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NCPA/HPO Annual Report 2022

General anaesthetics, Neuraxial blocks
and Regional blocks, Administered in
Public Hospitals in Ireland in 2022
as captured in HIPE

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Introduction

This is the 10th consecutive NCPA/HPO Annual Report. The first Annual Report was published by the College of Anaesthesiologists of Ireland (CAI) in 2015 and gave details for the year 2013 (1). The groundwork for these Annual Reports had been laid with the assistance and advice of Professor Miriam Wiley, Professor and Head of the Health Research & Information Division at the Economic and Social Research Institute (ESRI) which at the time dealt with the Hospital In-Patient Enquiry (HIPE) national file (2). The content of these Annual Reports is based on six simple data fields namely, the total number (and type) of anaesthetics administered, the patients' age, gender and ASA status, the procedures for which the anaesthetics were administered and the urgency of these procedures. In 2014 the Healthcare Pricing Office (HPO) was established and was given responsibility for managing the HIPE national file. The data contained in the Reports are assembled and validated by a team of four coding and data managers at the HPO using data from the HIPE national file.

The first Annual Report also contained supplementary data supplied by Organ Donation & Transplant Ireland (ODTI) on the number of patients whose organs had been retrieved for transplantation following a diagnosis of brain stem death, i.e. ASA 6 patient status. This type of data is not routinely collected by HIPE and the ODTA continues to assist in this regard.

The original format of the Reports has been retained during the intervening years and the data presented have been remarkably consistent. Data for the years 2020 and 2021 gave an important insight into the effect of the pandemic on this area of clinical anaesthesia which is still evident in the current Annual Report. Some new data fields and combinations have also been added to the Reports, e.g., Table 7 gives a comprehensive breakdown of patient age categories set against the various hospital groups to which these patients were admitted while Table 8 combines the admission type (emergency, elective, day case and maternity), and the hospital groups. As the number of Annual Reports grew it became possible to include data from previous years alongside current data so that trends could be observed and comparisons made. At this point a total of 5 years of data including the current year, appear in each Report. This has proved to be a particularly interesting aspect of the Reports.

The main purpose of these Annual Reports was to establish a regular and reliable source of information on certain aspects of clinical anaesthetic practice in Ireland - something which was not available at the time - and then to examine in more detail individual components of the Reports by audits conducted locally and nationally. To date two audits have been completed – a pilot audit project conducted in six hospitals to examine the reasons for the high number of ASA 99 codes recorded in national HIPE file, was completed in 2019 (3), and a national audit examining the Incidence of Emergency Readmission following Day case Procedures was completed in 2023 (4) despite the inordinate delays caused by the Covid 19 pandemic. An Occasional Data section has also been added to the Report which contains brief accounts of new or unusual aspects of the data compiled by the HPO.

The 2021 Report included some details of the number of patients reporting a positive Covid 19 test and this Report includes new information on the type and frequency of regional blocks used in clinical practice in Ireland.

Over the past ten years a substantial body of information on certain aspects of clinical anaesthesia in Ireland has been collected and presented in a consistent and easily accessible manner and circulated to departments of anaesthesiology and other institutions throughout the country. The National Clinical Programme for Anaesthesia (NCPA) is indebted to our colleagues at the HPO who provide the core data for these Reports and to the College of Anaesthesiology of Ireland for its continued support and assistance in publicising the Reports. The first ten years of this endeavour have been challenging but hugely rewarding and informative and one can reasonably look forward to the next ten years with a degree of optimism.

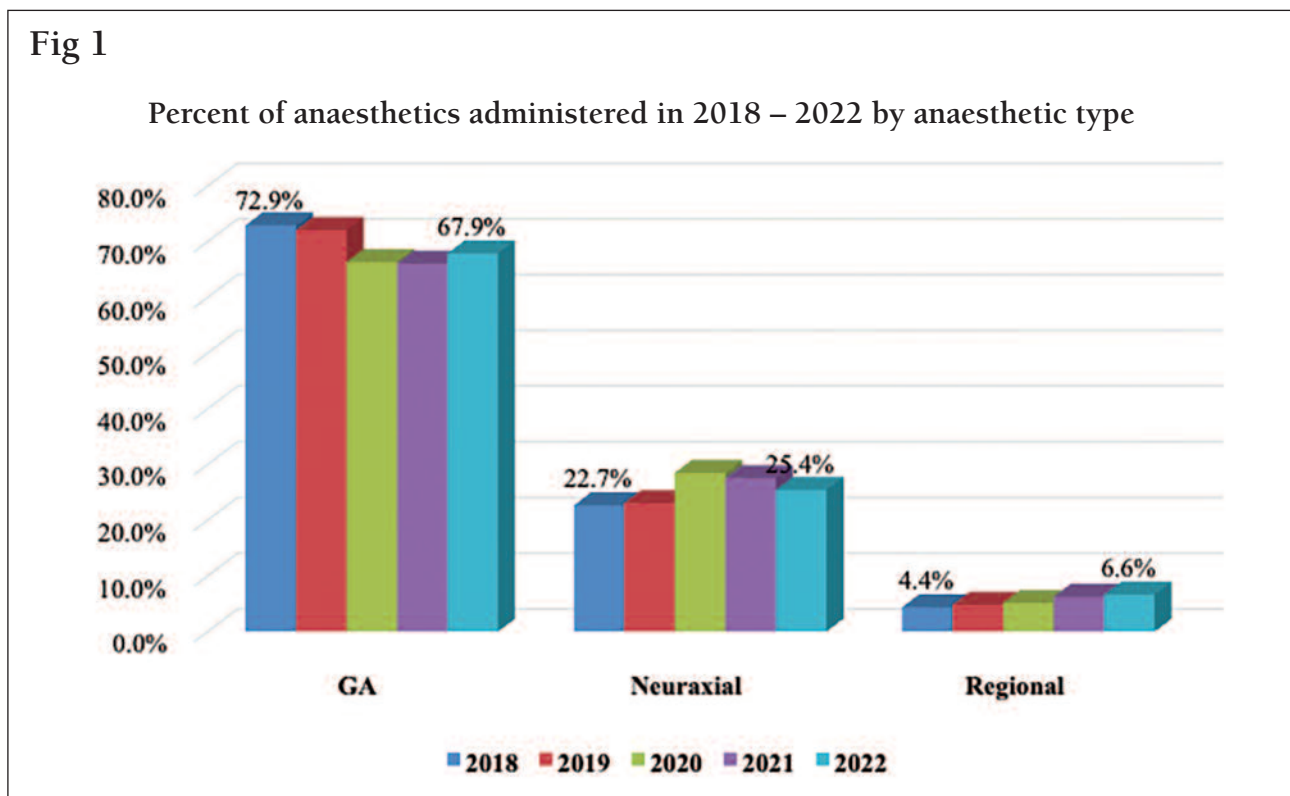
The authors acknowledge that these Annual Reports describes only part of the work of anaesthesiologists.

Part 1: Principal Data

Table 1 & Figure 1 describe the number and type of anaesthetic administered in 2018 – 2022 as reported to HIPE

Table 1
Number of anaesthetics administered in 2018 – 2022 by anaesthetic type

Year	2018	2019	2020	2021	2022
Anaesthetic type	Anaesthetic Count				
General	170,012	165,913	124,534	136,000	146,282
Neuraxial Block	52,825	53,157	53,555	56,774	54,769
Regional	10,250	11,076	9,644	12,911	14,279
TOTAL *	233,087	230,146	187,733	205,685	215,330



*The total number of anaesthetics is the sum of all three types of anaesthetics administered. The anaesthetic count (Table 1) exceeds the discharge count (Table 2) because some patients had more than one anaesthetic at the same time (e.g. GA and Neuraxial block) or more than one anaesthetic during the same admission.

Table 2 & Figure 2 describe the number of patient discharges reporting an anaesthetic procedure(s) in 2018 – 2022 by gender as reported to HIPE

Table 2
Number of patient discharges reporting an anaesthetic procedure(s) in 2018 – 2022 by gender

Year	2018	2019	2020	2021	2022
Gender	Discharge Count				
Male	84,572	82,976	63,569	69,794	74,987
Female	135,360	134,481	112,549	122,734	125,910
TOTAL	219,932	217,457	176,118	192,528	200,897

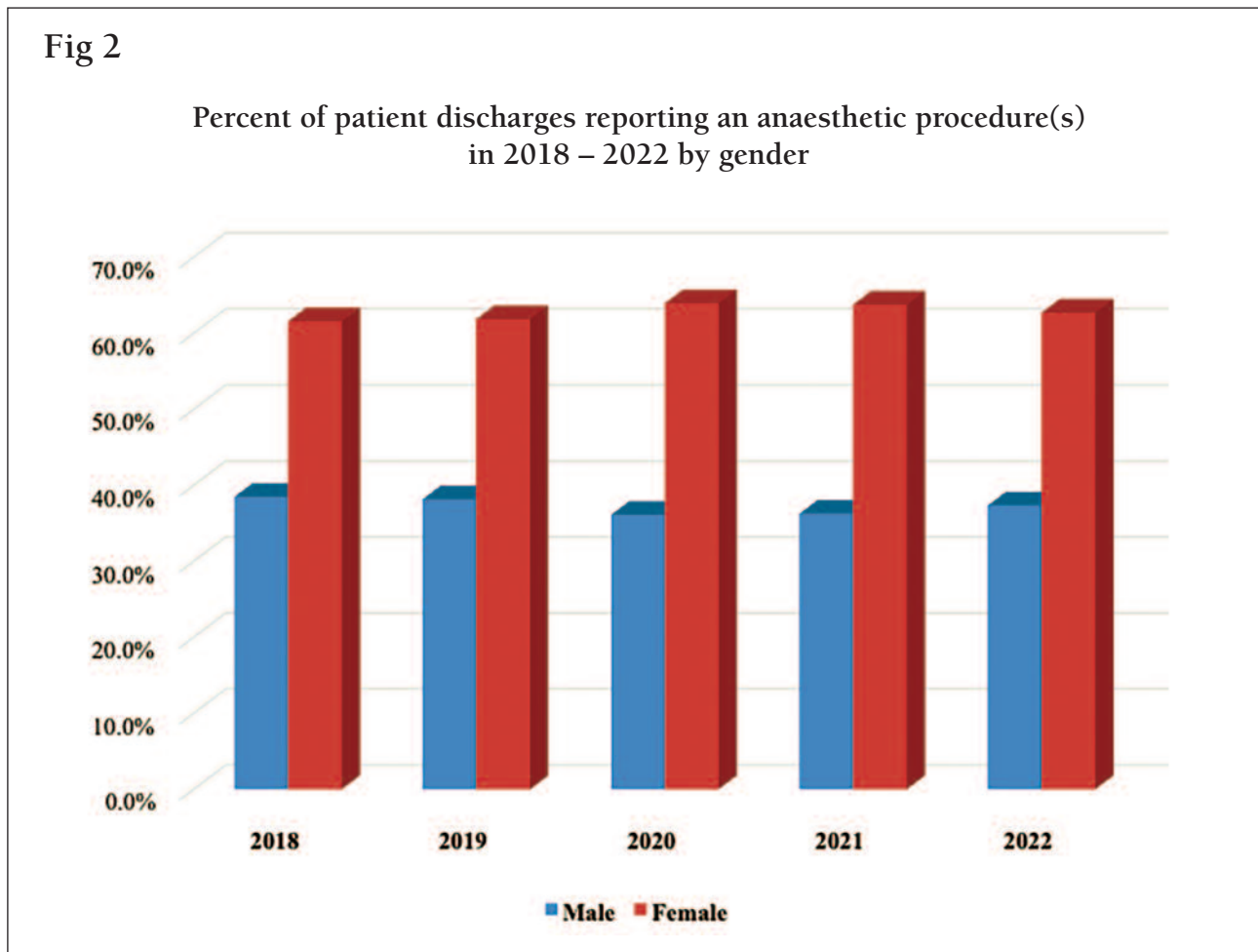
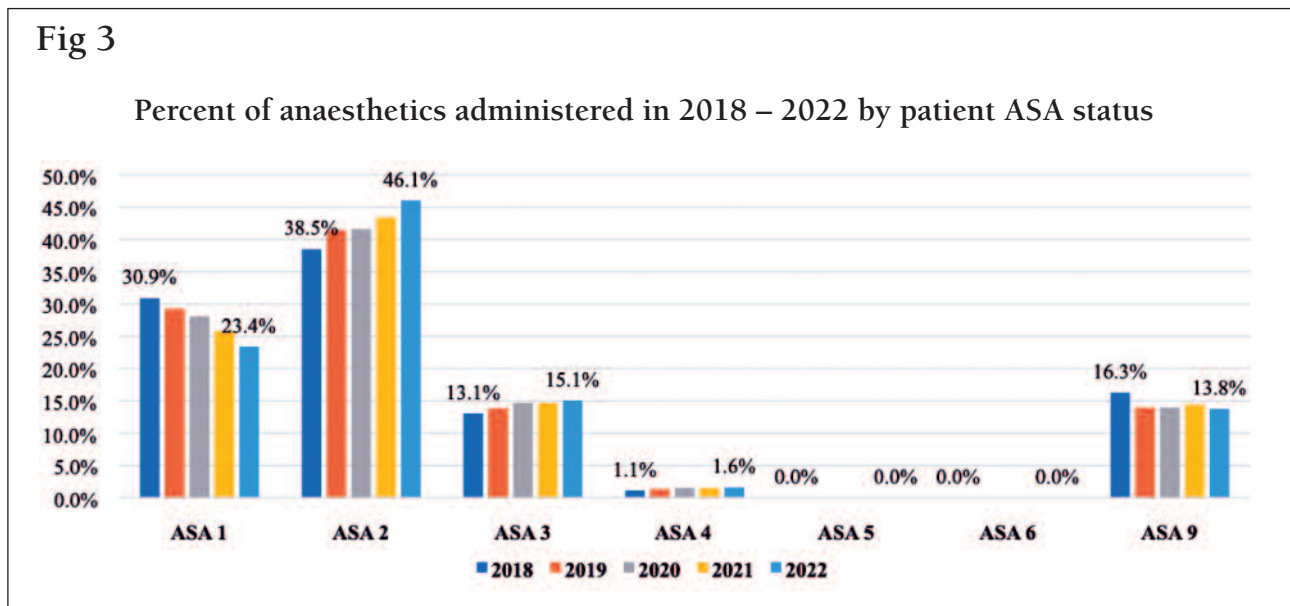


Table 3 & Figure 3 describe the number of anaesthetics administered in 2018 – 2022 by patient ASA status as reported to HIPE

Year		2018	2019	2020	2021	2022
#ASA Score	Patient status	Anaesthetic Count				
1	Normal healthy patient	72,055	67,358	52,697	53,091	50,413
2	Mild systemic disease	89,756	95,378	78,094	89,315	99,202
3	Severe systemic disease limiting activity	30,472	31,928	27,588	30,238	32,439
4	Severe systemic disease posing a constant threat to life	2,662	3,079	2,898	3,144	3,446
5	Moribund patient not expected to survive longer than 24 hrs without surgery	*	241	200	220	211
6	Brain stem death and organ donation for transplant	~	0	0	0	0
9	No documentation on ASA status	37,957	32,162	26,256	29,677	29,619
	TOTAL	233,087	230,146	187,733	205,685	215,330



#ASA scores -This information must be documented on the anaesthetic form before assigning these codes. Where there is no documentation of ASA score or the emergency modifier is not indicated, filler digits 9 should be assigned. Cells with discharges between one and five inclusive are not reported. In the table above such cells have been replaced by ~.Where further suppression is necessary to ensure that such cells are not disclosed it is necessary to suppress the cell with the next lowest discharges with*.

Table 4 & Figure 4 describe the number of anaesthetics administered in 2018-2022 by urgency of procedure as reported to HIPE

Table 4

Number of anaesthetics administered in 2018 – 2022 by urgency of procedure

Year	2018	2019	2020	2021	2022
Anaesthetic Count					
Emergency	32,187	33,650	33,394	37,655	38,606
Non-emergency or not known	200,900	196,496	154,339	168,030	176,724
TOTAL	233,087	230,146	187,733	205,685	215,330

Fig 4

Percent of anaesthetics administered in 2018 – 2022 by urgency of procedure

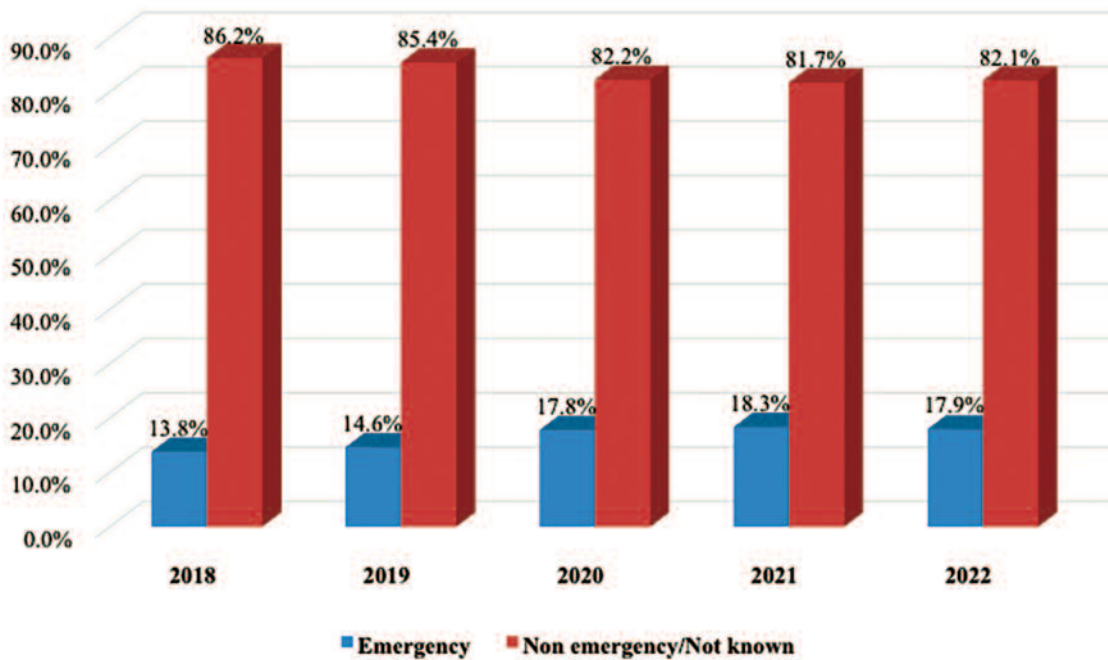


Table 5 & Figure 5 describe the number of patient discharges reporting an anaesthetic procedure(s) in 2018 – 2022 by age as reported to HIPE

Table 5

Number of patient discharges reporting an anaesthetic procedure(s) in 2018 – 2022 by age

Year	2018	2019	2020	2021	2022
Age categories (yrs)	Discharge Count				
Less than 1	1,952	1,775	1,696	1,574	1,529
1 – 5	13,175	12,269	8,597	8,695	9,270
6 – 15	20,603	20,120	14,776	16,473	17,508
16 – 25	18,122	17,649	14,516	15,819	16,545
26 – 35	38,684	37,847	34,750	37,664	35,666
36 – 45	36,636	36,658	31,157	33,837	33,641
46 – 55	25,240	25,222	19,277	20,982	23,031
56 – 65	24,584	24,561	18,844	21,143	23,035
66 – 75	24,240	24,182	18,598	20,360	22,968
76 – 85	13,372	13,761	10,977	12,598	14,108
Over 85	3,324	3,413	2,930	3,383	3,596
TOTAL	219,932	217,457	176,118	192,528	200,897

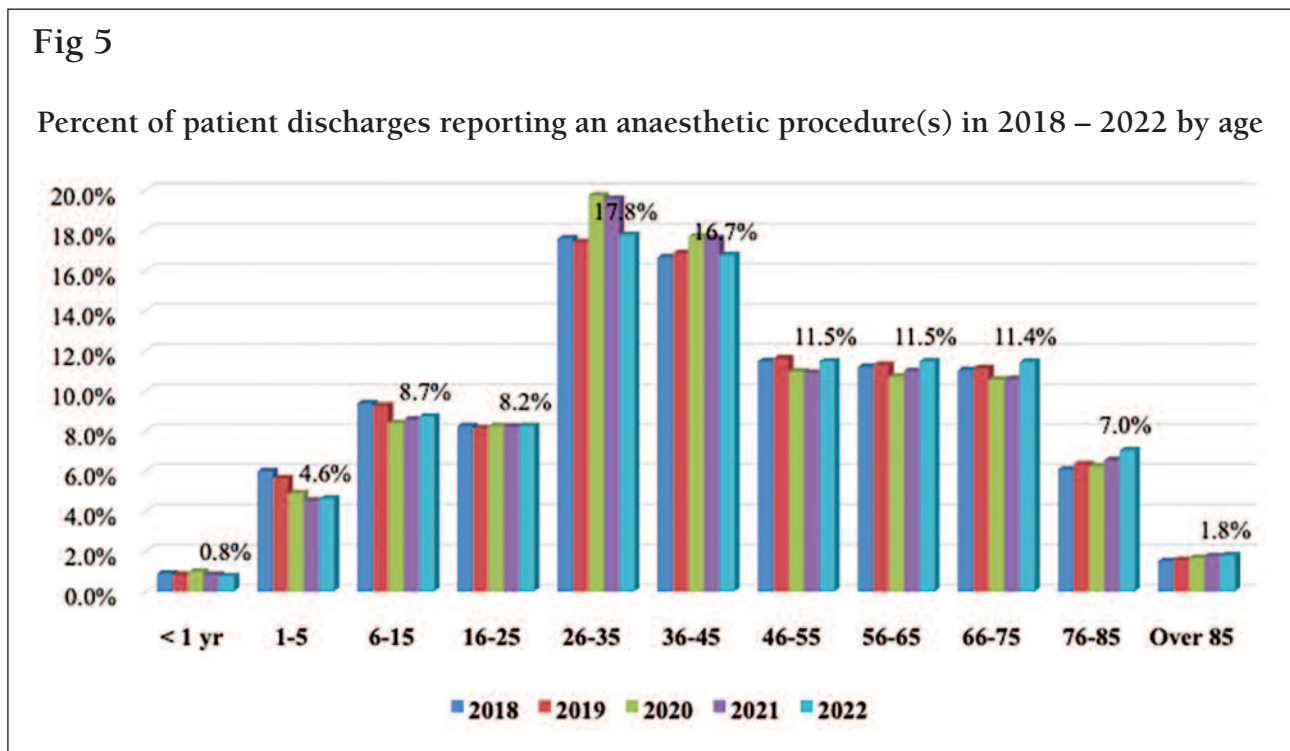


Table 6 describes the number of patient discharges reporting an anaesthetic procedure(s) in 2022 by age and hospital group as reported to HIPE

Table 6							
Number of patient discharges reporting an anaesthetic procedure(s) in 2022 by age and hospital group							
Discharge count by age and hospital group							
Age (years)	Ireland East	RCSI	Dublin Midlands	South S/West	UL Hospital Group	Saolta	Children's Group
Less than 1	0	0	0	63	10	16	1,440
1 – 5	419	247	356	1,692	418	903	5,235
6 – 15	1,178	935	903	3,606	1,176	1,994	7,716
16 – 25	3,384	2,848	2,771	3,531	1,367	2,162	482
26 – 35	8,272	7,380	5,910	6,825	2,615	4,664	0
36 – 45	7,929	6,124	5,739	6,689	2,621	4,539	0
46 – 55	5,898	3,552	3,509	5,014	2,055	3,003	0
56 – 65	6,259	2,602	3,369	5,421	1,906	3,478	0
66 – 75	5,908	2,560	3,130	5,593	1,874	3,903	0
76 – 85	3,557	1,663	1,785	3,327	1,095	2,681	0
Over 85	857	475	451	812	273	728	0
Sub totals	43,661	28,386	27,923	42,573	15,410	28,071	14,873
Total							200,897

The full list of hospitals in each hospital group is given in Appendix 1.

For reporting purposes, discharges aged 17 years and older from Tallaght University Hospital are included in the Dublin Midlands Hospital Group, while discharges aged less than 17 years from Tallaght University Hospital are included in the Children's Hospital Group.

Table 7 describes the number of anaesthetics administered in 2018 – 2022 by the Australian Classification of Health Interventions (ACHI) as reported to HIPE

Intervention Chapter	Anaesthetic Count				
	Year 2018	Year 2019	Year 2020	Year 2021	Year 2022
1. Procedures on the nervous system	5,484	5,321	4,967	5,173	5,015
2. Procedures on endocrine system	1,246	1,325	1,004	1,047	1,011
3. Procedures on eye and adnexa	8,916	9,819	7,113	8,736	10,025
4. Procedures on ear and mastoid process	4,417	4,073	2,447	2,149	2,657
5. Procedures on nose, mouth and pharynx	8,487	8,036	5,087	5,258	6,200
6. Dental services	4,977	4,752	2,714	3,574	4,296
7. Procedures on respiratory system	4,439	4,422	3,213	3,644	3,905
8. Procedures on cardiovascular system	7,831	7,755	6,137	6,025	6,410
9. Procedures on blood and blood forming organs	1,166	1,121	920	1,041	1,057
10. Procedures on digestive system	36,186	35,215	27,715	30,771	31,766
11. Procedures on urinary system	10,309	10,452	8,567	9,064	9,313
12. Procedures on male genital organs	7,049	6,709	4,996	5,540	6,145
13. Gynaecological procedures	24,667	25,054	18,916	19,874	21,997
14. Obstetric procedures	37,230	36,958	38,466	41,445	38,335
15. Procedures on musculoskeletal system	45,752	44,807	37,273	41,699	45,357
16. Dermatological and plastic procedures	12,142	11,738	8,670	9,642	10,257
17. Procedures on breast	5,821	5,651	3,727	4,777	5,530
18. Radiation oncology procedures	574	605	541	581	521
19. Non-invasive, cognitive and other interventions not elsewhere classified	3,292	3,240	2,725	2,809	2,594
20. Imaging services	1,870	1,843	1,399	1,632	1,826
No procedure on same date as anaesthetic procedure	1,232	1,250	1,136	1,204	1,113
TOTAL	233,087	230,146	187,733	205,685	215,330

Table 8 describes the number of patient discharges reporting an anaesthetic procedure(s) in 2022 by admission type and hospital group as reported to HIPE

Table 8

**Number of patient discharges reporting an anaesthetic procedure(s) in 2022
by admission type and hospital group**

Discharge count by admission type and hospital group

	Ireland East	RCSI	Dublin Midlands	South S/West	UL Hospital Group	Saolta	Children's Group	TOTAL
Day cases	14,199 (32.3%)	6,713 (23.6%)	8,021 (28.7%)	15,361 (36.1%)	5,526 (35.9%)	8,520 (30.4%)	8,348 (56.4%)	66,644 (33.2%)
In Patients								
Elective	12,149 (27.8%)	4,988 (17.6%)	5,756 (20.6%)	10,178 (23.9%)	3,654 (23.7%)	6,240 (22.2%)	2,848 (19.1%)	45,813 (22.8%)
Emergency	8,121 (18.6%)	7,108 (25.0%)	7,579 (27.1%)	9,409 (22.1%)	3,072 (19.9%)	7,310 (26.0%)	3,641 (24.5%)	46,240 (23.0%)
Maternity	9,272 (21.2%)	9,577 (33.7%)	6,567 (23.5%)	7,625 (17.9%)	3,158 (20.5%)	6,001 (21.4%)	0 (0%)	42,200 (21.0%)
Totals	43,661	28,386	27,923	42,573	15,410	28,071	14,873	200,897 (100.0%)

Note: The Admission Type is the category of admission relating to the episode of care and is downloaded directly from the patient administration system.

Part 2:

Supplementary data

ASA 6 Patient status

ASA 6 denotes a patient with a diagnosis of brain stem death who is donating organs for transplant.

Data from ODTI* indicate that 73 patients in 2022 donated organs following a diagnosis of brain stem death.

Deceased Organ Donors					
Year	2018	2019	2020	2021	2022
Beating heart	77	78	56	57	73
Non beating heart	4	7	7	8	13
TOTAL	81	85	63	65	86

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Organ Donation and Transplant Ireland has been delegated the regulatory functions assigned to the Health Service Executive (HSE) in Statutory Instrument (SI) 325 (2012), European Union (Quality and Safety of Human Organs Intended for Transplantation) Regulations 2012.

This annual ODTI report has been produced in compliance with part 5, SI 325 (2012)

ODTI* Organ Donation and Transplant Ireland
 2nd Floor, Temple Theatre, Hardwicke Place, Temple Street, Dublin 1.
 Email: odti@hse.ie

Occasional data

Since 2013 the National Clinical Programme for Anaesthesia, the Healthcare Pricing Office and the College of Anaesthesiologists of Ireland have been publishing annual reports containing data on the number of general anaesthetics (GAs), neuraxial blocks and regional blocks administered in public hospitals in Ireland (1).

From 2013 to 2019, just before the pandemic struck, the number of GAs and neuraxial blocks administered has fallen by 4.4% and 0.8% respectively but the number of regional blocks has risen by 50.8%. The reason for this significant increase in regional blocks is not immediately obvious but the now widespread use of ultrasound in anaesthetic practice is undoubtedly a factor.

A detailed account of regional blocks administered over that period seems an appropriate way of marking the 10th consecutive year of publishing these data.

1. The HIPE coding system records five categories of regional blocks: **Head & Neck, Upper Limb, Trunk, Lower Limb and Bier's block (Intravenous regional anaesthesia)**.
2. The number of regional blocks has risen from 7,143 in 2013 to 12,488 in 2021 (Fig A)
3. The number of blocks in all five categories has increased since 2013. Head & Neck comprises the largest category. (Fig B).

Bier's block is the smallest category representing just 3% of all blocks. Some of these were undoubtedly administered as pain management procedures which would not normally be included in these reports and they have not been included here.

4. The male/female ratio of the patients receiving these blocks is almost 50:50 but with a slight predominance of female patients (Fig C).
5. Regional blocks were administered to patients in all age groups from under 5 years to over 85 years and the number of blocks has risen across all age groups. Patients aged 66 – 75 years comprise the largest group receiving regional blocks. The largest increase (141%) in the number of regional blocks administered occurred in the 6 – 15 years age group. This is an interesting finding as the number of children in this age group receiving an anaesthetic has fallen by 17.7% since 2013. The second largest increase (95.5%) occurred in the >85 years age group. The number of patients in this age group receiving an anaesthetic has increases by 8.2% since 2013. (Fig D) & (Table 5 page 8 of main Report).
6. While many regional blocks were administered in combination with GAs and or neuraxial blocks, between 58.9% and 64.6% of procedures were conducted with regional blocks alone (Fig E).
7. Between 49.2% and 58.4% of regional blocks were administered to day case patients (Fig F).
8. The top 10 procedures carried out with a regional block alone for the years 2013 and 2021 are shown in Fig G1 & G2 and account for 73% and 64% of all procedures carried out with a regional block alone for those years. Ophthalmic procedures and a variety of orthopaedic procedures comprise the vast majority of these along with a small number of GU procedures. However even when the orthopaedic procedures are grouped together, they account for only a small proportion of the total with ophthalmic procedures making up 83.4% and 96.6% of the total for the years 2013 and 2021 respectively. This pattern is repeated for the intervening years 2015, 2017 and 2019.

Fig A

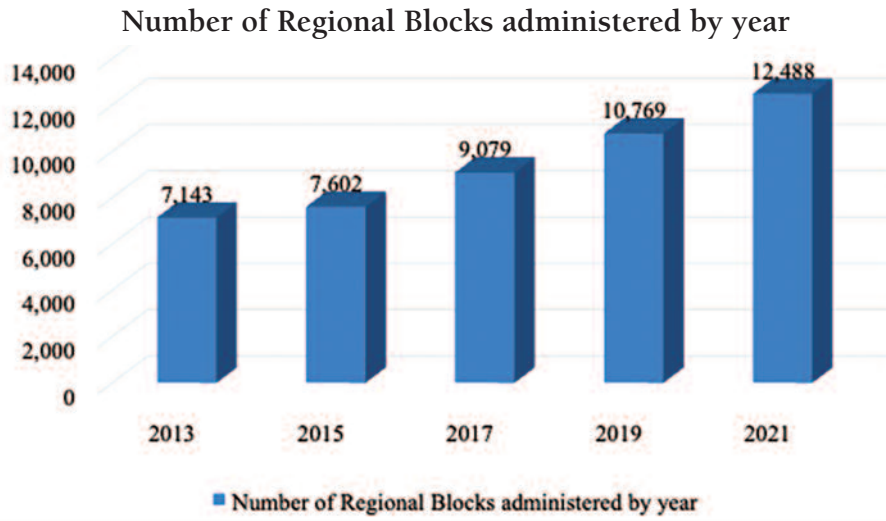


Fig B

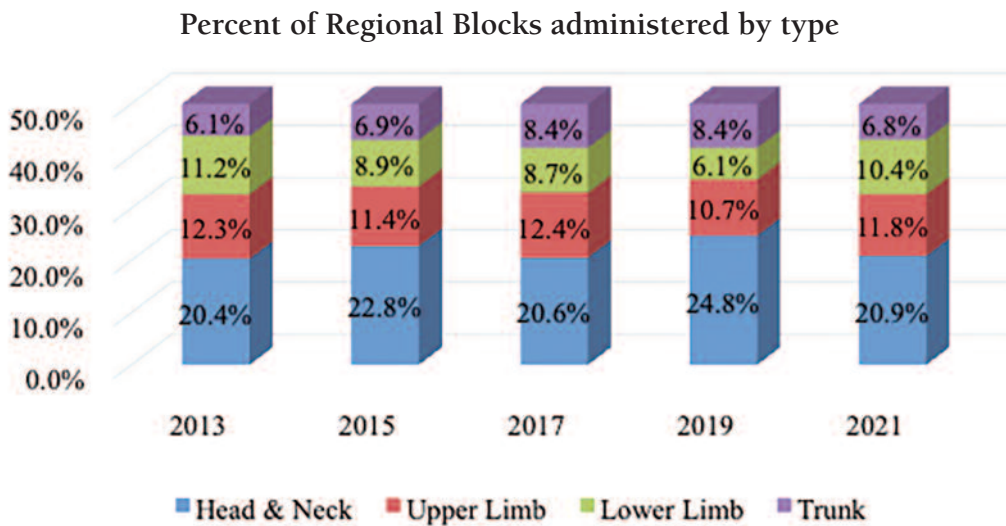


Fig C

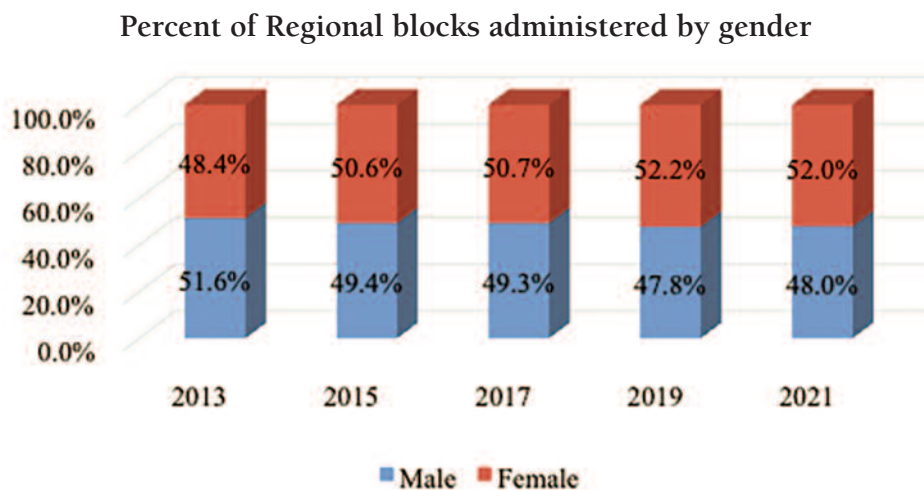
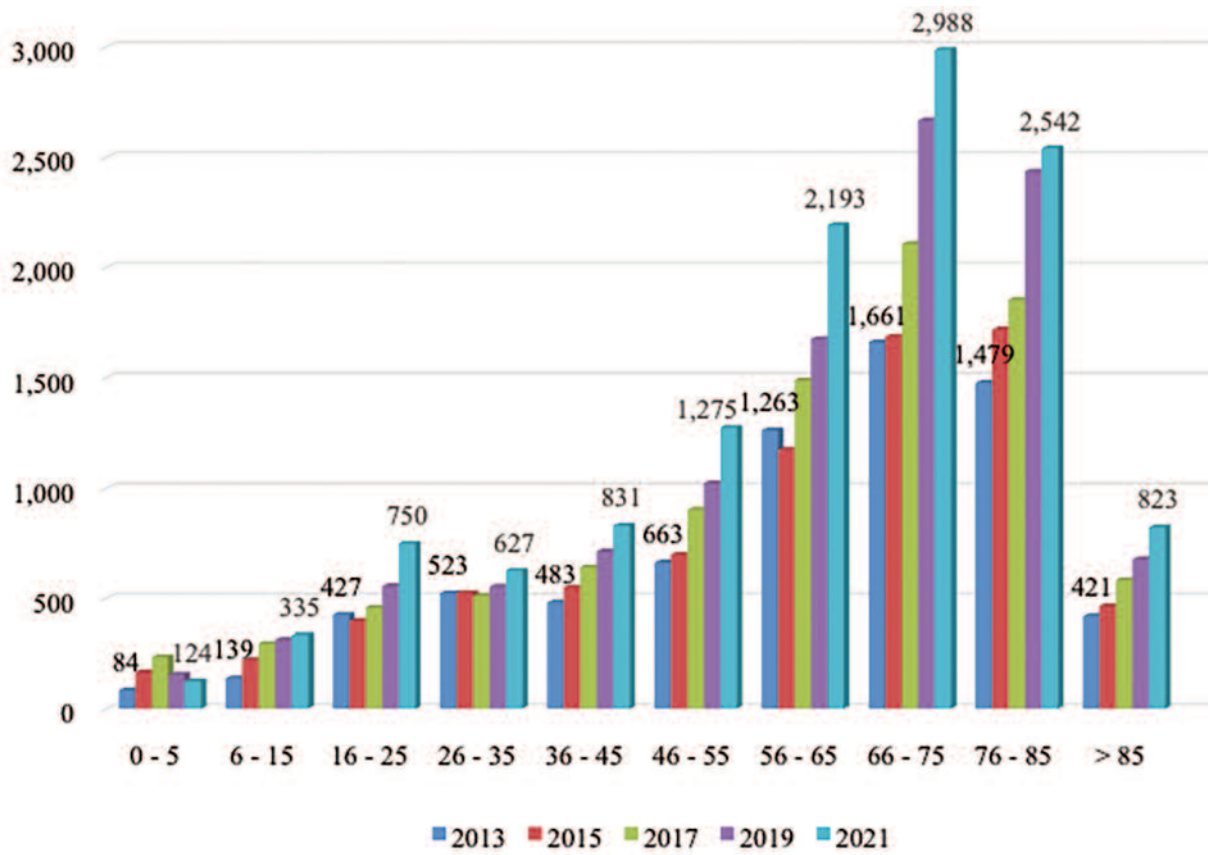


Fig D

Number of Regional Blocks administered by age (yrs)



Note: Only figures for the years 2013 and 2021 are given in each age group to avoid congestion

Fig E

Percent of regional blocks administered alone or in combination with a GA and or a neuraxial block

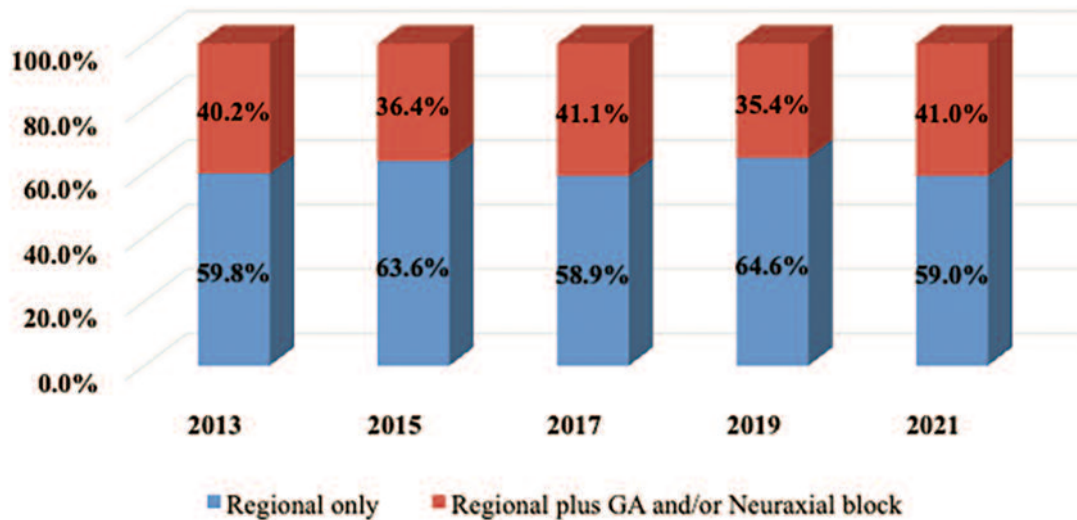


Fig F

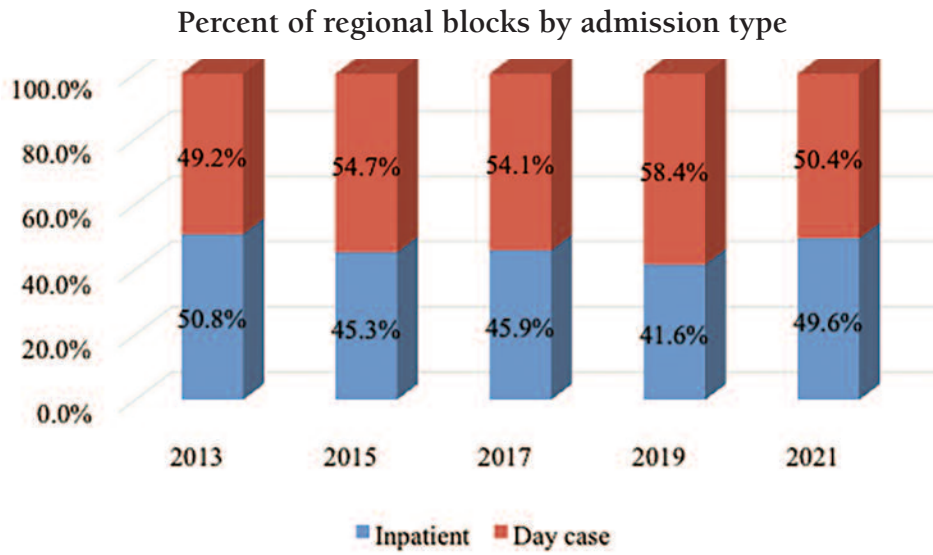
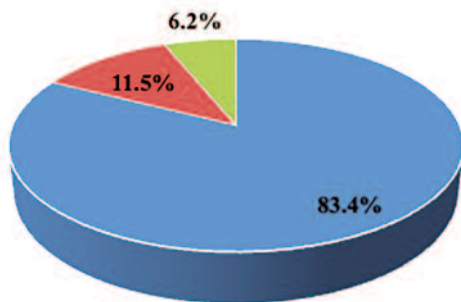


Fig G1

Top 10 procedures with a regional block alone in 2013



■ Ophthalmic procedures ■ Orthopaedic procedures ■ GU procedures

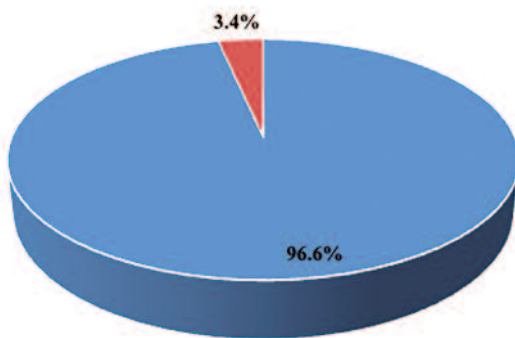
Ophthalmic procedures include extra capsular extraction of lens and administration of therapeutic agent into posterior chamber,

Orthopaedic procedures include palmer fasciotomy, skin debridement, primary repair of nail bed, release of carpal tunnel, reduction of fracture of distal end or radius and metacarpus.

GU procedures include transrectal needle biopsy of prostate.

Fig G2

Top 10 procedures with a regional block only in 2021



■ Ophthalmic procedures ■ Orthopaedic procedures

Ophthalmic procedures include phacoemulsification of lens, removal of vitreous, destruction procedures on retina, choroid or posterior chamber, trabeculectomy.

Orthopaedic procedures include reduction of fracture of distal radius, wedge resection of toe nail, skin debridement, palmar fasciotomy, release of Dupuytren's contracture.

Discussion & Conclusion

The data in this Annual Report shows a continued increase in anaesthetic activity since the pandemic years of 2020 and 2021 but it has still not recovered to the level seen in the pre pandemic year of 2019.

The total number of anaesthetics given in 2022 was 215,330 which is 6.4% fewer than for 2019 (Figure 1 & Table 1) while the number of patients who received an anaesthetic in 2022 was 200,897, 7.6% fewer than 2019. It is interesting to note however that while the number of general anaesthetics (GAs) given in 2022, (146,282), is still below that for 2019, (165,193), the pandemic has had almost no effect on the number of neuraxial blocks and regional blocks given. The upward trend in the number of these two blocks given annually since 2013 has continued with 54,769 neuraxial blocks and 14,274 regional blocks given in 2022 representing an increase of 3% and 28.9% respectively on the figures for 2019. More detail on the regional blocks is given in the Occasional Data section of this report.

The percentage of male and female patients who received an anaesthetic in 2022 is 9.6% and 6.4% lower than in 2019 – the male to female ratio remains at 2:3 (Figure 2 & Table 2)

The changing pattern of ASA scores is shown in Figure 3 & Table 3. The pre Covid 19 pattern appears to have been restored with the number of ASA 1 scores continuing to drop slowly while ASA 2 and 3 scores show a small but steady increase. The number of ASA 9's, used by HIPE coders when there is no ASA score recorded on the anaesthetic record sheet, appears to have plateaued at 13.8%. This nevertheless represents a significant improvement over the years in this important aspect of anaesthetic record keeping – the corresponding figure for ASA 9 scores in 2013 was 34.2%.

The breakdown of emergency and elective cases is shown in Figure 4 & Table 4. There were 38,606 anaesthetics given in 2022 for emergency procedures which represents a 14.7% increase on the number for 2019 and is the highest figure yet recorded. As noted in previous Annual Reports, the number of emergency cases has increased every year since 2013 (there was an insignificant fall of 0.8% from 2019 to 2020, the first year of the pandemic) and is unique in this regard among all other measures of anaesthetic activity that these Reports contain.

The age categories of patients who received an anaesthetic in 2022 are shown in Table 5 & Figure 5. Prior to the pandemic there was a steady if moderate decrease in the number of patients in the age groups of less than 36 years and a corresponding increase in numbers in the age groups 36 and older. The pandemic affected different age groups in different ways resulting in a mixed pattern overall and this effect has not been reversed yet. Of note however is the fact that no age group has yet returned to the levels of 2019, with the exception of the two oldest categories, 76 to 85 years and over 85 years both of which show increases of 2.5% and 5.4% respectively.

Table 7 shows the twenty Intervention Chapters of the Australian Classification of Health Interventions (ACHI) and the number of anaesthetics administered for procedures in each Chapter for the years 2018 to 2022. The effect of the pandemic is still evident and activity in seventeen of the Intervention Chapters is still below that of 2019, with just three Chapters, Procedures on the Eye and adnexa, Obstetric Procedures and Procedures on the Musculoskeletal system, showing small increases of 2.1%, 3.7% and 1.2% respectively. The number of patients donating organs for transplant following a diagnosis of brain stem death i.e. ASA 6, was 73 in 2022. (Supplementary data). This represents an increase of 28.1% on the figure for 2021 and although a welcome recovery, has not yet reached the figure of 78 for 2019. There were 13 beating heart donors.

All acute public hospitals participate in HIPE. Please note that the 2020 and 2021 data provided does not include any public activity performed in private hospitals under the 2020 private hospital agreements.

Acknowledgements

The NCPA acknowledges the support and expertise of the following people and the institutions they represent in preparing this report.

Healthcare Pricing Office	Ms Jacqui Curley Ms Helen Nolan Ms Laura Metcalfe Mr Shane McDermott Mr Brian McCarthy Mr Rory O'Reilly
College of Anaesthesiologists of Ireland	Professor George Shorten, President Dr Brian Kinirons, Immediate Past President Dr Wouter Jonker, Consultant Anaesthetist, Sligo University Hospital
Organ Donation and Transplant Ireland	Professor Jim Egan, Director, ODTI Ms Brenda Poole, Donor Co-ordinator, ODTI
NCPA Working Group Members	Ms Una Quill, NCPA Programme Manager Ms Aileen O'Brien, NCPA Nurse Lead Dr Michael Dockery, NCPA National Clinical Lead Dr John Cahill

References

1. National Clinical Programme for Anaesthesia. Audit Work Stream. Can HIPE be used as an Audit Tool or Anaesthesia? Available at hse.ie/anaesthesia – Programme Documents and Resources
2. Annual Report 2013 General anaesthetics, Neuraxial blocks and Regional blocks administered in public hospitals in Ireland in 2013 and captured in HIPE available at hse.ie/anaesthesia – Programme Documents and Resources
3. ASA 99 Pilot Audit Project Report- Part 1. Audit Results from 6 Departments of Anaesthesiology Available at hse.ie/anaesthesia – Programme Documents and Resources
4. National Audit of Emergency Readmissions following day case Procedures for 2018. Available at hse.ie/anaesthesia – Programme Documents and Resources

APPENDIX 1

Hospital Groups

Ireland East

Mater Misericordiae University Hospital,
 St Vincent's University Hospital,
 Midland Regional Hospital Mullingar,
 St Luke's Hospital Kilkenny,
 Wexford General Hospital,
 Our Lady's Hospital Navan,
 St Colmcille's Hospital,
 St Michael's Hospital Dun Laoghaire,
 National Maternity Hospital,
 Cappagh National Orthopaedic Hospital,
 The Royal Victoria Eye and Ear Hospital, Dublin.

RCSI

Beaumont Hospital,
 Our Lady of Lourdes Hospital Drogheda,
 Connolly Hospital,
 St Joseph's Hospital, Raheny,
 Cavan General Hospital,
 Rotunda Hospital,
 Louth County Hospital,
 Monaghan Hospital.

Dublin Midlands

St James's Hospital,
 AMNCH-Tallaght University Hospital**,
 St Luke's Hospital, Rathgar,
 Midland Regional Hospital Tullamore,
 Naas General Hospital,
 Midland Regional Hospital Portlaoise,
 The Coombe Women & Infants University Hospital.

South/South West

Bantry General Hospital,
 Cork University Hospital,
 University Hospital Kerry,
 Mallow General Hospital,
 Mercy University Hospital,
 South Infirmary Victoria University Hospital,
 South Tipperary General Hospital, Clonmel,
 University Hospital Waterford,
 Kilcreene Orthopaedic Hospital.

University of Limerick Hospital Group (U L Hospital Group)

University Hospital Limerick,
 University Maternity Hospital, Limerick,
 Croom Orthopaedic Hospital Limerick,
 Ennis General Hospital,
 Nenagh General Hospital,
 St John's Hospital Limerick.

Saolta

University Hospitals Galway including
 Merlin Park Hospital,
 Sligo University Hospital,
 Letterkenny University Hospital,
 Mayo University Hospital,
 Portiuncula University Hospital,
 Roscommon University Hospital

Children

Our Lady's Children's Hospital Crumlin,
 The Children's University Hospital Temple Street,
 AMNCH-Tallaght University Hospital Paediatrics.

** For reporting purposes, discharges aged 17 years and older from Tallaght University Hospital are included in the Dublin Midlands Hospital Group, while discharges aged less than 17 years from Tallaght University Hospital are included in the Children's Hospital Group.

