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Health Service Executive

NDTP
National Doctors Training & Planning

SPECIALITY REVIEW:

PAEDIATRICS AND NEONATOLOGY MEDICAL WORKFORCE IN IRELAND

2017

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1 INTRODUCTION TO REPORT AND OVERVIEW OF THE PAEDIATRICS AND NEONATOLOGY MEDICAL WORKFORCE

1.1 INTRODUCTION

The HSE National Doctors Training and Planning (NDTP) Unit is positioned within the HSE National Directorate for Human Resources, and has statutory roles in:

- Medical education and training;
- Medical workforce planning; and,
- The consultant post approval process.

Within its medical workforce planning remit, NDTP predicts and proposes on an annual basis the number of interns and medical trainees required for each specialty, as well as projecting the future medical workforce requirements for each speciality. This information then feeds into the medical education and training aspect of NDTP via the commissioning and funding of medical training required to meet workforce needs, ensuring that the training content and delivery is responsive to the changing needs of the Irish healthcare system, and supporting the retention of doctors upon completion of their training.

The main objective of NDTP is to ensure that, at all times, the Irish health service is provided with the appropriate number of specialists, who possess the required skills and competencies to deliver high quality and safe care, and whose training is matched to the model of healthcare delivery in Ireland, regardless of location.

1.2 BACKGROUND TO SPECIALTY-SPECIFIC REVIEWS

In 2014, NDTP published "Population Based Ratios of Specialists in Ireland and Internationally: An Information Source to Support Medical Workforce Planning", which was a benchmarking exercise conducted across all medical specialties, comparing specialist numbers against international examples. Included in this benchmarking exercise are the projected number of specialists required per specialty in ten years' time (2024). Data and contextual information were requested from individual postgraduate medical training bodies and associated national clinical programmes, which were considered in the development of each specialty-specific chapter.

As a follow-up to this exercise, it is timely to provide a review of each medical specialty based on current available data and input again from the postgraduate training bodies and clinical programmes. These reviews are high-level and are a companion to the more in-depth specialty specific reports which are published by NDTP (i.e. "Future Demand for General Practitioners 2015-2025", published in 2015. These reviews will be a useful reference for those with an interest in data on the medical workforce and medical workforce planning, comprising a live repository that will be continuously updated as each review is completed. Where a review has yet to be completed, the chapter from the benchmarking exercise in 2014 will be available for reference.

1.3 DATA USED AND LIMITATIONS

The data utilised in the analysis of the medical workforce in each speciality for these reviews are drawn from multiple sources:

- HSE Doctors Integrated Management E-System (DIME), which receives data from the postgraduate medical training bodies, the Medical Council of Ireland and each clinical site that employs doctors in the public health system in Ireland;
- HSE Workforce Planning, Analysis and Informatics Unit (WPAI);
- HSE Consultants Appointments Division;

- The Postgraduate Medical Training Bodies;
- The Medical Council of Ireland – Medical Council Workforce Intelligence Report;
- The National Clinical Programme linked to each specialty;
- International medical training bodies (UK and Australia);
- International medical workforce datasets (i.e. National Health Workforce Dataset in Australia); and,
- International health research groups (i.e. Health Workforce Australia).

Variations between datasets are not unexpected and therefore the results from the different sources in the reviews are not identical. These limitations of the datasets are due to variations in the time-point of data collection, differences in the variables collected (i.e. whole-time equivalents (WTE) versus headcounts), differences in the definitions of some variables (e.g. less than full-time versus part-time), absence of variable values (i.e. missing data) in datasets, and varying quality of data between sources.

The weaknesses of benchmarking domestic data against international data are known and include:

(i) Lack of contextual consideration;
(ii) Assumptions that the international standard is best practice; and,
(iii) Potential complacency should the domestic value equal that of the international value.

However, there is merit in this kind of comparison as these ratios are interesting in terms of contextualising the demand for consultants across international healthcare systems with similar training and healthcare delivery infrastructures to those in Ireland. Further, it provides an international baseline for comparison and can help identify areas for improvement. Irish doctors traditionally migrate to countries like the UK and Australia and so benchmarking against these countries is a useful exercise.

Should you require any further information on the reviews, please contact NDTP at doctors@hse.ie

1.4 THE CONTEXT OF PAEDIATRICS AND NEONATOLOGY MEDICINE IN THE IRISH HEALTH SERVICE

The number of children in Ireland under the age of sixteen is estimated to be around 1.1 million. Ireland has one of the highest birth rates in the European Union. There were 64,013 births in 2016, 65,909 births in 2015 and 67,462 births in 2014.This corresponds to a birth rate of 13.7 per 1,000 population in 2016, a rate decrease of 0.5 from 2015. There were 151 neonatal deaths registered in 2015, a neonatal mortality rate of 2.3 deaths per 1,000 live births, which was a decrease of 0.4 (CSO, 2017).

Children access healthcare services in a variety of settings; from primary and community care, to local and regional paediatric units, the tertiary children's hospitals in Dublin, and maternity hospitals/obstetric units. These children are cared for by a range of healthcare professionals including doctors, nurses and social care professionals.

The specialty of Paediatrics in Ireland includes a wide range of medical specialties. The main specialist services include those of General Paediatrics (with or without a special interest) and Neonatology. The area of Community Child Health is an area under development. Table 1 outlines the different paediatric medical specialties in Ireland.

Table 1 Paediatric Medical Subspecialties in Ireland (NPPN,2016, derived)
General Paediatrics
Allergy
Dermatology
Gastroenterology
Metabolic Medicine
Palliative Care
Cardiology
Diabetes & Endocrinology
Immunology
Nephrology
Respiratory
Community Child Health
Emergency Medicine
Infectious Diseases
Neonatology
Rheumatology

1.4.1 Model of Paediatric Care Delivery Today

In Ireland, a paediatric patient is defined as a patient under the age of 16 (i.e. up to the patients 16th birthday). While the majority of sick children in Ireland are treated in primary care, generally by a GP or public health nurse, a percentage of these children will be treated by paediatricians attached to the acute hospital system. Note that public health nurses are more involved in post-natal care, early childhood development and vaccinations rather than the care of the acutely unwell child.

In recent years, there has been a move towards increased numbers of general paediatricians working in paediatric services, particularly in the Dublin area. General Paediatrics provides a method to diagnose, treat and direct patients to the most appropriate services, including specialist reviews and investigation. In a situation where a child has a requirement to see a number of specialist service providers, the generalist can act as an overarching coordinator of that care.

In the regional and local paediatric units, General Paediatrics forms the core of healthcare delivery for children. Within these units, the majority of consultant paediatricians tend to be either generalists or generalists with a special interest. Special interests include, for example, Endocrinology, Neurodisability, Metabolic Medicine, Gastroenterology, Infectious Diseases and Allergy.

The role of general paediatricians includes the provision of:

- Outpatient general paediatric clinics;
- Acute unscheduled care;
- Day care;
- Coordination of care for patients with complex needs;
- Paediatric care in special care baby units (SCBUs); and,
- Specialist services in subspecialties in which the consultant has appropriate training.

General paediatricians with an area of special interest developservices within their area of special interest at a local level and link them to tertiary sub-specialist services as appropriate.

Within the specialty of General Paediatrics, the area of Community Child Health is developing. Internationally, Community Child Health (CCH) encompasses a broad range of children's health services including neurodevelopment

and disability, child protection and public health. In Ireland, CCH is a relatively new discipline within the field of General Paediatrics, with a focus on disability and child protection. Appointment of consultant general paediatricians with a special interest in CCH has so far been made by hospitals based on identified local need. All consultants in CCH in Ireland hold joint appointments with a large commitment (often at least 50%) to hospital-based General Paediatrics and neonatology. Within the National Clinical Programme for Paediatrics and Neonatology's (NCPPN) new model of care, there is a proposal to further develop the area of CCH with a significant increase in service delivery. This is further discussed in section 3 - of this report.

Infrastructure Underpinning Paediatric Care Delivery Today: Across Ireland, paediatric medical services are delivered in 3 tertiary paediatric hospitals in Dublin (Our Lady's Children's Hospital Crumlin (OLCHC), Temple Street Children's Hospital (TSCH) and the Adelaide and Meath National Children's Hospital in Tallaght (AMNCH)), 3 regional hospitals (based in Cork, Galway and Limerick) and in 14 local hospitals (see Table 2 for full list of hospitals delivering paediatric services in Ireland).

Tertiary Paediatric Hospitals: Tertiary paediatric hospitals provide the most specialised and complex paediatric care, and are staffed by paediatric specialists as well as by general paediatricians and generalists with a special interest.

Regional Units: In the regional units, a more intermediate level of care is provided, mainly delivered by general paediatricians with and without a special interest. If more complex care is required, patients are transferred to one of the tertiary paediatric hospitals.

Local Units: Local units deliver less complex care than the regional units and are also staffed by specialists in General Paediatrics, with and without a special interest. All regional and local units, with the exception of the Mercy Hospital in Cork, have co-located obstetric units.

It should also be noted that paediatric services are provided in other locations, for example, the National Rehabilitation Hospital in Dun Laoghaire and Cappagh Orthopaedic Hospital. Elective paediatric surgical services are delivered in many hospitals without medical paediatric services.

Table 2 Breakdown of Paediatric Hospital and Units

Tertiary Units
Temple Street Children's University Hospital
Our Lady's Children's Hospital, Crumlin
National Children's Hospital at Tallaght Hospital
Regional Units
Cork University Hospital
Limerick University Hospital
Galway University Hospital
Local Units
Midlands Regional Hospital, Mullingar
St. Luke's Hospital, Kilkenny
Wexford General Hospital
Mercy University Hospital Cork
Waterford University Hospital
South Tipperary General Hospital, Clonmel
Tralee General Hospital
Our Lady of Lourdes Hospital, Drogheda
Cavan General Hospital
Midlands Regional Hospital, Portlaoise
Portiuncula Hospital, Ballinasloe
Mayo General Hospital, Castlebar
Sligo General Hospital
Letterkenny General Hospital

Current Levels of Service Utilisation: There were an estimated 63,553 and 20,485 paediatric specialty-related inpatient and day case discharges respectively across Ireland in 2016. There were an estimated 190,581 outpatient attendances for children attending paediatric specialty out-patient clinics in the same year (HSE Business Intelligence Unit, 2016). Emergency attendances both new and return were in the region of 299,998. Together, attendance rates were up on those for the previous year (Table 3).

Table 3 Paediatric Specialty Service Utilisation 2016

Inpatient	Outpatient	Day Case	Emergency Attendances (new and return)
63,553	190,581	20,485	299,998

Includes children over 15 years who remain in the paediatric system

In addition, it is estimated that approximately 8,000 – 10,000 community-based appointments take place annually for children with a disability. This is an important figure, given the new policy to develop community child health services.

1.4.2 Model of Neonatology Care Delivery Today

The WHO defines a neonate as a child under the age of 28 days. In 2015 there were 65,909 births in Ireland (a decrease on previous years when the average was 70,000), of whom approximately 6% were born prematurely and over 600 were delivered with a birth weight of under 1500g (CSO, 2017; NCPPN, 2016).

Neonatology encompasses the care of the well and sick infant in the newborn period (up to 6 weeks), as well as longer-term follow-up of certain infants at risk of complications, including neurodisability. With the future development of CCH services it is likely that those babies over the age of 6 weeks with neurodisbilities (or those at risk of complications including developmental delay) will be transferred to CCH specialist services for treatment and surveillance.

Neonatologists provide care to babies categorised as requiring special care, high dependency care and intensive care, as well as to healthy babies. Neonatal care for a healthy newborn infant is based on three key areas: screening, nutrition and immunisation. For babies requiring more complex care the specialty of neonatology extends to the management of prematurity and attendant physiological and pathological challenges, as well as the diagnosis and management of congenital anomalies (identified both ante and postnatally). There are significant acute and neonatal intensive care (NIC) components to neonatology, but it also addresses the chronic management and developmental issues of those babies who have been discharged from the NIC unit. In this way, the specialty has a very broad remit.

Infrastructure Underpinning Neonatology Care Delivery Today: Neonatology services are located in all 18 hospitals providing maternity care in Ireland as follows:

- Tertiary Units: There are four tertiary neonatology units located in the National Maternity Hospital, Holles Street, the Rotunda Hospital, the Coombe Women & Infants University Hospital in Dublin, and Cork University Maternity Hospital. More than half of the country's annual births occur in these four maternity hospitals.

- Regional Units: Regional neonatology units in Ireland can be found in Drogheda, Waterford, Galway and Limerick. Babies requiring more complex care, including those babies typically born before 28 weeks gestation, are transferred to tertiary units.

- Local Units: The remaining neonatology units throughout the country provide routine newborn care and have immediate resuscitation facilities available. These units are staffed by general paediatricians and care for babies born after 32 weeks gestation. Babies born at less than this gestation, or if there is medical need, are transferred to either secondary or tertiary units.

All neonatal units are supported through the National Neonatal Transport Programme (NNTP).

Service Utilisation: The number of births in Ireland is considered a good indicator of service utilisation. Table 4 below outlines the number of births at each of the 19 maternity units in 2016 by hospital group, while Table 5 outlines the average annual number of admissions to special care/intensive care in each neonatal unit as indicated by the NCPPN. As can be seen, in 2016 there were over 64,000 births in Ireland. The vast majority of these births were in tertiary units.

Table 4 Number of Births in Ireland 2016 (BIU, 2017)

Unit	Number of Births
Tertiary Units	
National Maternity Hospital Holles Street	9,017
Coombe Women's & Infants University Hospital	8,303
Rotunda Hospital	8,589
Cork University Maternity Hospital	7,638
Regional Units	
University Maternity Hospital Limerick	4,490
Our Lady of Lourdes Hospital Drogheda	3,183
Galway University Hospitals	3,001
Local Units	
Letterkenny General Hospital	1,736
Mayo (Castlebar) General Hospital	1,650
Midland Regional Hospital Mullingar	2,107
St Luke's Hospital Kilkenny	1,631
Wexford General Hospital	1,796
Midland Regional Hospital Portlaoise	1,482
Cavan General Hospital	1,821
Kerry General Hospital	1,413
South Tipperary General Hospital	1,034
Portiuncula Hospital/Ballinasloe	1,816
Sligo General Hospital	1,360
University Hospital Waterford	1,946
Letterkenny	384
Waterford	450
National Total	**64,013**

Table 5 Average Annual Admissions to Special/Neonatal Intensive Care (NCPPN, 2016)

Hospital	N
Tertiary	
Holles Street	1,508
Rotunda	1,323
Cork	1,208
Coombe	1,095
Regional	
Drogheda	500
Limerick	400
Galway	377

Local	
Cavan	350
Tralee	344
Wexford	340
Ballinasloe	340
Sligo	336
Clonmel	305
Castlebar	276
Portlaoise	270
Kilkenny	250
Mullingar	250

1.4.3 The Medical Team Delivering Paediatric/Neonatology Care

Paediatric medical teams are comprised of consultants and NCHDs, the latter being a mix of trainees and non-trainees.

In the 3 Dublin tertiary paediatric hospitals, there are separate 24/7 team rosters for the Paediatric/Neonatology subspecialties in addition to the General Paediatric on-call roster.

Different hospitals and units will have different numbers of medical subspecialty rosters, each with a consultant of the day and one or more tiers of NCHD cover.

In the 4 maternity units in Dublin and Cork, there are 24/7 neonatology rosters, again each consisting of the consultant of the day plus 2 tiers of NCHD cover. These neonatology units are staffed by specialist neonatologists, registrars and SHOs. Neonatologists working in the Dublin hospitals also have a sessional commitment in the tertiary paediatric hospitals.

Regional and local units have small numbers of consultants who each cover the entirety of the specialty needs for on-call at any one time. In addition to general paediatric care, they cover neonatology care in hospitals with on-site obstetric units with the exception of Limerick which is a separate unit in the regional maternity hospital.

The total number of consultants in each local hospital is relatively small, most often between 3 and 5, one of whom usually has sessions devoted to CCH. Consultants are supported by a team of NCHDs who provide 2 tiers of on-call (e.g. an SHO and a registrar).

In the main, regional neonatology units are staffed by general paediatricians with a special interest in Neonatology while the local neonatology units are staffed by general paediatricians. Regional units should have a separate neonatal consultant roster.

The demands on the consultant paediatricians in these regional and local units are particularly onerous, with busy elective services and on-call rosters. Attempts have been made in recent times to increase the numbers on individual hospital sites.

2 PAEDIATRIC AND NEONATOLOGY MEDICAL WORKFORCE IN IRELAND

Paediatric and Neonatology doctors working in Ireland may work in hospital and community settings across both the public and private healthcare settings. The vast majority of these doctors work in the public sector and in the acute hospital setting. CCH is a developing area of medicine in Ireland and is currently planned for expansion and development. The population of doctors working in Paediatrics and Neonatology is made up of both consultants and non-consultant hospital doctors (NCHDs). This section of the report gives a breakdown of doctors working in specialist and NCHD posts across both the public and private sectors.

The major sources of data used in this report are:

1. Medical Council Workforce Intelligence Reports (2015 and 2016);
2. HSE Workforce Planning, Analysis and Informatics Unit Census of the Workforce (2016/17) (HSE-PAIU);
3. HSE National Doctors Training and Planning Unit (2016/17) (HSE-NDTP); and,
4. Clinical Programme Survey of the Workforce (2015).

Examination of the available data has allowed for a breakdown of the medical workforce by consultants and NCHDs working in the public and private sector. It has allowed further detailed analysis of those doctors actively participating in the medical workforce in Ireland by gender and working patterns, registration type, contract type, where doctors received their basic medical training, and age profile. The ratios of NCHDs to consultants are also considered.

Section 2.1 below outlines breakdown of the consultant/specialist workforce and is followed by an analysis of NCHD workforce in Section 2.2.

2.1 PARTICIPATION OF CONSULTANTS/SPECIALISTS IN THE PAEDIATRIC AND NEONATOLOGY MEDICAL WORKFORCE IN IRELAND

2.1.1 The Number of HSE Approved Consultant Posts

A total of 191 specialist paediatric posts were approved by the HSE as of October 2016. Of these, 141 were general paediatricians, 34 were neonatologists, 8 were specialists in Paediatric Cardiology and 8 were specialists in Paediatric Emergency Medicine. See Table 6 below for a breakdown of approved paediatric consultant posts by specialty and subspecialty.

Table 6 Number of Approved Paediatric Consultant Posts by Specialty (HSE NDTP, 2016)

Specialty	Subspecialty	N
General Paediatrics	Community Child Health	27
	Developmental Paediatrics	1
	Endocrinology	6
	Gastroenterology	4
	General	59
	Infectious Diseases	2
	Metabolic Diseases	4
	Nephrology	6
	Neurology	7
	Oncology	3

	Paediatric Cardiology	1
	Respiratory Medicine	14
	Rheumatology	2
	Paediatric Neurodisability	5
Total General Paediatrics		**141**
Neonatology		34
Paediatric Cardiology		8
Paediatric Emergency Medicine		8
Total Paediatrics		**191**

Data on vacant posts is not currently available. A once-off audit of approved posts found that, in September 2015, approximately 12% of approved posts at that time were vacant.

2.1.2 The Number of Specialists Registered with the Irish Medical Council and Working in the Irish Healthcare System in 2015/2016

The Irish Medical Council (IMC), as part of its annual registration process, invites doctors to record the area of medicine in which they spent most of their professional time in the previous year. In addition, doctors are asked if they have practiced medicine in the past 12 months, as well as the location in which they practiced (in Ireland only, abroad only, or both). For the purposes of this report, we only include those doctors who:

- Practiced mostly in Paediatrics
- Were actively in practice in the previous 12 months
- Worked in Ireland (either in Ireland alone, or in Ireland and abroad)

In 2016, a total of 824 doctors who renewed their registration with the IMC stated that they were professionally active in the specialty of Paediatrics in Ireland. A total of 284 were on the Paediatric Specialist Register (including Paediatric Cardiology; Table 7). Doctors on the General, Supervised and Training Registers are outlined in Section 2.2 below.

Table 7 Irish Medical Council 2016 Registrations for Paediatrics

Division Registered	N
Specialist registration – Paediatrics	278
Specialist registration – Paediatric Cardiology	6
Total Paediatrics	284

2.1.3 HSE Workforce Planning Analysis and Informatics; Number of Consultants Working in Publicly-Funded Services

According to figures from the HSE-WPAI, in March 2017 there were 194 consultants in Paediatrics and Neonatology working in the publicly-funded health sector in Ireland. This equates to approximately 161 WTEs. Table 8 below outlines the number of Paediatric and Neonatology specialists working in Ireland's public sector in March 2017 by specialty and special interest (SI). The overall WTE rate is .83.

Table 8 Consultant Paediatricians Working in Publicly-Funded Services (WPAI 2017)

Specialty	WTE	N
Consultant Neonatologist	24	28

Consultant Paediatric Cardiologist	0	1
Consultant Paediatric Endocrinologist	1	2
Consultant Paediatrician	114	135
Consultant Paediatrician SI:. metabolic diseases	4	6
Consultant Paediatrician SI: respiratory medicine	6	7
Consultant Paediatric Nephrologist	5	6
Consultant Paediatric Neurologist	4	5
Consultant Paediatric Oncologist	3	4
Total	161	194

2.1.4 Specialists Working Exclusively in the Private Sector

In 2016, there were 10 specialist registered doctors in Paediatrics (of a total of 284) working exclusively in the private sector (Table 9).

Table 9 Number of Specialists Who Worked in Privately-Funded Services in Ireland in 2016 (IMC, 2016)

	HC
Specialists working exclusively in the private sector	10

2.1.5 Gender and Working Patterns

According to data from the HSE WPAI census of the workforce, at the end of 2016 approximately 52% of all HC specialists were female. The gender breakdown for HSE WPAI data is fairly well aligned with that of the IMC (2016) data. Of the specialists working in Paediatrics (across both the public and private sectors) in 2015/16, approximately 56% of those on the specialist division of the IMC register were female while 44% were male (Table 10). Paediatric Medicine has a higher proportion of specialists who are female in comparison to other specialities.

Table 10 Gender Breakdown of Consultants/Specialists

Consultants/Specialists Working in Ireland in 2016 (includes Paediatric Cardiology)					
Source	Male %	Male HC	Female %	Female HC	Total HC
WPAI 2016	48%	93	52%	101	194
IMC 2016	44%	125	56%	159	284

The working patterns of specialists/consultants in Paediatrics are outlined in Tables 11 and 12 below.
Of the consultants working in HSE-funded services, approximately 69% (133 HC) were working on a full-time basis while 31% (61 HC) were working on a part-time basis (HSE WPAI, 2016).

Working patterns of the 294 doctors on the Specialist Register of the IMC in 2015/16 indicate that approximately 85% (250 HC) of specialists worked full-time and 15% (44 HC) of specialists worked less than full-time. The IMC data represents specialists working cross both the public and private sectors. Note that data on working patterns from the HSE and the IMC are not comparable due to differing definitions of part-time working. Part-time working infers an approximate WTE rate of less than 80% for IMC data. For HSE WPAI, part-time working is defined as a WTE rate of less than 100%. The overall WTE rate for HSE WPAI data is 83%.

Table 11 Working Patterns of Consultants in Publicly-Funded Services (WPAI, 2016)

Consultant Paediatricians	Full-time [WTE]	Part-time [WTE]	Total WTE	Full-time [HC]	Part-time [HC]	Total Headcount

Consultant Paediatric Neurologist	3	1	4	3	2	5
Consultant Paediatric Oncologist	3	0	3	3	1	4
Consultant Paediatric Cardiologist	0	0	0	0	1	1
Consultant Neonatologist	22	2	24	22	6	28
Consultant Paediatrician	93	21	114	95	40	135
Consultant Paediatric Nephrologist	4	1	5	4	2	6
Consultant Paediatrician SI: respiratory medicine	4	2	6	4	3	7
Consultant Paediatric Endocrinologist	0	1	1	0	2	2
Consultant Paediatrician SI: metabolic diseases	2	2	4	2	4	6
Total	131	30	161	133	61	194

Table 12 Working Patterns of Consultants/Specialists 2016

	HC	HC Full-Time	% Full-Time	HC Part-Time	% Part-Time
HSE WPAI (2016)	194	133	69%	61	31%
IMC (2016)	294	250	85%	44	15%

According to the IMC (2015) the prevalence of part-time working increases with age, being 17.1% for doctors aged between 55 and 64. These data suggest that in future years, the proportion of doctors practicing part-time will rise even further, paralleling the increasing feminisation of the medical profession.

The workforce data from the HSE-WPAI (2016) infer that around twice as many female specialists work part-time when compared with their male colleagues. Furthermore, the part-time adjustment statistic for females is in the region of 44%, while it is closer to 50% for males.

2.1.6 Permanent/Temporary Status of the Consultant Contract

Of the 194 consultants working in publicly-funded services, 159 (82%) held permanent contracts in 2016 (Table 13). The remaining 22% held non-permanent contracts and were typically on locum and specified purpose contracts (HSE WPAI, 2016).

Table 13 Permanent/Temporary Status of Consultant Contract 2016

	Total HC	Permanent	% Permanent	Non-Permanent	% Non-Permanent
WPAI	194	159	82%	35	18%

2.1.7 Country of Basic Medical Qualification

Of the 284 specialists registered with the IMC and working in Paediatrics in Ireland in 2015/16, 61% received their basic medical qualification from a university in Ireland, while 39% received their BMQ from a university outside Ireland (Table 14). These figures reflect a high dependency in the specialty of Paediatrics on international medical graduates.

Table 14 Country of Basic Medical Qualifications of Doctors on the Specialist Register who Worked in Ireland in the Past 12 months (Paediatric Specialist)

Current Area of Practice	Qualified in Ireland	Qualified outside Ireland	Total
Paediatrics	172 (149) 61%	112 (106) 39%	284 (255)

2.1.8 Doctors Exiting the Workforce

A total of 20 specialist paediatricians (5% of the specialist workforce) did not renew their registration with the Medical Council in 2016 (Table 15).

Table 15 Number of Doctors who Exited the Specialist Register in 2016

Most recent specialist qualification	Number leaving the register in 2016
Paediatrics (including Paediatric Cardiology)	20

These data include all specialists registered with the IMC as of 2015/16, including those who worked outside Ireland only.

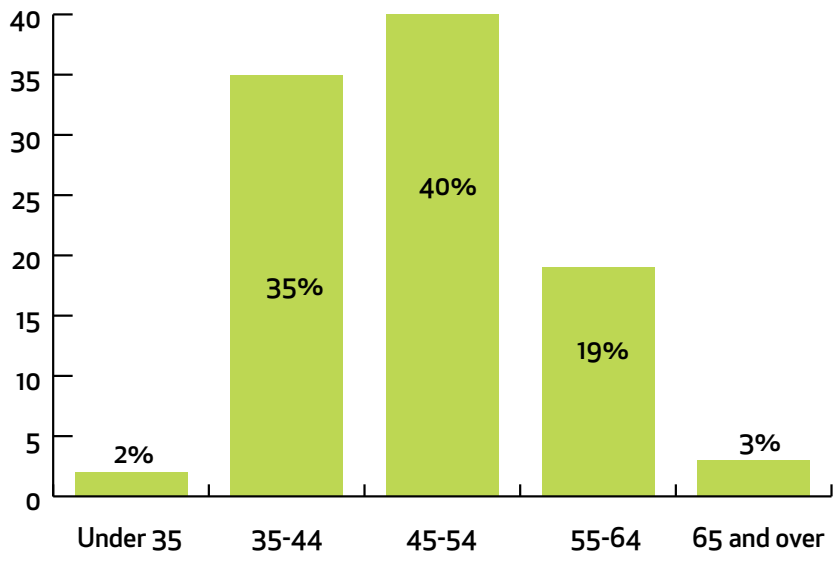
2.1.9 Age Profile of Consultants/Specialists

Of the specialists actively working in Paediatrics and registered with the IMC in 2015, 2% were under the age of 35, 35% were between the ages of 35 and 44, 30% were between the ages of 45 and 54 and 22% were over the age of 55 years (IMC, 2016). These data indicate that, over the next 10 years approximately 63 specialists (23% of all specialists) are likely to exit the Paediatric workforce due to retirement (Table 16; Figure 1).

Table 16 Age Group of Doctors working in Paediatrics in Ireland in 2015/16 (IMC 2016)

Area of Practise	Under 35		35-44		45-54		55-64		65 and over		Total No.
Specialist Division	%	N	%	N	%	N	%	N	%	N	
Paediatrics	2%	6	35%	99	40%	113	19%	55	3%	8	284

Figure 1 Age Profile of Specialists



2.2 PARTICIPATION OF NON-CONSULTANT HOSPITAL DOCTORS IN THE PAEDIATRIC MEDICAL WORKFORCE IN IRELAND

As with all medical specialties, Paediatrics is dependent on both NCHDs in training and not in training programmes to support service delivery. Table 17 below outlines the number of NCHDs who retained registration in 2015 and worked in Ireland in Paediatrics in the previous 12 months. Of these 550 doctors, 154 were on the Trainee Specialist Register, 375 were on the General Register and 14 were on the supervised register (IMC, 2016).

Table 17 Medical Council 2016 Registrations for Paediatrics

Division Registered	N	%
General registration - Paediatrics	375	68%
General registration – Paediatric Cardiology	7	1%
Trainee registration	154	28%
Supervised registration	14	3%
Total	**550**	**100%**

Of the total number of doctors working in Paediatrics (including specialists), 48% of were on the paediatric general and supervised divisions of the register. This highlights the high dependence in Ireland on non-training NCHDs to support the delivery of paediatric services. This has the potential to impede quality of care and ultimately patient outcomes.

As doctors with specialist registration in Paediatrics will almost certainly be working as consultants, we can extrapolate that the 48% on the general/supervised division are most likely employed as NCHDs, working alongside specialist trainees in public hospitals. There are no trainees in Paediatrics in the private sector.

2.2.1 Specialist Trainees Numbers and Future Entrants in to the Specialist Workforce

Basic Specialist Training (BST) in General Paediatrics is a two year programme, completed in SHO posts. On successful completion of BST, a trainee may apply for Higher Specialist Training (HST). HST in General Paediatrics is a five-year programme completed in Specialist Registrar (SpR) posts. Both BST and HST programmes are delivered by the Faculty of Paediatrics in the Royal College of Physicians of Ireland (RCPI).

Completion of the HST programme is necessary for a paediatrician to register on the specialist division of the Medical Council's Register. The programme incorporates the following core elements:

- At least two years in acute General Paediatrics, in inpatient and outpatient settings, with general on-call not less than one-in-six;
- 12 months in General Paediatrics, including 3 months of Community Paediatrics;
- 12 months continuous experience in neonatal intensive care;
- Experience in assessment and treatment of children in EDs;
- Experience in large teaching hospitals with academic activity; and,
- At least one year in a subspecialty, the preferred option being training in a number of subspecialties.

While the Medical Council Specialist Register recognises 3 specialties in Paediatrics (General Paediatrics, Neonatology and Paediatric Cardiology) there is only one recognised training programme, and this is in General Paediatrics. As can be seen from Table 18 below, the 2016 intake in to IST 1 (BST, year 1) was 40 trainees, while in year 2 the intake was 37.

Table 18 Initial Specialist Training 2016-2017: Distribution of posts by year of training (HSE NDTP, 2017).

	IST 1	IST 2	IST 3	IST 4	IST 5	Totals
Paediatrics	40	37	-	-	-	77

The average intake into HST in the years up to, and including 2013, was 15. The approved intake was increased to 30 in 2014, 22 in 2015 and 25 in 2016, following consultation with the National Clinical Care Programme and the National Paediatric Hospital (NPH) project team (Table 19). Both groups informed the HSE that the future plans for paediatric care were based on a consultant-delivered service and extended consultant presence in the hospital

outside core hours. There was also a recognition of the low consultant numbers in the Irish health system compared to international benchmarks, and a marked feminisation of the trainee cohort (75% of higher specialist trainees are female).

Table 19 Higher Specialist Training 2016-2017: Distribution of posts by year of training (HSE NDTP, 2017).

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Total
Paediatrics	25	22	31	20	17	-	115

Table 20 below outlines the gender distribution of the July 2016 intake of initial specialist trainees by specialty for Paediatrics.

Table 20 Gender Distribution of the Current Intake of Initial Specialist Trainees 2016/2017 (HSE NDTP, 2017).

Basic Specialist Trainees	Male		Female	
	N	%	N	%
Paediatrics	9	22	31	78

The majority of HST trainees are in clinical and lecturing posts in Ireland. There are 7 trainees in research posts currently, one partaking in flexible training, and the remaining trainees (22) are in research and training posts abroad (Table 21).

Table 21 Location of Trainees (HSE NDTP, 2017).

	Clinical / Lecturer Post in Ireland	Research Post in Ireland	HSE Scholar/ Fellowship Abroad	Clinical Post Abroad	Research Abroad	Flexible Training	Total
Paediatrics	85	7	-	6	16	1	115

Based on trainees currently in the training system, it is estimated that the annual number of doctors exiting training with specialist registration with the Medical Council in future years will be as per Table 22 below. The final numbers are dependent on external factors, such as doctors taking time out of training for various reasons, such as:

- Clinical training abroad;
- Research in Ireland or abroad; or,
- Clinical experience in Ireland.

Table 22 Estimated Output of Newly Qualified Specialists from Higher Specialist Training

Year	2016	2017	2018	2019	2220	2221
Estimated output (Total)	13	16	22	32	22	25*
Female	7	12	19	23	18	
Male	6	4	3	9	4	

An analysis of the number of doctors in HST training currently infers that a maximum of 25 and a minimum of 13 trainees annually will complete their training and be eligible for specialist registration over the next 5-6 years (HSE NDTP, 2017).

2.2.2 NCHDs Not in Training Posts

Total Number of Non-Training NCHDs in the Paediatric Workforce: Of the NCHDs who retained registration, 382 were on the General Register of the IMC (IMC, 2016; Table 23).

Table 23 Number of Non-Training NCHDs	
	Total Number
General Register (including Paediatric Cardiology)	382

Total Number of Non-Training NCHDs in the Publicly-Funded Paediatric Workforce: Data from NDTP's National Employment Record infers that there are approximately 207 non-training NCHDs working in Paediatrics. Of these non-training NCHDs approximately 131 are Registrars and 76 are SHOs (Table 24). There is a discrepancy between the IMC and NER data, with approximately 166 doctors unaccounted for (207 in publicly-funded hospitals plus 9 in private hospitals). The reason for this discrepancy is not clear.

Table 24 Non-Training NCHDs Working in the Publicly-Funded Sector	
Grade	N
SHO	76
Registrar	131
Total	**207**

Total Number of Non-Training NCHDs in the Privately Funded Workforce: Data from the IMC (2016) infers a total of 9 NCHDs in non-training posts were working exclusively in the private sector in 2015/16 (Table 25).

Table 25 Breakdown of NCHDs Practicing in Paediatrics in the Previous 12 Months in the Private Sector Only	
	General Division
Professionally active in past 12 months	9

2.2.3 Gender and Working Patterns of NCHDs

According to the IMC (2016), 59% of all NCHDs registered in 2015 and practicing in Paediatrics in Ireland in the previous 12 months were female. 72% of trainee doctors were female while 56% of doctors on the general register and 14% of doctors on the supervised division of the register were female (Table 26).

Table 26 Medical Council Registrations for Paediatrics: Gender					
Division of IMC Register	Female		Male		Total
	%	N	%	N	N
General	56%	213.92	44%	168.08	382
Trainee	72%	110.88	28%	43.12	154
Supervised	14%	1.96	86%	12.04	14
Total	59%	327	41%	223	550

Eighty six percent of doctors on the general register worked on a full-time basis and almost all trainees and all doctors on the supervised register worked on a full-time basis (Table 27).

Table 27 Working Patterns of NCHDs		
	Working Fulltime N (%)	Working Less Than Full Time N (%)
General Registration	327 (86%)	55 (14%)
Supervised Registration	14 (100%)	-
Trainee Specialist Registration	153 (99%)	1 (1%)
~~G~~ Grand Total and Total	**494 (90%)**	**56 (10%)**

Table 28 NCHDs Working in Ireland and Country of Basic Medical Qualification in 2015 (IMC, 2016)			
Paediatrics	**Graduated in an Irish Medical School**	**Graduated in a Medical School Outside Ireland**	**Total**
General Division	143(37%)	247 (63%)	390 (100%)
Trainee Division	134 (87%)	20 (13%)	154 (100%)
Totals	277 (51%)	267 (49%)	544 (100%)

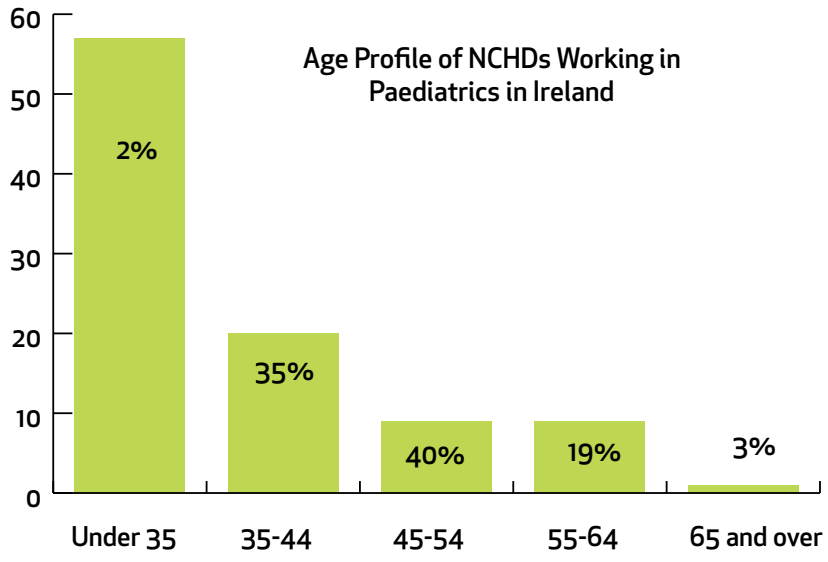
2.2.5 Age Profile of NCHDs

Of the 543 NCHDs actively working in Paediatrics in 2015/16 and on the General Division of the IMC register 44% were under the age of 35, 24% were between the ages of 35 and 44, 17% were between the ages of 45 and 54 and 15% were over the age of 55 years (Table 29). These data indicate that over the next 10 years approximately 56 paediatric doctors on the General Division are likely to exit the workforce due to retirement. Trainees and other NCHDs are younger and are unlikely to be retiring in the next 10 years (as in Table 30 and Figure 2).

Table 29 Age Profile of NCHDs Working in Ireland in 2015 by Registration Type (IMC, 2016)						
	Under 35	**35-44**	**45-54**	**55-64**	**65 and over**	**Total No.**
General Division	44%	24%	17%	13%	2%	375
Trainee Specialist Division	86%	13%	1%	-	-	154
Supervised Division	93%	7%	-	-	-	14

Table 30 Age Profile of NCHDs Working in Ireland – Total (IMC, 2016)						
	Under 35	**35-44**	**45-54**	**55-64**	**65 and over**	**Total No.**
N	310	111	65	49	8	543
%	57%	20%	9%	9%	1%	100%

Figure 2 Age Profile of NCHDs



2.3 Ratio of NCHDs to Consultants

As per Table 31 below, the ratio of NCHDs to consultants is approximately 2:1 with much higher ratios, up to 5:1, in some of the regional and local paediatric units around the country. Also of note is that the ratio of trainees to consultants is approximately 1:1.

Table 31 Ratios of NCHDs : Consultant Ratios in Publicly-Funded Services

Total NCHD Posts	N	NCHD : Consultant
Total Training	212	1:1
Non-training posts	207	1:1
Total NCHDs	419	2:1

2.4 Summary Workforce Numbers

Data from sources including the Medical Council, the HSE NDTP, HSE WPAI and the Faculty of Paediatrics at the Royal College of Physicians are used to inform the configuration of the Paediatric specialist workforce for planning purposes. These data are broken down as per Table 32 below.

Table 32 Summary Workforce Data for Use in Workforce Planning

Variable	Value	Source
Number of publicly-funded consultants excluding those on career break	194	HSE WPAI 2017. Accounts for non-permanent as well as permanent employees
WTE number of public consultants on the HSE payroll, excluding career break	161	HSE WPAI 2017. Accounts for non-permanent employees as well as permanent employees
Number of private consultants	10	IMC, 2016
Share of females in employment stock	52%	HSE WPAI End 2016. Accounts for non-permanent employees as well as permanent employees.
Share of males in employment stock	48%	HSE WPAI End 2016. Accounts for non-permanent employees as well as permanent employees
Share of part-time consultants	31%	HSE WPAI Nov 2016. Accounts for non-permanent employees as well as permanent employees
Share of females working part-time	48%	HSE WPAI Nov 2015. Accounts for non-permanent employees as well as permanent employees
Share of males working part-time	21%	HSE WPAI Nov 2015. Accounts for non-permanent employees as well as permanent employees
Overall WTE rate	.83	HSE WPAI Nov 2016. Accounts for non-permanent employees as well as permanent employees
M:.49 F:.44	WPAI 2016 – derived	
Part-time WTE adjustment rate	Overall: .48	
Annual retirement from public stock	6	IMC (2016) approximately 63 in total to 2027
Permanent status of the consultant contract	82%	WPAI (2016)
Intake into specialist training	25	HSE NDTP, 2017
Specialists with BMQ in Ireland	61%	IMC (2016)

Projected graduates from specialist training (headcount)	13-30	As advised by RCPI

3 CURRENT AND FUTURE DRIVERS OF DEMAND FOR PAEDIATRIC MEDICAL CARE

The information contained within this section of the report is derived from on-going communications and documentary submissions from both the NCPPN and the Children's Hospital Group.

3.1 NUMBER OF CHILDREN AND UTILISATION OF SERVICES

As already mentioned in Section 2 above, the number of children in Ireland under the age of sixteen today is estimated to be around 1.1 million. Furthermore, Ireland has one of the highest birth rates in the EU with an estimated 13.7 births/1,000 population in 2016 (CSO, 2017). While population projections indicate an overall reduction in the child population of around 53,000 over the next 10 years (from 1,108148 to 1,055181 in 2026), the demand for paediatric medical care is expected to increase. This is due to, among other things, increasing survival of extreme prematurity, the survival rates and number of children born with congenital diseases, and the rising incidence of chronic disease. Children with complex medical problems are now living longer and require on-going complex paediatric care.

Despite a fairly static paediatric population over the next 10 years, children's healthcare needs are becoming increasingly complex and are changing due to lifestyle and epidemiological factors, among other things. This, alongside the need to reconfigure the delivery of the specialty and address unmet patient need, is driving the increasing demand for specialists over the next decade and beyond.

3.2 NEW MODEL OF CARE FOR PAEDIATRIC SERVICES IN IRELAND

The new national model of care for Paediatrics and Neonatology was developed by the NCPPN in 2016. The model of care describes the future developments required over the medium to longer-term to develop the specialty of Paediatrics and Neonatology so that care of children and neonates is aligned with international best practice models (across each medical subspecialty). The model incorporates the development of the NPH as well as the development of local and regional services. The information outlined below relating to the new model of care and the NPH was submitted to NDTP by the NCPPN and the Children's Hospital Group over the course of 2015/2016.

The National Paediatric Hospital (NPH): The development of the NPH will involve the amalgamation of the three existing children's hospitals at Temple Street, Crumlin and Tallaght. Wider developments in paediatric services will see the development of an integrated national network for paediatric health services, with the NPH at the centre as the 'hub' and the regional and local paediatric units as the 'spokes' that link to each other and to the NPH (Figure 3). The planned NPH, is designed to be a world-class facility on a campus shared with St. James's Hospital, Dublin, supported by two satellite centres delivering Paediatric OPD and Urgent Care services to be situated alongside Tallaght Hospital on the south side of Dublin, and Connolly Hospital on the north side. The NPH will look after children and young people from all over Ireland who have complicated and serious illnesses and who are in need of specialist and complex care. It will also be the local hospital for the counties of Dublin, Wicklow, Kildare and parts of Meath. There will be 39 different specialities in this hospital.

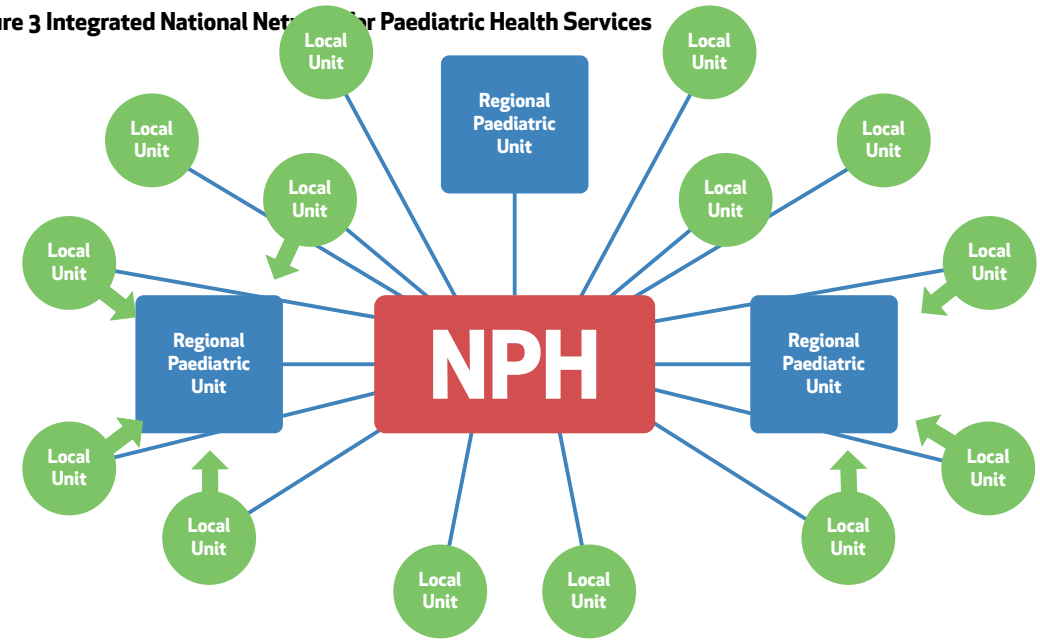
The hospital and its two satellite centres will provide secondary paediatric services, both emergency and planned, for children and young people from the greater Dublin area. The majority of these patients will be treated and discharged on the same day (i.e. without being admitted).

Local and Regional Paediatric Units: The new model of care states that all hospitals providing services for children will have clear guidelines related to what can be treated locally and what conditions need to be transferred to larger

regional or tertiary centres. A seamless integrated network of care from primary to secondary to tertiary care will be developed with the strengthening of local and regional paediatric centres including:

i. Agreed national clinical guidelines implemented across the paediatric healthcare system;
ii. Outreach from the tertiary centre to regional centres, with close working relationships and combined clinics with the local team;
iii. Outreach from regional centres to local centres within the same hospital group;
iv. Organisation of care for children with epilepsy, cystic fibrosis and type 1 diabetes on a regional basis based on the new group structure with integrated care pathway; and,
v. Sharing the new children's unit brand across the network, and ensuring comparable infrastructure and facilities are available in all units nationally.

Figure 3 Integrated National Net[illegible]r Paediatric Health Services



Key features of the new national model of care will be:

- An integrated national clinical network, based on a 'hub and spoke' model for specialist paediatric services to minimise geographical variation in care and ensure care delivered in the appropriate setting as close to home as possible;
- Outreach services from tertiary to regional units, and from regional to local units;
- Clear standards for local, regional and tertiary neonatal and paediatric units;
- Improved interface between primary, secondary and tertiary care, including the development of integrated care pathways;
- Increased levels of consultant-delivered care;
- A central role for General Paediatrics, which will require increased numbers of general paediatricians and/or general paediatricians with a special interest;
- Improved emergency and urgent care services with the introduction of short stay observation/clinical decision units and 'rapid access' general paediatric outpatient clinics;
- Expanded numbers of general paediatricians with an interest in community child health to develop child protection and disability services;
- Further development of paediatric and neonatal transport services, with the extension of paediatric retrieval to a 24/7 service and the introduction of a neonatal retro transfer service;
- Increased numbers of neonatal and paediatric nurses, community children's nurses, clinical nurse specialists, advanced nurse practitioners, and health and social care professionals;
- Enhanced roles for clinical nurse specialists, advanced nurse practitioners, and health and social care professionals in the delivery of specialised care and nurse- and therapy-led clinics;

- Development of agreed national clinical guidelines and algorithms; and,
- An emphasis on data collection and audit for benchmarking performance and participation in continuous quality improvement.

3.3 EPIDEMIOLOGY AND LIFESTYLE

Among the main drivers of future demand for Paediatric and Neonatology specialists in Ireland are increasing premature births, rising obesity rates and changing trends in immunodeficiency, allergy and infectious diseases.

Premature Births: The increasing rate of survival of premature babies is a significant driver of demand for Paediatric specialists over the next 10 years. Babies born prematurely have higher rates of cerebral palsy, sensory deficits, learning disabilities and respiratory illnesses compared with children born at term. Babies born under 26 weeks gestation may have long-term disabilities such as chronic lung disease, deafness, blindness and neurodevelopmental problems. Extremely premature babies require complex neonatal care and tend to require on-going paediatric care throughout childhood.

Obesity: Within the paediatric age-group, there has been a notable increase in those considered to be overweight. The Growing Up in Ireland Study (GUI, 2011) showed that almost 20% of nine-year-olds were overweight in 2011 and a further 7% were obese. The childhood obesity treatment programme at Temple Street Children's University Hospital in Dublin experienced a 400% increase in just one year in referrals of children under five years of age. Type 2 diabetes is linked to obesity and has increased dramatically in children and adolescents in Ireland in recent years.

Allergy: In Ireland, there has been a dramatic increase in the incidence of allergic disease in recent years, with up to 40% of children today experiencing atopy/allergy. At the same time, allergy related specialist services are markedly undeveloped.

Infectious Disease linked to Migration: Changing migration patterns into Ireland have impacted on the Infectious Diseases arena. New relaxation of border restrictions may have unintended infectious disease impact as outbreaks of previously controlled infectious diseases such as measles and rubella have been associated with such migration. Tuberculosis has also been on the increase, a development directly related to changing patterns of migration.

3.4 UNMET DEMAND IN PAEDIATRIC SERVICES

It is recognised that there is an undersupply of paediatric medical specialists across the country, with an increased need for generalists (with additional training in a subspecialty area) in order to more effectively manage the paediatric caseload. It is also argued that unmet demand for services may be leading to late presentation of patients to the services with a consequent increase in complexity of illness. Inability to meet established standards for access, throughput and turnaround are increasing waiting times for inpatient, outpatient and day case services, leading to a need for more intensive treatments which could have otherwse been avoided i.e. with timely access to services. Unmet demand for specialist services is evidenced by the following:

Waiting Times: Approximately 6,000 children were waiting for a paediatric specialty outpatient appointment over the 20 week target in 2014. A further 223 children were waiting for a day case appointment and there were 648 patients on paediatric specialty-related elective inpatient waiting lists (HSE Business Intelligence Unit, 2014).

Examples of overly long waiting times can be seen in:

- Paediatric Dermatology, where appointments in the tertiary hospitals are greater than 18 months.
- Large centres delivering diabetes care, which are unable to provide appointments every 3 months as recommended in the Diabetes Expert Advisory Group report due to insufficient staff, and in which many services were led by consultants with no fellowship training in Paediatric Diabetes. Centres with consultants trained specifically in Paediatric Diabetes and Endocrinology had significantly better patient outcomes as reflected in glycated haemoglobin levels.

Consultant Rostering Challenges: The shortage of specialists in the paediatric health care system is further highlighted through difficulties in staffing paediatric rosters. Throughout services, particularly those in peripheral hospitals, many paediatric rosters are 1-in-3 on-call rosters where a 1-in-6 on-call would be considered preferable.

Non-Consultant Hospital Doctors are increasingly being depended on to meet rostering requirements.

Many peripheral hospitals are staffed by only 3 to 4 consultants, some of whom will have a 50% Commitment to Community Child Health. Furthermore, some of these hospitals will have co-located obstetric units requiring further consultant paediatric cover. This small number of consultants in peripheral units is often required to provide 24/7/365 care for acute paediatric and neonatology patients, in addition to their elective care requirements. This leads to a heavy burden of work on the consultant, a level of unmet demand for consultant care and a parallel overreliance on locum cover.

Overdependence on NCHDs for the Delivery of Services: The national policy for hospital care is for a more consultant-delivered service, so that patients are first seen where possible by a fully trained doctor, i.e. a consultant. However, nationally the speciality of Paediatrics has a high level of dependency on NCHDs to deliver care. The Paediatric NCHD workforce is made up of around 50% training and 50% non-training NCHDs and the ratio of NCHDs to consultants nationally is approximately 2:1. This ratio is high when compared to other countries. It is also high when compared to other medical specialties in Ireland.

The ratio of NCHDs to consultants is higher in many of the peripheral hospitals where rostering commitments are often supported by these doctors and where there are difficulties filling vacant consultant and NCHD posts. The ratio of NCHDs to consultants in Waterford, for example, is 5.3:1. The National Clinical Programme for Paediatrics and Neonatology recommends rebalancing these ratios so that the number of NCHDs to consultants is much closer to 1:1 and so that the vast majority of NCHDs are participating in national training programmes.

The difficulties experienced in staffing consultant rosters adequately, as well as the high ratio of NCHDs to consultants, highlights the fact that there is a current unmet demand for paediatric consultants, in particular outside of Dublin. Further to this, difficulties in recruiting NCHDs in smaller units means recruitment of locum doctors is necessary to ensure compliance with the European Working Time Directive (EWTD) and to maintain service provision. Locum recruitment is costly due to the higher costs incurred. In addition, the quality and skills of locum doctors is variable and has implications for patient safety.

3.5 THE INTRODUCTION OF AN EXTENDED CONSULTANT PRESENCE

The new model of care proposes that General Paediatric services, regardless of whether they are located in the National Children's Hospital or in regional or local units outside Dublin, should incorporate more consultant-provided care and an extended consultant presence outside of core hours. The principles underpinning extended consultant presence for the specialty of Paediatrics, specifically General Paediatrics, have been agreed by the NCPPN and the HSE.

An extended General Paediatrics model of care with more consultant-provided care, proposes the following:

- An active consultant presence from 8pm/10pm, 7 days a week, 365 days a year;
- A team and paediatrician/neonatologist of the week model;
- Early contact with a senior decision maker. Most children seen at point of admission (many seen and discharged in acute settings) and all seen within 8-10 hours of admission;
- Regular patient review i.e. 2 reviews per day when admitted;
- An adequate number of consultants to staff rosters at paediatric units and to provide flexibility;
- Support to part-time workers to maximise and maintain the workforce;
- Adequate trainee numbers, rosters and training opportunities with an ultimate consultant to trainee ratio of 1:1;
- The development of supporting roles for nurses and physician assistants;
- A consultant-supervised handover, consultations and communications; and,
- Increased ambulatory care through the use of short or intermediate stay units – 6-12 hour units.

The potential benefits of such a model include:

- Enhanced safety, quality of care and patient experience;

- Significant reduction in acute overnight admissions – estimated at 25-33%;
- Decreased length of stay – estimated at 25%;
- Reduction in investigations (laboratory, radiology etc) leading to reduction in costs;
- Reduction in outpatient appointments for follow-up;
- Consultant capacity to develop special interests for non-acute care (e.g. Community Paediatrics, Neurodisability, Child Protection, Neonatology, Endocrine/Diabetes, CF, Asthma/Allergy, Adolescent, Epilepsy, Oncology, Obesity, Palliative) and partner with tertiary units for research and local service provision; and,
- Improved staff satisfaction.

4 STAKEHOLDER PERSPECTIVES ON THE FUTURE DEMAND FOR PAEDIATRICS AND NEONATOLOGY SPECIALISTS/ CONSULTANTS IN IRELAND

The information contained in this section of the report is based on communication and submissions from both the NCPPN and the Children's Hospital Group regarding the future demand for paediatric specialists to deliver the new model of care for the specialty, including specialists required to resource the NPH. Specialities requiring significant increases in numbers include General Paediatrics, Community Child Health (CCH) and Neonatology. This information was gathered through research and collaboration on the development of more detailed workforce planning projections and a planned in-depth workforce planning report for the specialty.

4.1 NATIONAL CLINICAL PROGRAMME FOR PAEDIATRICS AND NEONATOLOGY PERSPECTIVES ON FUTURE DEMAND FOR PAEDIATRIC AND NEONATOLOGY SPECIALISTS/CONSULTANTS IN IRELAND

The new model of care proposes that there be an increase in the number of specialists trained in General Paediatrics working within the paediatric health care system, with a parallel decrease in the number of tertiary specialists working in the system, specifically in hospitals outside of Dublin. More general paediatricians will be located in peripheral and regional hospitals where they can focus on the delivery of care to patients who require secondary level specialist treatment. Any patient requiring more complex care would be referred or transferred to the National Paediatric Hospital. Those doctors with more focused specialist training would be located in the National Paediatric Hospital, with a smaller proportion located in regional hospitals.

The model of care proposes that general paediatric services, regardless of whether they are located in the NPH or in regional or local units outside Dublin, should incorporate more consultant-provided care and an extended consultant presence outside of core hours. An extended consultant service will be piloted in University Hospital Waterford where the ratio of NCHDs to consultants is currently 5:1 with 3 consultants and 16 NCHDs. The impact of extended consultant presence, if applied according to agreed principles, should result in a reduced reliance on non-training NCHDs, an increased consultant to NCHD staffing ratio and better patient outcomes.

The model of care currently considers the demand for general paediatricians based on an extended consultant presence in the NPH only. The NCPPN do however recognise the need for an extended consultant presence across regional and local units also, in order to reduce the high dependence on NCHDs to deliver care.

Overall, the number of specialists in Paediatrics and Neonatology required to deliver the new model of care equates to a total of 394 WTEs to ensure appropriate model of care implementation nationally. The breakdown of specialists required is outlined in Table 33 below.

Table 33 Number of WTE Specialists to Deliver the NCPPN Model of Care

Specialty	WTEs Required
Allergy/immunology and ID	11
Cardiology	12
Community Child Health	65
Dermatology	10
Paediatric Emergency Medicine	35
Endocrinology	18.7
Gastroenterology	7
Oncology	8
Metabolic Medicine	6
Neonatology	42
Nephrology	8
Palliative Care	3.2
Respiratory	18.5
Rheumatology	6
General Paediatrics	133.5
Specialist Rehabilitation	1.2
Neurology	9
Total	**394**

4.2 CHILDREN'S HOSPITAL GROUP PERSPECTIVE ON FUTURE DEMAND FOR PAEDIATRIC AND NEONATOLOGY SPECIALISTS TO RESOURCE THE NPH

The Children's Hospital Group commissioned a review of the workforce requirements to resource the National Paediatric Hospital (NPH) in 2016. The NPH is also referred to as the new children's hospital in 2016. The review included an outline of the staffing requirements for all health professionals, including paediatric and other specialists,

as well as NCHDs. In relation to the Paediatric and Neonatology specialist workforce (i.e. those specialists trained at HST level in Paediatrics), in order to resource the NPH it is estimated at this point in time that 191 WTE specialists will be required.

5 A COMPARATIVE ANALYSIS OF THE PAEDIATRIC AND NEONATOLOGY WORKFORCE IN IRELAND, THE UK AND AUSTRALIA

5.1 IRELAND

Ireland's actual ratio of Paediatric and Neonatology specialists per 100,000 of the population was calculated using WPAI data of 194 HC and private sector data of 10 HC, giving a total of 204 HC. Using the CSO population estimate for 2016 of 4.7 million, this equates to an actual ratio of 4.3: 100,000 population (Table 34).

The NCPPC recommends that Ireland should increase the number of specialists to 394 WTEs, as per estimated workforce requirements, to underpin the new model of care. At a WTE rate of 0.83, this equates to a HC of approximately 474. If we take it that this increase is planned over a ten year period, then in 2027, this would equate to a ratio of approximately 9.3: 100,000(Table 34).

Table 34 Actual & Recommended Ratio per 100,000 - Ireland

	Actual	Recommended (2027)
Ratios – Ireland	4.3: 100,000 (HC)	9.3:100,000 (HC)

5.2 UNITED KINGDOM

Between 2013 and 2015, the UK paediatric consultant workforce grew from 3,718 to 3,996, a rise of 7.5%. At least 752 WTE extra consultants are required to meet the Royal College of Paediatrics and Child Health standards set out in a series of reports on the future development of the specialty (RCPCH, 2017).

The Office for National Statistics estimates the 2016 population of the United Kingdom to be 65.56 million. Taking the participation rate to be 0.94, the recommended number of consultants in terms of headcount is 4,920, while the approximate actual number of consultants as per 2015 is 4255. This gives a recommended ratio for the United Kingdom of 7.7 consultants per 100,000 population. The estimates in Table 35 below are based on data available to NDTP at the time of writing this report.

Table 35 Actual & Recommended Ratio per 100,000 – United Kingdom

	Actual	Recommended
Paediatrics	6.5: 100,000 (HC)	7.7: 100,000 (HC)

5.3 AUSTRALIA

The Australian Institute of Health and Welfare 2014 estimated that there were 1,578 specialists working in Paediatric Medicine in 2012 (whereby Paediatrics was their main specialism). This equates to a ratio of 7.0 per 100,000 of the population for 2012 (the population of Australia in 2012 was 22.68 million). The Australian Institute of Health and Welfare (2014) list 1,283 specialists in General Paediatrics and 295 in 'other Paediatrics', which includes Clinical Genetics, Community Child Health, Neonatal and Perinatal Medicine, Paediatric Cardiology, Paediatric Emergency Medicine, Paediatric Endocrinology, Paediatric Gastroenterology and Hepatology, Paediatric Haematology, Paediatric Immunology and Allergy, Paediatric Infectious Diseases, Paediatric Medical Oncology, Paediatric Nephrology, Paediatric Neurology, Paediatric Rehabilitation Medicine, Paediatric Respiratory and Sleep Medicine, Paediatric Rheumatology, and specialist paediatrician. Table 36 below represents estimates based on data available

to NDTP at the time of writing this report. The authors are unaware of a recommended ratio at this point in time.

Table 36 Actual & Recommended Ratio per 100,000 - Australia

	Actual	Recommended
Paediatrics and Neonatology	7: 100,000 (HC)	-

6 SUMMARY

Below is a summary of the data presented in Sections 2 to 4 above.

6.1 CURRENT PAEDIATRIC AND NEONATOLOGY WORKFORCE

- HSE Approved Consultant Posts: in the public health system there were 191 approved posts.
- There were 194 consultants (161 WTEs) in Paediatrics and Neonatology employed in publicly-funded services.
- A total of 10 doctors were actively working in the private sector in Paediatrics and Neonatology in 2015 and on the Specialist Register of the Medical Council.
- There were 284 specialists on the Specialist Register in 2015 who were actively participating in the Paediatric and Neonatology workforce.

6.2 PARTICIPATION OF CONSULTANTS/SPECIALISTS AND NCHDS IN THE MEDICAL WORKFORCE IN IRELAND

- Permanent/Temporary Status of Consultant Contract: In HSE-funded services, 82% held a permanent contract, while the remaining 18% held non-permanent contracts.
- Working Patterns: For specialists, 69% were working on a full-time basis, while approximately 90% of NCHDs worked full-time.
- Gender: For specialists, 48% were male and 52% were female, while for NCHDs 72% of trainees were female. The total percentage females in the NCHD workforce was 59%.
- Age: Of the specialists actively working in Paediatrics and registered with the IMC in 2015, 2% were under the age of 35, 35% were between the ages of 35 and 44, 30% were between the ages of 45 and 54 and 22% were over the age of 55 years (IMC, 2016). These data indicate that, over the next 10 years approximately 63 specialists (23% of all specialists) are likely to exit the Paediatric workforce due to retirement. For NCHDs, the majority (77%) were between the ages of 35 and 44, 9% were between the ages of 45 and 54 and 10% were over the age of 55 years and therefore expected to retire from the workforce over the next 10 years.
- Country of BMQ: Of the 284 specialists registered with the IMC and working in Paediatrics in Ireland in 2015/16, 61% received their basic medical qualification from a university in Ireland, while 39% received their BMQ from a university outside of Ireland. These figures reflect a high dependency in the specialty of Paediatrics on international medical graduates. A total of 49% of all NCHDs working in Paediatrics received their basic medical qualification from a medical school outside of Ireland. Approximately 13% of higher specialist trainees in Paediatrics qualified from a non-Irish medical school.
- Private Practice: 10 specialist registered doctors were working exclusively in the private sector.
- Expected Training Programme Exits: An analysis of the number of doctors in HST training currently infers that between 13 and 25 trainees annually will complete their training and be eligible for specialist registration over the next 5-6 years.

6.3 KEY DRIVERS OF CHANGE TO PAEDIATRIC AND NEONATOLOGY MEDICAL WORKFORCE

A number of factors that may influence future workforce supply and demand:

- An increasing number of children accessing paediatric and neonatology services due to, among other things, increasing survival of extreme prematurity, the survival rates and number of number of children born with congenital diseases and the rising incidence of chronic disease. Children with complex medical problems are now living longer and require on-going complex paediatric care.
- New model of care for paediatric and neonatology services in Ireland to include the development of the National Paediatric Hospital will involve a reconfiguration of services to form an integrated national clinical network, based on a 'hub and spoke' model for specialist paediatric services. This will minimise geographical variation in care and ensure care is delivered in the appropriate setting as close to home as possible. There will be an improved interface between primary, secondary and tertiary care, including

the development of integrated care pathways and increased levels of consultant-delivered care.

- Epidemiology and lifestyle trends such as increasing premature births, rising obesity rates and changing trends in immunodeficiency, allergy and infectious diseases.
- Current levels of unmet demand in Paediatric services due to the undersupply of specialists and leading to long waiting lists and onerous roster arrangements.
- Introduction of an extended consultant presence on the clinical floor to improve access to senior decision makers, and to improve efficiency and standards of medical care.

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