Irish Maternity Indicator System

National Report 2022 *(v1.1)*

National Women and Infants Health Programme

April 2024

Contents

Introduction

The IMIS system was developed in 2014 by the National Clinical Programme for Obstetrics and Gynaecology under the leadership of Professor Michael Turner. It was the first combined clinical and management data collection tool in the area of Obstetrics and Neonatology for all 19 maternity units. This followed a number of national recommendations such as the HIQA National recommendations 2013 and the HSE NIMT National recommendations in the same year. Ireland has a long history and tradition of data reporting at the individual hospital level. The IMIS allows units to audit local performance and also provides a national overview.

The IMIS contains a broad range of metrics across Obstetrics and Neonatology using agreed definitions, thus ensuring a standardised approach. These metrics range from demographics, hospital transfers/ activities, outcomes, and obstetric risks and complications. Some variability between sites is to be expected and the funnel plot visuals allow one to see where major outliers occur and to examine potential reasons for this.

National trends in metrics such as caesarean section delivery, postpartum haemorrhage and ectopic pregnancy are easily seen.

The IMIS report complements other valuable reports, including the National Therapeutic Hypothermia report, which is a collaboration with the National Perinatal Epidemiology centre (NPEC).

The IMIS has led to quality improvement interventions that impact all units. For example, there have been interventions in respect of neonatal encephalopathy, therapeutic hypothermia, and postpartum haemorrhage. Individual maternity units may focus on quality improvement initiatives based on their own local data. National clinical guidelines have been developed on subjects directly related to the IMIS metrics.

The current IMIS dataset is being reviewed to ensure relevance and usefulness and future publications will reflect feedback from users of tool. We are indebted to the contributors at all the 19 sites.

We acknowledge the work of both Professor Michael Turner and Dr Peter McKenna in the development of the IMIS report to date.

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April 2024

Demographics

Total women (#1) and Total births (#4)

Definitions

Total women: Number of women delivering a baby weighing ≥ 500g.

Total births: Number of births, including live births and stillbirths, weighing ≥ 500g.

Total Births and Total Women

Total women (n) Total births (n)
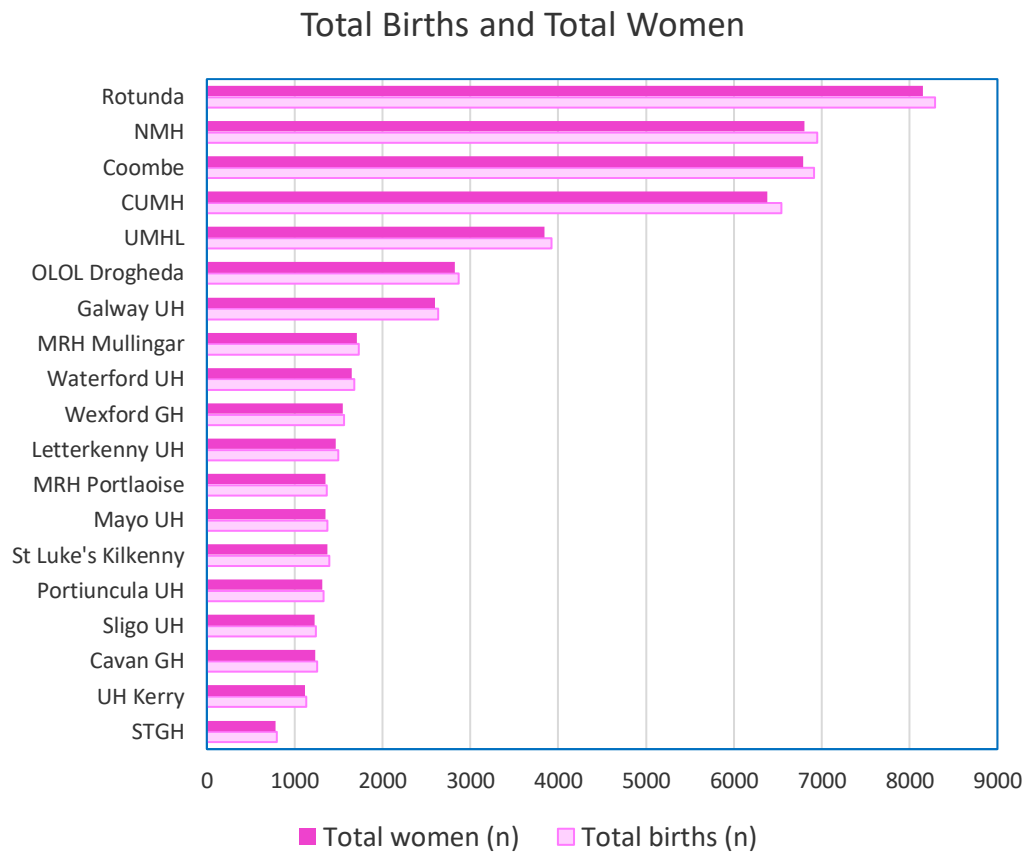
	Total women		Total births	
	2021*	**2022**	**2021**	**2022**
National (n)	59,443	53,495	60,492	54,467
Mean (S.D.)	3,129 (2,649)	2,815 (2365)	3,184 (2,706)	2,867 (2415)
Range	935-8,968	785-8,151	948-9,147	796-8,292

*Note: The number of Total women in 2021 was amended (from N=59,446) when retrospective changes were
submitted from the maternity units during 2022.

Total nulliparas (#2)

Definition   Number of deliveries (≥500g) to women who have never had a previous pregnancy resulting in a live birth or stillbirth.

	2021	2022
Rate *(% total women delivered)*	38.2%	39.7%
95% Confidence interval (CI)	37.8%-38.5%	39.3%-40.1%
Range	28.7%-44.6%	33.5%-43.9%
Total nulliparas (n)	22,683	21,224
Total women delivered (n)	59,443	53,495
Note:		

Note:

The rate of nulliparas has remained relatively steady in recent years, although it rose slightly in 2022.

More nulliparas attend large maternity hospitals than smaller units. This is an important metric for hospital future planning of healthcare provision.

Total multiparas (#3)
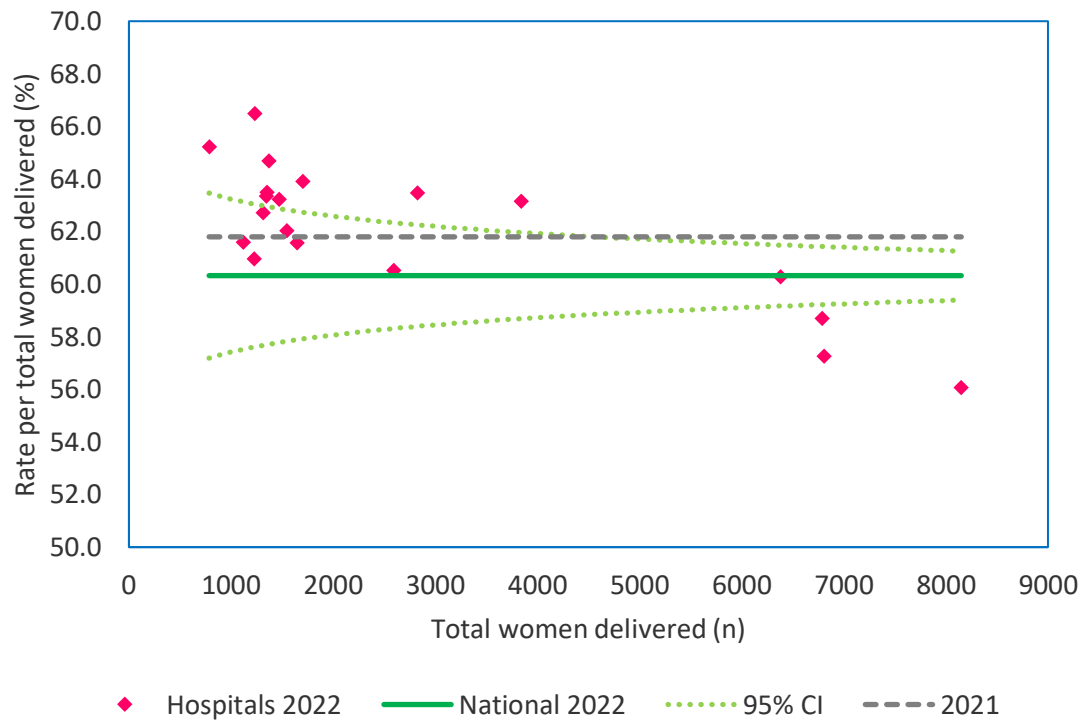
Definition   Number of deliveries (≥500g) to women who have had at least one previous pregnancy resulting in a live birth or stillbirth.

	2021	2022
Rate *(% total women delivered)*	61.8%	60.3%
95% CI	61.5%-62.2%	59.9%-60.7%
Range	55.4%-71.3%	56.1%-66.5%
Total multiparas (n)	36,760	32,271
Total women delivered (n)	59,443	53,495

Total multiple births (#6)

Definition   Number of multiple births, based on the number of women with multiple births (<u>not</u> the number of babies born) occurring during the current month. A multiple birth results when more than one baby is born from a single pregnancy.
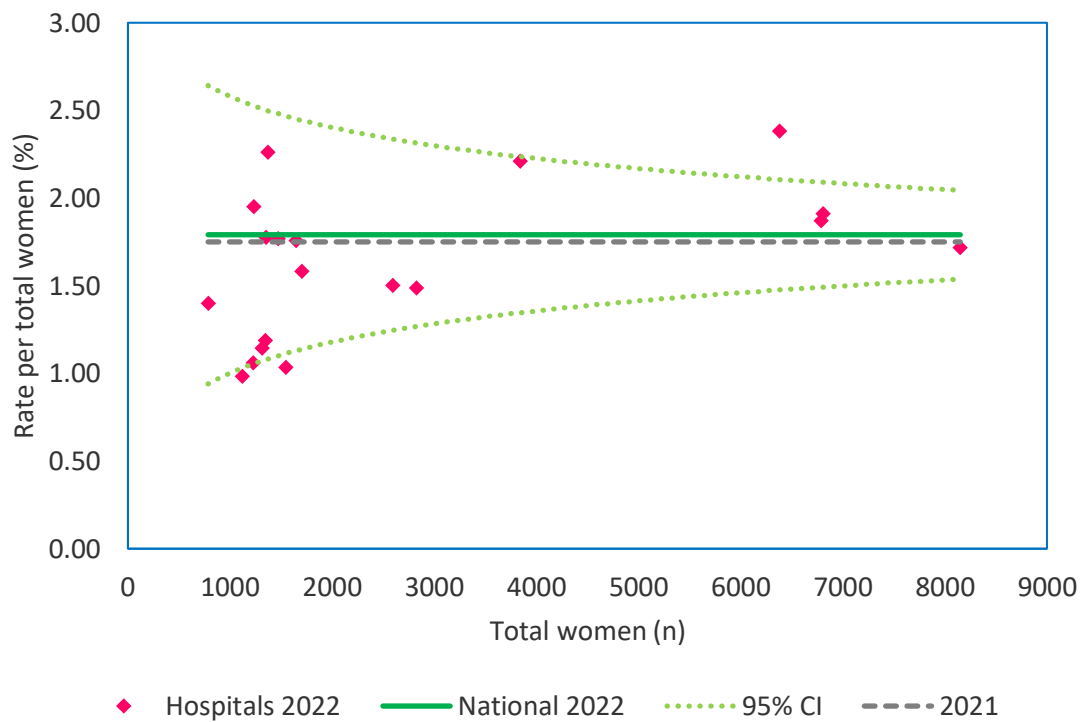
	2021	2022
Rate *(% total women delivered)*	1.8%	1.8%
95% CI	1.6%-1.9%	1.7%-1.9%
Range	0.8%-2.3%	1.0%-2.4%
Total multiple births (n)	1,040	958
Total women delivered (n)	59,443	53,495

Total maternal deaths (#7)

Definition   Number of deaths of women while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its mangement but not from accidental or incidental causes occurring during the current month.
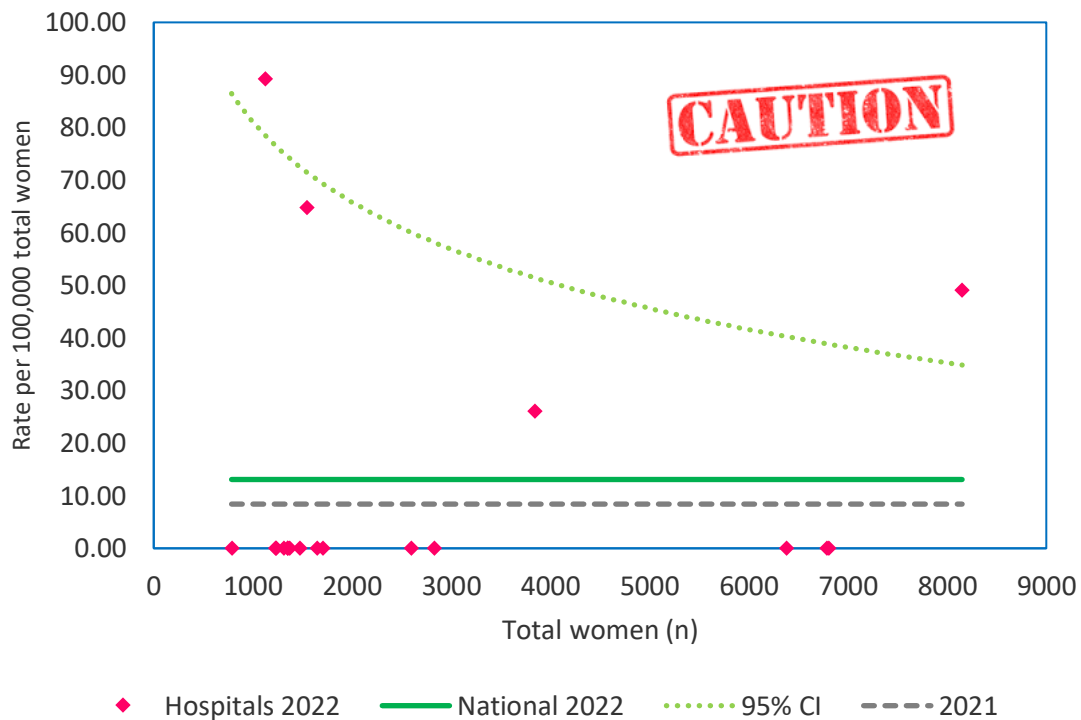
	2021	2022
Rate *(per 100,000 women delivered)*	8.41	13.09
95% CI	0.00-15.78	0.00-22.78
Range	0.00-51.15	0.00-89.29
Total maternal deaths (n)	5	7
Total women delivered (n)	59,443	53,495

Note:

Maternal deaths are reported to the Coroner Service gov.ie – Coroner Service (www.gov.ie). The Central Statistics Office (CSO) publishes on received data. It is accepted that these data show under-ascertainment, largely due to delayed registrations. The NWIHP is currently working with the CSO to examine the nature of data reporting and recording of these sensitive data.

For information about maternal death in Ireland, Maternal Death Enquiry (MDE) Ireland, established in 2009, conducts confidential reviews into maternal deaths and publishes anonymised aggregate triennial data, which includes late and co-incidental deaths.

Perinatal deaths (total) (#8)

Definition   Number of deaths, including stillbirths and early neonatal deaths from delivery to six completed days occurring during the current month. A stillbirth in this report refers to the death of a fetus weighing ≥500g, irrespective of duration of pregnancy; an early neonatal death refers to the death of a live born infant during the first seven days of life. This metric is not adjusted to exclude congenital anomalies.
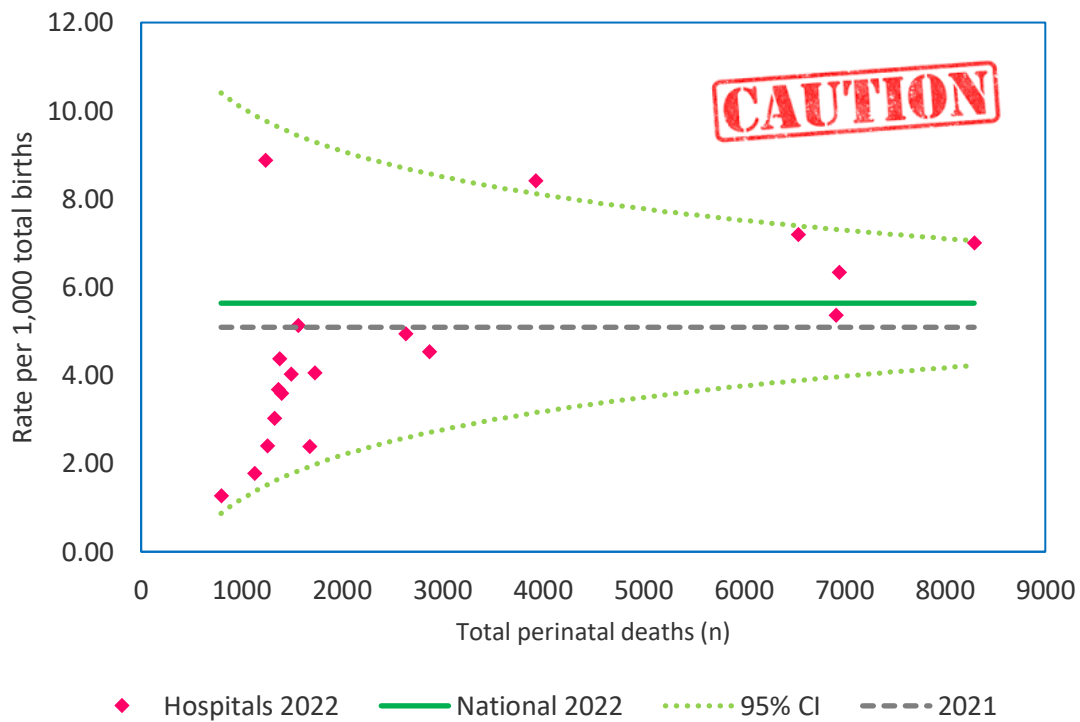
	2021	**2022**
Rate *(per 1,000 total births)*	5.09	5.64
95% CI	4.52-5.66	5.01-6.27
Range	2.74-7.89	1.26-8.87
Total perinatal deaths (n)	308	307
Total births (n)	60,492	54,467

Adjusted perinatal deaths (#9)

Definition   Number of perinatal deaths (stillbirths and early neonatal deaths) weighing 2.5kg or more without physiological or structural abnormalities that develop at or before birth and are present at the time of birth.
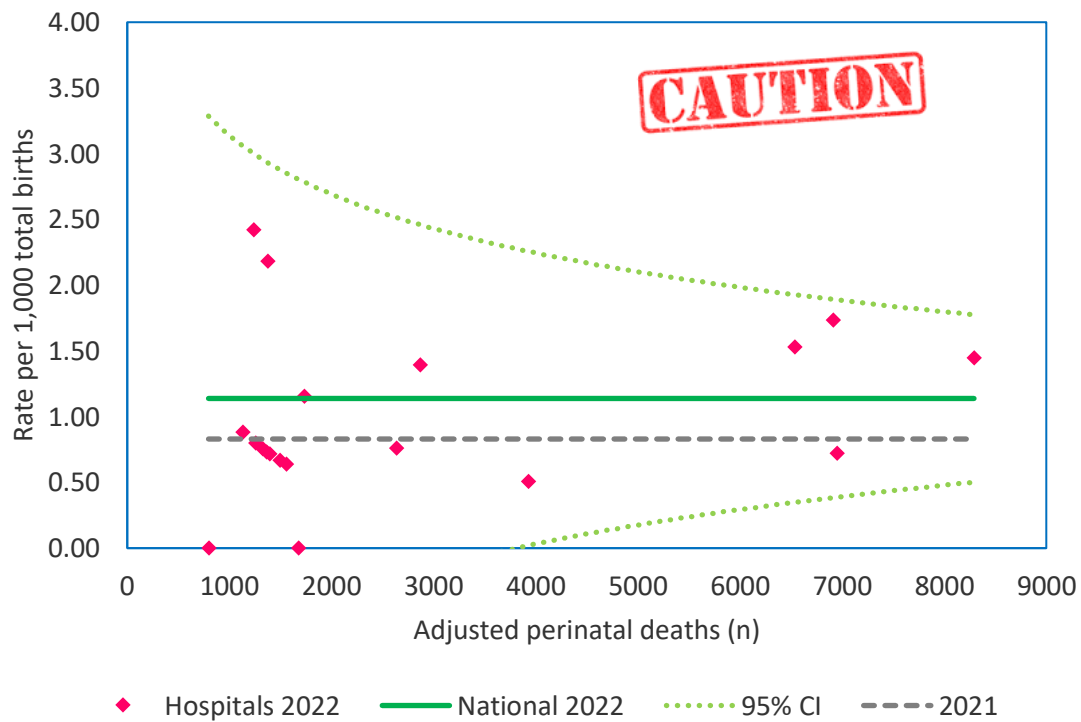
	2021	2022
Rate *(per 1,000 total births)*	0.83	1.14
95% CI	0.60-1.06	0.86-1.42
Range	0.00-2.34	0.00-2.42
Adjusted perinatal deaths (n)	50	62
Total births (n)	60,492	54,467

Hospital activities

EPAU first visits (#10)

Definition   Number of first visits to the Early Pregnancy Assessment Unit (EPAU) occurring during the current month (do not count the combined number of first and return visits).
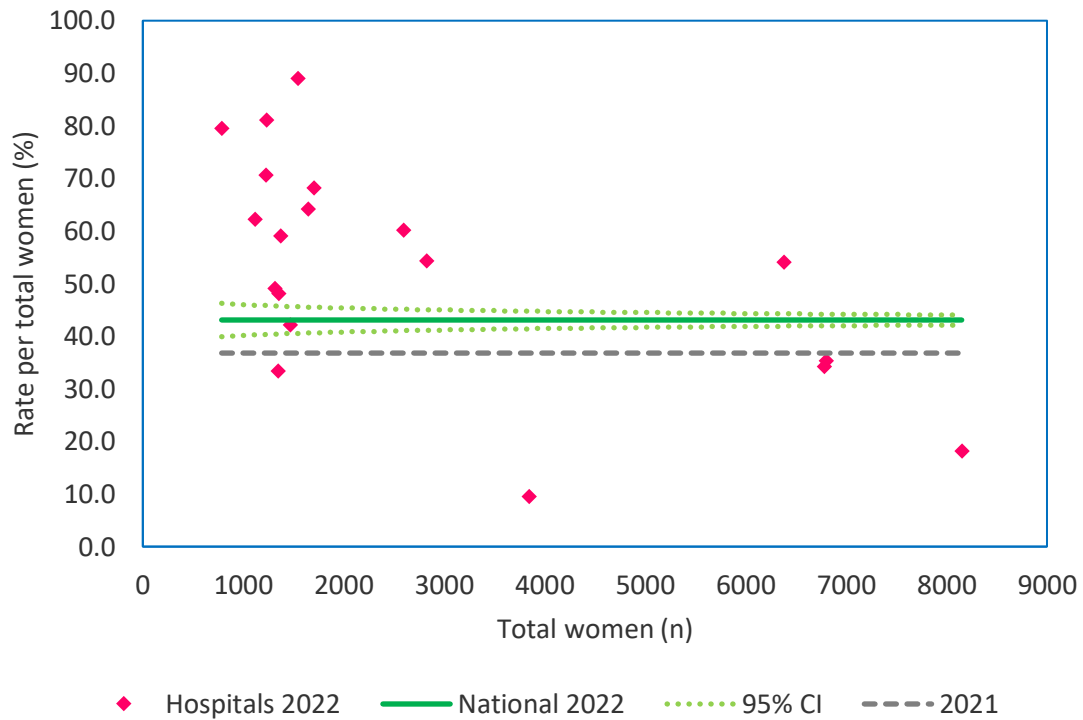
	2021	2022
Rate *(% of total women delivered)*	36.8%	43.1%
95% CI	36.4%-37.2%	42.7%-43.5%
Total EPAU first visits (n)	21,859	23,051
Total women delivered (n)	59,443	53,495
Note:		
Wide variation of the data indicates some units may be using the EPAU for a multiplicity of uses, including as a booking mechanism.		
This metric is currently under review.		

Maternal transfers (#7)

Definition Number of women transferred for critical care to Level 2 care and/or Level 3 care (e.g., Critical Care Unit, Intensive Care Unit, High Dependency Unit) either within the hospital or to another hospital/unit. Serious obstetric events that require women to be transferred should be reported by the hospital where she gave birth and not the hospital to which she was transferred and where she received treatment for the problem. There is no gestation parameter on this metric, i.e. it may include transfers from early pregnancy through post-natal readmissions.
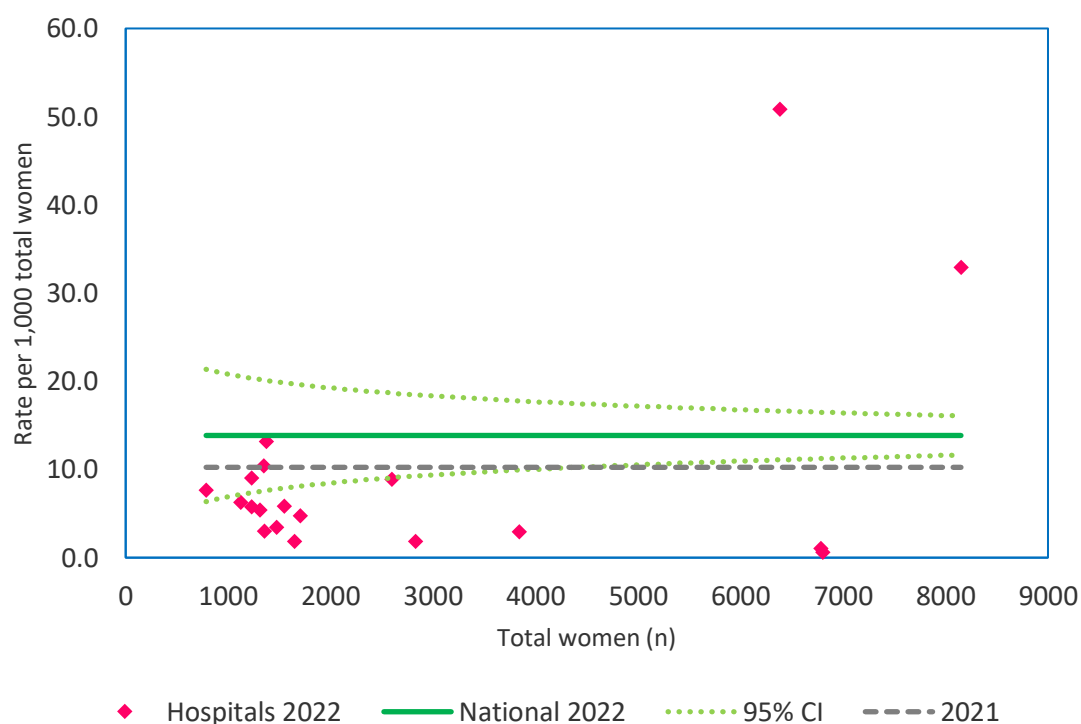
	2021*	**2022**
Rate *(per 1,000 women delivered)*	10.2	13.9%
95% CI	9.4-11.1	12.9%-14.8%
Total maternal transfers (n)	534	741
Total women delivered (n)	52,170	53,495

*Missing data from CUMH in 2021

Note:

Variation in the data indicates hospitals may be interpreting this metric in different ways.

The metric is currently under review.

In-utero transfers admitted (#14)

Definition   Number of women with a fetus in-utero admitted into the hospital after being transferred from another hospital *in the fetal interest*, during the current birth episode.
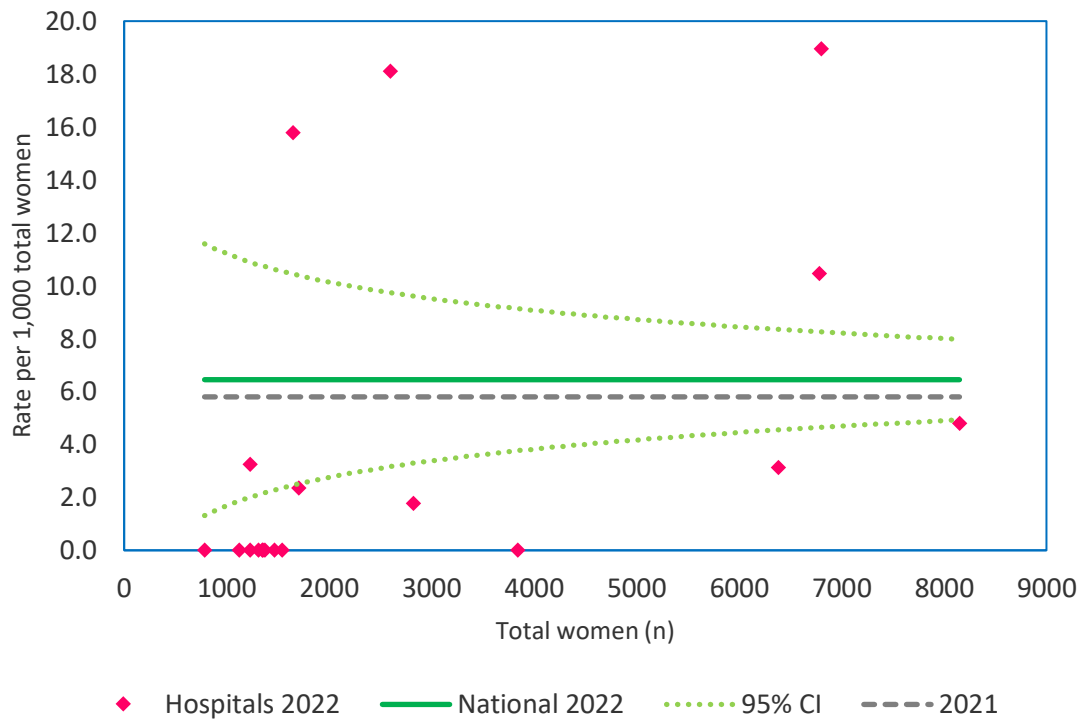
	2021	2022
Rate *(per 1,000 women delivered)*	5.8	6.5
95% CI	5.2-6.4	5.8-7.1
In-utero transfers admitted (n)	345	345
Total women delivered (n)	59,443	53,495

In-utero transfers sent out (#15)

Definition   Number of women with a fetus in-utero transferred out of the hospital to another hospital *in the fetal interest*, during the current birth episode (refers to transfers of inpatients only, not outpatients.)
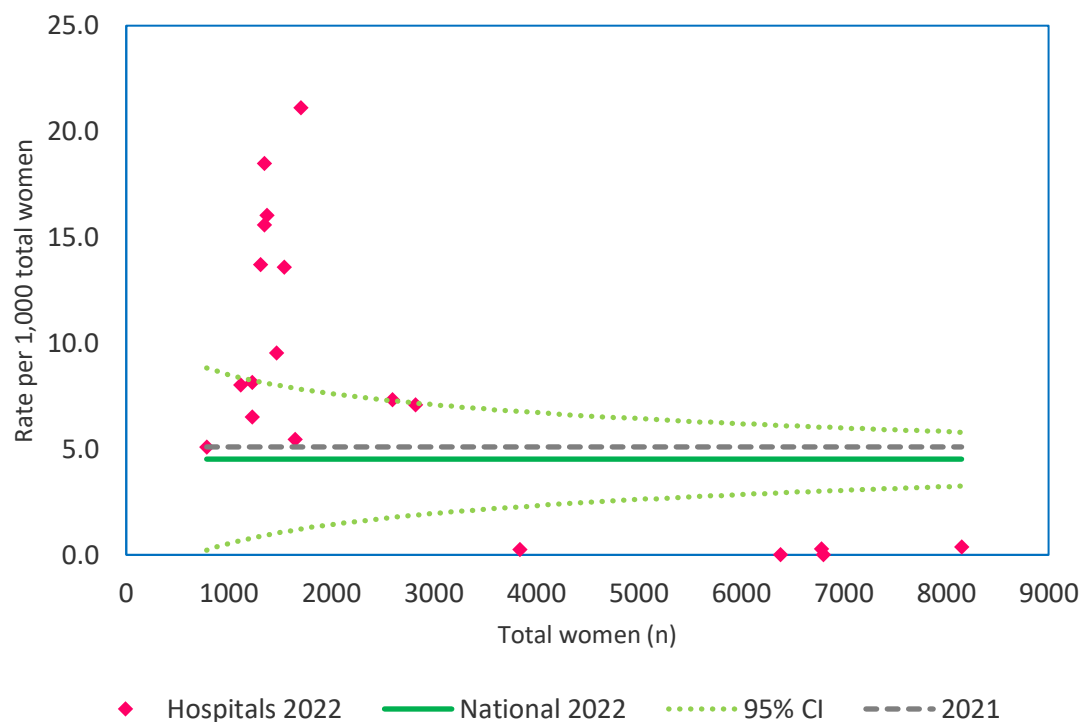
	2021	**2022**
Rate *(per 1,000 women delivered)*	5.1	4.5
95% CI	4.5-5.7	4.0-5.1
In-utero transfers sent out (n)	303	242
Total women delivered (n)	59,443	53,495

Neonatal care

Brachial plexus injury (#14)

Please note, this metric and the definition were changed during 2022/23. They are currently still under review. The NWIHP, in consultation with neonatal and physiotherapy staff at maternity hospitals, will produce an amended definition in 2024 to improve the standardised approach to data collection nationally.

Amended definition (2022/23):
Number of babies diagnosed with Brachial Plexus Injury two weeks after birth. The diagnosis is a neurological injury to the brachial plexus roots involving some or all of the cervical nerves C5, C6, C7, C8, and T1. These are the nerves that supply the muscles to the upper limb and hand. The commonest injury involves the C5, C6, C7 roots leading to absent shoulder flexion, elbow flexion, forearm supination, wrist extension, and fingers extension.
Please also note the following:
1. The condition should be initially called 'reduced movement of the upper limb' until the diagnosis is confirmed.
2. Note whether or not there had been shoulder dystocia.
3. X-rays should be performed to exclude a fracture of the clavicle or humerus.
4. Any infant with 'reduced upper limb movement' should be reviewed by a paediatric registrar/consultant and a physiotherapist (if available).
5. There should be a short interval of two weeks before confirming the diagnosis of Brachial Plexus Injury. This period of time will allow any transient problem to resolve.

	2021	2022
Rate *(per 1,000 total births)*	0.84	N/A
95% CI	0.61-1.07	N/A
Total BPI (n)	51	N/A
Total births (n)	60,492	54,467

Neonatal encephalopathy (#15)

Definition   All infants with ≥35 weeks' gestation who, during the first week of life, have seizures alone and/or signs of neonatal encephalopathy, which are defined as clinical findings in three or more of the following domains: Level of consciousness, spontaneous activity when awake or aroused, posture, tone, primitive reflexes, and automonic system.   Note, Hypoxic Ischaemic Encephalopathy (HIE) is a subset of NE and is the most common cause of NE; not all encephalopathies have a HIE.
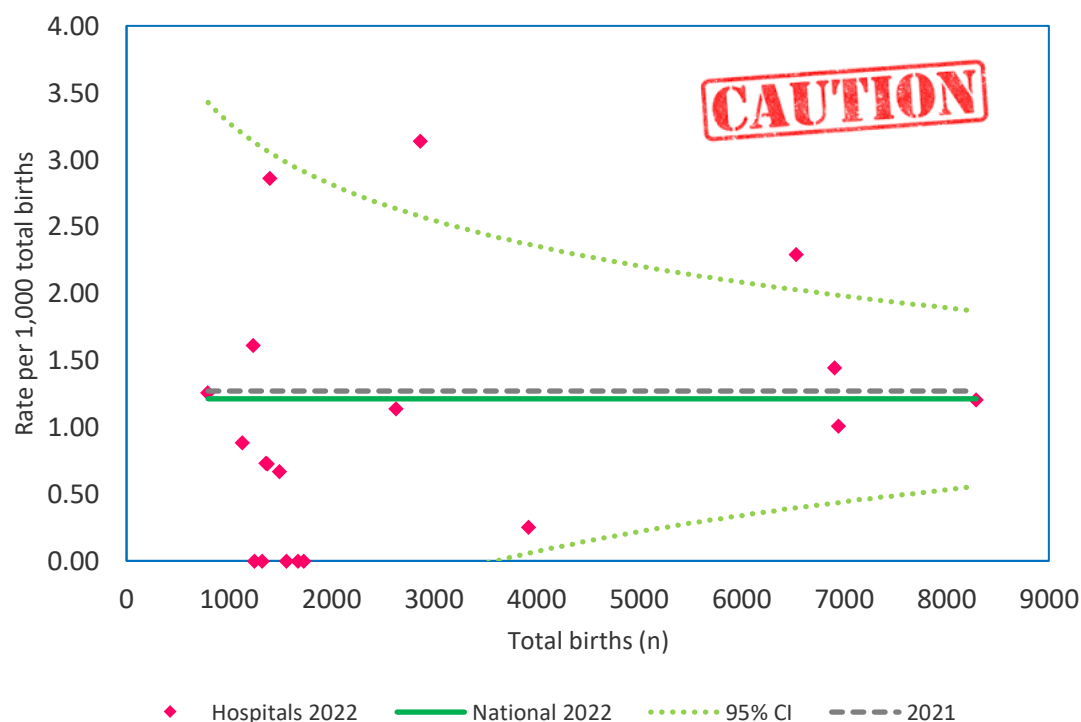
	2021	2022
Rate *(per 1,000 total births)*	1.27	1.21
95% CI	0.99-1.56	0.92-1.50
Total NE (n)	77	66
Total births (n)	60,492	54,467

Whole body neonatal cooling (Inborn) (#16)

Definition   WBNC refers to therapeutic 'active' (not passive) cooling administered during the current birth episode as a treatment for Hypoxic Ischemic Encephalopathy (HIE). WBNC is conducted at the four large maternity hospitals in Dublin and Cork. Babies may be transferred from smaller maternity units around the country via the National Neonatal Transport Programme, which operates 24 hours a day, seven days a week.
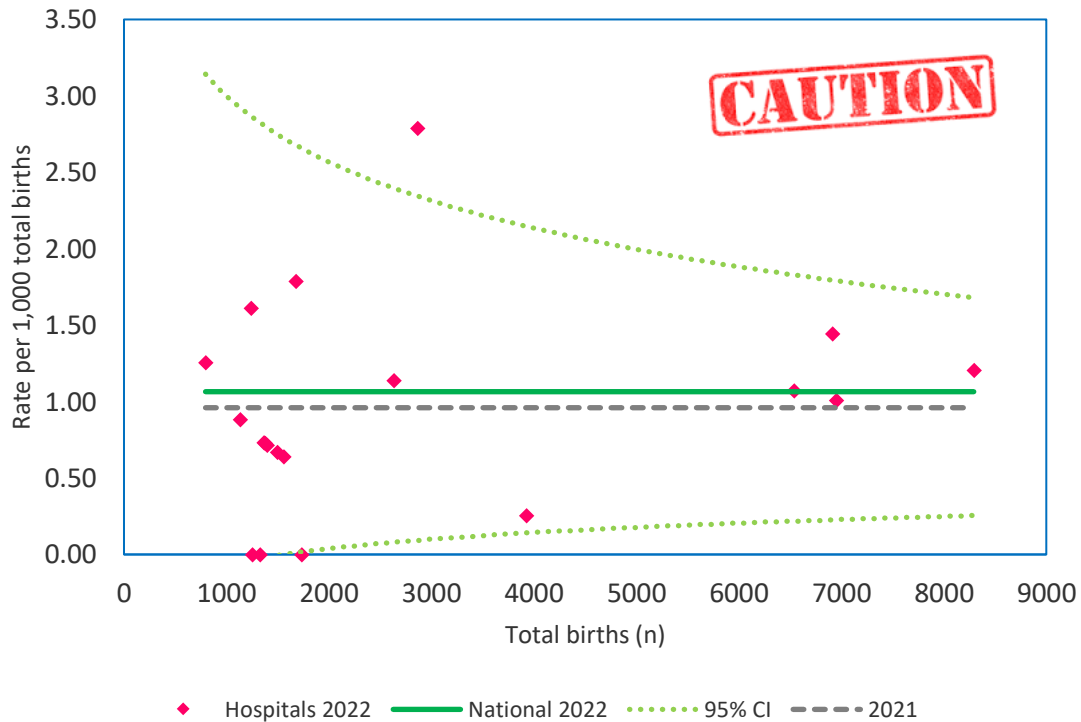
	2021	2022
Rate *(per 1,000 total births)*	0.96	1.06
95% CI	0.71-1.21	0.79-1.34
Total WBNC of inborn babies (n)	58	58
Total births (n)	60,492	54,467

Breastfeeding

Breastfeeding initiated (#17)

Definition   Number of babies breastfed at first feed following birth, i.e., direct from the breast or expressed. Rate is calculated per total live births.
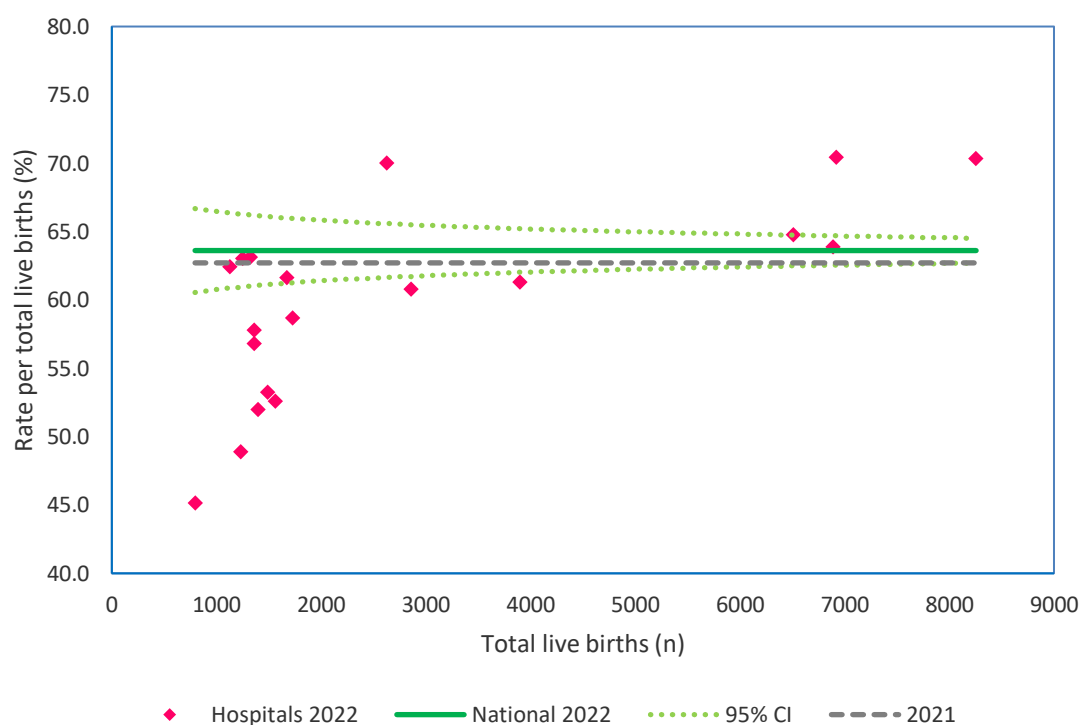
	2021*	**2022**
Rate *(% total live births)*	62.7%	63.6%
95% CI	62.3%-63.1%	63.2%-64.0%
Range	46.3%-71.7%	45.2%-70.5%
Total BF initiated (n)	36,925	34,505
Total live births (n)	58,886	54,243
Note:		
The large range in the data for breastfeeding initiated indicate differences in the methods of data collection. The metric is currently under review.		

Missing/incomplete data in 2021 from Cavan General Hospital (total live births=1,379)

Any Breastfeeding (BF) since birth/on discharge

Derived variable based on numbers of babies exclusively and/or non-exclusively breastfed since birth/on discharge.
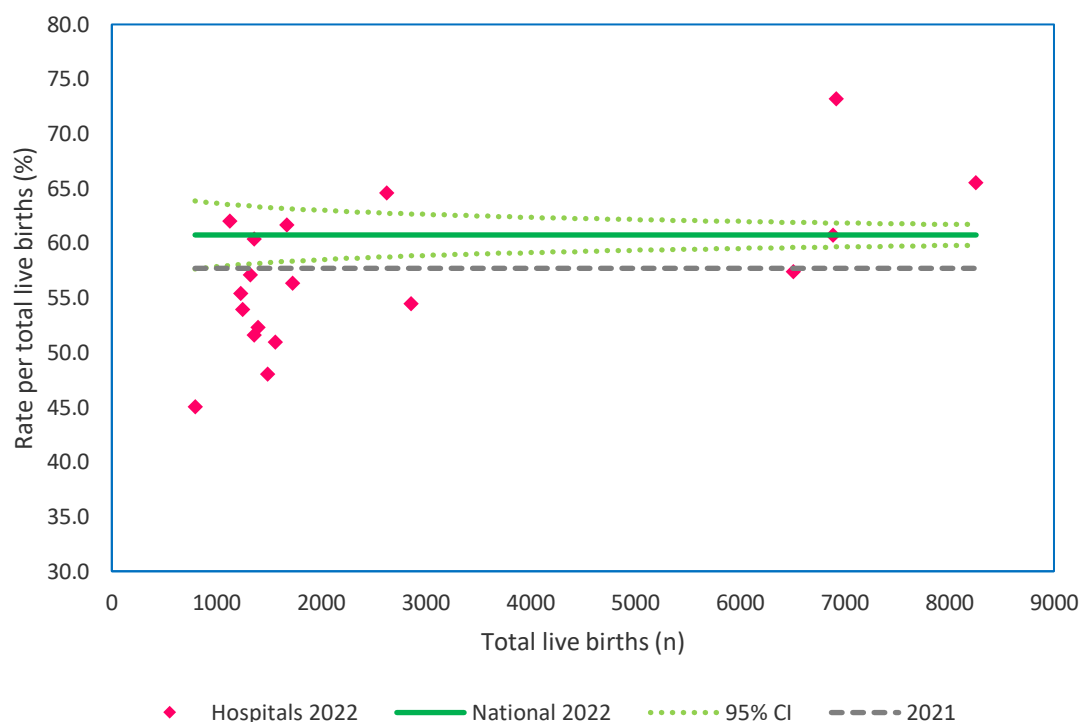
	2021*	**2022****
Rate *(% total live births)*	57.6%	60.8%
95% CI	57.2%-58.1%	60.3%-61.2%
Range	46.8%-65.9%	45.05-73.2%
Any BF (n)	59,443	30,584
Total live births (n)	51,069	50,344

Note: Other breastfeeding metrics in 2022

Exclusive BF=37.6% (95% CI 37.1%-38.0%), Range=24.0%-56.4%

Non-exclusive BF=23.2% (95% CI 5.3%-31.7%), Range=5.3%-31.7%

The large range in the data for exclusive and non-exclusive breastfeeding indicate differences in the methods of data collection and data sources. These metrics and the definitions are currently under review.

Missing/incomplete data in 2021 from NMH (total live births=7,817) and Cavan General Hospital (total live births=1,379)

**Missing data in 2022 from UMHL (total live births=3,899)*

Laboratory metrics

Maternal bacteraemia (#20)

Definition   Diagnosis of bacteraemia is based on laboratory definition only and does not include clinical indications. Diagnosis of bacteraemia is based on ONE positive blood culture for a recognised bacterial pathogen (e.g. *Staphylococcus aureus, Escherichia coli*). Cases of blood culture contamination (e.g. skin contaminants) should be excluded (ECDC 2012: 47). Cases should be defined as 'maternal' if the positive blood culture is taken at any time during pregnancy or within 42 days of the end of pregnancy.
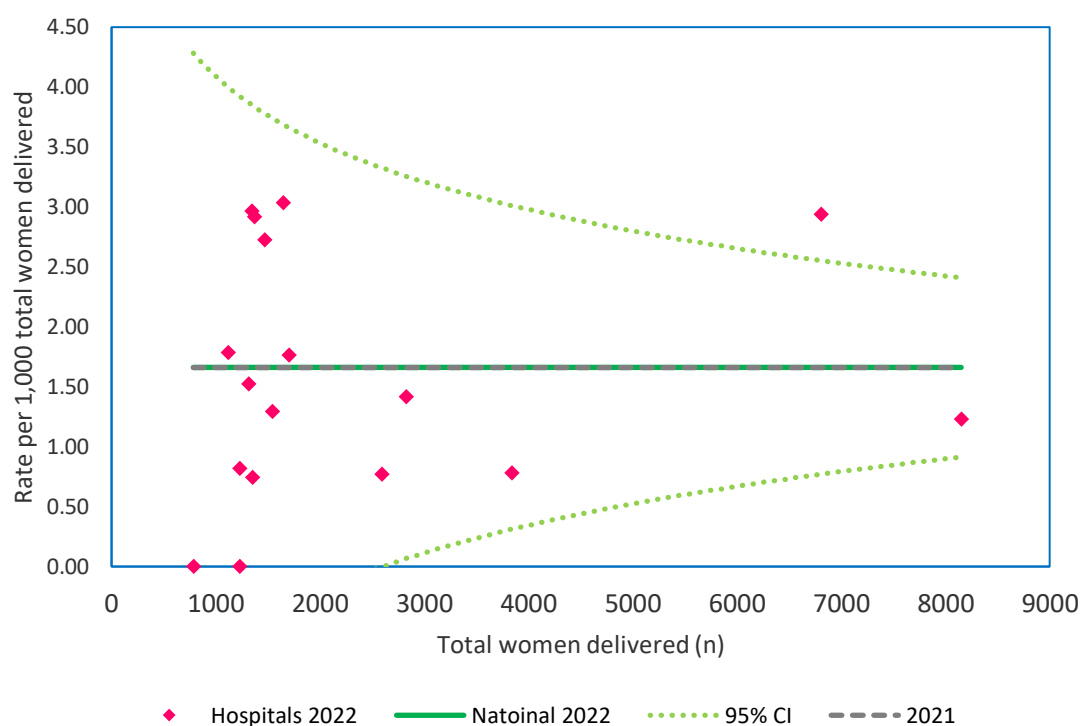
	2021*	2022*
Rate *(per 1,000 total women delivered)*	1.7	1.7
95% CI	1.3-2.0	1.3-2.1
Total maternal bacteraemia (n)	74	67
Total women delivered (n)	44,576	40,327
Note:		
This metric is currently under review.		

*Missing data in 2021 and 2022 from CUMH and Coombe Maternity Hospital

Neonatal bacteraemia (early-onset) (#21)

Definition   Diagnosis of neonatal bacteraemia refers to early-onset clinically significant bacteraemia in neonates (<72 hours of age) based on a laboratory definition of bacteraemia and does not include clinical indications. Diagnosis of bacteraemia is based on ONE positive blood culture for a recognised bacterial pathogen (e.g. *Staphylococcus aureus, Escherichia coli*). Cases of blood culture contamination (e.g. skin contaminants) should be excluded (ECDC 2012: 47).
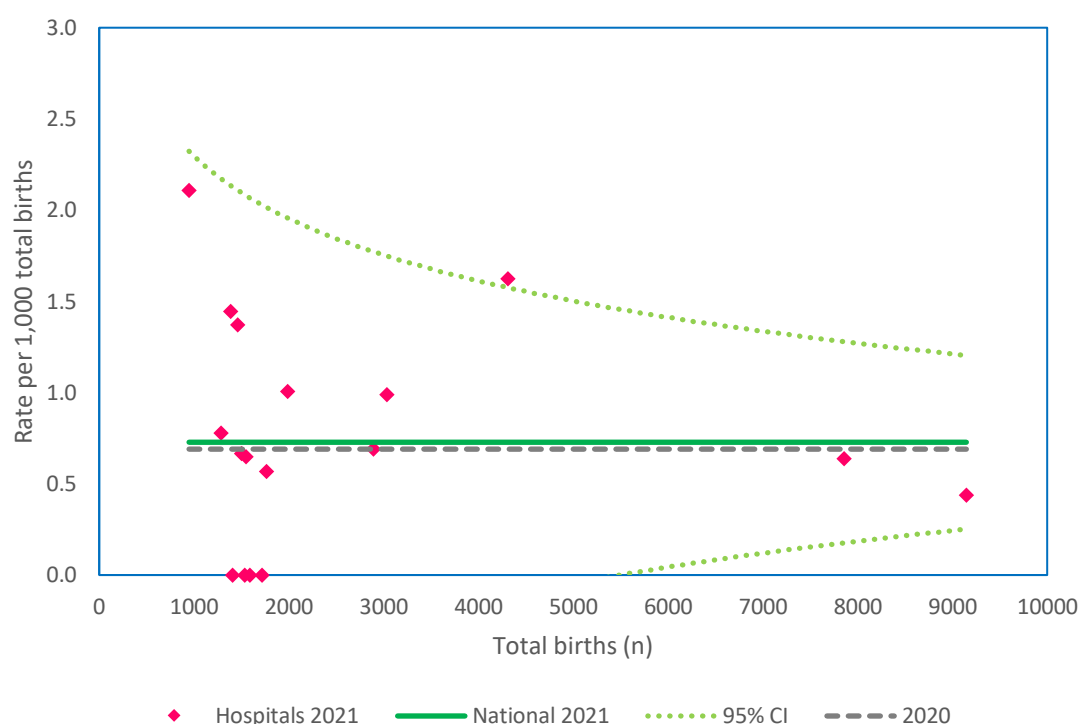
	2021*	2022*
Rate *(per 1,000 total births)*	0.7	0.9
95% CI	0.5-1.0	0.6-1.2
Total neonatal bacteraemia (n)	33	37
Total births (n)	45,338	41,014
* Missing data in 2021 and 2022 from CUMH and Coombe Maternity Hospital		
Note:		
This metric is currently under review.		

Obstetric blood transfusions (#22)

Definition   Number of obstetric patients who receive one or more units of blood components/products (including red cells, plasma, platelets, etc.), not including clotting factors or recombinant products. Report obstetric patients only, exclude gynaecology patients. Obstetric is defined as from the time of diagnosis of pregnancy (based on a positive pregnancy test).
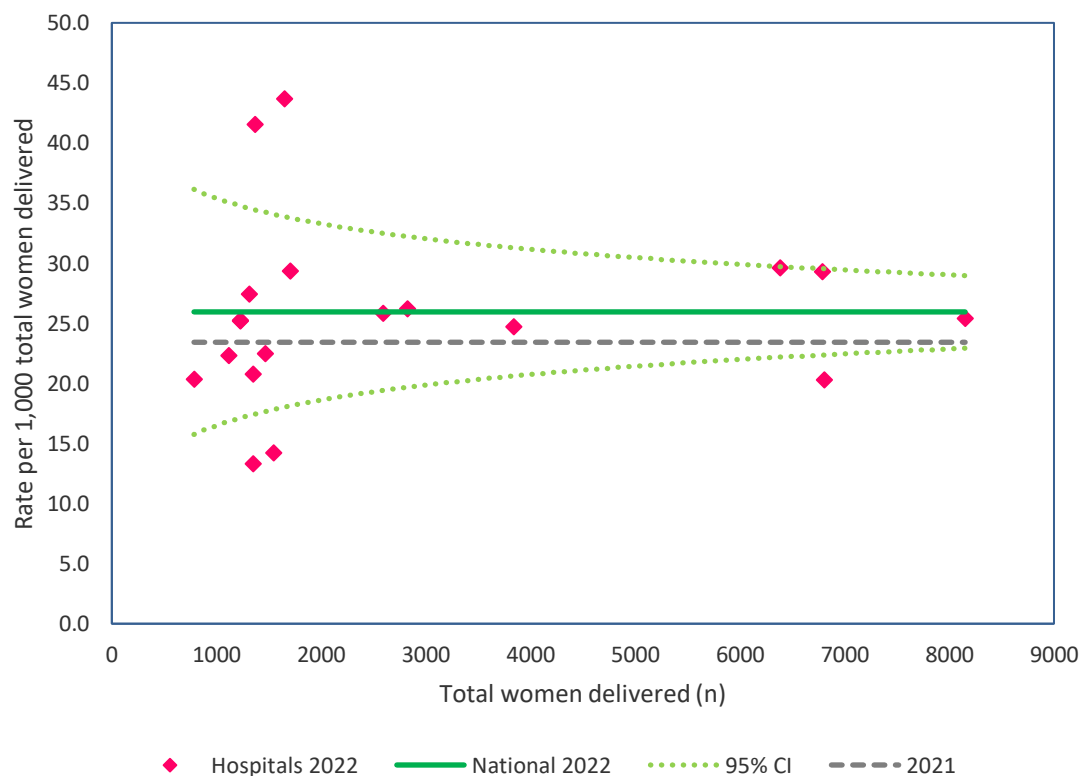
	2021	2022
Rate *(per 1,000 total women delivered)*	23.4	26.0
95% CI	22.2-24.6	24.6-27.3
Total OBT (n)	1,392	1,388
Total women delivered (n)	59,443	53,495

Obstetric risks and complications

Maternal sepsis (#24)

Definition Number of women diagnosed with maternal sepsis. According to the WHO (2017) definition, maternal sepsis is a life-threatening condition defined as organ dysfunction resulting from infection during pregnancy, childbirth, post-abortion, or postpartum period, i.e., within 42 days of termination of pregnancy. If sepsis develops during pregnancy, while or after giving birth, or after an abortion, it is called maternal sepsis.
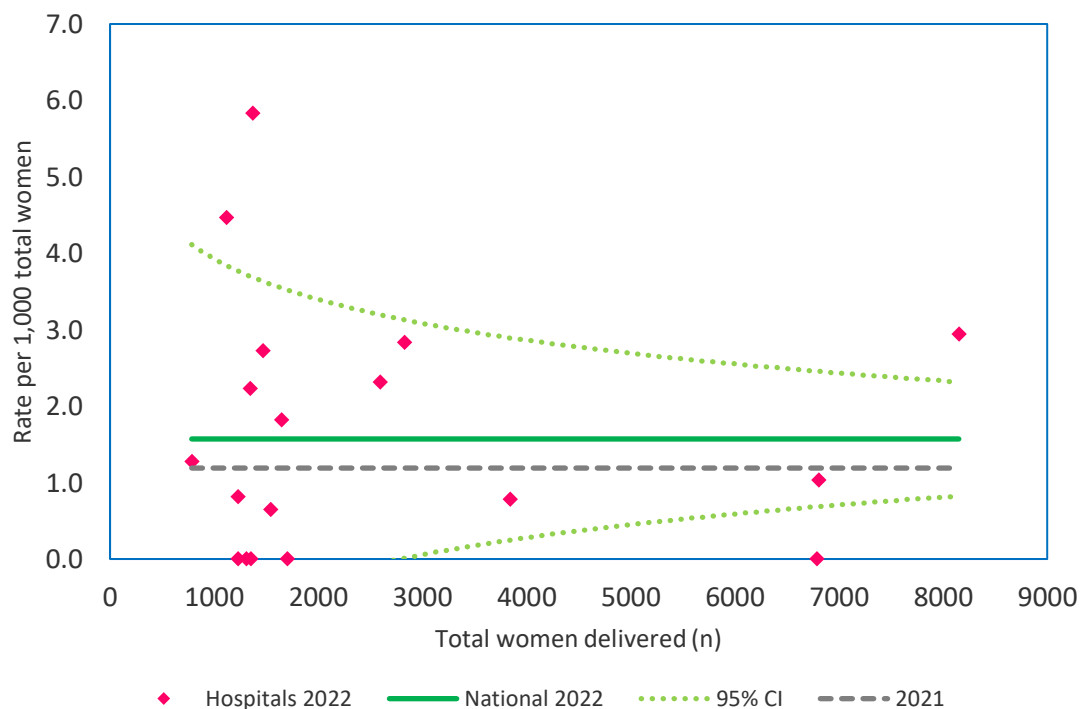
	2021*	**2022***
Rate *(per 1,000 women delivered)*	1.19	1.57
95% CI	0.89-1.48	1.21-1.93
Range	0.00-4.12	0.00-5.84
Maternal sepsis (n)	62	74
Total women delivered (n)	52,170	47,113

Missing data from CUMH in 2021 and 2022

Ectopic pregnancy (#24)

Definition Number of women diagnosed during the current month with an ectopic pregnancy, including abdominal pregnancy, tubal pregnancy, ovarian pregnancy, and other/unspecified pregnancy. Do not source data on ectopic pregnancies from the HIPE.
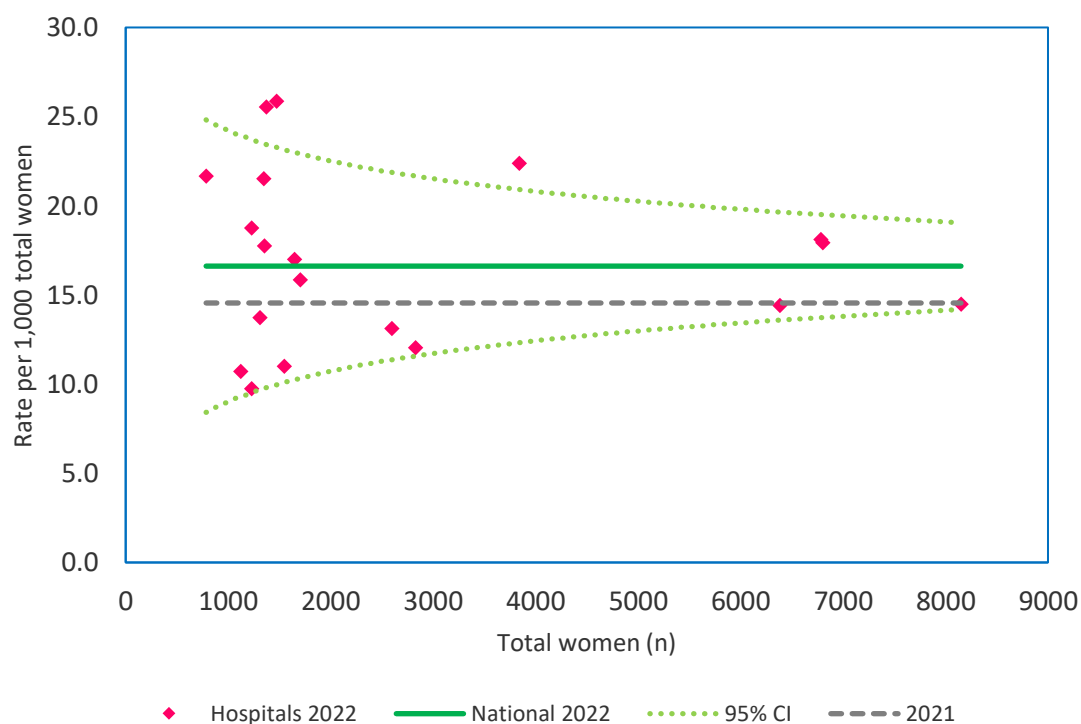
	2021	**2022**
Rate *(per 1,000 women delivered)*	14.6	16.6
95% CI	13.6-15.5	15.5-17.7
Range	8.0-24.8	9.8-25.9
Total ectopic pregnancies (n)	865	889
Total women delivered (n)	59,443	53,495

Eclampsia (#25)

Definition   Number of women diagnosed during the current month with eclampsia during any antenatal hospital event or at delivery, including eclampsia in pregnancy, in labour, in the puerperium, and eclampsia unspecified as to time period. The metric does not include severe pre-eclampsia.
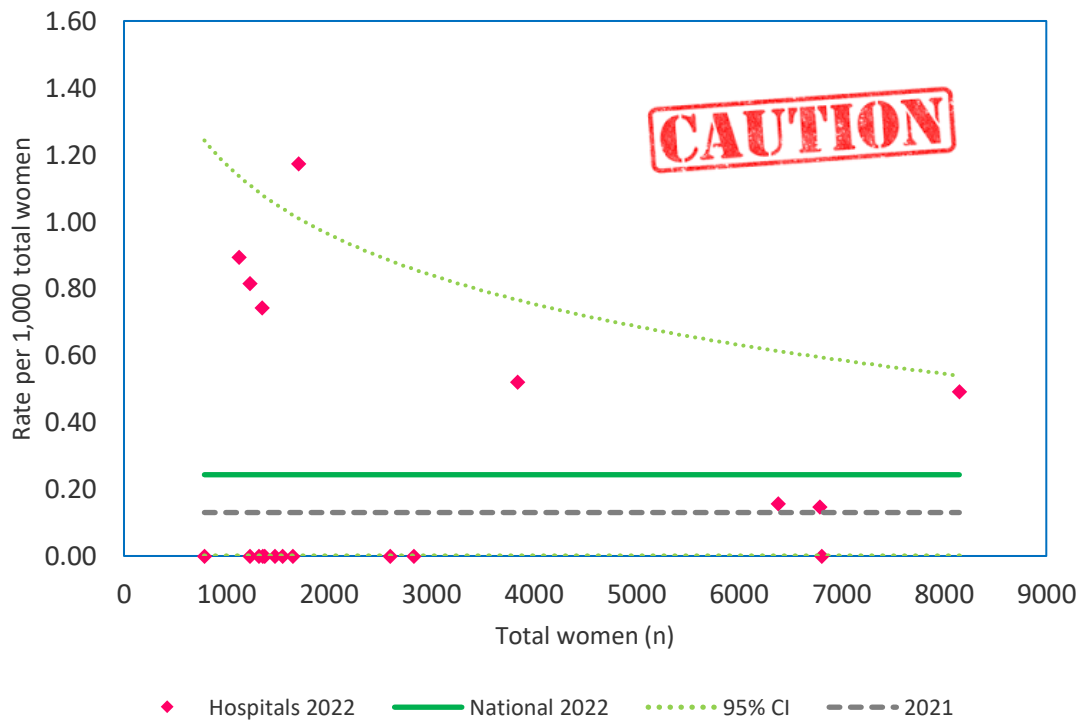
	2021	2022
Rates *(per 1,000 women delivered)*	0.13	0.24
95% CI	0.04-0.23	0.11-0.38
Total eclampsia (n)	8	13
Total women delivered (n)	59,443	53,495

Note:

Eclampsia has become rare due treatment of pre-eclampsia with antihypertensives, magnesium sulphate and expedited birth.

Uterine rupture (#26)

Definition   Number of women diagnosed during the current month with rupture of uterus before onset of labour or during labour, including cases that may not be diagnosed until after delivery. The IMIS definition of uterine rupture refers to complete rupture.
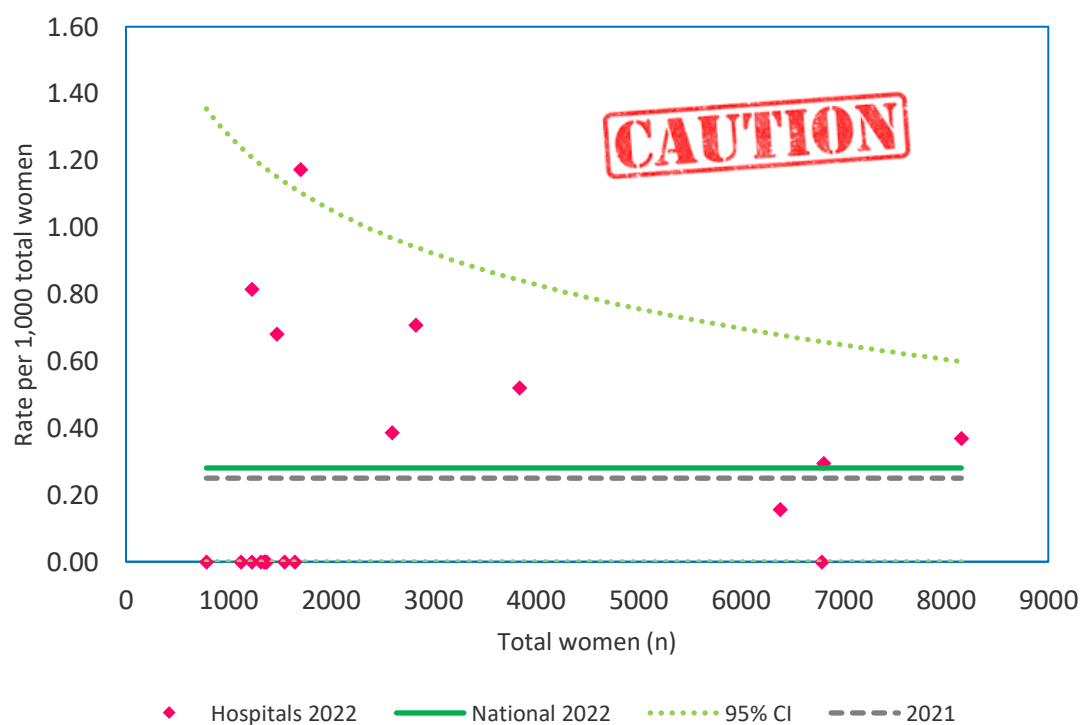
	2021	2022
Rates *(per 1,000 women delivered)*	0.25	0.28
95% CI	0.12-0.38	0.14-0.42
Total uterine rupture (n)	15	15
Total women delivered (n)	59,443	53,495

Peripartum hysterectomy (#27)

Definition   Number of hysterectomy procedures completed during the current month, usually following a caesarean section, including hysterectomies performed during pregnancy and/or procedures within seven completed days after delivery.
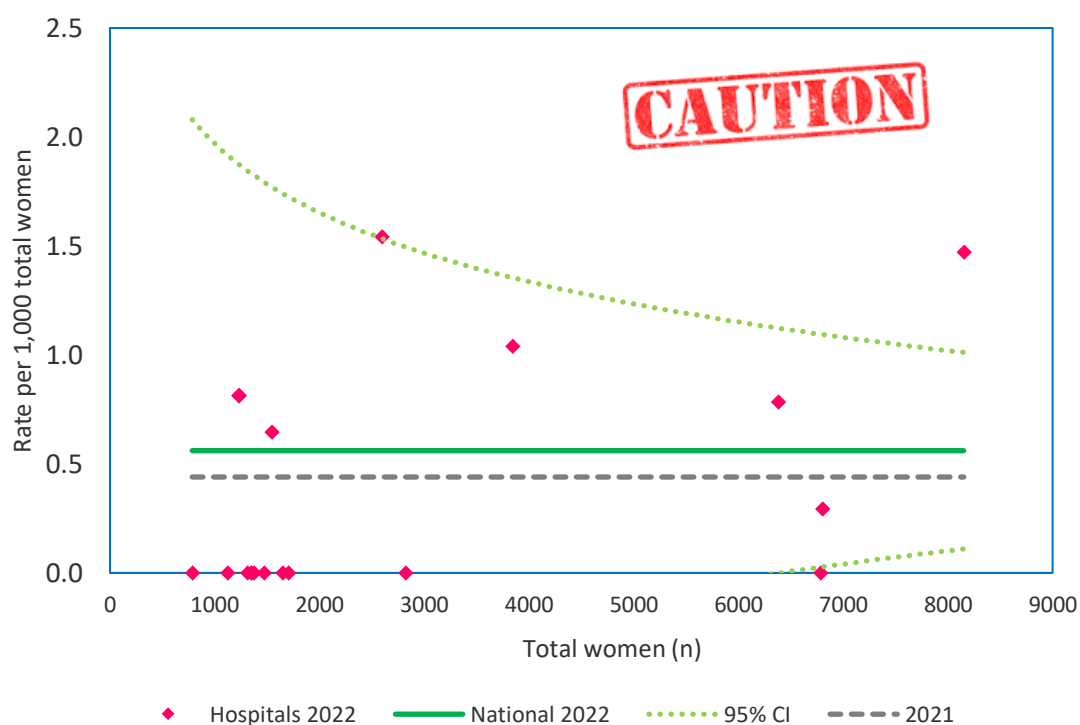
	2021	**2022**
Rates *(per 1,000 women delivered)*	0.44	0.56
95% CI	0.27-0.61	0.36-.076
Total peripartum hysterectomy (n)	26	30
Total women delivered (n)	59,443	53,495

Pulmonary embolism (#28)

Definition   Number of women diagnosed during the current month with obstetric pulmonary emboli in pregnancy and/or the puerperium and excludes embolism complicating abortion or ectopic or molar pregnancy.
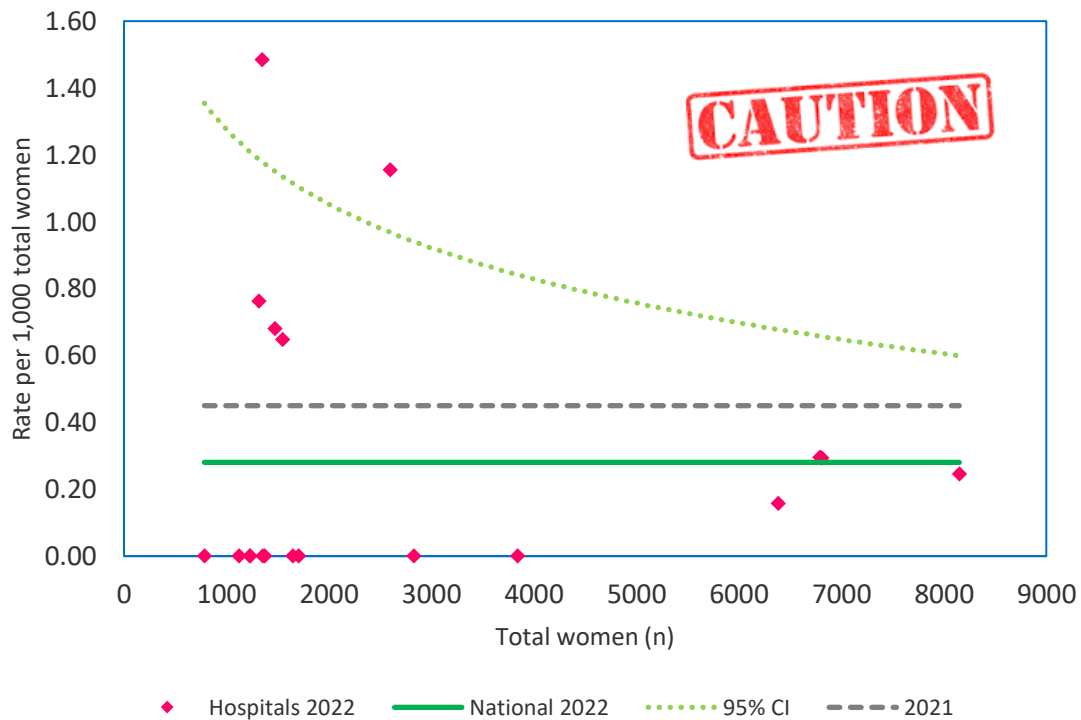
	2021	2022
Rates *(per 1,000 women delivered)*	0.45	0.28
95% CI	0.28-0.63	0.14-0.42
Total pulmonary embolism (n)	27	15
Total women delivered (n)	59,443	53,495

Perineal tears (#29)

Definition   Number of women with third-degree and/or fourth-degree perineal lacerations during the current month, including tears in the vaginal tissue, perineal skin, and perineal muscles that extend into the anal sphincter and/or go through the anal sphincter and the tissue underneath it.
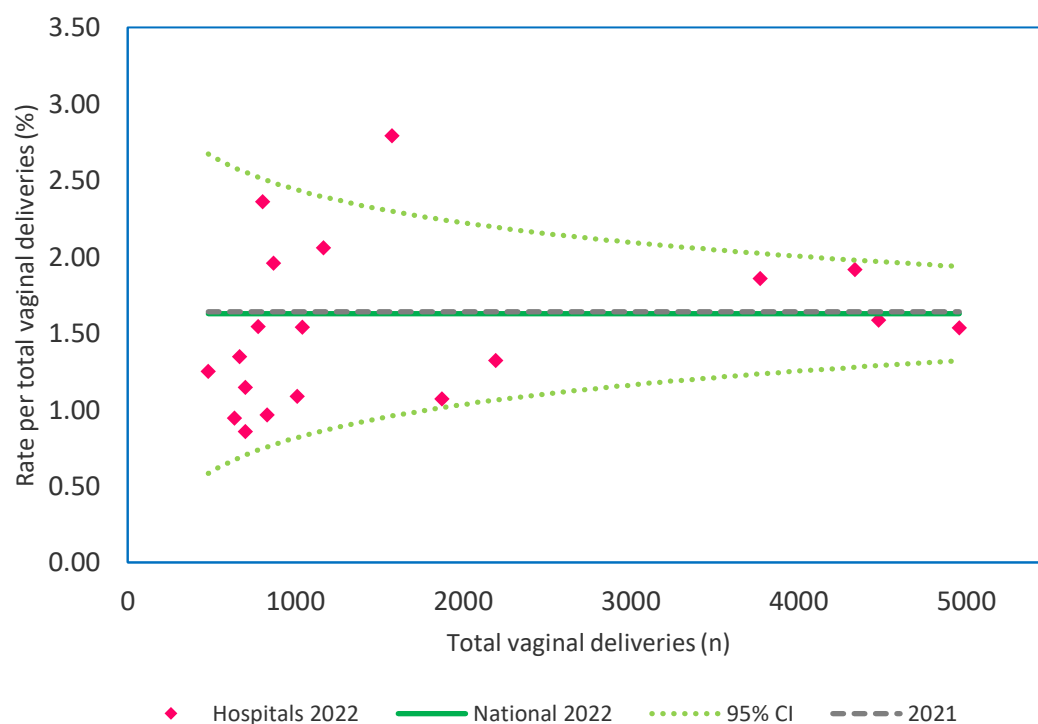
	2021*	2022
Rates *(% total vaginal deliveries)*	1.6%	1.6%
95% CI	1.5%-1.8%	1.5%-1.8%
Range	0.5%-2.4%	0.9%-2.8%
Total perineal tears (n)	586	535
Total vaginal deliveries (n)	35,772	32,875

Missing/incomplete data from OLOL Drogheda in 2021

PPH Vaginal delivery (#30)

Definition   Number of women with one episode of blood loss of ≥1,000mL
following a vaginal delivery and prior to discharge from the labour ward.
Do not count PPH after discharge from labour ward. Discount/exclude
liquor from the measurement of blood loss. PPH is the most common
form of major obstetric haemorrhage.
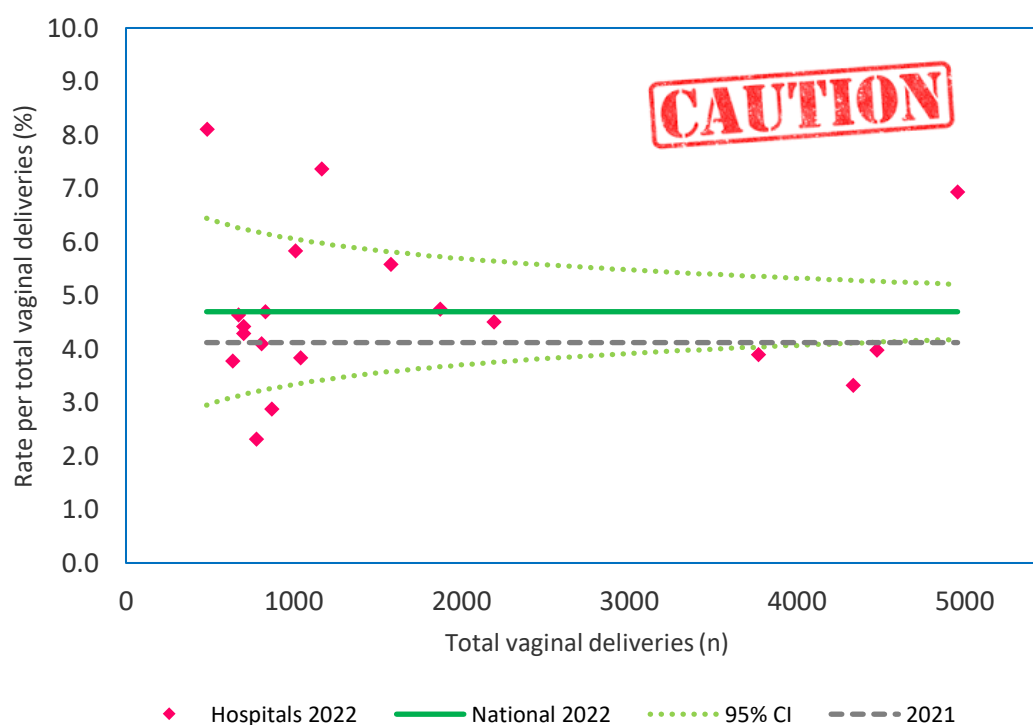
	2021*	2022
Rates *(% total vaginal deliveries)*	4.1%	4.7%
95% CI	3.9%-4.3%	4.55-4.9%
Range	1.2%-8.6%	2.3%-8.1%
PPH per total vaginal deliveries (n)	1,475	1,544
Total vaginal deliveries (n)	35,772	32,875
Missing/incomplete data from OLOL Drogheda in 2021		

PPH Caesarean section (#31)

Definition   Number of women with one episode of blood loss of ≥1,000mL following Caesarean section delivery and prior to discharge from the labour ward. Do not count PPH following discharge from theatre. Discount/exclude liquor from the measurement of blood loss. PPH is the most common form of major obstetric haemorrhage.
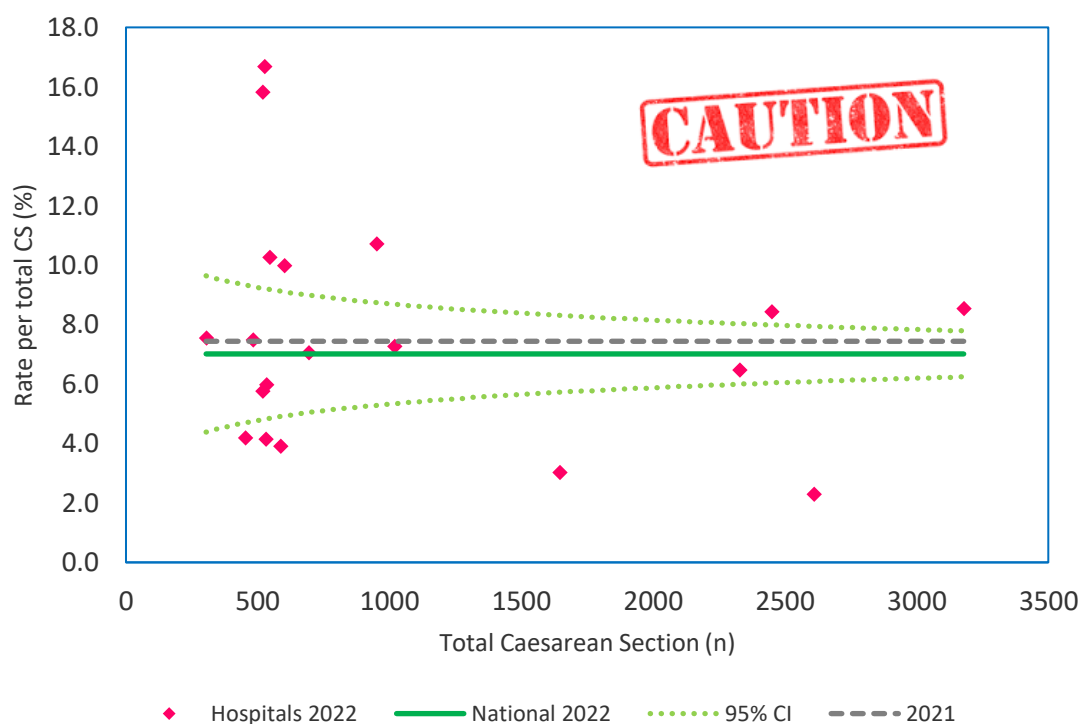
	2021*	2022
Rates *(% total CS)*	7.4%	7.0%
95% CI	7.1%-7.8%	6.7%-7.4%
Range	3.1%-17.9%	2.3%-16.7%
PPH per total CS *(n)*	1,539	1,436
Total CS *(n)*	20,690	20,474

Missing/incomplete data from OLOL Drogheda in 2021

Miscarriage misdiagnosis (#32)

Definition Number of women diagnosed during the current month with a spontaneous miscarriage when a subsequent ultrasound confirms an ongoing pregnancy.

No cases in 2022

	2021*	2022
Rates *(per 1,000 women delivered)*	0.05	0.00
95% CI	0.00-0.11	--
Total miscarriage misdiagnosis (n)	3	0
Total women delivered (n)	56,462	53,495
Missing/incomplete data from OLOL Drogheda in 2021		

Retained swabs (#33)

Definition Number of women during the current month who have a swab retained unintentionally in the vagina after a vaginal delivery.
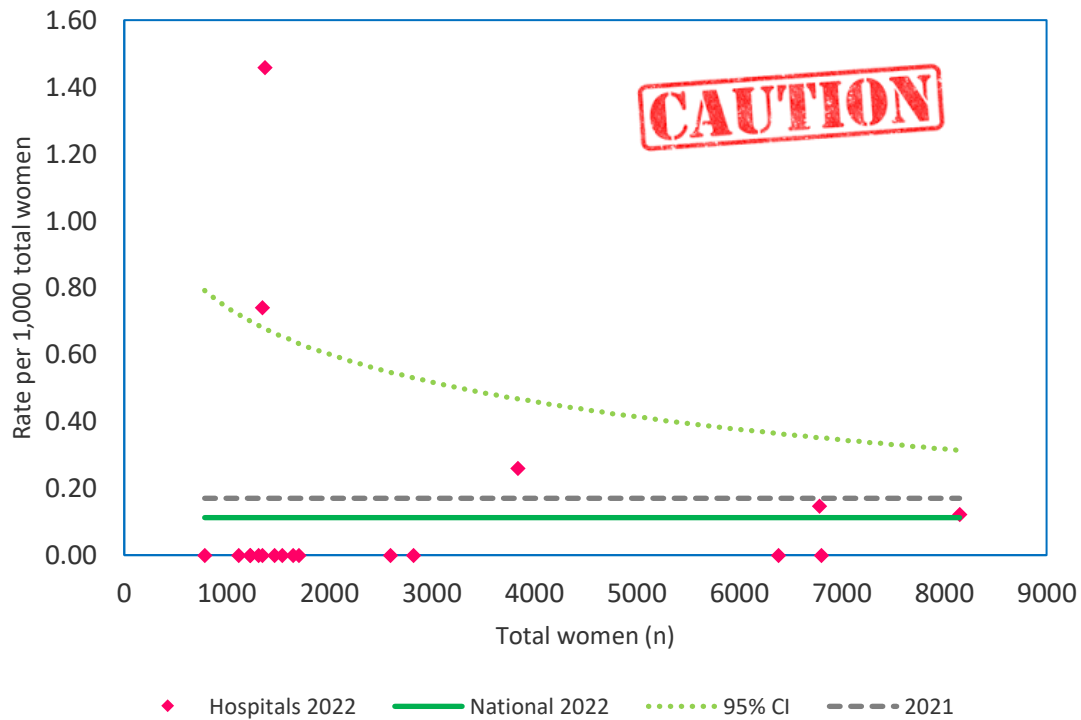
	2021	2022
Rates *(per 1,000 women delivered)*	0.17	0.11
95% CI	0.06-0.27	0.02-0.20
Total retained swabs (n)	10	6
Total women delivered (n)	59,443	53,495

Episiotomy (#34)

Definition   Number of women undergoing episiotomy procedures. Episiotomy is a
                  surgical cut made at the opening of the vagina during childbirth, to aid a
                  difficult delivery and prevent rupture of tissues. The procedure may be
                  performed by a midwife or obstetrician, usually during second stage of
                  labour. Usually performed under local anaesthetic and requires
                  suturing after delivery.
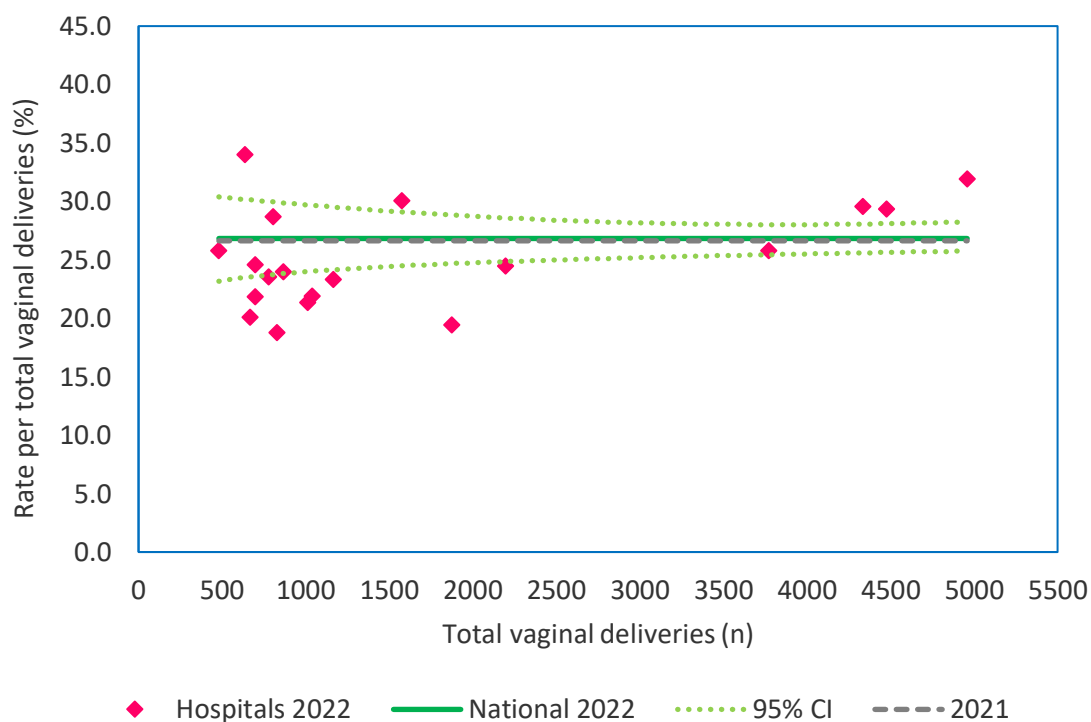
	2021*	2022
Rates *(per total vaginal deliveries (%)*	26.6%	26.8%
95% CI	26.2%-27.1%	26.4%-27.3%
Total episiotomies (n)	9,304	8,820
Total vaginal deliveries (n)	34,935	32,875

Missing/incomplete data from OLOL Drogheda and Cavan General Hospital in 2021

Deliveries

General anaesthetic for Caesarean section (#35)

(Per total women delivered)

Definition   Number of women during the current month who underwent a Caesarean section and were administered a general anaesthetic (GA), including primary GA and also conversion to GA from regional anaesthetic (epidural or spinal).
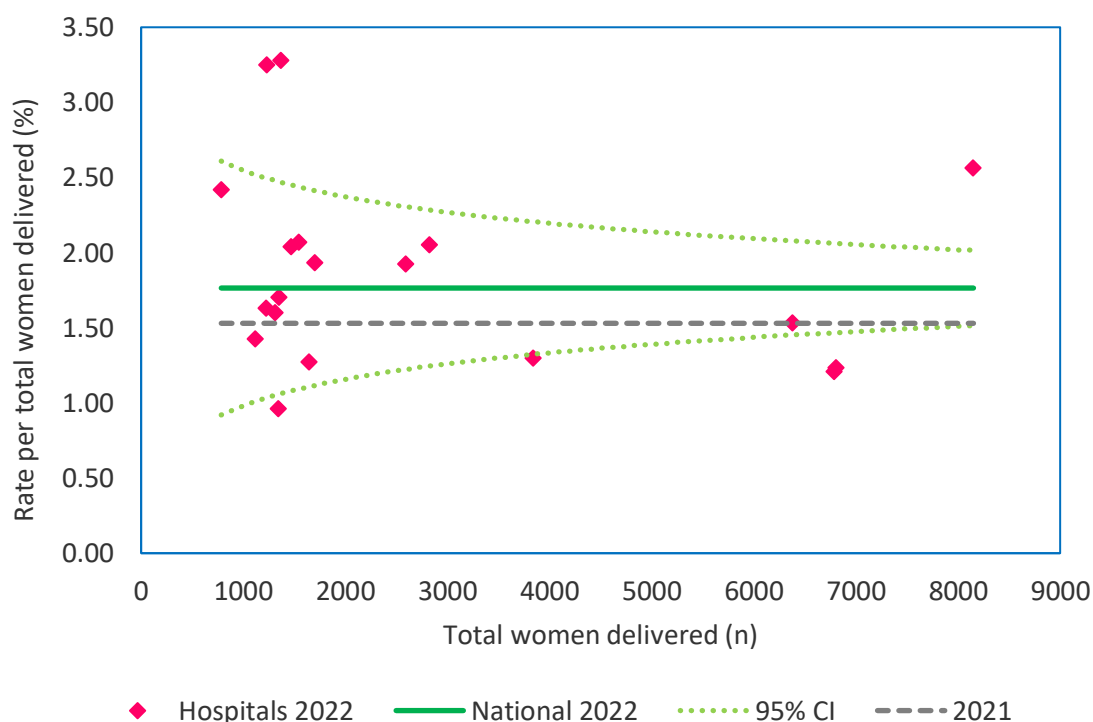
	2021*	2022
Rates *(per total women delivered (%))*	1.5%	1.8%
95% CI	1.4%-1.6%	1.7%-1.9%
Range	0.6%-3.1%	1.0%-3.3%
Total GA for CS (n)	844	944
Total women delivered (n)	55,093	53,495

*Missing/incomplete data from Cavan General Hospital and OLOL Drogheda in 2021

Labour epidural (#36)

Definition   Number of women for whom labour epidural was administered during the current month, including neuraxial block during labour and neuraxial block during labour and delivery procedure.
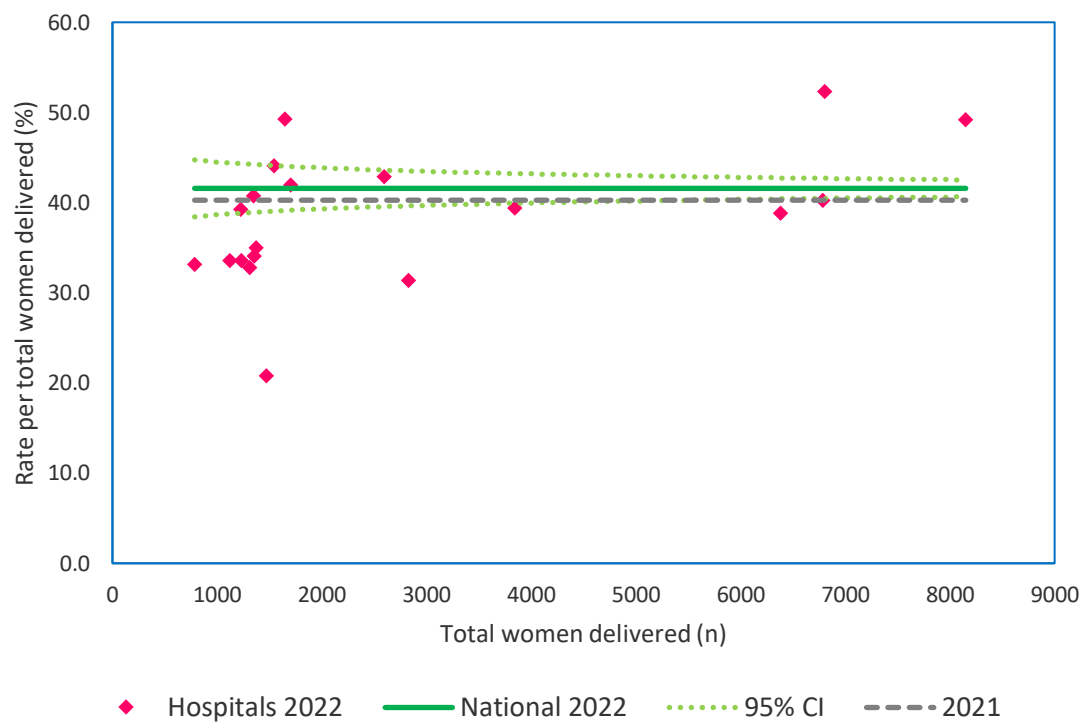
	2021*	2022
Rates *(per total women delivered (%))***	40.3%	41.6%
95% CI	39.8%-40.7%	41.2%-42.0%
Total labour epidurals (n)	19,090	22,244
Total women delivered (n)	47,402	53,495

*Missing or inocmplete data in 2021 from NMH, OLOL Drogheda and Cavan General Hospital

**Note: The base 'per total women delivered' is a proxy denominator for total women in labour

Total vaginal deliveries[1]

Definition Derived metric, based on the difference between total number of women delivered less total Caesarean sections.
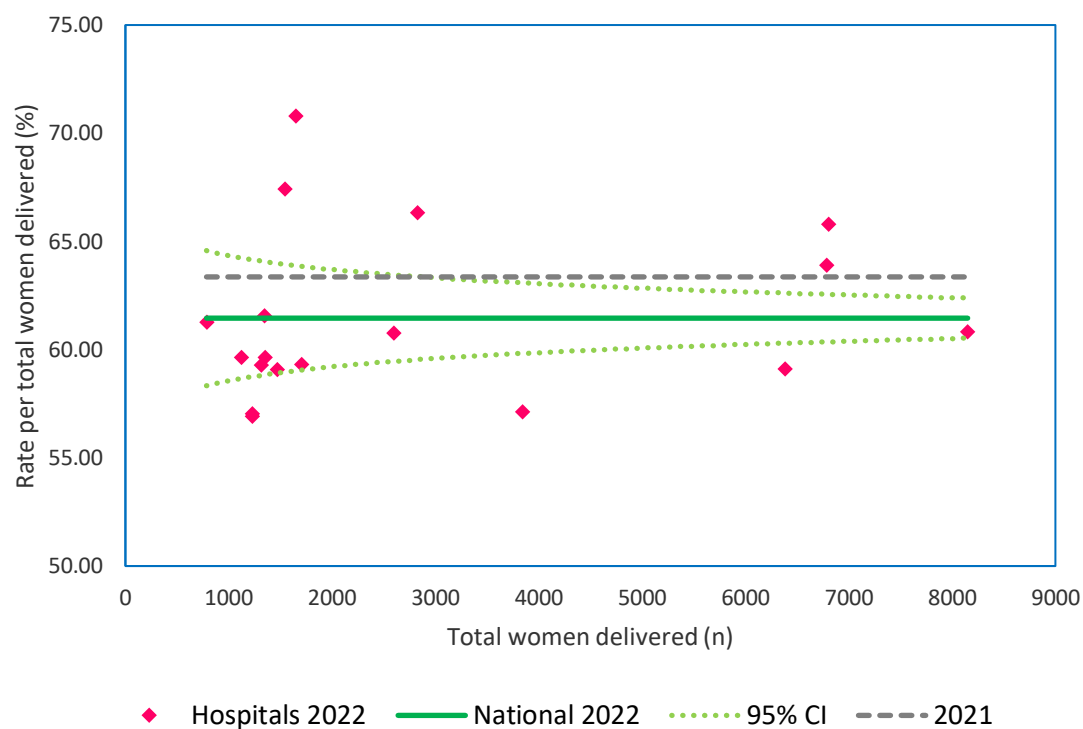
	2021	2022
Rates *(% total women delivered)*	63.4%	61.5%
95% CI	63.0%-63.8%	61.0%-61.9%
Range	56.0%-73.5%	46.3%-70.8%
Total vaginal deliveries (n)	37,670	32,875
Total women delivered (n)	59,443	53,495

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1 This metric was amended in April 2024

Total operative vaginal delivery (#37)

Definition Number of women undergoing operative vaginal delivery (OVD), or instrumental delivery. This metric includes forceps delivery and vacuum extraction, assisted breech delivery with forceps to after-coming head and breech extraction with forceps to after-coming head. Excludes failed forceps and failed vacuum extraction.
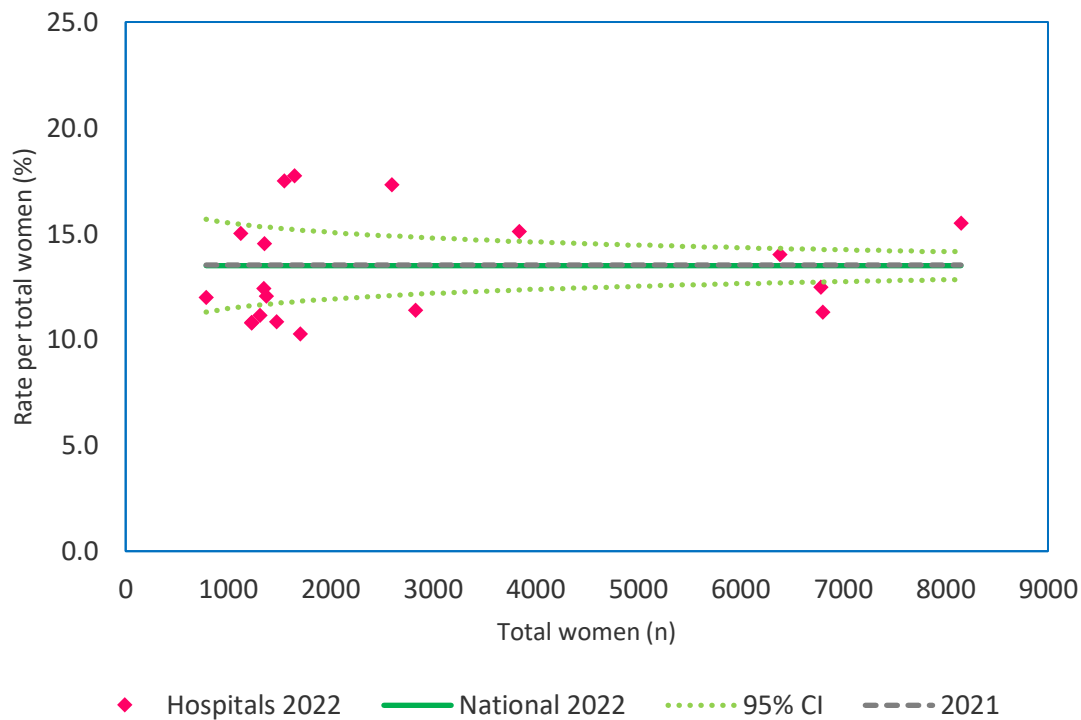
	2021	**2022**
Rates *(% total women delivered)*	13.5%	13.5%
95% CI	13.3%-13.8%	13.2%-13.8%
Range	8.5%-18.6%	10.3%-17.7%
Total OVD (n)	8,038	7,216
Total women delivered (n)	59,443	53,495

OVD among nulliparas (#37a)

Definitions as before
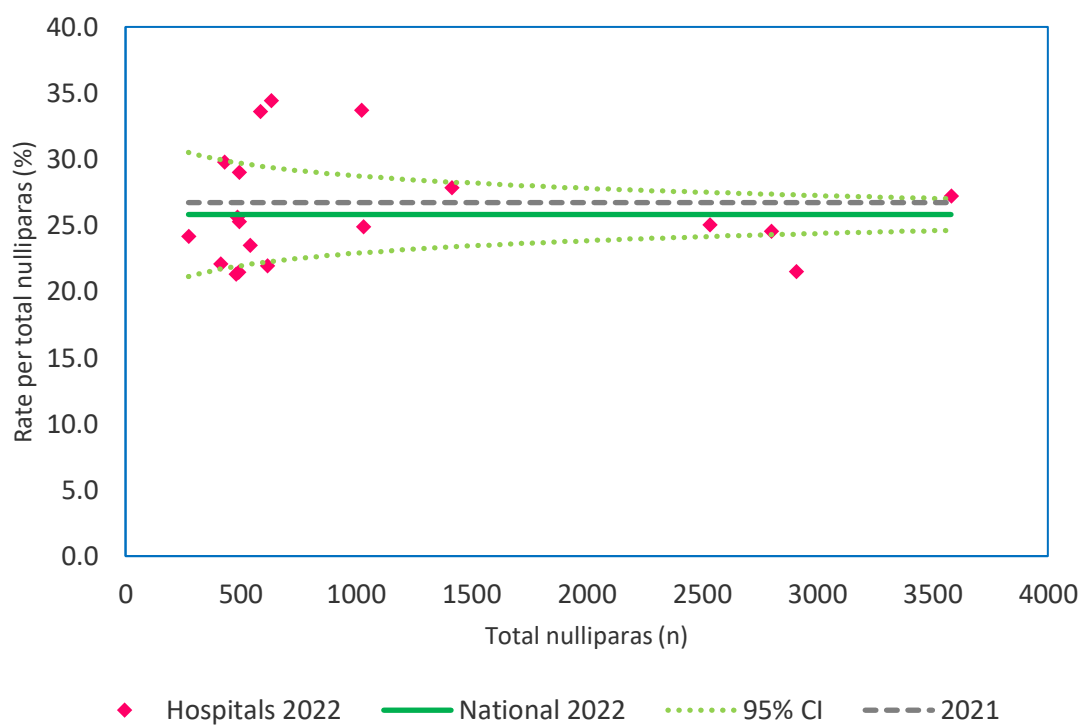
	2021	**2022**
Rates *(% nulliparas)*	26.7%	25.8%
95% CI	26.1%-27.2%	25.2%-26.4%
Range	18.9%-36.2%	21.3%-34.4%
OVD among nulliparas (n)	6,046	5,480
Total nulliparas (n)	22,683	21,224

OVD among multiparas (#37b)

Definitions as before
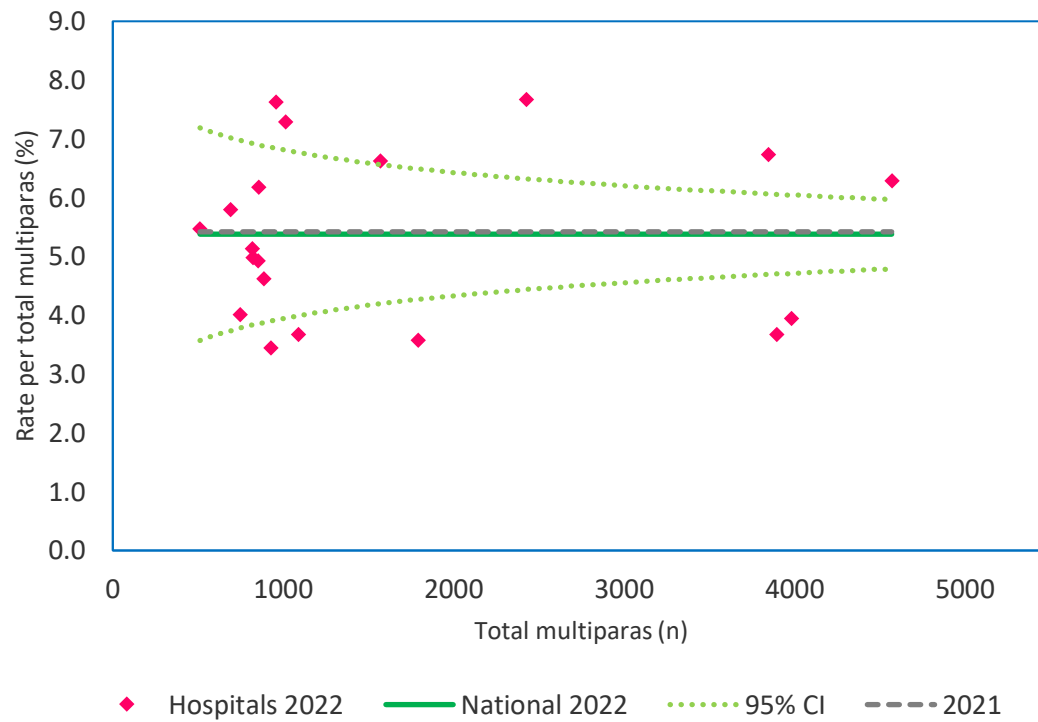
	2021	2022
Rates *(% multiparas)*	5.4%	5.4%
95% CI	5.2%-5.7%	5.1%-5.6%
Range	3.4%-10.3%	3.4%-7.7%
OVD among multiparas (n)	1,992	1,736
Total multiparas (n)	36,760	32,271

Total Induction of labour (IOL) (#38)

Definition   Number of women during the current month undergoing induction of labour (IOL), including medical and/or surgical inductions of labour. Include use of oxytocin, prostaglandin, or other. Include artificial rupture of membranes or other surgical means. Include synchronous medical and surgical IOL.
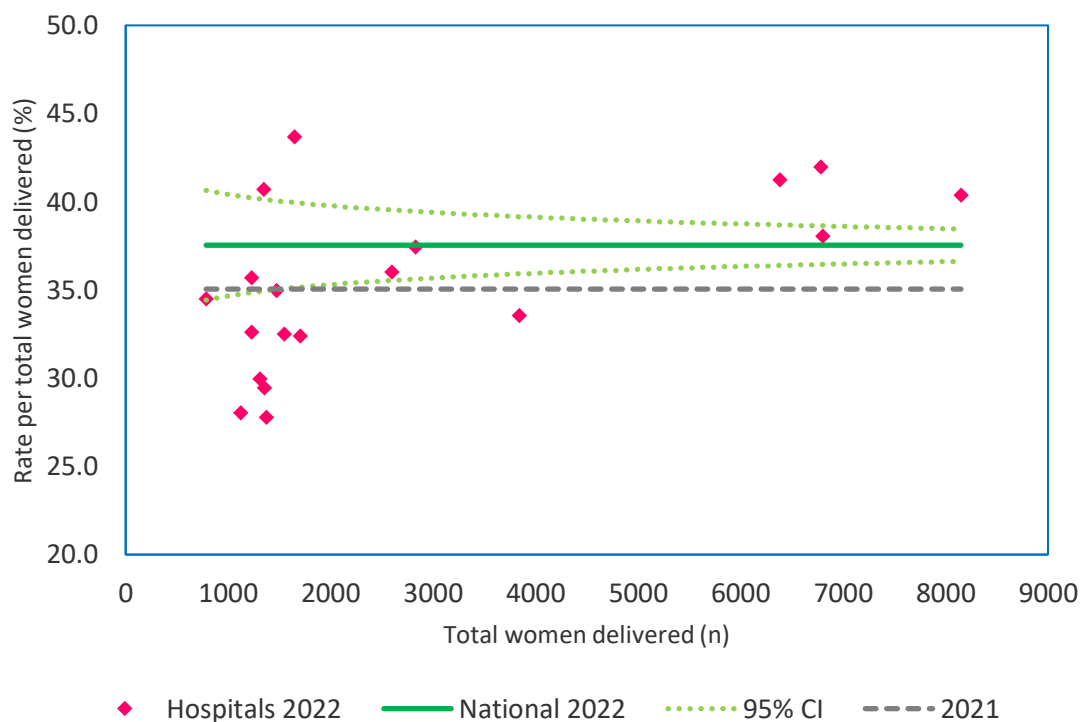
	2021	2022
Rates *(% total women delivered)*	35.1%	37.5%
95% CI	34.7%-35.4%	37.1%-38.0%
Range	23.4%-40.8%	27.8%-43.7%
Total IOL (n)	20,836	20,081
Total women delivered (n)	59,443	53,495

IOL among nulliparas (#38a)

Definitions as before
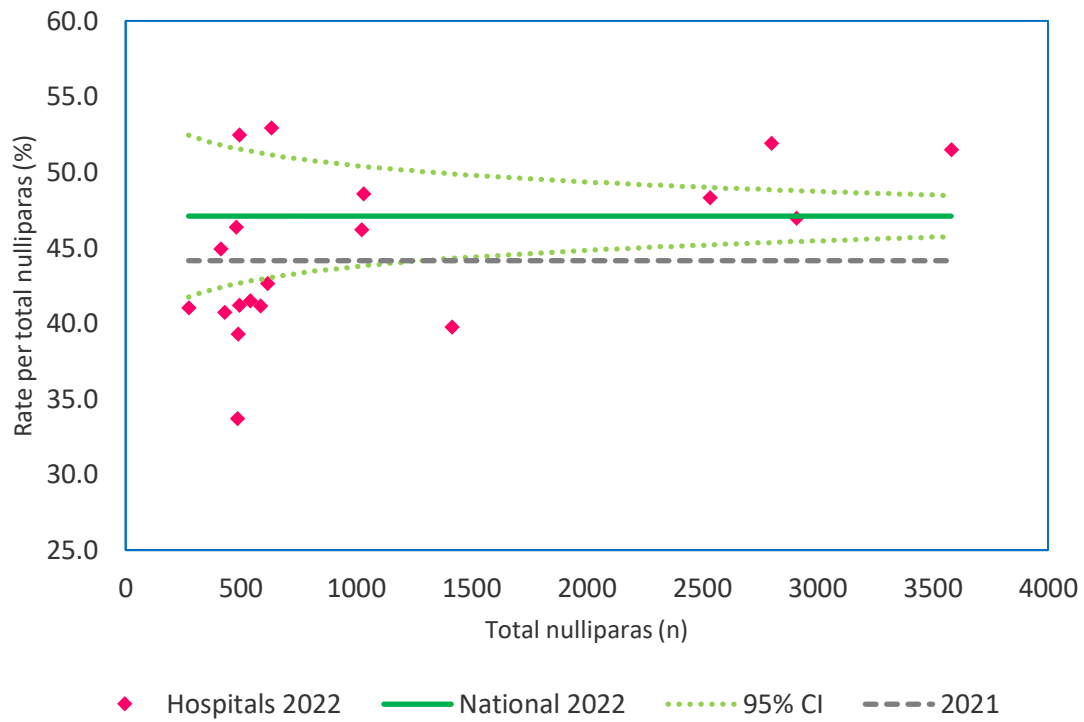
	2021	**2022**
Rate *(% nulliparas)*	44.0%	47.1%
95% CI	43.4%-44.7%	46.4%-47.8%
Range	30.6%-51.2%	33.7%-52.9%
IOL among nulliparas (n)	9,987	9,994
Total nulliparas (n)	22,683	21,224

IOL among multiparas (#38b)

Definitions as before
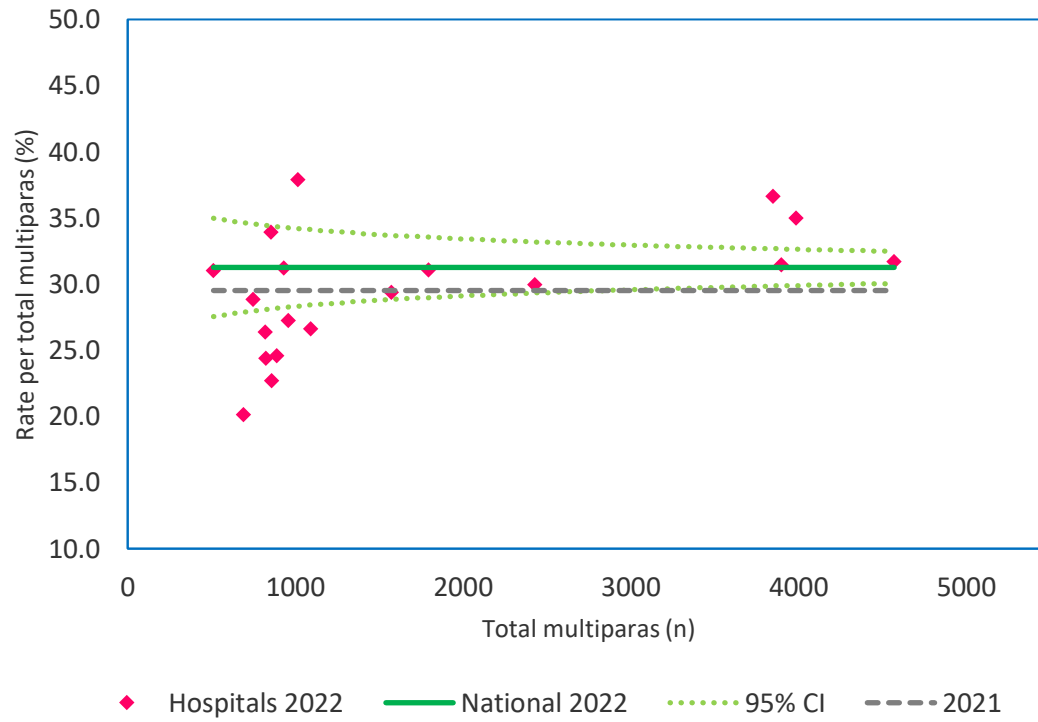
	2021	2022
Rate *(% multiparas)*	29.5%	31.3%
95% CI	29.1%-30.0%	30.8%-31.8%
Range	16.5%-36.2%	20.1%-37.9%
IOL among multiparas (n)	10,849	10,087
Total multiparas (n)	36,760	32,271

Total Caesarean section (#39)

Definition   Number of women during the current month giving birth by Caesarean section (CS), including elective classical Caesarean section, emergency classical Caesarean section, elective lower segment Caesarean section, and emergency lower segment Caesarean section.
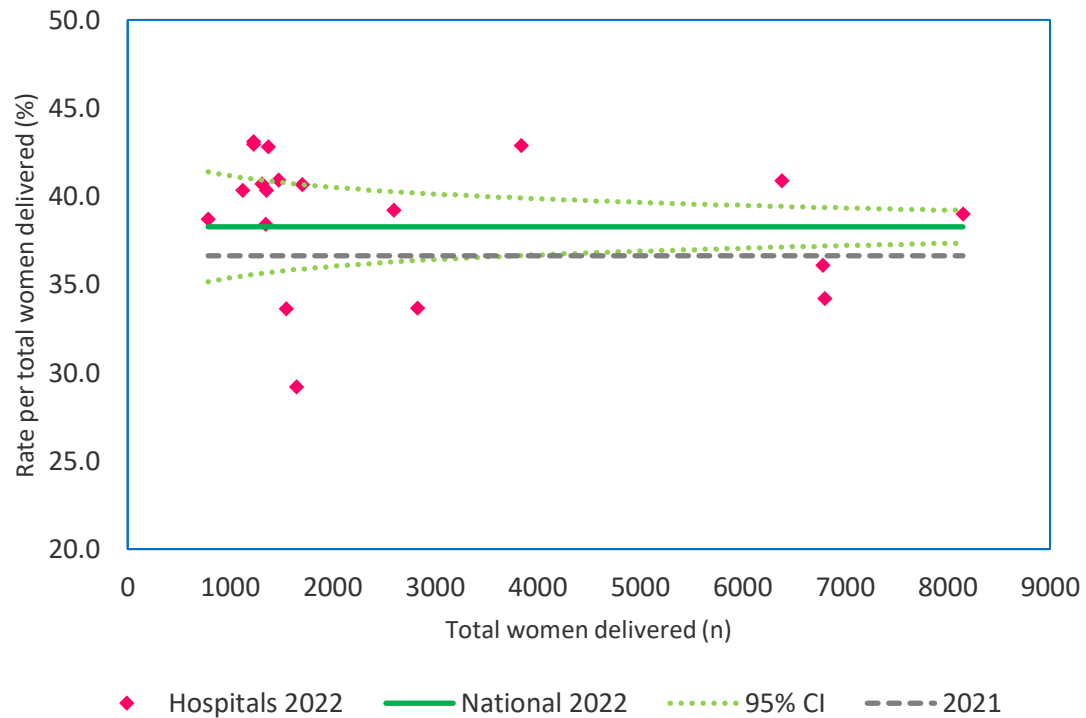
	2021	**2022**
Rate *(% total women delivered)*	36.6%	38.3%
95% CI	36.2%-37.0%	37.9%-38.7%
Range	26.5%-44.0%	29.2%-43.1%
Total CS (n)	21,773	20,474
Total women delivered (n)	59,443	53,495

CS among nulliparas (#39a)

Definitions as before
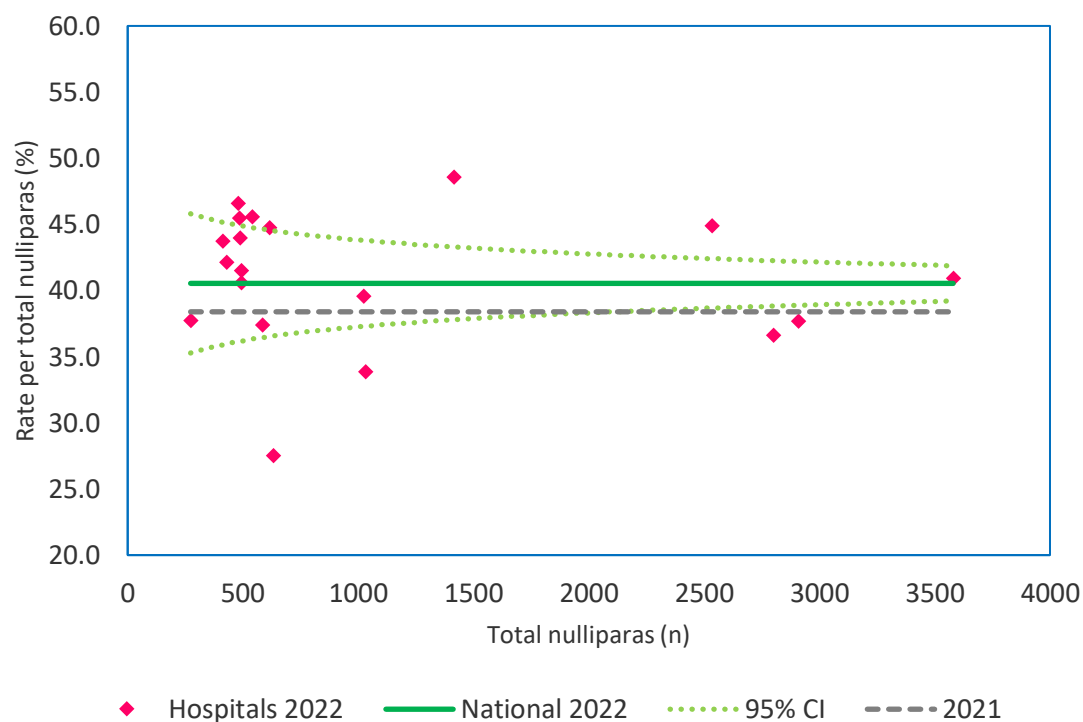
	2021	**2022**
Rate *(% nulliparas)*	38.3%	40.5%
95% CI	37.7%-38.9%	39.9%-41.2%
Range	25.2%-46.8%	27.5%-48.6%
CS among nulliparas (n)	8,687	8,604
Total nulliparas (n)	22,683	21,224

CS among multiparas (#39b)

Definitions as before
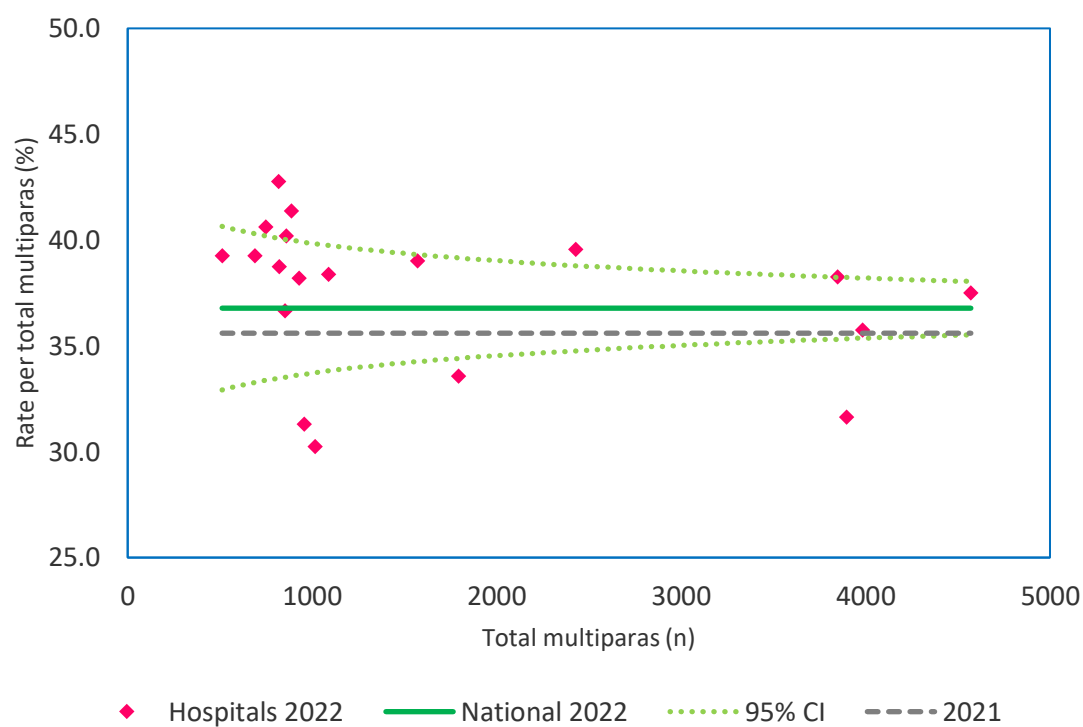
	2021	2022
Rate *(% multiparas)*	35.6%	36.8%
95% CI	35.1%-36.1%	36.3%-37.3%
Range	27.2%-43.7%	30.3%-42.8%
CS among multiparas (n)	13,086	11,870
Total multiparas (n)	36,760	32,271

VBAC (#40)

Definition   Delivery through the birth canal in a pregnancy subsequent to one in which delivery was by Caesarean section (VBAC). The previous CS may or may not have been directly prior to the current pregnancy.
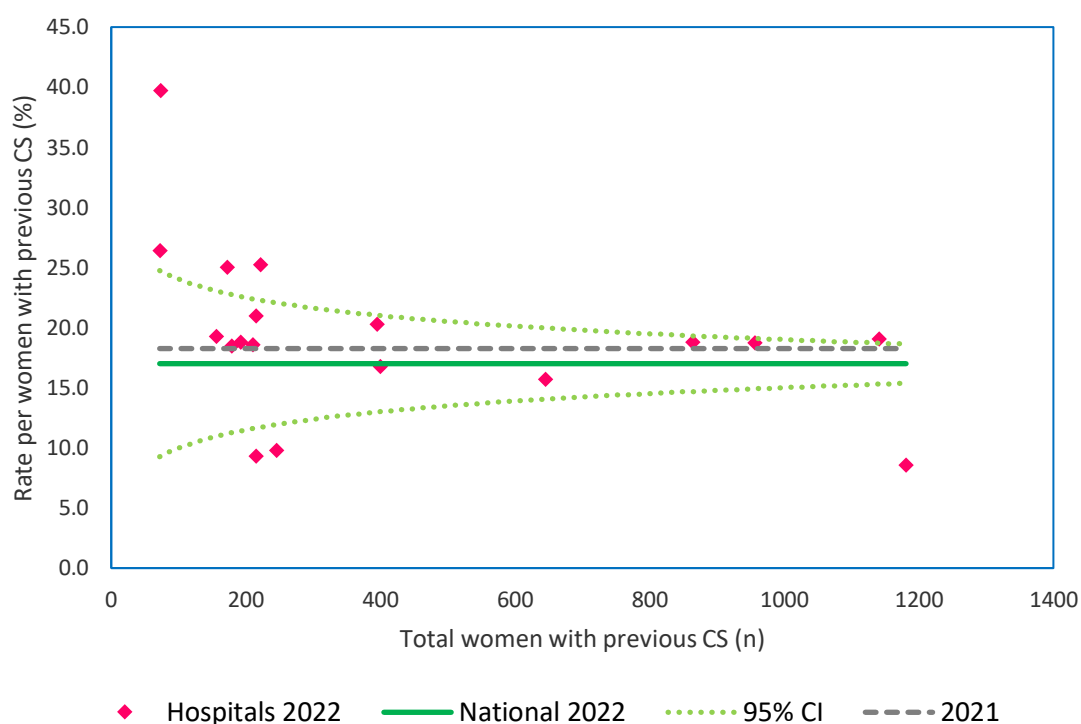
	2021*	2022**
Rate *(% women with previous CS)*	18.3%	17.0%
95% CI	17.4%-19.1%	16.2%-17.9%
VBAC (n)	1,395	1,281
Total women with previous CS (n)	7,641	7,534

Missing/incomplete data in 2021 from MRHP, OLOL Drogheda, Cavan General Hospital

**Missing data in 2022 from MRHP*

Appendices

Appendix 1. IMIS Officers/Teams in the 19 maternity hospitals/units

Cavan General Hospital Ms Karen Malocca, CNM2 MN-CMS; Dr Rukhsana Majeed

Cork University Maternity Hospital Ms Claire Everard, Quality and Risk Manager

Coombe Women and Infants University Hospital Ms Julie Sloane, Data Analyst, Ms Emma McNamee, IT Systems Manager

Our Lady of Lourdes Hospital, Drogheda Ms Maeve Gaynor, Acting CMM3 MN-CMS

Galway University Hospital Ms Anne-Marie Grealish, ADOM; Ms Claire Greaney, CMM2 IT & Data Management; Ms Siobhán Canny, Saolta Hospital Group Director of Midwifery; Ms Kathleen McGrath, Data Analyst, Saolta Hospital Group

University Hospital Kerry Ms Mary Stack-Courtney, CNM3; Ms Mairéad Griffin, MNCMS-Local Project Support; Ms Sandra O'Connor, Director of Midwifery

St Luke's Hospital, Kilkenny Ms Anne Hogan, Director of Midwifery; Ms Kayla Thornton

Letterkenny University Hospital Ms Evelyn Smith, Director of Midwifery; Ms Marion Doogan, ADOM, Ms Mary Lynch CMM3; Ms Alison Johnston CNM IT & Data Management

University Maternity Hospital Limerick Mr Stephen Culligan, Senior Maternity Data Analyst

Mayo General Hospital Ms Andrea McGrail, Director of Nursing & Midwifery; Ms Jacinta Byrne CMM2

Midland Regional Hospital, Mullingar Ms Marie Corbett, Director of Midwifery

National Maternity Hospital, Dublin Ms Fionnuala Byrne, Information Officer

Portiuncula University Hospital Ms Sheila Melvin, IT Midwife

Midland Regional Hospital, Portlaoise Ms Ita Kinsella, ADOM

Rotunda Hospital, Dublin Ms Kathy Conway, Clinical Activity Reporting Manager

Sligo University Hospital Ms Niamh McGarvey, ADOM, Colette Kivlehan, QI and Patient Safety Midwife; Ms Geraldine O'Brien CMM2; Ms Ita Morahan CMM3

South Tipperary General Hospital Ms Maggie Dowling, Director of Midwifery; Ms Maura Clooney, Business Manager DOM; Ms Colette Kivlehan CMM2

University Hospital Waterford Ms Paula Curtin, Director of Midwifery

Wexford General Hospital Ms Helen McLoughlin, Director of Midwifery

Appendix 2. IMIS data collection form (2022)

IMIS 2022			Previous year		Current year	
			Month	YTD	Month	YTD
DEMOGRAPHICS	1.	Total women delivered (n)				
	2.	Total nulliparas (n)				
	3.	Total multiparas (n)				
	4.	Total births (n)				
	5.	Total live births (n)				
	6.	Total multiple births (n)				
	7.	Maternal death (n)				
	8.	Total perinatal death (n)				
	9.	Adjusted perinatal death (n)				
HOSPITAL ACTIVITIES	10.	EPAU first visits (n)				
	11.	Maternal transfers (n)				
	12.	In-utero transfers admitted (n)				
	13.	In-utero transfers sent out (n)				
NEONATAL METRICS	14.	Brachial plexus palsy (n)				
	15.	Neonatal encephalopathy (n)				
	16.	Whole body neonatal cooling (n)				
BREASTFEEDING	17.	BF initiated (n)				
	18.	BF exclusively on discharge (n)				
	19.	BF non-exclusively on discharge (n)				
LABORATORY	20.	Maternal bacteraemia (n)				
	21.	Neonatal bacteraemia (n)				
	22.	Obstetric blood transfusions (n)				
OBSTETRIC RISKS	23.	Maternal sepsis (n)				
	24.	Ectopic pregnancy (n)				
	25.	Eclampsia (n)				
	26.	Uterine rupture (n)				
	27.	Peripartum hysterectomy (n)				
	28.	Pulmonary embolism (n)				
	29.	Perineal tears (3rd / 4th degree) (n)				
	30.	PPH vaginal delivery (n)				
	31.	PPH Caesarean section (n)				
	32.	Miscarriage misdiagnosis (n)				
	33.	Retained swabs (n)				
	34.	Episiotomy (n)				
DELIVERIES	35.	General anaesthetic for CS (n)				
	36.	Labour epidural (n)				
	37.	Operative vaginal delivery (n)				
	38.	Induction of labour (n)				
	39.	Caesarean section (n)				
	40.	VBAC (n)				
	41.	One previous CS (n)				

Appendix 3. IMIS Implementation Guidelines

1. The IMIS is designed to capture and measure clinical activities in the maternity unit. It is intended for within-hospital use: the data will be collected by hospital staff within the maternity hospital/unit and reviewed by senior hospital managers.
2. The IMIS should be based entirely on data sourced directly from maternity units.
3. Monthly completion of the IMIS is mandatory for the 19 maternity units.
4. The IMIS is approved by the National Implementation Group HSE/HIQA Maternity Services Investigations and is aligned with national recommendations in the Investigation Report of the HSE National Incident Management Team (2012); HIQA Investigation Report (2012); Report of Chief Medical Officer on Perinatal Deaths 2006-date (February 2014), Safety Incident Management Policy (June 2014), Review by Dr Peter Boylan (June 2015), the National Maternity Strategy 2016-2026, and the HSE Maternity Clinical Complaints Review (May 2016).
5. The IMIS Officers in all 19 maternity units were nominated to work part-time on implementing the IMIS, whilst continuing with their other existing roles. The IMIS Officer should have access to maternity hospital/unit data files and should be accustomed to dealing with data within the hospital/unit.

IMIS Monthly data collection and reporting

6. The reporting period is the calendar month (i.e., from first to last day of the month).
7. The monthly report should be completed by the 20th day of the following month.
8. The IMIS Officers should send a monthly IMIS report to senior managers in their hospital/unit:
    – Chief Executive Officer or Master
    – Clinical Director(s), as appropriate
    – Director of Midwifery/Nursing
9. Senior managers should review the monthly IMIS. If they have concerns arising from the IMIS, these should be discussed with the clinical staff and, if appropriate, reported to the Hospital Board or equivalent. In the event of concerns with national implications arising, these should be reported to the head of HSE Acute Hospitals Division via NWIHP.

IMIS Annual reporting

10. The annual IMIS data should be completed by **end of February** of the following year.
11. The QA Officer should send the annual IMIS data to the following people:
    a) Senior managers of the hospital (as above)
    b) NWIHP Programme Director
    c) IMIS Project Manager
12. Staff at the NWIHP will check and verify annual data in collaboration with staff at maternity hospitals/units.
13. The NWIHP will prepare IMIS reports and disseminate to maternity hospitals/units and relevant organisations.
14. If senior managers of the hospitals have concerns arising from the annual IMIS data, these should be discussed and escalated as above.
15. Reviews of the IMIS format will be conducted by the NWIHP and changes introduced on an annual basis.

Appendix 4. National recommendations

There follows an outline of the relevant national recommendations and initiatives produced since June 2013, which align with and support the IMIS as a management instrument for quality improvement in maternity services.

1. **HSE NIMT Recommendations, Incidental factor 1 (June 2013)**

   'The review team recommends consideration of a National Quality Assurance Programme of Obstetrics and Gynaecology as an initial step to maintain confidence amongst patients/services users, staff, the public administrators and regulators and to put into place safety systems and interventions before a catastrophe happens. Monthly workloads, clinical outcomes, and adverse incidents should be monitored by using a dashboard to include green, amber and red signals to warn of the possibilities of impending problems.' (HSE, June 2013).

2. **HIQA National Recommendations (October 2013)**

   In October 2013, the HIQA produced national statutory recommendations, two of which refer directly to quality assurance in the maternity services.

   'The HSE and key stakeholders should agree and implement effective arrangements for consistent, comprehensive national data collection for maternity services in order to provide assurance about the quality and safety of maternity services. This should include the development of an agreed and defined dataset and standardised data definitions to support performance monitoring, evaluation and management of key patient outcome and experience indicators.' (National Recommendation N16)

   'The arrangements for collecting, reviewing and reporting maternal morbidity and mortality should be reviewed by the HSE to facilitate national and international benchmarking for improved learning and safety in the provision of maternity services. This should include a formal process for the implementation of recommendations of the Confidential Maternal Death Enquiries.' (National Recommendation N17)

3. **HSE Midland Regional Hospital, Portlaoise, Report of Chief Medical Officer on Perinatal Deaths 2006-date (2014):**

   In February 2014, Dr Tony Holohan, Chief Medical Officer, reported to the Minister for Health Dr James Reilly TD, about perinatal deaths in Portlaoise. The report contained a list of recommendations, several of which are relevant to quality and safety (and measurement) in the maternity services and which led to the development (by the HSE Acute Hospitals Division, the National Clinical Programme in Obstetrics and Gynaecology, the HSE Quality Assurance and Verification Division, and the HSE Quality Improvement Division) in May 2015 of the Maternity Patient Safety Statement (MPSS). The MPSS is intended to be a monthly statement on the quality of care in maternity units. It is based on the design of the IMIS and uses 16 IMIS indicators.

Theme IV recommendations:

- The HSE should issue a directive to all providers to require them to notify the director of quality and patient safety and HIQA of all 'never events' (R.21)
- The HSE should ensure that every maternity service (and later every health service provider) should be required to complete a Patient Safety Statement which is published and updated monthly (R.22) (O.R.10)

Overall recommendations:

- Every maternity service (and later every health service provider) be required to complete a Patient Safety Statement which is published and updated monthly (O.R.10)
- The Patient Safety Statement should be a requirement of hospital licensing (R.23) (O.R.10)
- A National Patient Safety Surveillance system should be established by HIQA (O.R.11)

4. **HSE NIMT, Safety Incident Management Policy (June 2014)**

In June 2014, the HSE National Incident Management Team drafted the Safety Incident Management Policy, which was approved by Dr Philip Crowley, National Director Quality and Patient Safety, HSE. The purpose of the document is to set out the HSE policy for managing safety incidents across a range of areas, including surgical events, product or device events, patient protection events, care management events, environmental events, and criminal events. Several of the Serious Reportable Events (SRE) are relevant to maternity services.

5. **HIQA Report of the investigation into the safety, quality and standards of services provided by the Health Service Executive to patients in the Midland Regional Hospital, Portlaoise (May 2015)**

Recommendation 6c: 'The Health Service Executive (HSE), along with the chief executive officers of each hospital group, must ensure that the new hospital groups prioritise the development of strong clinical networks underpinned by regular evaluation and audit of the quality and safety of services provided.'

6. **Boylan P. Report, 'A Review of 28 Maternity Case Notes' (June 2015)**

Recommendation: 'Each hospital in the State should implement a formal system of audit of pregnancy outcome classified according to the Ten Groups Classification as recently endorsed by the WHO. This audit should take place on a monthly basis and involve all relevant clinicians. Each hospital needs to supply relevant administrative support.' […] 'Using data from individual maternity units, an annual audit of Irish maternity services should be implemented without delay.' […] 'Ongoing audit in this manner will allow a pattern of adverse outcomes to be identified in a timely fashion so that appropriate action can be taken.'

7. **'Creating a better future together', National Maternity Strategy 2016-2026 (2017)**

Action: Measurement and analysis for quality improvement and safety will occur at national, network and service level, based on an agreed minimum dataset (Action 4.14.5).

8. **HSE Maternity Clinical Complaints Review (May 2017)**

    The final report of the Maternity Clinical Complaints Review concluded a review process commissioned by the HSE in 2014. The report reviewed complaints received from patients and their families and outlined recommendations for all maternity services nationally.
    Recommendation: 'External oversight should be provided in order to assure the public of the quality of maternal services. The National Women and Infants Health Programme (NWIHP) should develop a model to ensure external oversight is applied across each hospital group. The Irish Maternity Indicator System (IMIS) currently provides information for local scrutiny of clinical maternity activity. The NWIHP will expand the role of IMIS to provide for Group and National level oversight, as well as local.'

9. **HSE National Maternity Strategy Implementation Plan (October 2017)**

    Developed by the National Women and Infants Health Programme (NWIHP) in 2017, the Implementation Plan stipulates that the IMIS will be the agreed measurement instrument for quality improvement and safety at national, network and service level and the IMIS will form part of the standing agenda for monthly meetings with the maternity networks.

Appendix 5. IMIS data and methods

Data

The IMIS 2021 data were provided by IMIS Officers, or nominated personnel at all maternity hospitals/units, following review and approval by hospital senior management. They were checked and verified by the NWIHP. Comparative national data for the national longitudinal trends were drawn from the National Perinatal Reporting System (NPRS),[2] obtained from the Healthcare Pricing Office, and the Hospital In-Patient Enquiry system (HIPE).[3]

Methods

The IMIS data were analysed using MS Excel. National rates were calculated for all maternity units and hospital-level rates were calculated for each unit individually. Confidence intervals at 95% levels were calculated and customised funnel charts designed for the IMIS indicators.

Funnel charts

Funnel charts are useful where observations for different hospitals are based on varying sample sizes. They are a form of scatter-plot, in which observed area rates are plotted against area populations. Control limits are then overlaid on the scatter plot. The control limits represent the expected variation in rates assuming that the only source of variation is stochastic (i.e., including a random variable). The control limits were computed in a fashion very similar to confidence limits and exhibit the distinctive funnel shape as a result of smaller expected variability in larger populations.

The funnel-shaped confidence limits indicate that, as sample sizes decrease, an observation must be further from the national rate to be considered significantly different. The purpose of the charts is to enable each maternity unit to observe their position relative to the national benchmark and the upper and lower control limits.

<div align="center">

Caution is advised where small values are concerned.

</div>

Maternity hospitals/units lying beyond the confidence limits on the funnel plots may be considered in a 'warning' sector. However, since no statistical analysis has been conducted to take formal account of the multiple characteristics that are not shown in the funnel plot, in this report crossing a threshold does not indicate high or low 'quality'. We recommend senior managers at maternity units should <u>investigate the reasons for variations at the hospital level before action is taken</u>.

Several funnel plots in the IMIS National Reports show evidence of a phenomenon known as overdispersion (Spiegelhalter 2005).[4] This overdispersion is not an unusual phenomenon in health data and, in fact, can be useful in model specification (Birkmeyer 2001).[5] Overdispersion occurs when a greater level of variability is demonstrated than can be explained by chance and the existence of a small number of outlying maternity hospitals/units.

Potential explanations for overdispersion are differences in data quality, lack/limitations of risk adjustment, and clinical uncertainty. Given that no risk adjustment has been executed in the analysis presented in this report, it is likely that these are the underlying reasons for much of the systematic variation between units. Consequently, it would be premature to draw conclusions

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2 The NPRS provides national statistics on perinatal events based on approximately 70,000 birth records each year from 19 maternity units and all practicing self-employed community midwives.

3 The HIPE provides demographic, administrative, and clinical data on inpatient and day-case discharges from publicly-funded acute hospitals in Ireland.

4 Spiegelhalter DJ. (2005). Handling over-dispersion of performance indicators. *Qual Saf Health care 14*: 347–51.

5 Birkmeyer JD. (2001). Primer on geographic variation in health care. *Effective Clinical Practice 4*(5): 232-33.

from the charts alone about whether differences in the patterns of maternity care provision reflect differences in quality.

To compensate for the absence of statistical risk adjustment, notes are provided after the funnel charts. These notes contain crucial details that inform or explain the results. They are based on clinical expertise and hospital management experiences. The notes contribute explanations of the annual hospital rates where they lie above or below the national rates and, particularly, where they lie beyond the confidence limits.

Interpreting a funnel plot:

Diamond-shaped markers represent the 19 maternity hospitals/units.

The horizontal axis represents the base number (in most charts, the base is the number of total births or total maternities). The diamonds further to the right are maternity units with more births/maternities.

The vertical axis measures the frequency of the outcome, usually expressed as a percentage rate or rate per 1,000 women delivered or births. The diamonds placed higher up on the chart represent maternity units with higher rates of an outcome.

The solid horizontal green line shows the national rate in the current year. The horizontal dotted line shows the national rate in the previous year.

The dotted curved green lines constitute the statistical reference range or 95% confidence limits for the current year. The reference range defines what is regarded as the 'normal', or typical, range. Anything beyond the range is regarded as abnormal or non-standard. The reference range allows us to say that if the true value of the parameter lies beyond the 95% confidence limits, then an event has occurred which had a probability of 5% (or less) of happening by chance alone.

Sample funnel chart
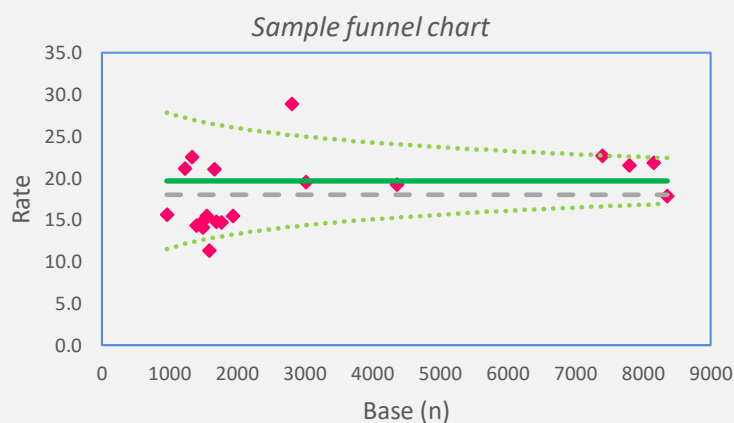
Appendix 6. Maternity hospitals/units in Republic of Ireland (n=19)

Appendix 7. HSE Maternity Networks

Ireland East	National Maternity Hospital, Dublin (NMH)
	Midland Regional Hospital Mullingar (MRHM)
	St Luke's Hospital, Kilkenny (SLHK)
	Wexford General Hospital
RCSI	Rotunda Hospital, Dublin
	Cavan General Hospital
	Our Lady of Lourdes Hospital, Drogheda (OLOL)
Dublin Midlands	Coombe Maternity Hospital, Dublin
	Midland Regional Hospital Portlaoise (MRHP)
University Limerick	University Maternity Hospital Limerick (UMHL)
South/South West	Cork University Maternity Hospital (CUMH)
	South Tipperary General Hospital (STGH)
	University Hospital Kerry (UHK)
	University Hospital Waterford (UHW)
Saolta	University Hospital Galway (UHG)
	Letterkenny University Hospital (LUH)
	Mayo University Hospital (MUH)
	Portiuncula University Hospital (PUH)
	Sligo University Hospital (SUH)

Appendix 8. Relevant data sources/agencies

The following offices collect and provide health- and hospital-related data, including data on maternity and perinatal activities, in ROI:

BNF01   Birth Notification Form
Four-part form completed by staff at maternity hospitals/units for each live birth and stillbirth and returned to the HPO for distribution to CSO, GRO, and NPRS.

CSO   Central Statistics Office
Ireland's national statistical office provides vital statistics, including births, stillbirths, and deaths.

GRO   General Register Office
Central civil repository for records including births, stillbirths, and deaths in Ireland.

HIPE   Hospital In-Patient Enquiry system
A health information system designed to collect demographic, clinical, and administrative data on hospital day cases and in-patients as well as deaths from acute hospitals nationally. The HIPE is the only source of morbidity statistics available nationally for acute hospital services. All acute public hospitals participate in HIPE, reporting on over 1.5 million records annually.

IMIS   Irish Maternity Indicator System
The IMIS is a standardised data-based management tool for individual maternity hospitals/units and national analysis. Data are collected and reviewed monthly. National reports are published annually.

MPSS   Maternity Patient Safety Statement
Initiated by the Department of Health, the MPSS is published for all maternity hospitals/units on a monthly basis and is intended to provide assurance that maternity services are delivered in an environment that promotes open disclosure.

NPEC   National Perinatal Epidemiology Centre, University College Cork
The NPEC collaborates with maternity services and publishes annual data on perinatal mortality and severe maternal morbidity using a range of research methodologies and drawing on the HIPE data.

NPRS   National Perinatal Reporting System
Based on data derived from the BNF01, the NPRS provides national statistics on perinatal events, in particular data on pregnancy outcomes, perinatal mortality, and important aspects of perinatal care.

NWIHP   National Women and Infants Health Programme
Established in 2017, the NWIHP leads the management, organisation, and delivery of maternity, gynaecology and neonatal services in line with the National Maternity Strategy. The NWIHP is overseeing development of maternity networks and has responsibility for allocating development funding for maternity services.

Appendix 9. Glossary and Abbreviations

ACHI	Australian Classification of Health Interventions
BPP	Brachial plexus palsy
CA	Congenital anomaly
CS	Caesarean section
ECDC	European Centre for Disease Prevention and Control
EPAU	Early Pregnancy Assessment Units
GA	General anaesthetic
HIE	Hypoxic ischaemic encephalopathy
HIPE	Hospital In-Patient Enquiry system
HIQA	Health Information and Quality Authority
HPO	Healthcare Pricing Office
HSE	Health Services Executive
ICD	International Classification of Diseases
IMIS	Irish Maternity Indicator System
IOL	Induction of labour
NCG	National Clinical Guideline
NE	Neonatal encephalopathy
NPEC	National Perinatal Epidemiology Centre
NPRS	National Perinatal Reporting System
NWIHP	National Women and Infants Health Programme
OVD	Operative vaginal delivery
PPH	Postpartum haemorrhage
QA	Quality Assurance
WBNC	Whole body neonatal cooling
WHO	World Health Organisation

Appendix 10. National longitudinal trends, 2008-2022

1. **Total women and Total births**

Total women: Number of women delivering a baby weighing ≥500g.

Total births: Total number of births weighing ≥500 grams (in accordance with WHO guidelines), including both live births and stillbirths, occurring during the current month.
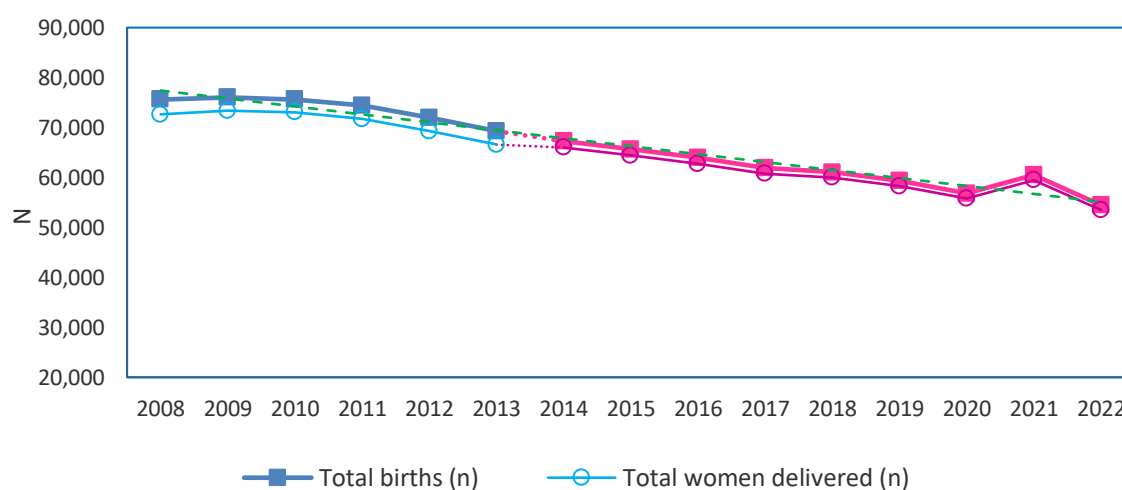
	NPRS						IMIS								
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Births	75587	76023	75600	74377	71986	69267	67263	65680	63964	61902	61084	59352	56833	60492	54467
Women	72574	73373	73032	71705	69263	66574	65987	64435	62736	60744	59981	58272	55799	59443	53495

Sources: NPRS Annual Report 2013, IMIS 2014-2022

Total nulliparas and Total multiparas

Nulliparas: Number of women delivering a baby ≥500g who have never had a previous pregnancy resulting in a live birth or stillbirth.

Multiparas: Number of women delivering a baby ≥500g who have had at least one previous pregnancy resulting in a live birth or stillbirth.
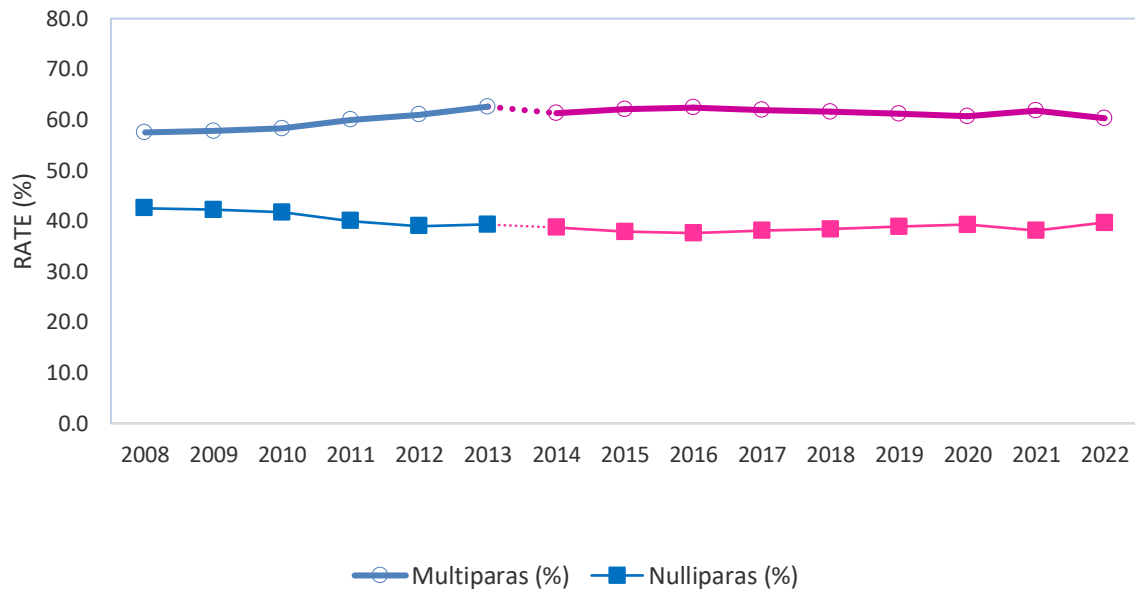
	NPRS						IMIS								
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Multips	57.5	57.8	58.3	60.0	61.0	62.6	61.3	62.1	62.4	61.9	61.6	61.2	60.7	61.9	60.3
Nullips	42.5	42.2	41.7	40.0	39.0	39.3	38.7	37.9	37.6	38.1	38.4	38.8	39.3	38.1	39.7

Sources: NPRS Annual Report 2013, IMIS 2014-2022

2. Multiple births

Definition:

Number of multiple births, based on the number of women with multiple births (<u>not</u> the number of babies delivered by women with multiple pregnancies) occurring during the current month. A multiple birth results when more than one baby is born from a single pregnancy.
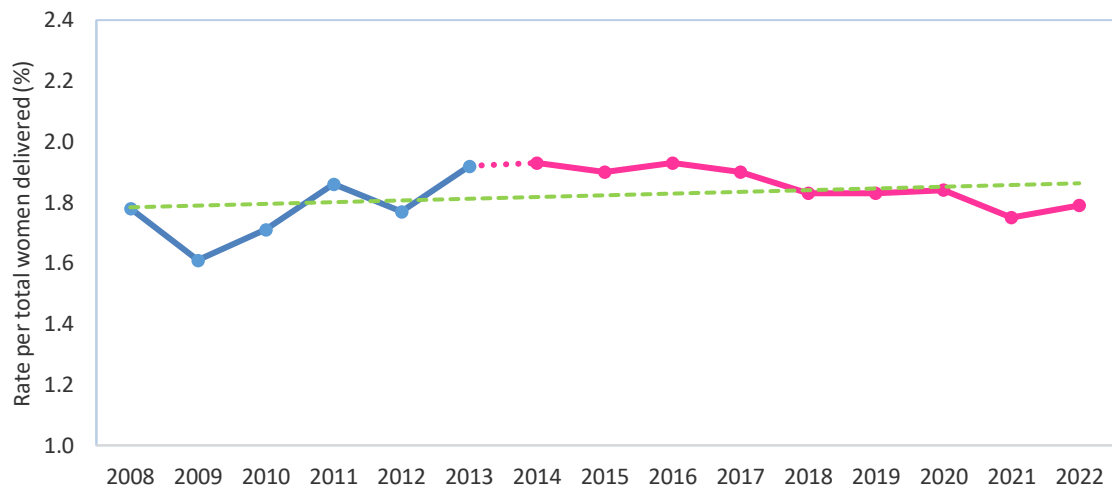
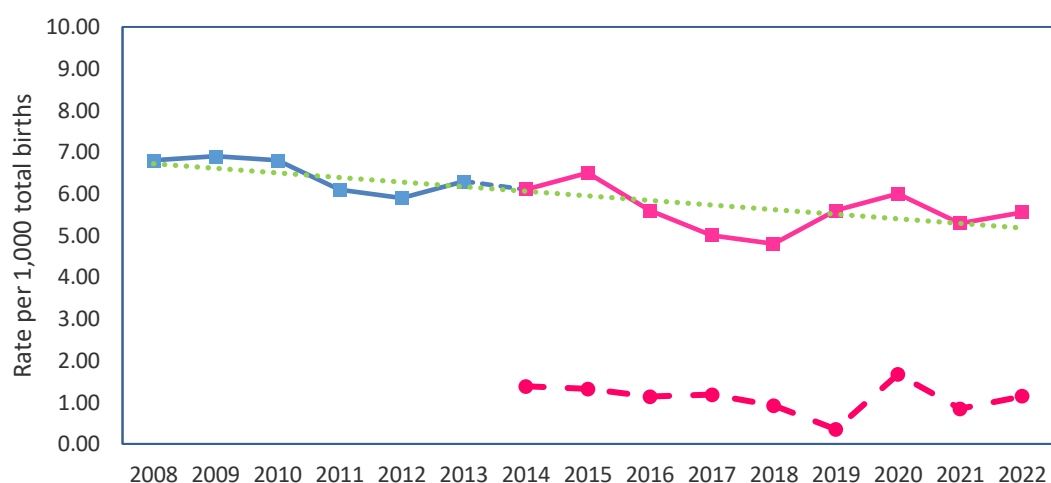|	NPRS						IMIS								
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Multiple births (%)	1.78	1.61	1.71	1.86	1.77	1.92	1.93	1.90	1.93	1.90	1.83	1.83	1.84	1.75	1.79

Sources: NPRS Annual Report 2013, IMIS 2014-2022

3.   **Total perinatal death rate and Adjusted perinatal death rate**

Definitions

Total perinatal deaths: Number of deaths, including stillbirths and early neonatal deaths from delivery to six completed days occurring during the current month. A stillbirth in this report refers to the death of a fetus weighing ≥500g, irrespective of duration of pregnancy; an early neonatal death refers to the death of a live born infant during the first seven days of life. This metric is not adjusted to exclude congenital anomalies.

Adjusted perinatal deaths: Number of perinatal deaths (stillbirths and early neonatal deaths) weighing 2.5kg or more without physiological or structural abnormalities that develop at or before birth and are present at the time of birth.
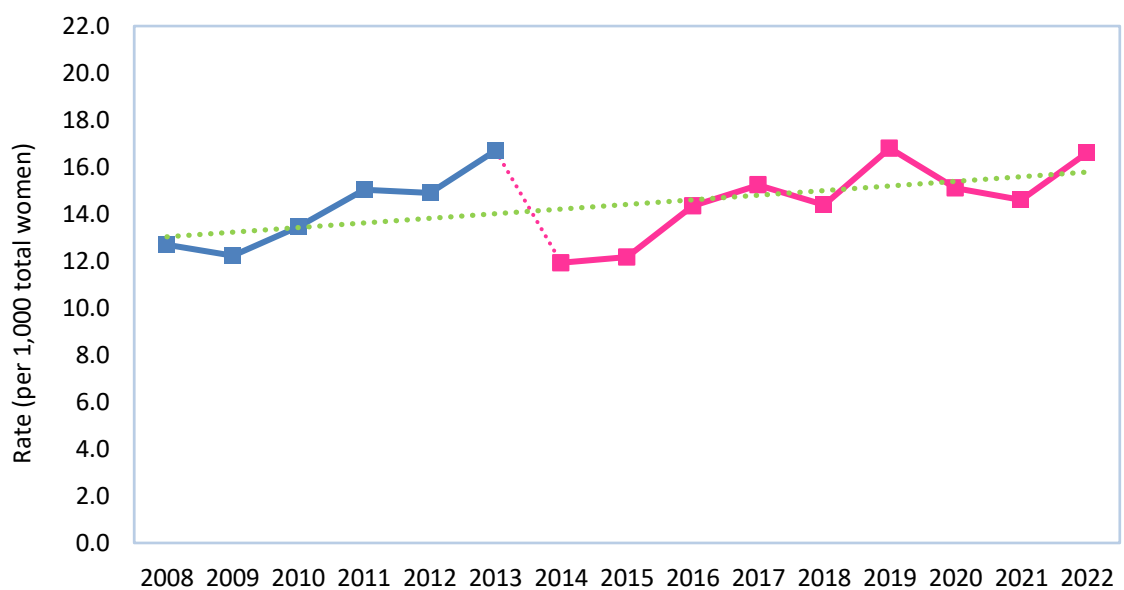

| | NPRS* | | | | | | IMIS | | | | | | | | |
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Perinatal death rate	6.9	6.9	6.8	6.1	5.9	6.3	6.1	6.5	5.6	5.0	4.8	5.6	6.0	5.1	5.6
Adjusted perinatal death rate	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	1.4	1.3	1.1	1.2	0.9	1.4	1.7	0.8	1.1

Sources: NPRS Annual Report 2013, IMIS 2014-2022

* The NPRS definition of perinatal deaths includes stillbirths and early neonatal deaths. Fetal death is defined as death prior to the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of the pregnancy. An early neonatal death refers to the death of a live born infant during the first week of life. Rate calculation: (Number of stillbirths + early neonatal deaths/Total live births and stillbirths) x 1,000.

4. Ectopic pregnancy

Definition: Number of women diagnosed during the current month with an ectopic pregnancy, including abdominal pregnancy, tubal pregnancy, ovarian pregnancy, and other/unspecified pregnancy. Do not source data on ectopic pregnancies from the HIPE.
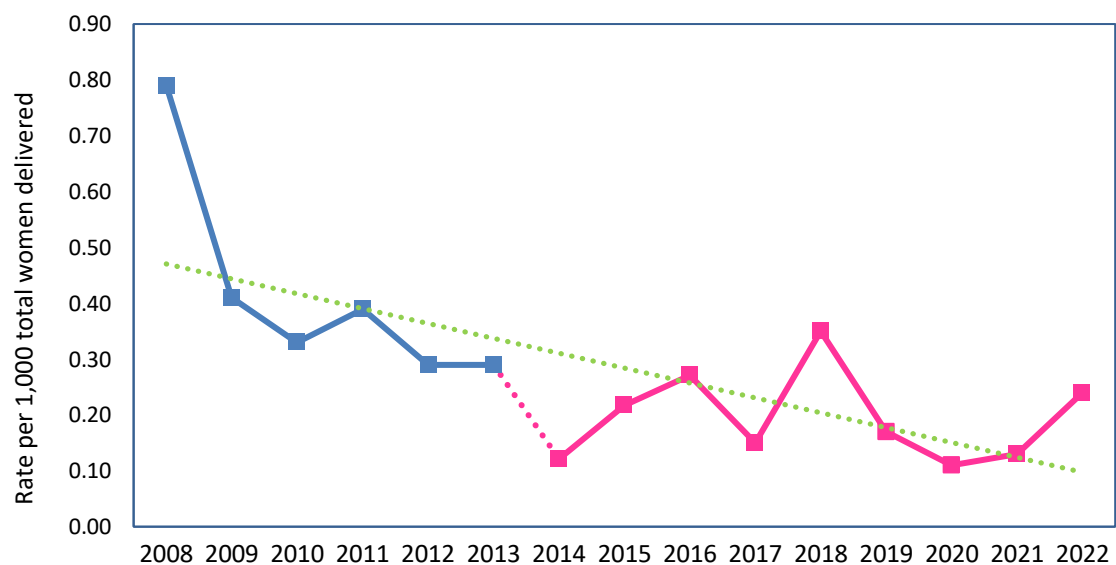

	NPRS						IMIS								
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Rate*	12.7	12.2	13.5	15.0	14.9	16.7	11.9	12.2	14.3	15.2	14.4	16.8	15.1	14.6	16.6

*Per 1,000 women delivered. Sources: HIPE (closed national files for 2008-2013); NPRS 2008-2013; IMIS 2014-2022

5. Eclampsia

Definition   Number of women diagnosed during the current month with eclampsia during any antenatal hospital event or at delivery, including eclampsia in pregnancy, in labour, in the puerperium, and eclampsia unspecified as to time period. Does not include severe pre-eclampsia.
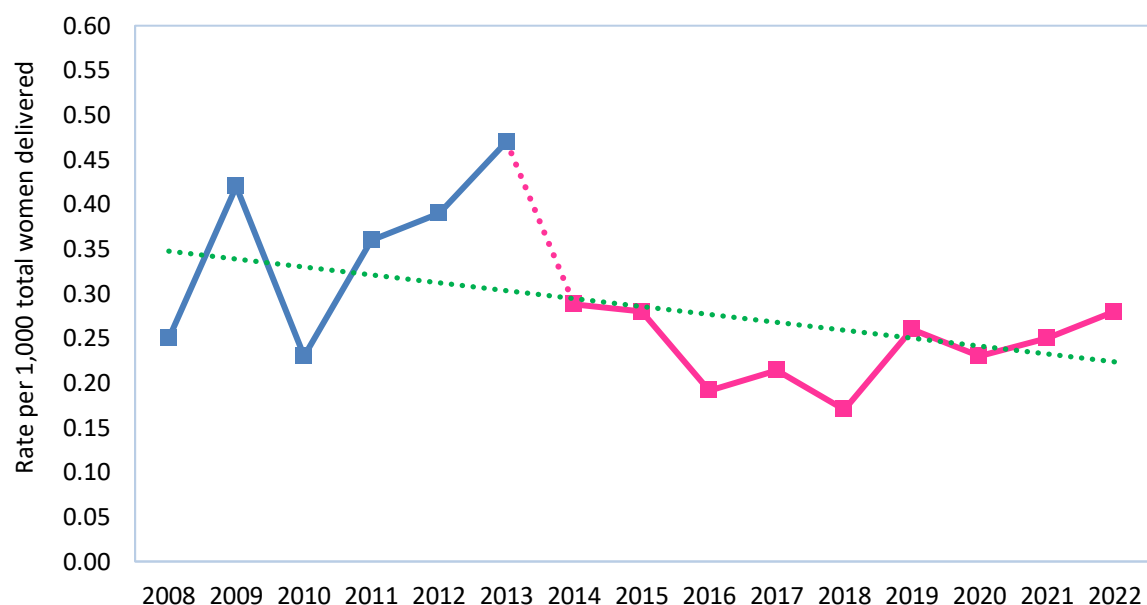

	NPRS						IMIS								
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Rate*	0.79	0.41	0.33	0.39	0.29	0.29	0.12	0.22	0.27	0.15	0.35	0.19	0.11	0.13	0.24

Per 1,000 women delivered

Sources: HIPE (closed national files for 2008-2013); IMIS 2014-2021

6. Uterine rupture

Definition   Number of women diagnosed during the current month with rupture of uterus before onset of labour or during labour, including cases that may not be diagnosed until after delivery. The IMIS definition of uterine rupture refers to complete rupture.
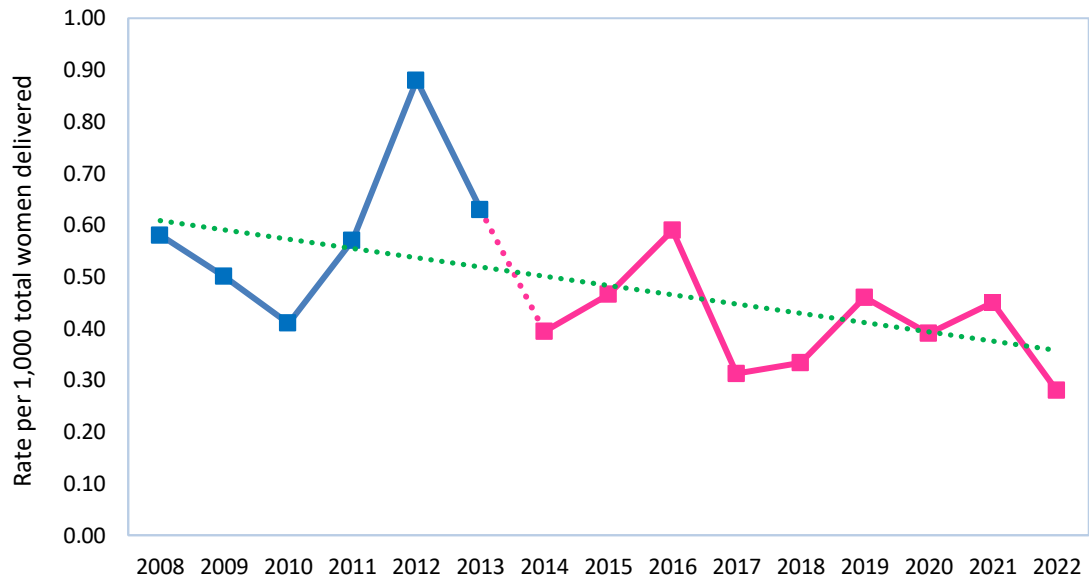

	NPRS						IMIS								
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Rate*	0.25	0.42	0.23	0.36	0.39	0.47	0.29	0.28	0.19	0.21	0.17	0.26	0.23	0.25	0.28

Per 1,000 women delivered

Sources: HIPE (closed national files for 2008-2013); IMIS 2014-2022

7. Pulmonary embolism

Definition   Number of women diagnosed during the current month with obstetric pulmonary emboli in pregnancy and/or the puerperium and excludes embolism complicating abortion or ectopic or molar pregnancy.
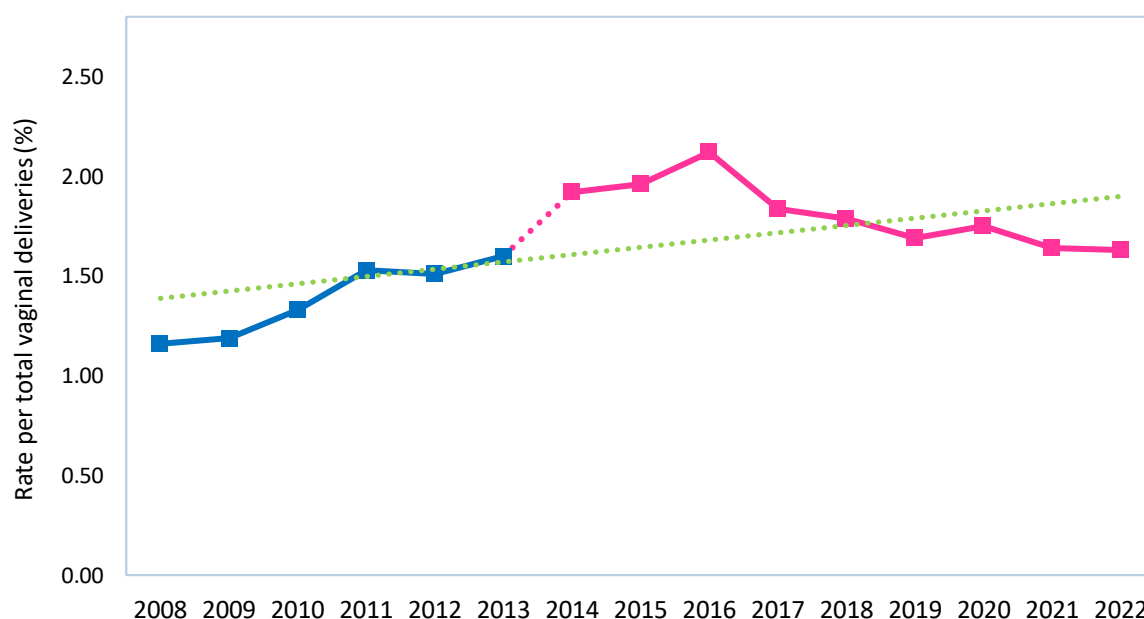

	NPRS						IMIS								
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Rate*	0.58	0.50	0.41	0.57	0.88	0.63	0.39	0.47	0.59	0.31	0.33	0.45	0.39	0.45	0.28

*Per 1,000 women delivered

Sources: HIPE (closed national files for 2008-2013); IMIS 2014-2022

Perineal tears (third-degree and/or fourth-degree tears)

Definition   Number of third-degree and/or fourth-degree perineal lacerations diagnosed during the current month, including tears in the vaginal tissue, perineal skin, and perineal muscles that extend into the anal sphincter and/or go through the anal sphincter and the tissue underneath it.
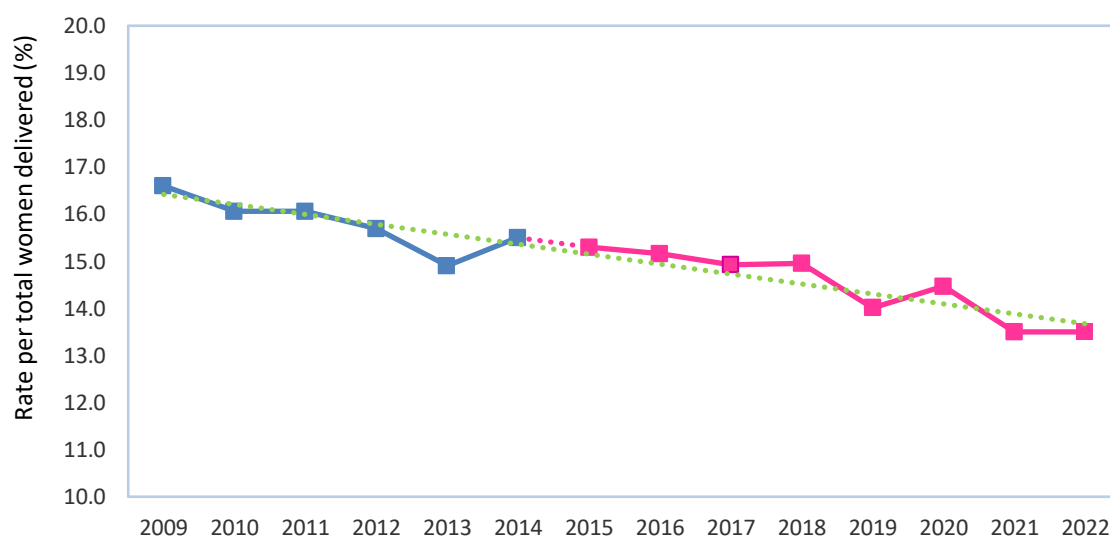

	NPRS						IMIS								
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Rate*	1.16	1.19	1.33	1.53	1.51	1.60	1.92	1.96	2.12	1.84	1.79	1.69	1.75	1.64	1.63

Rate per total vaginal deliveries (%)

Sources: HIPE (closed national files for 2008-2013); NPRS 2008-2013; IMIS 2014-2022

8.   Operative vaginal deliveries (total)

Definition   Number of women undergoing operative vaginal delivery, or instrumental delivery. This includes forceps delivery and vacuum extraction, assisted breech delivery with forceps to after-coming head and breech extraction with forceps to after-coming head. Excludes failed forceps and failed vacuum extraction.
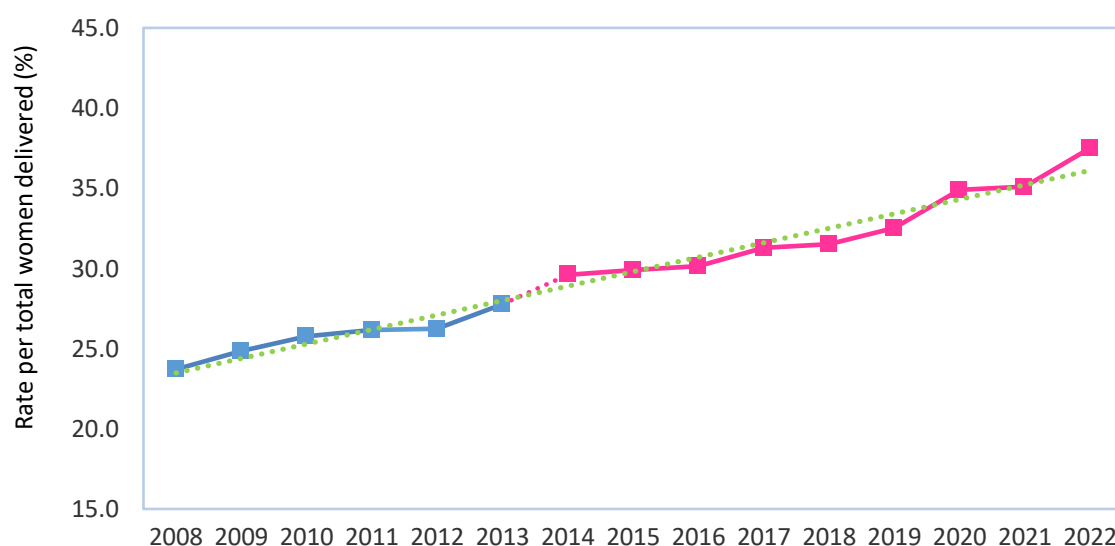

	NPRS						IMIS								
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Rate*	16.1	16.6	16.1	15.7	15.7	14.9	15.5	15.3	15.2	14.9	15.0	14.0	14.5	13.5	13.5

Per total women delivered (%)

Sources: HIPE (closed national files for 2008-2013); NPRS 2008-2013; IMIS 2014-2022

9. Induction of labour (IOL) (total)

Definition   Number of women during the current month undergoing induction of labour, including medical induction of labour, oxytocin; medical induction of labour, prostaglandin; other medical induction of labour. Include surgical induction of labour by artificial rupture of membranes; other surgical induction of labour; and synchronous medical and surgical induction of labour.
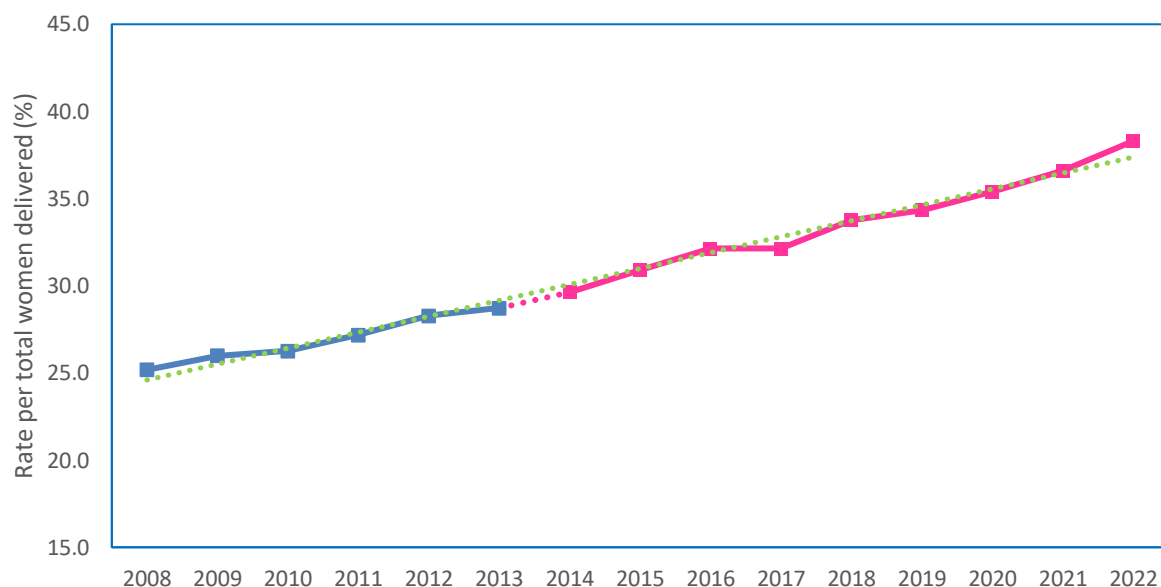

	NPRS						IMIS								
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Rate*	23.7	24.9	25.8	26.2	26.2	27.8	29.6	29.9	30.1	31.3	31.5	32.5	34.9	35.1	37.5

Per total women delivered (%)

Sources: HIPE (closed national files for 2008-2013); NPRS 2008-2013; IMIS 2014-2022

10. Caesarean section (total)

Definition   Number of women during the current month giving birth by Caesarean section, including elective classical Caesarean section, emergency classical Caesarean section, elective lower segment Caesarean section, and emergency lower segment Caesarean section.

	NPRS						IMIS								
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Rate*	25.2	26.0	26.3	27.2	28.3	28.7	29.6	30.9	32.1	32.1	33.8	34.3	35.4	36.6	38.3

Per 100 women delivered (%)

Sources: HIPE (closed national files for 2008-2013); NPRS 2008-2013; IMIS 2014-2022

Irish Maternity Indicator System (IMIS)

National Report 2022, v1.1

National Women and Infants Health Programme

April 2024