517	3661	22.17	16970	3573	21.05
TOTAL	92731	26377	28.44	100667	29102	28.91	102183	30223	29.58

**Fig 3.1 Trends of LSCS from 2016-2020**





**Table 3.3: LSCS rate by Ethnicity 2018-2020**

Ethnicity	2018			2019			2020		
	Total Delivery	CS		Total Delivery	CS		Total Delivery	CS	
	n	n	%	n	n	%	n	n	%
Malay	72761	19142	26.31	72121	20345	28.21	72121	21283	29.51
Chinese	4655	1310	28.14	4329	1501	34.67	4329	1390	32.11
Indian	4498	1579	35.10	4266	1631	38.23	4266	1756	41.16
Kadazan	1427	500	35.04	1759	637	36.21	1759	630	35.82
Dusun	1629	565	34.68	2277	836	36.71	2277	841	36.93
Bajau	1756	546	31.09	2354	652	27.70	2354	741	31.48
Murut	253	80	31.62	329	103	31.31	329	110	33.43
Melanau	32	6	18.75	44	8	18.18	44	14	31.82
Iban	295	81	27.46	373	90	24.13	373	111	29.76
Bidayuh	54	17	31.48	71	23	32.39	71	14	19.72
OA Peninsular Malaysia	539	55	10.20	281	82	29.18	281	61	21.71
Oi group in Sabah and Sarawak	156	34	21.79	204	66	32.35	204	46	22.55
Others	3781	1171	30.97	5039	14	0.28	5039	1623	32.21
Foreigner	4786	1246	26.03	5735	1408	24.55	5735	1556	27.13
NA	94	38	40.43	246	72	29.27	246	84	34.15

Fig 3.2: LSCS trends in 3 main ethnic groups 2018-2020

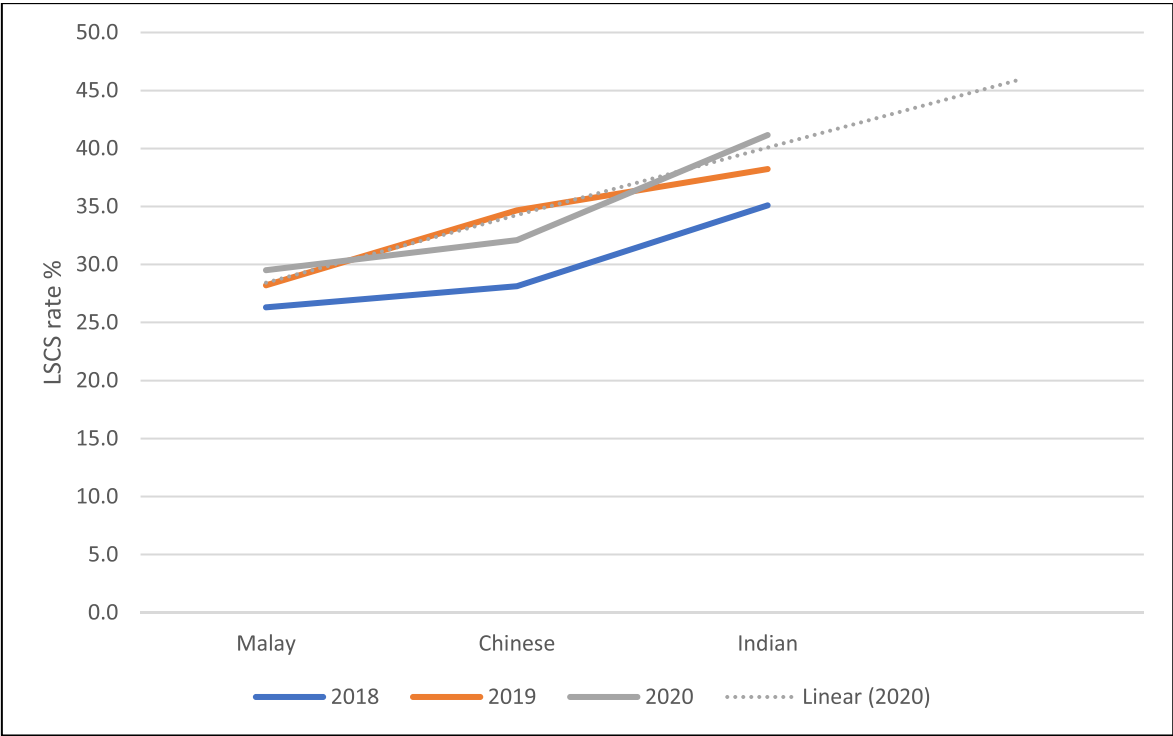
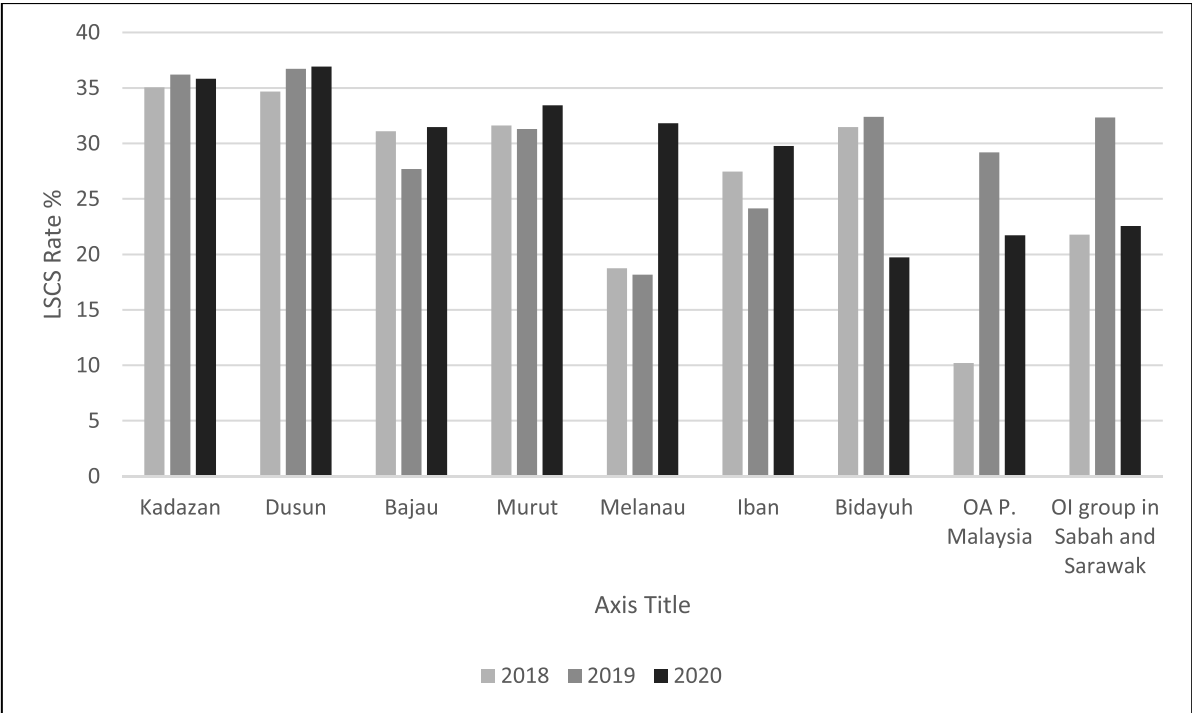


Fig 3.3: LSCS trends in indigenous group 2018-2020



**Table 3.4: LSCS rate by Maternal Age 2018-2020**

Age (years)	2018						
	Total Delivery	Elective		Emergency		Total CS	CS Rate
	n	n	%	n	%	n	%
10-14	28	2	7.14	8	28.57	10	35.71
15-19	1612	28	1.74	396	24.57	424	26.30
20-24	10103	349	3.45	2934	29.04	3283	32.50
25-29	22030	1253	5.69	7058	32.04	8310	37.72
30-34	18372	2100	11.43	6013	32.73	8113	44.16
35-39	9355	1521	16.26	3378	36.11	4899	52.37
40-44	2280	329	14.43	898	39.39	1227	53.82
45-49	142	27	19.01	65	45.77	92	64.79
	2019						
10-14	24	0	0.00	6	25.00	6	25.00
15-19	1706	25	1.47	470	27.55	495	29.02
20-24	10744	380	3.54	3239	30.15	3619	33.68
25-29	23280	1364	5.86	7691	33.04	9055	38.90
30-34	19409	2318	11.94	6583	33.92	8901	45.86
35-39	20425	1680	8.23	3803	18.62	5483	26.84
40-44	2463	398	16.16	1052	42.71	1450	58.87
45-49	144	26	18.06	61	42.36	87	60.42
	2020						
10-14	34	1	2.94	8	23.53	9	26.47
15-19	1510	48	3.18	506	33.51	554	36.69
20-24	10003	319	3.19	3341	33.40	3660	36.59
25-29	22526	1380	6.13	7943	35.26	9323	41.39
30-34	18783	2316	12.33	6919	36.84	9235	49.17
35-39	10067	1750	17.38	4141	41.13	5891	58.52
40-44	2339	444	18.98	1058	45.23	1502	64.22
45-49	141	22	15.60	64	45.39	86	60.99

**Table 3.5: LSCS rate by Parity 2018-2020**

Parity	2018			2019			2020		
	Total Delivery	CS		Total Delivery	CS		Total Delivery	CS	
	n	n	%	n	n	%	n	n	%
1	17531	6639	37.87	17981	7006	38.96	19099	7331	38.38
2-5	24129	9314	38.60	25592	9925	38.78	27108	10359	38.21
≥6	974	418	42.92	1019	417	40.92	967	433	44.78

**Table 3.6: LSCS by Accoucheur 2018-2020**

Accoucheur	2018		2019		2020	
	n	%	n	%	n	%
Consultant	52	0.20	108	0.37	78	0.26
Specialist	1673	6.34	1503	5.16	1313	4.34
MO with > 6 months O&G experience	24473	92.78	27264	93.68	28738	95.09
MO with < 6 months O&G experience	160	0.61	212	0.73	139	0.46
MO with no O&G experience	20	0.08	16	0.05	3	0.01

**Table 3.7: LSCS and Risk level at Booking 2018-2020**

Risk level at booking	2018			2019		
	Total Delivery	CS		Total Delivery	CS	
	n	n	%	n	n	%
Red	1220	569	46.64	879	585	66.55
Yellow	8806	4450	50.53	9745	5519	56.63
Green	49672	19874	40.01	53519	21382	39.95
White I	1507	346	22.96	1268	245	19.32
White II	377	99	26.26	369	58	15.72
No Code	1695	561	33.10	1346	476	35.36

**Table 3.8: LSCS rate in relation to Apgar score 2018-2020**

Apgar Score	2018			2019			2020		
	Total Delivery	CS		Total Delivery	CS		Total Delivery	CS	
	n	n	%	n	n	%	n	n	%
Apgar 1min									
≤7	3483	2060	59.14	3565	527	14.78	3453	2115	61.25
>7	60320	24288	40.27	64383	21851	33.94	68085	28163	41.36
Apgar 5 min									
≤7	1049	527	50.24	1018	527	51.77	1016	548	53.94
>7	53570	20792	38.81	56034	21851	39.00	58241	22573	38.76

**Table 3.9: LSCS rate by Distribution of Medical Disorders 2018-2020**

Medical Disorders	2018			2019			2020		
	Total Delivery	CS		Total Delivery	CS		Total Delivery	CS	
	n	n	%	n	n	%	n	n	%
None	48093	19543	40.64	48923	20638	42.18	49708	20485	41.21
Diabetes	9828	4614	46.95	13052	6078	46.57	15885	7304	45.98
Heart disease	161	81	50.31	125	67	53.60	152	106	69.74
Hypertensive	2152	1616	75.09	2225	1689	75.91	2303	1812	78.68
Asthma	1346	481	35.74	1390	554	39.86	1489	601	40.36
Blood disorder	2385	625	26.21	3251	965	29.68	3183	938	29.47
Psychiatric	49	10	20.41	61	18	29.51	61	36	59.02
Renal disease	15	11	73.33	11	4	36.36	14	12	85.71
Thyroid disease	291	113	38.83	16	12	75.00	274	133	48.54
Tuberculosis	21	8	38.10	21	11	52.38	15	12	80.00
Other medical problems	7340	503	6.85	6752	1999	29.61	7271	2173	29.89

**Table 3.10: LSCS rate by Diabetes in Pregnancy 2018-2020**

Diabetes in pregnancy	2018			2019			2020		
	Total Delivery	CS		Total Delivery	CS		Total Delivery	CS	
	n	n	%	n	n	%	n	n	%
GDM Diet control	7479	3135	41.92	9735	3966	40.74	11417	4680	40.99
GDM Insulin	1998	1139	57.01	2783	1535	55.16	3535	1856	52.50
Pre-existing DM type 1	118	69	58.47	44	44	100.00	33	25	75.76
Pre-existing DM type 2	159	137	86.16	164	143	87.20	216	185	85.65

**Table 3.11: LSCS rate in relation to period of gestation 2018-2020**

Period of gestation	2018			2019			2020		
	Total Delivery	CS		Total Delivery	CS		Total Delivery	CS	
	n	n	%	n	n	%	n	n	%
22 - 36+6 weeks	4683	1936	41.34	4751	2045	43.04	4964	2085	42.00
37 - 40 weeks	37367	9931	26.58	40752	11229	27.55	40665	11320	27.84
>40- 42 weeks	1940	582	30.00	1628	540	33.17	1434	489	34.10
NA	48747	13929	28.57	53537	15289	28.56	55361	16412	29.65

**Table 3.12 LSCS rate in relation to Birthweight 2018-2020**

Birthweight (grams)	2018			2019			2020		
	TD	CS		TD	CS		TD	CS	
	n	n	%	n	n	%	n	n	%
< 1000	710	235	33.10	728	253	34.75	762	252	33.07
1000 - 1500	993	624	62.84	1018	633	62.18	1097	667	60.80
1501 - 2000	2456	1279	52.08	2745	1512	55.08	2813	1469	52.22
2001 - 2500	10484	3660	34.91	11861	4297	36.23	11541	4285	37.13
2501 - 3000	34088	8595	25.21	37472	9820	26.21	37880	10273	27.12
3001 - 3500	33203	8278	24.93	35693	8845	24.78	36784	9348	25.41
3501 - 4000	10106	3300	32.65	10614	3478	32.77	11027	3708	33.63
> 4000	1612	911	56.51	1530	871	56.93	1570	901	57.39



**Table 3.13 LSCS rate in relation to indication 2018-2020**

Indication for CS	2018		2019		2020	
	n	%	n	%	n	%
Abnormal labour progress	1909	6.87	2361	7.67	2802	8.59
Abnormal lie	721	2.60	880	2.86	995	3.05
Amniotic fluid abnormalities	445	1.60	601	1.95	1009	3.09
Cord prolapse/presentation	133	0.48	123	0.40	148	0.45
Failed induction of labour	1905	6.86	2237	7.27	2530	7.76
Failed instrumental delivery	31	0.11	28	0.09	28	0.09
Fetal distress	9274	33.40	9674	31.44	9404	28.84
Foetal anomaly	69	0.25	54	0.18	136	0.42
Heart disease	41	0.15	37	0.12	60	0.18
Hypertensive disorders	635	2.29	759	2.47	800	2.45
IUGR	316	1.14	321	1.04	380	1.17
Macrosomia	1170	4.21	1260	4.10	1192	3.65
Malpresentation	1971	7.10	2334	7.59	2134	6.54
Maternal request	1391	5.01	1538	5.00	1878	5.76
Multiple pregnancy	313	1.13	371	1.21	339	1.04
Placental factor	904	3.26	1035	3.36	1031	3.16
Pre-term labour	251	0.90	242	0.79	365	1.12
Previous uterine surgery	2464	8.87	2845	9.25	3182	9.76
Retroviral disease	26	0.09	29	0.09	23	0.07
Other indications	3800	13.68	4036	13.12	4177	12.81

**BREECH**

**Table 4.1: Distribution of Breech Delivery by Hospitals 2018-2020**

<b>2018</b>						
<b>SDP</b>	<b>Total Delivery</b>		<b>Vaginal Breech</b>		<b>CS Breech</b>	
	<b>n</b>	<b>%</b>	<b>n</b>	<b>%</b>	<b>n</b>	<b>%</b>
HSA, Johor	11403	12.29	69	0.61	251	2.20
HSB, Kedah	9888	10.66	21	0.21	184	1.86
HRPZII, Kelantan	11499	12.40	36	0.31	281	2.44
Hospital Melaka	9262	9.99	7	0.08	162	1.75
HTJ, N. Sembilan	9057	9.76	11	0.12	203	2.24
HTF, Perlis	3927	4.23	4	0.10	73	1.86
HPP, Pulau Pinang	3774	4.06	13	0.34	52	1.38
HWKK, Likas, Sabah	9664	10.42	12	0.12	256	2.65
HTAR, Selangor	8542	9.21	39	0.46	160	1.87
HSNZ, Terengganu	15715	16.94	66	0.42	294	1.87
<b>2019</b>						
HSA, Johor	12174	12.09	56	0.46	318	2.61
HSB, Kedah	9636	9.57	29	0.30	223	2.31
HRPZII, Kelantan	10864	10.79	18	0.17	272	2.50
Hospital Melaka	9411	9.34	3	0.03	212	2.25
HTJ, N. Sembilan	10184	10.11	20	0.20	230	2.26
HTF, Perlis	4137	4.10	5	0.12	100	2.42
HPP, Pulau Pinang	3788	3.76	10	0.26	52	1.37
HWKK, Likas, Sabah	13660	13.56	23	0.17	311	2.28
HTAR, Selangor	10296	10.22	51	0.50	232	2.25
HSNZ, Terengganu	16517	16.40	47	0.28	297	1.80
<b>2020</b>						
HSA, Johor	13904	13.60	59	0.42	262	1.88
HSB, Kedah	7760	7.59	24	0.31	193	2.49
HRPZII, Kelantan	11696	11.44	31	0.27	272	2.33
Hospital Melaka	10059	9.84	2	0.02	201	2.00
HTJ, N. Sembilan	9385	9.18	13	0.14	217	2.31
HTF, Perlis	3771	3.69	2	0.05	78	2.07
HPP, Pulau Pinang	3956	3.87	7	0.18	42	1.06
HWKK, Likas, Sabah	12826	12.55	29	0.23	309	2.41
HTAR, Selangor	11856	11.60	44	0.37	186	1.57
HSNZ, Terengganu	16970	16.60	44	0.26	290	1.71

**Table 4.2a: Distribution of Breech Delivery by Ethnicity 2018-2019**

Ethnicity	2018				
	Total Delivery	Vaginal Breech		CS Breech	
	n	n	%	n	%
Malay	70829	209	0.30	1387	1.96
Chinese	3992	19	0.48	104	2.61
Indian	3788	13	0.34	77	2.03
Kadazan	1349	1	0.07	36	2.67
Dusun	1619	1	0.06	53	3.27
Bajau	1760	2	0.11	49	2.78
Murut	253	0	0.00	10	3.95
Melanau	31	0	0.00	1	3.23
Iban	285	1	0.35	5	1.75
Bidayuh	54	0	0.00	1	1.85
OA Peninsular	183	0	0.00	4	2.19
OI group in Sabah and Sarawak	152	0	0.00	1	0.66
Others	3758	11	0.29	95	2.53
foreigner	4541	21	0.46	92	2.03
NA	86	0	0.00	1	1.16
2019					
Malay	73401	181	0.25	1611	2.19
Chinese	4661	16	0.34	113	2.42
Indian	4041	13	0.32	87	2.15
Kadazan	1711	3	0.18	32	1.87
Dusun	2403	3	0.12	61	2.54
Bajau	2486	5	0.20	46	1.85
Murut	355	0	0.00	7	1.97
Melanau	36	0	0.00	0	0.00
Iban	329	1	0.30	11	3.34
Bidayuh	68	0	0.00	0	0.00
OA Peninsular	217	1	0.46	7	3.23
OI group in Sabah and Sarawak	265	1	0.38	8	3.02
Others	5166	11	0.21	132	2.56
foreigner	5213	26	0.50	125	2.40
NA	229	1	0.44	7	3.06

**Table 4.2b: Distribution of Breech Delivery by Ethnicity 2020**

Ethnicity	2020				
	Total Delivery	Vaginal Breech		CS Breech	
	n	n	%	n	%
Malay	75032	181	0.24	1477	1.97
Chinese	3935	11	0.28	90	2.29
Indian	4210	12	0.29	75	1.78
Kadazan	1626	4	0.25	43	2.64
Dusun	2267	4	0.18	53	2.34
Bajau	2358	3	0.13	48	2.04
Murut	329	2	0.61	10	3.04
Melanau	45	0	0.00	1	2.22
Iban	381	1	0.26	11	2.89
Bidayuh	75	0	0.00	1	1.33
OA Peninsular	228	1	0.44	6	2.63
OI group in Sabah and Sarawak	203	0	0.00	3	1.48
Others	5087	10	0.20	122	2.40
foreigner	5740	25	0.44	102	1.78
NA	242	1	0.41	8	3.31

**Table 4.3: Distribution of Breech Delivery by Maternal Age 2018-2020**

Age (years)	2018				
	Total Delivery	Vaginal Breech		CS Breech	
	n	n	%	n	%
10-14	48	0	0.00	1	2.08
15-19	2529	11	0.43	45	1.78
20-24	14826	46	0.31	263	1.77
25-29	31536	90	0.29	616	1.95
30-34	26766	68	0.25	561	2.10
35-39	13524	41	0.30	336	2.48
40-44	3247	21	0.65	81	2.49
45-49	223	1	0.45	9	4.04
50-54	7	0	0.00	1	14.29
55-59	1	0	0.00	0	0.00
NA	49	0	0.00	3	6.12
2019					
10-14	50	0	0.00	0	0.00
15-19	2925	11	0.38	67	2.29
20-24	16041	36	0.22	318	1.98
25-29	33700	71	0.21	727	2.16
30-34	28712	74	0.26	626	2.18
35-39	15312	50	0.33	374	2.44
40-44	3707	17	0.46	129	3.48
45-49	233	3	1.29	3	1.29
50-54	5	0	0.00	0	0.00
55-59	1	0	0.00	0	0.00
NA	16	0	0.00	3	18.75
2020					
10-14	56	0	0.00	1	1.79
15-19	2868	11	0.38	38	1.32
20-24	15861	41	0.26	291	1.83
25-29	34332	77	0.22	602	1.75
30-34	29238	74	0.25	601	2.06
35-39	15886	41	0.26	390	2.45
40-44	3718	9	0.06	120	3.23
45-49	234	2	0.85	7	2.99
50-54	7	0	0.00	0	0.00
55-59	0	0	0.00	0	0.00
NA	24	0	0.00	0	0.00

**Table 4.4: Distribution of breech delivery by birthweight 2018-2020**

Birthweight (grams)	2018				
	Total Delivery	Vaginal Breech		CS Breech	
	n	n	%	n	%
< 1000	710	77	10.85	13	1.83
1000 - 1500	993	19	1.91	34	3.42
1501 - 2000	2456	35	1.43	87	3.54
2001 - 2500	10483	58	0.55	427	4.07
2501 - 3000	34087	71	0.21	795	2.33
3001 - 3500	33202	18	0.05	431	1.30
3501 - 4000	10106	4	0.04	138	1.37
> 4000	1612	0	0.00	18	1.12
2019					
< 1000	728	71	9.75	16	2.20
1000 - 1500	1018	28	2.75	58	5.70
1501 - 2000	2745	43	1.57	102	3.72
2001 - 2500	11861	57	0.48	480	4.05
2501 - 3000	37472	40	0.11	900	2.40
3001 - 3500	35692	21	0.06	525	1.47
3501 - 4000	10614	5	0.05	144	1.36
> 4000	1530	0	0.00	31	2.03
2020					
< 1000	758	68	8.97	12	1.58
1000 - 1500	1095	32	2.92	36	3.29
1501 - 2000	2808	35	1.25	114	4.06
2001 - 2500	11525	56	0.49	417	3.62
2501 - 3000	37803	46	0.12	838	2.22
3001 - 3500	36727	18	0.05	476	1.30
3501 - 4000	11013	4	0.04	148	1.34
> 4000	1569	1	0.06	23	1.47

**Table 4.5: Distribution of Vaginal Breech by complication 2018-2020**

Complication	2018		2019		2020	
	Vaginal Breech		Vaginal Breech		Vaginal Breech	
	n	%	n	%	n	%
Asphyxia	19	6.83	18	6.87	15	5.88
Congenital anomaly	7	2.52	3	1.15	6	2.35
Intrauterine death (IUD)	22	7.91	33	12.60	24	9.41
Congenital pneumonia	0	0.00	1	0.38	1	0.39
TTN	13	4.68	14	5.34	10	3.92
Others	79	28.42	55	20.99	56	21.96
None	125	44.96	131	50.00	136	53.33

**Table 4.6: Vaginal breech delivery in relation to Apgar score 2018-2020**

Apgar score	2018			2019			2020		
	Total Delivery	Vaginal Breech		Total Delivery	Vaginal Breech		Total Delivery	Vaginal Breech	
Apgar 1 min	n	n	%	n	n	%	n	n	%
≤7	4643	128	2.76	4821	121	2.51	4632	116	2.50
>7	87883	138	0.16	95757	129	0.13	97719	131	0.13
NA	304	13	4.28	205	12	5.85	194	8	4.12
Apgar 5 min									
≤7	1322	76	5.75	1352	67	4.96	1347	70	5.20
>7	73747	125	0.17	77042	120	0.16	78395	110	0.14
NA	17714	77	0.43	22349	77	0.34	22758	76	0.33



# **PREMATURITY**

**Table 5.1: Distribution of Preterm births by Hospital 2018-2020**

SDP	2018			2019			2020		
	Total Delivery	Preterm		Total Delivery	Preterm		Total Delivery	Preterm	
	n	%	n	n	n	%	n	n	%
HSA, Johor	11403	1029	9.02	12174	1062	8.72	13904	1182	8.50
HRPZ 11, Kelantan	11499	595	5.17	10864	650	5.98	11696	750	6.41
HTJ, Sembilan	9057	836	9.23	10184	918	9.01	9385	938	9.99
HTF, Perlis	3927	245	6.24	4137	201	4.86	3771	197	5.22
HPP, Pulau Pinang	3774	165	4.37	3788	190	5.02	3956	265	6.70
HTAR, Selangor	8542	788	9.23	10296	740	7.19	11856	770	6.49
HSNZ, Terengganu	15715	838	5.33	16517	799	4.84	16970	639	3.77
TOTAL	63917	4496	7.03	67960	4560	6.71	71538	4741	6.63

**Table 5.2: Distribution of preterm by Risk level at Booking 2018-2019**

Risk level at booking	2018			2019			2020		
	Total Delivery	Preterm		Total Delivery	Preterm		Total Delivery	Preterm	
	n	n	%	n	n	%	n	n	%
Red	1220	215	17.62	879	196	22.30	344	217	63.08
Yellow	8806	864	9.81	9745	957	9.82	3146	1002	31.85
Green	49672	3252	6.55	53519	3279	6.13	20786	3430	16.50
White I	1507	93	6.17	1268	74	5.84	1091	74	6.78
White II	377	26	6.90	369	25	6.78	299	11	3.68
No Code	1695	160	9.44	1346	129	9.58	1246	111	8.91
NA	924	73	7.90	834	91	10.91	1085	98	9.03

**Table 5.3a: Distribution of Preterm by Ethnicity 2018-2019**

Ethnicity	2018			2019		
	Total Delivery	Preterm		Total Delivery	Preterm	
	n	n	%	n	n	%
Malay	53543	3642	6.80	56215	3616	6.43
Chinese	2935	228	7.77	3460	271	7.83
Indian	3307	386	11.67	3519	359	10.20
Kadazan	77	32	41.56	64	26	40.63
Dusun	26	17	65.38	1038	30	2.89
Bajau	546	32	5.86	-	-	-
Murut	32	6	18.75	55	5	9.09
Melanau	19	3	15.79	17	0	0.00
Iban	174	23	13.22	201	21	10.45
Bidayuh	17	2	11.76	-	-	-
OA Peninsular Malaysia	147	16	10.88	174	33	18.97
OI group in Sabah and Sarawak	93	4	4.30	265	7	2.64
Others	646	104	16.10	928	108	11.64
Foreigner	2719	183	6.73	2833	216	7.62
NA	76	5	6.58	199	15	7.54

**Table 5.3b: Distribution of Preterm by Ethnicity 2020**

Ethnicity	2020		
	Total Delivery	Preterm	
	n	n	%
Malay	59027	3758	6.37
Chinese	2857	242	8.47
Indian	3702	370	9.99
Kadazan	79	37	46.84
Dusun	82	37	45.12
Murut	45	10	22.22
Melanau	25	5	20.00
Iban	256	19	7.42
OA Peninsular Malaysia	187	26	13.90
OI group in Sabah and Sarawak	119	10	8.40
Others	1118	146	13.06
Foreigner	3309	217	6.56
NA	200	16	8.00

**Table 5.4: Distribution of Preterm by Age 2018-2020**

Age (years)	2018			2019			2020		
	Total Delivery	Preterm		Total Delivery	Preterm		Total Delivery	Preterm	
	n	n	%	n	n	%	n	n	%
10-14	28	1	3.57	24	2	8.33	34	4	11.76
15-19	1612	148	9.18	1706	150	8.79	1510	127	8.41
20-24	10103	717	7.10	10744	693	6.45	10003	702	7.02
25-29	22030	1431	6.50	23280	1457	6.26	22526	1551	6.89
30-34	18372	1286	7.00	19409	1307	6.73	18783	1381	7.35
35-39	9355	844	9.02	20425	879	4.30	10067	898	8.92
40-44	2280	240	10.53	2463	243	9.87	2339	263	11.24
45-49	142	13	9.15	144	19	13.19	141	16	11.35
50-54	2	1	50.00	0	0	0.00	0	0	0.00
55-59	1	0	0.00	1	1	100.00	0	0	0.00
NA	12	2	16.67	11	0	0.00	17	1	5.88

**Table 5.5: Distribution of Preterm by Parity 2018-2020**

Parity	2018			2019			2020		
	Total Delivery	Preterm		Total Delivery	Preterm		Total Delivery	Preterm	
	n	n	%	n	n	%	n	n	%
1	17531	1082	6.17	17981	1081	6.01	19099	1055	5.52
2-5	24129	1802	7.47	25592	1744	6.81	27108	1807	6.67
≥6	974	78	8.01	1019	64	6.28	967	81	8.38
NA	20495	1526	7.45	10856	1665	15.34	24364	1783	7.32

**Table 5.6: Distribution of Preterm by Type of Pregnancy 2018-2019**

Type of Pregnancy	2018			2019			2020		
	Total Delivery	Preterm		Total Delivery	Preterm		Total Delivery	Preterm	
	n	n	%	n	n	%	n	n	%
Singleton	63305	4404	6.96	67303	4446	6.61	70814	4621	6.53
Twins	597	265	44.39	645	296	45.89	713	313	43.90
Triplets	15	14	93.33	12	9	75.00	11	9	81.82

**Table 5.7: Distribution of Preterm by Medical Disorders 2018-2020**

Medical Disorders	2018			2019			2020		
	Total Delivery	Preterm		Total Delivery	Preterm		Total Delivery	Preterm	
	n	n	%	n	n	%	n	n	%
None	48093	3382	7.03	48923	3262	6.67	49708	3223	6.48
Diabetes	9828	796	8.10	13052	961	7.36	15885	1197	7.54
Heart disease	161	19	11.80	125	6	4.80	152	16	10.53
Hypertensive	2152	372	17.29	2225	424	19.06	2303	432	18.76
Asthma	1346	88	6.54	1390	104	7.48	1489	97	6.51
Blood disorder	2385	135	5.66	3251	195	6.00	3183	171	5.37
Psychiatric	49	5	10.20	61	3	4.92	61	5	8.20
Renal disease	15	3	20.00	11	1	9.09	14	5	35.71
Thyroid disease	291	18	6.19	16	16	100.00	274	30	10.95
Tuberculosis	21	2	9.52	21	2	9.52	15	2	13.33
Other medical problems	7340	450	6.13	6752	526	7.79	7271	545	7.50

**Table 5.8: Distribution of Preterm with Diabetes in Pregnancy 2018-2020**

Diabetes in pregnancy	2018			2019			2020		
	Total Delivery	Preterm		Total Delivery	Preterm		Total Delivery	Preterm	
	n	n	%	n	n	%	n	n	%
GDM Diet control	7479	512	6.85	9735	642	6.59	11417	760	6.70
GDM Insulin	1998	226	11.31	2783	247	8.88	3535	307	8.70
NA	45	6	13.33	265	23	8.68	599	38	6.30
Pre-existing DM type 1	118	8	6.78	44	7	15.91	33	33	100.00
Pre-existing DM type 2	159	19	11.95	164	27	16.46	216	100	46.30
NA	5	0	0.00	5	1	20.00	2	2	100.00

**Table 5.9: Distribution of Preterm by Apgar score 2018-2020**

Apgar Score	2018			2019			2020		
	Total Delivery	Preterm		Total Delivery	Preterm		Total Delivery	Preterm	
	n	n	%	n	n	%	n	n	%
Apgar 1min									
≤7	3483	645	18.52	3565	743	20.84	3453	736	21.31
>7	60320	3830	6.35	64383	3833	5.95	68085	4019	5.90
Apgar 5 min									
≤7	1049	308	29.36	1018	329	32.32	1016	314	30.91
>7	53570	3427	6.40	56034	3338	5.96	58241	3463	5.95

**Table 5.10: Prematurity and birthweight 2018-2020**

Birthweight (grams)	2018			2019			2020		
	TD	Preterm		TD	Preterm		TD	Preterm	
	n	n	%	n	n	%	n	n	%
< 1000	710	191	26.90	728	183	25.14	762	196	25.72
1000 - 1500	993	352	35.45	1018	220	21.61	1097	440	40.11
1501 - 2000	2456	570	23.21	2745	615	22.40	2813	667	23.71
2001 - 2500	10484	603	5.75	11861	602	5.08	11541	701	6.07
2501 - 3000	34088	280	0.82	37472	251	0.67	37880	344	0.91
3001 - 3500	33203	60	0.18	35693	36	0.10	36784	103	0.28
3501 - 4000	10106	17	0.17	10614	9	0.08	11027	30	0.27
> 4000	1612	4	0.25	1530	1	0.07	1570	9	0.57

**Table 5.11: Preterm and stillbirth rate per 1000 livebirths 2018-2020**

Year	Preterm	FSB		MSB	
	n	n	%	n	%
2018	4,488	46	10.25	128	28.52
2019	4488	44	9.80	163	36.32
2020	4726	48	10.16	156	33.01

Table 5.12: Distribution of Preterm by Mode of Delivery 2018-2020

SDP	Preterm	2018									
		Total Delivery	CS		Instrumental		Vaginal		Other		NA
			n	%	n	%	n	%	n	%	
HSA, Johor	22 - 36+6 weeks	11403	393	3.45	33	0.29	597	5.24	6	0.05	0
HRPZ II, Kelantan	22 - 36+6 weeks	11499	200	1.74	3	0.03	392	3.41	0	0.00	0
HTJ, N. Sembilan	22 - 36+6 weeks	9057	441	4.87	14	0.15	380	4.20	0	0.00	1
HTF, Perlis	22 - 36+6 weeks	3927	103	2.62	1	0.03	141	3.59	0	0.00	0
HPP, Pulau Pinang	22 - 36+6 weeks	3774	74	1.96	2	0.05	88	2.33	1	0.03	0
HTAR, Selangor	22 - 36+6 weeks	8542	367	4.30	37	0.43	382	4.47	2	0.02	0
HSNZ, Terengganu	22 - 36+6 weeks	15715	292	1.86	7	0.04	539	3.43	0	0.00	0
2019											
HSA, Johor	22 - 36+6 weeks	12174	469	3.85	24	0.20	568	4.67	1	0.01	0
HRPZ II, Kelantan	22 - 36+6 weeks	10864	276	2.54	5	0.05	369	3.40	0	0.00	0
HTJ, N. Sembilan	22 - 36+6 weeks	10184	489	4.80	14	0.14	415	4.08	0	0.00	0
HTF, Perlis	22 - 36+6 weeks	4137	80	1.93	0	0.00	121	2.92	0	0.00	0
HPP, Pulau Pinang	22 - 36+6 weeks	3788	95	2.51	5	0.13	90	2.38	0	0.00	0
HTAR, Selangor	22 - 36+6 weeks	10296	282	2.74	28	0.27	429	4.17	1	0.01	0
HSNZ, Terengganu	22 - 36+6 weeks	16517	278	1.68	9	0.05	512	3.10	0	0.00	0
2020											
HSA, Johor	22 - 36+6 weeks	13904	530	3.81	34	0.24	607	4.37	11	0.08	0
HRPZ II, Kelantan	22 - 36+6 weeks	11696	297	2.54	12	0.10	441	3.77	0	0.00	0
HTJ, N. Sembilan	22 - 36+6 weeks	9385	496	5.29	20	0.21	422	4.50	0	0.00	0
HTF, Perlis	22 - 36+6 weeks	3771	81	2.15	3	0.08	113	3.00	0	0.00	0
HPP, Pulau Pinang	22 - 36+6 weeks	3956	118	2.98	15	0.38	131	3.31	1	0.03	0
HTAR, Selangor	22 - 36+6 weeks	11856	275	2.32	34	0.29	458	3.86	1	0.01	2
HSNZ, Terengganu	22 - 36+6 weeks	16970	199	1.17	4	0.02	436	2.57	0	0.00	0

# STILLBIRTH



**Table 6.1: Trends in Stillbirth rate by Hospitals 2018-2020**

SDP	2018			2019			2020		
	Total Delivery	Stillbirth	SB rate	Total Delivery	Stillbirth	SB rate	Total Delivery	Stillbirth	SB rate
	n	n		n	n		n	n	
HSA, Johor	11403	104	9.12	12174	96	7.89	13904	117	8.41
HSB, Kedah	9890	59	5.97	9636	57	5.92	7760	62	7.99
HRPZ 11, Kelantan	11499	70	6.09	10864	66	6.08	11696	83	7.10
Hospital Melaka	9262	62	6.69	9411	49	5.21	10060	25	2.49
HTJ, Sembilan	9057	39	4.31	10184	36	3.53	9385	45	4.79
HTF, Perlis	3927	11	2.80	4137	12	2.90	3771	14	3.71
HPP, Pulau Pinang	3774	29	7.68	3788	21	5.54	3956	26	6.57
HWKK, Likas, Sabah	9668	72	7.45	13661	91	6.66	13025	132	10.13
HTAR, Selangor	8542	65	7.61	10296	84	8.16	11856	91	7.68
HSNZ, Terengganu	15715	83	5.28	16517	97	5.87	16970	104	6.13
TOTAL	92737	594	6.41	100668	609	6.05	102383	699	6.83

- SB rate by per 1000 livebirths

**Table 6.2: Stillbirth rate in relation to Risk levels at Booking 2018-2020**

Risk level at Booking	2018			2019			2020		
	Total Delivery	Stillbirth	SB Rate	Total Delivery	Stillbirth	SB Rate	Total Delivery	Stillbirth	SB Rate
	n	n		n	n		n	n	
Red	1288	21	16.30	1245	22	17.67	1427	17	11.91
Yellow	12560	102	8.12	15134	117	7.73	15855	121	7.63
Green	72092	386	5.35	77077	384	4.98	78591	446	5.67
White I	2085	9	4.32	1917	7	3.65	1739	10	5.75
White II	543	2	3.68	567	1	1.76	402	6	14.93
No Code	2156	32	14.84	1795	30	16.71	1825	38	20.82

**Table 6.3: Stillbirth rate by Ethnicity 2018-2020**

Ethnicity	2018			2019			2020		
	Total Delivery	Stillbirth	SB Rate	Total Delivery	Stillbirth	SB Rate	Total Delivery	Stillbirth	SB Rate
	n	n		n	n		n	n	
Malay	70811	435	6.14	73379	396	5.40	75014	448	5.97
Chinese	3992	20	5.01	4657	20	4.29	4288	25	5.83
Indian	3788	35	9.24	4040	44	10.89	4210	30	7.13
Kadazan	1423	11	7.73	1828	8	4.38	1771	11	6.21
Dusun	1620	15	9.26	2402	16	6.66	2295	20	8.71
Bajau	1760	10	5.68	2484	16	6.44	2367	32	13.52
Murut	253	0	0.00	355	2	5.63	333	2	6.01
Melanau	31	0	0.00	36	1	27.78	45	0	0.00
Iban	284	4	14.08	329	3	9.12	381	2	5.25
Bidayuh	54	0	0.00	68	0	0.00	74	1	13.51
OA Peninsular Malaysia	183	0	0.00	217	2	9.22	228	4	17.54
OI group in Sabah and Sarawak	152	1	6.58	265	1	3.77	203	1	4.93
Others	3757	20	5.32	5166	45	8.71	5129	44	8.58
Foreigner	4540	42	9.25	5210	52	9.98	5762	76	13.19

- SB rate by per 1000 livebirths

**Table 6.4: Stillbirth rate by Maternal Age 2018-2020**

Age (years)	2018			2019			2020		
	Total Delivery	Stillbirth	SB Rate	Total Delivery	Stillbirth	SB Rate	Total Delivery	Stillbirth	SB Rate
	n	n		n	n		n	n	
10-14	48	1	20.83	50	0	0.00	56	1	17.86
15-19	2529	10	3.95	2924	25	8.55	2873	22	7.66
20-24	14820	32	2.16	16037	86	5.36	15883	91	5.73
25-29	31535	63	2.00	33691	178	5.28	34365	215	6.26
30-34	26759	67	2.50	28701	165	5.75	29277	177	6.05
35-39	13519	50	3.70	15304	115	7.51	15904	137	8.61
40-44	3247	9	2.77	3705	37	9.99	3721	50	1.34
45-49	223	3	13.45	233	3	12.88	234	4	17.09
50-54	7	1	142.86	5	0	0.00	7	1	142.86

**Table 6.5: Stillbirth rate by Parity 2018-2020**

Parity	2018			2019			2020		
	Total Delivery	Stillbirth	SB Rate	Total Delivery	Stillbirth	SB Rate	Total Delivery	Stillbirth	SB Rate
	n	n		n	n		n	n	
1	24961	129	5.17	25300	121	4.78	25918	162	6.25
2-5	35436	231	6.52	37550	224	5.97	37889	254	6.70
≥ 6	1663	23	13.83	1710	16	9.36	1625	15	9.23
NA	30677	211	6.88	36108	248	6.87	36912	267	7.23

- SB rate by per 1000 livebirths

**Table 6.6: Stillbirth rate in relation to birthweight 2018-2020**

Birth Weight (grams)	2018			2019			2020		
	Total Delivery	Stillbirth	SB Rate	Total Delivery	Stillbirth	SB Rate	Total Delivery	Stillbirth	SB Rate
	n	n		n	n		n	n	
< 1000	710	237	333.80	728	254	348.90	762	282	370.08
1000 - 1500	993	102	102.72	1018	109	107.07	1097	124	113.04
1501 - 2000	2456	85	34.61	2745	78	28.42	2810	100	35.59
2001 - 2500	10484	59	5.63	11861	73	6.15	11537	72	6.24
2501 - 3000	34088	54	1.58	37472	48	1.28	37862	76	2.01
3001 - 3500	33203	43	1.30	35693	36	1.01	36768	33	0.90
3501 - 4000	10106	13	1.29	10614	15	1.41	11026	11	1.00
> 4000	1612	11	6.82	1530	7	4.58	1570	8	5.10

**Table 6.7: Stillbirth rate by period of gestation 2018-2020**

POA	2018				
	Total Delivery	FSB		MSB	
	n	n	%	n	%
22 - 36+6 weeks	4683	48	10.25	133	28.40
37 - 40 weeks	37367	17	0.45	39	1.04
>40-42 weeks	1940	1	0.52	2	1.03
NA	48747	141	2.89	214	4.39
2019					
22 - 36+6 weeks	4751	46	9.68	165	34.73
37 - 40 weeks	40752	5	0.12	44	1.08
>40-42 weeks	1628	0	0.00	0	0.00
NA	53537	163	3.04	186	3.47
2020					
22 - 36+6 weeks	4964	49	9.87	166	33.44
37 - 40 weeks	40665	13	0.32	55	1.35
>40-42 weeks	1434	0	0.00	1	0.70
NA	55361	166	3.00	250	4.52

**Table 6.8: FSB and MSB in relation to birthweight 2018-2020**

Birthweight (grams)	2018				
	Total Delivery	FSB		MSB	
	n	n	%	n	%
< 1000	645	91	141.09	146	226.36
1000 - 1500	891	33	37.04	69	77.44
1501 - 2000	2136	24	11.24	61	28.56
2001 - 2500	9103	23	2.53	36	3.95
2501 - 3000	30422	18	0.59	36	1.18
3001 - 3500	30267	13	0.43	30	0.99
3501 - 4000	9346	6	0.64	7	0.75
> 4000	1499	3	2.00	8	5.34
	2019				
< 1000	662	100	151.11	154	232.63
1000 - 1500	918	29	3.16	80	87.15
1501 - 2000	2396	30	1.25	48	20.03
2001 - 2500	10345	27	0.26	46	4.45
2501 - 3000	33671	16	0.05	32	0.95
3001 - 3500	32795	10	0.03	26	0.79
3501 - 4000	9926	7	0.71	8	0.81
> 4000	1437	0	0.00	7	4.87
	2020				
< 1000	699	110	157.37	175	250.36
1000 - 1500	997	31	31.09	93	93.28
1501 - 2000	2479	23	9.28	77	31.06
2001 - 2500	9992	24	2.40	48	4.80
2501 - 3000	33701	31	0.92	45	1.34
3001 - 3500	33652	12	0.36	22	0.65
3501 - 4000	10267	1	0.10	10	0.97
> 4000	1471	1	0.68	7	4.76

**Table 6.9: Stillbirth rate in relation to and medical disorders in pregnancy 2018-2020**

Medical disorders	2018				
	Total Delivery	FSB		MSB	
	n	n	%	n	%
Asthma	1650	2	1.21	5	3.03
Blood disorder	3423	3	0.88	9	2.63
Pneumonia	5	0	0.00	1	200.00
Renal disease	24	0	0.00	1	41.67
Thyroid disease	389	1	2.57	2	5.14
Diabetes in pregnancy	12716	19	1.49	60	4.72
Hypertensive disorder in pregnancy	3000	16	5.33	29	9.67
	2019				
Asthma	1765	4	2.27	9	5.10
Blood disorder	3822	9	2.35	14	3.66
Psychiatric disorder	70	1	14.29	1	14.29
Renal disease	14	1	71.43	0	0.00
Thyroid disease	389	0	0.00	1	2.57
Diabetes in pregnancy	16858	16	0.95	56	3.32
Hypertensive disorder in pregnancy	2926	14	4.78	24	8.20
	2020				
Asthma	1861	4	2.15	11	5.91
Blood disorder	4104	10	2.44	17	4.14
Thyroid disease	441	3	6.80	3	6.80
Tuberculosis	37	0	0.00	1	27.03
Diabetes in pregnancy	20298	36	1.77	66	3.25
Hypertensive disorder in pregnancy	3258	23	7.06	31	9.52

**Table 6.10: Table Stillbirth rate by type of pregnancy 2018-2020**

Type of Pregnancy	2018				
	Total Delivery	FSB		MSB	
	n	n	%	n	%
Singleton	91844	192	2.09	369	4.02
Twins	870	15	17.24	19	21.84
	2019				
Singleton	99695	203	2.04	376	3.77
Twins	955	11	11.52	17	17.8
Triplets	17	0	0.00	2	117.65
	2020				
Singleton	101391	215	2.12	453	4.47
Twins	1016	13	12.8	17	16.73
Triplets	17	0	0.00	2	117.65

# **HYPERTENSIVE DISORDERS IN PREGNANCY**

**Table 7.1: Distribution of Hypertension in pregnancy by Hospital 2018-2020**

SDP	2018			2019			2020		
	Total Delivery	Hypertension		Total Delivery	Hypertension		Total Delivery	Hypertension	
	n	n	%	n	n	%	n	n	%
HSA, Johor	11403	384	3.37	12174	394	3.24	13904	433	3.11
HSB,Kedah	9888	466	4.71	9636	341	3.54	7760	508	6.55
HRPZII, Kelantan	11499	280	2.43	10864	311	2.86	11696	353	3.02
Hospital Melaka	9262	66	0.71	9411	56	0.60	10059	9	0.09
HTJ,N.Sembilan	9057	320	3.53	10184	349	3.43	9385	376	4.01
HTF,Perlis	3927	89	2.27	4137	60	1.45	3771	58	1.54
HPP, Pulau Pinang	3774	63	1.67	3788	66	1.74	3956	71	1.79
HWKK, Likas,Sabah	9664	316	3.27	13660	304	2.23	12826	431	3.36
HTAR, Selangor	8542	268	3.14	10296	342	3.32	11856	399	3.37
HSNZ,Terengganu	15715	748	4.76	16517	703	4.26	16970	613	3.61
TOTAL	92731	3000	3.24	100667	2926	2.91	102183	3251	3.18

**Table 7.2a: Distribution of Hypertensive disorders by Hospitals 2018-2019**

SDP	2018											
	Hypertension	Pre-existing Chronic Hypertension		Gestational hypertension		Chronic Hypertension with superimposed PE		Unclassified hypertension		NA		
	n	n	%	n	%	n	%	n	%	n	%	
HSA, Johor	384	21	5.47	239	62.24	56	14.58	6	1.56	62	16.15	
HSB, Kedah	466	39	8.37	312	66.95	85	18.24	11	2.36	19	4.08	
HRPZII, Kelantan	280	53	18.93	197	70.36	26	9.29	3	1.07	1	0.36	
Hospital Melaka	66	5	7.58	56	84.85	3	4.55	0	0.00	2	3.03	
HTJ, N.Sembilan	320	10	3.13	232	72.50	73	22.81	0	0.00	5	1.56	
HTF, Perlis	89	23	25.84	19	21.35	35	39.33	9	10.11	3	3.37	
HPP, Pulau Pinang	63	11	17.46	28	44.44	18	28.57	4	6.35	2	3.17	
HWKK, Likas, Sabah	316	3	0.95	202	63.92	60	18.99	10	3.16	41	12.97	
HTAR, Selangor	268	2	0.75	179	66.79	61	22.76	9	3.36	17	6.34	
HSNZ, Terengganu	748	118	15.78	476	63.64	144	19.25	5	0.67	5	0.67	
TOTAL	3000	285	9.50	1940	64.67	561	18.70	57	1.90	157	5.23	
2019												
HSA, Johor	394	11	2.79	251	63.71	77	19.54	5	1.27	50	12.69	
HSB, Kedah	341	37	10.85	170	49.85	116	34.02	5	1.47	13	3.81	
HRPZII, Kelantan	311	32	10.29	239	76.85	37	11.90	0	0.00	3	0.96	
Hospital Melaka	56	16	28.57	27	48.21	1	1.79	1	1.79	11	19.64	
HTJ, N.Sembilan	349	6	1.72	225	64.47	116	33.24	0	0.00	2	0.57	
HTF, Perlis	60	8	13.33	17	28.33	25	41.67	7	11.67	3	5.00	
HPP, Pulau Pinang	66	12	18.18	35	53.03	13	19.70	2	3.03	4	6.06	
HWKK, Likas, Sabah	304	7	2.30	176	57.89	32	10.53	11	3.62	78	25.66	
HTAR, Selangor	342	3	0.88	138	40.35	119	34.80	46	13.45	36	10.53	
HSNZ, Terengganu	703	46	6.54	455	64.72	182	25.89	17	2.42	3	0.43	
TOTAL	2926	178	6.08	1733	59.23	718	24.54	94	3.21	203	6.94	



Table 7.2b: Distribution of Hypertensive disorders by Hospital 2020

SDP	2020											
	Hypertension		Pre-existing Chronic Hypertension		Gestational hypertension		Chronic Hypertension with superimposed PE		Unclassified hypertension		NA	
	n	%	n	%	n	%	n	%	n	%	n	%
HSA, Johor	433		5	1.15	200	46.19	153	35.33	0	0.00	75	17.32
HSB, Kedah	508		29	5.71	308	60.63	161	31.69	4	0.79	6	1.18
HRPZII, Kelantan	353		30	8.50	276	78.19	43	12.18	0	0.00	4	1.13
Hospital Melaka	9		5	55.56	2	22.22	0	0.00	0	0.00	2	22.22
HTJ, N. Sembilan	376		8	2.13	235	62.50	133	35.37	0	0.00	0	0.00
HTF, Perlis	58		6	10.34	16	27.59	32	55.17	0	0.00	4	6.90
HPP, Pulau Pinang	71		16	22.54	38	53.52	10	14.08	2	2.82	5	7.04
HWKK, Likas, Sabah	431		3	0.70	251	58.24	145	33.64	10	2.32	22	5.10
HTAR, Selangor	399		4	1.00	183	45.86	117	29.32	67	16.79	28	7.02
HSNZ, Terengganu	613		31	5.06	379	61.83	193	31.48	7	1.14	3	0.49
TOTAL	3251		137	4.21	1888	58.07	987	30.36	90	2.77	149	4.58

**Table 7.3: Distribution of Hypertension in Pregnancy by Ethnicity 2018-2020**

Ethnicity	2018			2019			2020		
	Total Delivery	Hypertension		Total Delivery	Hypertension		Total Delivery	Hypertension	
	n	n	%	n	n	%	n	n	%
Malay	72761	2493	3.43	74581	2432	3.26	72121	2419	3.35
Chinese	4655	134	2.88	5272	126	2.39	4329	128	2.96
Indian	4498	91	2.02	4682	91	1.94	4266	82	1.92
Kadazan	1427	60	4.20	1831	53	2.89	1759	83	4.72
Dusun	1629	73	4.48	2403	72	3.00	2277	72	3.16
bajau	1756	46	2.62	2482	43	1.73	2354	69	2.93
Murut	253	6	2.37	355	13	3.66	329	13	3.95
Melanau	32	4	12.50	37	0	0.00	44	3	6.82
Iban	295	17	5.76	326	11	3.37	373	16	4.29
Bidayuh	54	3	5.56	69	3	4.35	71	1	1.41
OA Pen	539	26	4.82	574	23	4.01	281	10	3.56
OI group in Sabah and Sarawak	156	3	1.92	273	3	1.10	204	4	1.96
Others	3781	139	3.68	5157	110	2.13	5039	157	3.12
foreigner	4786	92	1.92	5431	80	1.47	5735	148	2.58
NA	94	1	1.06	249	12	4.82	246	9	3.66

Table 7.4a: Distribution of Hypertensive disorders by Ethnicity 2018

Ethnicity	2018											
	Total Delivery	Pre-existing Chronic Hypt		Gestational Hypertension		Chronic Hypt with superimposed PE		Unclassified hypertension		NA		
	n	n	%	n	%	n	%	n	%	n	%	
Malay	72761	285	0.39	1626	2.23	436	0.60	36	0.05	110	0.15	
Chinese	4655	6	0.13	93	2.00	22	0.47	3	0.06	10	0.21	
Indian	4498	5	0.11	71	1.58	10	0.22	2	0.04	3	0.07	
Kadazan	1427	0	0.00	40	2.80	12	0.84	0	0.00	8	0.56	
Dusun	1629	2	0.12	47	2.89	15	0.92	2	0.12	7	0.43	
bajau	1756	1	0.06	28	1.59	8	0.46	3	0.17	6	0.34	
Murut	253	0	0.00	4	1.58	0	0.00	0	0.00	2	0.79	
Melanau	32	0	0.00	2	6.25	1	3.13	1	3.13	0	0.00	
Iban	295	1	0.34	10	3.39	5	1.69	0	0.00	1	0.34	
Bidayuh	54	0	0.00	2	3.70	1	1.85	0	0.00	0	0.00	
OA Pen	539	5	0.93	17	3.15	1	0.19	1	0.19	2	0.37	
Ol group in Sabah and Sarawak	156	0	0.00	3	1.92	0	0.00	0	0.00	0	0.00	
Others	3781	7	0.19	89	2.35	24	0.63	2	0.05	17	0.45	
foreigner	4786	6	0.13	60	1.25	13	0.27	3	0.06	10	0.21	
NA	94	0	0.00	1	1.06	0	0.00	0	0.00	0	0.00	

**Table 7.4b: Distribution of Hypertensive disorders by Ethnicity 2019**

Ethnicity	2019											
	Total Delivery		Pre-existing Chronic Hypt		Gestational Hypertension		Chronic Hypt with superimposed PE		Unclassified hypertension		NA	
	n	%	n	%	n	%	n	%	n	%	n	%
Malay	72121	0.16	115	1422	1.97	0.99	711	0.09	67	0.14	104	0.14
Chinese	4329	0.14	6	72	1.66	0.92	40	0.02	1	0.21	9	0.21
Indian	4266	0.05	2	52	1.22	0.56	24	0.09	4	0.00	0	0.00
Kadazan	1759	0.00	0	39	2.22	2.16	38	0.11	2	0.23	4	0.23
Dusun	2277	0.00	0	45	1.98	1.10	25	0.04	1	0.04	1	0.04
bajau	2354	0.08	2	38	1.61	1.15	27	0.00	0	0.08	2	0.08
Murut	329	0.00	0	8	2.43	1.22	4	0.00	0	0.30	1	0.30
Melanau	44	0.00	0	2	4.55	2.27	1	0.00	0	0.00	0	0.00
Iban	373	0.80	3	10	2.68	0.54	2	0.00	0	0.27	1	0.27
Bidayuh	71	0.00	0	1	1.41	0.00	0	0.00	0	0.00	0	0.00
OA Pen	281	0.71	2	5	1.78	0.71	2	0.00	0	0.36	1	0.36
OI group in Sabah and Sarawak	204	0.00	0	2	0.98	0.49	1	0.00	0	0.49	1	0.49
Others	5039	0.00	0	93	1.85	0.95	48	0.10	5	0.22	11	0.22
foreigner	5735	0.05	3	96	1.67	0.54	31	0.17	10	0.14	8	0.14
NA	246	0.00	0	6	2.44	1.22	3	0.00	0	0.00	0	0.00

**Table 7.4c: Distribution of Hypertensive disorders by Ethnicity 2020**

Ethnicity	2020											
	Total Delivery		Pre-existing Chronic Hypt		Gestational Hypertension		Chronic Hypt with superimposed PE		Unclassified hypertension		NA	
	n	%	n	%	n	%	n	%	n	%	n	%
Malay	72121	0.16	115	0.16	1422	1.97	711	0.99	67	0.09	104	0.144
Chinese	4329	0.14	6	0.14	72	1.66	40	0.92	1	0.02	9	0.208
Indian	4266	0.05	2	0.05	52	1.22	24	0.56	4	0.09	0	0.000
Kadazan	1759	0.00	0	0.00	39	2.22	38	2.16	2	0.11	4	0.227
Dusun	2277	0.00	0	0.00	45	1.98	25	1.10	1	0.04	1	0.044
bajau	2354	0.08	2	0.08	38	1.61	27	1.15	0	0.00	2	0.085
Murut	329	0.00	0	0.00	8	2.43	4	1.22	0	0.00	1	0.304
Melanau	44	0.00	0	0.00	2	4.55	1	2.27	0	0.00	0	0.000
Iban	373	0.80	3	0.80	10	2.68	2	0.54	0	0.00	1	0.268
Bidayuh	71	0.00	0	0.00	1	1.41	0	0.00	0	0.00	0	0.000
OA Pen	281	0.71	2	0.71	5	1.78	2	0.71	0	0.00	1	0.356
Ol group in Sabah and Sarawak	204	0.00	0	0.00	2	0.98	1	0.49	0	0.00	1	0.490
Others	5039	0.00	0	0.00	93	1.85	48	0.95	5	0.10	11	0.218
foreigner	5735	0.05	3	0.05	96	1.67	31	0.54	10	0.17	8	0.139
NA	246	0.00	0	0.00	6	2.44	3	1.22	0	0.00	0	0.000

**Table 7.5: Distribution of Hypertensive disorders by Age 2018-2020**

Age (years)	2018										
	Total Delivery	Pre-existing Chronic Hypertension		Gestational hypertension		Chronic hypertension with superimposed PE		Unclassified hypertension		NA	
	n	n	%	n	%	n	%	n	%	n	%
15-19	2722	1	0.04	20	0.73	5	0.18	3	0.11	4	0.15
20-24	15330	15	0.10	200	1.30	28	0.18	4	0.03	16	0.10
25-29	32732	53	0.16	505	1.54	95	0.29	7	0.02	26	0.08
30-34	28026	82	0.29	622	2.22	156	0.56	14	0.05	58	0.21
35-39	14226	118	0.83	539	3.79	187	1.31	21	0.15	53	0.37
40-44	3342	43	1.29	195	5.83	69	2.06	4	0.12	16	0.48
45-49	227	6	2.64	10	4.41	8	3.52	0	0.00	3	1.32
50-54	7	0	0.00	1	14.29	0	0.00	0	0.00	0	0.00
55-59	1	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
NA	48	0	0.00	1	2.08	0	0.00	0	0.00	0	0.00
2019											
15-19	3033	3	0.10	25	0.82	3	0.10	2	0.07	0	0.00
20-24	16378	6	0.04	187	1.14	34	0.21	10	0.06	21	0.13
25-29	34633	34	0.10	411	1.19	116	0.33	26	0.08	41	0.12
30-34	29700	56	0.19	550	1.85	222	0.75	22	0.07	65	0.22
35-39	15843	71	0.45	479	3.02	218	1.38	21	0.13	64	0.40
40-44	3809	30	0.79	187	4.91	110	2.89	10	0.26	26	0.68
45-49	242	1	0.41	16	6.61	10	4.13	0	0.00	3	1.24
50-54	5	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
55-59	1	0	0.00	1	100.00	0	0.00	0	0.00	0	0.00
2020											
10-14	57	0	0.00	1	1.75	0	0.00	0	0.00	0	0.00
15-19	2803	0	0.00	24	0.86	7	0.25	1	0.04	4	7.02
20-24	15342	2	0.01	176	1.15	31	0.20	7	0.05	8	0.05
25-29	33356	17	0.05	464	1.39	155	0.46	28	0.08	28	0.08
30-34	28471	51	0.18	571	2.01	275	0.97	21	0.07	52	0.18
35-39	15510	32	0.21	479	3.09	330	2.13	28	0.18	42	0.27
40-44	3635	30	0.83	166	4.57	141	3.88	5	0.14	13	0.36
45-49	224	1	0.45	10	4.46	17	7.59	0	0.00	3	1.34
50-54	7	0	0.00	0	0.00	1	14.29	0	0.00	0	0.00

Table 7.6: Distribution of Hypertensive disorder by Birthweight 2018-2020

Birthweight (grams)	2018											
	Total Delivery		Pre-existing Chronic Hypertension		Gestational hypertension		Chronic hypertension With superimposed PE		Unclassified hypertension		NA	
	n	%	n	%	n	%	n	%	n	%	n	%
< 1000	710	2.11	15	2.11	48	6.76	17	2.39	2	0.28	1	0.14
1000 - 1500	993	1.11	11	1.11	89	8.96	38	3.83	1	0.10	5	0.50
1501 - 2000	2456	0.81	20	0.81	161	6.56	38	1.55	4	0.16	11	0.45
2001 - 2500	10483	0.34	36	0.34	341	3.25	90	0.86	12	0.11	26	0.25
2501 - 3000	34087	0.26	89	0.26	625	1.83	203	0.60	18	0.05	59	0.17
3001 - 3500	33202	0.21	71	0.21	502	1.51	127	0.38	15	0.05	38	0.11
3501 - 4000	10106	0.35	35	0.35	148	1.46	41	0.41	5	0.05	13	0.13
> 4000	1612	0.68	11	0.68	49	3.04	13	0.81	0	0.00	4	0.25
2019												
< 1000	728	1.10	8	1.10	39	5.36	34	4.67	3	0.41	5	0.69
1000 - 1500	1018	0.88	9	0.88	75	7.37	43	4.22	7	0.69	6	0.59
1501 - 2000	2745	0.55	15	0.55	178	6.48	73	2.66	8	0.29	14	0.51
2001 - 2500	11861	0.24	29	0.24	332	2.80	153	1.29	17	0.14	38	0.32
2501 - 3000	37472	0.10	38	0.10	583	1.56	201	0.54	36	0.10	75	0.20
3001 - 3500	35692	0.15	53	0.15	402	1.13	158	0.44	20	0.06	55	0.15
3501 - 4000	10614	0.23	24	0.23	122	1.15	52	0.49	4	0.04	9	0.08
> 4000	1530	0.26	4	0.26	26	1.70	14	0.92	1	0.07	2	0.13
2020												
< 1000	758	0.40	3	0.40	38	5.01	34	4.49	3	0.40	2	0.26
1000 - 1500	1095	0.46	5	0.46	106	9.68	56	5.11	4	0.37	3	0.27
1501 - 2000	2808	0.21	6	0.21	164	5.84	93	3.31	4	0.14	7	0.25
2001 - 2500	11525	0.23	26	0.23	353	3.06	152	1.32	18	0.16	24	0.21
2501 - 3000	37803	0.12	47	0.12	623	1.65	336	0.89	33	0.09	58	0.15
3001 - 3500	36727	0.10	38	0.10	471	1.28	231	0.63	24	0.07	43	0.12
3501 - 4000	11013	0.14	15	0.14	130	1.18	68	0.62	5	0.05	10	0.09
> 4000	1569	0.06	1	0.06	30	1.91	27	1.72	1	0.06	2	0.13

**Table 7.7: Distribution of Hypertensive disorders by Parity 2018-2020**

Parity	Total Delivery	2018									
		Pre-existing Chronic Hypertension		Gestational Hypertension		Chronic Hypertension with superimposed PE		Unclassified hypertension		NA	
		n	%	n	%	n	%	n	%	n	%
1	25979	61	0.23	417	1.61	131	0.50	17	0.07	42	0.16
2-5	36719	176	0.48	905	2.46	266	0.72	24	0.07	82	0.22
≥6	1730	19	1.10	72	4.16	23	1.33	1	0.06	8	0.46
NA	32291	62	0.19	699	2.16	128	0.40	11	0.03	44	0.14
2019											
1	26121	41	0.16	400	1.53	160	0.61	20	0.08	39	0.15
2-5	38509	107	0.28	760	1.97	345	0.90	32	0.08	93	0.24
≥6	1755	5	0.28	53	3.02	36	2.05	2	0.11	8	0.46
NA	37337	48	0.13	645	1.73	172	0.46	37	0.10	80	0.21
2020											
1	25099	26	0.10	350	1.39	179	0.71	15	0.06	31	0.12
2-5	36766	73	0.20	752	2.05	483	1.31	42	0.11	63	0.17
≥6	1603	6	0.37	47	2.93	45	2.81	32	2.00	2	0.12
NA	35960	28	0.08	742	2.06	250	0.70	1	0.00	54	0.15

**Table 7.8: Distribution of Hypertensive by Mode of delivery 2018-2020**

Mode of delivery	2018			2019			2020		
	Total Delivery	Hypertension		Total Delivery	Hypertension		Total Delivery	Hypertension	
	n	n	%	n	n	%	n	n	%
CS	27989	1708	6.10	30240	1783	5.90	29092	1978	6.80
Instrumental	3665	82	2.24	4162	85	2.04	4424	107	2.42
Vaginal	64913	1392	2.14	69162	1206	1.74	65801	1330	2.02
NA	127	6	4.72	138	12	8.70	90	1	1.11



**Table 7.9: Distribution of Types of Gestational Hypertension by Mode of delivery 2018-2020**

Mode of Delivery	2018											
	Total Delivery	Hypertension	PE		Gestational Hypertension		Severe PE		Eclampsia		NA	
	n	n	n	%	n	%	n	%	n	%	n	%
CS	27989	1708	286	16.74	525	30.74	140	8.20	24	1.41	130	7.61
Instrumental	3665	82	14	17.07	32	39.02	3	3.66	0	0.00	6	7.32
Vaginal	64913	1392	112	8.05	646	46.41	18	1.29	3	0.22	151	0.23
	2019											
CS	30240	1783	250	14.02	519	29.10	120	6.73	18	1.00	149	8.36
Instrumental	4162	85	7	8.24	33	38.82	3	3.53	1	1.17	12	14.12
Vaginal	69162	1206	86	7.13	507	42.03	1	0.08	2	0.16	127	10.53
	2020											
CS	29092	1978	261	13.20	497	25.13	149	7.53	19	0.96	117	5.92
Instrumental	4424	107	9	8.41	42	39.25	4	3.74	0	0.00	16	0.36
Vaginal	65801	1330	83	6.24	542	40.75	15	1.13	1	0.08	135	10.15

**Table 7.10: Distribution of birthweight by Hypertensive disorders in pregnancy 2018-2020**

Birthweight (grams)	2018										
	Total Delivery	Pre-existing Chronic Hypertension		Gestational hypertension		Chronic Hypertension with superimposed PE		Unclassified hypertension		NA	
	n	n	%	n	%	n	%	n	%	n	%
< 1000	710	17	2.39	48	6.76	15	2.11	2	0.28	1	0.14
1000 - 1500	993	38	3.83	89	8.96	11	1.11	1	0.10	4	0.40
1501 - 2000	2456	38	1.55	161	6.56	20	0.81	4	0.16	13	0.53
2001 - 2500	10484	90	0.86	341	3.25	36	0.34	12	0.11	31	0.30
2501 - 3000	34088	203	0.60	625	1.83	89	0.26	18	0.05	99	0.29
3001 - 3500	33203	127	0.38	502	1.51	71	0.21	15	0.05	60	0.18
3501 - 4000	10106	41	0.41	148	1.46	35	0.35	5	0.05	25	0.25
> 4000	1612	13	0.81	49	3.04	11	0.68	0	0.00	5	0.31
	2019										
< 1000	728	34	4.67	39	5.36	8	1.10	3	0.41	6	0.82
1000 - 1500	1018	43	4.22	75	7.37	9	0.88	7	0.69	7	0.69
1501 - 2000	2745	73	2.66	178	6.48	15	0.55	8	0.29	9	0.33
2001 - 2500	11861	153	1.29	332	2.80	29	0.24	17	0.14	44	0.37
2501 - 3000	37472	201	0.54	583	1.56	38	0.10	36	0.10	92	0.25
3001 - 3500	35693	158	0.44	402	1.13	53	0.15	20	0.06	60	0.17
3501 - 4000	10614	52	0.49	122	1.15	24	0.23	4	0.04	22	0.21
> 4000	1530	14	0.92	26	1.70	4	0.26	1	0.07	2	0.13
	2020										
< 1000	762	34	4.46	38	4.99	3	0.39	3	0.39	2	0.26
1000 - 1500	1097	56	5.10	106	9.66	5	0.46	4	0.36	9	0.82
1501 - 2000	2813	93	3.31	164	5.83	6	0.21	4	0.14	17	0.60
2001 - 2500	11541	153	1.33	353	3.06	26	0.23	18	0.16	48	0.42
2501 - 3000	37880	338	0.89	625	1.65	48	0.13	33	0.09	98	0.26
3001 - 3500	36784	231	0.63	472	1.28	38	0.10	24	0.07	64	0.17
3501 - 4000	11027	68	0.62	132	1.20	15	0.14	5	0.05	20	0.18
> 4000	1570	27	1.72	30	1.91	1	0.06	1	0.06	7	0.45

**Table 7.11 Distribution of Birthweight by Types of Gestational hypertension 2018-2020**

Birthweight (grams)	2018										
	Total Delivery	Gestational Hypertension		Preeclampsia		Severe PE		Eclampsia		NA	
	n	n	%	n	%	n	%	n	%	n	%
< 1000	48	12	25.00	17	35.42	18	37.50	0	0.00	1	2.08
1000 - 1500	89	16	17.98	35	39.33	30	33.71	4	4.49	4	4.49
1501 - 2000	161	50	31.06	59	36.65	31	19.25	8	4.97	13	8.07
2001 - 2500	341	184	53.96	79	23.17	43	12.61	4	1.17	31	9.09
2501 - 3000	625	404	64.64	96	15.36	21	3.36	5	0.80	99	15.84
3001 - 3500	502	361	71.91	75	14.94	6	1.20	0	0.00	60	11.95
3501 - 4000	148	96	64.86	19	12.84	6	4.05	2	1.35	25	16.89
> 4000	49	31	63.27	8	16.33	4	8.16	1	2.04	5	10.20
	2019										
< 1000	39	18	46.15	7	17.95	8	20.51	0	0.00	6	15.38
1000 - 1500	75	19	25.33	26	34.67	19	25.33	4	5.33	7	9.33
1501 - 2000	178	76	42.70	59	33.15	31	17.42	3	1.69	9	5.06
2001 - 2500	332	158	47.59	91	27.41	35	10.54	4	1.20	44	13.25
2501 - 3000	583	357	61.23	92	15.78	35	6.00	7	1.20	92	15.78
3001 - 3500	402	291	72.39	38	9.45	11	2.74	2	0.50	60	14.93
3501 - 4000	122	78	63.93	19	15.57	3	2.46	0	0.00	22	18.03
> 4000	26	18	69.23	4	15.38	2	7.69	0	0.00	2	7.69
	2020										
< 1000	38	12	31.58	7	18.42	16	42.11	1	2.63	2	5.26
1000 - 1500	106	28	26.42	40	37.74	24	22.64	5	4.72	9	8.49
1501 - 2000	164	52	31.71	59	35.98	35	21.34	1	0.61	17	10.37
2001 - 2500	353	195	55.24	72	20.40	32	9.07	6	1.70	48	13.60
2501 - 3000	625	399	63.84	86	13.76	39	6.24	3	0.48	98	15.68
3001 - 3500	472	316	66.95	70	14.83	19	4.03	3	0.64	64	13.56
3501 - 4000	132	82	62.12	19	14.39	8	6.06	3	2.27	20	15.15
> 4000	30	15	50.00	7	23.33	1	3.33	0	0.00	7	23.33



A publication of National Obstetrics Registry, Institute Clinical Research, and  
Health Informatic Center, Ministry of Health Malaysia