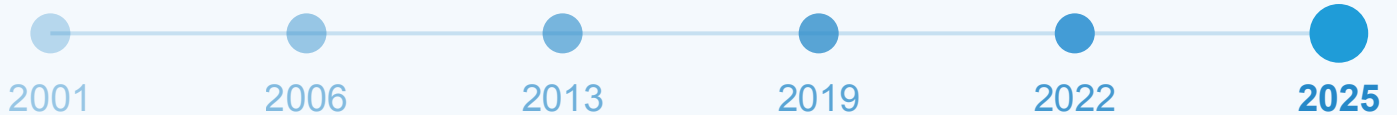


NNTTP
25

**NATIONAL NEONATAL
TRANSPORT PROGRAMME**



**NATIONAL NEONATAL
TRANSPORT PROGRAMME**

National Neonatal Transport Programme (NNTTP)

25 Years of Dedicated Service 2001–2025

www.nntp.ie

Compiled and written by

Ann Bowden

National Neonatal Transport Programme Coordinator.

On behalf of NNTP Clinical Management.

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The 25th Anniversary of the National Neonatal Transport Programme

I am honoured to write the preface marking the 25th anniversary of the establishment of the National Neonatal Transport Programme (NNTP). It is an endeavour that has been one of the most remarkable successes in Irish medicine. It is the gem of our national neonatal service. Since its inception it has transported almost 11,000 babies. It was established in March 2001. For the first 13 years it was a day time service that operated between 9am and 5pm, 7 days a week. It was expanded to a 24/7 service on December 2, 2013 which led to more than a doubling of the number of transports from 300 to 650 annually. In May 2025 the NNTP commenced the bidirectional transport of babies, that is the addition of a repatriation limb to the existing retrieval service. Currently there are 50 acute retrievals (red team) and 25 repatriations (blue team) every month. The latter are important for facilitating patient flow through the system and for the provision of family centred care closer to the family home.

Throughout its 25 years, the NNTP has been based on a weekly rotation system out of the NICUs at the 3 Dublin maternity hospitals, the Rotunda, the Coombe, and the National Maternity hospital. This close clinical link has been invaluable in terms of the continuity and stability for the service. It has provided the NNTP with the complete guarantee of skilled neonatal nursing and medical staff for every transport.

The NNTP is built on the solid foundation that the safe transport of ill babies is an essential component of a regionalised neonatal service. Neonatal transport is now a distinct specialised area within neonatal medicine. Its operation requires a well-trained experienced team, appropriate equipment, a bespoke neonatal ambulance, evidence based guidelines, structured handovers, and high quality documentation. In essence there are many moving parts that must be synchronised in order to achieve the goal of a safe transport.

The single national governance of the Irish service guarantees the avoidance of variation in the delivery of care. A triage system is applied to every request to determine the best skill mix for each individual transport. The NNTP maintains a database of all neonatal transports which is used to produce audits and to provide clinical benchmarking.

The NNTP is an exemplar of how a national high quality operating system should work. Quality is best defined as something that we know to be good. The NNTP is good in so many ways. It provides a rapid, responsive retrieval service for sick babies requiring neonatal intensive care or surgery. It provides stabilisation at the referring hospital, safe skilled transport, structured handover, formal reviews and quality improvement. It is the strategic link between the Levels 1,2,3 neonatal units and with the surgical and specialist neonatal services at CHI (Children's Health Ireland). The positive benefits for newborn babies since the commencement of the NNTP in 2001 have been logarithmic. Preventable complications during transport, including hypothermia, hypoglycaemia, and airway problems have been virtually eliminated.

Preface

The transfer of ill babies has become rapid, efficient, effective, and safe. This is so important because they are vulnerable to rapid deterioration, and the margin for error is narrow.

The NNTP over its 25 year existence has become a highly regarded neonatal tradition. Tradition means that an organisation has been built on the shoulders of very good innovative people. Tom Clarke and Frieda Gorman followed by Ann Twomey were the neonatologists who developed the concept and drove the establishment of the service. Ann Bowden has been the programme co-ordinator and the heartbeat of the NNTP from its early existence. The subsequent major contributors to the service are Jan Franta who was the first consultant neonatologist appointment, Hana Fucikova, Nurul Aminudin, Jyothsna Purna, Carmel Moore, Eoin O'Curraín, Dermot Doherty, Josephine Morris, Tara Moore, Petra Miletinova, the neonatal nurses, NCHDs, ambulance crews, and clinical engineers.



The NNTP is good in so many ways. It provides a rapid, responsive retrieval service for sick babies requiring neonatal intensive care or surgery.

The next 25 years will pose many challenges for neonatal transport medicine. I am confident that the NNTP with its robust, effective management structures will be able to provide the necessary innovative solutions. One of the next frontiers will be the expansion of air transport services. Air offers clear benefits when road journeys are long, and when getting the baby to the treatment centre is time-critical. Telemedicine has the potential to provide audio-visual communication giving immediate and continuous advice and support between the transferring hospital and the transport team prior to its on-site arrival.

The NNTP has made a truly invaluable contribution to the care of sick babies. Its services are greatly appreciated by all those working in both the referring and receiving hospitals and the babies and their families who benefit from it. It is a national treasure. We need to ensure that it continues to receive the necessary investment in its infrastructure and staffing.

Dr JF Murphy

National Clinical Lead in Neonatology emeritus

Programme Team

Consultant Neonatologists (NNTP)

Dr. Hana Fucikova — NNTP Clinical Lead (2024–present)

Dr. Jan Franta — Clinical Lead (2014–2024), NNTP Consultant Neonatologist

Dr. Nurul Aminudin — NNTP Consultant Neonatologist

Dr. Carmel Moore — NNTP Consultant Neonatologist

Dr. Jyothsna Purna — NNTP Consultant Neonatologist

Programme Coordination

Ms Ann Bowden — NNTP Programme Coordinator

Clinical Nurse Specialists (NNTP)

Ms Josephine Morris

Ms Petra Miletinova

Ms Tara Moore

Clinical Teams

Nursing, midwifery, NCHD and fellow staff based across the three Dublin maternity hospitals, delivering neonatal transport as part of the National Neonatal Transport Programme

National Ambulance Service Critical Care Retrieval Services (NASCCRS) and National Emergency Operations Centre (NEOC)

Dr. Dermot Doherty — NASCCRS Clinical Director

Ms Lucyna Holton — NAS Operations Manager

Emergency Medical Technicians and Ambulance Assistants

Emergency Medical Technicians (EMTs) and ambulance personnel providing critical care retrieval and transport services

NEOC call handling and control staff coordinating emergency transport requests

Clinical Engineering Support

Mr Eoghan Hayden and the Clinical Engineering Department of the National Maternity Hospital

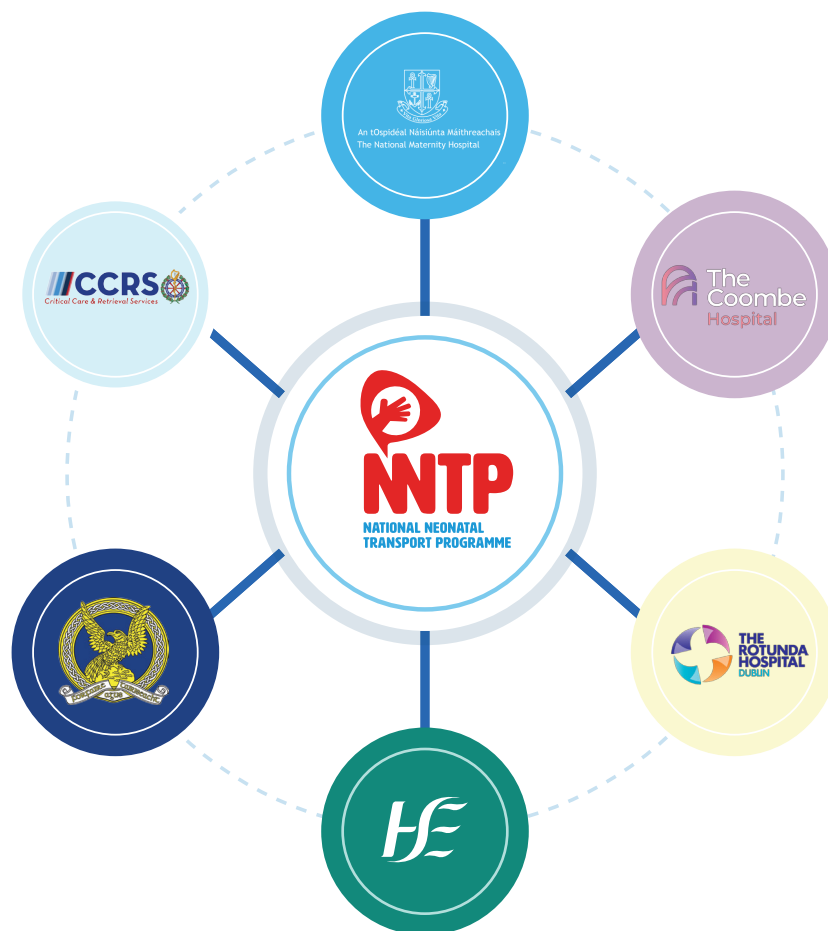
(Staff list as of 2025)

Mission Statement

The National Neonatal Transport Programme is committed to:

- Delivering safe, timely, and expert neonatal retrieval and repatriation services
- Ensuring equitable access to specialist neonatal and surgical care across Ireland
- Providing consultant-led, evidence-based transport medicine
- Supporting national neonatal networks through governance, education, and research
- Maintaining family-centred care throughout the transport journey
- Driving national standards in stabilisation, therapeutic hypothermia, and thermal management

Together, these commitments underpin the NNTP as a nationally coordinated, collaborative model of care that supports infants and families across Ireland.



Collaborators

- | | | |
|--|---|--|
|  The National Maternity Hospital
Dublin maternity unit |  The Coombe Hospital
Dublin maternity unit |  The Rotunda Hospital
Dublin maternity unit |
|  NASCCRS
National Ambulance and Critical Care Retrieval Services |  DOH / HSE
Dept of Health & HSE |  Irish Air Corps
Air Ambulance |

Executive Summary

Executive Summary

This report presents a 25-year review of the National Neonatal Transport Programme (NNTP), examining its development, clinical and operational activity, and its role within the national neonatal care system. While it reflects the evolution of the service since its establishment, the majority of activity presented relates to the modern 24-hour, consultant-led service model, providing the most relevant view of current practice.

Mission Statement

The National Neonatal Transport Programme (NNTP) delivers safe, timely, and expert neonatal retrieval and repatriation across Ireland. It ensures equitable access to specialist neonatal and surgical care through a consultant-led, evidence-based model, while supporting the wider neonatal network through governance, education, and research. A strong emphasis is placed on family-centred care throughout the transport journey.

History

Established in 1999, with its first transfer in 2001, the NNTP has transported almost 11,000 infants and developed into a 24-hour, consultant-led national service. Early development centred on a coordinated model across the three Dublin maternity hospitals, supported by the National Ambulance Service. Key milestones include the introduction of a 24-hour service in 2013 and full consultant-delivered care by 2019. Clinical capability has evolved in parallel, including therapeutic hypothermia, nitric oxide transport, and advanced monitoring. The introduction of a nurse-led transport team in 2025 reflects continued service evolution.

Introduction

The NNTP operates within a centralised neonatal care system, where access to specialist services is concentrated in a small number of tertiary centres. Delivered in partnership with the Dublin maternity hospitals and the National Ambulance Service, it provides a continuous national retrieval function. Neonatal transport is recognised as an extension of intensive care, requiring specialist clinical expertise and coordination to safely transfer critically ill infants.

Operational Model

The NNTP provides national coverage for infants up to 28 days of age, supporting all neonatal units, tertiary paediatric centres, adult hospitals, and selected international partners. The service is delivered through a consultant-led critical care team operating 24/7, supported since 2025 by a nurse-led team for lower-acuity and repatriation transfers. All activity is coordinated through the National Emergency Operations Centre, with integrated road and aeromedical transport capability

Executive Summary

Governance

The NNTP operates within NAS Critical Care and Retrieval Services (NASCCRS), which provides national coordination, infrastructure, and transport capability. Within this structure, the National Neonatal Transport Programme (NNTP) continues to operate as a clinically led neonatal retrieval service closely integrated with the three Dublin maternity hospitals. Clinical governance is provided through the NAS-CCRS structure, including dedicated NNTP clinical leadership and consultant oversight, while operational capability is delivered through the National Ambulance Service.

Operational Activity

NNTP activity has been consistently high-acuity, with 80–90% of transports (2014–2024) involving escalation to higher levels of care. Transfers to tertiary paediatric centres account for the largest proportion (55–61%), with the NNTP undertaking approximately 86% of such transfers nationally. Repatriation activity remained low until 2025, when it increased to 32% following service expansion. Most transfers originate from Level 1 and 2 units, reflecting established referral pathways.

Clinical Activity

The case mix remains predominantly ICU-level (78–80%), with HDU at 16% and Special Care increasing to 6% following expansion. Indications are broadly distributed, with medical, surgical, cardiac, and repatriation transfers each contributing approximately 20%. Around 45–50% of infants are preterm, including 4–6% <1000g and 1–2% <500g. Most transfers occur in the first days of life. The service delivers advanced care during transport, including ventilation (38%), CPAP (20%), high-flow (10%), nitric oxide (~5%), and therapeutic hypothermia (3 to 4%).

Executive Summary

Performance

The NNTP undertakes approximately 92% of national neonatal critical care transfers and provides the majority of transports from Level 1 (94%) and Level 2 (89%) hospitals. Mobilisation occurs within one hour in ~80% of cases, with 77% of infants reached within two hours. Stabilisation averages one hour, and total transport duration averages five hours. Longer times reflect geography rather than operational delay. The NNTP delivers national coverage for critically ill neonates, with comparable response times, acuity, and clinical capability.

Education

Education is central to NNTP activity, supporting both internal competency and national practice. Training includes structured induction, simulation, and aeromedical training with the Irish Air Corps. Outreach supports stabilisation skills in non-tertiary units and promotes consistency of care across the network. There have been over 134 STABLE courses delivered, together with focused outreach training, with more than 2,500 staff across the country having attended or participated in training since 2013.

Key Strategic Priorities

- Improve access to aeromedical transport: Current availability remains limited, with over 90% of transfers by road, contributing to prolonged transport times in remote regions
- Implement an integrated electronic patient and transport record: To improve capture of referral and transport timelines and support enhanced service evaluation.
- Expand and standardise national outreach education: To maintain stabilisation skills across Level 1 and 2 units.
- Further develop family-centred care during transport: To enhance parental involvement and support throughout the transfer journey.

Executive Summary



Introduction

Twenty-five years on, and following more than 11,000 safe neonatal transports, the National Neonatal Transport Programme (NNTP) has become a cornerstone of neonatal care delivery in Ireland. The programme was established in 1999 by clinicians working within maternity hospitals who recognised the need for a coordinated system to retrieve critically ill newborn infants requiring transfer to tertiary centres. Endorsed by the Department of Health, the programme undertook its first transport in March 2001. Its sustained delivery reflects a strong and enduring partnership between the three Dublin maternity hospitals, which provide dedicated clinical staff, and the National Ambulance Service (NAS), underpinning a service that has maintained uninterrupted national availability since inception. From the outset, neonatal transport has been understood not simply as a logistical exercise, but as a continuation of intensive care in a mobile environment. Infants requiring transfer are among the most clinically vulnerable, and their safe movement demands advanced decision-making, technical expertise, and close coordination between referring and receiving teams. From the perspective of those delivering the service, each transport is recognised as a critical extension of neonatal intensive care, requiring the same standards of vigilance, intervention, and multidisciplinary collaboration as those within the NICU.

Central to this capability is the partnership with the National Ambulance Service (NAS), whose provision of dedicated ambulances, Emergency Medical Technicians (EMTs), and national call handling and coordination systems enables the safe and timely transfer of infants between hospitals. The integration of specialist clinical teams with this national infrastructure allows neonatal transport to function as a cohesive and responsive service, reliant on the coordination and expertise of transport teams, ambulance personnel, and hospital staff.

Over time, the NNTP has developed from a limited-hours service into a 24-hour, consultant-delivered national retrieval programme, a transition completed in December 2013. This reflects a broader commitment to equitable access to specialist neonatal care, ensuring timely retrieval regardless of location or time of presentation. More recently, the establishment of dedicated transport consultant posts providing continuous 24/7 clinical leadership, alongside the development of clinical nurse specialist roles, has further strengthened the quality and consistency of care delivered. These developments have been supported through the evolution of the Health Board Executive (HeBe) (2003), the National Transport Medicine Programme (2012) and the establishment of NAS Critical Care and Retrieval Services (NASCCARS) since 2018, reflecting close alignment across services.

The organisation of neonatal services in Ireland has strongly shaped the role of the NNTP. With tertiary neonatal intensive care units and national subspecialist services concentrated in a small number of centres—particularly within Children’s Health Ireland in Dublin—many infants born in regional units require transfer for ongoing care. In this context, the NNTP serves as a vital link within a centralised national system, connecting geographically dispersed birth settings with centres of expertise.

Introduction

A significant recent development has been the expansion of service capacity in May 2025 with the introduction of a nurse-led transport service (Blue Team). Alongside the existing consultant-led critical care retrieval service (Red Team), this enables the transfer of lower-acuity infants and supports repatriation to local units. The facilitation of bi-directional transport, improves patient flow, optimises capacity in tertiary centres, and enhances continuity of care by enabling infants to return closer to home. It also reinforces the family-centred focus of the service.

This report marks over 25 years of the NNTP and reflects on the activity and development of the service over that time, with a particular focus on the 24/7 service period. It highlights the evolution of a nationally coordinated model of care that has become an integral part of neonatal services in Ireland, and recognises the collective contribution of those involved in its delivery. The experience over this period reflects a service that is valued across the network it supports, and this report provides an opportunity to review its activity while acknowledging its established and valued role within neonatal care pathways nationwide.



Dr Hana Fucikova
NNTP Clinical Lead



Ann Bowden
NNTP Coordinator



Historical Development & Key Milestones

1999-2001

Development and Launch of NNTP with dedicated ambulances and drivers. Nurse and doctor available available 9 to 5, seven days per week. First patient transported in March 2001

2005

Launch of NNTP website and first 1,000 infant transfers safely completed.

2008

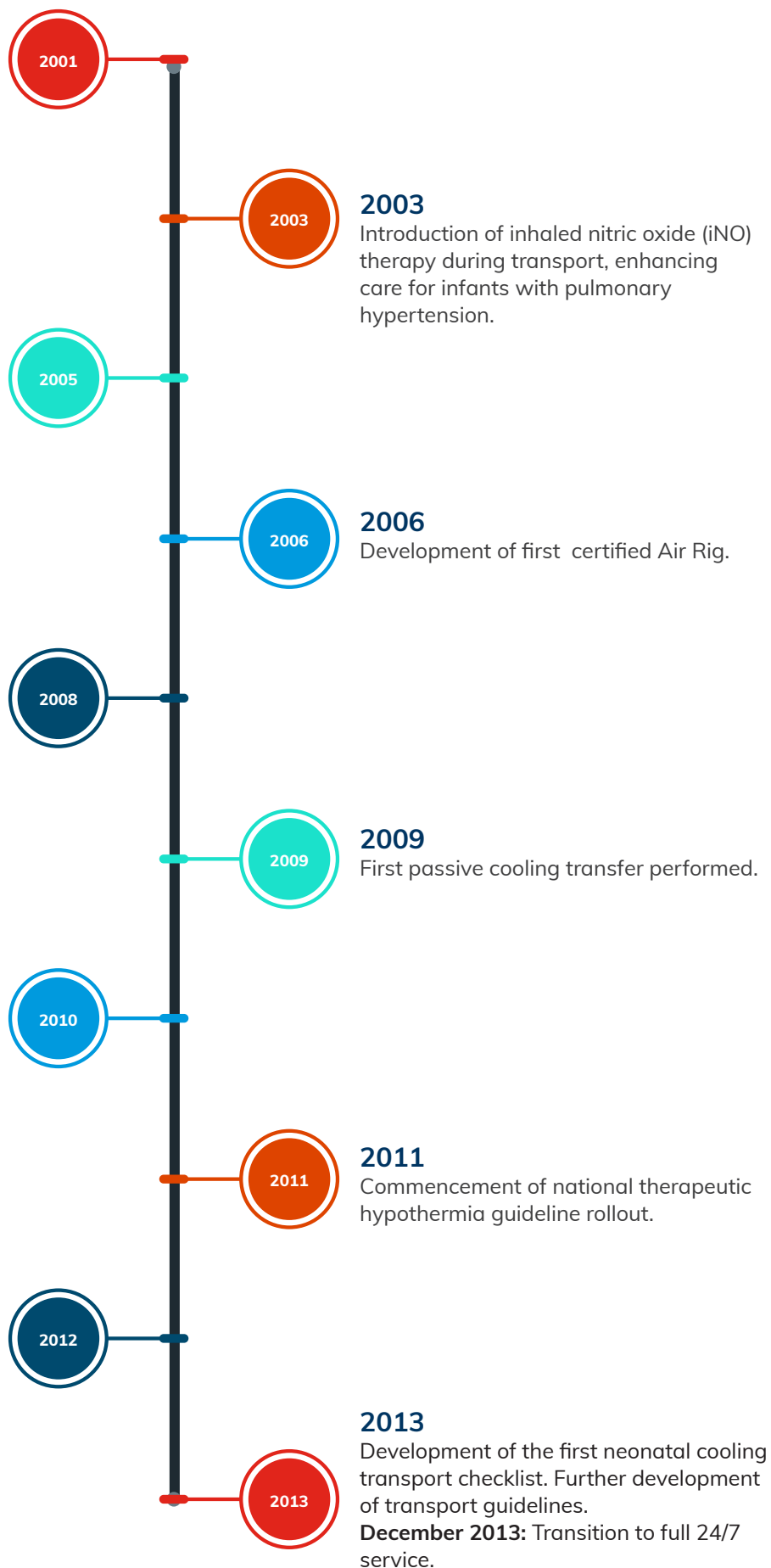
Establishment of a single national access phone line.

2010

Launch of National Daily Neonatal Bed Census and online bed status reporting system

2012

Integration into the National Clinical Programme for Transport Medicine.



Historical Development & Key Milestones

2014

Appointment of first dedicated NNTP consultant and introduction of new twin custom-built ambulances. First NNTP National Symposium

2017

Appointment of second full-time consultant. Publication of second edition National Cooling Guidelines and cooling graph, adopted as national standard. Introduction of NNTP Clinical Fellowships.

2019

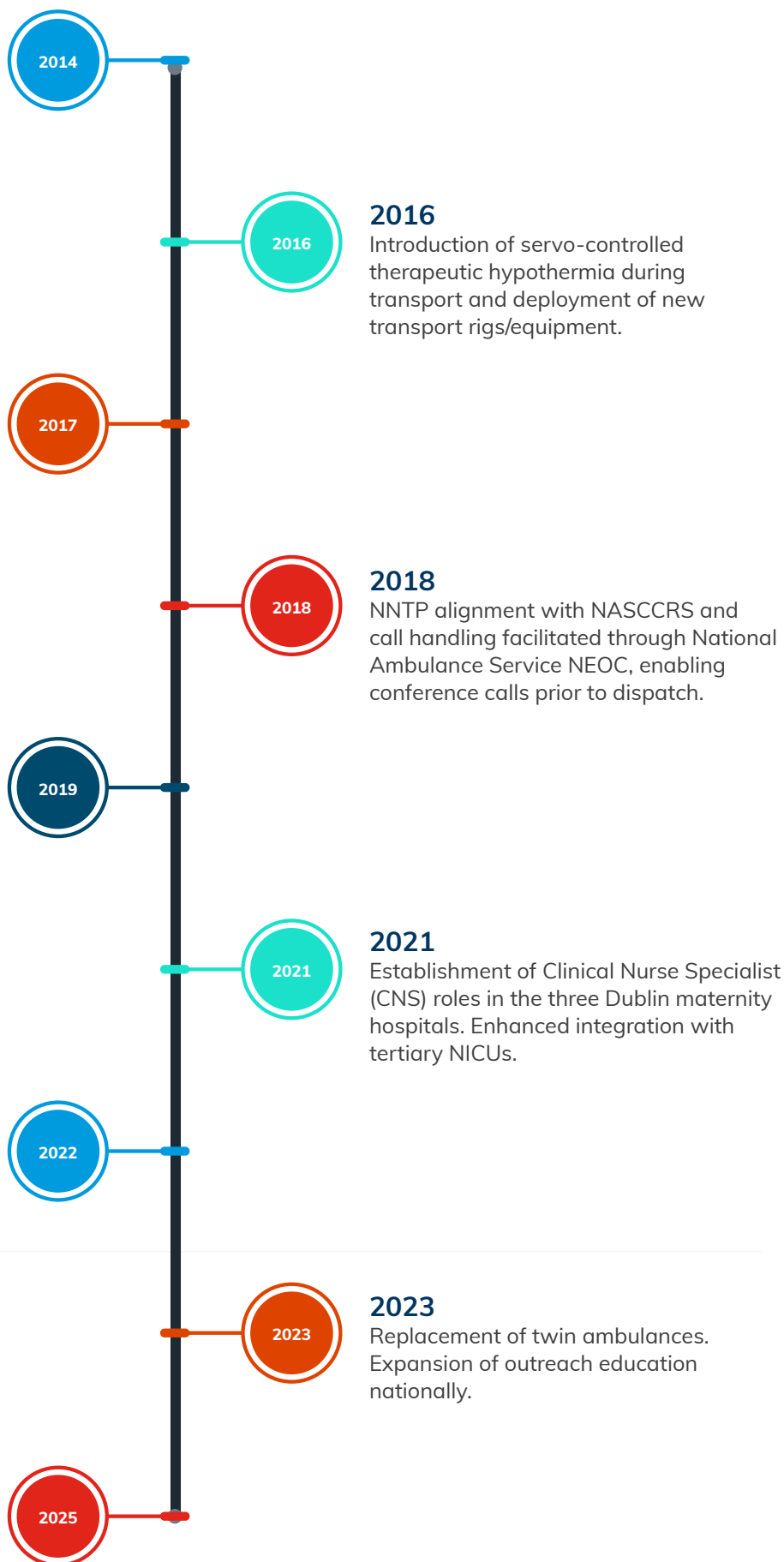
Full 24-hour, 7-day dedicated consultant coverage achieved with the appointment of two further consultants to the NNTP.

2022

Introduction of NNTP Medical Fellowship.

2025

Expansion to bidirectional capacity with nurse-led team operating 08:00–20:00 Monday–Friday.



Historical Development & Key Milestones

Pre-1999 to 2001 | Origins and Establishment

Prior to the development of the NNTP, neonatal transport in Ireland was undertaken by clinical staff from maternity units, often requiring doctors and nurses to leave their base hospitals to accompany critically ill infants. This placed ongoing pressure on staffing, with real-time decisions required regarding service provision within units.

While these transfers were carried out with commitment and professionalism, evidence identified associated risks, including hypothermia and suboptimal stabilisation. Over many years, clinicians within the Faculty of Paediatrics (RCPI) advocated for the establishment of a coordinated national service to address these challenges.

This led to the Department of Health approving the establishment of the NNTP in 1999. In its early development, the programme was supported by a part-time medical director and a transport coordinator, who established the initial operational and clinical framework. The service was developed as a collaboration between multidisciplinary clinical teams from the three Dublin maternity hospitals and the Eastern Health Board ambulance service. From the outset, ambulance personnel were integral to the service, with dedicated drivers and operational support forming a key component of the model.

2001 | Service Commencement

The NNTP became operational in 2001, with the first neonatal transfer undertaken in March. The service initially operated during daytime hours, with a nurse and doctor supported by dedicated ambulance resources. From the outset, ambulance personnel were integral to the service, with dedicated drivers and operational support forming a key component of the model.

In its first year, 174 infants were transferred, of whom approximately 90% were ventilated, reflecting the high acuity of the cohort.

2002–2010 | Expansion, Capability Development and Growing Demand

From 2002 onwards, activity increased steadily, with over 30% of transports occurring outside scheduled hours, highlighting early demand for a 24-hour service. The programme continued to operate within its existing structure during this period, maintaining service delivery alongside increasing activity.

Clinical capability expanded significantly during this period. The introduction of inhaled nitric oxide (iNO) therapy during transport in 2004 enhanced the management of critically ill infants with pulmonary hypertension. Air transport became a formalised component of the service in 2006, following the development of specialised neonatal transport modules and protocols in collaboration with the Air Corps, enabling a more standardised and clinically governed approach to transfer.

Historical Development & Key Milestones

Transport capability on the ground also evolved, with upgraded ambulances improving reliability and capacity, including the ability to transport twins. This development was supported by the continued commitment of ambulance personnel, whose flexibility and availability enabled the service to respond to increasing and often unscheduled demand.

Education and outreach were established as core components of the programme. Structured neonatal stabilisation training and ongoing engagement with referring units supported improved preparation of infants prior to transfer and contributed to national consistency in care.

Communication systems improved in parallel, including the launch of the NNTP website in 2005 and the introduction of a single national access phone line in 2007. In 2010, the National Neonatal Bed Census and online bed status reporting system was introduced, enhancing national coordination and visibility of capacity.

Despite a detailed business case submitted in 2007, expansion to a 24-hour service was not approved at that time. However, there was sustained advocacy for service expansion from clinicians nationally, supported by the NNTP, reflecting growing recognition of the need for a 24-hour model. The introduction of therapeutic hypothermia in 2009 further reinforced this need, highlighting the importance of timely transfer for infants requiring specialist care.



Historical Development & Key Milestones

2011–2013 | National Alignment and Transition to 24-Hour Service

The establishment of the National Clinical Programmes in Neonatology and Transport Medicine from 2011 provided a structured framework for service development. NNTP aligned with these programmes, strengthening governance and integration at a national level.

Increasing clinical demand, particularly in relation to therapeutic hypothermia, led to the expansion of the NNTP to a full 24-hour service, which commenced in December 2013.

2014 | Transition to Consultant-Led 24-Hour Service

2014 marked a significant step change in the programme. The appointment of the first dedicated NNTP consultant and clinical lead established a structured, consultant-led model, strengthening clinical oversight, coordination, and continuity of care.

In tandem with the introduction of the 24-hour service, operational capacity was expanded. A second dedicated ambulance was introduced, and transport teams across the three maternity hospitals were augmented to support continuous service delivery. Activity increased significantly during this period, reflecting previously unmet demand.

2015–2019 | Consolidation and Service Development

Following this expansion, the service entered a period of consolidation and continued development.

In 2016, transport capability was significantly enhanced through the introduction of modern T1 ventilators providing ICU-level respiratory support, servo-controlled nitric oxide delivery, phototherapy, and, for the first time, servo-controlled therapeutic hypothermia during transport.

In 2017, neonatal therapeutic hypothermia transport guidelines developed by NNTP were revised and adopted nationally. These supported both active and passive cooling during transport and were accompanied by updated documentation and assessment tools, alongside continued national outreach education.

The consultant workforce expanded during this period, and by 2019 the service had achieved full 24-hour consultant coverage.

In 2018, the programme aligned with the National Ambulance Service Critical Care and Retrieval Services (NAS CCRS), enabling integration with the National Emergency Operations Centre and improving coordination of referrals.

Historical Development & Key Milestones

2020–2022 | Sustained Service During the Pandemic

During the COVID-19 pandemic, NNTP activity remained high, peaking at 677 transports in 2021. Despite system pressures, the service maintained full operational capacity.

In 2020, Clinical Neonatal Transport Nurse Specialist (CNS) roles were established across the three Dublin maternity hospitals. These roles strengthened local leadership, supported training and competency development, and enhanced coordination between units and the transport service..

2023 | Enhancement of Clinical Capability

In 2023, further advancements in transport capability were introduced, including the availability of video laryngoscopy, ultrasound, and continuous end-tidal CO₂ monitoring, enhancing airway management and clinical monitoring during transfer.

2025 | Introduction of Bidirectional Transport (Blue Team Model)

In May 2025, a bidirectional, nurse-led transport model (Blue Team) was introduced, focusing on the transfer of lower-acuity patients and repatriation between units.

In its first eight months, approximately 200 transfers were completed, with activity projected to exceed 300 in its first year. This model has improved patient flow, enhanced system capacity, and added resilience to the service.

Throughout its development, the service has remained focused on the safe and timely transfer of infants, with care centred on the needs of babies and their families at a critical point in their journey. This focus has shaped how the service has been designed, delivered, and sustained over time.

As the service continues to evolve, the NNTP remains committed to maintaining this patient-centred approach within an increasingly complex healthcare environment.



25 years on the road and over 11,000 infants safely transported, the NNTP is now an integral part of neonatal services nationally, supporting coordinated care across Ireland.

NNTP Governance and Service Delivery Framework

National Structure and Oversight (NAS-CCRS)

The National Ambulance Service – Critical Care and Retrieval Services (NAS-CCRS) operates as a national service within the National Ambulance Service (NAS), reporting through the Director of the NAS to Acute Operations within the HSE. NAS-CCRS provides the national governance and operational framework through which neonatal, paediatric, and adult retrieval services are coordinated and delivered in support of national models of care.

NAS-CCRS evolved from the National Transport Medicine Programme (NTMP), established in 2011 in response to the recognised need for a coordinated national approach to the transfer of critically ill patients between hospitals. The National Neonatal Transport Programme (NNTP), established in 2001, became part of the NTMP in 2011 and was incorporated into NAS-CCRS in 2018.

Within NAS-CCRS, retrieval services operate through defined operational and clinical governance structures. NAS-CCRS is led by a Clinical Director, while the NNTP operates under a dedicated NNTP Clinical Lead, supported by NNTP consultants with responsibility for clinical governance, retrieval oversight, education, quality assurance, and service development.

NAS-CCRS provides the operational infrastructure for retrieval services nationally, including:

- ambulance platforms,
- transport personnel,
- communications and clinical coordination systems,
- deployment capability,
- and operational support structures.

Together, these elements support the safe, timely, and standardised transfer of critically ill patients between hospitals nationally.

Clinical Delivery Model and Role of the Maternity Hospitals (NNTP)

The National Neonatal Transport Programme (NNTP) is a core component of neonatal critical care delivery in Ireland and operates within the NAS-CCRS framework. While nationally coordinated through NAS-CCRS, the clinical delivery model remains closely linked to the three Dublin maternity hospitals, which have been central to the service since its inception.

NNTP Governance and Service Delivery Framework

These hospitals have maintained continuous involvement in neonatal transport for over 25 years, reflecting a longstanding culture of clinical ownership, collaboration, and shared responsibility for neonatal outcomes.

Neonatal retrieval initially developed through hospital-based multidisciplinary teams supported by consultant neonatologists and has evolved into a consultant-delivered retrieval service. A dedicated NNTP Consultant Lead and subsequent consultant posts were introduced from 2014, with full 24-hour consultant-delivered service provision established from 2019. NNTP consultants are clinically based within the maternity hospitals, provide continuous oversight of neonatal retrieval activity, and accompany transports where clinically indicated.

The NNTP continues to operate through multidisciplinary teams drawn from neonatal services within the maternity hospitals. NCHDs and clinical fellows work under consultant supervision, while nurses undertake focused education and competency-based training in neonatal transport and retrieval medicine. Specialist nursing roles, including Clinical Nurse Specialists in neonatal transport, support a structured and consistent model of care.

Responsibility for the clinical care of the infant during retrieval rests with the NNTP clinical team operating within the governance structures of NAS-CCRS and the participating maternity hospitals. This model ensures that neonatal retrieval remains aligned with neonatal intensive care practice and supports continuity of specialist clinical decision-making throughout transfer.

Enduring Partnership Model

The partnership between NAS-CCRS/NNTP and the three Dublin maternity hospitals represents a defining strength of the Irish neonatal retrieval model. The integration of national operational coordination with hospital-based specialist neonatal care has enabled the development of a mature, resilient, and nationally consistent neonatal transport service.

Operational Details

3.1 Scope of Service

Neonatal care in Ireland is delivered within a centralised, networked model, where access to neonatal intensive care and highly specialised services is concentrated within a small number of tertiary centres. For critically ill newborns, timely transfer between units is a core component of the clinical pathway

The National Neonatal Transport Programme (NNTP) provides the dedicated national transport function for this network, facilitating timely access to appropriate care for neonates across all regions.

The NNTP supports the following hospitals:

Level 3 — Tertiary Neonatal Centres

- The Rotunda Hospital, Dublin
- The Coombe Hospital, Dublin
- The National Maternity Hospital, Dublin
- Cork University Maternity Hospital

Level 2 — Neonatal Centres

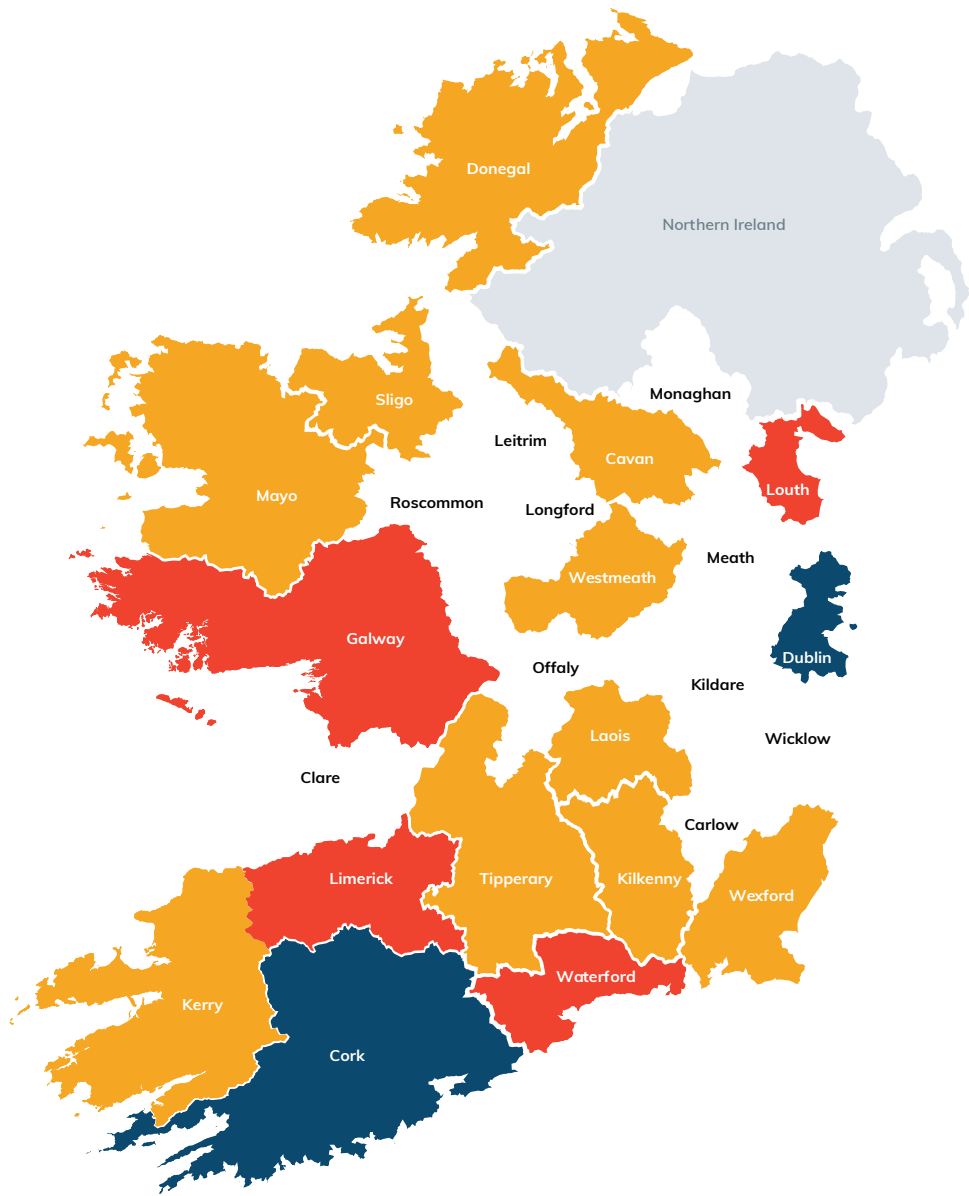
- University Hospital Galway
- University Maternity Hospital Limerick
- Our Lady of Lourdes Hospital, Drogheda
- University Hospital Waterford

Tertiary Paediatric Centres

- Children's Health Ireland at Crumlin
- Children's Health Ireland at Temple Street

Operational Details

HSE Health Regions Serviced by the NNTP in Ireland.



Level 1 — Neonatal Centres

- | | |
|---|---|
| ■ Midlands Regional Hospital Mullingar | ■ Letterkenny University Hospital |
| ■ Midlands Regional Hospital Portlaoise | ■ Mayo University Hospital |
| ■ Cavan General Hospital | ■ Sligo University Hospital |
| ■ Portiuncula University Hospital | ■ Tipperary University Hospital |
| ■ Wexford General Hospital | ■ St. Luke's General Hospital, Kilkenny |
| ■ University Hospital Kerry | |

Operational Details

REGIONAL HEALTH AREAS

19 maternity hospitals across 6 regional health areas

Level One Hospitals

Cavan, CGH • Donegal, LGH Letterkenny • Galway East, Portiuncula (Ballinasloe) • Kerry, KGH Tralee • Kilkenny, St Lukes • Mayo, MUH Castlebar • Portlaoise, MRHP • Sligo, SGH • Tipperary South, Clonmel, South Tipp General Hosp • West Meath, Mullingar, MRHM • Wexford, WGH

Level Two Hospitals

Galway, GUH • Limerick, UMHL • Louth, OLLH Drogheda • Waterford, WUH

Level Three Maternity Hospitals

Cork, CUMH • Dublin, NMH, CH, RH

NEONATAL UNITS

22

served nationally

19 NICU/SCBU
+ 2 PICU & TUH

DISTANCE RANGE

600 m

minimum

697 km

maximum (one way)
full national coverage

TRANSPORT TIME

30 min

shortest

>18 hrs

longest
varies by case & distance

Regional Paediatric Units

Including units in hospitals such as Tallaght University Hospital, Limerick, Drogheda, and other regional paediatric centres — for neonates re-presenting from home in the early neonatal period.

Adult (Non-Maternity) Hospitals

- Mater Misericordiae University Hospital
 - St. Vincent’s University Hospital
 - Connolly Hospital Blanchardstown (as required)
- St. James’s Hospital
 - Beaumont Hospital (as required)

Operational Details

International Partners

- Northern Ireland and United Kingdom centres
- European centres (including the Netherlands, Belgium, and Spain)
- Occasional repatriations from European countries (including Poland)

As a single national service, the NNTP operates across all of these entities, undertaking transfers between all levels of care. This includes both escalation to tertiary centres and inter-regional transfers between maternity and paediatric units, with established transfer pathways into the tertiary centre in Cork and into regional centres such as Galway and Waterford, as well as transfers to and from surrounding hospitals as clinically required. This model ensures equitable access to appropriate neonatal care regardless of location and supports both national and international neonatal retrieval activity.



Operational Details

3.2 Service Overview

The National Neonatal Transport Programme (NNTP) is Ireland's dedicated neonatal retrieval service, providing stabilisation and inter-hospital transport for critically ill and premature infants requiring specialist care. The service supports neonates from birth up to 28 days of age and facilitates transfers both nationally and, where required, internationally.

As a central component of the national neonatal care network, the NNTP enables timely access to appropriate levels of care and supports the safe and coordinated movement of infants between units. In addition to its transport function, the programme plays a significant role in supporting clinical practice across the network through outreach education, training, and engagement with referring units.

Service Population

The NNTP provides a national transport service for neonates up to 28 days of age who require inter-hospital transfer for specialist care or ongoing management within the neonatal network.

The service is primarily focused on the transport of critically ill infants requiring neonatal intensive care or access to specialist services, including cardiology, surgery, neurology, and advanced neonatal care. These transfers represent the majority of NNTP activity and are delivered on a 24-hour, 7-day basis.

While a proportion of these cases are time-critical and require immediate retrieval, many critical care transfers are urgent but not time-dependent, reflecting the broader scope of neonatal intensive care transport.

In addition, the NNTP facilitates the transfer of clinically stable infants requiring repatriation or movement to a more appropriate level of care within the neonatal network. Since May 2025, the programme has expanded to formally incorporate these bi-directional and lower-acuity transfers, delivered through a dedicated weekday service (Monday to Friday, 08:00–20:00).

Service Model

The NNTP operates a national, consultant-led retrieval service, coordinated through a single access pathway and delivered in partnership with the three Dublin maternity hospitals—The Coombe Hospital, The National Maternity Hospital, and The Rotunda Hospital—and the National Ambulance Service / National Ambulance Critical Care and Retrieval Services (NASCCRS). Where required, the service is further supported by the Irish Air Corps for aeromedical transport.

All referrals are managed through a centralised national coordination system within the National Emergency Operations Centre (NEOC), supporting timely call handling and facilitating early clinical communication between referring and receiving teams.

Operational Details

Transport teams provide clinical support throughout the retrieval process, including early advice to referring units, on-site stabilisation, and ongoing care during transfer. The service is designed to respond to a wide range of clinical scenarios, with prioritisation based on clinical urgency where multiple requests arise.

This model enables the NNTP to deliver both time-critical retrievals and planned inter-hospital transfers as part of an integrated national neonatal transport system.

NNTP Team Structure

Team Delivery

The NNTP operates a two-tiered team structure comprising:

- A critical care transport team, available 24 hours a day
- A nurse-led transport team for lower-acuity transfers during weekday hours

The NNTP has a team of five dedicated neonatal transport consultants (4.5 WTE) who deliver 24-hour, 7-day clinical leadership and oversight of the service. Consultants are involved in all transport activity from the point of referral, supporting clinical decision-making, determining team composition, and overseeing each transport episode. They also undertake direct clinical care and accompany transports when required, providing hands-on support for the most critically ill infants.

The programme is delivered through a collaborative model involving the three Dublin maternity hospitals—The Coombe Hospital, The National Maternity Hospital, and The Rotunda Hospital—which contribute staff on a structured rotational basis.

This model has worked very extremely well over the lifetime of the programme, with uninterrupted staffing support from participating hospitals over 25 years.

Operational Details

Within each hospital, the NNTP supports a core cohort of neonatal nurses trained in transport medicine, working within a structured rota to deliver transport activity. Clinical leadership is provided by a Clinical Nurse Specialist in neonatal transport in each unit, supporting training, competency development, and alignment of practice across sites.

Medical staffing is further supported by the maternity hospitals with neonatal registrars and NNTP fellows participating in transport activity under the NNTP consultant supervision, with medical personnel attending all critical care transports.

A key component of service delivery is the partnership with the National Ambulance Service / National Ambulance Critical Care and Retrieval Services (NASCCRS). Dedicated ambulance crews provide essential operational and clinical support for all transports, working in close collaboration with the neonatal team. The availability of specialist crews and dedicated transport vehicles is integral to the safe and effective delivery of the service across all settings.

The programme is further supported by clinical engineering expertise, provided through a service level agreement with the Clinical Engineering Department of the National Maternity Hospital, ensuring the maintenance, safety, and ongoing development of specialised neonatal transport equipment.

Programme Coordination

The programme is supported by a National Neonatal Transport Coordinator, who provides central operational oversight and facilitates the integration of clinical, transport and communication systems across the network. The Coordinator has played a key role in the development of service structures, including communication and transport platforms, data systems and standardised operational processes, and supports areas such as budget, training, policy development, audit and service coordination.

Transport Platforms and Clinical Capability

The NNTP delivers neonatal transport through a multimodal system, utilising road ambulance, rotary wing (helicopter), and fixed wing (aircraft) transport.

The vast majority of transfers are undertaken by road, supported by dedicated NASCCRS neonatal ambulances, which were designed specifically for the NNTP. They have the capacity to accommodate two incubators simultaneously to allow for the carriage of twins. These vehicles incorporate features to optimise the neonatal transport environment, including reduced noise and vibration, on board power generation, and transverse positioning of the infant, allowing transport in a direction considered optimal from a clinical perspective.

Operational Details

The service operates a number of dedicated neonatal transport systems, based across the three Dublin maternity hospitals, with additional systems configured for aeromedical use. These systems are fully portable and interoperable, allowing seamless transfer between dedicated ambulances, frontline emergency vehicles, and Irish Air Corps aircraft, as well as international transport platforms where required.

Across all transport modes, the NNTP is equipped to deliver a high level of neonatal intensive care during transfer, including specialised therapies such as nitric oxide delivery, servo-controlled therapeutic hypothermia, advanced airway management, phototherapy, and point-of-care imaging.

For aeromedical transport, dedicated modules integrate with the Irish Air Corps rotary (EC135, AW139) and fixed wing (Casa, PC12) aircraft, ensuring continuity of care across all transport environments.



Transport systems are fully portable and interoperable, allowing seamless transfer between dedicated ambulances, frontline emergency vehicles, and Irish Air Corps aircraft, as well as international transport platforms where required.

Access, Coordination and Communication

Access and Referral

The NNTP is accessed via a single national referral pathway, coordinated through the National Emergency Operations Centre (NEOC) within the National Ambulance Service. NEOC provides a streamlined, centralised system for call handling and coordination of all transport requests.

Through this pathway, referring clinicians are connected directly with the NNTP team and, where appropriate, with receiving centres, enabling real-time clinical discussion and early decision-making. This facilitates the development of a clear management and transfer plan in advance of team mobilisation.

In time-critical situations, the NNTP may mobilise prior to confirmation of a receiving bed, with bed allocation finalised prior to departure from the referring unit.

Operational Details

Coordination and Communication

In addition to real-time clinical coordination through NEOC, the NNTP supports national service coordination through a centralised communication and information platform.

A dedicated NNTP website provides daily national NICU bed-status updates, visibility of transport activity and service availability, staff scheduling and rota information, and access to referral pathways, guidelines, and operational resources.

- Daily national NICU bed-status updates
- Visibility of transport activity and service availability
- Staff scheduling and rota information across participating centres
- Access to referral pathways, guidelines, and operational resources

The platform also hosts the National Neonatal Activity Census, supporting national service visibility, planning, and evaluation.

Education and Training

The NNTP delivers a structured programme of education and training for its own transport teams, including induction, ongoing competency development, and simulation-based training across both road and aeromedical environments, ensuring preparedness for a wide range of clinical scenarios.

In addition, the programme supports referring units through outreach education and engagement, including focused training initiatives and programmes such as STABLE, aimed at enhancing neonatal stabilisation and care prior to transport.

Programme Activities and Service Development

In addition to its transport and education functions, the NNTP is engaged in a range of activities that support the ongoing development and quality of neonatal care services. These include:

- Audit and service evaluation to monitor activity and outcomes
- Research and data collection, supported by a centralised data system

These elements contribute to continuous quality improvement and inform the ongoing development of the service.

Operational Details



Operational Activity

4.1 NNTP Year on Year Activity

Since its establishment in 2001, the NNTP has seen a steady rise in activity, increasing from low volumes in the early years to an average of ~300 transports annually under a predominantly 9–5 service model up to Dec 2013. Demand consistently extended beyond these hours, reflecting unmet need. Approximately two-thirds of transfers were national (involving a hospital outside Dublin) and one-third within Dublin, with all transports focused on critically ill infants

The transition to a 24/7 service in December 2013 marked a significant inflection point. Activity increased almost immediately, doubling to over 500 transports per year and subsequently stabilising in the 550–650 range. A notable peak occurred in 2021, with 677 transports—the highest annual activity up to that point—during the second year of the COVID-19 pandemic.

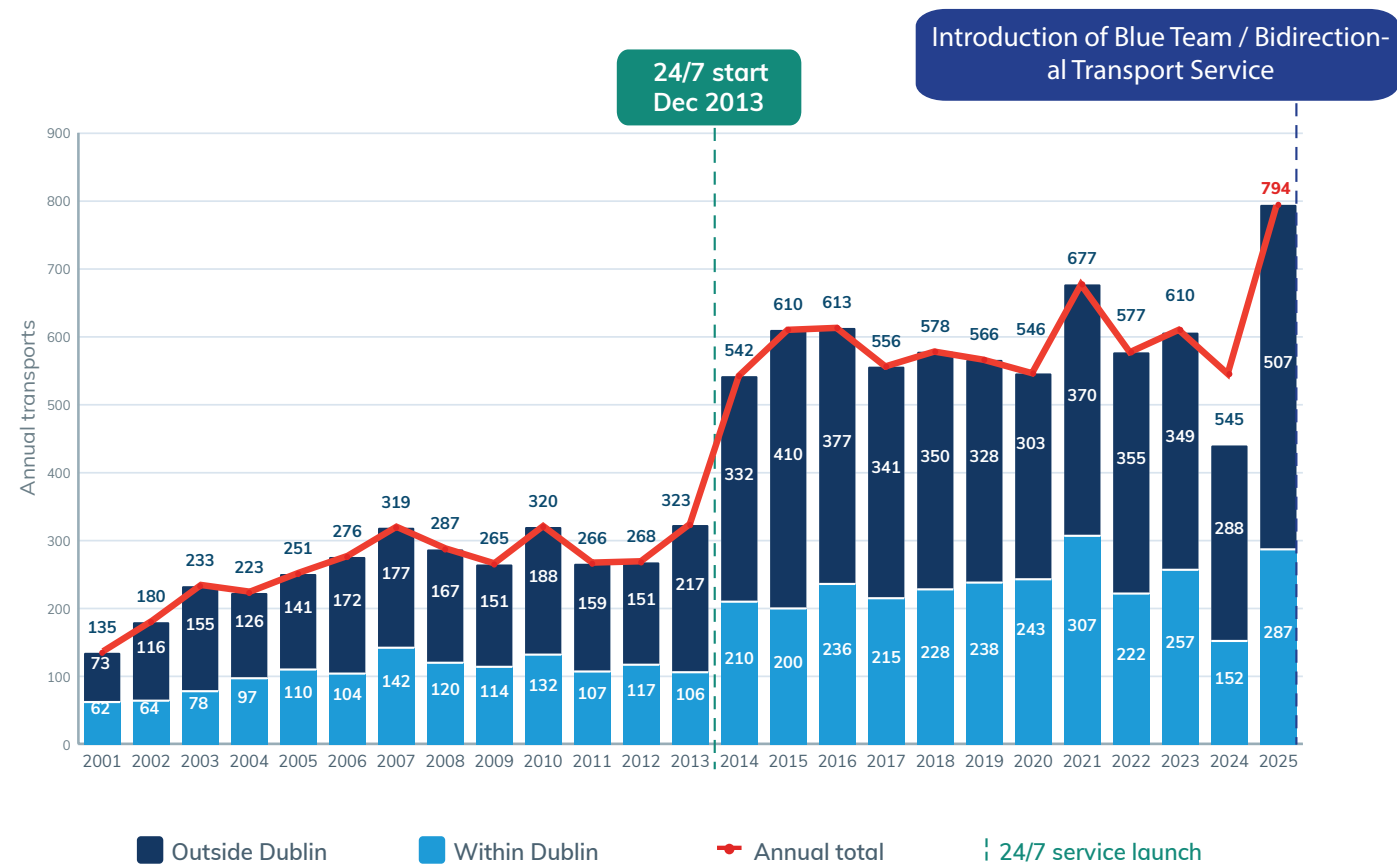
This likely reflects a combination of factors, including increased access to the service and changes in patient flow across the network during that period. Following this, activity stabilised before a further step-change in 2025, with the introduction of the nurse-led 'Blue' transport team in May, enabling bidirectional transfers across all acuity levels.

In the eight months following implementation, activity increased by approximately 200 transports, indicating a projected annual impact of ~300 additional transfers. This expansion reflects a maturing service model that continues to respond to system needs.



The transition to a 24/7 service in December 2013 marked a significant inflection point. Activity increased almost immediately, doubling to over 500 transports per year and subsequently stabilising in the 550–650 range.

Operational Activity



Operational Activity

4.2 NNTP Month on Month Activity

Highlighted = monthly count ≥ 60 transports

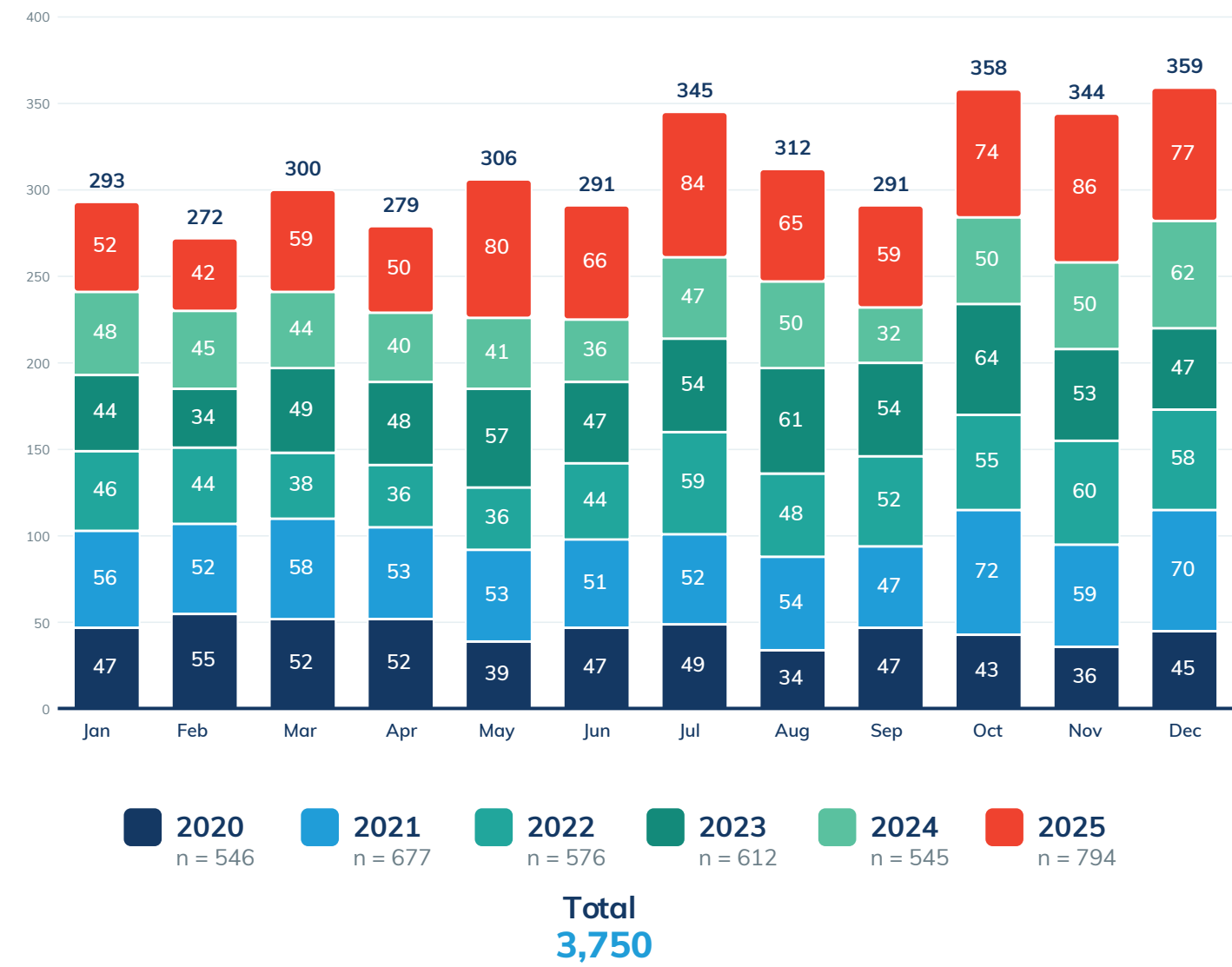
Month	2014	2015	2016	2017	2018	2019
January	44	64	65	37	55	51
February	35	42	47	38	48	40
March	50	50	45	64	29	39
April	38	41	62	51	39	37
May	40	52	53	55	43	35
June	41	47	49	38	59	45
July	53	59	54	42	47	45
August	50	53	55	44	47	59
September	47	40	42	50	50	57
October	40	56	49	40	48	40
November	63	51	44	51	52	51
December	41	55	48	46	61	67
Total	542	610	613	556	578	566

Month	2020	2021	2022	2023	2024	2025
January	47	56	46	44	48	52
February	55	52	44	34	45	42
March	52	58	38	49	44	59
April	52	53	36	48	40	50
May	39	53	36	57	41	80
June	47	51	44	47	36	66
July	49	52	59	54	47	84
August	34	54	48	61	50	65
September	47	47	52	54	32	59
October	43	72	55	64	50	74
November	36	59	60	53	50	86
December	45	70	58	47	62	77
Total	546	677	576	612	545	794

Reviewing NNTP month-on-month activity over the years since the introduction of the 24-hour service, months exceeding 60 transports highlight the sustained demand, broadly reflecting an average of at least two transports per day across the service. While these higher-activity months were initially intermittent, they have become more frequent in recent years. Since May 2025, with the introduction of the second ('blue') team, there has been a clear step-change, with a sustained increase in monthly activity, several months exceeding 80 transports, and frequent days where the service is undertaking multiple transfers, often five to six within a 24-hour period.

Operational Activity

4.3 NNTP Transports by Monthly Distribution



NNTP monthly activity over the past years demonstrates no clear seasonal variations with demand remaining consistent throughout the year. This is likely to be because neonatal activity is driven by perinatal factors rather than the seasonal illness patterns seen in older populations. There is, however, a gradual increase in overall monthly volumes, with fewer low-activity periods. This is most evident in 2025, where activity rises further from May, following the introduction of the second ('blue') team, reflecting increased capacity and sustained service demand."

Operational Activity

4.4 NNTP Transports by Day v Nights

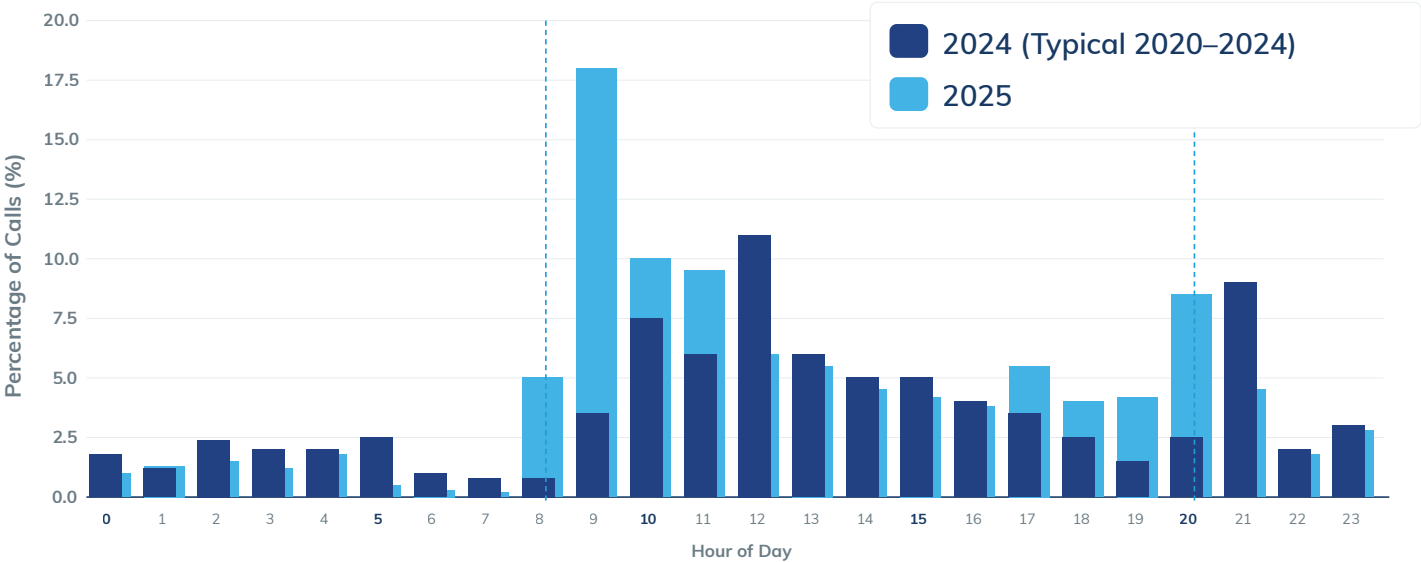
Day v Night Team Transports (%) (2020–2025)						
	2020	2021	2022	2023	2024	2025
Day	69.8%	66.2%	64.6%	67.5%	68.8%	76.7%
Night	30.2%	33.8%	35.4%	32.5%	31.2%	23.3%

The NNTP operates a 24-hour service across two 12 hour shifts (08:00–20:00 and 20:00–08:00), and transports commencing after 07:30 and 19:30 are attributed to the respective day and night teams. Looking at the most recent years of the service activity has been consistently distributed across the 24-hour period, with approximately two-thirds of transports occurring during the day and one-third at night. This pattern remained stable until 2025, when the introduction of the second ('blue') daytime team in May led to a shift in proportional distribution towards daytime activity. This reflects increased daytime capacity and overall throughput, rather than a reduction in night-time workload, with absolute night activity remaining broadly unchanged.

4.5 NNTP Transports by Hours

Distribution of NNTP Calls 2020–24 vs 2025 (with Blue Team)

Blue dashed lines mark hour 08:00 (Blue Team start) and 20:00 (Blue Team end)



Operational Activity

Timing of NNTP Transports Across the Day (2020–2025)

The 2024 distribution is representative of the typical pattern observed between 2020 and 2024, during which approximately two-thirds of transports occurred during daytime hours and one-third at night. The comparison with 2025 demonstrates a shift toward earlier daytime concentration of activity, in the context of increased overall demand and service expansion.

NNTP Transport times of day

Across all years, NNTP transport activity is predominantly concentrated within daytime hours, with a clear peak between 09:00 and 14:00, representing the core operational period of the service. A consistent feature is the increase in activity around 08:00, corresponding to the transition between night and day shifts. This peak reflects a combination of factors, including:

- overnight accumulation of cases awaiting transport,
- handover dynamics between shifts, and
- timing of clinical decision-making within referring hospitals, where decisions to transfer patients are frequently made during morning ward rounds.

In the years up to 2024, the distribution demonstrates a broader spread of activity into the late afternoon and evening period (16:00–22:00), with a proportion of calls extending beyond the 20:00 shift boundary into the night service. In 2025, there was a shift in the pattern with a greater concentration of activity earlier in the day, particularly in the morning period (08:00–11:00), and a relative reduction in evening dispersion.

This change coincides with the introduction (May 2025) of the additional nurse-led “blue team”, when the service expanded beyond a strictly critical care transport model to include patients of lower acuity. These transports are more often planned, logistically prepared in advance, and ready to proceed earlier in the day, thereby contributing to the increased clustering of activity in the morning hours.

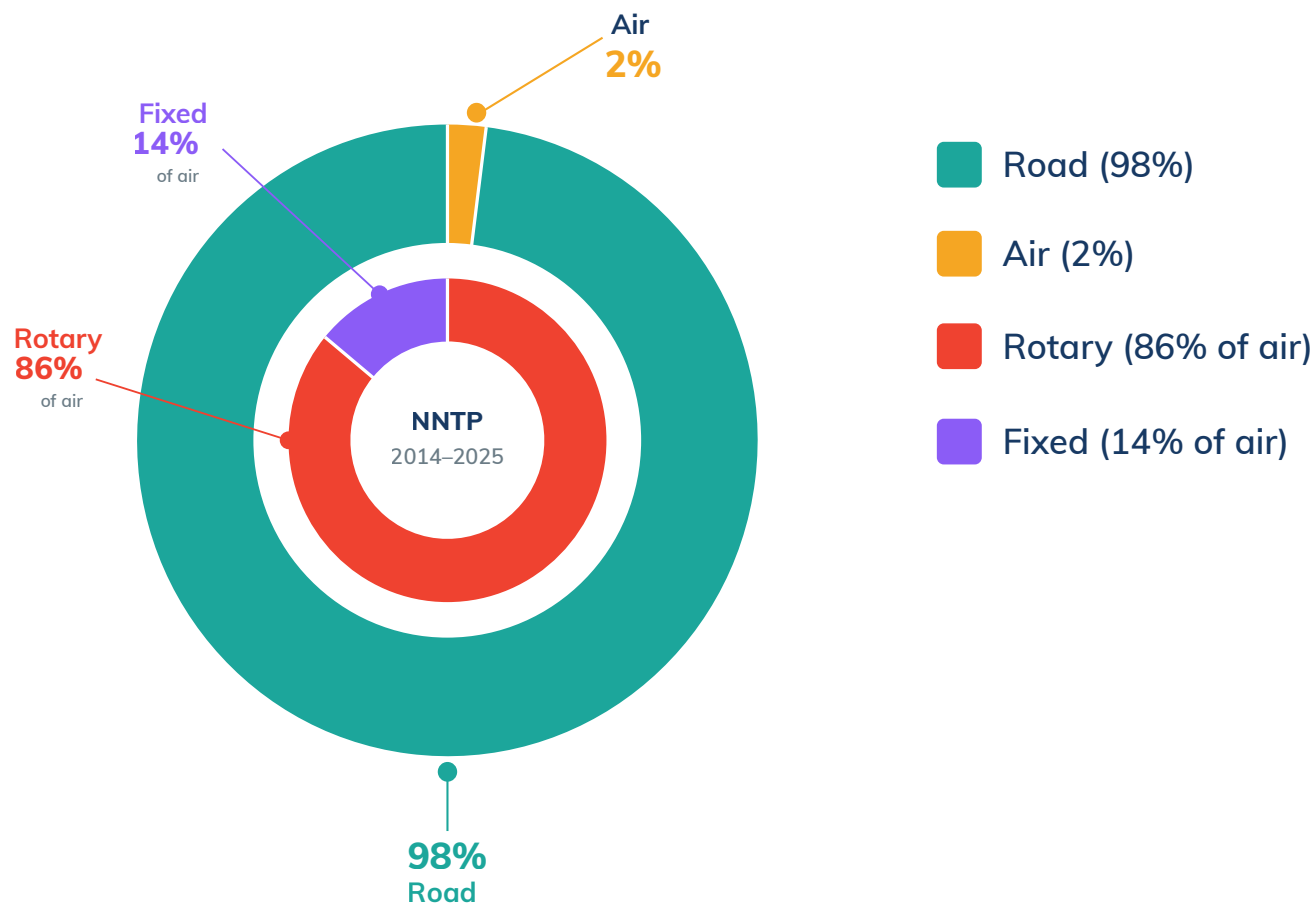
Despite the redistribution of workload into earlier daytime hours, a persistent proportion of NNTP transport calls continue beyond 20:00 hrs, representing time-critical or non-deferrable transfers and reinforcing the continued requirement for a fully resourced 24-hour NNTP service.

Operational Activity

4.6 NNTP Modes of Transport

The NNTP utilises both road and air transport modalities to deliver neonatal retrieval services. Since the introduction of the 24-hour service, over 98% of all NNTP transports have been completed by road, reflecting both the geography of Ireland and the consistent availability of dedicated neonatal transport ambulances and specialist retrieval teams.

NNTP Transport Modalities and Air Breakdown



Road ambulance remains the primary mode of transport for the NNTP, accounting for over 98% of all transports since the introduction of the 24-hour service.

The service operates dedicated, custom-designed neonatal transport ambulances in partnership with NASCCRS (NASCritical Care and Retrieval Services), with crews available on a 24-hour basis. These ambulances are configured for neonatal intensive care transport, including full incubator systems with advanced ventilatory support, monitoring, Nitric and Cooling therapy capability, and provide capacity for the simultaneous transport of two infants where required. A transverse orientation of the incubator is used for single-patient transport, optimising haemodynamic stability during transfer.

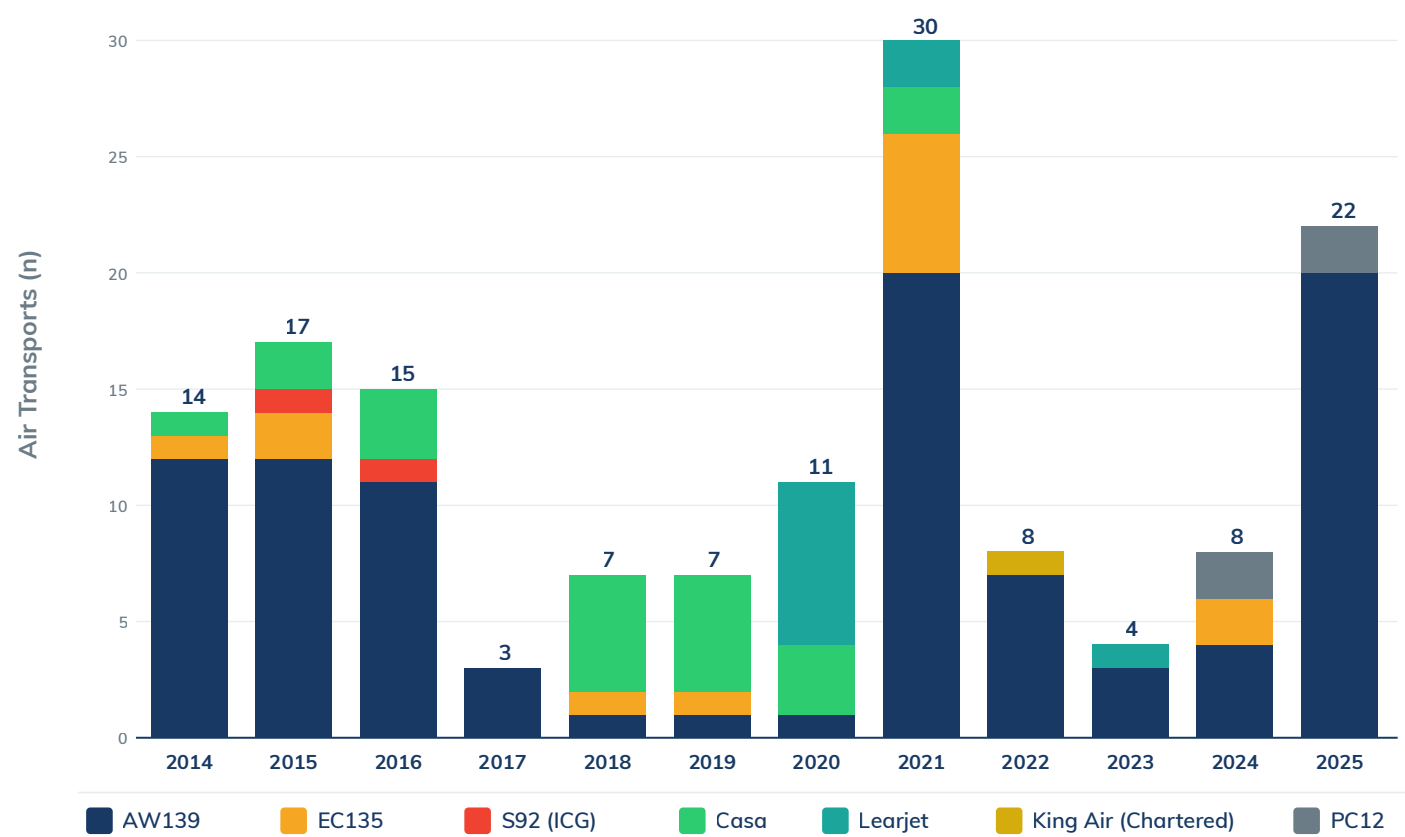
A principal advantage of road transport is its reliability, with dedicated NNTP/NASCCRS vehicles and personnel available 24/7 and minimal restriction due to weather or operational factors.

Operational Activity

NNTP Air Transport Mode Activity

Air transport represents a small proportion of overall NNTP activity (~2%) but remains an important adjunct to the service. Over the period 2014–2025, a total of 139 air transports were undertaken. Of these, 119 were completed using rotary wing aircraft (primarily AW139 and, less frequently, EC135), while 20 were fixed wing transfers using Irish Air Corps aircraft (CASA and PC-12). Fixed wing transport is used exclusively for overseas transfers, representing a small but important component of NNTP activity.

NNTP Air Transports by Aircraft 2014–2025



NNTP air transport activity has varied over time, with a notable increase in 2021 (30 transports) during a period of increased availability of aviation resources. A further increase has been observed in 2025, particularly from May onwards, reflecting improved access to planned, daylight air transport operations. These transfers have largely involved less acute or repatriation patients requiring long-distance transfer, where air transport offers a clear logistical advantage and aligns with international practice.

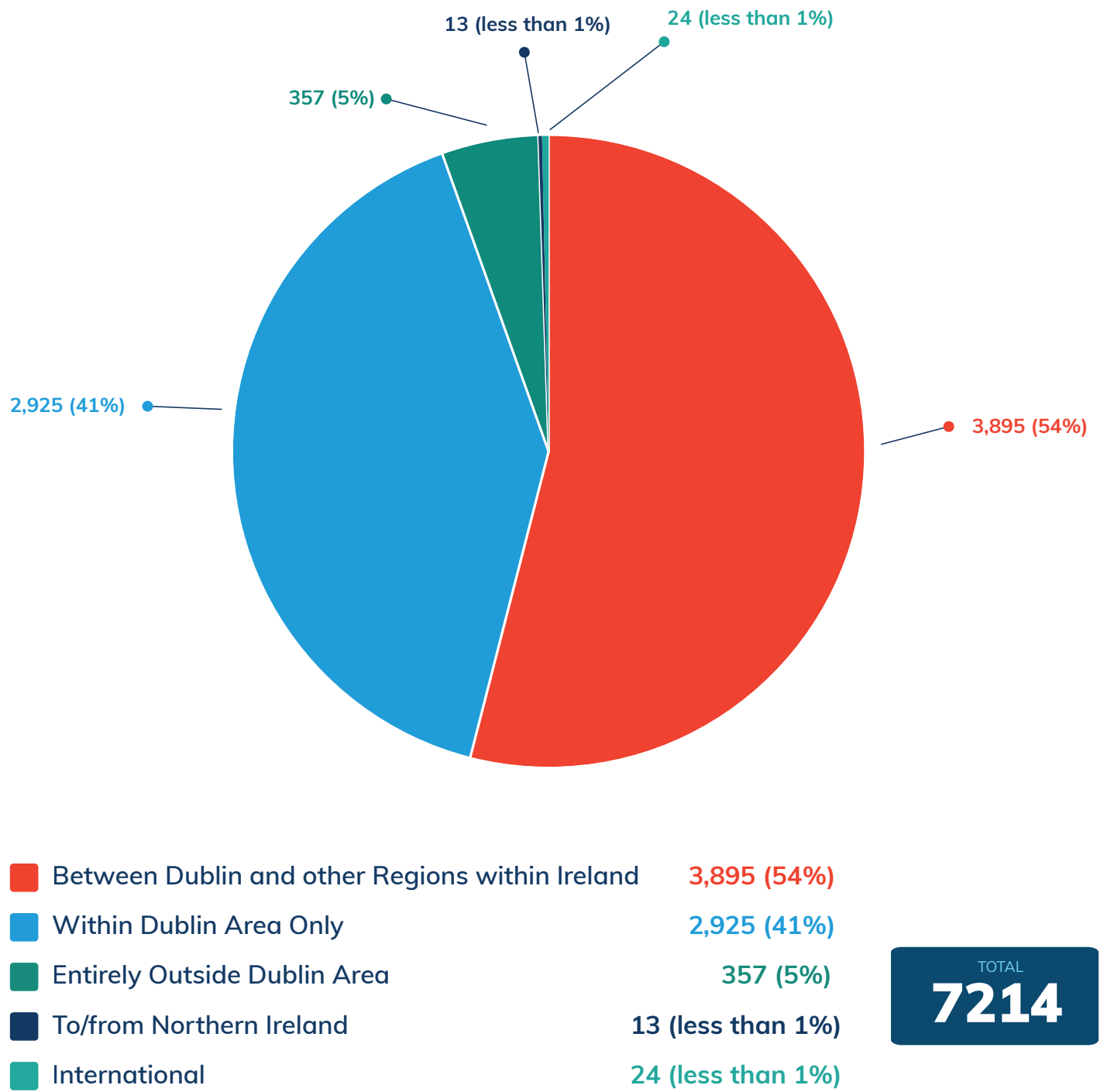
Despite this, overall utilisation of air transport remains low relative to total NNTP activity. While it accounts for approximately 2% of transports, its role within the service is shaped by operational availability, and its broader application is considered in a later section.

Operational Activity

4.7 Overview of NNTP Activity

As part of this 25-year review of the National Neonatal Transport Programme (NNTP), particular focus has been placed on activity since 2014, when the service transitioned to a 24-hour operational model. This period provides the most consistent reflection of national demand and service utilisation.

Distribution of NNTP Transports 2014–2025



Operational Activity

Over the period 2014–2025 (n = 7,214) approximately 60% of NNTP transports involved a hospital outside Dublin, reflecting the programme’s role in delivering a national neonatal transport service. Transports between Dublin and other regions accounted for 54% of activity, with a further 41% within Dublin and 5% occurring between regional centres. A very small number involved Northern Ireland (13) or international transfers (24).

This distribution reflects the national configuration of neonatal services in Ireland, with three of the four tertiary units and Children’s Health Ireland (CHI) based in Dublin; CHI alone accounts for over half of transports as the receiving centre. Consequently, much of the activity involves transfer to or from Dublin-based specialist services.

The NNTP also undertakes a consistent cohort of interregional transports between centres outside Dublin, averaging approximately 30 cases per year, supporting appropriate regional referrals and repatriation closer to home. Overall, the pattern reflects both the centralisation of specialist services and the NNTP’s role in enabling equitable access to neonatal care nationally.



Over the period 2014–2025 approximately 60% of NNTP transports involved a hospital outside Dublin, reflecting the programme’s role in delivering a national neonatal transport service.

Operational Activity

4.8 Regional Distribution of NNTP Activity within the ROI

NNTP activity across all six Regional Health Areas from 2014–2025, demonstrates utilisation of the service on a nationwide basis. The cumulative distribution of transports is as follows:

1.

Dublin Midlands: 6,880 (50.4%)
2.

Dublin South East: 2,410 (17.6%)
3.

Dublin & North East: 2,093 (15.4%)
4.

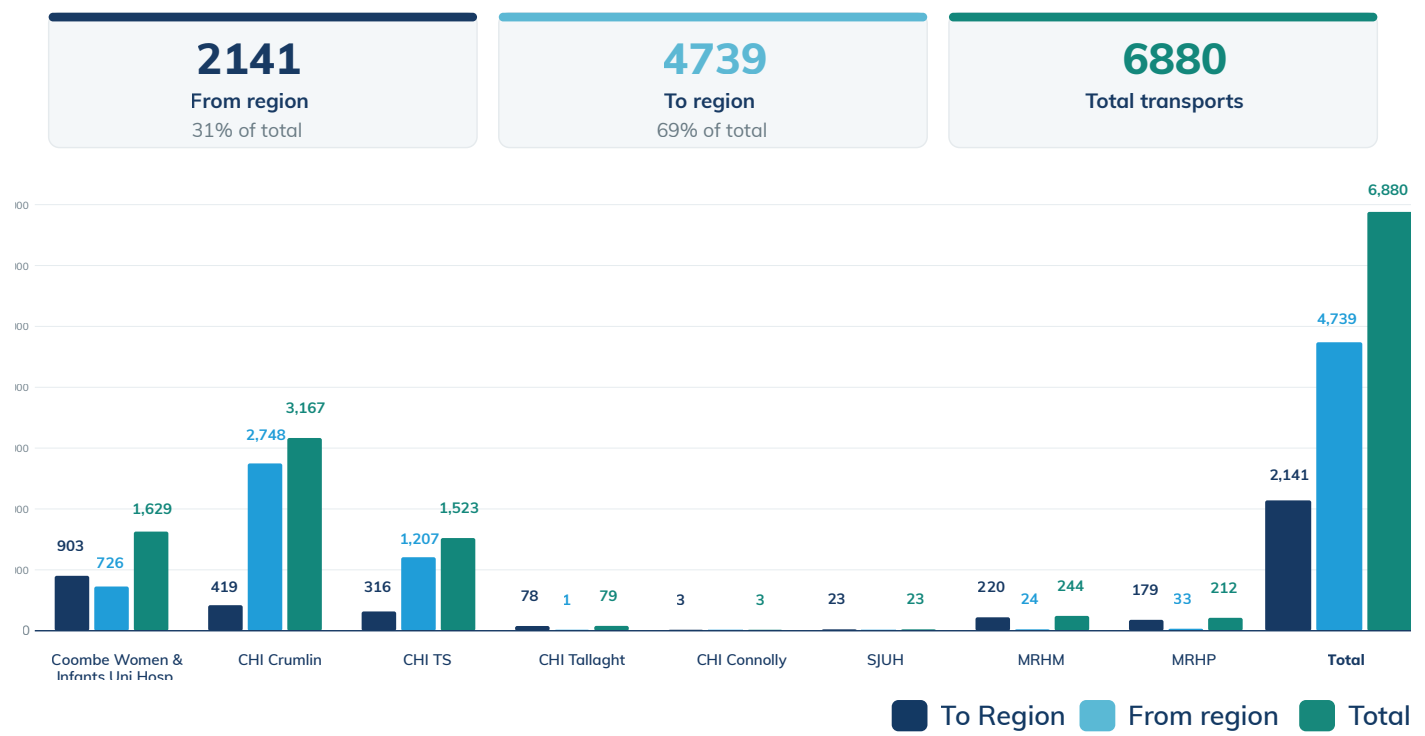
West & North-West: 1,226 (9%)
5.

South-West: 694 (5.1%)
6.

Midwest: 343 (2.5%)

NNTP transports to and from hospitals in the HSE Dublin Midlands region

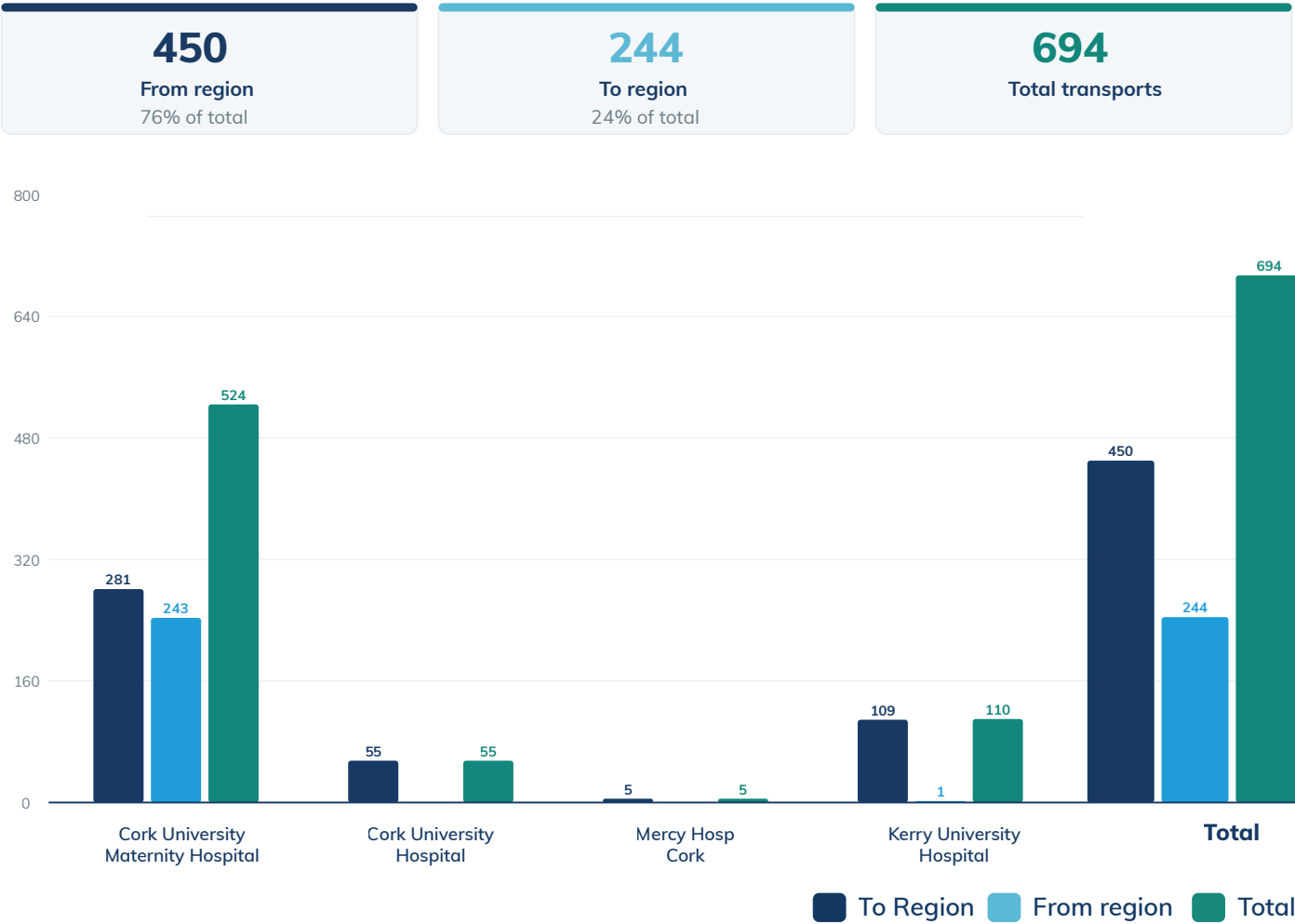
N = 6,880 (50.4% of all NNTP transports)



Operational Activity

NNTP transports to and from hospitals within the HSE Southwest region

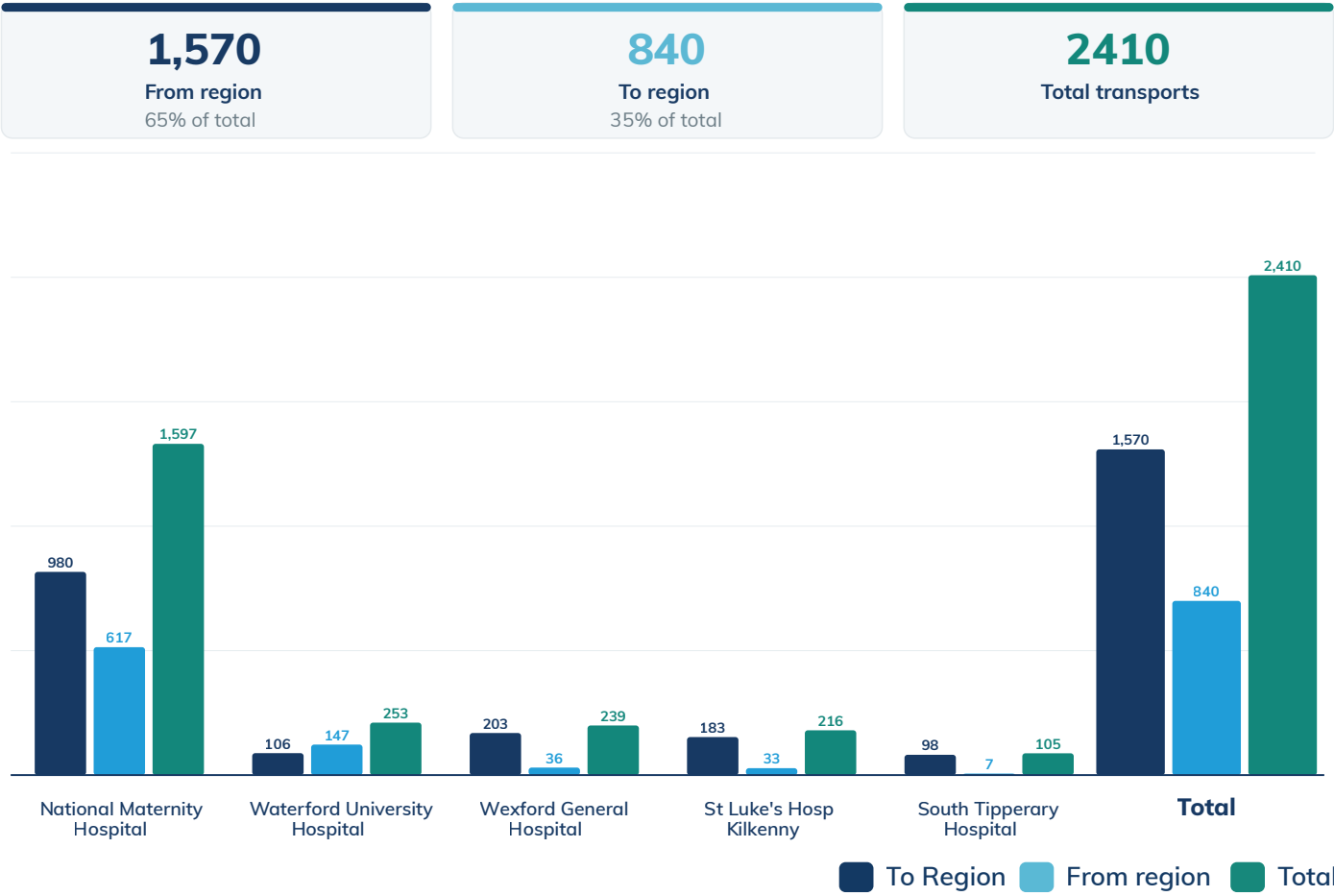
N = 694 (5% of all NNTP transports)



The distribution of activity is primarily influenced by the location of specialist services. National paediatric tertiary services are centralised within Children’s Health Ireland (CHI) at Crumlin and Temple Street, both located in the Dublin Midlands Region. Approximately half of all NNTP transports over the reporting period are directed to CHI, reflecting its role as the principal national referral centre for infants requiring specialist paediatric, surgical, and cardiology care. This is the primary driver of the higher volume of activity observed in the Dublin Midlands Region.

Operational Activity

NNTP transports to and from hospitals in the HSE Dublin South East region
 N = 2,410 (17.7% of all NNTP transports)

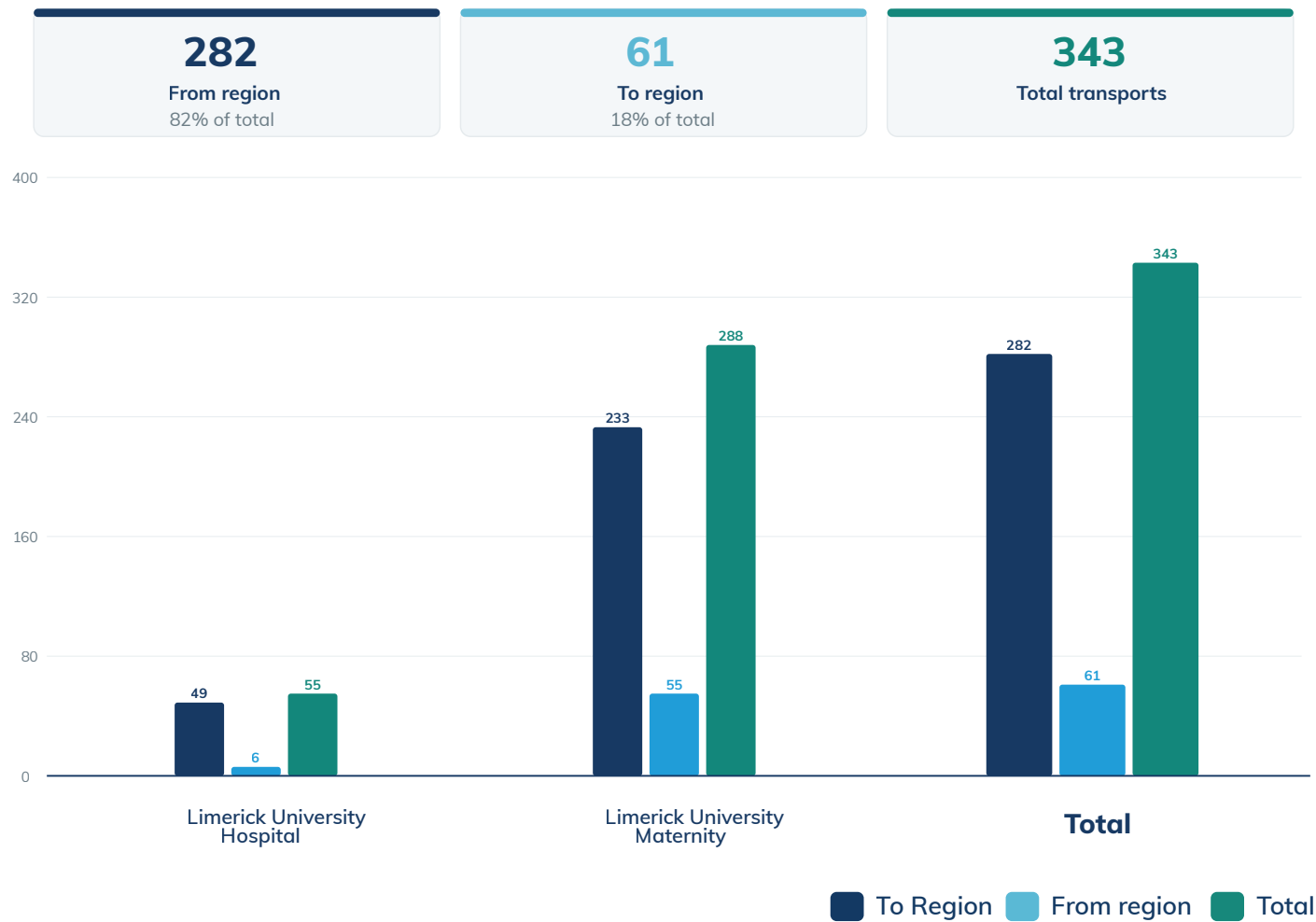


“
 Across the dataset, the majority of transports are ‘uplift’ transfers, consistent with the NNTP’s established role as a retrieval service, transferring infants from referring units to centres providing higher levels of care.

Operational Activity

NNTP transports to and from hospitals in the HSE Midwest region

N = 343 (2.5% of all NNTP transports)

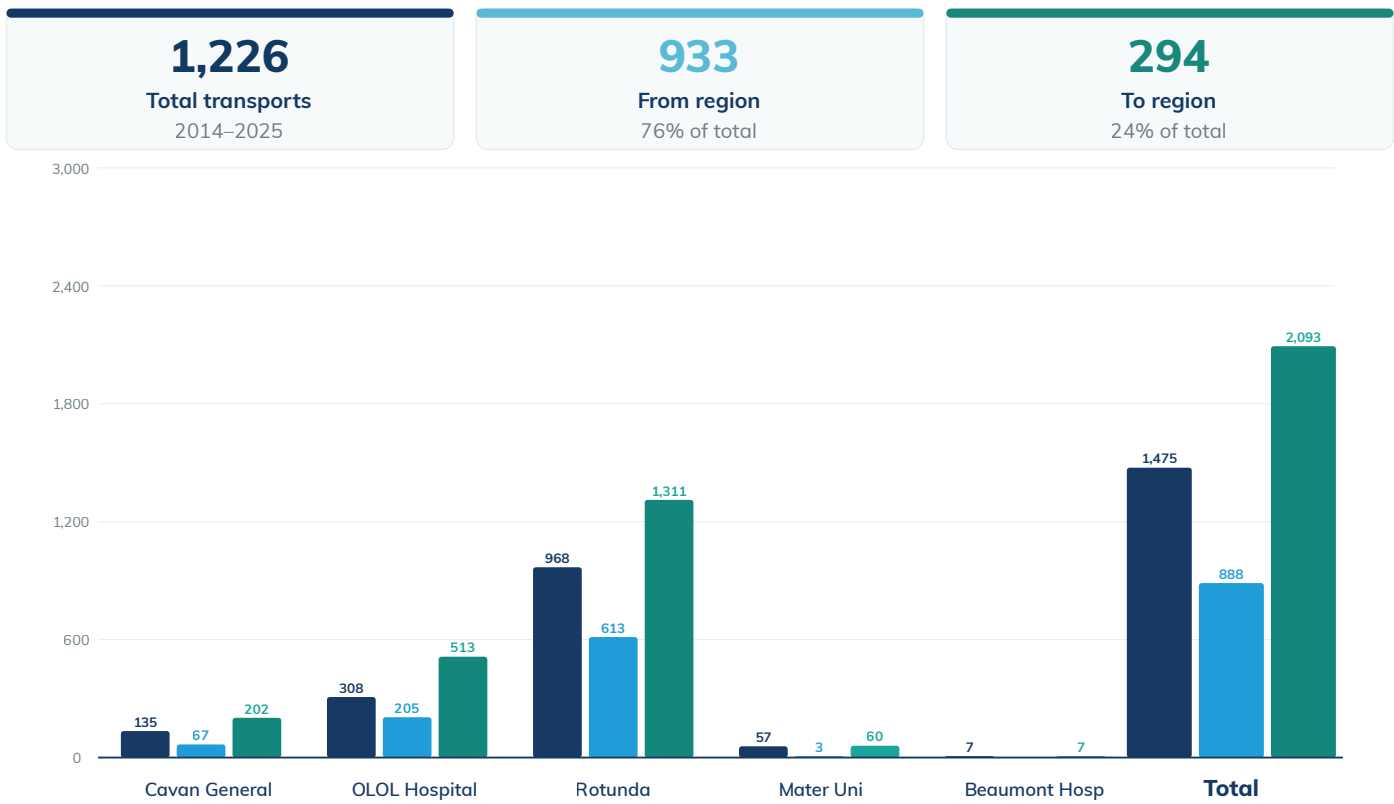


Tertiary neonatal care is provided across four principal centres: the Coombe Hospital, the National Maternity Hospital and the Rotunda Hospital in Dublin and Cork University Maternity Hospital, Cork. These centres receive infants requiring the highest level of neonatal care and contribute to activity across multiple regions.

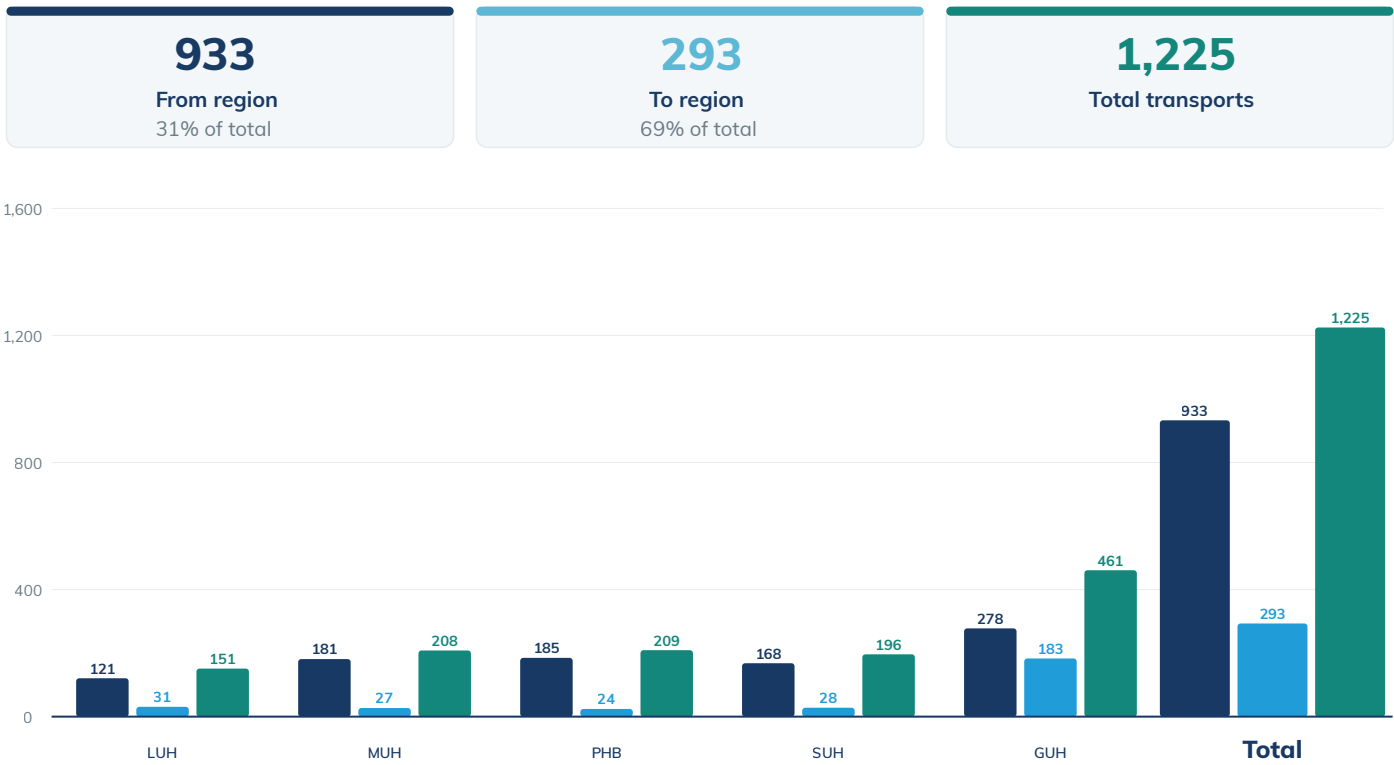
University Hospital Galway and University Hospital Waterford function as important regional referral centres for neonatal care in the West/North West Region. Our Lady of Lourdes Hospital Drogheda and University Maternity Hospital Limerick also operate as Level 2 neonatal units and are included within referral pathways; however, NNTP referral activity into these centres is relatively low, reflecting established clinical pathways and geographic patterns.

Operational Activity

NNTP transports to and from hospitals in the HSE Dublin & North East Region N = 1,226 (9% of all NNTP transports)



NNTP transports in the HSE West and Northwest region N = 1,226 (9% of all NNTP transports)



Operational Activity

Across the dataset, the majority of transports are 'uplift' transfers, consistent with the NNTP's established role as a retrieval service, transferring infants from referring units to centres providing higher levels of care.

While bi-directional transfers, including repatriation, were introduced from May 2025 and are included within the activity presented, their volume to date is relatively small in the context of the overall dataset and does not yet significantly influence the overall distribution. It is anticipated that this pattern will become more evident in future analyses as the service develops.

Overall, this analysis demonstrates that NNTP activity spans all regions and aligns with national referral pathways. While activity is concentrated in areas where specialist services are located—particularly CHI in the Dublin Midlands—the presence of sustained activity across all regions would indicate that the NNTP functions as a national programme, with variation driven by service configuration rather than access.



Receiving Hospital

45 National Neonatal Transport Programme · 25 Years of Dedicated Service 2001–2025

Operational Activity

This table outlines NNTP activity by referring and receiving hospitals 2014 to 2025 grouped by level

Receiving Hospital

ReferringHospital 🏥		Northern Ireland				Adult		Overseas Hosps												Total	Ann.Avg
		Belfast	Derry	Antrim	Belgium	HYPER Barric	Mater	Leeds UK	Ox UK	Man UK	KCHL UK	Berm UK	GOSH UK	BeRm	Utrecht HOL	laura Lynn	Total	Ann. Avg			
Category	Referring Hosp																Total	Avg			
Level 3 Neonatal NICU	CWH		2	2	1	1			1								903	75.3			
	NMH																1	980	81.7		
	RH						3											968	80.7		
	CUMH									2								281	23.4		
L3/4 Paed	CHI Crum	3						1	2		1	1	2	1			420	35			
	CHI TS									1						1	315	26.3			
Level 2 Neonatal Hosp	GUH																245	20.4			
	OLLHD	2															262	21.8			
	UMHL																233	19.4			
	WUH																106	8.8			
Level 1 Neonatal Hosps	CGH																129	10.8			
	KUH																98	8.2			
	LUH	1															196	16.3			
	MRHM																185	15.4			
	MRHP																158	13.2			
	MUH																171	14.3			
	PHB																165	13.8			
	SUH																151	12.6			
	SLHK																183	15.3			
	STGH																98	8.2			
	WGH																203	16.9			
Level 1/2 Paed Hosps	TUH																78	6.5			
	CHB																1	0.1			
	GUH																33	2.8			
	PHB																20	1.7			
	CGH																6	0.5			
	STGH																15	1.3			
	UHL																49	4.1			
	Mercy Cork																5	0.4			
	MRHP																21	1.8			
	OLLHD																46	3.8			
	LUH																25	2.1			
	SLHK																42	3.5			
	KUH																11	0.9			
	MUH																10	0.8			
	SUH																17	1.4			
	MRHM																35	2.9			
WGH																34	2.8				
WUH																17	1.4				
CUH																55	4.6				
Adult Hosps	BEAU H																7	0.6			
	MMUH																57	4.8			
	SVUH																20	1.7			
	SJUH																23	1.9			
Out of ROI	CHB																2	0.2			
	Belfast																1	0.1			
	Belgium																2	0.2			
	Enniskillen																1	0.1			
	Gosh																2	0.2			
	Ulster Hosp																1	0.1			
	Poland																1	0.1			
	Leeds																1	0.1			
	The Netherlands																1	0.1			
Royal Manchester																1	0.1				
Total per receiving hosp:		6	2	2	1	1	3	1	3	3	1	1	2	1	1		7,089				
Annual Average:		0.5	0.2	0.2	0.1	0.1	0.3	0.1	0.3	0.3	0.1	0.1	0.2	0.1	0.1	0.1		590.8			

NNTP Referral Patterns

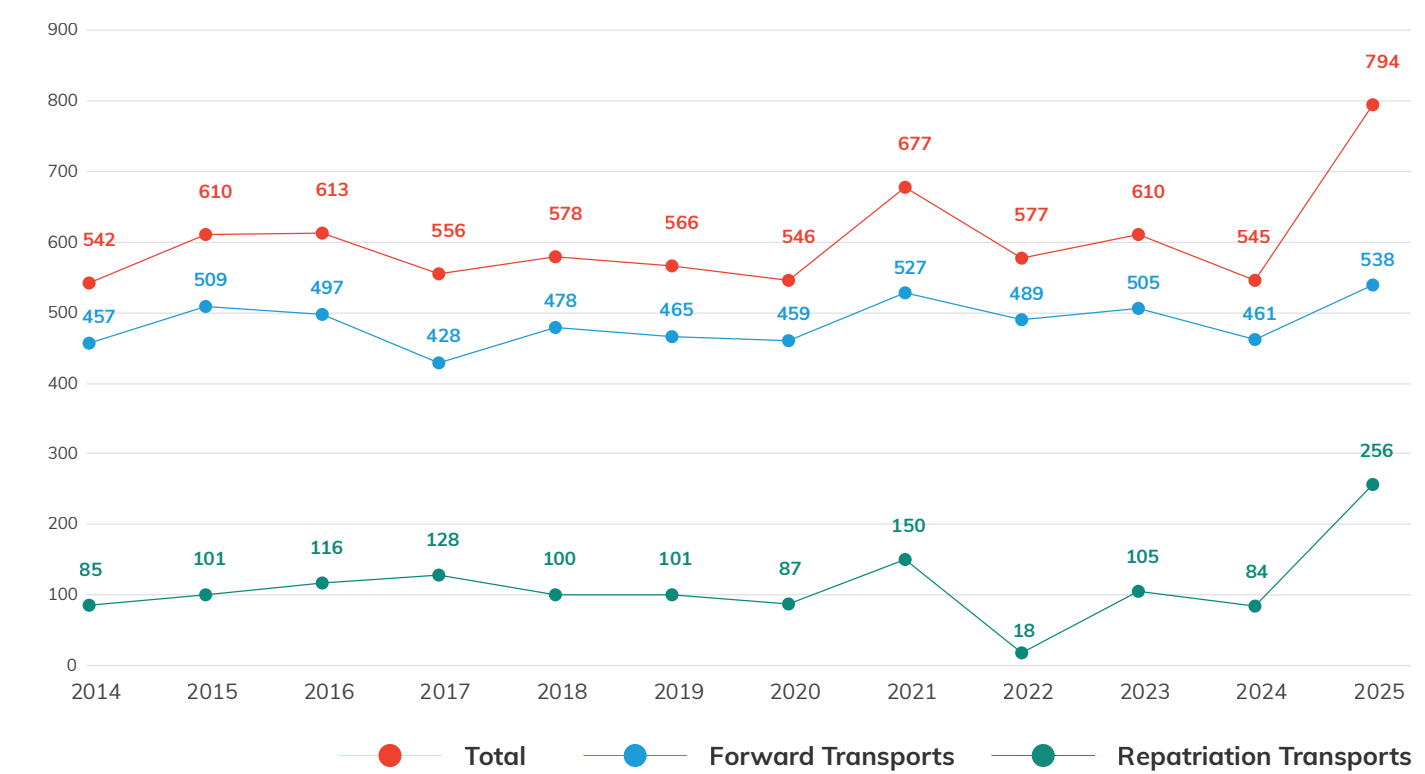
5.1. Transport Direction and System Flow

Following the move to a 24-hour service in Dec 2013, the NNTP activity has been overwhelmingly comprised of forward (uplift) transports, consistently representing ~90% of workload. This reflects the NNTP’s original critical care only retrieval model, operating as a single national transport service, where the prioritisation of higher-acuity transfers ensured that the team remained available to infants requiring ICU-level transport.

While repatriations accounted for ~14% of transports, these were not low-acuity transfers. Notably, over 40% of repatriated infants remained intubated and ventilated, reflecting that the NNTP was frequently undertaking the transfer of ongoing ICU-level patients back to regional NICUs. This demonstrates that in the case of the NNTP, transport direction is not a proxy for acuity, with many repatriated infants still requiring ICU-level care during transfer.

From a service perspective, this imbalance in transport direction was recognised as a marker of unmet need in back-transfer capability, informing subsequent service development and expansion. Repatriation transports increased from 85 to 244 (~187% increase) from May 2025, reflecting growing system demand and the impact of introducing a second nurse-led ‘blue’ team to facilitate bi-directional flow and support care closer to home.

NNTP transports by direction of care, 2014–2025



NNTP Referral Patterns

5.2 NNTP Forward (Uplift) Transports 2021-2025 by Hospital Classification

Referrals To	From	2021	2022	2023	2024	2025
DUBLIN L3 NEONATAL HOSPITALS	Level 1 Neonatal Units	82	69	76	86	100
	Level 2 Neonatal Units	24	26	18	25	27
	Level 3 Neonatal Units	1	2	1	3	4
	Non-Maternity Hospitals	17	14	11	8	7
	Total % of NNTP Transport	124 (18.3%)	111 (18.2%)	106 (17.4%)	122 (22.4%)	138 (17.4%)
REGIONAL L3 NEONATAL	Level 1 Neonatal Units	4	9	10	8	8
	Level 2 Neonatal Units	4	4	8	7	4
	Total % of NNTP Transport	8 (1.2%)	13 (2.1%)	18 (3.3%)	15 (2.8%)	12 (1.5%)
REGIONAL L2 NEONATAL	Level 1 Neonatal Units	21	14	18	19	23
	Level 2 Neonatal Units	2	—	—	—	—
	Total % of NNTP Transport	23 (3.4%)	14 (2.3%)	18 (3.3%)	19 (3.5%)	23 (2.9%)
Total Referrals % of NNTP Transport		155 (22.9%)	138 (23.9%)	142 (23.3%)	156 (28.6%)	173 (21.8%)
L3 PAEDIATRIC HOSPITALS DUBLIN	Level 1 Neonatal Units	42	43	47	29	41
	Level 2 Neonatal Units	40	50	42	31	46
	Level 3 Dublin Neonatal Units	205	181	195	199	216
	Level 3 Regional NICU	19	25	23	16	20
	Level 3 CHI Units	60	45	50	25	31
	Level 1 & 2 ED Paediatric Units	5	6	5	3	10
	Non-Maternity Hospital	—	—	—	—	1
	Paediatric Hospital EU	1	1	—	—	—
	Total % of NNTP Transport	373 (55%)	353 (61%)	361 (59%)	303 (55.6%)	365 (46%)
PAED — INTL	Paed Unit NI Level 2 ED & Paediatric Unit	—	—	1	1	—
	Paed Unit UK Level 3 CHI Units	—	—	1	1	—
Total Referrals to Paediatric Units % of NNTP Transport		372 (55%)	351 (61%)	363 (60%)	305 (56%)	365 (46%)
NNTP REFERRALS % of NNTP Transport		527 (77.8%)	489 (84.7%)	505 (82.7%)	461 (84.6%)	538 (67.8%)

■ Dublin L3 Neonatal
 ■ Regional L3 Neonatal
 ■ Regional L2 Neonatal
 ■ L3 Paediatric (Dublin)
 ■ Paed NI / UK
 ■ Grand Total

This table outlines NNTP forward (uplift) transports from 2021 to 2025 by receiving service and referring hospital classification. Forward transfers accounted for the majority of NNTP activity across all years (77.8–84.7%), with a relative reduction to 67.8% in 2025, reflecting the expansion of the service to include bidirectional transport.

Referrals to neonatal hospitals remained stable (approximately 22–29%), largely reflecting escalation from Level 1 and Level 2 units to tertiary care. While most transfers are directed towards Dublin

NNTP Referral Patterns

centres, activity to the regional Level 3 centre in Cork reflects expected referral patterns based on geography and population distribution.

Transfers from Level 3 units were consistently low, indicating that inter-tertiary neonatal transfer remains uncommon outside of specific indications.

Transfers to paediatric hospitals comprised the largest proportion of activity between 2021 and 2024 (55–61%), decreasing to 46% in 2025. This likely reflects the inclusion of lower-acuity and return transfers following service expansion, rather than a change in underlying demand for specialist paediatric care. A substantial proportion of these transfers originated from Level 3 neonatal units, consistent with established pathways to specialist and surgical services.

Overall, referral patterns remain stable, reflecting appropriate escalation pathways and access to specialist services within a geographically distributed system.

5.3 Referrals to Paediatric Hospitals

Transfers to paediatric hospitals represent the largest component of NNTP activity, accounting for approximately 55–61% of all transports between 2021 and 2024, with a relative reduction to 46% in 2025. These transfers reflect neonates requiring specialist paediatric input, including cardiology, surgical management and PICU care, as well as acute medical conditions such as bronchiolitis. These referrals are almost exclusively to CHI at Crumlin and Temple Street, with the exception of a small number of cross-jurisdictional transfers to Northern Ireland and the UK for highly specialised services.

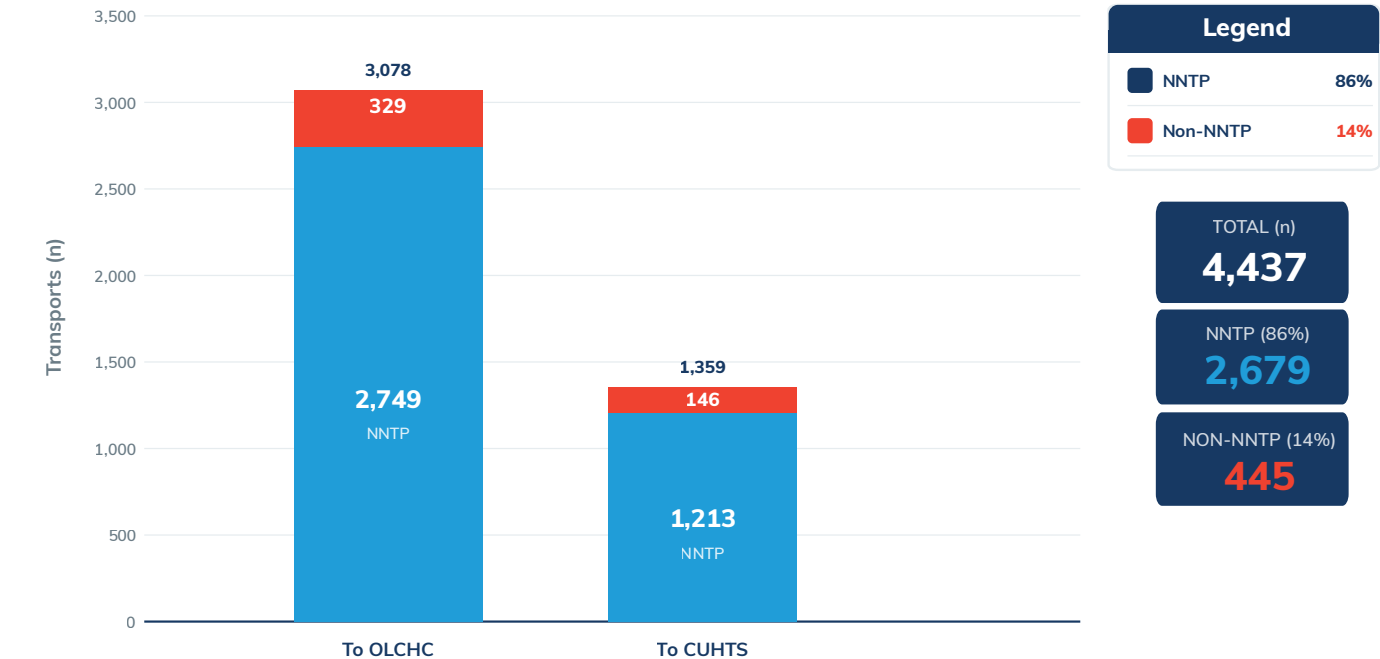
The majority of these transfers originate from neonatal units, accounting for approximately 82–91% of referrals annually, consistent with established pathways for onward transfer from neonatal services to paediatric centres for specialist care. A smaller but important proportion (~9–18%) arise from Level 1 and Level 2 paediatric and emergency units, representing neonates presenting post-discharge or from the community who require escalation of care.

Overall, these transfers represent neonatal activity directed towards paediatric centres, reflecting a diverse clinical case-mix and highlighting the central role of NNTP in supporting timely access to specialist paediatric services within a coordinated national and, where necessary, international framework.

NNTP Referral Patterns

5.4 Total Critical Care Transfers to CHI

N = 4437 (86% NNTP transports=2679)

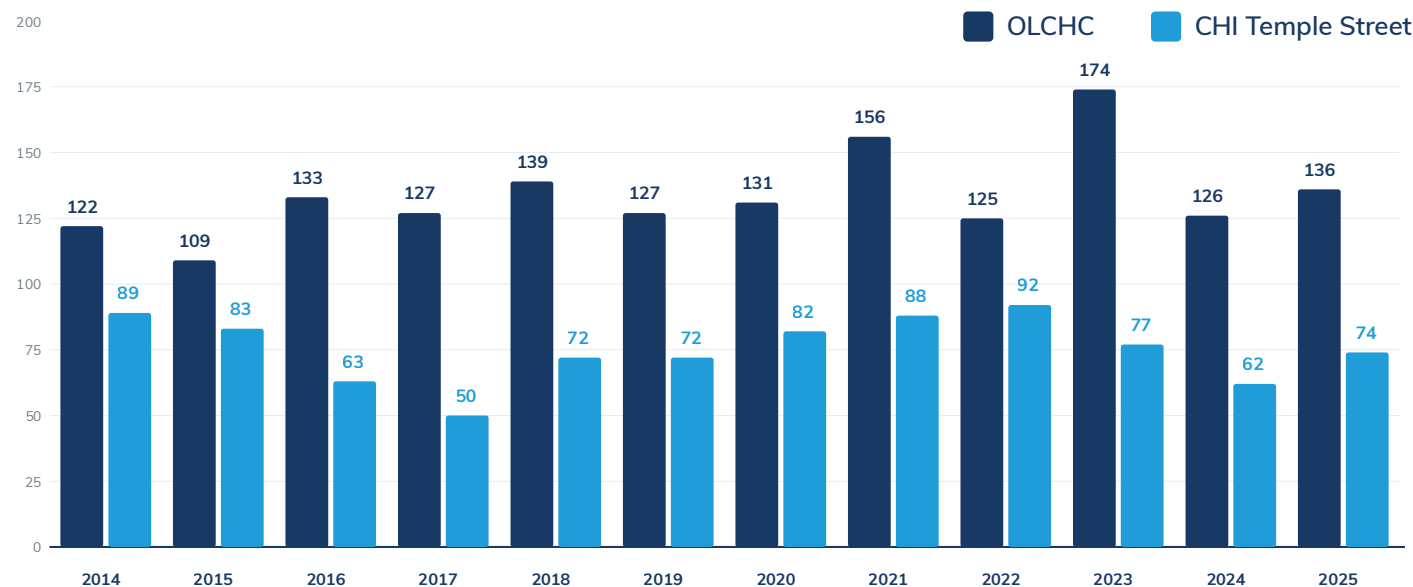


The NNTP undertakes the vast majority of neonatal critical care transfers to tertiary paediatric centres, accounting for approximately 86% of all such activity nationally, with only a small proportion (14%) undertaken by referring hospitals. This highlights the central role of NNTP in delivering equitable access to specialist paediatric services, including PICU and cardiac care.

5.5 NNTP transports to PICU at CHI 2014–25

To CHI Temple Street (CUHTS) and Our Lady’s Children’s Hospital Crumlin (OLCHC)

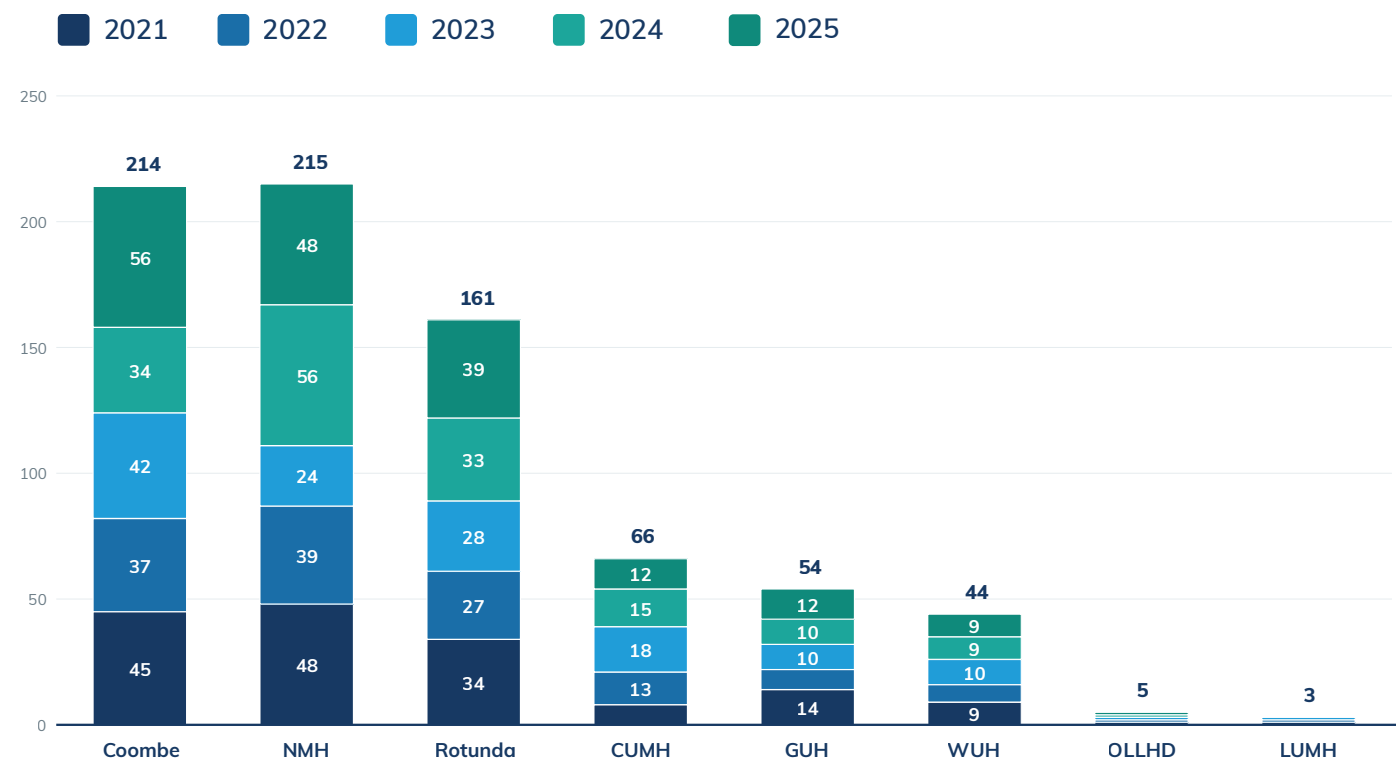
When PICU-specific transfers are considered, approximately two-thirds of NNTP activity to CHI centres relates to PICU admissions, with the remaining one-third reflecting specialist pathways, predominantly cardiac transfers to CHC at Crumlin.



NNTP Referral Patterns

5.6 NNTP Transports for Primary Neonatal Management to the Eight Neonatal Unit

n = 753 • National Annual Average = 151

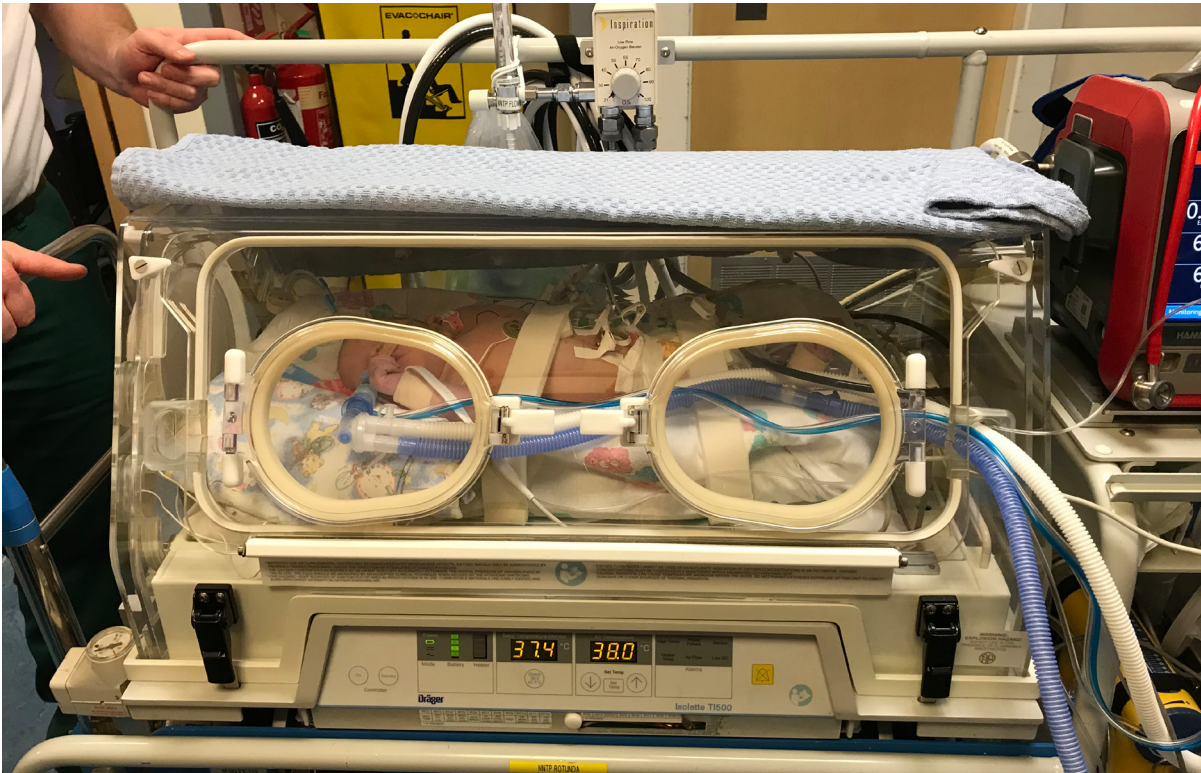


This figure outlines NNTP transfers accepted for primary neonatal management across the eight designated referral centres between 2021 and 2025 (n=753; annual average 151). When considered in the context of overall NNTP activity, transfers for primary neonatal management account for approximately 22–29% of total transports annually, consistent with previously described referral patterns.

Across the period, the three Dublin neonatal centres collectively account for approximately 75–80% of these transfers, reflecting their central role within the national service configuration. Individually, the Coombe and NMH each receive in the region of 25–30% of transfers, with Rotunda accounting for a further ~20%, demonstrating a broadly balanced distribution across the Dublin network. The remaining 20–25% of transfers are directed to regional centres, including CUH as the tertiary centre in Cork, alongside GUH, UHW and others, reflecting appropriate referral based on geography, clinical need and service capability.

Overall, the distribution of transfers remains consistent over time and highlights a coordinated national system, with activity aligned to both service configuration and population catchment.

NNTP Referral Patterns

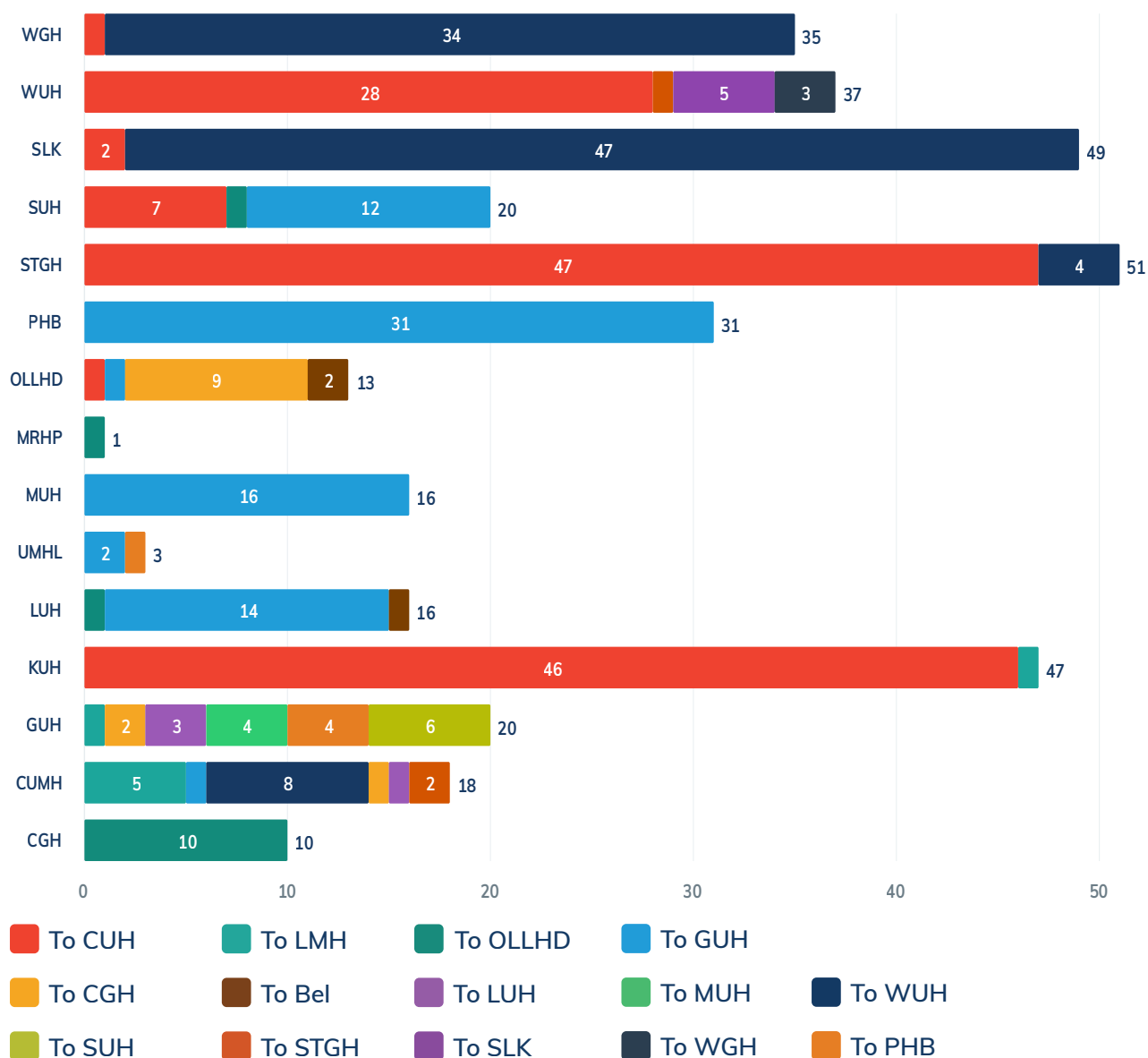


NNTP Referral Patterns

5.7 Referral Pattern Across the Regional Neonatal Receiving Hospitals

n = 367 (5% of all NNTP Transports) — Annual average 30.6

Referring Hospitals



NNTP Referral Patterns

NNTP Inter-Regional Transport - 2014 to 2025

Inter-regional transport activity demonstrates defined referral pathways, with CUH and GUH acting as key receiving centres, reflecting their roles as tertiary and regional network hubs respectively. In addition, WUH (Waterford), as a Level 2 centre, contributes to inter-regional activity, receiving both primary referrals and step-down transfers. Since the inception of the 24-hour neonatal transport programme in 2014, the NNTP has sought to facilitate transfers to these centres where clinically appropriate, including infants requiring specialist care such as extreme prematurity or therapeutic hypothermia to CUH, and those managed within established regional pathways to GUH and WUH, although to a lesser extent than the larger centres.

While the NNTP operates as a single, Dublin-based national service—aligned with the geographic concentration of maternity and paediatric services—it continues to support access to regional centres where possible. Inter-regional transfers account for approximately 30 cases annually, representing a modest but important component of activity. Although geographic and operational factors can present challenges, current volumes remain relatively low and do not, at present, provide a clear basis for the development of additional transport hubs, while the service continues to work towards equitable national access to specialist care.

Referring	To CUH	To LMH	To OLLHD	To GUH	To WUH	To CGH	To Bel	To LUH	To MUH	To PHB	To SUH	To STGH	To SLK	To WXG	Total
CGH			10												10
CUMH		5		1	8	1		1				2			18
GUH		1				2		3	4	4	6				20
KUH	46	1													47
LUH			1	14			1								16
UMHL	7			2					1						10
MUH				16											16
MRHP			1												1
OLLHD	1			1	9	2									13
PUH				31											31
STGH	47				4										51
SUH			1	12											13
SLK	2				47										49
WUH	28										1	5		3	37
WGH	1				34										35
Total	132	7	13	77	93	12	3	4	4	5	6	3		3	369

NNTP Referral Patterns

Referral Patterns Across the Primary Neonatal Receiving Centres

To examine how NNTP transport activity aligns with national service configuration, referral and patterns to the principal receiving centres were reviewed. This includes activity involving the three Dublin neonatal units, as well as the regional centres in Cork (CUMH) and Galway, with particular focus on how referrals are directed for primary neonatal management across the network

5.8. Coombe Hospital Activity 2022-25

The Coombe Hospital plays a dual role within the NNTP, both providing transport capacity and utilising the service for patient care. Its teams consistently deliver around one-third of NNTP transports, while 8–11% of overall NNTP transfers result in admissions to Coombe. Many of these referrals come from non-tertiary neonatal units, with Coombe receiving approximately 28–39% of national neonatal referrals to Dublin NICUs over the past four years (average ~35%). This pattern reflects the hospital’s integral role within the network, both as a provider of transport services and as a key receiving centre.

Activity	2022	2023	2024	2025
Total NNTP Transports	577	610	545	794
By Teams from Coombe	190 33%	174 29%	183 34%	250 31.5%
Admitted to Coombe	44 7.7%	69 11%	53 9.7%	69 8.8%
From Non-Tertiary Units	35	42	34	55
From Paediatric Hospitals	8	23	17	9
From Adult Hospitals	1	4	2	3
Tert. Neonatal o/f	—	—	—	3
Originating from Coombe	56 9.7%	96 16%	70 11.5%	120 15.1%
To Tertiary Paed Ctrs	47	80	65	80
Back to Orig Hospitals	9	16	5	40

NNTP Referral Patterns

5.9 The National Maternity Hospital (NMH)

National Maternity Hospital 2022–25

The National Maternity Hospital is also an equal contributor to NNTP activity, with its teams undertaking approximately 30–36% of all transports annually. The hospital also utilises the service regularly, with 7–11% of NNTP transfers resulting in admissions. Neonatal referrals—predominantly from non-tertiary units—make up the majority of these admissions, with NMH receiving approximately 25–43% of national neonatal referrals to Dublin NICUs over the past four years (average ~38%). In addition, outbound activity from NMH has increased over time, rising from 11–15% to almost 19% of NNTP transports in 2025, largely reflecting transfers to tertiary paediatric centres. Overall, this demonstrates NMH’s central role within the network, both in delivering transport capacity and in supporting national referral pathways.

Activity	2022	2023	2024	2025
Total NNTP Transports	577	610	545	794
By Teams from NMH	175 30%	221 36%	176 32%	290 36%
Admitted to NMH	60 10%	38 6%	69 12.6%	57 7.2%
From Non-Tertiary Neonatal	44	43	37	47
From Other Tertiary Neonatal	5	—	2	—
From Paediatric Hospitals	9	12	13	9
From Adult Hospitals	2	2	1	1
Originating from NMH	74 13%	65 11%	81 15%	149 19%
To Tertiary Paed Ctrs	65	58	66	70
Back to Orig Hospitals	9	7	15	79

NNTP Referral Patterns

5.10 Rotunda Hospital Activity

Rotunda Hospital 2022–25

The Rotunda Hospital is also a key contributor to NNTP activity, with its teams undertaking approximately one-third of all transports each year (32–36%). It also makes consistent use of the service, with 7–8% of NNTP transfers resulting in admissions. Neonatal referrals from both tertiary and non-tertiary units form a substantial component of this activity, with the Rotunda receiving around 20–32% of national referrals to Dublin NICUs over the past four years (average ~26%). The hospital also generates a steady volume of outbound transfers (12–15% of NNTP activity), predominantly to tertiary paediatric centres. Together, this reflects the Rotunda's established role within the network as both a major transport provider and an active participant in national referral pathways.

Activity	2022	2023	2024	2025
Total NNTP Transports	577	610	545	794
By Teams from Rotunda	209 36%	218 36%	197 36%	258 32.5%
Admitted to Rotunda	39 7.7%	48 7.7%	48 8.4%	57 7.1%
From Tertiary & Non-Tert.	19	25	26	33
From Paediatric Hospitals	17	13	13	17
From Adult Hospitals	7	6	5	3
Tert. Neonatal Overflow	1	3	2	4
Originating from Rotunda	83 14.4%	80 13.4%	81 14.8%	94 11.8%
To Tertiary Paed Ctrs	68	61	68	67
Overflow to Other Unit	—	—	2	2
Back to Orig Hospitals	15	19	11	23
Compassionate Transports	—	—	—	2

NNTP Referral Patterns

5.11. Access to CUMH Across the Southwest

CUMH 2022–25

TO / FROM	STGH Clonmel		UHL		KUH		WUH		CU(M)H		Dublin		Total
BY:	NNTP	Own Hosp	NNTP	Own Hosp	NNTP	Own Hosp	NNTP	Own Hosp	NNTP	Own Hosp	NNTP	Own Hosp	
To CUMH	18	1	7	7	18	7	17*	0	—	—	27	0	102
To DUB NICU	2	0	9	1	1	0	6	0	6	0	—	—	25
To CHI	(7)	0	(68)	(6)	(6)	(2)	(21)	(6)	93	17	—	—	226
Totals	20 (+7)	1	16 (+68)	8	19 (+6)	7	23 (+21)	(6)	99	17	27	0	353

Review of neonatal critical care transport activity between 2022 and 2025 demonstrates that infants from the South West are, in the majority, transferred to CUMH where clinically appropriate, consistent with established regional referral pathways.

A high proportion of infants from Kerry and Clonmel (92%) were transported to Cork, with the majority of referrals from Waterford (74%) also directed to CUMH. Referrals from Limerick were more variable, reflecting a combination of NNTP and local transport arrangements. Transfers to Dublin occurred in line with defined clinical pathways, including proximity and access to specialist paediatric services at CHI.

The NNTP undertook the majority of transports across all pathways, including:
88% of Cork–Dublin transfers

1. 86% of transfers to CHI
2. 76% of NICU referrals to Cork

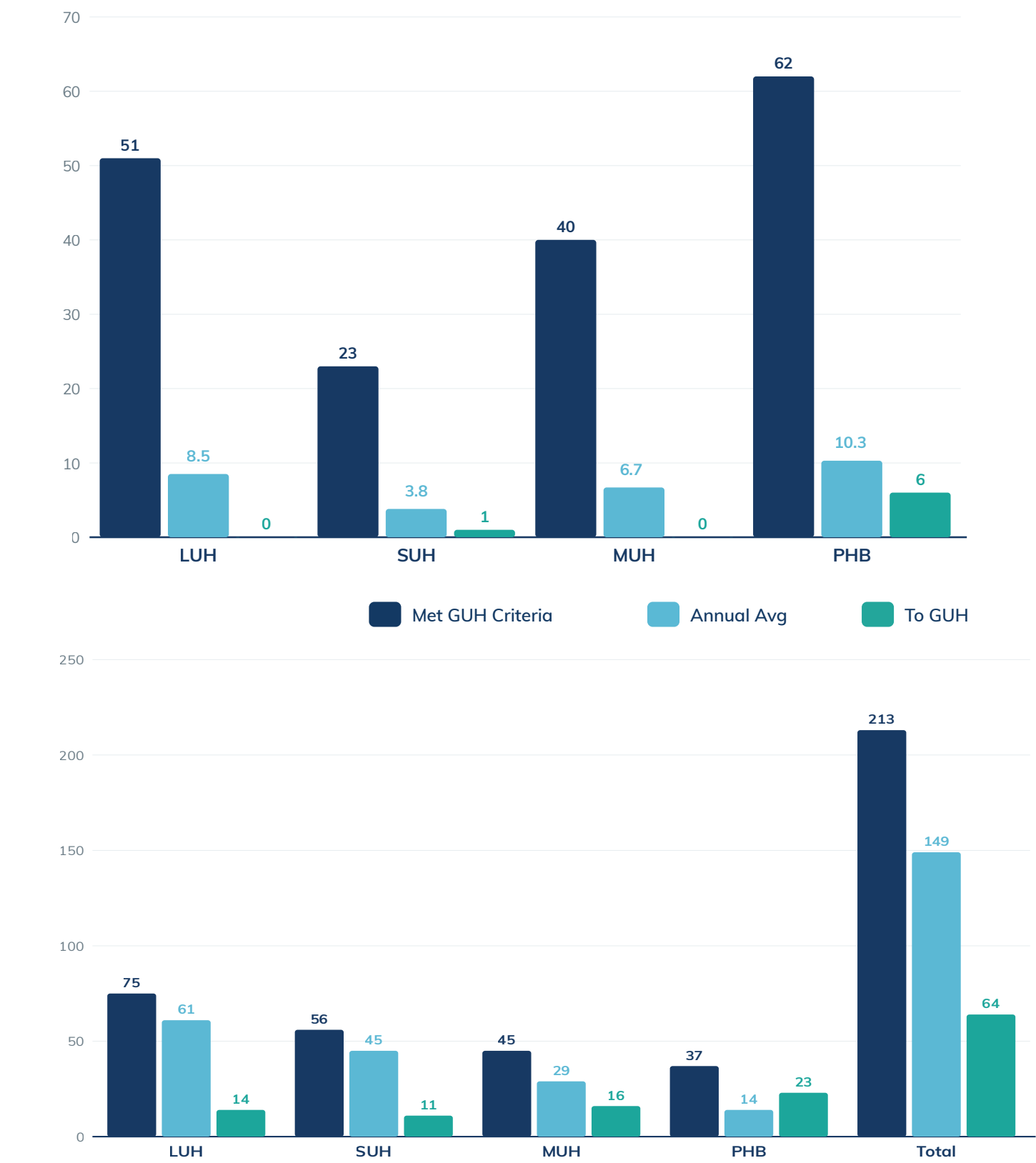
with relatively few transfers undertaken by referring hospitals.

Overall, activity involving Cork accounted for 7.9% of total NNTP workload over the study period. These data indicate that referral pathways to CUMH are being followed in practice, with NNTP facilitating the majority of appropriate transfers to Cork in line with regional service configuration

NNTP Referral Patterns

5.12. NNTP tranfers from Northwest meeting criteria for GUH NICU care

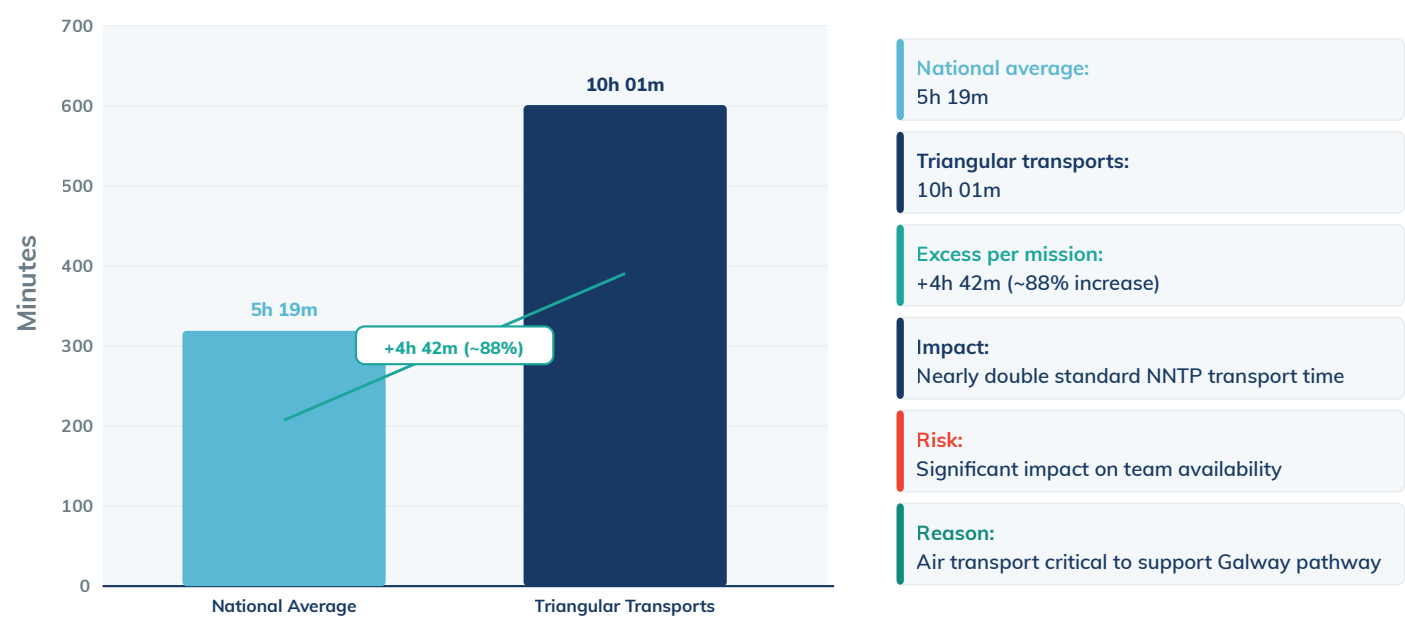
Critical Care Neonatal Transports from Saolta Hospitals



NNTP Referral Patterns

There has been a marked improvement in alignment with GUH NICU referral criteria over time. Between 2014–2019, only 4% (6/176) of eligible infants from Saolta hospitals were transferred to GUH, compared with 31% (52/170) from 2020 onwards, indicating a substantial shift toward more appropriate pathway use.

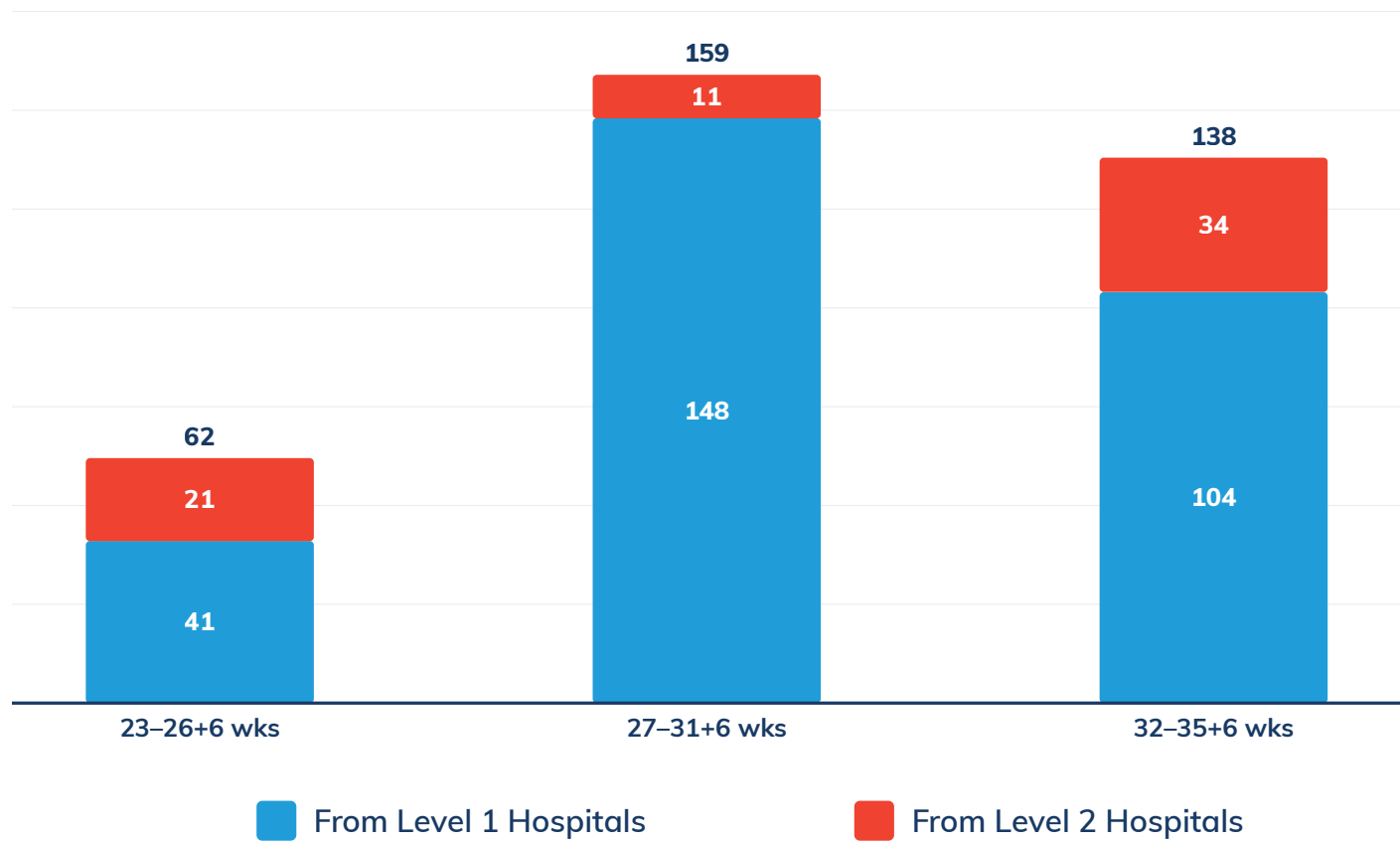
Average NNTP Direct Transport Time: vs Saolta Regional Transport Times by Road



However, significant logistical challenges remain. Transport times for infants from LUH, MUH and SUH to GUH are notably prolonged, averaging 9 hours 40 minutes—almost double the national NNTP average of 5 hours 8 minutes. Limited access to air transport is a key contributing factor, with only 31% (11/34) of these transfers conducted by air. In the context of overall regional activity, these findings suggest that while referral practices have improved, geographic transport constraints continue to impact timely access to appropriate care, highlighting the need for greater availability of air transport.

NNTP Referral Patterns

5.13 Pre-term infants moved in the first few days of life for operative neonatal care 2021–2025 from Level 1 and 2 hospital units



This graph shows the number of preterm infants moved within the first 72 hours of life between 2021 and 2025, broken down by gestational age and referring hospital level.

An annual average of 127 premature infants were transported by the NNTP in the first three days of life. Importantly, the most immature cohort—those under 27 weeks—represents a relatively small group, just 70 infants (annual average 14,) reflecting that the majority of extremely preterm babies in Ireland are appropriately delivered in tertiary centres.

As expected, most transfers originate from Level 1 and 2 units, representing babies who require escalation to neonatal centres for ongoing intensive care. In contrast, the transfers from Level 3 units largely reflect babies requiring specialist surgical care, particularly in the more mature gestational groups .

From a clinical perspective, minimising postnatal transfer—particularly in the first 72 hours of life for premature infants—is desirable, given the known risks associated with transport in this vulnerable period. The low number of early transfers observed in Ireland therefore suggests that, in most cases, infants are being delivered in the appropriate setting, reducing the need for postnatal movement.

NNTP Referral Patterns

5.14 NNTP Referrals for capacity

Over the five-year period from 2021 to 2025, NNTP data identified only 13 infants transferred within the first 72 hours of life for capacity-related reasons, equating to approximately 0.05 transfers per 1,000 births. This rate is substantially lower than that reported in the UK, where capacity-related early neonatal transfers occur at approximately 0.5 per 1,000 births over a comparable period.

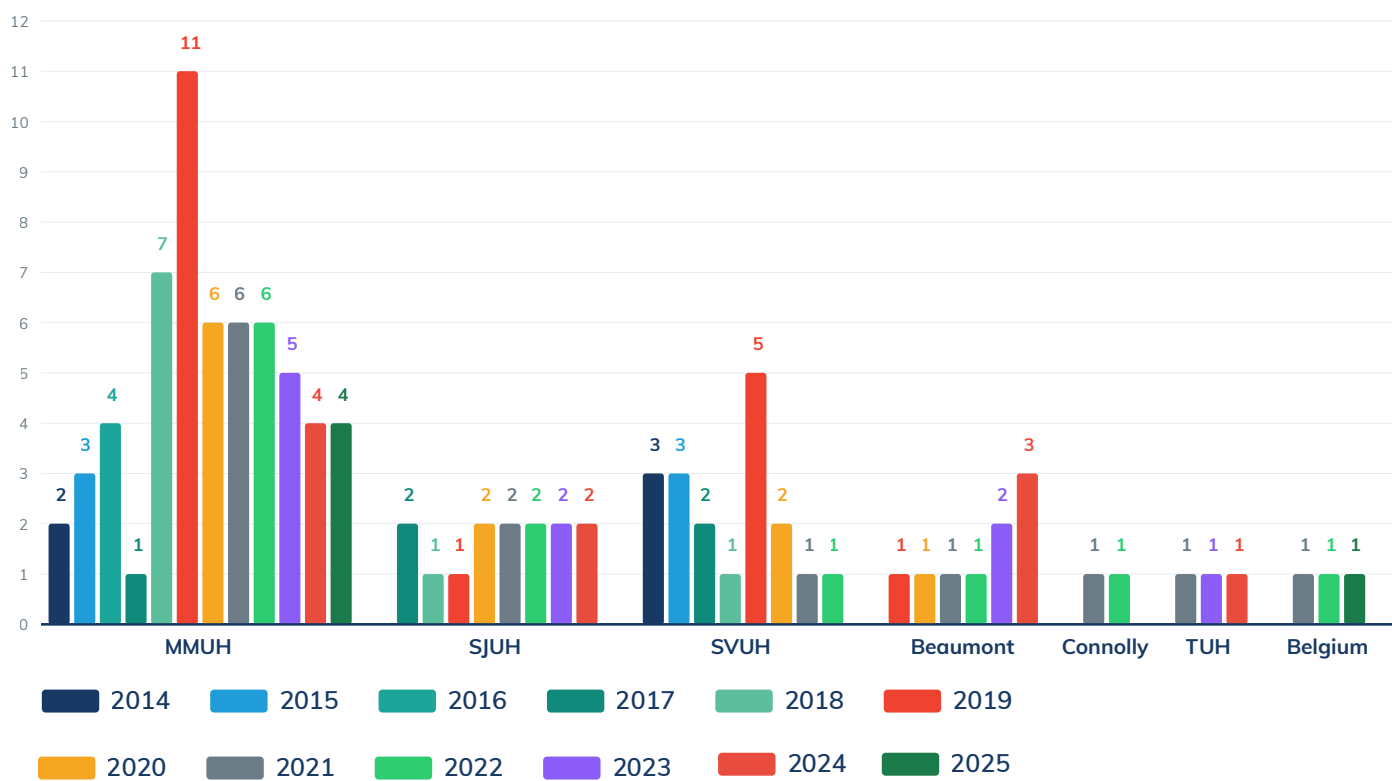
From a clinical perspective, minimising postnatal transfer—particularly in the first 72 hours of life—is a key priority given the recognised risks associated with transport in premature and critically ill infants. The very low number of capacity-driven transfers observed in Ireland suggests that neonatal services are largely operating within capacity, and that infants are, in most cases, being delivered in centres appropriate to their anticipated level of care.

Overall, capacity-related transfers represent a minimal component of neonatal transport activity in Ireland and do not appear to reflect a significant systemic pressure on neonatal intensive care resources.



NNTP Referral Patterns

5.15 Non-Maternity Hospital Delivery and Transport



Deliveries in adult (non-maternity) hospitals arise in the context of significant maternal illness, where women require delivery in a tertiary adult centre for specialist care. These are typically planned, coordinated cases for maternal indications, most commonly including maternal cardiac disease and placenta accreta spectrum. Other contributing conditions include neurological and respiratory disease, with a notable increase during the COVID-19 period due to critically unwell mothers. As such, they represent high-acuity, multidisciplinary events, distinct from unplanned presentations, and require delivery with full neonatal and obstetric support.

Since the establishment of a 24-hour, consultant-delivered NNTP service, the programme has facilitated the majority of these cases across the three Dublin maternity hospitals, attending 110 of 119 deliveries (92%), based on data from the National Neonatal Daily Activity Census (NNTP), with only three cases since 2020 occurring without NNTP attendance. Across 2014–2025, these 110 cases represent approximately 1.5% of all NNTP transports (annual average ≈9 cases). While low in volume, they are consistently complex and resource-intensive, requiring advance planning, mobilisation of a full neonatal resuscitation and transport team, and significant time commitment per case.

Activity has been concentrated in major Dublin tertiary centres, with 52% of cases occurring in the Mater Hospital, reflecting the burden of maternal cardiac disease, and a further 16% each in St. James's Hospital and St. Vincent's Hospital. In addition to domestic activity, the NNTP has supported two international maternal retrievals from Belgium following fetal procedures, accompanying

NNTP Referral Patterns

multidisciplinary teams due to the risk of in-transit delivery, although no births occurred. Overall, these data highlight that while infrequent, planned maternal deliveries in adult hospitals represent a high-risk, highly coordinated component of NNTP activity, requiring sustained expertise and specialised support.

5.16 NNTP Repatriation Transports: Referring and Receiving Hospitals

This next table outlines NNTP repatriation transports from 2021 to 2025 by referring and receiving hospital classification. Repatriations accounted for 15–22% of total NNTP transports between 2021 and 2024, increasing to 32% in 2025, reflecting expansion of the service.

NNTP repatriation transports 2021–2025 by hospital classification

Referring Hospital		2021	2022	2023	2024	2025
FROM CHI PICU	To Level 1 Neonatal Units	1	2	1	—	8
	To Level 2 Neonatal Units	10	10	4	6	9
	To Level 3 Dublin NICU	57	30	50	44	36
	To Level 3 Regional NICU	4	7	6	3	14
	To Level 1/2 Paed / CHI Units	—	1	—	—	6
	To Level 3 CHI Units	—	1	1	—	2
	To Level 3 Paed Hospital NI	—	—	—	—	2
Total						
% of Total NNTP Transports		72 (10.5%)	51 (8.8%)	62 (10.1%)	53 (9.6%)	77 (9.8%)
FROM DUBLIN L3 NICUs	To Level 1 Neonatal Units	12	7	10	14	90
	To Level 2 Neonatal Units	44	21	30	15	43
	To Level 3 Dublin NICU	9	2	1	—	5
	To Level 3 Regional NICU	6	3	1	1	—
	To NI Level 2 NICU	1	—	—	—	—
Total						
% of Total NNTP Transports		72 (10.5%)	33 (5.6%)	42 (6.7%)	30 (5.3%)	138 (17.4%)
FROM REG L3 NICU	To Level 1 Neonatal Units	—	—	—	—	3
	To Level 2 Neonatal Units	4	3	—	—	2
	To Level 3 Dublin NICU	—	1	—	—	—
Total						
% of Total NNTP Transports		4 (0.6%)	4 (0.6%)	—	—	5 (0.6%)
FROM LEVEL 2 NICU	To Level 1 Neonatal Units	1	—	1	—	33
	To Level 3 Regional NICU	—	—	—	—	1
	Total					
% of Total NNTP Transports		1 (0.2%)	—	1 (0.2%)	—	34 (4.2%)
INTL	From NI NICU	—	—	1	—	2
	To Level 3 Dublin NICU	—	—	—	—	—
	From Overseas					
To Level 3 CHI		1 (0.2%)	—	—	1 (0.2%)	—
Total Repatriations						
% of Annual NNTP Transports		150 (22%)	88 (15%)	105 (17%)	84 (15%)	256 (32%)
Annual NNTP Total Transports		677	577	610	545	794

NNTP Referral Patterns

Transfers originating from paediatric hospitals (CHI) consistently represented a notable component of repatriation activity, accounting for approximately 9–10% of total NNTP transports annually, with infants primarily returning to Level 2 and Level 3 neonatal units following specialist care. Repatriations from Dublin Level 3 neonatal units accounted for a further 5–10% of total activity between 2021 and 2024, increasing to 17.4% in 2025, largely reflecting step-down transfers to Level 1 and Level 2 units as infants stabilise.

Regional-to-regional transfers account for approximately 7–15% of repatriation activity, with the higher proportion in more recent data reflecting the formal inclusion and resourcing of these pathways within the NNTP service.

Overall, the data would seem to demonstrate a functioning repatriation network with activity distributed across tertiary, paediatric, and regional services, supporting both step-down care and return closer to home following specialist management.



NNTP Bidirectional Service Expansion

6.1 NNTP Blue Team – Nurse-Led Service Expansion

Background and Rationale

The development of the NNTP Blue Team represents a significant and planned evolution of the National Neonatal Transport Programme, designed to improve patient flow across the neonatal network, support family-centred care and enable infants to be cared for closer to home wherever appropriate. Central to this model is the timely transfer of infants who no longer require intensive care in tertiary centres, facilitating the release of critical care capacity while ensuring continuity of care in local or regional units.

In addition, the service supports clinically stable infants requiring transfer for admission, including both repatriation and forward (uplift) transfers. This need was identified in the 2015 National Neonatal Model of Care and supported by an NNTP business case, which estimated that approximately 400 neonatal transfers annually in Ireland fell into this category.

The introduction of the Clinical Nurse Specialist (CNS) role within the NNTP in 2020 was a key enabler in progressing this model of care. The development of advanced nursing practice, alongside strengthened clinical governance and education capacity, created the foundations necessary to support a nurse-led transport service. Following delays related to the COVID-19 pandemic, and supported by renewed national and organisational momentum in early 2025, the expanded service was introduced in May 2025. The rapid implementation of the Blue Team was made possible through strong collaboration and support from the Dublin maternity hospitals, which facilitated the operational rollout of the service within a short timeframe.

Model of Care and Operations

The Nurse Led 'Blue' Team is designed for clinically stable neonates requiring intra-hospital transfer for admission, including repatriation and forward (uplift) transfers. This team operates as an integrated component of the NNTP, alongside the critical care "Red Team," with overall clinical responsibility remaining with the NNTP Consultant On-Call, who provides oversight for both service streams.

A key strength of the model is the use of a shared workforce across both service streams. The same cohort of highly trained NNTP nurses and personnel from National Ambulance Service Critical Care and Retrieval Services (NASCCRS) operate across Red and Blue team duties.

This ensures consistency in clinical standards, communication and teamwork, while providing important operational flexibility. In practice, this integrated approach has enhanced service resilience, with the ability to support the creation of a second critical care team when required.

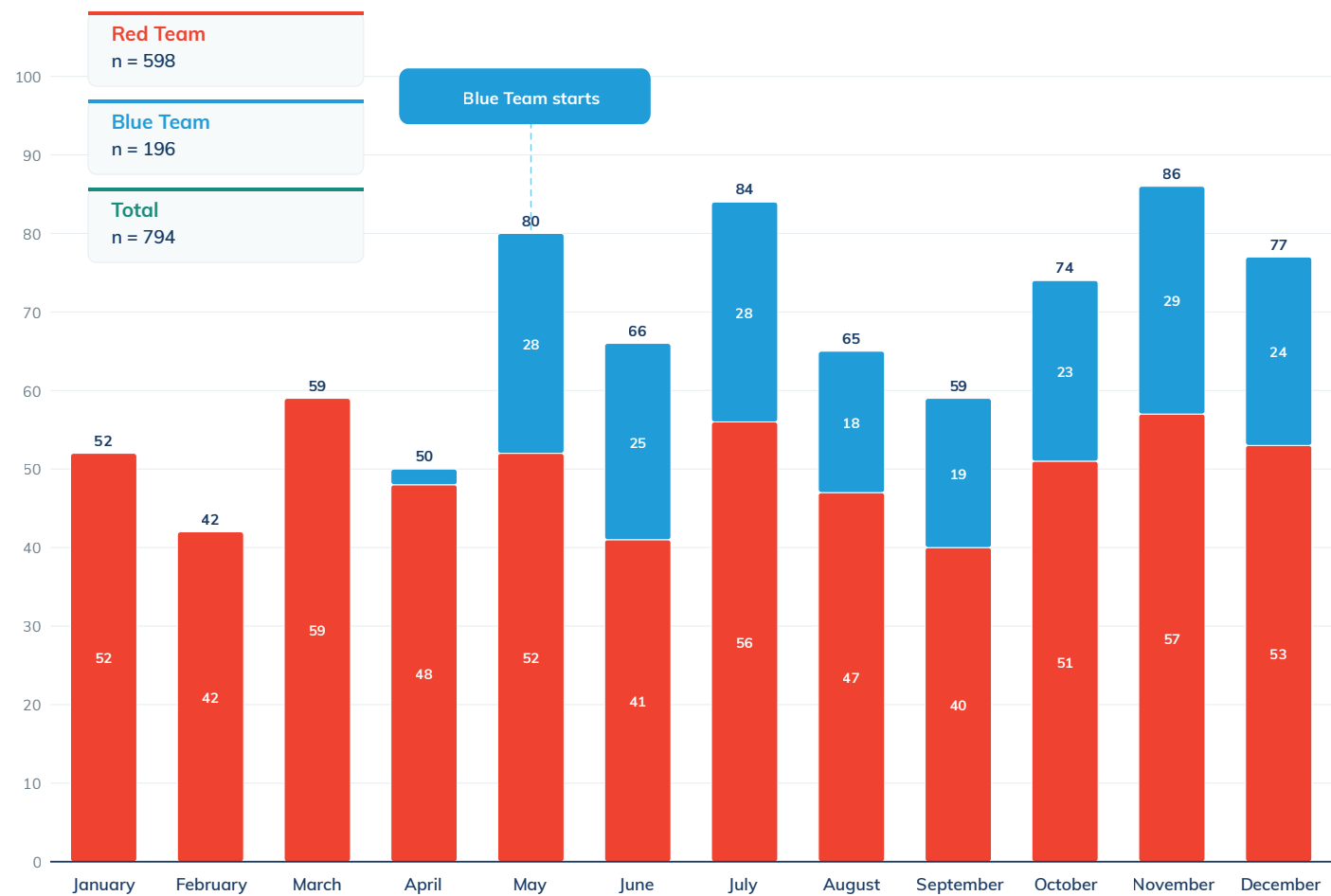
The service is accessed through the established NNTP referral and triage system via the NAS's National Emergency Operations Centre (NEOC). Building on a model already proven in critical care transport, this allows for real-time coordination and clinical prioritisation. The NNTP Consultant is engaged early in the process to support triage decisions, including team selection and allocation based on patient acuity and service demand.

NNTP Bidirectional Service Expansion

6.2 Neonatal Transports 2025 by Red and Blue Teams — n = 794

Activity and Impact

First year with additional nurse-led team from 1st May 2025



In its first eight months of operation, the Blue Team has become an integral part of the NNTP, delivering approximately 25% of all neonatal transports (195 of 794 total transfers). This level of activity aligns with expectations for a weekday, daytime service and indicates that the model is meeting a significant proportion of national demand.

While the majority of transfers relate to repatriation (86%), a meaningful proportion (14%) represent forward or uplift transfers, reinforcing the service’s role as a bi-directional transport pathway. Importantly, transfer type does not directly reflect clinical acuity within the wider NNTP.

The service is demonstrating a strong national function. A substantial proportion of transfers originate outside Dublin, including 21% occurring between regional hospitals, alongside transfers from tertiary centres back to regional units. This reflects the programme’s role in facilitating care closer to home and improving equity of access across the network.

NNTP Bidirectional Service Expansion

The clinical profile of infants transported highlights the complexity managed within the nurse-led model. Infants requiring respiratory support, including CPAP (4%) and high-flow oxygen therapy (10%), were safely transferred, with babies as small as 1 kg included in the cohort. The service has also supported air transfers and the transport of multiple births, demonstrating adaptability in varied clinical and logistical scenarios.

A central strength of the service is its family-centred approach, with parents facilitated to travel with their infant during transfer. This has been highly valued and provides reassurance during what is often a stressful time.

The contribution of the workforce has been fundamental to the success of the service. The model places a high level of clinical responsibility on the transport nurse, supported by strong consultant oversight and multidisciplinary collaboration. The expertise, adaptability, and professionalism of NNTP nurses and NASCCRS personnel—supported by Clinical Nurse Specialists—have been widely recognised.

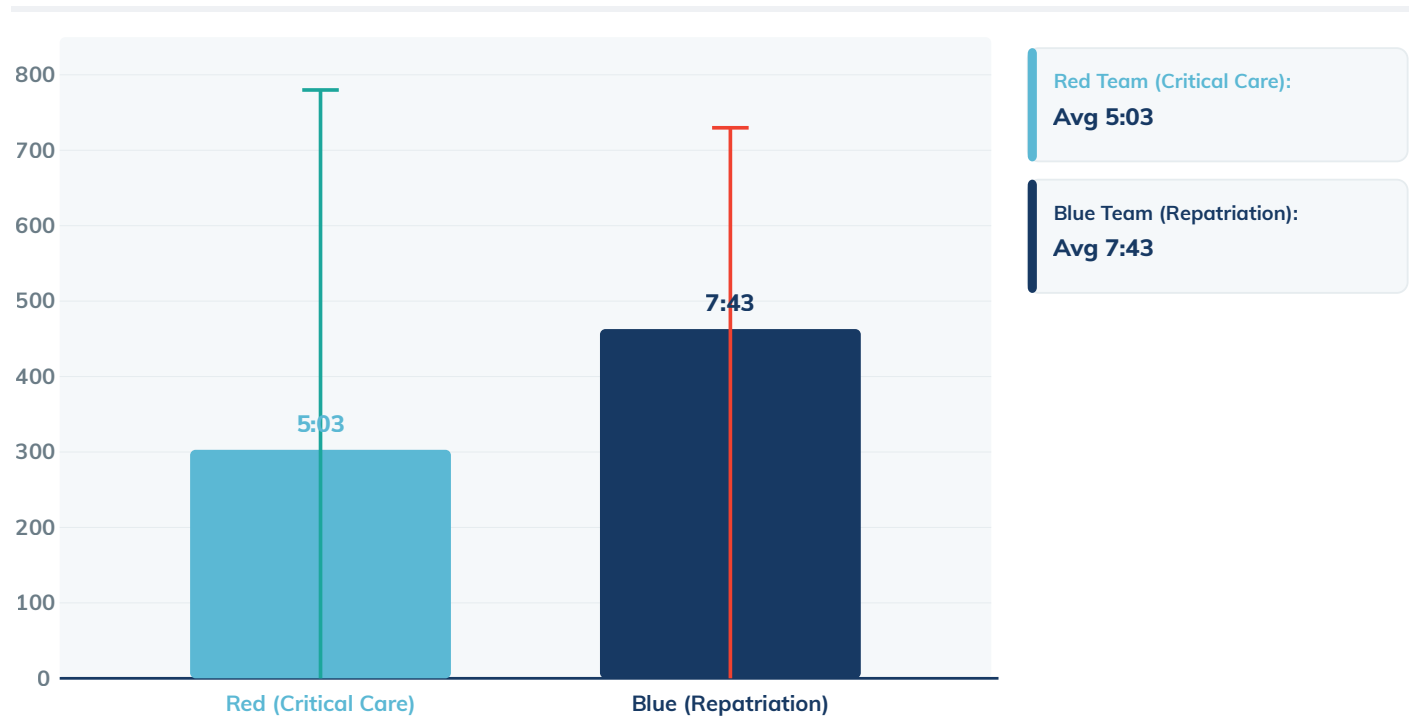
6.3 Blue Team Activity Summary – May to December 2025

Category	Number	% of Blue Team	Notes
Total NNTP Transports	794	—	All transports
Blue Team Transports	195	25% of total	Nurse-led activity
Additional Critical Care Support (2nd Red Team)	11	—	Enhanced system resilience
Repatriation Transports	168	86%	Majority of activity
Forward / Uplift Transports	27	14%	Bi-directional capability
Regional Transfers	41	21%	National reach
On CPAP	8	4%	Higher acuity within cohort
On High Flow	20	10%	Respiratory support
Air Transports	11	6%	Includes twin transfer
Twin Sets (together)	11	—	Single journey
Twin Sets (separate)	16	—	Additional transfers
Median Weight	2.0 kg	—	Infants as small as 1 kg
Outcome	—	—	All infants transported safely

NNTP Bidirectional Service Expansion

6.4 Average Length of Transports: Red v Blue Team 2025

Average duration in minutes



Prolonged 'Blue' Transport Durations

Operationally, 'Blue Team' transports are typically more prolonged than 'Red Team' transfers, with an average duration of 7 hours 43 minutes in the first eight months of the service, compared to 5 hours 3 minutes for critical care transports over the same period. This reflects the absence of emergency transport prioritisation, including limited use of blue lights and sirens, as well as the longer distances and traffic-related delays often encountered, particularly in urban areas.

While infants transported by the Blue Team are generally clinically stable at the outset, extended transfer durations may increase the potential for evolving clinical instability during transit, particularly on longer journeys. To mitigate this, the NNTP utilises rotary wing air transport selectively, where available, to reduce both overall mission duration and the time infants are exposed to the transport environment.

In the first eight months of the service, 11 transports were undertaken by air, predominantly along the western corridor, including routes between Galway, Letterkenny, Mayo, and Castlebar. The feasibility of these transfers has been supported by the alignment of Blue Team activity with daytime operating hours, allowing greater access to aviation services. However, recognising the competing demands on air transport resources, the NNTP continues to deploy this modality judiciously, reserving it for cases where it offers clear clinical and operational advantage

NNTP Bidirectional Service Expansion

Future Development

The Blue Team has established itself as a safe, effective, and flexible extension of the NNTP, with clear benefits for patients, families, and the wider healthcare system. Future development will focus on:

- Strengthening education and engagement across referring units
- Introducing standardised handover tools and processes
- Improving access to Air transport
- Continuing to enhance national connectivity and care closer to home

As the service evolves, it remains focused on meeting patient needs through clinically informed, responsive care.

Learning and Service Development

Early experience has highlighted several important areas for ongoing development.

1. The 'blue' team expansion has not only increased the workload for nurses and EMTs but also resulted in a significant increase in demand at consultant level, with higher volumes of calls for advice, coordination, and clinical decision-making, reflecting the broader accessibility of the service.
2. The expansion of the service has also increased interactions with a broader range of clinical environments, including units less familiar with structured neonatal transport processes. This has emphasised the need for continued education, engagement, and the development of standardised handover tools to support consistency and efficiency.

NNTP Air Transport

7.1 NNTP Air Transport Capability, Activity and Access

The NNTP has, since its early development, established the capability to deliver neonatal retrieval by air in partnership with the Irish Air Corps. This has included the collaborative development of dedicated neonatal transport modules suitable for both rotary and fixed wing aircraft, alongside specialised loading systems and transport trolleys. In addition, the NNTP has developed detailed clinical guidelines, training programmes, and operational procedures to support the safe and effective delivery of neonatal care in the aeromedical environment.

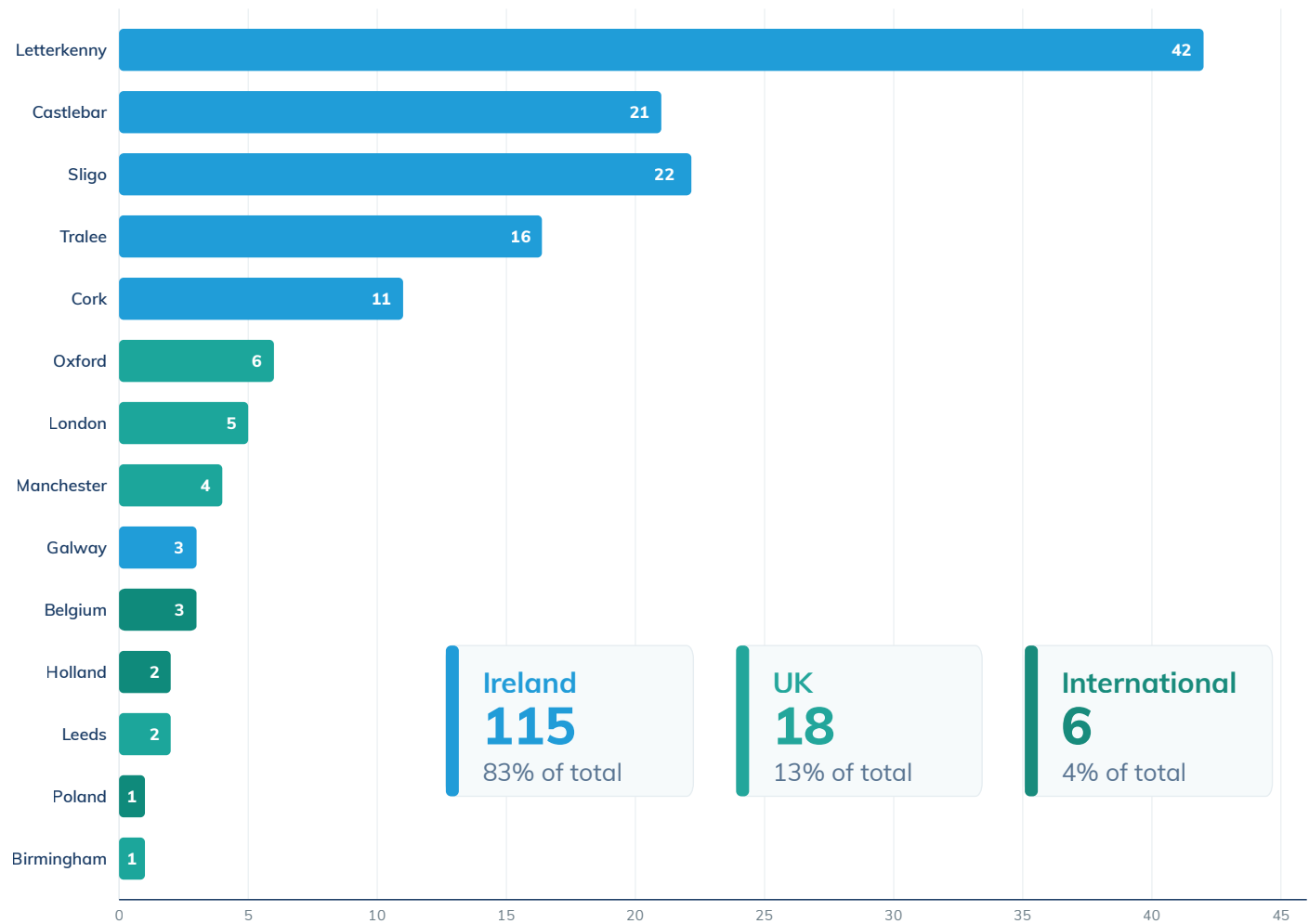
The majority of air transports were completed using rotary wing aircraft, primarily the AW139 and, less frequently, the EC135, while fixed wing transfers utilised Irish Air Corps platforms including the CASA and PC-12. In addition to neonatal transfers, the NNTP has supported a small number of antenatal cases, including transfers involving women returning from foetal medicine procedures abroad, undertaken in collaboration with obstetric teams and MICAS (adult critical care transport).



NNTP Air Transport

7.2 NNTP Air Transports by Destination 2014–2025

Air Transport Destinations

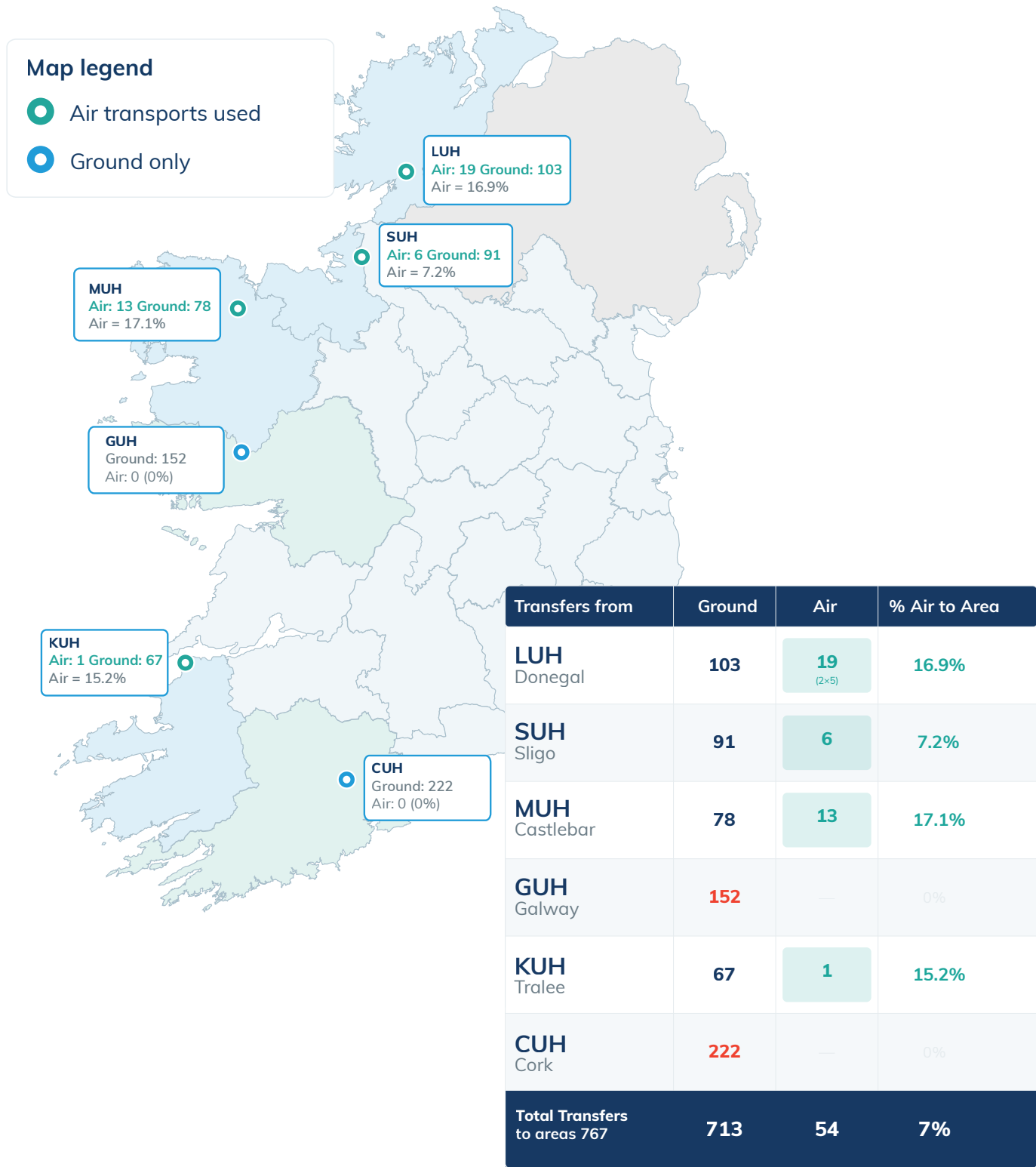


Between 2014 and 2025, the NNTP undertook 139 air transports to a range of national and international destinations, averaging approximately 11–12 transfers per year. Rotary wing activity was predominantly directed towards geographically distant centres within Ireland including Letterkenny, Castlebar, Sligo, and Tralee, reflecting established referral pathways and the role of air transport in supporting access from more remote regions.

NNTP Air Transport

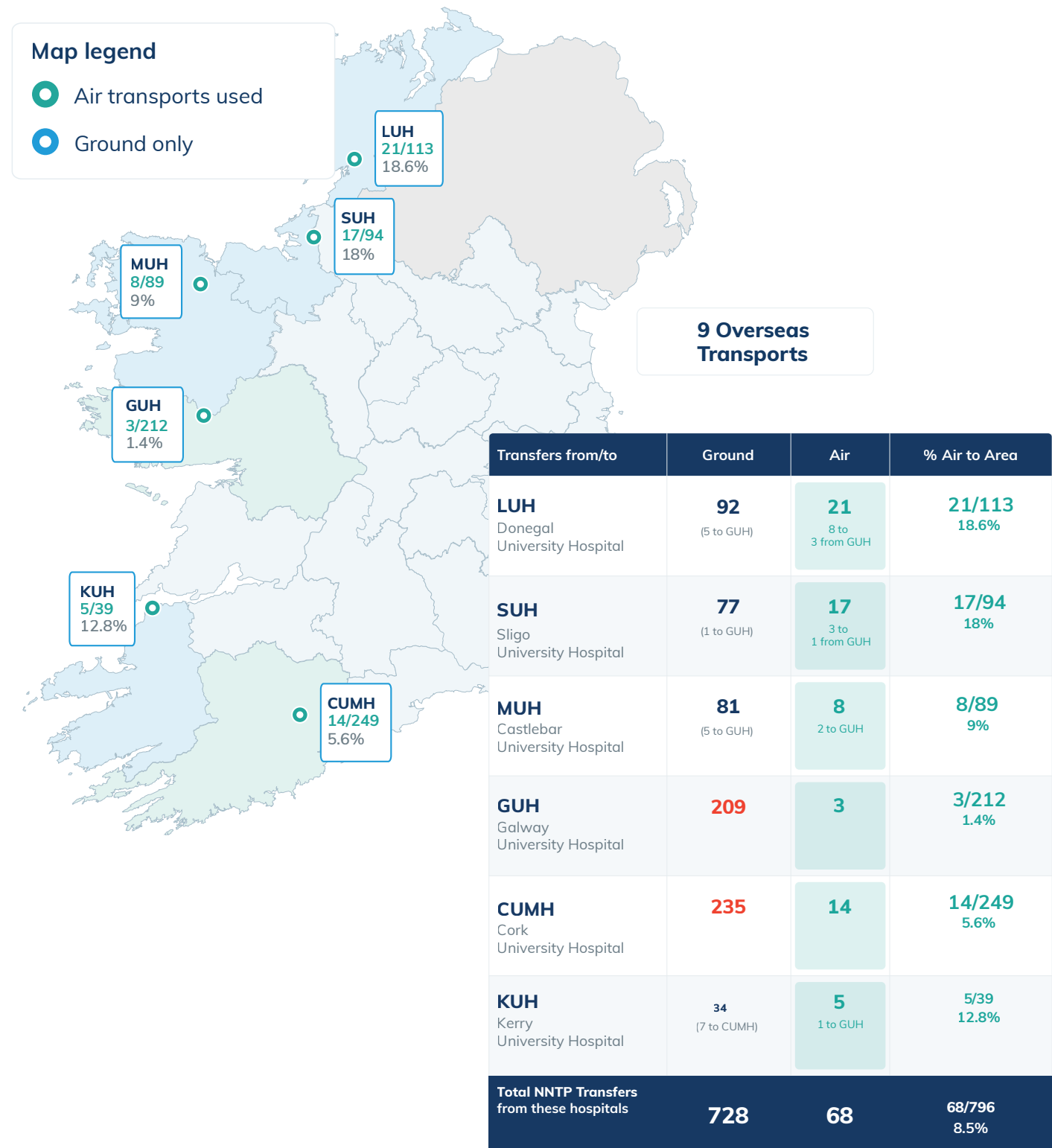
7.3 Air Transport By Region

NNTP Transports Ground vs Air within Ireland 2014–2020



NNTP Air Transport

NNTP Transports Ground vs Air within Ireland 2020–2025



NNTP Air Transport

NNTP data demonstrate that air transport use underrepresents true demand, as occasions where it is clinically indicated but unavailable are prospectively recorded.

Analysis of transfers to geographically distant regions shows consistently limited access where air transport would offer greatest benefit. Between 2014–2020, 54 of 767 transfers (7%) were completed by air, increasing slightly to 68 of 796 (8.5%) between 2020–2025. These figures reflect access within this cohort rather than overall utilisation.

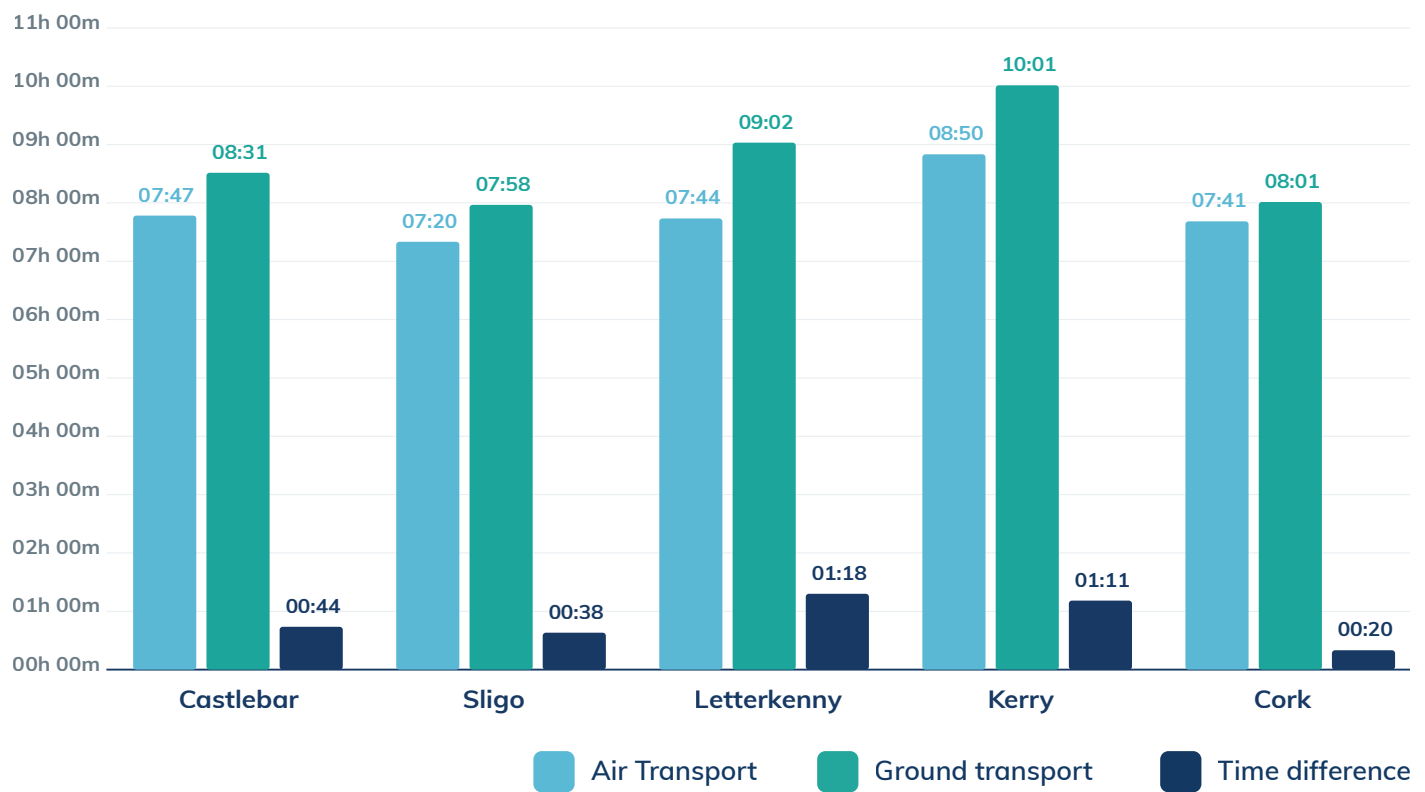
Despite modest improvement, availability remains constrained and variable, with earlier periods showing minimal or no access in some high-volume centres. While access has improved in recent years, it remains inconsistent relative to clinical need.

Air Transport Access and Service Limitations

Across geographically distant regions, over 90% of transfers are undertaken by road, even where air transport would be expected to offer clear clinical and logistical advantages. This reliance on road transport results in prolonged journey times and delayed access to specialist care, particularly in time-critical situations.

Average NNTP Transport Durations to Hospitals > 200 kms - 2020-2025

Air transport vs Ground transport • Time difference (ground – air)



NNTP Air Transport

For longer-distance transfers (>200 km), air transport is associated with shorter overall journey times compared to road, reducing time spent in transit and enabling earlier access to specialist care. While these journeys are inherently prolonged due to geography, the use of air transport can meaningfully shorten the duration of road travel and facilitate a more rapid response by the retrieval team.

However, these benefits must be considered alongside operational constraints. Delays in confirming access to air assets can prolong the time to transport initiation, partially offsetting the time gained in transit. These factors are reflected in the observed journey times.

Overall, the data support the need for improved access to air transport on a clinical needs basis, rather than an availability-based model, in order to fully realise its benefits for neonatal retrieval. Periods of increased availability provide insight into underlying demand. Notably, increases in air transport activity in 2021 and again in 2025, associated with improved daytime access, demonstrate that utilisation rises when availability improves. This supports the conclusion that current levels of aeromedical transport reflect access constraints rather than true clinical demand.

It is recognised that the Department of Health, HSE, NAS Critical Care and Retrieval Services (NASCCRS), and NNTP are engaged in ongoing discussions regarding the future development of national aeromedical retrieval capacity. These discussions reflect an increasing recognition of the need to strengthen and align air transport provision with clinical requirements.

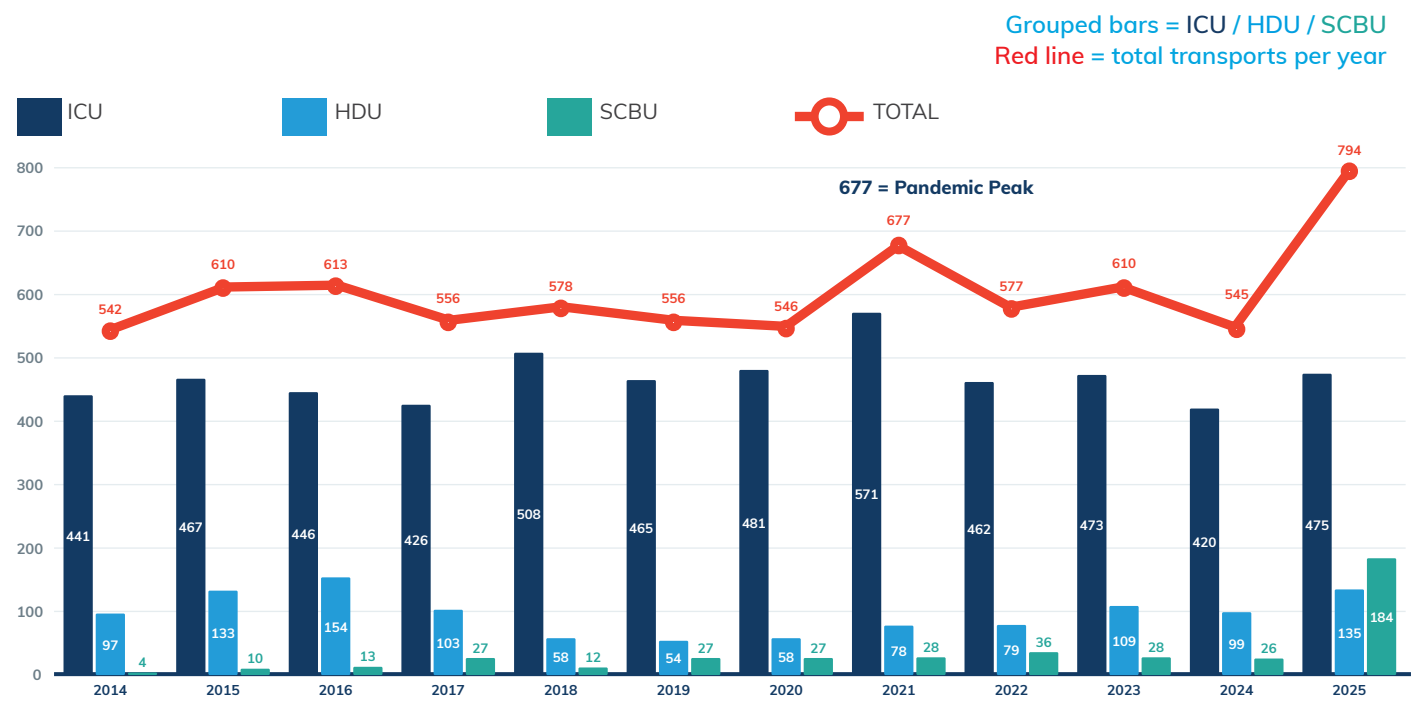
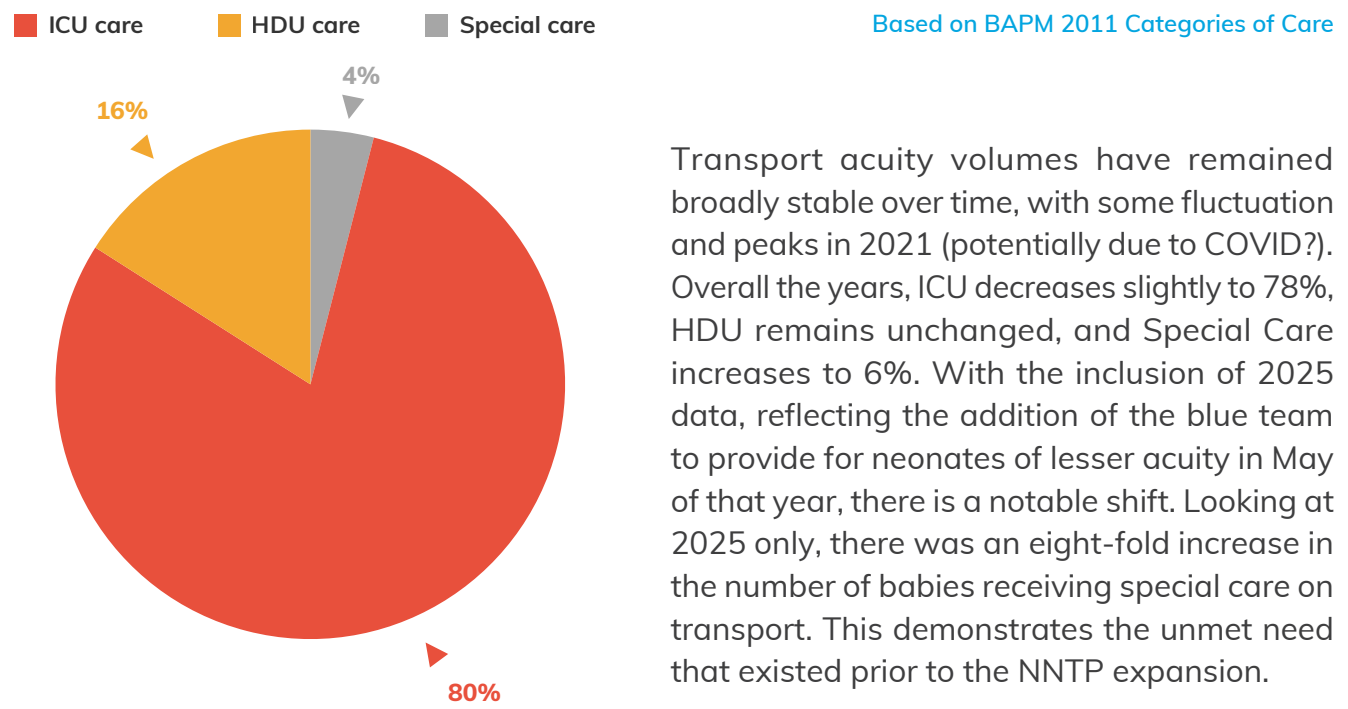


Clinical Activity

8.1 Acuity Levels on NNTP Transport

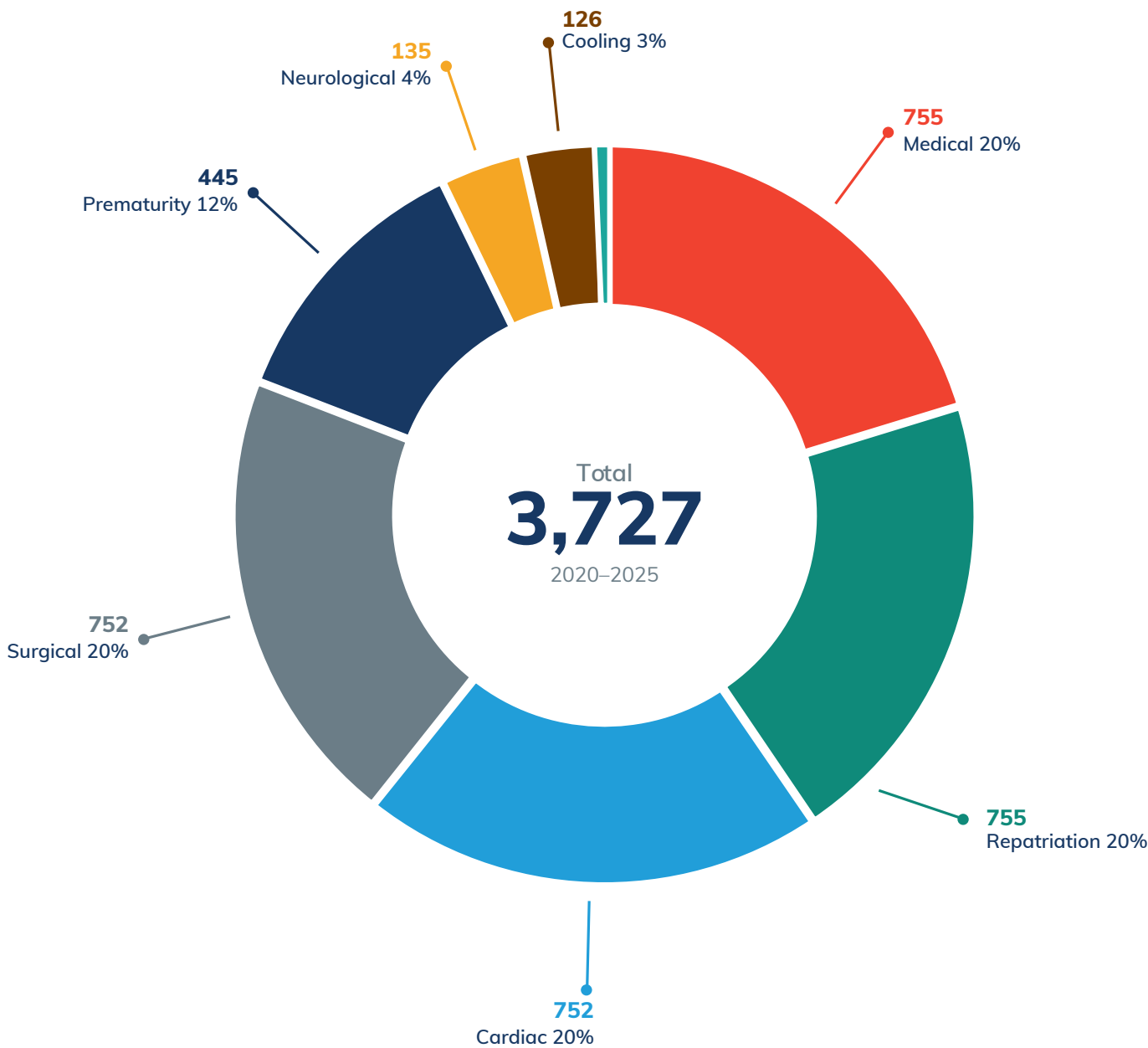
Throughout the years of the 24/7 service, infants requiring ICU transfers have dominated NNTP activity, highlighting the consistently high-acuity nature of the service provision .Prior to the introduction of the Blue Team (2014–2024), the NNTP case mix was heavily ICU-focused (80%), with HDU at 16% and Special Care minimal (4%).

Acuity Level on NNTP Transports 2014–2024 (Prior to introduction of Blue Team)



8.2 NNTP Reasons for Transport, Total

Reason for Transport 2020-2025



The most recent NNTP transport activity data (2020–2025) demonstrates a broad and relatively even distribution of indications to transport. This contrasts with the earliest years of the programme, when cardiology—particularly for PDA ligation and related care—accounted for the largest proportion of transports (annually 40%).

Over the subsequent decade, evolving neonatal practice has moved away from routine surgical closure towards conservative management, with PDA ligation now rarely performed. This shift is reflected in this aggregate data, where cardiology now accounts for approximately 20% of all transports, similar to medical, surgical, and repatriation categories, each contributing roughly one-fifth of activity.

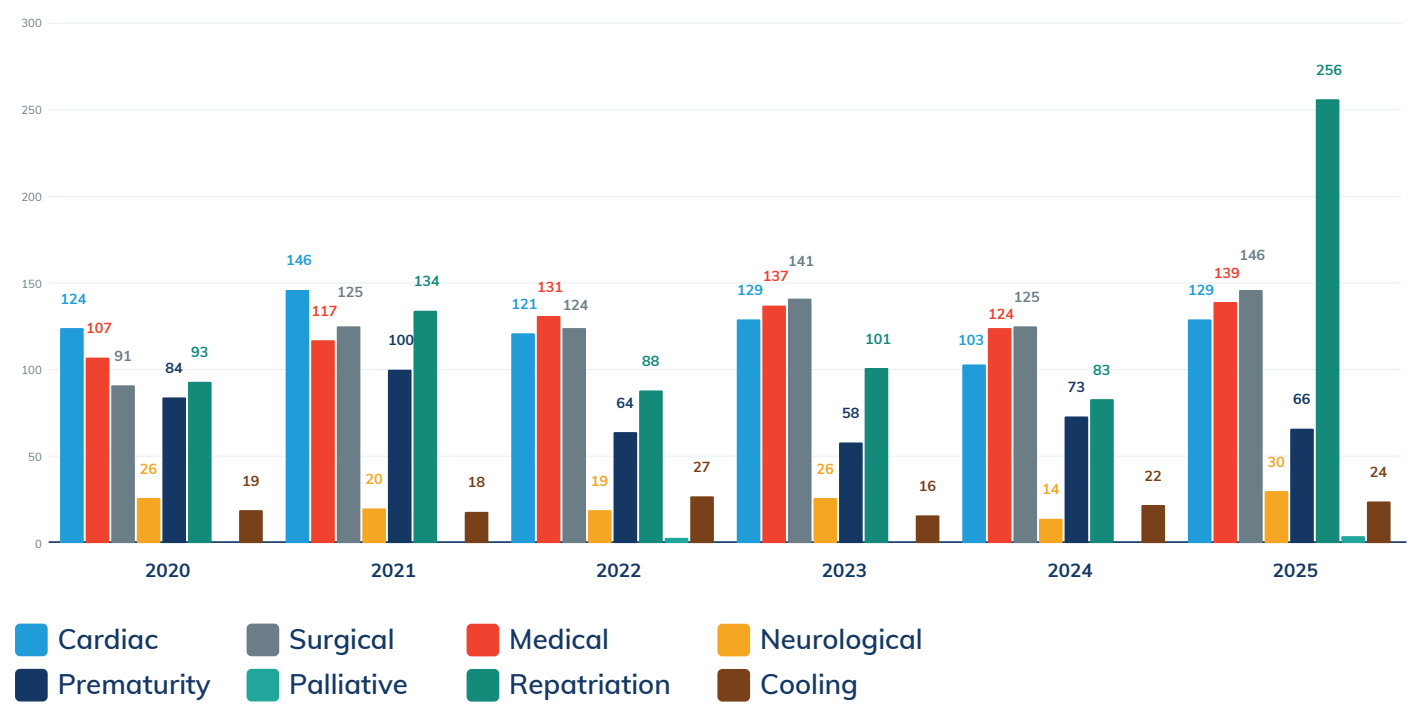
Clinical Activity

There has also been a notable increase in repatriation activity, rising from approximately 10% in earlier years to 20% of NNTP workload up to 2024, reflecting the expansion of the service to facilitate the return of infants closer to home following stabilisation.

Prematurity (12%) and neurological transfers (4%) represent smaller but important cohorts, while cooling and palliative transfers comprise a minor proportion overall.

8.3 Indications for NNTP Transport , Year on Year

Reason for Transport 2020-2025



Across the six-year period, medical, surgical, repatriation, and cardiac transfers each contribute approximately 20% of overall activity, highlighting a relatively even distribution of workload. Of these, repatriation has emerged as a particularly prominent and increasing component, reflecting the expanded capacity of the NNTP in 2025 to accommodate these transport across all acuity levels. Surgical transfers also represent a substantial proportion, indicating the centralisation of specialist neonatal surgical services and ongoing demand for timely access to these centres. General medical transfers remain consistently high, reflecting the broad range of neonatal conditions requiring escalation of care.

In contrast, prematurity accounts for a smaller proportion of transports (approximately 12%) than might be anticipated, given its prevalence in neonatal practice. This likely reflects the fact that many preterm infants are delivered in, or transferred antenatally to tertiary centres, reducing the need for postnatal transport. Neurological transfers (approximately 4%) and cooling-related transfers (4% but clinically significant cohort) represent more specialised, time-critical indications. Although smaller in number, these cases require highly coordinated pathways and rapid intervention, particularly in

Clinical Activity

the context of therapeutic hypothermia, where timely achievement of target temperature is essential. Overall, the pattern of activity is stable, with changes over time reflecting developments in clinical practice and service delivery rather than significant shifts in case mix

8.4 Transports in ROI for Therapeutic Hypothermia

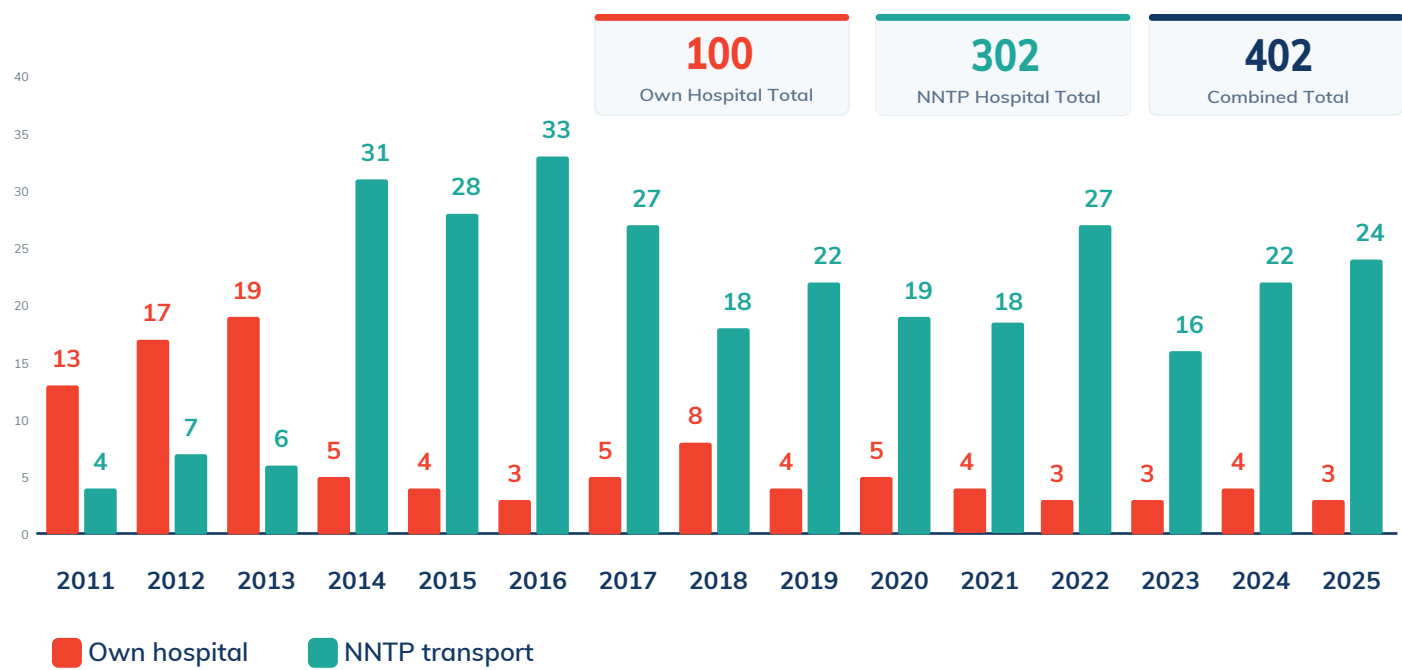
Activity data from the NNTP’s National Daily Census and own database records, show that therapeutic hypothermia transfers represent an established component of neonatal retrieval work in Ireland, with approximately 75% of these transports undertaken by the NNTP each year.

There are four tertiary neonatal centres providing cooling (three in Dublin and one in Cork), and geography continues to influence transfer patterns and transport modality. A smaller proportion of infants—particularly those requiring transfer to Cork—are brought directly by referring hospitals due to time-critical considerations.

Therapeutic hypothermia is a time-critical therapy, where effectiveness is determined by achieving target temperature within the recommended timeframe. Until 2016, the capacity to transport infants using servo-controlled (active) cooling was not available, and passive cooling was therefore implemented across referring units. The NNTP played a central role in establishing this approach through national guidance, education, and structured tools, supporting a continuum of care from the referring hospital through to the receiving centre.

Since 2016, the NNTP has introduced and, for much of this period, remained the primary provider of servo-controlled cooling during transport, facilitating a more controlled and manageable approach to temperature regulation, while achieving similar therapeutic goals.

In the ROI 2011–2025 — Own hospital vs NNTP transport



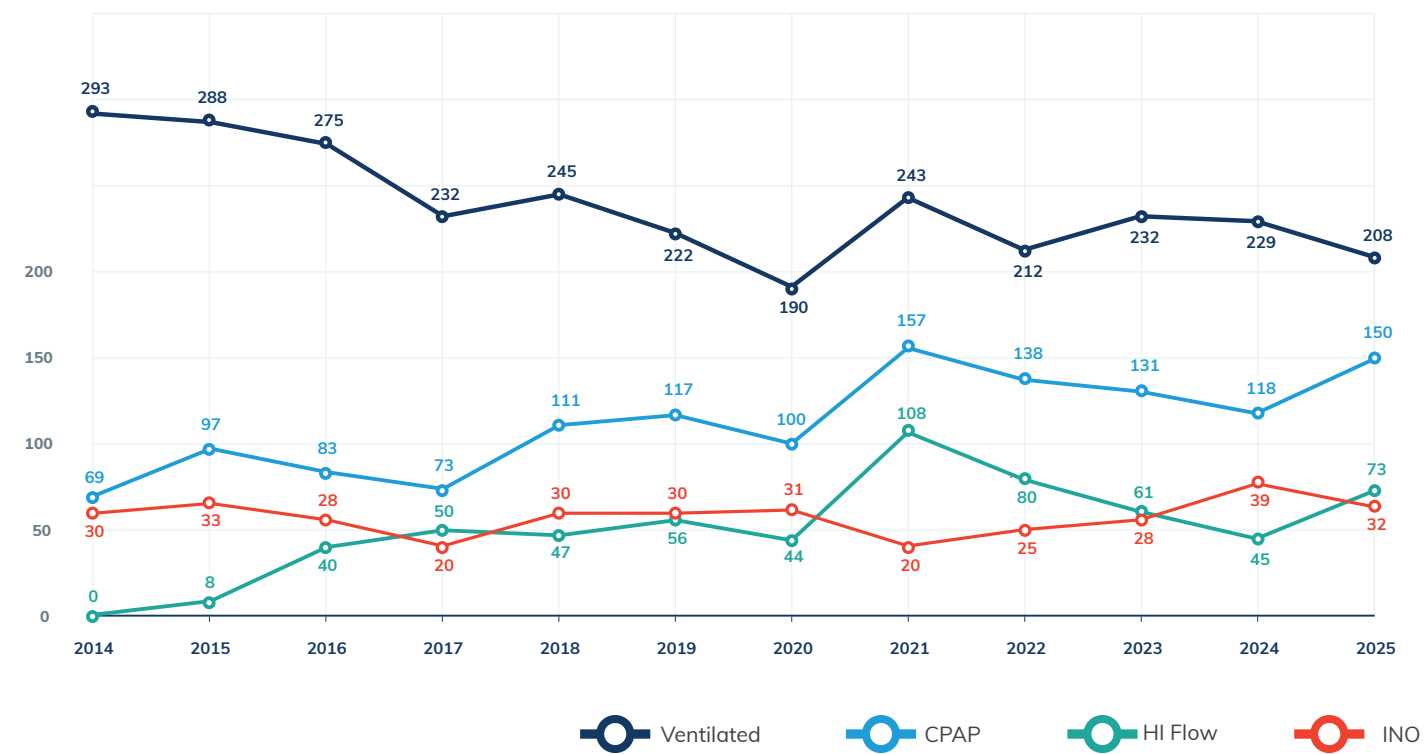
8.5 Respiratory Support During Transport

Over the lifetime of the NNTP, there has been a marked reduction in the proportion of ventilated patients from approximately 90% in the early years to around 25–40% in recent years. However, while the proportion of ventilated infants has declined, the absolute number of ventilated transports has remained relatively consistent over time. More recent reductions in proportion, particularly in 2025, reflect service expansion and the inclusion of a broader case mix, rather than a reduction in the number of critically ill infants requiring ventilation.

Similarly, the number of infants transported while receiving inhaled nitric oxide has remained relatively consistent over time.(5%) and appears higher than reported in some international datasets, which may reflect differences in service configuration.

Non-invasive modalities, particularly CPAP (20%), now form a consistent component of transport care.

Clinical Therapies on NNTP Transport



The introduction of high-flow therapy (10%) in more recent years has further expanded the range of respiratory support available, allowing for greater flexibility in managing infants during transfer, particularly in those requiring ongoing or step-down respiratory support.

Overall, these trends reflect the experience of a service adapting to changes in neonatal practice, supporting a broader range of respiratory needs while maintaining the capability to safely transfer infants requiring intensive ventilatory support.

Clinical Activity

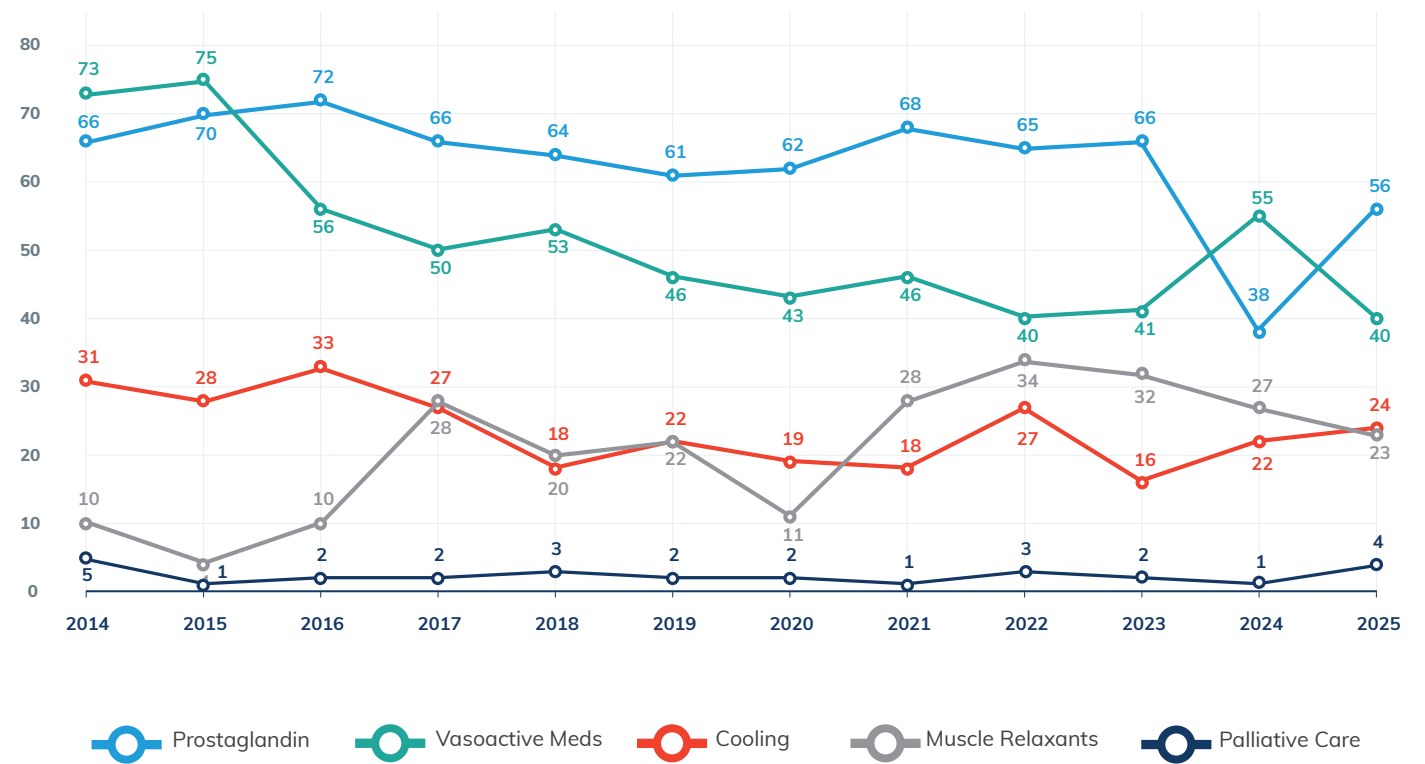
Overall, these trends reflect the experience of a service adapting to changes in neonatal practice, supporting a broader range of respiratory needs while maintaining the capability to safely transfer infants requiring intensive ventilatory support.

8.6 Clinical Therapies on NNTP Transports from 2014

The NNTP has delivered a consistent pattern of clinical therapies during transport over this period, reflecting the high-acuity nature of the service. Prostaglandin use has remained in the region of 60–70 infants per year, consistent with the volume of cardiac-related transfers managed by the service. Vasoactive medication use has generally ranged between 20 and 35 cases annually, reflecting the ongoing management of haemodynamically unstable infants during transport.

Muscle relaxant use has varied across the period, with lower numbers in the earlier years and increased use more recently. This reflects changes in clinical practice within the service, particularly the introduction of muscle relaxants to support intubation during transport.

Palliative care transfers remain low throughout, typically between 1 and 5 cases per year. Overall, NNTP activity reflects the ongoing delivery of specialist transport for a consistent cohort of high-acuity infants, with variation over time reflecting both case mix and evolving clinical practice.



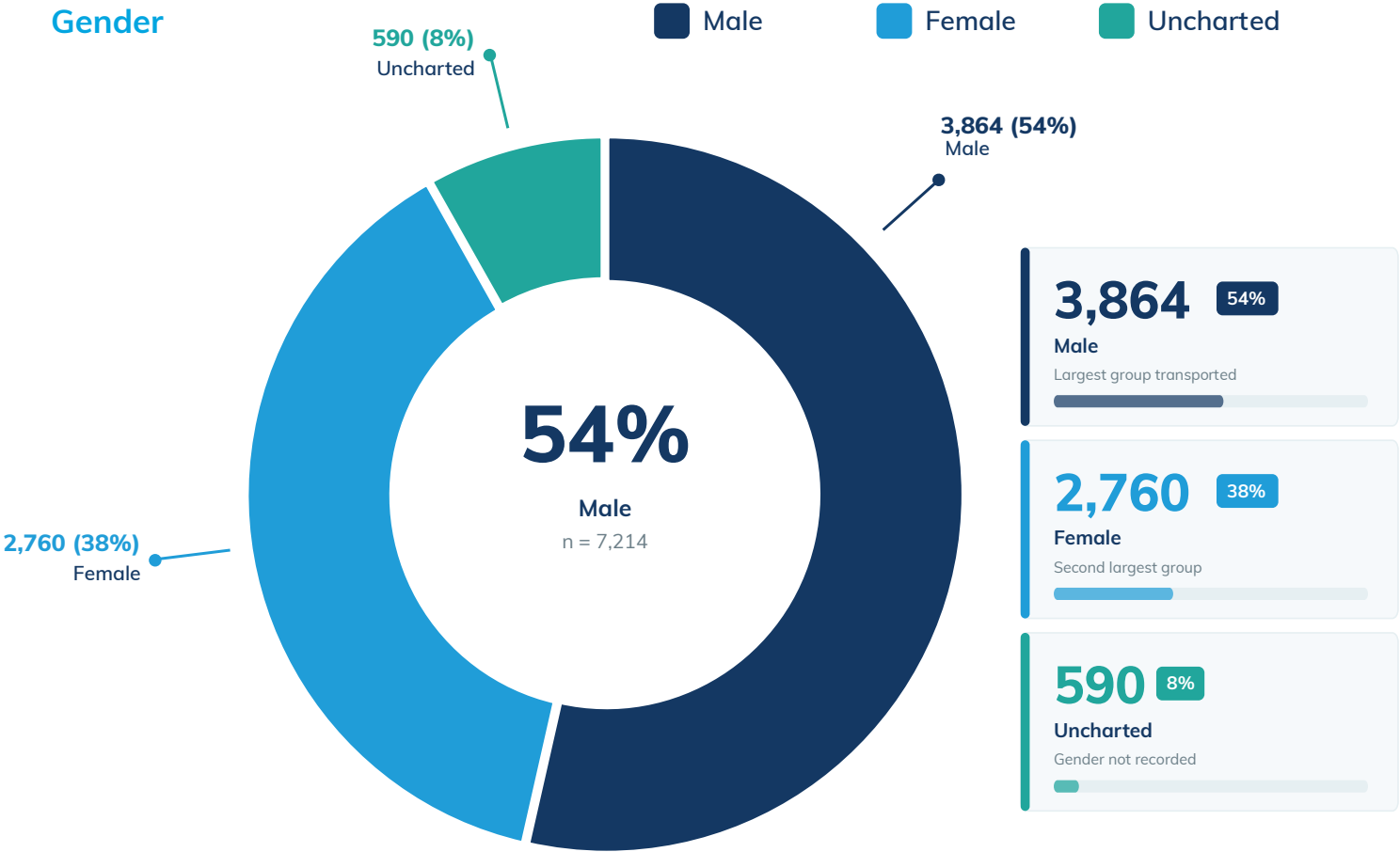
Clinical Therapies Used During Transport Year on Year: (2020–2025) n (%)

Therapy	2020 (546)	2021 (677)	2022 (577)	2023 (610)	2024 (545)	2025 (794)
Ventilated	190 (34.8%)	243 (35.9%)	212 (36.7%)	232 (38.0%)	229 (42.0%)	208 (26.2%)
CPAP	100 (18.3%)	157 (23.2%)	138 (23.9%)	131 (21.5%)	118 (21.7%)	150 (18.9%)
High Flow	44 (8.1%)	108 (16.0%)	80 (13.9%)	61 (10.0%)	45 (8.3%)	73 (9.2%)
iNO	31 (5.7%)	20 (3.0%)	25 (4.3%)	28 (4.6%)	39 (7.2%)	32 (4.0%)
Vasoactive	43 (7.9%)	46 (6.8%)	40 (6.9%)	41 (6.7%)	56 (10.3%)	40 (5.0%)
Prostaglandin	62 (11.4%)	68 (10.0%)	65 (11.3%)	66 (10.8%)	38 (7.0%)	56 (7.1%)
Prostin (S/V)	49 (9.0%)	45 (6.6%)	48 (8.3%)	43 (7.0%)	25 (4.6%)	45 (5.7%)
Cooling	19 (3.5%)	18 (2.7%)	27 (4.7%)	16 (2.6%)	22 (4.0%)	24 (3.0%)

8.7 Characteristics of Infants Transported by NNTP

The distribution of infants transported by the NNTP shows a predominance of male infants, accounting for approximately 54% of transfers, compared with 38% female and 8% where gender was not recorded. While a proportion of cases have unrecorded gender, this is unlikely to significantly alter the overall pattern, which is consistent with the recognised male predominance in neonatal intensive care populations.

Gender



Clinical Activity

This pattern aligns with wider neonatal data, where male infants are known to have higher rates of prematurity, respiratory morbidity, and need for intensive care support. In contrast, the sex distribution at birth in Ireland is relatively balanced, with only a slight excess of male births, suggesting that the difference observed in transport activity reflects clinical factors rather than population demographics.

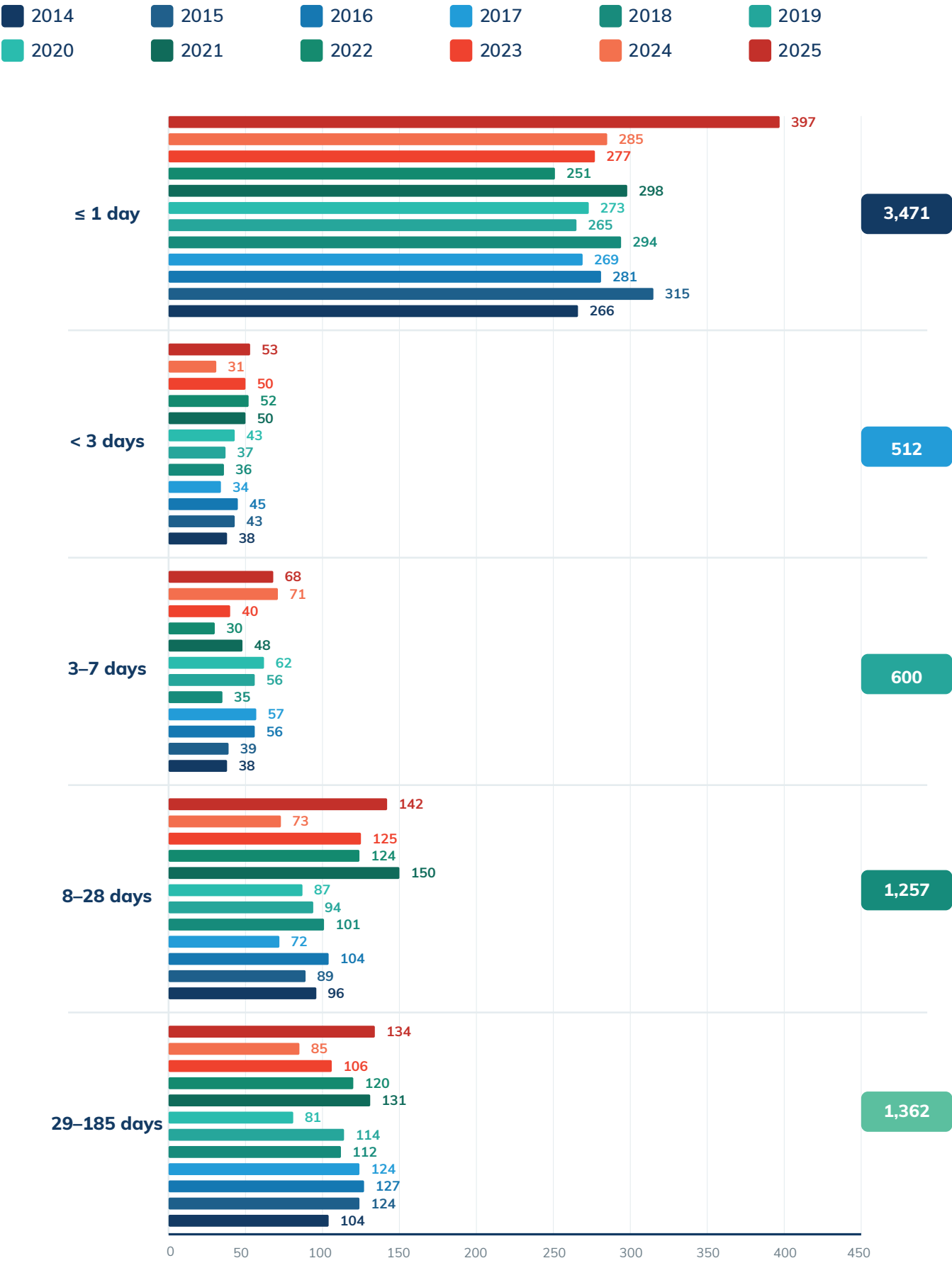
8.8 Age of Infants when Transported by NNTP, Year on Year

The distribution of infants transported by the NNTP shows a predominance of male infants, accounting for approximately 54% of transfers, compared with 38% female and 8% where gender was not recorded. While a proportion of cases have unrecorded gender, this is unlikely to significantly alter the overall pattern, which is consistent with the recognised male predominance in neonatal intensive care populations.



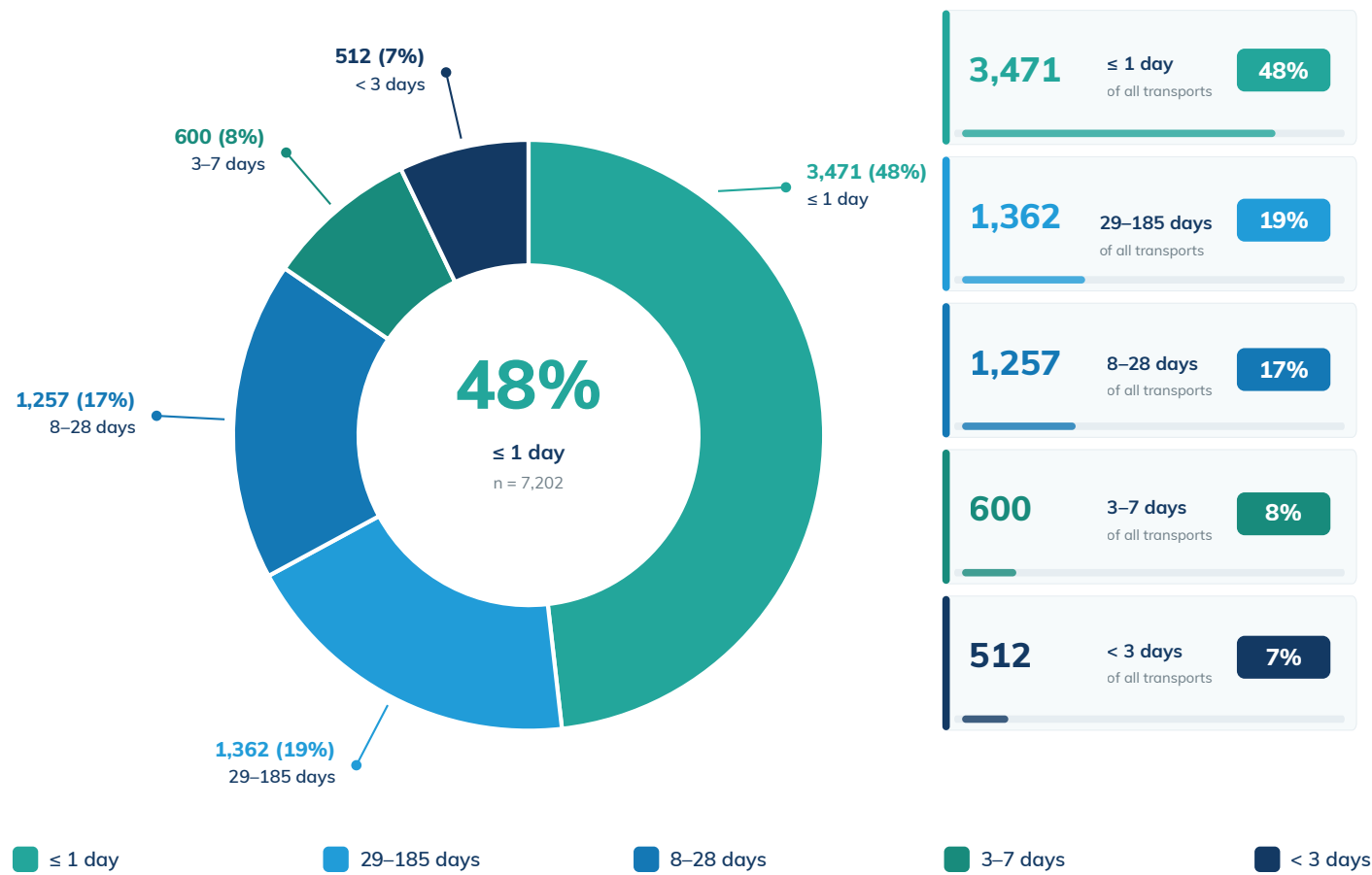
Clinical Activity

Day of life on NNTP Transport 2014 -2025



8.9 Age of Infants when Transported by NNTP 2014–2025, n=7214

Day of life on NNTP Transport 2014 -2025



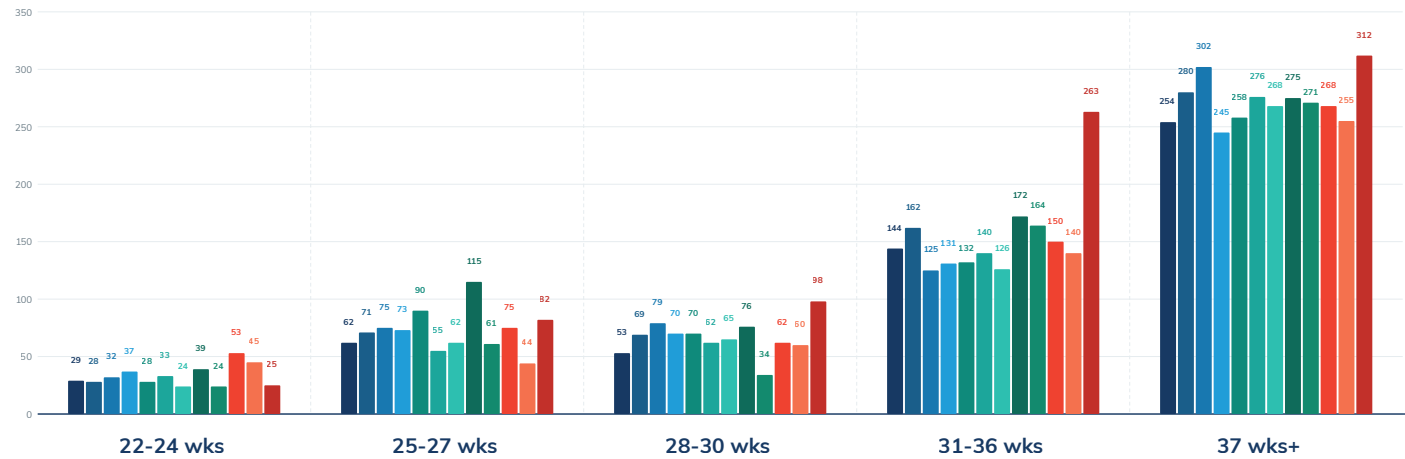
Almost half of all infants are transferred within the first day of life, reflecting the urgency of early neonatal conditions requiring specialist care. Later transfers are more commonly associated with repatriation following stabilisation, while those in between represent infants with evolving clinical needs, including surgical or septic presentations.

8.10 Birth Gestation v Gestation on NNTP Transport

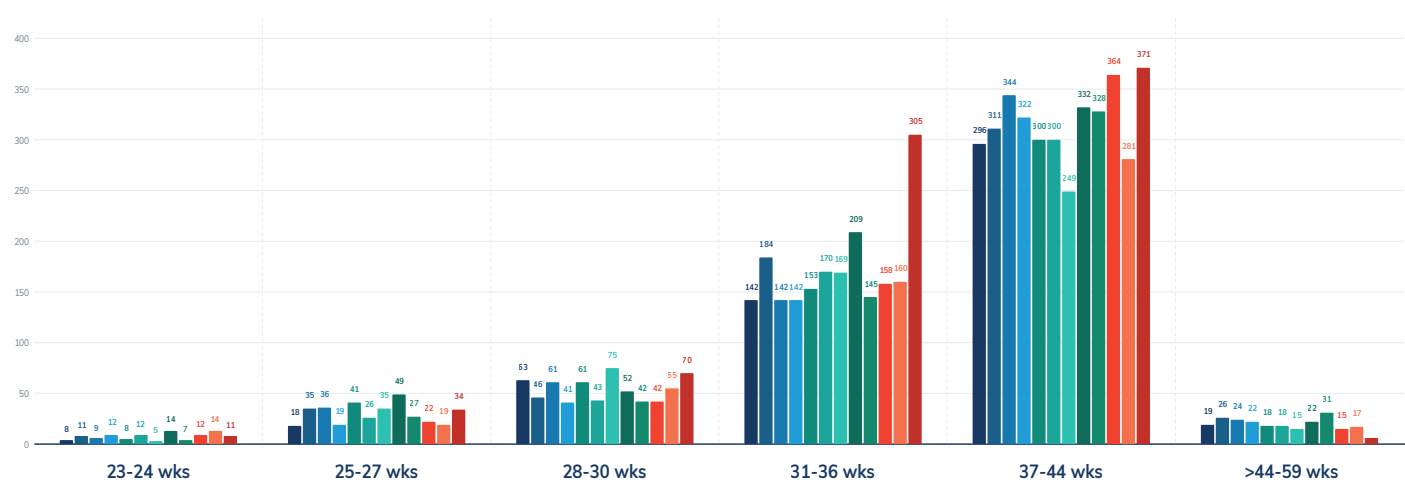
Birth Gestational vs Gestation on NNTP Transport



Birth Gestational Age



Gestational Age on Transport



The distribution of gestational age at birth and at the time of transport demonstrates a shift towards more mature gestations at the point of transfer. At birth, approximately 40–45% of infants are ≥ 37 weeks' gestation, increasing to around 50–55% at the time of transport. Correspondingly, infants < 37 weeks account for approximately 55–60% at birth, compared with around 45–50% at the time of transfer.

Despite this shift, approximately half of all infants transported remain preterm (< 37 weeks), highlighting the continued contribution of prematurity across a wide range of transport indications. This reflects the overlap between prematurity and other clinical conditions, including respiratory,

Clinical Activity

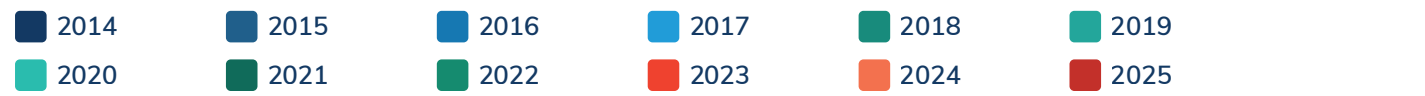
surgical, cardiac, and infective causes, rather than prematurity acting as an isolated reason for transfer.

A small number of infants are transported beyond 44 weeks’ gestation, accounting for approximately 3–5% of NNTP activity. While the development of paediatric transport services has reduced this cohort, a proportion of older infants continues to be facilitated by the NNTP where coverage is not fully provided elsewhere. Overall, NNTP activity spans both early transfers of term infants requiring urgent specialist care and the ongoing transport of preterm infants across a broad range of clinical indications.

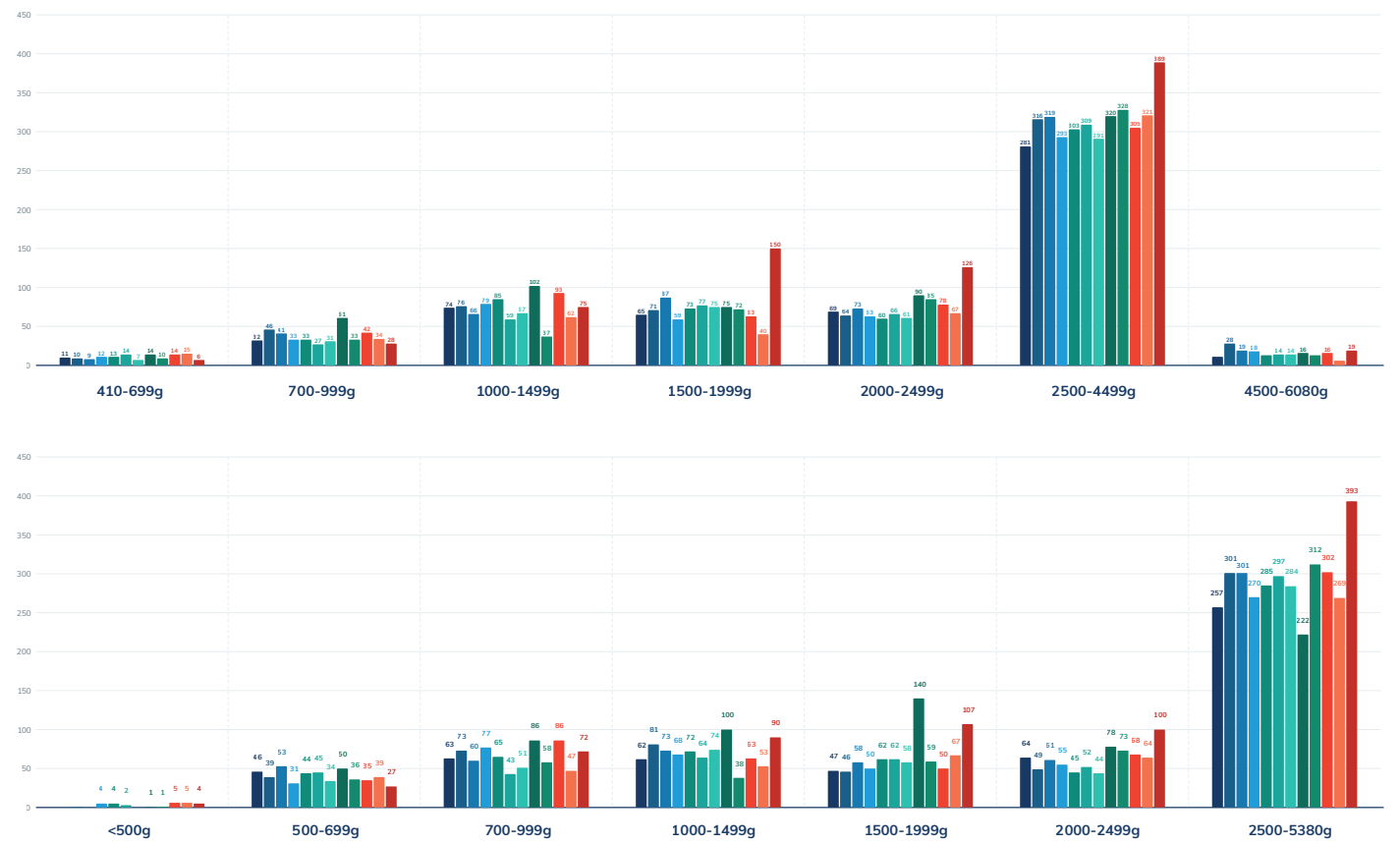
8.11 Birth Weight v Weight on NNTP Transport

The distribution of birth weight and weight at the time of transport demonstrates that a consistent cohort of very small and vulnerable infants is managed by the NNTP. Infants with a birth weight of <500g represent approximately 1–2% of activity, while those <1000g account for approximately 5–7% of infants at birth.

At the time of transport, a similar pattern is observed, with infants <500g representing approximately 1% of transfers and those <1000g accounting for approximately 4–6% of activity. When combined, infants <1500g represent approximately 15–20% of births and 14–18% of transport activity.



Weight on Transport



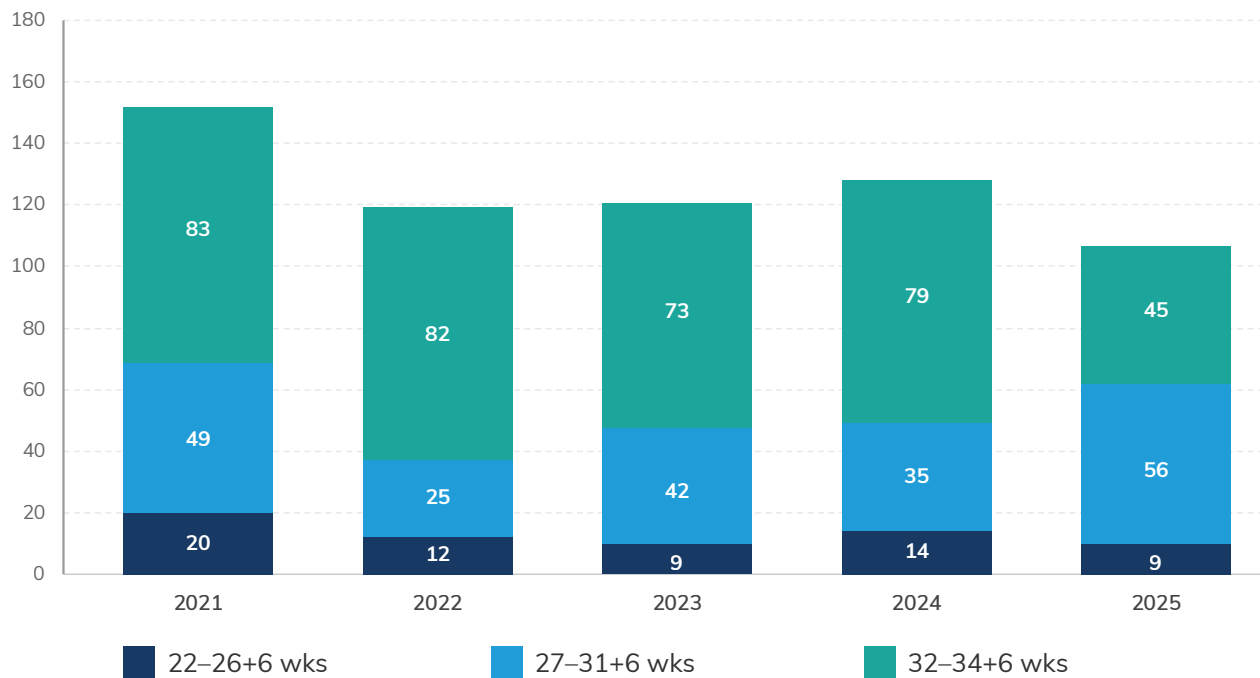
Clinical Activity

Birth Weight Vulnerable Cohort

Across both gestational age and birth weight, a consistent cohort of very small and vulnerable infants is evident within NNTP activity. Approximately 45–50% of infants transported are preterm (<37 weeks’ gestation), with a smaller but significant group at the limits of viability. This is reflected in the birth weight profile, where infants <1000g account for approximately 4–6% of transport activity, and those <500g represent a small but consistent cohort of approximately 1–2%. When combined, infants <1500g comprise approximately 14–18% of NNTP activity, demonstrating that a significant minority of transfers involve very low birth weight infants. These infants represent the most clinically vulnerable cohort and require highly specialised stabilisation and transport. Overall, these data demonstrate that, while NNTP activity includes a high volume of larger, more mature infants, the service continues to support the safe transfer of extremely preterm and very low birth weight infants, reflecting the full spectrum of neonatal acuity managed within a national transport programme.

8.12 Early Transfer of Preterm Infants (First 72 Hours of Life)

Preterm Infants moved in first 3 days of Life for uplift 2021-2025



Transfer of preterm infants within the first 72 hours of life is an important clinical consideration, as movement in this period is generally avoided where possible due to the risks associated with transporting this vulnerable group. A small cohort of preterm infants requires early transfer. Over five years, approximately 639 such transfers were undertaken, representing a low proportion relative to the estimated 4,500–5,000 preterm births annually in Ireland. This suggests that most preterm infants are delivered in appropriate centres

Clinical Activity

Overall, while small in number, this cohort is clinically significant for the NNTP and reflects transfers undertaken primarily where clinically indicate rather than driven by capacity, (there were only 13 capacity transports since 2021) and reflect the ongoing role of the NNTP in supporting timely access to specialist care for a vulnerable group of infants.

8.13 Twins Transported Together by NNTP (2014–2025)

Twin transport activity within the NNTP demonstrates a consistent service capability, with an average of approximately 10–12 twin transports per year since the establishment of the 24-hour service. A small number of triplet births are also reflected in the data, where two infants have been transported together with subsequent retrieval of the third, depending on clinical need and operational timing.

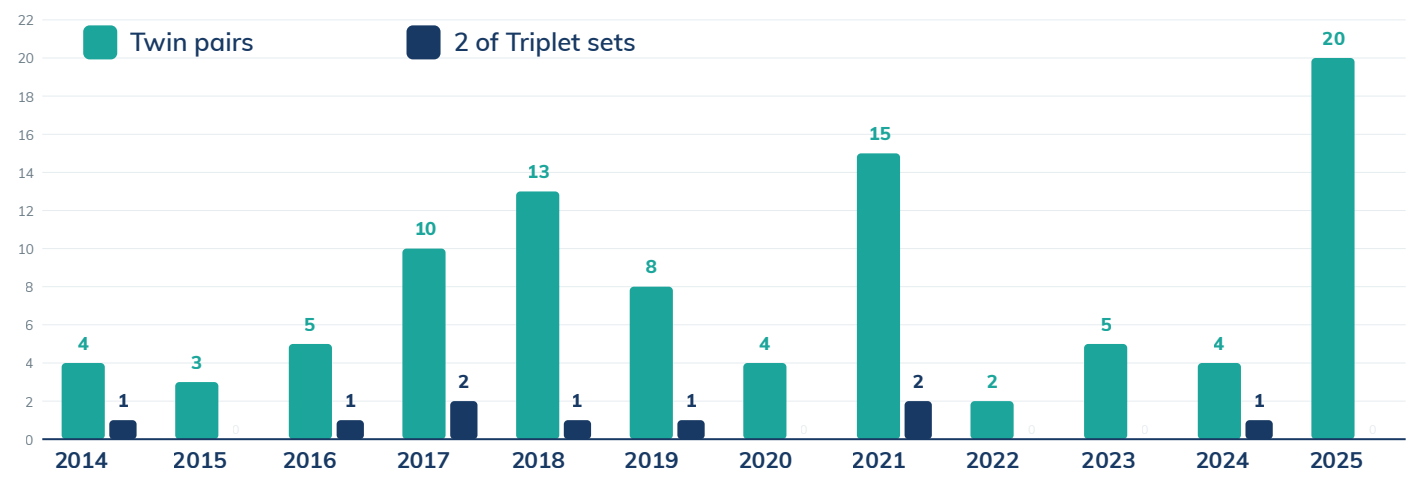
Variation is seen across individual years, with a temporary reduction in activity around 2021–2022, reflecting a period where twin transport capacity was impacted by technical issues with the dedicated ambulance and delays associated with the COVID-19 pandemic.

In 2025, particularly following the introduction of the second (Blue) transport team, there has been an increase in the number of twin transports, including the repatriation of infants together to their local units.

The ability to transport twins avoids the need to prioritise one infant over another, particularly in the context of premature deliveries occurring at a distance from tertiary centres, where both infants may require timely transfer. It also supports family-centred care by minimising separation of infants and reducing the burden on parents during an already stressful period.

Twin transports require additional coordination and staffing, with augmentation of the transport team to safely manage two infants simultaneously. These transfers are often more complex and resource-intensive, with careful planning required across clinical and logistical elements. Because of this, internationally, the routine transport of critical care twins together is not widely practiced

The NNTP has however maintained this capacity since its establishment and with the availability of successive generations of dedicated NNTP/NASCCRS twin transport ambulances, continues to deliver twin transport as a core component of the service.



NNTP Performance

9.1 Operational Performance:

Assessment of a neonatal transport service requires consideration of both operational performance and clinical effectiveness, as measures of how well the service delivers timely, safe, and appropriate care to its patient population. While reporting activity data is essential, it is equally important to interpret these metrics in the context of what constitutes a high-functioning service and what this means for service users. Within this chapter, NNTP activity is therefore examined using key performance indicators that reflect both responsiveness and service reach. Data for this analysis were derived from the NNTP transport database and operational records, alongside transport activity reported through the National Neonatal Daily Census on the NNTP website, which is completed on a daily basis through structured self-reporting by individual hospitals.

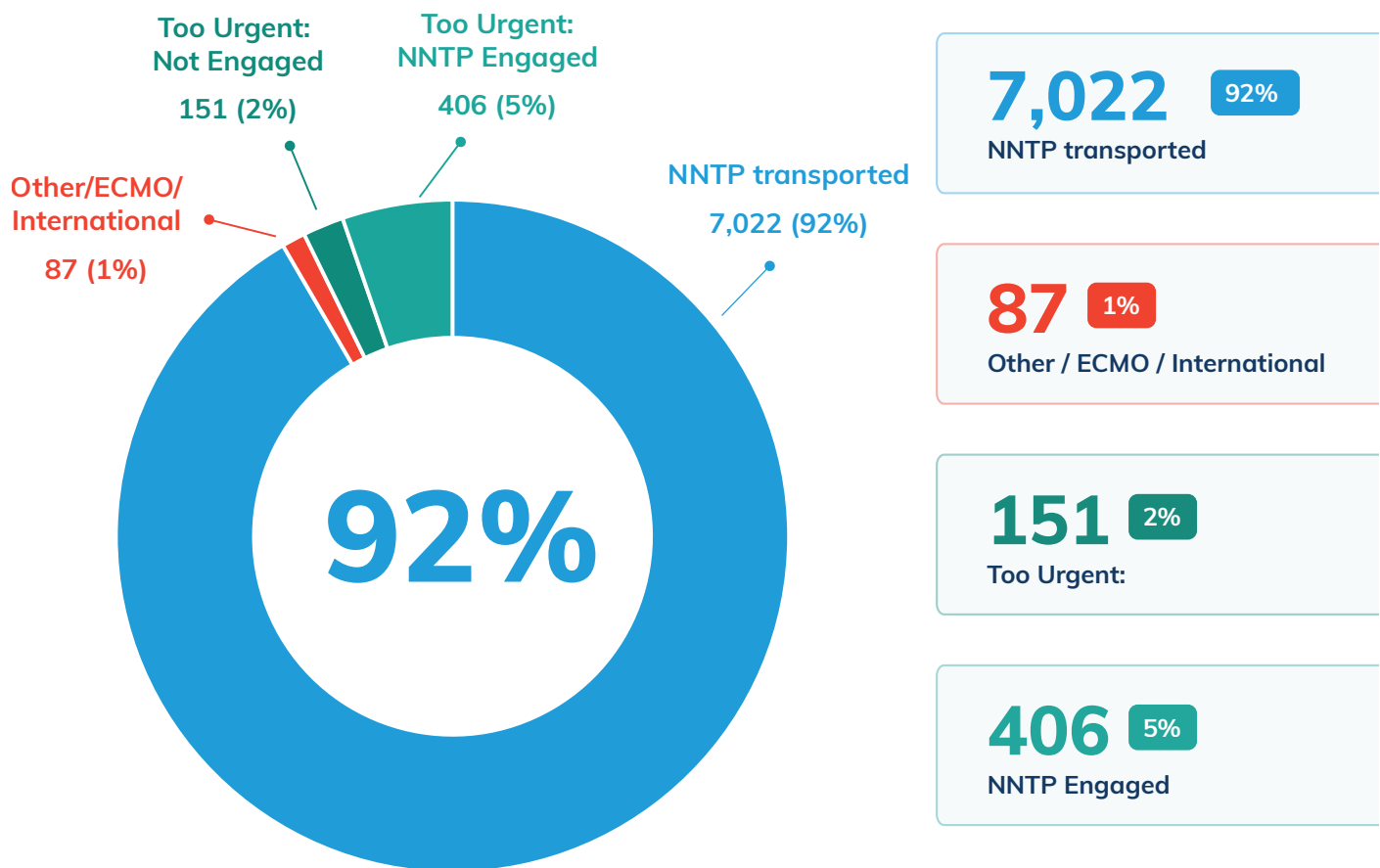
Key Performance Indicators

Service Delivery/Transport Coverage

One key measure of service performance is the proportion of national critical care transports undertaken by the programme since the introduction of a 24-hour service. As illustrated below the NNTP has consistently fulfilled approximately 92% of transport demand over the period 2014–2025 when the service became 24/7, indicating a high level of national coverage and accessibility.

Neonatal Critical Care Transports in ROI 2014–2025

n = 7,666 — The NNTP met 92% of all neonatal critical care transport need in the ROI



NNTP Performance

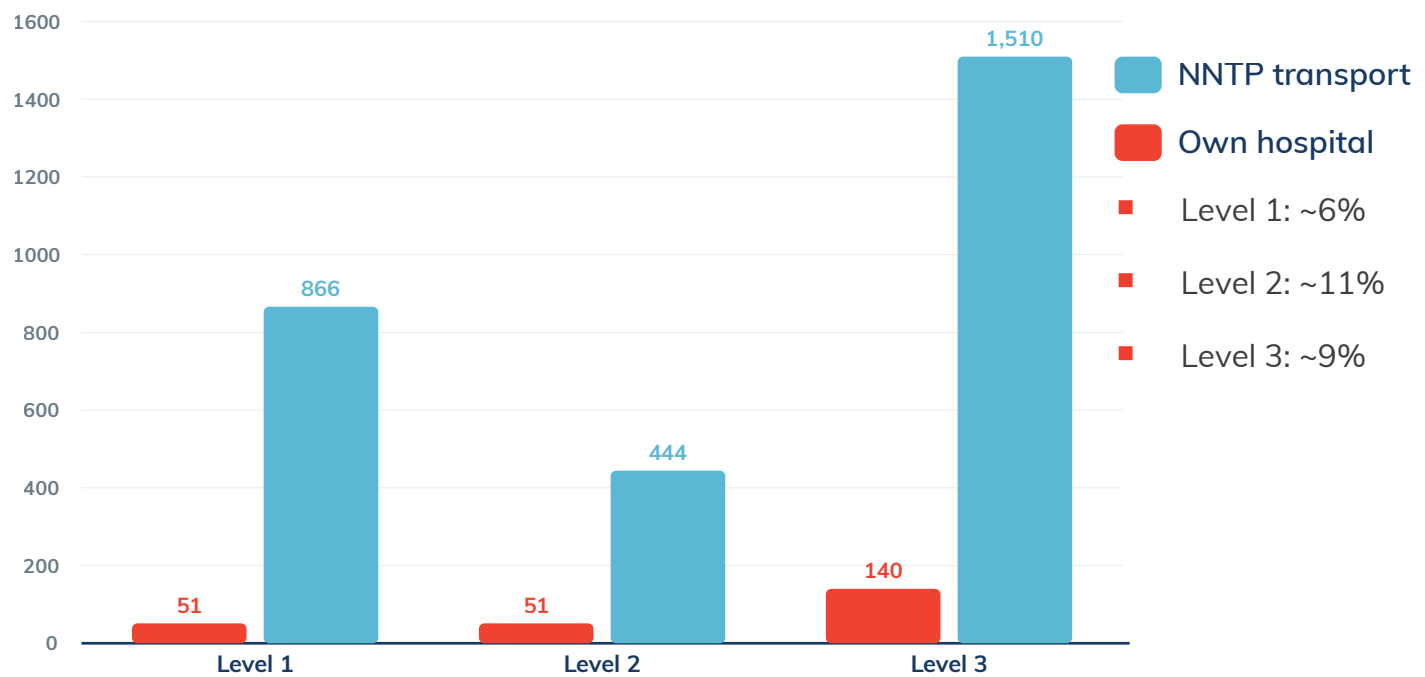
In this context, published data from the UK Neonatal Transport Group (NTG) describe a well-functioning neonatal transport service as one that undertakes the majority of critical care transfers within its commissioned region, typically around 95%. While recognising differences in geography and service configuration and factoring in the 2% that were deemed too urgent and 1% where another transport service (ECMO) were tasked, NNTP activity is broadly aligned with this expectation

Distribution of Transport Activity by Hospital Level (2021–2025)

A key principle underpinning the NNTP model is the prioritisation of critically ill neonates requiring transfer from centres with lower levels of neonatal care provision. In this context, activity has been examined by hospital level to assess the distribution of transport provision across Level 1, Level 2, and Level 3 centres.

NNTP v Own Hospital Critical Care Transports

2021–2025 — Level 1, 2 & 3 hospitals - NNTP versus Own Hospital Transports



NNTP delivers the vast majority of critical care transports at all levels, particularly in the case of Level one hospitals where total own hospital transfers were 6%.

NNTP Performance

Neonatal Transport Table by Hospital Level 2021–2025

NNTP vs Own Hospital Transport — Level 1, 2 & 3 Centres

Hospital	NNTP	%NNTP	Own	%Own	Total
Level 1 Centres — 11 hospitals					
Cavan General Hospital	60	96.8%	2	3.2%	62
Letterkenny University Hospital	114	98.3%	2	1.7%	116
Mayo University Hospital	62	98.4%	1	1.6%	63
Midlands Regional Hospital Mullingar	87	97.8%	2	2.2%	89
Midlands Regional Hospital Portlaoise	88	94.6%	5	5.4%	93
Portiuncula University Hospital	68	94.4%	4	5.6%	72
South Tipperary General Hospital	35	92.1%	3	7.9%	38
St Luke's General Hospital Kilkenny	111	94.9%	6	5.1%	117
University Hospital Kerry	35	70.0%	15	30.0%	50
Wexford General Hospital	130	96.3%	5	3.7%	135
Level 2 Centres — 4 hospitals					
Our Lady of Lourdes Hospital Drogheda	122	95.3%	6	4.7%	128
University Hospital Galway	135	95.1%	7	4.9%	142
University Hospital Limerick	121	87.1%	18	12.9%	139
University Hospital Waterford	66	76.7%	20	23.3%	86
Level 3 Centres — 4 hospitals					
Cork University Maternity Hospital	144	83.2%	29	16.8%	173
Coombe Women & Infants University Hospital	468	92.1%	40	7.9%	508
National Maternity Hospital	498	94.3%	30	5.7%	528
Rotunda Hospital	400	90.7%	41	9.3%	441
Summary Totals					
Level 1	866	94.4%	51	5.6%	917
Level 2	444	89.7%	51	10.3%	495
Level 3	1,510	91.5%	140	8.5%	1,650
National Total	2,820	92.1%	242	7.9%	3,062

NNTP Performance

As in the previous table the NNTP undertakes the vast majority of transports from Level 1 and Level 2 hospitals, accounting for 94.4% and 89.7% of transfers respectively over the period 2021–2025. These centres, which do not routinely perform neonatal critical care transport, represent the most vulnerable cohort in terms of access to specialist retrieval services. The high proportion of NNTP-delivered transports in these settings reflects appropriate service prioritisation and ensures equitable access to specialist care.

While Level 3 centres demonstrate a slightly lower proportion of NNTP involvement (91.5%), this reflects the greater capacity within tertiary units to undertake time-critical or immediate transfers where clinically indicated. Overall, the relatively small proportion of “own transports” across all hospital levels (7.9% nationally) indicates that the majority of neonatal transfers are undertaken by the specialist transport team. These findings are consistent with those observed in earlier years and, by focusing on the most recent period, provide a representative assessment of contemporary service delivery.

9.2 Transport Timelines

NNTP Transport Times (2020–2025)

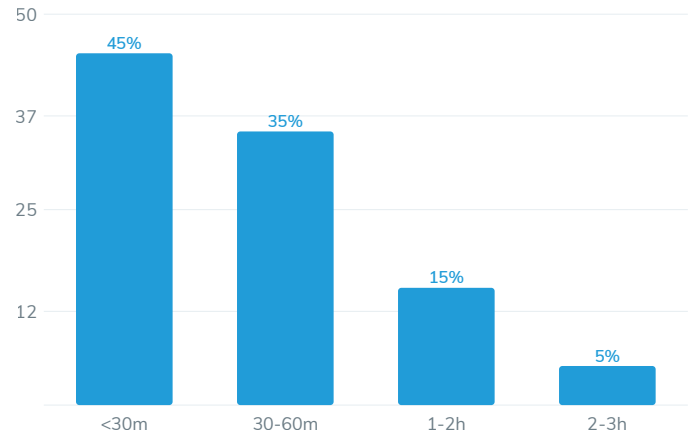
As part of this National Neonatal Transport Programme (NNTP) 25-year review, transport activity over the most recent period (2020–2025) was examined using routinely collected operational data. This timeframe was selected as it reflects the current model of service delivery and therefore provides the most relevant assessment of present-day performance. These timelines were analysed as key indicators of service performance, providing an assessment of the programme’s responsiveness and efficiency once a transport has been activated.

Across all phases of transport — Mobilisation, Response, Stabilisation, Infant Journey, and Total Transport Duration — the findings demonstrate a consistently responsive and effective service. Interpretation of these data is supported by comparison with published reports from the UK Neonatal Transport Group (NTG), recognising that direct comparison is influenced by differences in geography, service configuration, and resource availability.

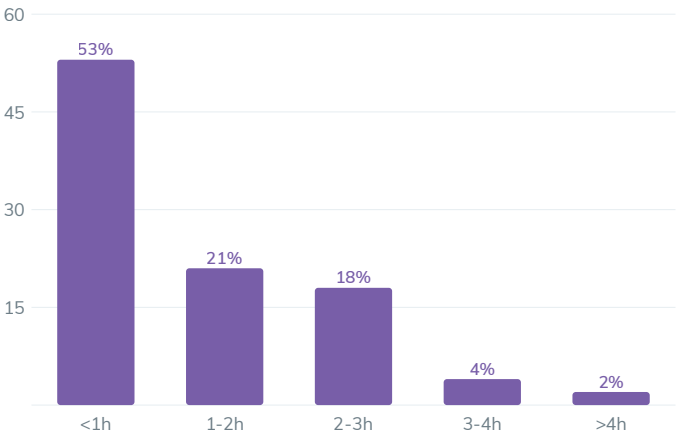
NNTP Performance

NNTP Transport Phases (2020–2025)

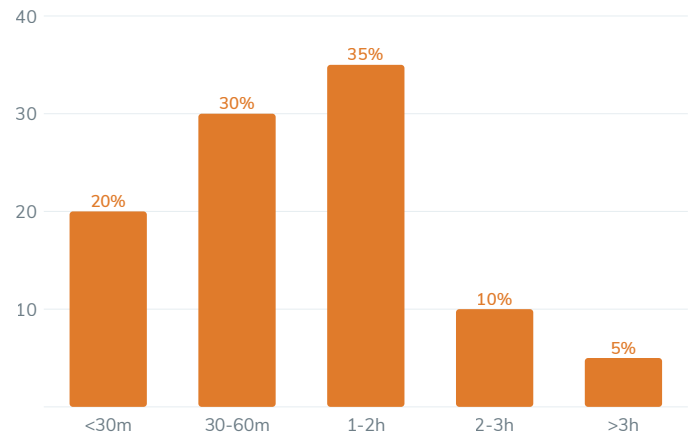
Mobilisation



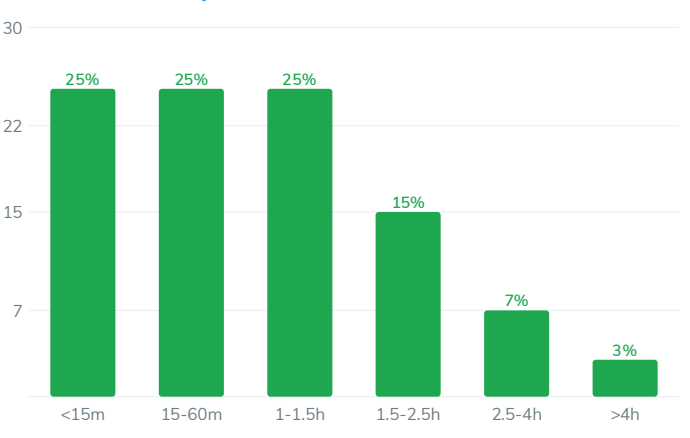
Response



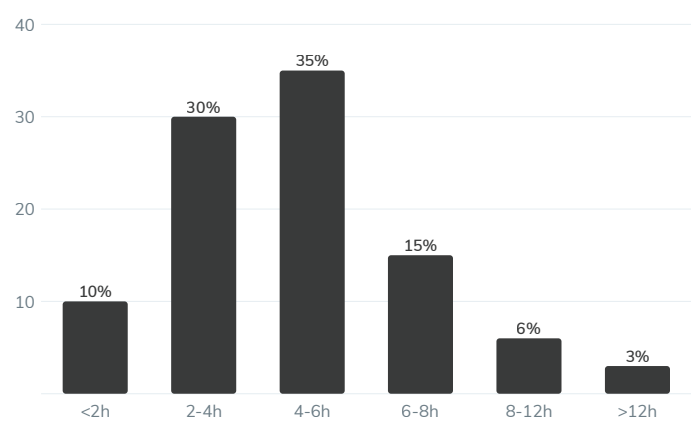
Stabilisation



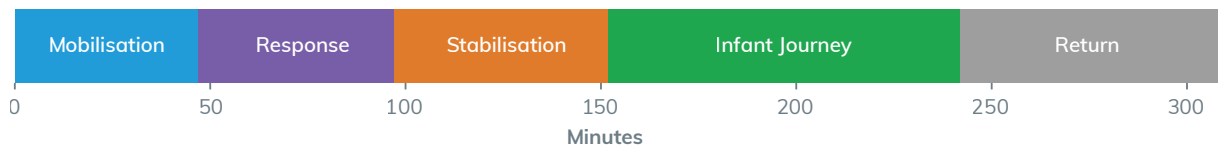
Infant Journey



Total Transport



- Mobilisation
- Response
- Stabilisation
- Infant Journey
- Return



NNTP Performance

Response time: defined as the interval from departure from base to arrival at the referring centre, indicates that approximately 77% of patients are reached within two hours. A smaller proportion of transports extend beyond this timeframe, including approximately 5% exceeding three hours and a very small proportion exceeding four hours. In comparison with NTG data, where shorter response intervals are facilitated by a higher density of teams and shorter inter-hospital distances, these longer response times are consistent with the geographic distribution of services in Ireland. In this context, extended response intervals are largely attributable to distance rather than delays in mobilisation or deployment.

Mobilisation: representing the interval from activation to departure from base, remains a key internal measure of readiness. Using a target of 40–45 minutes, mobilisation occurred within this timeframe in the majority of cases, with approximately 80% of transports initiated within one hour. This reflects a high level of operational preparedness when the team is available to respond, while also acknowledging the realities of a single-team national service, where concurrent activity may influence immediate availability.

Stabilisation time: encompassing the period from arrival at the referring centre to departure with the patient, remains consistent across the study period, with median values of approximately one hour. Approximately 65% of stabilisations are completed within two hours. Published data from established neonatal transport networks report similar stabilisation timeframes, typically in the range of 60–90 minutes, with variation primarily driven by patient acuity and clinical complexity rather than operational inefficiency (Neonatal Transport Group; BAPM, 2019; Stroud et al., 2011). The distribution observed within NNTP is therefore in keeping with established neonatal transport practice.

The Infant Journey phase: referring to the transfer from the referring hospital to the receiving centre, is typically completed within 1.5 hours in approximately 75% of cases. A minority of transports extend beyond this timeframe, including approximately 10% exceeding 2.5 hours and a small proportion exceeding four hours. As with response times, these longer journeys reflect transfer distance and the centralisation of specialist services, and are consistent with patterns described in national transport systems where geography influences transfer duration.

Total Transport Duration: measured from activation to return to base, averages approximately five hours. While most transports are completed within 4–6 hours, approximately 10% exceed eight hours and a small proportion exceed 12 hours. These extended durations reflect the cumulative impact of travel distance, service coverage, and operational workflow, including periods where the transport team may be required to manage sequential or overlapping referrals. In a small number of cases, prolonged durations also include transports involving overseas retrievals, where additional coordination and travel time — including delays related to access to receiving centres — may contribute to extended overall timelines. Similar patterns of extended total transport times have been described in NTG reporting, where overall duration reflects system-wide factors rather than inefficiency within individual phases of care

NNTP Performance

NNTP Transport Stage Distributions 2020–2025

All values represent % of transports within time bands

Time Band	Mobilisation	Response	Stabilisation	Infant Journey	Total Transport
<30 min	45%	—	20%	25%	—
30–60 min	35%	50% (<1h)	30%	25%	—
1–2 h	15%	21%	35%	25% (1–1.5h)	—
2–3 h	5%	18%	10%	15%	—
3–4 h	—	3%	5% (>3h)	7%	—
>4 h	—	2%	—	3%	—
<2 h	—	—	—	—	10%
2–4 h	—	—	—	—	30%
4–6 h	—	—	—	—	35%
6–8 h	—	—	—	—	15%
8–12 h	—	—	—	—	7%
>12 h	—	—	—	—	3%

Overall, when considered in the context of a single-team national model operating across a geographically dispersed population, the findings would suggest that the NNTP delivers timely and clinically appropriate care. Variability in longer time intervals is largely explained by external factors — including distance, service configuration, and resource availability — rather than delays within the transport process itself. Comparisons with NTG (UK) data support the interpretation that NNTP performance is consistent with established neonatal transport practice, while reflecting the distinct operational context of the Irish healthcare system.

NNTP Performance

NNTP Service Context and Considerations

The NNTP critical care transports are delivered through a single-team model operating on a 24-hour basis, with a day and a night team. At times, the team may already be engaged in an active transport when additional referrals are received. In these situations, transports may be accepted but not immediately undertaken, with prioritisation and timing determined by clinical need and operational workflow.

For the purposes of this analysis, prolonged mobilisation intervals (>3 hours) were excluded, as these represent deferred or planned transports rather than real-time mobilisation performance. The resulting data therefore reflect the responsiveness of the service when the team is in a position to mobilise.

The NNTP records the time at which referrals are received; however, the timelines presented here are based on the point at which a transport is activated. In practice, there may be a delay between referral and activation, most commonly related to identification of a receiving bed. This interval is not consistently represented within the current analysis.

As a result, the reported time intervals reflect the performance of the transport service once activation has occurred and may not fully capture the total time experienced by referring units prior to mobilisation. Notwithstanding this, the data demonstrate clear responsiveness once mobilisation and response processes are underway.

Future Development

The NNTP acknowledges the importance of continuously improving the accuracy and completeness of service evaluation. Work is currently underway to implement an enhanced electronic data capture system, which is expected to be in place within the coming year. This will allow for more detailed recording across all phases, including earlier referral and activation intervals such as bed allocation, providing a more comprehensive understanding of both operational performance and service user experience.

9.3 International Benchmarking

NNTP Service Comparison with UK Neonatal Transport Services

The National Neonatal Transport Programme (NNTP) operates as the sole provider of neonatal transport services in Ireland, delivering a nationally coordinated retrieval service. While the NNTP operates within a shared ambulance provision framework as part of NASCCARS, alongside its sister organisations, the Irish Paediatric Acute Transport Service (IPATS) and the Mobile Intensive Care Ambulance Service (MICAS), this commonality does not support benchmarking. These services differ significantly in terms of patient cohorts, service models, and operational requirements, and are therefore not directly comparable for neonatal transport benchmarking.

In the absence of a national comparator, benchmarking has been undertaken against the United Kingdom Neonatal Transport Group (NTG/BPMA), which represents the closest available reference point. However, direct comparison between systems has limitations, reflecting differences in population structure, geography, service configuration, and transport models. The UK comprises multiple regional transport teams serving populations within more densely distributed hospital networks, often over shorter distances, while also including regions such as Scotland where larger geographical areas and greater reliance on aeromedical retrieval influence service delivery. In contrast, the NNTP operates as a single national service, managing a mix of both short- and long-distance transfers.

Within this context, benchmarking in this section focuses on transport activity rates and the acuity profile of transported infants, rather than direct comparison of overall service performance.

Activity, Births, Rates & Year-on-Year Change

Ireland vs UK — 2020–2024

Table: Activity, Births, Rates & Year-on-Year Change (Ireland vs UK)

Year	IE Births	UK Births	NNTP	UK NTG	IE /1000	UK /1000	IE YoY %	UK YoY %
2020	56,818	681,560	546	14,228	9.6	20.9	-3.5%	-8.5%
2021	60,575	694,685	677	15,073	11.2	21.7	24.0%	5.9%
2022	54,483	~673,000	577	14,976	10.6	22.2	-14.8%	-0.6%
2023	~54,500	~660,000	610	14,976	11.2	22.2	5.7%	0.0%
2024	54,062	~660,000	545	15,308	10.1	23.2	-10.7%	2.2%
2025	~54,000	—	794	—	14.7	—	45.7%	—

NNTP Performance

NNTP activity rates have been consistently lower than those reported in UK data (see Table 1; Figure 1), at approximately 9–11 transfers per 1,000 births, compared with 21–23 per 1,000 births in the UK. This difference reflects variation in service model rather than variation in demand, as UK Neonatal Transport Group (NTG) data encompass the full spectrum of neonatal transfer activity, including both critical care and lower-acuity or bidirectional transfers. In contrast, NNTP activity up to 2024 has been predominantly focused on critically ill infants requiring escalation of care. This distinction is further reflected in the acuity profile of transported infants (see Table 2), with a higher proportion of ventilated and CPAP-supported infants within NNTP activity, consistent with a service model centred on high-acuity, clinically indicated transfers. UK datasets demonstrate a broader case mix, including a greater proportion of lower-acuity and capacity-related transfers.

Comparison of NNTP (IRL) v UK NTG (UK)

Modalities on Transport 2020–2024 (% of Transports)

VENT			HFOV		CPAP		HFlo		TH		iNO	
Year	NNTP %	UK %	NNTP %	UK %	NNTP %	UK %	NNTP %	UK %	NNTP %	UK %	NNTP %	UK %
2020	34.8	22.6	N/A	0.75	18.3	6.1	8	10.9	3.5	3.5	5.7	2.1
2021	35.9	22.5	N/A	0.74	23.2	6.8	16	11.7	2.7	3.3	3	1.9
2022	36.7	22.8	N/A	0.65	23.9	6.5	13.9	12.1	4.7	2.9	4.3	1.8
2023	38	22.8	N/A	0.75	21.5	6.5	8.3	13.7	2.6	2.9	4.6	1.9
2024	42	21	N/A	0.78	21.7	6.6	10	14.4	4	2.9	6.9	1.8

(* 2025 UK data not available for comparison)

The increase in NNTP activity observed in 2025 (see Figure 1) reflects the introduction of expanded service capacity, including a second transport team and bidirectional transfer capability, and represents a transition toward a broader transport model more aligned with UK service scope. As this expansion was implemented from May 2025, current activity levels are likely to underestimate full-year performance under the NNTP’s expanded model.

NNTP Performance

Service Characteristics and Comparative Capability

In addition to activity and acuity metrics, the UK Neonatal Transport Group (NTG) also reports on a range of service-level characteristics, including staffing, operational infrastructure, clinical capability, and family engagement, which provide further context for benchmarking.

The NNTP has operated with a fully consultant-delivered neonatal transport service on a 24-hour basis since 2019. UK data indicate that less than half of transport services provide this level of consultant availability, with variation in staffing models and out-of-hours provision.

In terms of operational infrastructure, there is some variation across UK transport networks in access to coordinated demand management systems, including bed bureau and call coordination functions. The NNTP operates within a centralised coordination model, supported by the National Emergency Operations Centre (NEOC) of the National Ambulance Service (NAS), which provides structured call handling and facilitates call conferencing.

The NNTP has also developed an integrated national bed status system, populated daily by neonatal units, supporting real-time awareness of neonatal critical care capacity. While this system is not an automated bed management platform, it provides an effective and responsive mechanism for coordinating care.

From a clinical capability perspective, the NNTP supports end-tidal CO₂ monitoring during transport and has the capability to deliver volume-targeted ventilation where required. While not all UK services have access to these modalities, differences in equipment availability are recognised across systems. The NNTP does not utilise high-frequency oscillatory ventilation, reflecting current practice within the service.

The NTG dataset also includes measures relating to family involvement and service feedback, and this represents an area of relative development within the NNTP. While parental presence during transport is facilitated where feasible, this is applied on a case-by-case basis, and there is less formalisation of this practice compared with some UK services. Similarly, although a parental feedback mechanism is available via the NNTP website, utilisation is limited, and further development of structured feedback processes may be beneficial. UK benchmarking also highlights the role of maternal (in utero) bed-finding pathways, which are more established across UK services. This represents an area of ongoing development within the NAS/NASCCRS, with the potential for retrieval services broadly to further support antenatal transfer and reduce the need for postnatal neonatal transport.

In conclusion, benchmarking against UK neonatal transport services provides important context for understanding NNTP activity and service capability, while recognising the limitations of direct comparison between differing systems. The NNTP's historically focused, high-acuity service model, combined with its single national structure, distinguishes it from the multi-regional UK network. Overall, the NNTP compares well with UK neonatal transport services when differences in population and service model are taken into account. The NNTP delivers national coverage for critically ill neonates, with comparable response times, acuity, and clinical capability, supported by a 24-hour consultant-led model.

9.4 NNTP National Initiatives

A "Cooling Babies" : A National Strategy – Development

Over the past 25 years, the National Neonatal Transport Programme (NNTP) has led and supported a number of developments aimed at improving equitable access to specialist neonatal care across Ireland. A key area of focus has been the delivery of therapeutic hypothermia for infants with hypoxic-ischaemic encephalopathy.

In the early 2010s, timely access to this time-critical therapy was inconsistent, particularly for infants born outside tertiary centres. Variation in practice and the requirement to initiate cooling within six hours of birth posed significant challenges.

From 2011–2012, the NNTP introduced a national approach to “cooling on transport,” incorporating clinical guidance, equipment standardisation, and multidisciplinary education

The NNTP subsequently developed therapeutic hypothermia transport guidelines including a neonatal transport cooling candidacy checklist. These were endorsed by the Royal College of Physicians of Ireland and adopted nationally from 2013. They remain the basis of current practice..

The cooling candidacy checklist has since evolved into a structured clinical record, now utilised in all hospitals, supporting consistent assessment and communication between referring units and transport teams. An enhanced cooling graph, also developed by the NNTP, has further supported safe passive cooling in the pre-transport period.

Since 2016, the NNTP has introduced and, for much of this period, remained the primary provider of servo-controlled cooling during transport, facilitating a more controlled and manageable approach to temperature regulation while achieving similar therapeutic goals.

In the context of the fourth tertiary centre in Cork, the proximity of Level 1 and Level 2 units allows some stable, non-ventilated infants to be transferred by local teams to expedite care. In these cases, all centres continue to follow NNTP guidance and utilise established tools to support safe passive cooling during transport. This approach has been supported by national data, including the Therapeutic Hypothermia in Ireland Report (2020), demonstrating the effectiveness of standardised passive cooling practices. These initiatives have contributed to standardised national practice, with the vast majority of infants now identified promptly, cooled within recommended timeframes, and arriving at specialist centres within the target temperature range.

This work reflects the NNTP’s role in identifying gaps in care and leading the development of practical, nationally adopted solutions to support timely and equitable neonatal care.

B Thermal Management Tool

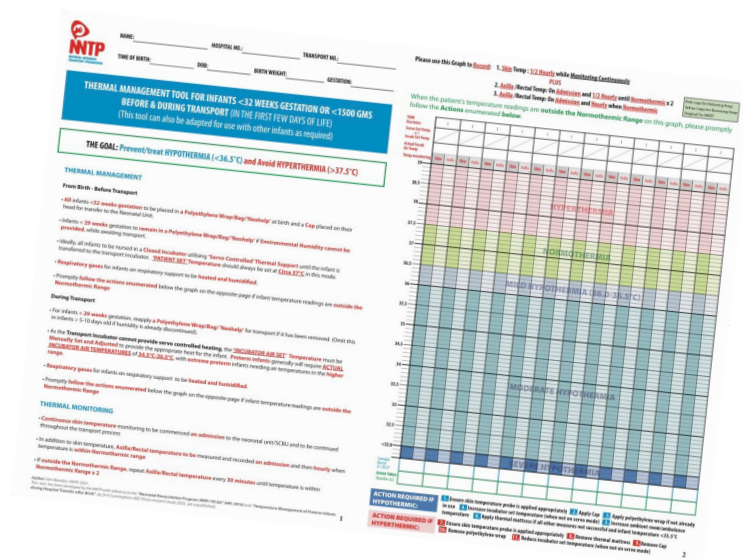
A further national initiative undertaken by the Neonatal Transport Programme (NNTP) was the development of a structured thermoregulatory guidance tool for infants <32 weeks' gestation. This was informed by NNTP research published in 2020, which evaluated thermoregulation using routinely recorded transport data from 2011–2015. In this retrospective cohort of 194 infants, approximately 21% were hypothermic and 2% hyperthermic on arrival at the receiving unit, while 20% were hypothermic and 7.5% hyperthermic at NNTP arrival to the referring hospital. These findings highlighted a substantial burden of temperature instability across the transport pathway and underscored the need for a more standardised approach to thermal management.

The thermoregulatory tool was developed based on the success of the NNTP's nationally implemented 'Cooling graphs' and is intended as a practical bedside aid rather than additional documentation. It functions as a visual guide, clearly delineating the target temperature range (36.5–37.5°C) and supporting clinicians in maintaining infants within this range. It incorporates guidance on temperature monitoring and the appropriate use of thermal adjuncts, including plastic wrapping, hats, and warming mattresses. The tool is designed to support thermoregulation across the continuum of care, commencing at the referring hospital, and has been disseminated nationally with accompanying education and training.

A retrospective review of NNTP transport records since its implementation was undertaken, including 212 infants <32 weeks' gestation transported within the first 72 hours of life. Temperatures were assessed at NNTP arrival to the referring hospital (pickup) and on arrival at the receiving unit.

“

Hypothermia has been effectively eliminated at the point of arrival in recent years.



NNTP Performance

Temperature Outcomes Across the NNTP Pathway

Referring Hospital

Year	n	Hypothermia n (%)	Hyperthermia n (%)	Outside Range n (%)
2022	51	5 (9.8%)	2 (3.9%)	7 (13.7%)
2023	51	6 (11.8%)	2 (3.9%)	8 (15.7%)
2024	51	2 (3.9%)	2 (3.9%)	4 (7.8%)
2025	59	3 (5.1%)	3 (5.1%)	6 (10.2%)
2022–2025 Combined	212	16 (7.5%)	9 (4.2%)	25 (11.8%)

Receiving Hospital

Year	n	Hypothermia n (%)	Hyperthermia n (%)	Outside Range n (%)
2022	51	1 (2.0%)	1 (2.0%)	2 (3.9%)
2023	51	1 (2.0%)	2 (3.9%)	3 (5.9%)
2024	51	1 (2.0%)	3 (5.9%)	4 (7.8%)
2025	59	0 (0%)	4 (6.8%)	4 (6.8%)
2022–2025 Combined	212	3 (1.4%)	10 (4.7%)	13 (6.1%)

The above table explores: Temperature outcomes at NNTP arrival at referring hospital and at arrival to the receiving unit in infants <32 weeks' gestation transported within the first 72 hours of life. A reduction in temperature instability is observed across the transport pathway.

At pickup, 25 infants (11.8%) were outside the normothermic range, compared with 13 infants (6.1%) on arrival at the receiving unit. Hypothermia was infrequent and has been effectively eliminated at the point of arrival in recent years, with no hypothermic infants recorded in 2025. Residual temperature instability was predominantly attributable to mild hyperthermia.

Temperature Distribution at Arrival to Receiving Unit (NNTP, 2022–2025)

These findings demonstrate an improvement in thermoregulation across the NNTP pathway compared with historical data, where approximately 23% of infants were outside the normothermic range. The persistence of mild hyperthermia however, may reflect the challenges of achieving precise thermal balance during transport in the absence of automated temperature regulation. The NNTP is currently procuring transport incubators with servo-controlled temperature regulation, which should further optimise thermal stability during transport.

NNTP Education

10.1 Education and Training

Education and training are a core component of the National Neonatal Transport Programme , underpinning the safe delivery of neonatal transport. As the national service, the NNTP plays a central role in developing and maintaining the clinical, technical and operational competencies required for neonatal transfer.

Total Transport Education Delivered by NNTP 2013–2018

National Neonatal Transport Programme • 6-year period

Classification	Number	Annual Average
National — Neonatal Outreach STABLE Courses	69	11.5
National — Neonatal Outreach Cooling Sessions	36	4.5
National — Neonatal Transport Presentations	18	4.5
National — Neonatal Transport Symposium	1	—
International — Neonatal Transport Presentations	6	1.5
International Neonatal Transport Conference (staff)	7	1.75
NNTP Staff Induction Days	15	3.75
NNTP Staff In Service Sessions	29	7
NNTP Staff (+ iPats 2014) Air Transport Training	15	3.75
National Paediatric Transport Outreach (Participated)	11	2.75
iPATs Staff Training (Participated)	2	—

The NNTP's educational activity has expanded significantly over time as evidenced in the varied and high volume of sessions delivered .The success of the NNTP over 25 years reflects the sustained commitment to education, training and collaboration across all teams involved in neonatal transport

Transport Education Delivered by NNTP 2019–2025

Classification	Number	No. of Attendees
National — Neonatal Outreach STABLE Program Courses	67	1,041
National — Neonatal Outreach (Hospital Focused, Practical Study Days)	17	~315
National — Neonatal Outreach (Thermoregulation) Sessions	14	~80
National — Neonatal Transport Presentations (+Poster Presentation)	11	—
International — Neonatal Transport Presentations (+Poster)	15	—
NNTP Staff Induction Days (2 via Zoom)	21	422
NNTP Staff In Service Sessions	–Ongoing	—
NNTP Staff Air Transport Training	8	208
Neonatal Nursing Higher Diploma Student Training Sessions	7	~200
NASCCRS/NEOC Presentations/Training Sessions	~10	~150
Medical Student Training		—

10.2 Team Education and training

A structured programme of training is embedded within the NNTP service and delivered across clinical teams (medical and nursing) in the three Dublin maternity hospitals. All staff undertake formal orientation, induction, and specialist training, including air transport training, reflecting the operational requirements of the service. This is supported by simulation, equipment training, and ongoing in-service education.

Non-Consultant Hospital Doctors (NCHDs) participate in regular induction and focused training sessions and are involved in all aspects of the programme's specialist education. Clinical fellows, together with Clinical Nurse Specialists, provide additional support to staff within the service. For NNTP nursing staff, training is delivered through a structured competency-based framework, incorporating formal education, supervised transport experience, and regular assessment, supporting the maintenance of clinical standards within the transport environment.

Air transport training is a specific component of the NNTP education programme, delivered in conjunction with the Irish Air Corps. This includes orientation flights for clinical staff, with dedicated practical training sessions within the aircraft environment at Baldonnell. Delivered on a regular basis, this training supports safe and effective neonatal transfer in aeromedical settings.

The NNTP also contributes to cross-service education with the National Ambulance Service Critical Care Retrieval Services (NASCCRS) and the National Emergency Operations Centre (NEOC), supporting communication, coordination and shared understanding of transport processes.

Key Education Highlights (2013–2025)

- Over 135 STABLE courses delivered nationally, with additional outreach courses also provided through NNTP educational programmes from 2013 to 2025
- **2,500 + healthcare staff** trained through outreach programmes (2013–2025)
- Regular **induction and orientation programmes** for clinical staff
- **Specialist training, including air transport training**, delivered to all staff
- Dedicated **aeromedical training with the Irish Air Corps**, including practical training in aircraft environments
- Ongoing **competency-based training framework** for nursing staff
- Delivery of **hospital-based study days and targeted clinical education**
- Active participation in **national and international presentations**
- **Cross-service education and training** with NASCCRS and NEOC
- Education embedded across **clinical, transport and control services**

10.3 Outreach Education

The NNTP's Outreach education forms an extension of this core training function,

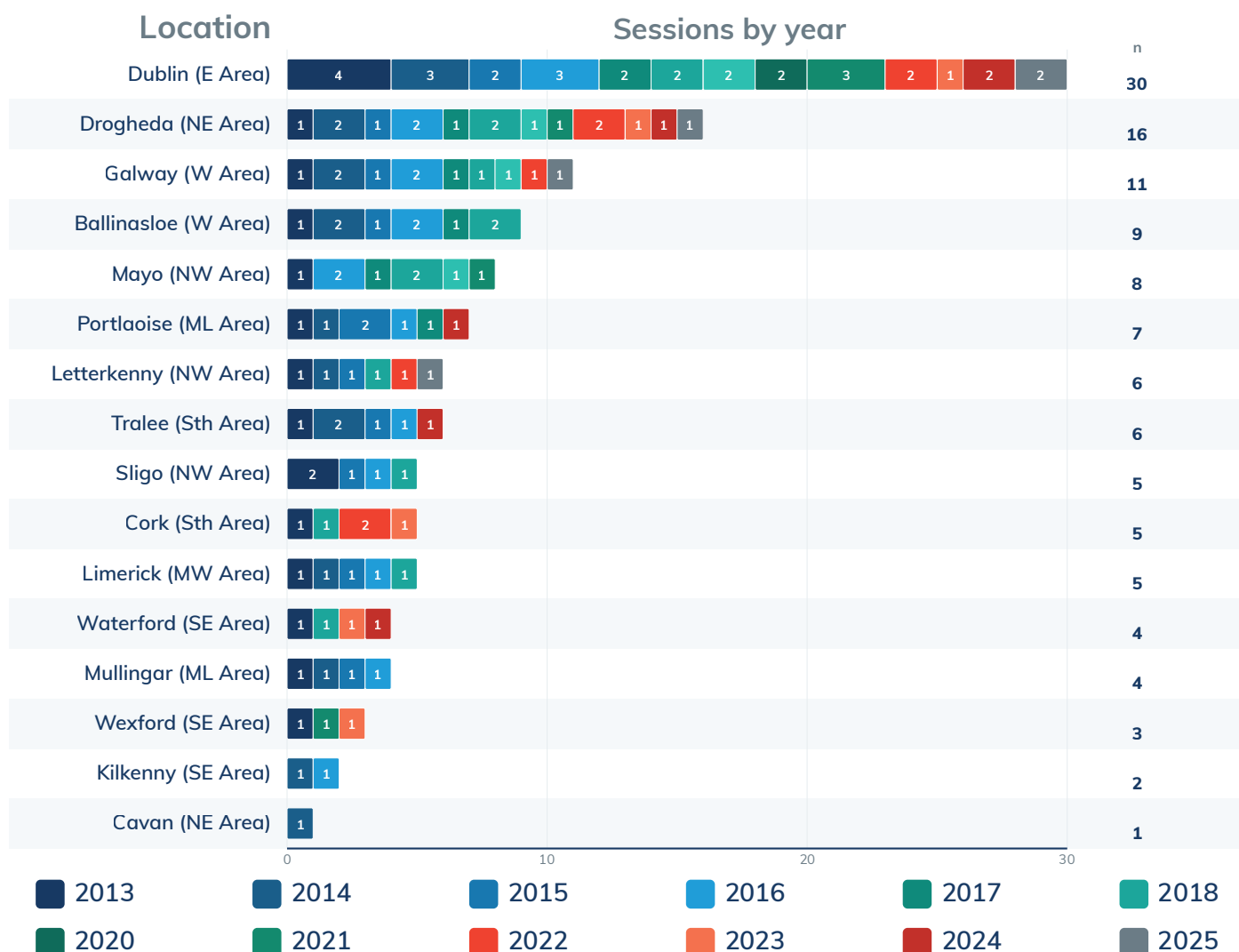
The National Neonatal Transport Programme (NNTP) operates within a system that has become increasingly centralised, both in terms of neonatal transport and the wider organisation of neonatal services. Antenatal transfer of mothers to appropriate centres has reduced the number of high-risk deliveries occurring in non-tertiary units. While this has improved outcomes overall, it has also resulted in reduced exposure within these units to the management of preterm and unwell neonates. As a result, opportunities for staff to gain and maintain experience in early stabilisation and initial management are more limited.

NNTP Education

Outreach education therefore remains an important component in supporting clinical practice across the country. Outreach education delivered by the NNTP includes both the STABLE programme and a range of other educational activities. The STABLE programme has been a significant and enduring component of this work and is delivered nationally, both centrally and within individual units. In parallel, the NNTP has contributed to additional outreach education over time, often in response to specific clinical developments or emerging needs, including areas such as temperature management and therapeutic hypothermia. Together, these approaches reflect both the structured and responsive elements of NNTP educational activity.

Location of STABLE Outreach Delivered by NNTP 2013–2025

n = 122 • 16 locations • Bars show sessions per year • Sorted by total



NNTP Education

The Stable Program

The NNTP continues to deliver approximately ten STABLE courses annually, including the introduction of the seventh edition in 2025. This formal, certified programme focuses on the management of infants in the post-resuscitation, pre-transport phase, covering key domains including ventilation, cardiovascular stability, airway management, fluid balance, and family support. It also provides a reliable platform for core teaching and for sharing updates in neonatal practice and NNTP processes. Attendance is multidisciplinary, with approximately two-thirds of participants from nursing backgrounds and one-third from medical staff. The programme has become a part of mandatory training in many hospitals for both medical and nursing staff, and feedback has remained highly positive over time.

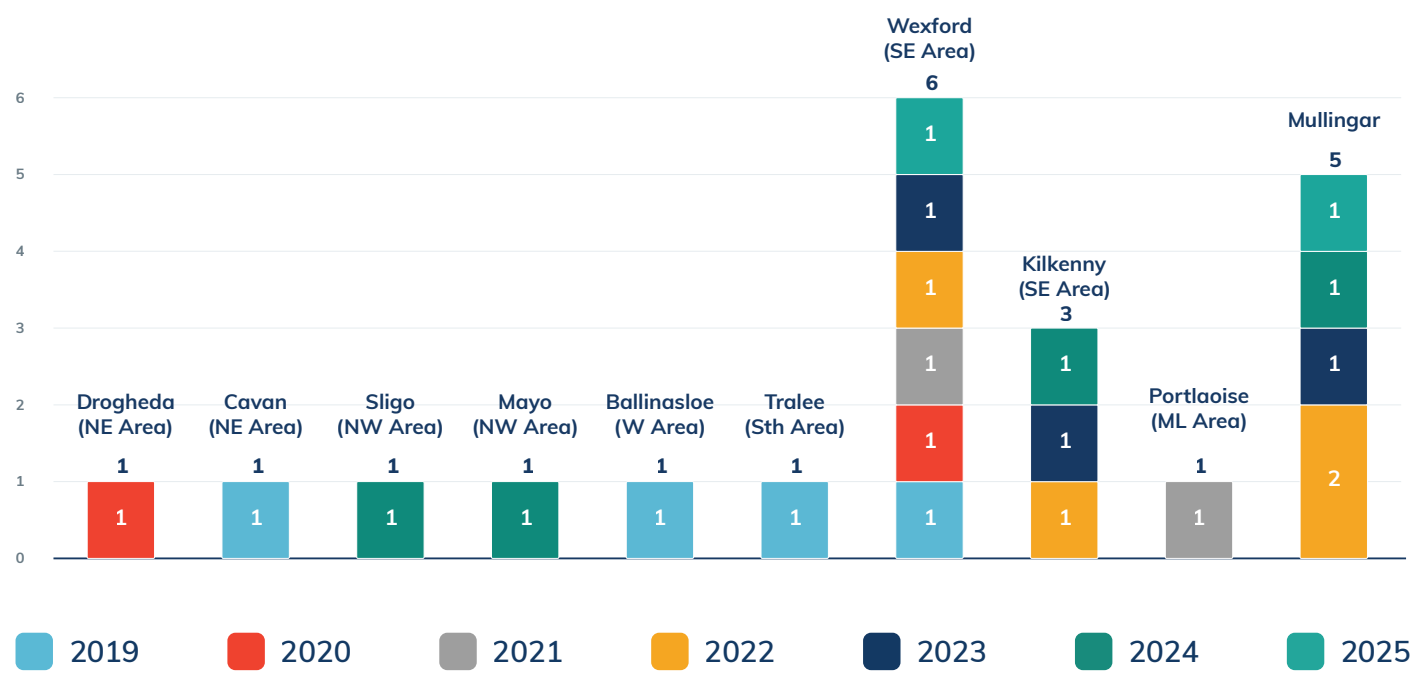
NNTP STABLE Course Attendees 2013–2025

Category	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Totals	Ann.Avg
No. of Courses	14	13	8	8	12	13	13	5	8	15	8	11	6	134	10
Nurses/ANPs/Midwives	156	138	108	79	106	147	155	24	68	179	83	136	74	1,453	112
Consultants	13	8	3	2	4	3	3	5	—	3	—	4	3	51	4
NCHDs	43	59	51	60	55	56	49	35	40	69	29	51	16	613	47
Paramedic/EMT	—	—	—	—	—	1	1	—	—	—	—	—	—	2	—
TOTAL	212	205	162	141	165	207	208	64	108	251	112	191	93	2,119	163

Hospital Focused Outreach

With the expansion of the NNTP team, including increased consultant presence and the development of neonatal transport clinical nurse specialist roles, there has been greater capacity to deliver more targeted outreach education within individual units, with an emphasis on unit specific training. These study days are delivered across the network and are tailored to the needs of the host unit, with an emphasis on practical, skills-based learning in the local clinical environment. While this outreach education activity has increased, delivery has not yet been uniform across all units, and further development of these study days is anticipated this year.

Location of Hospital Focused Outreach Delivered by NNTP



Core topics include airway management and intubation (including videolaryngoscopy), ventilation and oxygenation strategies, temperature management and therapeutic hypothermia, preterm stabilisation and “Golden Hour” care, and key procedural skills such as umbilical line insertion and chest drain management. Sessions also provide an opportunity to reinforce familiarity with NNTP processes, documentation, and available supports.

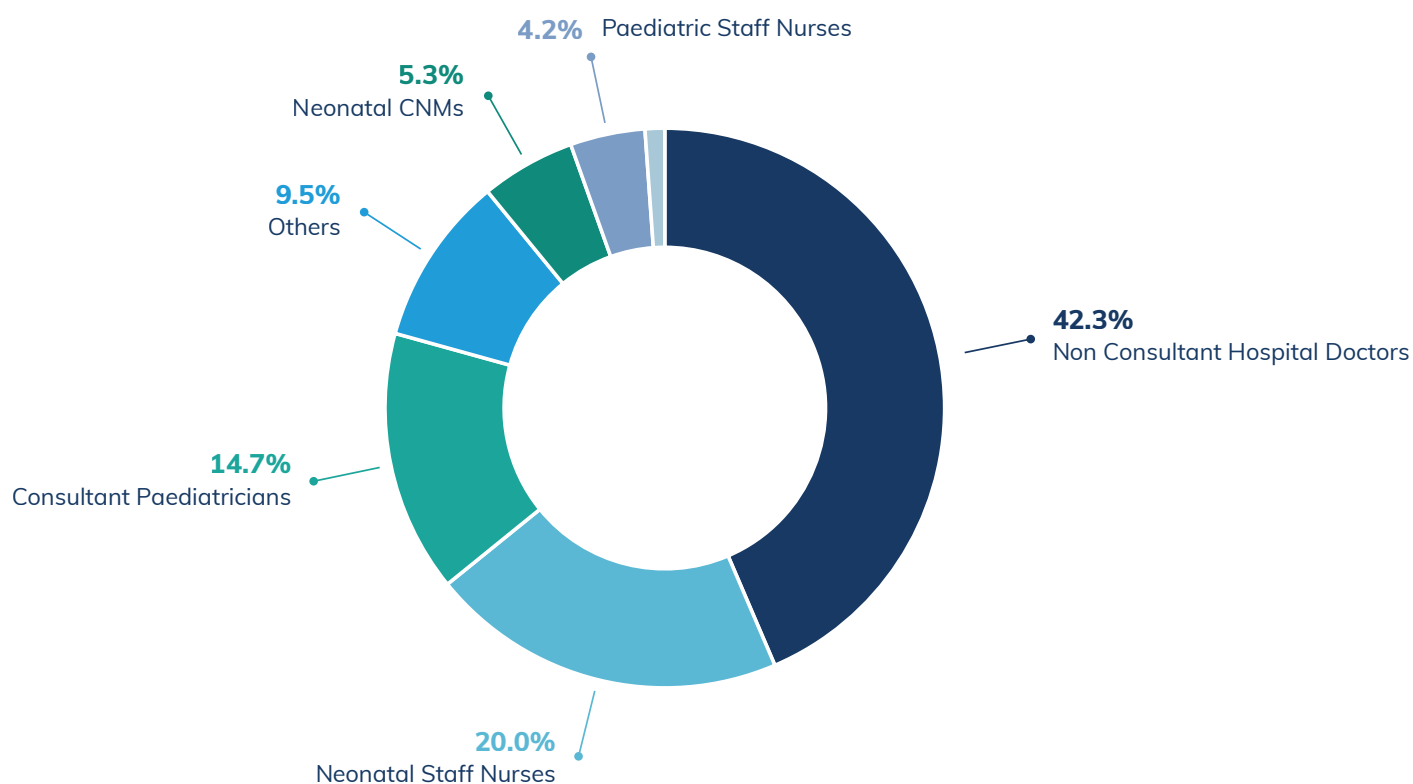
Formal feedback indicates very high levels of engagement and relevance among participants, with a clear preference for practical, hands-on teaching. Attendance reflects a broad multidisciplinary group, with a significant proportion of nursing staff alongside medical personnel.

NNTP Education

Breakdown of Staff Attendance at NNTP Outreach Study Days

2019–2025

Proportion of participants by staff role



In addition to fostering the maintenance of clinical skills in non-tertiary units, all NNTP outreach sessions facilitate the sharing of current practice, and strengthen links between the NNTP and local teams. Continued development of these activities is important in supporting consistent standards of neonatal care across the country

Research

Research, Original Research and Presentations Undertaken by the NNTP in Recent Years

The National Neonatal Transport Programme (NNTP) has contributed to a growing body of academic and clinically focused research over recent years, reflecting both its experience in neonatal transport and the ongoing development of the service. While the programme has historically been primarily service-driven, there has been increasing engagement in research, education, and evaluation activities, supporting the development of evidence-based neonatal transport practice.

The following represents a selection of research outputs, postgraduate work, publications, and presentations associated with the NNTP. This is not an exhaustive list but provides an overview of work undertaken within the programme.

Postgraduate Research (Higher Degrees)

Aminudin NH. Neonatal noise exposure and noise reduction during neonatal transport [MD]. Dublin: Royal College of Surgeons in Ireland; 2020.

Cunningham KM. Temperature management of outborn preterm infants during inter-hospital transfer after birth [MD]. Dublin: University College Dublin; 2020.

Aminudin NH. Development of a curriculum for the neonatal transport fellow (NNTP) [MSc LHPE]. Dublin: Royal College of Surgeons in Ireland; 2016.

Research Funding

Aminudin NH. National Children's Research Centre Research Education Support Grant: 2017. Rotunda Foundation. NNTP research equipment funding; 2017.

Peer-Reviewed Publications

1. Moore T, Afridi A, Aminudin NH, Gibbons C, Grant O, Fucikova H, et al. Impact of a national nirsevimab programme on critical care transport of babies with bronchiolitis. *Arch Dis Child*. 2026.
2. Moore CM, O'Reilly D, Aminudin N, Purna JR, Franta J, Fucikova H. Carbon emissions from road transport on a national neonatal transport service. *BMJ Paediatr Open*. 2025;9:e003320.
3. Moore CM, Bowden A, Fucikova H, Purna JR, O'Curraín E, Franta J. Infants born in a non-maternity hospital: the role of the NNTP. *Ir Med J*.
4. Fucikova H, Blatny J, Stingl J, Miletin J. Capnometry during neonatal transport: a mini review. *Acta Paediatr*. 2023;112:919–923.
5. Aminudin N, Franta J, Bowden A, Corcoran JD, El-Khuffash A, McCallion N. Noise exposure exceeded safe limits during neonatal care and transport but was reduced by active noise cancelling. *Acta Paediatr*. 2023;112:2060–2065.

Abstracts and Conference Publications

Fucikova H, Stepanova R, Miletin J. CAPNO study: capnometry during neonatal transport. *Acta Paediatr.* 2024;113(Suppl 484):58.

Aminudin N, Franta J, Bowden A, Corcoran D, El-Khuffash A, McCallion N. Neonatal noise exposure and reduction during helicopter transport. JENS Congress; Maastricht; 2019.

Aminudin N, Franta J, Bowden A, Corcoran D, El-Khuffash A, McCallion N. Noise exposure in NICU and during neonatal transport. *J Pediatr Neonat Individual Med.* 2018;7:e070125.

Moore CM, Cassidy M, Byrne M, Bowden A, Franta J, Farombi I, et al. Neonatal transport to and from a regional level 2 centre. *J Pediatr Neonat Individual Med.* 2017;6:e060214.

Aminudin N, Bowden A, Franta J. Comparison of response and journey times between air versus ground transport. THRN; Genoa; 2015.

Oana P, Aminudin N, Bowden A, Franta J. Therapeutic hypothermia during neonatal transport. THRN; Genoa; 2015.

Presentations (Selected)

Kasha S, Bowden A, Fucikova H, Franta J, Aminudin N, Purna J, Moore CM. Therapeutic hypothermia on transport: are we achieving target temperature? Irish Paediatric Association; Cork; 2024.

Fucikova H. Neonatal transport in Ireland. Neonatologické dny; Czech Republic; 2023.

Moore CM, Bowden A, Fucikova H, Purna J, O'Curraín E, Franta J. Neonatal transport workload associated with infants born in non-maternity hospitals. UK Neonatal Transport Group; 2021.

Moore CM, Bowden A, O'Curraín E, Purna J, Fucikova H, Franta J. Neonatal transport workload associated with non-maternity births. UENPS; 2020.

Moore CM, Petrea O, Bowden A, Purna J, Fucikova H, Franta J. Staying cool on the move: therapeutic hypothermia starts from the decision to cool. Irish Paediatric Association; Athlone; 2019.

Fucikova H. Extremely preterm infants born outside perinatal centres: outcomes. Neonatologické dny; Czech Republic; 2019.

Research

Posters and Scientific Meetings

Moore T, Aminudin N, Fucikova H, Moore CM. Impact of nirsevimab on neonatal critical care transport. UK Neonatal Transport Group; Bristol; 2025.

Morris J, Moore T, Miletinova P, Bowden A, Aminudin N, Purna JR, Franta J, Fucikova H, Moore CM. Level 1 neonatal unit outreach education: feasibility and success. UK NTG; Bristol; 2025.

Moore CM, O'Reilly D, Aminudin N, Purna JR, Franta J, Fucikova H. Carbon emissions from neonatal transport. JENS; Belgrade; 2025.

Moore CM, Bowden A, Purna J, Fucikova H, Franta J. Implementation of a national cooling protocol. UK NTG; Southampton; 2019.

Moore CM, Cassidy M, Byrne M, Bowden A, Franta J, Farombi I, Fitzsimons J. Moving babies: transport to and from a regional centre. JENS; Venice; 2017.

Aminudin N, Franta J, Corcoran D, El-Khuffash A, McCallion N. Neonatal noise levels and reduction. Irish Neonatal Research Symposium; Dublin; 2017.

Moore T. Nurses' and doctors' experiences of teamwork on neonatal transport. UK NTG; Brighton; 2015.

Summary

These outputs reflect ongoing engagement in research, education, and service evaluation within the NNTP, contributing to the development of neonatal transport practice and supporting the continued evolution of the service within a national clinical framework.

Acknowledgments

Acknowledgement of NNTP Contributors (2001–2025)

The National Neonatal Transport Programme (NNTP) gratefully acknowledges the commitment, expertise and collaboration of all those who have contributed to the development and delivery of neonatal transport services in Ireland over the past 25 years.

The NNTP has evolved through the collective efforts of clinical, transport, operational, technical and administrative teams across multiple organisations and sites nationwide. We extend our sincere thanks to all individuals and services who have supported the programme throughout its development.

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The NNTP gratefully acknowledges the support and guidance of the National Clinical Programmes, particularly in Transport Medicine and Neonatology, whose leadership and advocacy contributed significantly to the development of neonatal retrieval services in Ireland. We especially acknowledge:

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Prof John Murphy — National Clinical Lead in Neonatology, for his longstanding support, collaboration and advocacy for neonatal transport development nationally.

NNTP Clinical Leadership

Prof Tom Clarke — Medical Director (2001–2003, part-time)

Dr Freda Gorman — Medical Director (2004–2005, part-time)

Dr Anne Twomey — Medical Director (2005–2014, part-time)

Dr Jan Franta — Clinical Lead (2014–2024)

Dr Hana Fucikova — Clinical Lead (2024–present)

Consultant Neonatologists (NNTP)

Dr Jan Franta (2014–present)

Dr Hana Fucikova (2017–present)

Dr Jyothsna Purna (2018–present)

Dr Nurul Aminudin (2023–present)

Dr Carmel Moore (2024–present)

Dr Eoin O' Currain (2020–2022)

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Programme Coordination

Helen Byrne (2001–2002)
Ann Bowden (2002–present)

Clinical Nurse Specialists (NNTP)

Petra Miletinova (2023–present)
Tara Moore (2021–present)
Josephine Morris (2021–present)
Blaithin Quinlan (2021–2023)

Clinical Fellows (NNTP)

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Dr. Carmel Moore	Dr. Sarah Kasha
Dr. Ahmed Afifi	Dr. Caitriona Ní Cathahasaigh
Dr. Mahmoud Farhan	Dr. Jsun Loong Wong
Dr. Muller Thuebo	Dr. Shozab Ali Taj
Dr. Emma Dunne	Dr. Colin McGrath
Dr. Jiri Halbrstat	
Dr. Tayyab Anwar	
Dr. Laura Ryan	

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NASCCRS Clinical Leadership

Dr Dermot Doherty — Clinical Director, NASCCRS
Ms Anne McCabe — Director of Nursing, NAS

NAS Operational Leadership

Caolan O’Cinneide
Ian Brennan
Ger Carthy
Fergus Murray
Darryl Coen
Alan Sheehan
John Shevlin
Lucyna Holton

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Acknowledgments

NNTP Members 2001–2025

Over the past 25 years, a very large number of nurses, NCHDs, registrars, fellows, EMTs, NASCCRS operatives, NEOC personnel and multidisciplinary team members have contributed to the delivery and development of the NNTP.

The following lists recognise those staff members who participated directly in the programme across different periods of its development. While every effort has been made to ensure completeness and accuracy, the breadth of contribution over 25 years means there may be inadvertent omissions, for which we sincerely apologise. These names are included here in recognition that the NNTP has evolved through the commitment, teamwork and professionalism of the many individuals who delivered and supported neonatal transport care over the years.

NNTP Nursing Team Members

Alice O'Connor	Edel Smith	Jorge Pascal	Mary Cassidy
Ancy Varghese	Edna Woolhead	Josephine Morris	Mary Jacob
Angelina Morales	Elaine Butler	Jovelle Lorenzo	Mary Joseph
Anita Morales	Elizabeth Doran	Julie Heslin	Michelle OLoughlin
Ann Kelly	Elizabeth Tobin	Julie Miague	Michelle Quinn
Anne Healy	Emily Barriga	Karen Bourke	Monica Kavanagh
Anne Little	Emma Thompson	Kathleen Keegan	Nalini Mantilla
Anne McIntyre	Freian Urbano	Kendy Bermejo	Nancy Grosvenor
Anne O'Sullivan	Geena Joseph	Kristiane Flores	Narthel Almeida
Anna Pereira	Gemma Brown	Lea Sacopaso	Niamh Buggy
Avril Kearney	Geraldine Walsh	Lily Cudimat	Niamh Hegarty
Bernadette Loughran	Gijo Antony	Linda Collins	Nova Quiapos
Bindhu Chako	Gilda Aum	Linda Coughlan	Orla OByrne
Blaithin Quinlan	Gina Neric	Linda Smiles	Patricia Healy
Breda Coronella	Guna Sheela Shetty	Lourdes Segador	Patricia Trish Walsh
Brid O'Brien	Hannah Fitzmaurice	M Juan	Pauline OConnell
Carolina Comendador	Hazel Cook	Mairead McMorrow	Petra Miletinova
Carol Kamto	Helen Lonergan	Margaret Coleman	Princy Thomas
Ciara Murphy	Helen Walsh	Marian Barron	Rabekah Prabakaran
Chriselda Mallari	Irene Glynn	Marian OShaughnessy	Rachel Irwin
Christina Kilpatrick	Jackie Clavarez	Mariola Buczkowska	Reshma Raj
Christine Becker	Jennifer Doyle	Mark Hollywood	Sally Thomas
Christine McDermott	Jeanne Belan	Maria Lourdes Segador	Sam Manaog
Cyril Sta Cruz	Jennifer Galong	Maria OConnell	Sarah Hennigan
Deirdre McBride	Jeanne Belan	Maria Teresa Figueroa	Sarah Nolan
Deirdre Molloy	Jessie Thomas	Marie Lynch	Sarah Rock
Deirdre O'Connell	Joan O'Neill	Marlene Montero	Seena Mathew
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 Aveen Haughton
 Brian Cox
 Brian O'Rourke
 Ciaran Boylan
 Conor Garvey
 Darren Gillick
 David Carroll
 Eddie King
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 John Smith
 Jordan Reilly
 Martin Keenan
 Michael Delaney
 Paddy Traynor
 Phil O'Dwyer
 Sarca Flynn
 Stephen Early
 Stephen Morley
 Tommy O'Reilly
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NEOC Team Members who have worked with the NNTP from 2018

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Ann Grimes	Ian Patrick Murphy	Kevin Shields
Brian McCoy	Johanna Byrne	Chris Keogh
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Daragh Lettice	Karen Murray	Stephanie Duffy
Gavin Doyle	Lisa Breen	Zoe Wright
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Adam James	Annabelle Piquet	C. Samaan	Daniel O'Reilly
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Agnes O'Donoghue	Anita Caco	Caoimhe Costigan	Danielle Vincent
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Ahmed Afifi	Aoife Branagan	Caroline Fox	David Sheridan
Aida Abedin	Aoife Carroll	Carmel Moore	David Staunton
Ailbhe McGrath	Aoife Cassidy	Catalin Soroiu	Davina Henderson
Ailbhe Murphy	Aoife Flynn	Catherine Breen	Deirbhile Henderson
Aine English	Aoife Keane	Catherine O'Carroll	Deirdre Ryan
Aine Fox	Aoife McDonald	Cathy Gibbons	Deirdre Sweetman
Aisling Dunne	Aoife Waters	Caylee O'Leary	Deborah Condren
Aisling Flynn	Arie Fischer	Cecilia Halling	Declan O'Rourke
Aisling Garvey	Arianna Mareri	Chike Onwuneme	Dermot Wildes
Aisling Geoghegan	Asad Rahman	Chitra Arumugam	Des Cox
Aisling Lyons	Asim Ali	Chris Pitan	Dhani Box
Aisling McCann	Ashling Geoghegan	Ciara Broderick Farrell	Doireann Eves
Aisling Meyers	Ashling Walsh	Ciara Hopkins	Domhnall McGlacken-
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Aisling Semple	Atif Elmali	Ciara O'Neill	Draike Okafor
Aisling Smith	Atif Kahlil	Ciara O'Shea	Eadaoin Hayes
Aisling Stafford	Attia Kalim	Ciara Terry	Edel Smith
Alan Macken	Audhild Prytz	Claire Connellan	Ehtasham Yousaf
Alanna Ahmad Kamar	Ayoub Mohamed	Claire Gaffney	Eimear Loftus
Alaa Abdallah	Babu Paturi	Claire Murphy	Eimear O'Connell
Alam Zeb	Banumathy Ramakrishnan	Claire Purcell	Elaine Neary
Alessandra Bagini	Barry Linnane	Claire Thompson	Eleanor Burke
Alexander Boldy	Barry Scanlan	Claudia Stanciu	Eleanor Jenkins
Alexandra Blararu	Basant Pillai	Claudine Vavasseur	Eleanor McLaughlin
Alexandra Lee	Bazlin Ramly	Clodagh O'Gorman	Eleanor Ryan
Ali Eltoum	Beth Gordon	Colin McGrath	Elizabeth Murphy
Ali Raba	Bhushan Sandeerrappa	Colm Breatnach	Ellen Crushell
Amel Osman	Bilal Java	Colm Travers	Elyassa Hamza
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Amy Lee Chong	Blathnaid McCoy	Conor Ring	Emily Farnan
Ana Louise Hawke	Bola Diya	Cormac Breathnach	Emily Kieran
Anabelle Piquet	Breda Hayes	Cormac Owens	Emily Stenke
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Greg Murphy	John Walsh	L Zakharchenko	Mohammed Khan
Griffiths	Johannes Leyshanti	M Osman	Mohd Fazly
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Helen Deeny	Jsun Wong	Maja Kuhar	Mudaffa Al Muddaffer
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Ireti Farombi	Katie Cunningham	Marguerite Lawler	Nadeem Khan
Irwin Gill	Katie Flinn	Maria Dominguez	Nana Yao
Iva Bilic Cace	Kevin Gaughan	Maria Mohammed	Nancy O'Hanrahan
Jack McCaffery	Kevin Slater	Maria Stack	Naomi Bergin
Jackie Pando Kelly	Klara Skorkovska	Mark Glynn	Naomi Howard James
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