



THE MATER
HOSPITAL

Annual Report



2020

Working in partnership with



Contents

CEO INTRODUCTION	6
Executive, Governance and Highlights of the Year	8
The Mater and Covid-19.....	19
Delivering Quality Care.....	31
Clinical Services.....	50
Research	103
Finance	146

CEO INTRODUCTION

2020 has been one of the most challenging years in our 159-year history as we prepared for and responded to the Covid-19 pandemic.

As one of the leading hospitals and academic centres in the country, much was asked of our people over the course of 2020, and they delivered. They adapted, remained agile, and always put the care and safety of our patients, their families and their colleagues at the core of everything they did.

In this Annual Report you will find highlights and the substantive achievements that are due to the collective actions of our teams. While some accomplishments can be quantified, it is the many daily acts of compassion and kindness that contributed to positive outcomes for our patients and the living of the Mater values through our everyday actions. The standouts for me are the

- ▶ Way the Mater pulled together to take on the challenge of the Covid-19 pandemic
- ▶ The response of our Critical Care Service in a national emergency

- ▶ The high levels of innovation and change that were incorporated during the year as we strove to meet the needs of our patients
- ▶ The response of our research colleagues in developing new preventative and treatment options for Covid-19

Our services at the Mater adapted to reflect the reality of the global pandemic, including increased services being offered online. There were long hours and stressful times, but above all else there has been a unified effort to serve our community. We may never be able to quantify the full impact of our Covid-

19 response, but we know that lives have been saved because of it. I would like to thank all our staff, whose dedication to patient care really shone through in 2020.

Finally, in April, we lost our esteemed chair and friend Thomas Lynch. Tom joined the Mater board in 2012 and took over as chair in 2015. He brought passion

for health equality and a deep conviction in the role of higher education in healthcare to his role as chair of the hospital and then as chair of the Ireland East Hospital Group. We will miss his counsel and wisdom.

Alan Sharp
Chief Executive





Executive, Governance and Highlights of the Year

Executive, governance and highlights of the year

The Mater Misericordiae University Hospital is a level 4 teaching hospital based in Dublin's north inner city

The hospital was opened in 1861 by the Sisters of Mercy and is part of the Ireland East Hospital Group and provides a range of frontline and specialist services on a regional and national level.

The Mater is a major cardiac centre, including the national heart and lung transplantation centre and the national centre for congenital heart disease, is home to the national spinal unit, as well as being one of the eight nationally designated cancer centres. The hospital is also a major centre for ophthalmology, intensive care medicine and is the national centre for rare diseases. The Mater's enduring partnership with University College Dublin, has enabled the hospital to become one of the largest academic medical centres in the country, with an international reputation for producing high quality research that delivers a meaningful difference to patient care. Our strong

partnership with UCD also enables us to deliver undergraduate and postgraduate education to hundreds of healthcare professionals including nurses, doctors, clinical therapists, radiographers and many more.

Mission, vision, values and priorities

Our mission at the Mater Misericordiae University Hospital is *to care for the sick with compassion and professionalism at all times, to respect the dignity of human life, and to promote excellence, quality and accountability through all our activities.*

Our vision

To be a leader in innovation of specialist services and healthcare transformation with a strong academic and research agenda, demonstrating consistent efficiencies and quality care improvements and delivering excellence in care as perceived by our patients.

Our values

- ▶ Excellent reputation
- ▶ Competent and motivated staff
- ▶ Education, training and research
- ▶ Clinical excellence
- ▶ Positive patient experience
- ▶ Financial accountability
- ▶ Partnership
- ▶ Strategic planning and development

Our strategic goals



In Memory

Thomas Lynch

Tom was an integral part of the emerging hospital groups and appointed Chair of the Ireland East Hospital Group by the Minister for Health



On the 1st April 2020 we lost our esteemed Chair and friend Mr Thomas Lynch. Tom spent a career in biopharmaceuticals specialising in research discovery and clinical trials and was appointed Director to the Board of the Mater in 2012 and Chair of the Board in 2015. Tom was an integral part of the emerging hospital groups and was appointed chair of the Ireland East Hospital Group (IEHG) by the Minister for Health.

His knowledge and expertise led to his appointment in 2011 as chair of Molecular Medicine Ireland, now Clinical Research Development Ireland, a collaborative entity involving UCD, RCSI, University College Cork, Trinity College Dublin, and NUI Galway and their associated academic hospitals. This research partnership is designed to accelerate the translation of biomedical research into improved diagnostics and therapies for patients. He was also a member of the advisory board of the Institute for Human Virology in the US.

Tom held a deep conviction in equality and devoted his personal energy and influence to the areas of public health and higher education in healthcare. From 2008 to 2010 he was a member of an Expert Group on Resource Allocation in the Health Service. He was chair of the Dublin Academic Medical Centre from 2007, which joined the Mater, St Vincent's University Hospital and University College Dublin together to champion academic medicine in this country.

He brought his passion for these three institutions together in fighting for them to remain together when the Higgins Report was published recommending the establishment of hospital groups. The two Level 4 hospitals and UCD forming the basis of the Ireland East Hospital Group. He brought that forward with the vision to create an Academic Health Science Centre between Mater, St Vincent's and UCD.

The publication of the Sláintecare healthcare policy in July 2019 proposed six new regional integrated care organisations. While Tom embraced the plan to improve integration of community and hospital care, he advocated strongly for the retention of the hospital groups networks and the need to incorporate an academic health sciences centre model in developing structures.

He is survived by his wife Deirdre, his children Jennifer, Rebecca and Mark and his many friends.

Board of Directors

Chairman



Thomas Lynch
Chairman



David Begg
Vice Chairman

Chief Executive



Alan Sharp
Chief Executive

Executive Members



Prof Padraic MacMathuna
Chairman
Medical Executive



Prof Jim Egan
Executive Clinical
Director



Suzanne Dempsey
Director of Nursing



Brid Cosgrove
Director of Finance

Non-Executive Members



Dr Mary Carmel Burke
General Practice
Representative



Rod Ensor
Solicitor



Tony Garry
Company Director



Prof Cecily Kelleher
College Principal



Eilis O'Brien
Comms/Marketing
Director UCD



David O'Kelly
Advisory Partner
KPMG



Dr Mary McMenamin
Departmental
Lecturer, Oxford

Mater fast facts 2020

24,598
inpatients

3,500
staff

477
publications

1,467
positive Covid-19
inpatients

25
transplants
(↓53%)

1,009
Covid-19
ICU admissions

72,676
ED presentations
(↓14%)

209,477
out-patient
presentations
(↓6%)

56,779
surgical
procedures
(↓16.5%)

2020 highlights

Coronavirus was the biggest event of the year and our health service faced its greatest challenge yet, but it was not the only story of the year.

Mater Staff gather to applaud the Irish public on Thursday 9th April

During Wave 1 of the Covid-19 pandemic the staff at the Mater gathered to thank people for staying at home and helping to slow the spread of Covid-19 and the pressure on hospitals.

Frontline staff at the hospital gathered at safe physical distances at the North Circular Road entrance and clapped for two minutes at 11.00am.

Professor Sean Gaine, Consultant Respiratory Physician explained.

"We are all working extremely hard to deal with COVID-19 and to care for all patients that attend the Mater Hospital. We understand that it is difficult to stay apart from loved ones and believe that it is only right to pay tribute to the Irish public who are adhering to the public health guidelines".

Minister for Health opens new units

On 3rd December 2020 the Minister for Health Stephen Donnelly TD officially opened two new units at the Mater Hospital. These two facilities, an Acute Medical Short Stay Unit and a Hyper Acute Stroke and Medicine for the Elderly Care Unit will add an additional 34 beds to the Hospital.

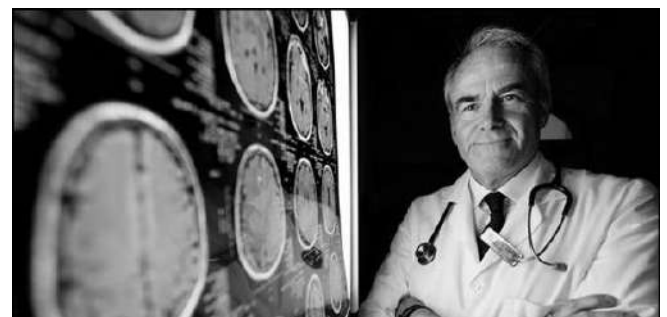
The Acute Medical Short Stay Unit comprises of 28 beds, made up of four single isolation rooms, four more single rooms, two beds specifically for elderly care and six new three-bed units. The unit provides care to patients who are very unwell with a new or long-term medical condition. Many of these patients being referred through the Mater Emergency

Department. The isolation beds enhanced the Mater's capacity to treat patients with infectious diseases such as Covid-19.

The new Hyper Acute Stroke Unit (HASU) is a new service to the Mater Hospital and provides immediate care to stroke patients in the acute phase of their care. The unit also contains a medicine for the elderly care unit which provides ongoing care and treatment for patients attending medicine of the elderly services at the hospital. Six new single bedrooms, a family room, eight clinical rooms and a treatment room all form part of the new unit.

National Covid Biobank

During 2020 Prof Tim Lynch, Chief Academic Officer (CAO) of the Ireland East Hospital Group (IEHG) and Consultant Neurologist at the Mater, along with six CAO colleagues from across the country launched a bid for a National Covid Biobank. A National Biobank would enhance our capability to study diseases in the Irish population and enable high-impact research that straddles the arenas of clinical practice and scientific research.



Prof Tim Lynch

To date over 20 countries across the EU have been successful in establishing Biobanks and creating the BBMRI_ERIC (Biobanking and BioMolecular Resources Research Infrastructure – European Research Infrastructure Consortium), the world’s largest biorepository of human samples that connects 600 biobanks across those states.

In relation to Covid-19, a National Biobank would support our clinician researchers in distinguishing asymptomatic carriers from the severely affected, those more likely to mount a meaningful response, as well as those survivors of severe Covid-19 who will develop chronic complications. It would also aid finding a cure for the virus and enable clinicians to direct scarce resources, intensive care beds and novel antiviral agents to those most in need.

In late December 2020, the Health Research Board (HRB) issued a call seeking a single application on behalf of a consortium of national partners to establish and maintain a National Covid-19 Biobank, as part of a coordinated national research response to Covid-19.

Compassion awards

At the Mater Misericordiae University Hospital, we believe that every staff member is key to providing a kind, compassionate and caring service to all patients and their families.

The Compassion Awards were set up several years ago by the CEO and the Director of Mission Effectiveness to recognise and acknowledge the great work and outstanding care provided by our staff every day in the hospital. The Compassion Awards aim to recognise staff members who demonstrate

- ▶ Dedication and effort above and beyond the call of duty
- ▶ Going the extra mile in helping patients, visitors and colleagues
- ▶ Displaying a positive, friendly, caring, courteous, and professional attitude when dealing with patients, visitors and colleagues
- ▶ Honouring the Mater Hospital’s motto “Maintain an attitude of tenderness, empathy and respect”

On Wednesday 12th February 2020 the Mater Hospital held the Compassion Awards Ceremony during lunch hour in the Freeman Auditorium. The submissions made by patients, relatives and colleagues clearly demonstrated the depth of compassion, dedication and commitment of our staff. The narratives were powerful and the task of choosing the winning submission was challenging for our external adjudication Siobhan Brady.

” This year we received a total of 510 nominations from across all disciplines within the hospital. The award ceremony took place in the Freeman Auditorium

The winning nominees were

- ▶ **1st Place** Brid Morris Consultant Ophthalmic Surgeon
- ▶ **2nd Place** Brenda Moran Medical Secretary Nephrology Service
- ▶ **3rd Place** Yvonne Gahan Lung Cancer Coordinator
- ▶ **4th Place** Alison Munroe Health Care Assistant Radiology



Group photo of Compassion Award nominees

Sláintecare integration projects

Sláintecare integration projects recommenced again in September 2020 after a five-month pause following

the redeployment of staff during the initial phase of the pandemic. Sláintecare projects and funding will now extend into 2021. The Mater is the lead organisation in three of these projects.

Project	Lead Organisation	Description
North Dublin Integrated Sexually Transmitted Infections (STI) Service	Mater Misericordiae University Hospital	The project aims to reduce demands on the acute care system by accessing populations in the community for early intervention and treatment, with the added benefits of preventing the spread of STIs. Two primary care centres in Grangegorman and Summerhill will establish walk in clinics. All patients requiring advanced care will be referred to the Mater STI clinic
Rehabilitative Palliative Care	Mater Misericordiae University Hospital	The project provides an innovative model of rehabilitative palliative care spanning hospital and community by: <ul style="list-style-type: none"> ▶ Integrating rehabilitation and enablement into the model of palliative care. ▶ Improving hospital flow, support integrated discharge and capacity for Allied Health Professionals to work in partnership across transitions of care. Empower people with life-limiting conditions to self-manage their condition, enabling them to live fully and enjoy the best quality of life possible at home.
StrokeLINK Innovating Stroke Support	Mater Misericordiae University Hospital	StrokeLINK innovates care after stroke by providing a holistic support system that will move with the patient through the acute phase and into the community. <ol style="list-style-type: none"> 1. Two stroke clinic nurse specialists (CNS) who will act as “keyworkers”, supporting the patient from their acute hospital stay through to community living. 2. Personalised education and support tools which will consist of complementary digital and more traditional (paper-based) tools co-designed with patient representatives, healthcare professionals, interaction designers and a software provider.

2020 innovation sprint

The Pillar Centre for Transformative Healthcare supported the 2020 Innovation Sprint, a free 8-week MedTech development course for all staff at the hospital. The virtual 8-week programme enables staff to

1. Identify a viable solution to an unmet clinical need
2. Utilise team-based development of ideas
3. Mentor-assisted team brainstorming
4. Establish feasibility for an enterprise Ireland funding application

All participants received a certificate of completion from the Pillar Centre.

Pillar Centre for Transformative Health strategic plan 2020-2023

In October, the Mater Hospital launched a Strategic Plan for a new academic clinical centre at the hospital. The Pillar Centre for Transformative Healthcare Strategic Plan 2020-2023 seeks to advance training, research and innovation opportunities at the hospital and sets out five strategic priorities to achieve the vision of becoming “a leader in education, research and innovation.

Prof Brendan Kinsley, Clinical Director of the Pillar Centre, said their goal was to create a centre which optimised the potential of staff at the Mater Hospital. “This is a hospital-wide collaboration with academic, commercial and local partners to bring added value to the education, research and innovation carried out at the Pillar Centre.

The centre also intends to enhance healthcare innovation, aiming to develop programmes in device development and remote monitoring, as well as building a formalised programme in innovation in services and new models of care.



Erin Daly. Manger, The Pillar Centre, Mater Hospital Dublin, and Clinical Director, Prof Brendan Kinsley at the launch of the Pillar three year strategy



The Mater and Covid-19

The Mater and Covid-19

In December 2019, a novel strain of coronavirus disease commonly known as Covid-19, was identified in the city of Wuhan in the Hubei province of China

This SARS (severe acute respiratory syndrome) - CoV2 virus spread globally and continues to cause huge disruption and strain on healthcare services, society and the world economy.

On the 27th January 2020, the National Public Health Emergency Team (NPHET) for Covid-19 was created to coordinate the Irish Response to the pandemic. Following this the Coronavirus Expert Advisory Group, a sub-group of NPHET met for the first time in Dublin on the 5th February 2020. The first confirmed case in Ireland was identified on the 29th February 2020.

Over the course of 2020, Covid-19 placed extreme societal and economic strain on the people of Ireland and around the world. In March and April 2020, the

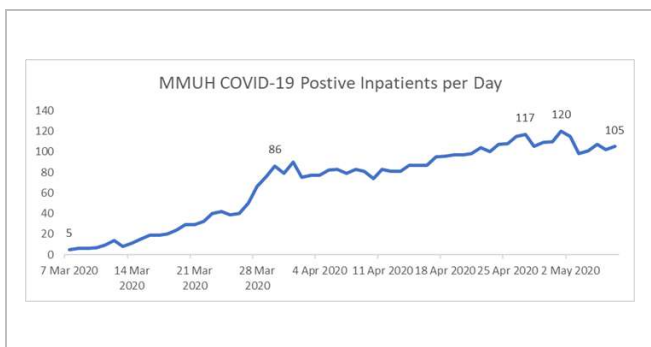
Mater Hospital along with the rest of the Irish healthcare systems braced itself for the impact of a surge of severely unwell patients with Covid-19. Most elective and routine work was stopped abruptly with significant work undertaken to create capacity in the hospital and particularly in the intensive care unit. This preparedness enabled the Mater and other hospitals around the country to cope with the influx of Covid-19 admissions and prevent the wider health service becoming overwhelmed as was seen in countries like Spain and Italy.



Wave 1 timeline

Mater response

The hospital commenced planning for Covid-19 in February 2020, with the first admission of a patient with potential Covid-19 on 28th February 2020. From the 5th March 2020, the Mater Covid Steering Committee met virtually daily or twice daily to plan the hospital’s response.



MMUH COVID-19 positive inpatients per day

Initially patients on the Covid-19 pathway were admitted to the National Isolation Unit or Critical Care Unit. However, as the numbers increased it was necessary to evolve new clinical pathways in order to

- ▶ Separate potential Covid-19 and non-Covid-19 patients presenting to the Emergency Department.
- ▶ Create inpatient ward capacity for those on a Covid-19 pathway.
- ▶ Protect vulnerable non-Covid inpatient groups.
- ▶ Enable critical care capacity to manage a potential surge of patients with critical care requirements.

- ▶ Maintain emergency and urgent surgical activity where possible.

Infection Prevention and Control

During these initial stages the Infection Prevention and Control (IPC) team provided critical guidance and support to enable the hospital respond to the Covid-19 pandemic.

The IPC shaped the implementation of the organisational measures required to deal with Covid-19, ensured that the hospital complied with emerging national and international standards, provided a structure to enable the continuance of urgent and time critical care and importantly guided the reorganisation and design of services to enable resumption of scheduled hospital-based care. This included

- ▶ Development and updating of all infection prevention and control (IPC) guidelines related to Covid-19.
- ▶ Review of all Personal Protective Equipment (PPE) guidelines, assessing PPE to ensure compliance with European standards and projections for future PPE needs.
- ▶ PPE Training for all frontline staff members.
- ▶ Acquisition of a UVC decontamination robot which decontaminates all room surfaces as well as the surrounding air using ultra-violet light (the first in Ireland).

- ▶ To address the severe shortage of goggles, Nanoclave, a UVC decontamination box, which effectively decontaminates goggles and other medical equipment, was acquired.
- ▶ Extensive contact tracing for all confirmed Covid-19 patients.
- ▶ Active surveillance and analysis of Covid-data to identify patterns of transmission.
- ▶ Provision of IPC expert advice and assistance to colleagues working in public and private long term care facilities and nursing homes on management of Covid-19 in their organisation.

Patient Streaming

From the 12th March to the 30th April, the Acute Medical Assessment Unit (AMAU) became a dedicated ward for patients with stable symptoms but potential Covid-19.

Unstable patients continued to be seen in the main Emergency Department (ED) resuscitation area and two dedicated ED cubicles. Rapid development by the Mater Estates and Facilities team converted 4 multi-bedded bays in the AMAU to 16 isolation spaces, with the two dedicated cubicles in the main ED also converted to isolation rooms.

On the 9th April 2020, the Forward Streaming Tent became operational – allowing senior decision maker streaming of ED presentations to the hospital directly to an appropriate Covid/non-Covid pathway

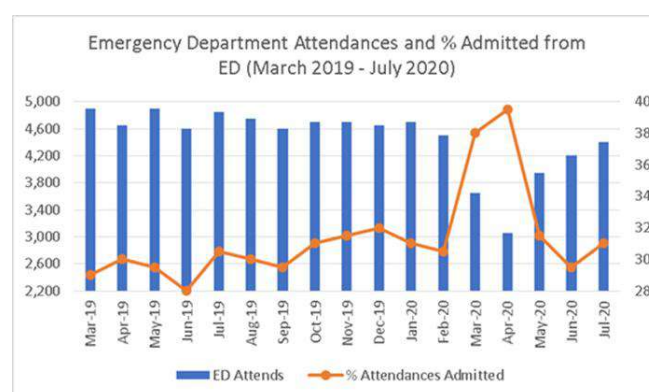
RED ZONE	YELLOW ZONE	GREEN ZONE	BLUE ZONE
Resuscitation level of care for Covid-19 and non Covid-19 patients	Covid-19 likely patients with significant symptoms, likely to require admission	Potential Covid-19 positive patients, stable symptoms, well enough to go home	People not likely Covid-19 positive

Covid-19/ Non-Covid-19 Pathway

Emergency Department (unscheduled care)

The Emergency Department attendances (across the Mater Main Emergency Department, the Smithfield Rapid Injury Clinic and the Eye Emergency Department) were heavily impacted at the start of the pandemic.

Attendances dropped by a third between February 2020 and April 2020 (the most heavily impacted month). In conjunction with the sharply reduced attendances, in the March-April time period, the hospital saw a sharp increase in the admission rate from approx. 31% in February 2020 to 38% and 39.5% respectively in March and April.



The ED pathways which were modified and streamlined to support the Covid-19 pandemic admission process were rapidly put in place. The ED was segregated into 4 zones- Yellow stream (Covid Pathway), Blue stream (Clean non covid stream), Red Stream (Resuscitation - a blend of Covid and non covid) and the Green stream (GP led ambulatory stream). Forward triage services were led by Consultant/Senior decision maker enabling appropriate streaming of patients. New pathways were developed to support new stream from triage to streamline the unscheduled medical admission pathway.

In response to the increasing volume of over 75 years attending the ED over the summer, a frailty

intervention team (FITT) commenced on the 10th August. Pathways to support early intervention were developed, with a focus on discharge directly home or to rehab with a focus on admission avoidance.

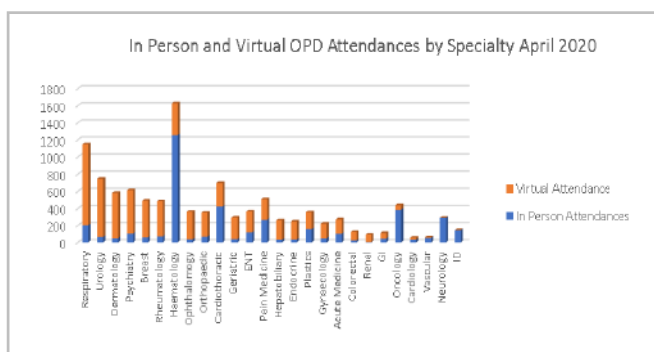
In August, a number of new initiatives were implemented in ED to support flow at the front door- Emergency ambulatory stream and Frailty at the front door stream. This reduced the *left before seen rate* = 5.9% compared to 14.6% for the same period last year.

Over the summer of 2020 the Covid streams in the Mater decreased while the non-Covid stream steadily increased almost pre Covid levels from June. The service continually adapted their streams and work processes to meet the changing demand. By late October a new challenge emerged as the Covid stream started to grow again while the non-Covid stream remained largely unchanged.

Outpatient Services

All outpatient activity was initially reviewed to limit footfall at the hospital. All non-urgent outpatient activity ceased.

The Fracture Clinic was relocated from the Mater Hospital to the Charter Smithfield Clinic on the 18th March 2020.



OPD attendances In Person vs Virtual April 2020

The pandemic led to unprecedented disruption to normal healthcare activity with all services affected. A major drive was undertaken to boost digital

healthcare services as part of the response to Covid. Where possible specialties moved to telephonic/virtual reviews to meet some of their outpatient demand.

” The shift to virtual clinics happened at an unprecedented rate and provided the majority of out-patient attendances in April

Driven nationally by the HSE there was considerable focus on expanding access to virtual clinics.

Telehealth

The Covid-19 pandemic necessitated rapid adoption of new technologies and service models to facilitate remote care wherever possible across all outpatient specialties.

In the early weeks of the pandemic, the Operations team along with IMS and Medical Records Departments quickly adapted the administrative process and the patient administration system functionality to enable phone-based consultant clinics to be scheduled and documented and the activity captured. In April 2020, approximately 70% of outpatient clinic consultations recorded on the system were virtual. Recognising the significant achievement and opportunity that this represented, the CEO requested Mater Transformation Office to carry out a report to inform how the hospital might capitalise on the opportunity to enhance and embed the adoption of telehealth and remote care as part of the hospital’s outpatient service offering.

Following consultation with a range of key stakeholders (23 consultants, eight Advanced Nurse Practitioners/Clinical Nurse Specialists, eight Health and Social Care Professional managers and six patient interviews) and in-depth analysis of activity, a

recommendations report was produced in May 2020 titled – Telehealth: opportunities for innovation of outpatient care during Covid-19 pandemic and beyond.

Following on from the report the Transformation Office team helped drive several initiatives based on the findings including

- ▶ **Video consultation (via T-Pro platform)** The Transformation Office worked closely with Information Management Services (IMS) and Operations in procuring and roll out of software and equipment to enable video consultations across all specialties
- ▶ **Enhanced reporting on virtual activity** In collaboration with IMS and the Outpatient Steering Group, data reporting capability was enhanced to enable monitoring of virtual versus face to face activity across specialties
- ▶ **Support tools** In Quarter 4 2020, recognising that outpatient services were likely changed for longer term, planning commenced with the Out-patient Department Steering Group and Clinical Photography to create videos for the hospital website explaining virtual clinics to patients (how they work and the benefits) as well as explaining how face to face outpatient clinics now run to keep everyone safe.

MyPatientSpace App In collaboration with IMS, a new app for interfacing with outpatients and empowering them in self-care was examined. The app, 'MyPatientSpace, was procured and funded by HSE Digital Transformation. Two teams were invited to participate in the pilot – Oncology and Lung Transplant. The pilot commenced in the last quarter of 2020 and continues in 2021.

Covid-19 Remote Monitoring Clinic

In early March 2020, it became apparent that the hospital would soon be dealing with large numbers of positive patients, many of whom would have a relatively mild clinical course.

In order to preserve the bed base for those who required in-patient care, the National Isolation Unit (NIU) team carried out a one-week pilot to test the potential to use a HSE-funded software platform to monitor a cohort of milder patients remotely. Through use of the app and Bluetooth enabled pulse oximeters, key patient metrics were recorded and monitored remotely by a clinical team. Following the pilot, the Transformation Office team was brought on board to develop and scale up the concept.

In collaboration with the National Isolation Unit (NIU) team, Transformation worked with the software provider (patientMpower) on the development of the portal and with the Mater IMS department to develop electronic records which would be accurate, secure and readily available 24/7 to all clinicians should there be an emergency admission. Algorithms and Standard Operating Procedures were developed and staff were redeployed from around the hospital to staff the service. Patient numbers swelled to 30 within 1 week and grew to an average of over 100 patients on daily remote monitoring during Covid-19 surges. Up to 50% of patients required a phone call every day – either to prompt and/or assist patients to enter the data or to discuss deteriorating symptoms and potential ambulance back to the hospital for re-assessment and potential admission.

In the third quarter of 2020, management of the Covid-19 Remote Monitoring Clinic was handed fully over to Infectious Diseases team and the Emergency Department and Specialty Medicine Directorate. The service continues to be centrally placed as part of the Mater Covid-19 response, providing safe, continued monitoring of Covid-19 positive outpatients.

Inpatient Ward Response

Inpatient wards were reorganised to deliver increased capacity as Covid wards that included single room assessment and treatment spaces and multi-bay rooms for confirmed positive patients.

” There were 1,467 Total Direct Admissions to the Covid Pathway between 3rd March and 13th May 2020

Patients initially transfer into single rooms (St. Agnes’s or St. Cecelia’s Ward) and then either transferred out to non-Covid wards following a negative swab result, or to Covid wards (St. John’s, St. Anne’s or St. Raphael’s Wards) as they are confirmed positive and if care needs allow. Details of the opening dates are outlined below.

3 rd March 2020	National Isolation Unit
6 th March 2020	St Agnes’ Ward
12 th March 2020	Acute Medl Assessment Unit
14 th March 2020	St Cecelia’s Ward
24 th March 2020	St Anne’s Ward
10 th April 2020	St Raphael’s Ward
14 th April 2020	St John’s Ward

Significant support from Estates and Facilities, as well as Clinical Engineering was required to ensure the ward infrastructure and equipment required was available to care for Covid patients. Particular attention was given to medical gas supplies in different parts of the hospital and ensuring close monitoring of total oxygen consumption.

Covid patients frequently require high flow oxygen support.

” 145 patients went to the post-acute wards in St Vincent’s Hospital, Fairview between 27th March and 14th April

Additional ward changes were agreed to protect vulnerable cohorts of non-Covid patients and release physical capacity in the hospital. The Specialist Geriatric Ward was decanted from St. Anne’s Ward to the post-acute wards (Synge, Yeats and Joyce) in St. Vincent’s Hospital Fairview on 27th March 2020.

The Mater also accessed additional offsite capacity in Ferndale Beneavin, for an older patient cohort. 37 patients were transferred between 6th March and the 14th May, with the National Treatment Purchase Fund funding some of these beds.

Discharges

Expedited, alternative and supported discharge routes were imperative to maintaining flow through the hospital and keeping capacity available for new admissions on both Covid and non-Covid pathways.

Clontarf Hospital developed a rehabilitation pathway for patients who were Covid positive and accepted discharges of Covid positive patients from the Mater for rehabilitation. The existing rehabilitation pathway for non-Covid patients continued to function in Clontarf in parallel to this development.

On the 18th March a Mater Covid Virtual Clinic was established to remotely monitor Covid positive discharged patients (including staff who test positive) under the governance of the National Isolation Unit (NIU) consultants. Patients utilised Bluetooth enabled mobile pulse oximeters linked to an app, patientMpower, and were reviewed twice a day via a portal. Patients and staff who required a place to isolate, who did not have suitable home accommodation to do so and did not require inpatient care were accommodated in the City West isolation facility.

Laboratory Testing

In normal time the National Virus Reference Laboratory (NVRL) at University College Dublin covers

the country for all usual requirements in terms of virus detection and identification.

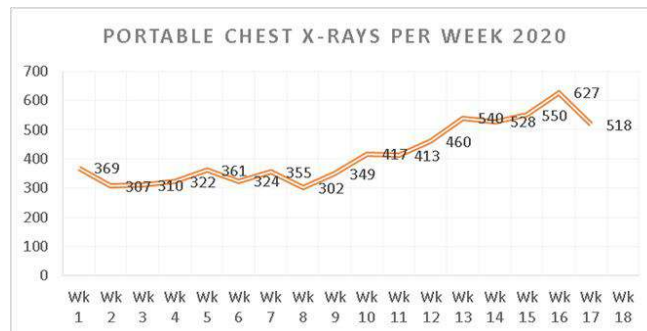
With the Covid-19 emergency, the NVRL was overwhelmed with samples from swabbing. The team at the Mater worked closely with the Ireland East Hospital Group Laboratory Response Group, which was chaired by Prof Conor O’Keane. The Response Group identified four main priorities that needed to be addressed

- ▶ Increase capacity for testing.
- ▶ Increase staff resources.
- ▶ Fast turnaround Times (TAT): 24-hour turnaround time for diagnostic testing by RT-PCR (reverse transcription – polymerase chain reaction).
- ▶ Provide Urgent Rapid Testing (GeneXpert Platform).

In conjunction with the National HSE Laboratory Task Force, demand forecasting modelling was conducted and a comprehensive business case was developed and submitted to the HSE Taskforce outlining laboratory needs and requirements to meet demand.

Diagnostic Imaging

Diagnostic imaging has been a key adjunct to laboratory testing in identification and clinical management for patients with suspected and confirmed Covid-19. Chest x-rays were rapidly included in initial diagnostic assessments for all patients admitted with suspected Covid-19. Processes were rapidly adapted to support use of portable x-ray to keep movement of patients with potential Covid-19 separate from other hospital patients, limit patient movement through the hospital and manage cleaning requirements.



Demand for portable x-ray at the Mater Week 1 -18, 2020

Computed Tomography (CT) of the chest has been an often performed, and useful, test in patients suspected of having Covid-19 pneumonia but who have negative laboratory tests. Laboratory testing can have false negatives and thus physicians are cautious in de-escalating certain patients from the Covid pathway based purely on laboratory testing.

A negative chest CT gives extra re-assurance that a patient is truly negative. Conversely chest CT has also detected Covid pneumonia on patients who were swab negative which has repercussions for personal protective equipment (PPE) use, patient location and ongoing management. In addition, CT imaging often consists of examinations for pulmonary embolism (PE) in this patient cohort. A relatively high rate of 35% of PE has been detected in Covid patients.

” Demand for portable x-ray went from a pre Covid-19 rates average of 333 per week, rising to 512 average per week

Pharmacy and Medicines Optimisation Response

COVID-19 impacted all Pharmacy & Medication Optimisation (PAMO) Directorate services.

Given global demands, significant procurement strategies were required to maintain and optimise drug stocks and supplies for Covid surges, including the increase in critical care capacity. Intensive efforts were required to ensure continuity of drug supply, including anti-virals, antimicrobials, fluids and alcohol hand sanitiser. Ms Mairead O'Connor, Pharmacy Lead – Infectious Diseases, participated in National Medicines Criticality Group (NPHET sub-group) and contribution to National Guidance on the use of Antiviral Therapy in the Clinical Management of Acute Respiratory Infection with SARS-CoV-2 (Covid-19), sharing Mater learnings and actions widely with other institutions.

The PAMO Directorate established an emergency weekend pharmacy service in response to hospital requirements and the Clinical Pharmacy Service supported new ward openings and ward reconfigurations during Covid-19 management. The PAMO Directorate implemented emergency changes to pharmacy legislation and regulations, e.g. electronic transmission of prescriptions, 9-month prescription validity. A drug delivery service to patients' homes was also launched for patients unable to attend the Mater during the pandemic.

As Covid-19 is a new disease, drug treatments continue to be experimental with limited evidence base and requiring significant investigation before use. Thirty-eight Policies, Procedures, Protocols & Guidelines (PPPGs) were drafted / updated in response to Covid-19 in 2020 with a new Prescriber's Guide Covid-19 chapter introduced to reflect the changing healthcare environment. Ms Patricia Ging, Transplant/Pulmonary Hypertension pharmacist, was one of the authors of Guidance from the International Society of Heart and Lung Transplantation (ISHLT) regarding the SARS CoV-2 pandemic. This guidance

addresses frequently asked questions for care providers of patients with chronic lung / heart disease and transplant mechanical circulatory support, and pulmonary vascular disease. Three Covid-19 Therapeutic Clinical Trials were initiated in the Mater that involved PAMO development and implementation of new PPPGs for the operation of a Clinical Trial in an in-patient setting.

Staffing Response

The dedication, flexibility and commitment of staff across all hospital departments and services has been exceptional.

By 15th May 314 Mater staff had tested positive for Covid-19

Reduction in outpatient activity and non-essential surgery allowed redeployment of staff and was instrumental in ensuring Covid wards had appropriate complements, including increasing staffing ratios on Covid wards with high acuity patients. Additional training was organised to enable the staffing needs in the expanded critical care capacity in the high dependency unit and cardiothoracic HDU to be met.

Extensive reorganisation of medical staffing was required to provide two separate rotas for a Covid and non-Covid stream, and separate on call rotas. Non-Consultant Hospital Doctors (NCHDs) were moved flexibly from their base teams and provided cover across the hospital. Surgical colleagues supported Covid pathways where reduced surgical activity allowed.

Priority was given to the management of staff absences due to Covid-19 either from becoming positive, being a close contact or for those cocooning. Processes were put in place to support staff screening for Covid-19 as required and contact tracing for

positive staff. The Occupational Health Department commenced screening for staff from 8th March 2020.

On the 31st March 2020 the hospital agreed a plan for derogation for return to work of essential health care workers (HCWs) during the Covid-19 pandemic. This provided a framework for safe return to work of non-symptomatic staff where required.

Delivering Surge Capacity

The projected surge in capacity created enormous challenges for the team at the Mater. The existing infrastructure of medical beds and critical care capacity required substantial expansion in order to meet Covid-19 demand. A range of options were developed to use and repurpose all available space to maximise space and manage patient flow. The cancellation of elective work, the repurposing of operating theatres and commissioning the use of private facilities all formed part of the overall response.

Routine out-patient work was scaled down to reduce the burden on the hospital and the infection risk for patients. Where possible appointments were shifted to telephone or video calls to avoid unnecessary visits to the hospital.

Daily calls assessed capacity and allocation of space and resources. Separate treatment areas were established for suspected Covid-19 patients to maintain flow in the Emergency Department. Clinical engineering worked with external contractors to enable rooms and theatres to be converted to negative pressure spaces (areas that isolate infectious patients from other patients), with the delivery of every aspect of care being fundamentally reorganised in response to the Covid-19 surge.

This model of care delivery was redesigned with a focus on what is best for patients.

” *Surge capacity expanded the number of critical care beds available at the Mater to 93*

A plan for escalation of critical care capacity was put in place from the start of Covid-19 planning which included full utilisation of the Intensive Care Unit (ICU) and management of ventilated patients in the High Dependency Unit (HDU), Cardiothoracic HDU, Post-Acute Care Unit and theatre areas as required.

This expansion required significant up-skilling of medical and nursing staff with dedicated simulation training and buddy training with critical care nursing.

Adequate core equipment (ventilators, infusion pumps, drugs) were put in place. The completion of the Hyper Acute Stroke Unit (HASU) and the use of the Mater Private Hospital to support services were additional resources available if required and provided the hospital with a total of 93 available critical beds.



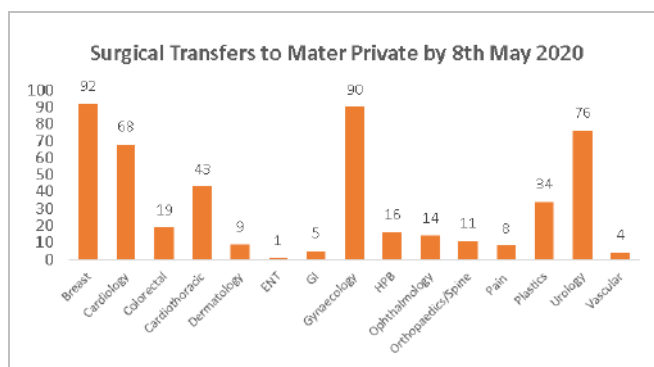
Hyper Acute Stroke Unit

Work with Partner Institutions

Mater Private Hospital

Collaborative agreements with the Mater Private Hospital (MPH) and National Orthopaedic Hospital Cappagh (NOHC) allowed for maintenance of urgent surgical pathways and the discharge of some inpatients to those hospitals to support flow in the Mater Hospital.

The hospital engaged in an agreement with the Mater Private Hospital (MPH) to use its facilities, in advance of the national agreement regarding use of private hospitals, which facilitated the transfer of non-Covid medical and surgical inpatients and released capacity within the Mater’s main wards.

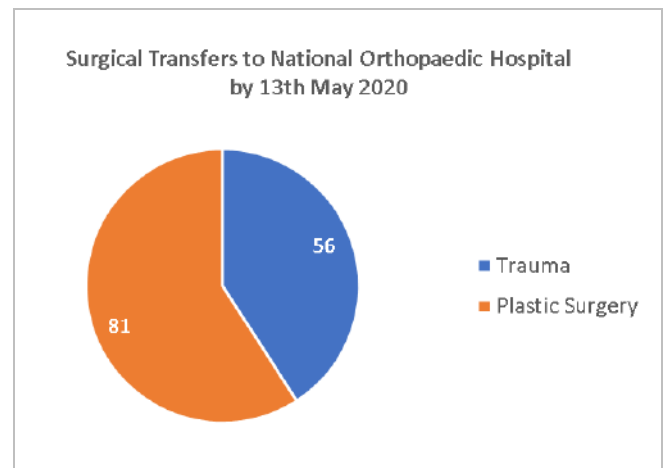


Surgical Transfers to the Mater Private Hospital as of 8th May 2020

The National Orthopaedic Hospital Cappagh (NOHC)

Similarly, the National Orthopaedic Hospital Cappagh (NOHC) supported Mater surgical patients requiring orthopaedic and plastics surgical intervention during the Covid period.

” By the 8th May 2020, a combined 555 surgical and medical patients were transferred to the Mater Private Hospital

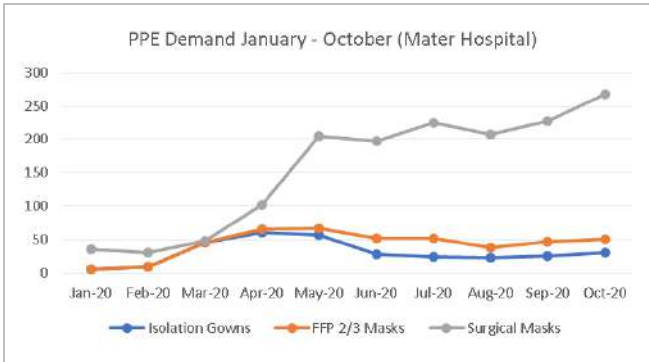


Surgical Transfers to the National Orthopaedic Hospital, Cappagh as of 13th May 2020

Procurement and Logistics

Since the onset of Covid-19, maintaining secure supply chains of quality assured PPE (Personal Protective Equipment) was a significant challenge for the health sector nationally.

The Mater’s demand for surgical masks increased by over 600% between February and May, while isolation gown demand increased by over 700% during the same period. With many states stopping the export of PPE coupled with increased demand, this led to shortages of stock globally and price increases of between 300%-1000%.



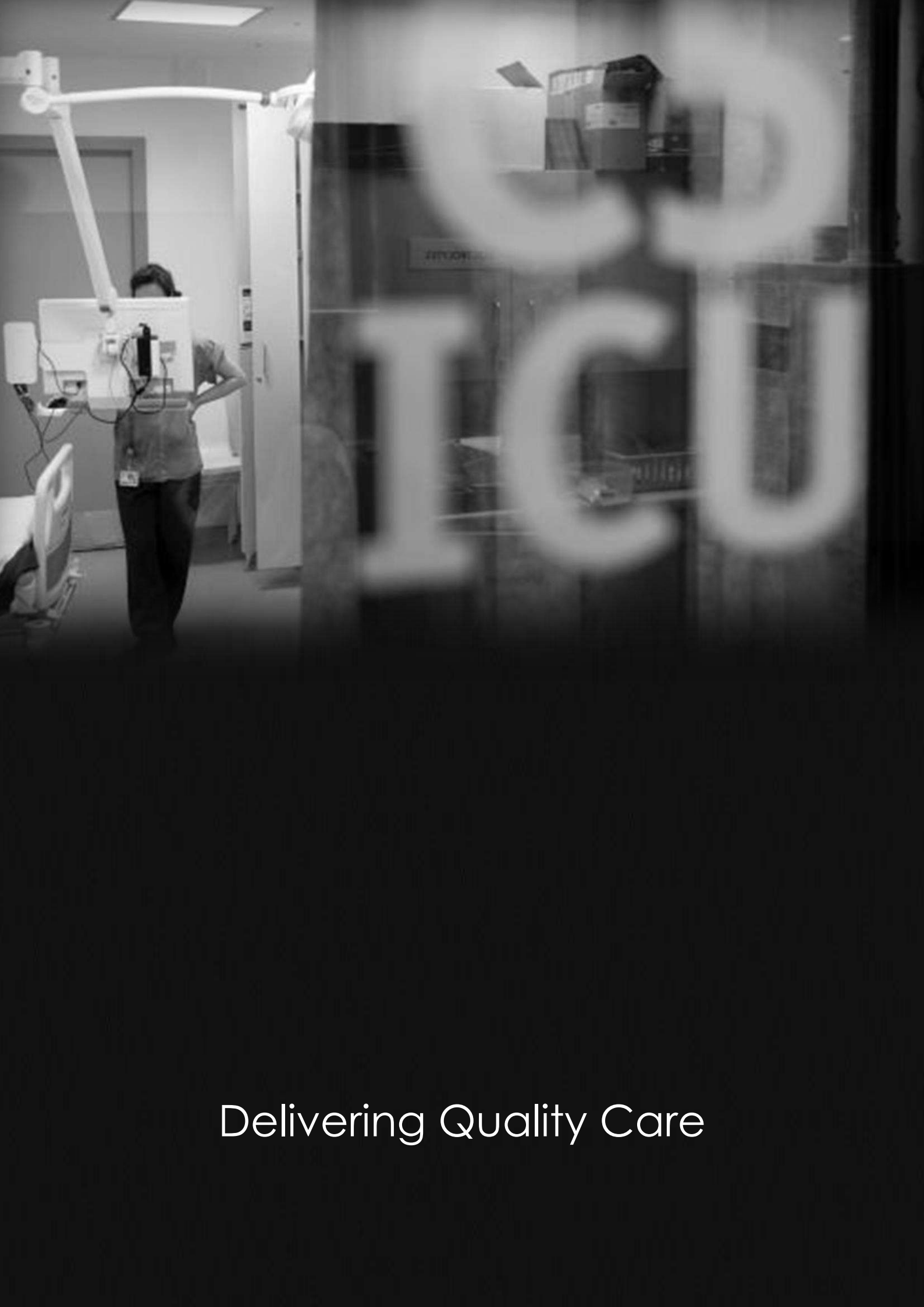
Mater Hospital Demand for PPE January-October 2020

The Procurement and Logistics Department established a PPE Unit to rapidly source and distribute PPE.

This was enabled by the reallocation of existing staff and halting all non-Covid19 related work.

A number of supply lines were established to manufacturers in China and Turkey. The hospital also entered into an arrangement with CEVA Logistics to store contingency stock of PPE offsite with 1 month's stock of PPE held and a further 2 month's stock en route.

The national supply chain via the HSE ramped up its ability to supply PPE, primarily through China and to a lesser extent Korea. The initial shortfalls in supply, with major surge in April and May 2020 were addressed and stabilised in Q3 and Q4 of 2020.



Delivering Quality Care

Delivering Quality Care

Consistent improvement in healthcare delivery requires a deliberate focus on quality of health services

The Mater continues to provide the expertise to standardise delivery of evidence-based best practices, focusing on patient safety and care across our healthcare continuum.

Delivering high quality care for our patients is at the heart of what the Mater stands for. We recognise that, due to the changeable nature of our dynamic health-care system, we need to continually evaluate how we ensure continued success in serving the health needs of our community.

The values and actions we collectively demonstrate in shaping our ambition to be Ireland's leading and exemplary provider of safe and efficient public healthcare services determines our success in realising our ambition.

Quality and Patient Safety

The Mater Misericordiae University Hospital continues to place quality, safety and the experience of patients at the forefront of everything that we do. The Quality and Patient Safety Directorate supports the delivery of patient care that is safe, high quality and person-centred.

The directorate’s work includes patient safety and risk management, quality assurance, clinical audit and quality improvement. Many of the quality and patient safety initiatives planned for 2020 have been impacted by Covid-19, but where possible these were progressed in parallel with monitoring and promoting patient safety during the pandemic.



Framework for High Quality Healthcare at Mater Hospital

Effective Care

The guiding principle at the Mater Hospital is to continuously improve the quality of care by providing world class patient centric care across all clinical areas. Our goal of putting our patients first and always providing safe and effective care is achieved by our continued focus on safe, effective, evidence-based care for all.

We continuously measure outcomes and monitor our performance to support the delivery of safe, effective, quality health care. Clinical audit forms an integral part of the clinical governance framework through which the hospital is accountable for improving the quality of services and safeguarding high standards of care. Clinical audit is a quality improvement process that seeks to improve patient care and outcomes through systematic measurement against explicit criteria and the implementation of any necessary change.

The Mater is also part of the wider national initiatives to improve the quality of care delivered and is part of several large scale national clinical audits in the following areas

- ▶ National Audit of Hospital Mortality.
- ▶ National Cancer Control Programme, Rapid Access Clinic Reviews
- ▶ Irish Hip Fracture Database
- ▶ National Stroke Register
- ▶ Major Trauma Audit
- ▶ National Intensive Care Unit Audit
- ▶ National Quality Improvement Programmes – Endoscopy, Histology and Radiology

National Audit of Hospital Mortality (NAHM)

The National Office of Clinical Audit (NOCA) was established in 2012 to create sustainable clinical audit programmes at national level. The fifth National Audit of Hospital Mortality was published in December 2020 and covers the year 2019.

Data in the report is extracted from 44 public acute hospitals and focuses on data for six key diagnoses identified for public reporting

- ▶ acute myocardial infarction (AMI)
- ▶ heart failure
- ▶ ischaemic stroke
- ▶ haemorrhagic stroke
- ▶ chronic obstructive pulmonary disease (COPD)
- ▶ pneumonia

Hospitals can view their in-hospital mortality data for all diagnoses throughout the year.

The report provides an analysis of in-hospital mortality to stakeholders, patients, the public and the wider healthcare system, and communicates the recommendations made on the basis of the findings.

*” Clinical audit is a cyclical process that aims to improve patient care and outcomes by systematic, structured review and evaluation of clinical care against explicit clinical standards on a national basis
National Clinical Effectiveness Committee*

The aims of the NAHM are to

- ▶ Understand and improve the quality of hospital-based mortality data
- ▶ Promote reflection on the quality of overall patient care
- ▶ Identify areas for improvement

The audit uses a standardised mortality ratio (SMR) to calculate mortality trends. The SMR is a calculation of the number of patients that died within a hospital compared to the number that were expected to die when the SMR factors are taken into account. The SMR factors are

- ▶ Age
- ▶ Gender
- ▶ Co-morbidities (other existing conditions)
- ▶ Type of admission (emergency or elective)
- ▶ Source of admission (home, nursing home, etc)
- ▶ Number of emergency admissions (last 12 months)
- ▶ Proxy level of deprivation (medical card).
- ▶ Palliative care

Acute Myocardial Infarction (AMI) In-hospital mortality for AMI has decreased 35% over the past 10 years

Heart Failure In-hospital mortality for AMI has decreased 23% over the past 10 years

Ischaemic Stroke In-hospital mortality for ischaemic stroke has decreased by 38% between 2009 and 2018.

Haemorrhagic Stroke In-hospital mortality for haemorrhagic stroke has decreased by 9% over the past 10 years

Chronic Obstructive Pulmonary Disease (COPD) In-hospital mortality for COPD has increased by 12% between 2010 and 2019.

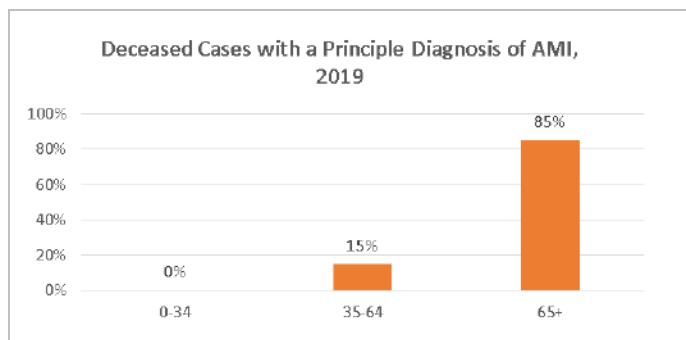
Pneumonia In-hospital mortality for pneumonia has decreased by 27% in the last 10 years.

Key Findings of the National Audit of Hospital Mortality 2019

Cardiovascular Disease

Cardiovascular disease is the number one cause of death globally, causing approximately 17.9 million deaths each year. Of these deaths, 85% are due to heart attack or stroke (World Health Organisation, 2019). Cardiovascular diseases are a group of disorders affecting the heart and blood vessels. These conditions include coronary heart disease (myocardial infarction and heart attack), cerebrovascular disease (ischaemic and haemorrhagic stroke), heart failure, and rheumatic heart disease.

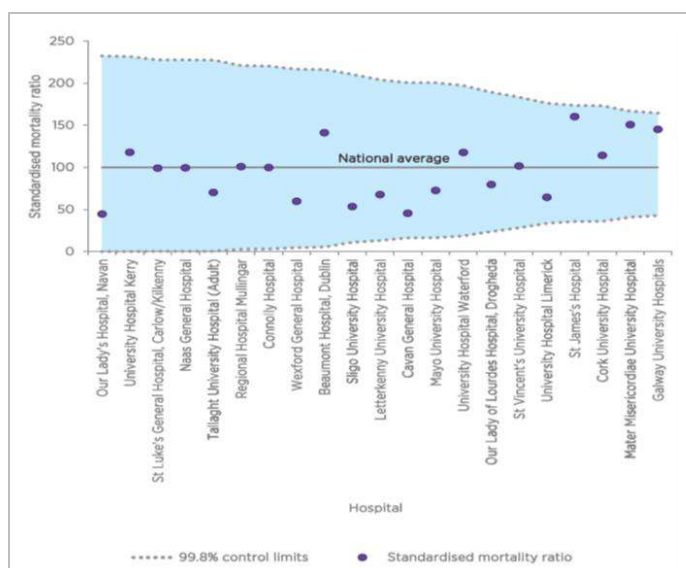
Acute Myocardial Infarction



Deceased cases with a principal diagnosis of AMI, by age group, 2019

	No Significant Pre-Existing Comorbidities	Moderate Comorbidities	Severe Comorbidities
AMI and Comorbidity	64%	15%	21%

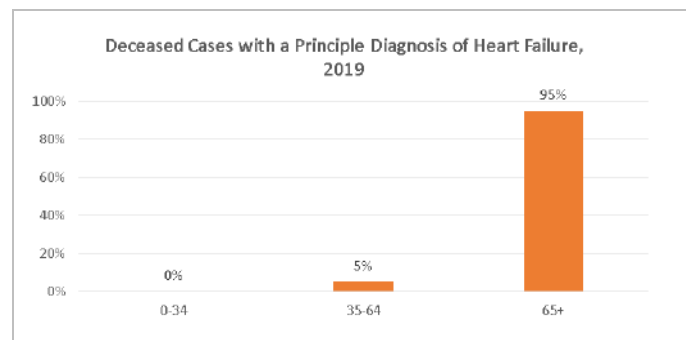
Charlston Comorbidity Index Scores for cases with a principal diagnosis of AMI, 2019



National In-hospital SMR following admission with a principle diagnosis of AMI 2019

The Charlston Comorbidity Index is a method of categorising comorbidities of patients based on the International Classification diagnosis codes

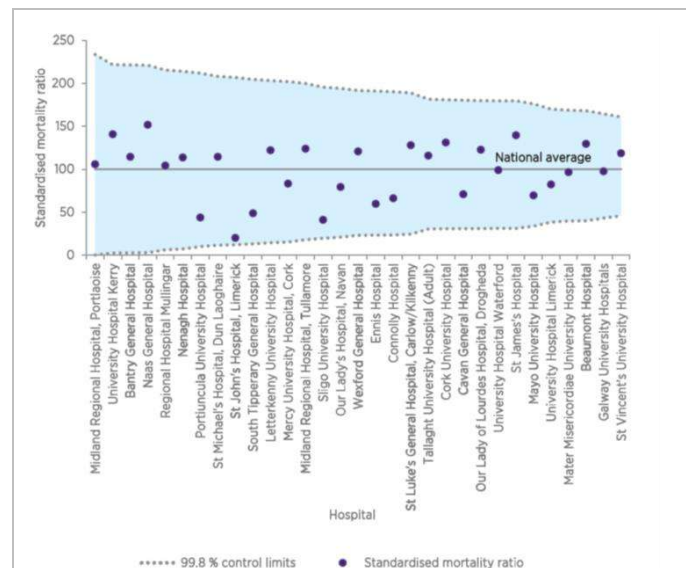
Heart Failure



Deceased cases with a principal diagnosis of Heart Failure, by age group, 2019

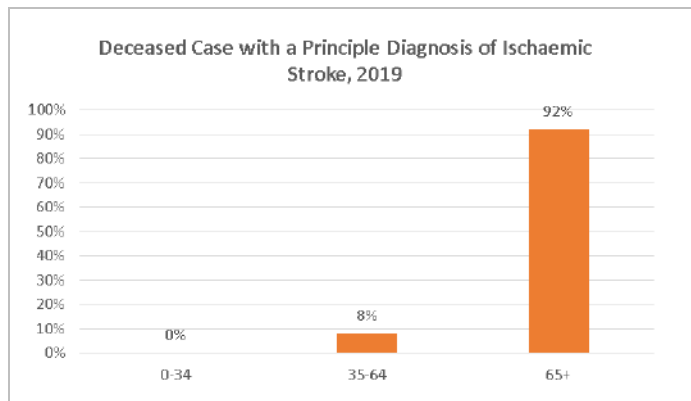
	No Significant Pre-Existing Comorbidities	Moderate Comorbidities	Severe Comorbidities
Heart Failure & Comorbidity	50%	20%	30%

Charlston Comorbidity Index Scores for cases with a principal diagnosis of Heart Failure, 2019



National In-hospital SMR following admission with a principle diagnosis of Heart Failure 2019

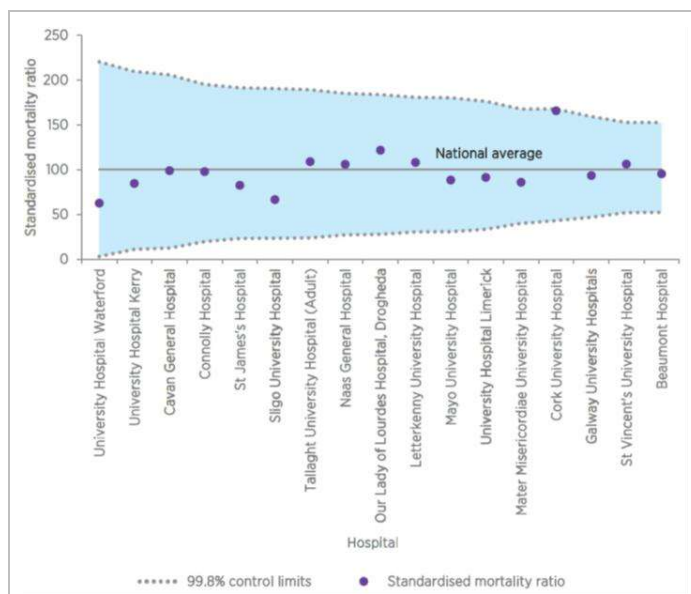
Ischaemic Stroke



Deceased cases with a principal diagnosis of Ischaemic Stroke, by age group, 2019

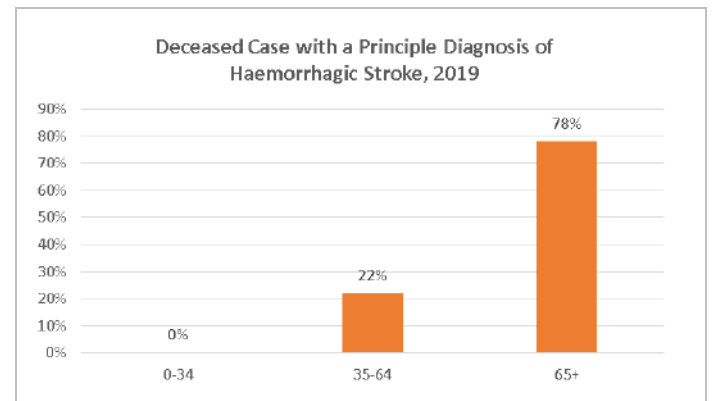
	No Significant Pre-Existing Comorbidities	Moderate Comorbidities	Severe Comorbidities
Ischaemic Stroke & Comorbidity	38%	30%	32%

Charlston Comorbidity Index Scores for cases with a principal diagnosis of Ischaemic Stroke, 2019



National In-hospital SMR following admission with a principle diagnosis of Ischaemic Stroke 2019

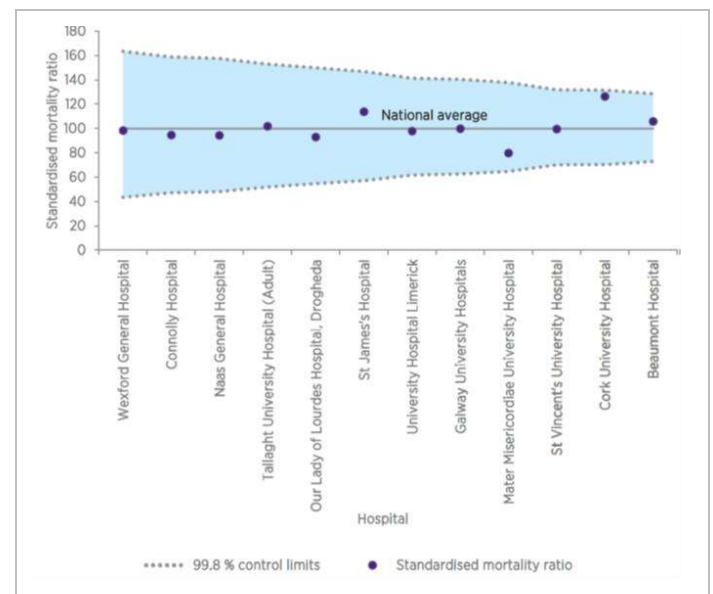
Haemorrhagic Stroke



Deceased cases with a principal diagnosis of Haemorrhagic Stroke, by age group, 2019

	No Significant Pre-Existing Comorbidities	Moderate Comorbidities	Severe Comorbidities
Haemorrhagic Stroke & Comorbidity	47%	21%	32%

Charlston Comorbidity Index Scores for cases with a principal diagnosis of Haemorrhagic Stroke, 2019

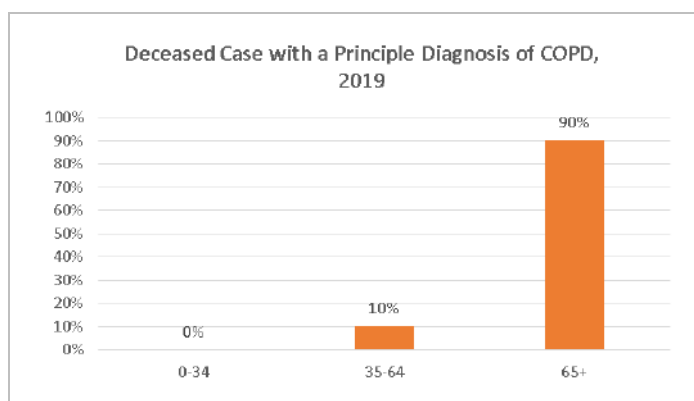


National In-hospital SMR following admission with a principle diagnosis of Haemorrhagic Stroke 2019

Respiratory Diagnosis

Respiratory diseases are diseases of the airways and other structures of the lung. Some of the most common are chronic obstructive pulmonary disease (COPD), asthma, occupational lung diseases and pulmonary hypertension.

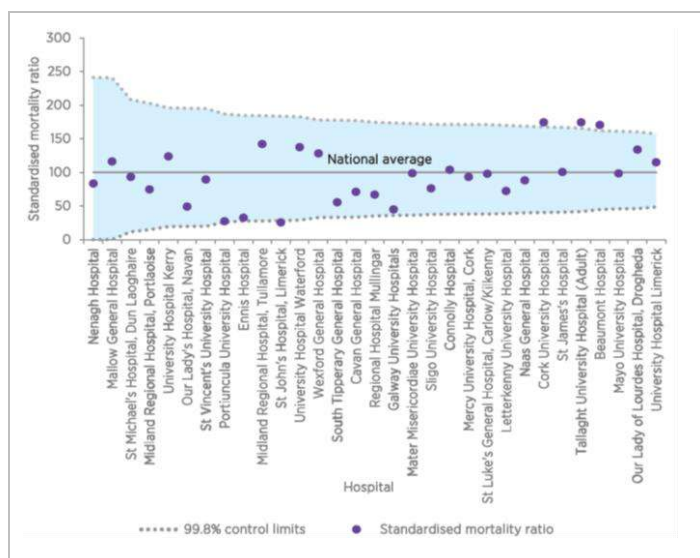
Chronic Obstructive Pulmonary Disease (COPD)



Deceased cases with a principal diagnosis of COPD, by age group, 2019

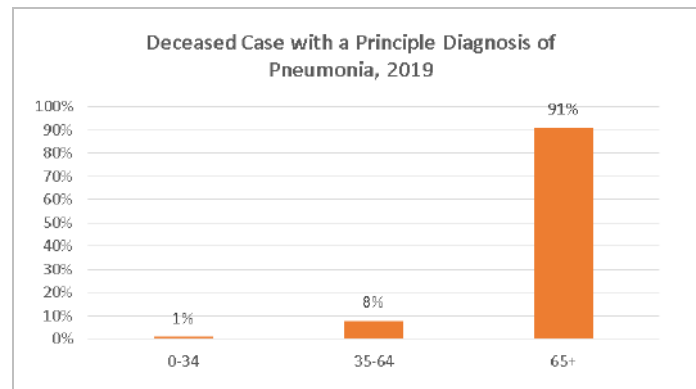
	No Significant Pre-Existing Comorbidities	Moderate Comorbidities	Severe Comorbidities
COPD & Comorbidity	65%	13%	22%

Charlston Comorbidity Index Scores for cases with a principal diagnosis of COPD, 2019



National In-hospital SMR following admission with a principle diagnosis of COPD 2019

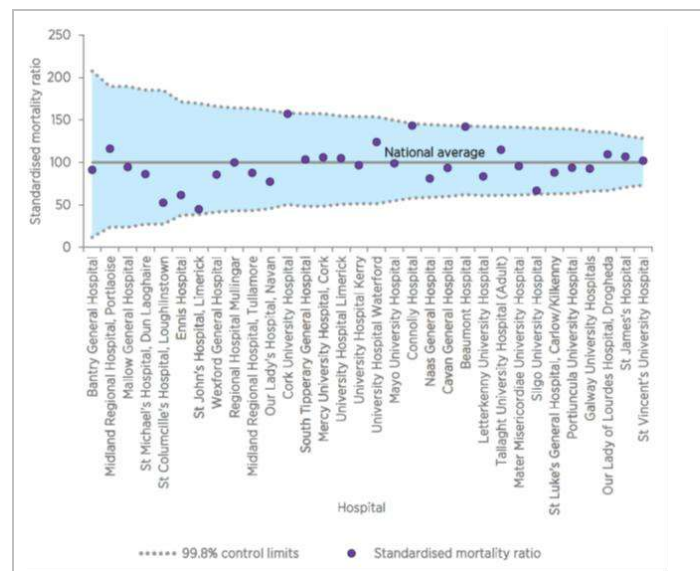
Pneumonia



Deceased cases with a principal diagnosis of Pneumonia, by age group, 2019

	No Significant Pre-Existing Comorbidities	Moderate Comorbidities	Severe Comorbidities
Pneumonia & Comorbidity	45%	19%	36%

Charlston Comorbidity Index Scores for cases with a principal diagnosis of Pneumonia, 2019



National In-hospital SMR following admission with a principle diagnosis of Pneumonia 2019

Over the last two decades, in-hospital mortality patterns have been used internationally as one

indicator of the quality of care. Several broadly similar methods have evolved, and the standardised mortality ratio (SMR) is the most commonly used approach for exploring hospital mortality patterns within a country.

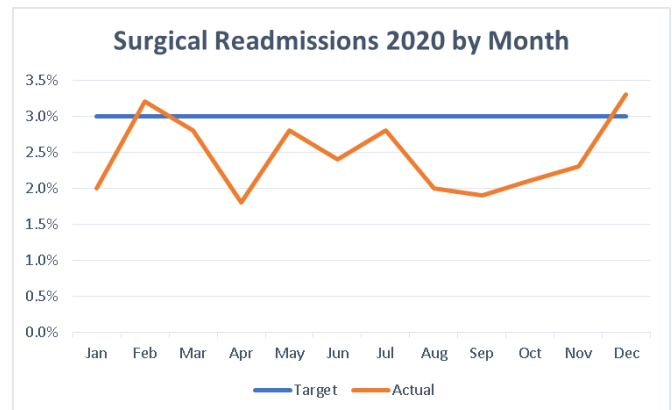
The National Audit found that the Mater Hospital was within the expected range for Standardised Mortality Ratio for all six diagnoses areas. While this reflects the quality of care at the Mater, the hospital is using the NAHM data to continuously identify areas for quality improvement in the care we provide to patients.

Hospital Readmissions

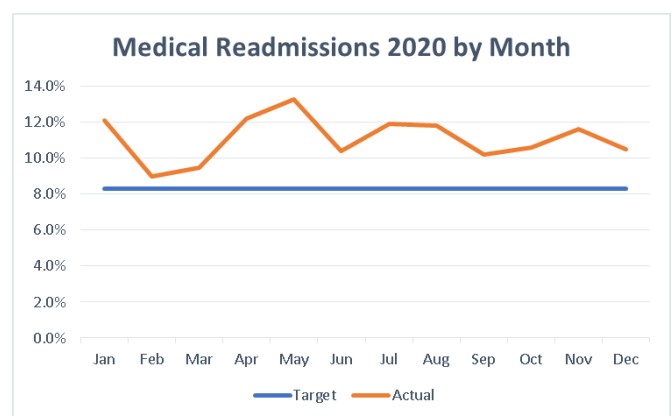
Hospital readmission rates are an important indicator of patient health outcomes and of the healthcare system performance. Low readmission rates in healthcare are regarded as an indicator of effective care and efficient co-ordination of services.

International studies and quality-reporting initiatives have shown that 15-25% of people who are discharged from the hospital will be readmitted within 30 days or less, and that many of these readmissions are preventable. The Mater Hospital has set targets for readmissions

- ▶ 3% for Surgical Readmissions
- ▶ 8.3% for Medical Readmissions



Surgical Readmissions 2020



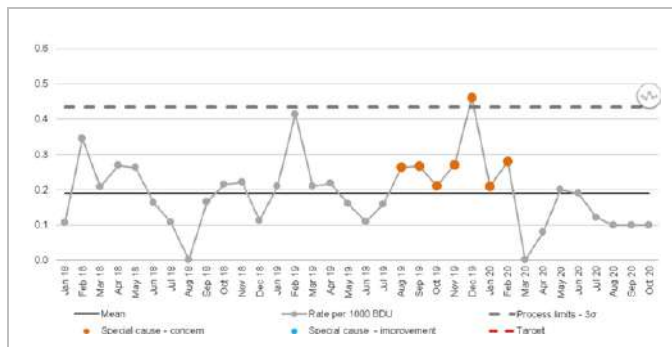
Medical Readmissions 2020

Reducing readmissions is a benefit for both the patient and the hospital. The patient benefits from not requiring further hospitalised care, while the hospital benefits from not having to incur the cost and time of treating the patient again.

Safe Care

Falls with Category 1 and 2 Harm in Hospital

Whilst it is evident from the literature that patient falls occur, it is the injuries sustained that can result in the need for surgical intervention and/or a longer hospital stay, and this ultimately can contribute to negative patient care outcomes.

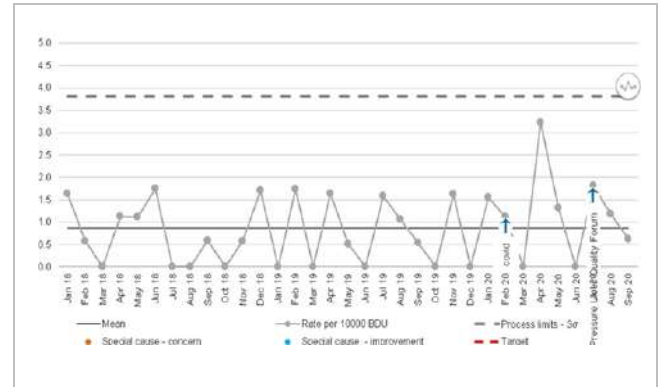


Falls with Harm January 2018 to October 2020

There has been a statistically significant reduction in falls with harm since March 2020. Recurrent and potentially preventable root causes of falls with severe or moderate harm are regularly studied by the multi-disciplinary Mater Falls Prevention Committee. Improvement initiatives to date include the appropriate use of bed rails, enhanced specials policy, clinical audit on the role of polypharmacy on risk of falling, and development of processes for early recognition and appropriate management of delirium.

Harm from Hospital Acquired Pressure Ulcers

There has been no statistically significant change in the rate of moderate or severe pressure ulcers. Pressure Ulcer prevention remains a Quality Improvement priority.



Grade 3 and 4 Hospital Acquired Pressure Ulcers January 2018 to October 2020

Venous Thromboembolism (VTE)

The rate of hospital acquired venous thromboembolism reported has significantly reduced largely through the various initiatives brought forward by a dedicated multi-disciplinary Quality Improvement (QI) improvement working group. Significant work was done on implementing a process of review of all cases to ensure they were true hospital acquired. In addition, there was hospital wide education e.g. pop up messages on patient centre, an educational video at the hospital entrance, a series of clinical audits focusing on this topic which were presented at appropriate fora (e.g. surgical grand rounds, monthly VTE online education sessions). Completion of the VTE risk assessment tool also forms part of the VANISH drug error medication safety education programme.



Hospital Acquired VTE January 2019 to September 2020

In 2020 the Hospice Friendly Hospitals programme received a very generous donation of a small number of tablets to facilitate 'virtual visiting' to

- ▶ Support patients to stay in touch with their relatives when they don't have access to a smartphone or who are too frail or ill to use their phone to make a video call.
- ▶ Improve end of life care and allow a 'virtual visit' take place in cases where a family member can't visit the hospital..

The team devised a system to facilitate virtual visiting in the hospital which includes

- ▶ The Intensive Care Unit (ICU), High Dependency Unit (HDU), St Anne's and St Cecelia's Ward, were allocated a tablet each to facilitate 'virtual visiting' in their respective ward areas.
- ▶ The Specialist Palliative Care Team also facilitates 'virtual visiting' for patients.
- ▶ In addition any staff member can identify a patient who they believe would benefit from a 'virtual visit' and can get access to a tablet on their ward.



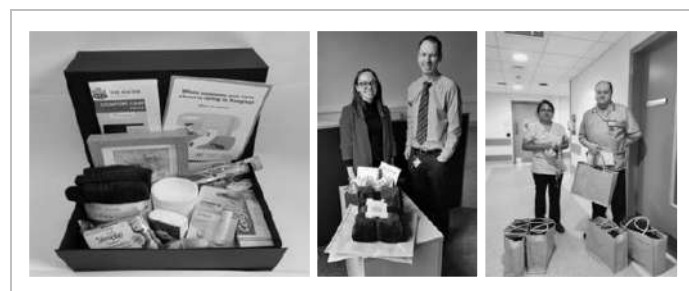
New Virtual Visiting Tablets

Comfort Care Pack

Pre Covid-19 , the Mater team developed a comfort care pack to help provide some comfort when a person is seriously ill or dying.

Each box is filled with several practical items including a blanket, face cloths, face wipes, a toothbrush and toothpaste. It also includes

- ▶ a hand and body moisturising cream for a hand massage
- ▶ a lip balm to moisten lips
- ▶ a picture frame, to hold a photograph of family, a pet or a place the person enjoys going to relax and unwind
- ▶ a battery-operated candle to provide a soothing atmosphere



Comfort Care Packs

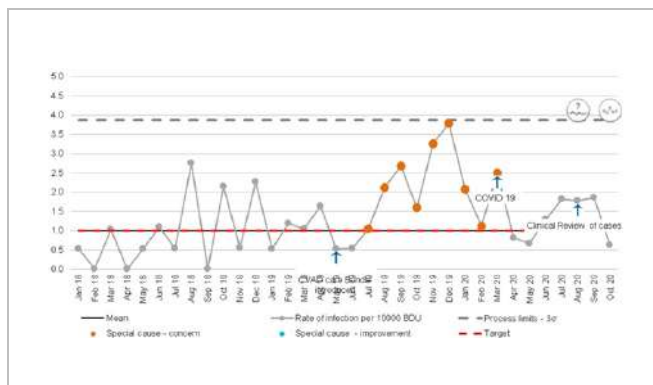
Infection Prevention and Control

Hospital-acquired infections (HAIs) are a long-recognised problem affecting the overall quality of health care.

The Mater Hospital monitors the level of hospital acquired infections to provide quality outcome indicators and identify key measures in order to reduce the burden of HAIs. This level of monitoring enables the hospital to

- ▶ Identify trends, including the detection of outbreaks
- ▶ Provide early warnings and investigation of infection problems, and subsequent planning and intervention to control
- ▶ Prioritise resource allocation
- ▶ Examine the impact of interventions
- ▶ Gain information on the overall quality of patient care

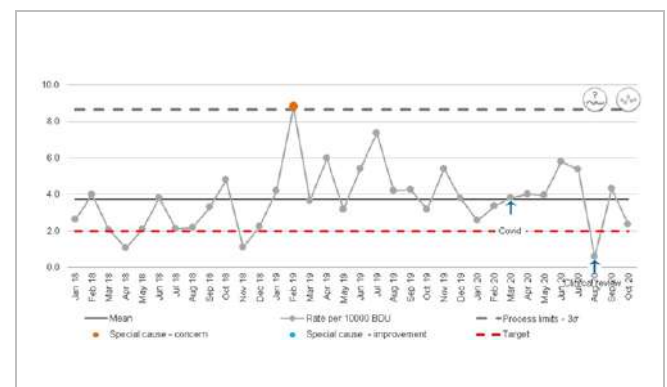
Hospital Acquired Infection



Staphylococcus Bacteremia Infections January 2018 to October 2020

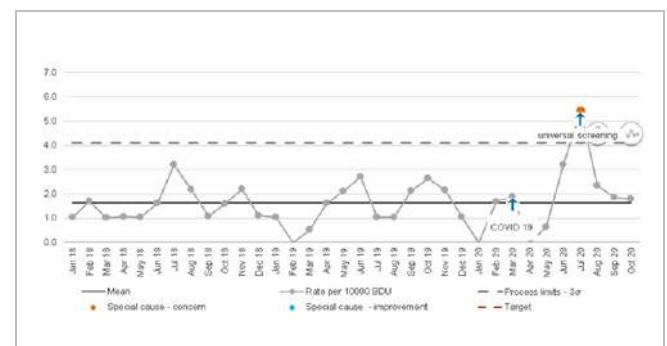
There has been a statistically significant improvement in the rate of staph aureus bacteraemia infection since April 2020. The addition of additional microbiology resources from November 2020 allowed clinical review of each case has taken place; this has enabled improved root cause analysis and feedback to

teams. Of note only one staph aureus bacteraemia case was potentially preventable.



Clostridium Difficile Infections January 2018 to October 2020

The rate of Clostridium Difficile infection is stable but high. High prevalence in the community may be a significant contributor to hospital rates remaining above national target. Cases are categorised as Minor, Moderate or Severe. There have been no severe cases reported since June 2020. There is ongoing work led by the microbiology, pharmacy and Quality and Patient Safety (QPS) teams to promote good antibiotic stewardship and IPC team to promote good hygiene practices and reduce risk of cross-contamination.



Staphylococcus Bacteremia Infections January 2018 to October 2020

” *The rate of cases of CPE detected reflect the introduction of universal screening on admission from 5th July 2020*

The hospital introduced several initiatives to reduce hospital acquired infections, such as

- ▶ hand hygiene campaigns
- ▶ implementation of line care bundles
- ▶ antimicrobial stewardship education led by IPC team/microbiology
- ▶ covid-19 management pathways

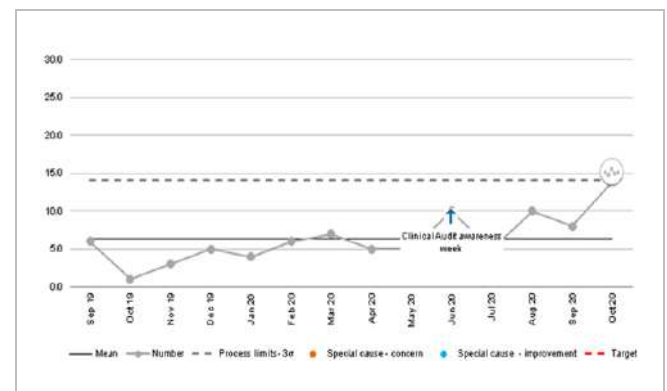
Clinical Audit and Effectiveness Committee

In 2020 the Clinical Audit and Effectiveness Programme prioritised the use of clinical audit as an everyday tool for better understanding healthcare challenges and delivering improved care.

There was particular focus on developing the clinical audit mentorship programme, access to clinical audit education materials and support services.

The newly convened clinical audit and effectiveness committee met monthly to approve audit applications and reports and to agree strategy to promote clinical audit across the hospital.

The annual clinical audit day planned for Friday 3rd July 2020 was replaced this year with a successful scientific poster display of completed audits.



Clinical Audit Applications September 2019 to October 2020

Transformation Office

The Transformation Office at the Mater Hospital supports and drives the change agenda across the hospital. It manages a number of large-scale projects relating to both un-scheduled and scheduled care.

All Transformation projects have a central purpose of improving patient's experience, irrespective of whether they are directly related to frontline care or the infrastructure and processes that support the delivery of care.

During 2020, the Transformation Office focus adapted to the impact of Covid-19 on the hospital and the wider health service by providing significant support to the Mater's Covid-19 response. For extended parts of the year the full transformation team were deployed onto Covid-19 related projects.

Covid-19 Response

Covid-19 Remote Monitoring Clinic

The Remote Monitoring Clinic was established to manage the significant number of patients who had a relatively mild clinical course with Covid-19. The clinic was part of the hospital strategy to preserve the bed base for those who required in-patient care.

Utilising an app and bluetooth enabled pulse oximeters, key patient metrics were recorded and monitored remotely by the clinical teams. The transformation team worked closely with the software provider (patientMpower) and the hospital Information Management Services Department to develop electronic records that were accurate, secure and available to clinicians 24/7.

During Covid-19 surges there were often over 100 patients on daily remote monitoring.

Telehealth

The Covid-19 pandemic necessitated rapid adoption of new technologies and service models to facilitate remote care wherever possible across all outpatient specialties. In March the administrative process was adapted to enable phone-based consultant clinics to be scheduled and documented and the activity captured. In April 2020, approximately 70% of outpatient clinic consultations recorded on the system were virtual. Recognising the significant initial achievement and based on the Transformation Office's recommendations report ("Telehealth: opportunities for innovation of outpatient care during Covid-19 pandemic and beyond") several telehealth initiatives were progressed

- ▶ Video consultation rolled out across all specialities via the T-Pro platform
- ▶ Enhanced reporting on virtual activity to enable monitoring of activity.
- ▶ Development of online support tools for patients and staff using telehealth.
- ▶ Development of the "MyPatientSpace App" for interfacing with the outpatient department and empowering them in self-care which was piloted in Q4 2020 and continues in Q1 2021.

Volunteer Design Team

The hospital's relationship with the National College of Art and Design (NCAD), which started with the first Design Week in 2016 and has run annually ever since. At the outset of the pandemic, a team of lecturers and students from the Design School at NCAD offered their services voluntarily to support the Mater in its

response to the highly pressured and rapidly changing Covid-19 context. This team of designers were on stand-by for ten weeks, working remotely and in their own time to quickly turn around design work required by hospital staff and management. The Transformation Office coordinated this work, which included design of numerous posters, leaflets, directional signage, advice on digital tools and development of a suite of algorithms to help staff quickly understand new processes and protocols. This invaluable work was testament to the strength of the relationship between the two institutions.

Covid-19 Staff Communications – Bulletin and Covid Centre

During the early stages of the COVID-19 crisis, it became clear that the hospital faced a real challenge in communicating clearly and efficiently with all staff, particularly those not desk based. Staff had a pressing need for consistent, approved, reliable information and advice but also very little capacity to read through details emails and memos from a variety of sources. To help address this, Mater Transformation worked with the **National College of Art and Design (NCAD)** volunteer designers, to develop the Mater COVID-19 Staff Bulletin. This one-page Bulletin provides the most critical messages in a centralised place. Critically, it was scannable and signposts the reader elsewhere for additional information. It also included a combination of operational information but also information about how staff can take care of themselves while dealing with the crisis. It was written in plain English and bullet format. The feedback from staff on the Bulletin was extremely positive and by the end of 2020, 41 issues had been published.

Covid-19 Med-Tech Innovation

In response to the Covid-19 pandemic, the innovation function within the Transformation Office pivoted to focus on medical device innovation that specifically addresses the new needs that were identified by Mater staff working in the Covid-19 context. The Transformation Office leveraged its relationship with

the National College of Art and Design in responding to these challenges

- ▶ **Colear** This medical device innovation is a novel face mask which will reduce risk of infection during routine ENT and Speech & Language Therapy (SLT) procedures - including oral cavity examination, nasoendoscopy and laryngoscopy. Colear also has a clear front allowing the clinician to look into the mouth as well as better read facial expression. This project emerged out of a collaboration over the summer of 2020 between ENT, SLT, Transformation and a master's student from NCAD. Funding was secured through Mater Foundation to bring this project to the next stage – fine tuning the design so that it is commercially viable and ready for manufacture. This work will be carried out in 2021.
- ▶ **Covid-19 Proning Project** This project set out to address the challenges faced by patients and staff using 'awake proning'. This well established treatment for Covid-19 involves the patient lying on their front for extended periods with face mask in situ. It can be uncomfortable, painful, difficult to tolerate and cause risk of pressure areas on the face. The Innovation Manager and Clinical Nurse Manager (CNM III) for Innovation, Technology & Research worked with a volunteer from NCAD to research the market for suitable solution and quickly identifying a gap in the market. An industry partner was identified (Irish company TruLife) and a team of critical care nurses, physiotherapist and occupational therapists were formed to serve as Key Opinion Leaders. The group's goal is to develop a new solution to better support tolerance and comfort and reduce risk of pressure areas during awake proning for Covid-19 and other respiratory conditions.

Non- Covid Activity

Dermatology and Plastics Transformation Project

Access to OPD and consequent treatment and procedures were a major driver in the selection of these specialities to undergo a transformation

programme- both of which have significant out-patient department (OPD) waiting lists of 3,455 and 2,722 respectively (Nov 2020). The changes in OPD initiated by the Covid-19 pandemic also provides opportunity to select these specialities as a medical and surgical services respectively that will be subject to more whole system transformation and serve as flagships for improvement and innovation in OPD. The programmes were initiated in August 2020 with focus on the shared Skin Cancer Service and used a root and branch analysis of both services being carried out in parallel. Extensive data gathering was carried out in the month of September, including a weeklong GEMBA period where on the ground observational studies were carried out to understand and review current processes and practices.

The Value Stream Analysis event was carried out on the week of 5th October at which data was presented, analysed and solutions generated, was very well attended by all clinical teams and supported by senior management. What emerged is a change programme for the two services with three major improvement streams across the Skin Cancer, Dermatology and Plastic Surgery Services – 16 project streams in total. A *30 Day Report Out* to a Senior Management team took place on 10th December to provide update on the change programmes with work well progressed within each of the 16 Project Streams. An overview of the agreed target areas is given below

Dermatology Improvement Programme

- ▶ **Referrals to Triage** Standardising triage to allow equity in access for patients and ensure patients requiring urgent appointments have access to earliest available slot
- ▶ **Streamlining Clinics**
 - Introducing structures to optimise existing capacity
 - Facilitating Clinical Nurse Specialist (CNS) led clinics
 - Restructuring clinics to enable new and consolidated pathways
- ▶ **Streamlining Procedures**
 - Optimising capacity in existing procedure room

- Improving accuracy in data capture
- Plastic Surgery Improvement Programme

Developing a Hub and spoke model

- Development of pathways to enable hub and spoke model to enable best use of model 4 services going forward and utilizing capacity in associated model 3 centres
- ▶ **Clinic efficiencies**
 - Improving information flow and planning for hand therapy patients, building up to therapy led clinics for hand patients to improve flow and increase capacity in clinics.
 - Separating wound care clinic from general to enable additional capacity for complex and new patients at consultant led clinics
 - Developing a model for tissue viability CNS to run same
 - Separating skin cancer clinics and hand clinics
- ▶ **Physical infrastructure**
- ▶ **Developing model** to support current and future Plastics Surgery service

These streams will continue during 2021 building incremental improvements reporting out to senior management at key milestone events.

StrokeLINK

StrokeLINK is a Slaintecare funded initiative that innovates how patients are supported as they transition from hospital to community post stroke. Patients are supported by a StrokeLINK nurse and a suite of tools to empower them in self-care post stroke. This project is a collaboration between the Mater Stroke Service, the Mater Transformation Office and the National College of Art and Design. Despite recruitment challenges, followed by period of redeployment of key staff due to the pandemic in March, this project made excellent progress in 2020. Feedback to date from patients is extremely positive and preliminary data showed significant impact on patient outcomes, with reduced crisis visits to the Emergency Department and avoidable readmissions. Due to pandemic redeployment issues, the project

will run until July 2021. The goal will be to develop a fully tested, transferrable model for transitional stroke care which can be scaled nationally.

Innovation Funding Support

The Public Service Innovation Fund and the Spark Seed Fund both had funding calls in January 2020. Support was provided to staff across the hospital with applications by the Innovation Manager and the Clinical Nurse Manager for Innovation, Technology and Research. A number of staff were shortlisted for the Spark Seed Fund. The process was then paused due to the Covid-19 pandemic.

Connected Clinical Innovation

This collaboration between the Mater Hospital, NOVA UCD and National College of Art and Design (NCAD) seeks to develop a robust model for enabling healthcare staff to actively engage with needs led innovation in the medical device and digital healthcare sector. In January 2020, funding was secured from Knowledge Transfer Ireland to support the group with international site visits to learn from centres of excellence internationally. Following significant delays to the project due to restrictions on international travel and challenges for staff in committing time due to the pandemic, the team agreed to commission an external consultant instead to carry out interviews remotely. This work will be completed in Q1 2021.

Design Week

The 6th Annual Mater-National College of Art and Design (NCAD) Design Week ran from 23rd -27th November. The nine projects this year ranged from solutions to address mental health in diabetes patients, to reducing risk of Covid-19 transmission among healthcare staff on breaks.

Final solutions were presented as part of a 'Design in Health' webinar on Friday 27th. Over 80 people

participated in this online event featuring four international keynote speakers for the first time which was made available on the Mater intranet.

The winning project, *In a Flap about Consent*, led by Ms Christine Quinlan, Plastic Surgeon, received a €3,000 seed fund to kick start the project. The Mater Transformation Office and the Clinical Nurse Manager for Innovation will continue to provide guidance and support to each of the Mater project leads in rolling out solutions in 2021.

Transformation Clinic

In March 2020 the Mater Transformation Office developed a new "Transformation Clinic" and held its first consultation session. This is a new and unique clinic, which offers Mater staff the chance to discuss their ideas for improving the service they deliver, through mentorship in quality and service improvements, innovation and creative design, lean, six-sigma and person-centred improvements. A second clinic was held in September.

In October 2020, Transformation ran a clinic jointly with the Quality and Patient Safety Directorate team. Staff with improvement ideas came forward for direction and mentoring from Innovation, Lean and Quality functions. It was agreed that these joint sessions could be expanded to a group format for shared learning. The model will continue to evolve in 2021 – the shared goal being to develop a format that provides a wide base of staff the opportunity to access mentoring and guidance with limited resource available from the Transformation and Quality teams.

Robotic Process Automation

Robotic Process Automation (RPA) is becoming embedded in global healthcare services and has been shown to deliver efficiency, risk reduction and save costs. The HSE is actively supporting the expanded use of RPA in Ireland. Subsequent to the successful implementation of RPA by the Infection Prevention and Control Team, the Mater Hospital is recognised as

being uniquely positioned to become a Centre of Excellence for Robotic Process Automation in healthcare. A mechanism to deliver on RPA potential in the Mater has been proposed to ensure appropriate governance.

The RPA leads in the Department of Public Expenditure and Reform (DPER) are very keen to support growth of RPA at the Mater. The first step is to up skill Mater staff in RPA implementation practices. Four Mater staff undertook training in 2020 and further training will be provided in the first quarter of 2021. A group from IMS, Transformation, HR and Finance began to meet with a view to selecting and delivering RPA projects.

Safer Identification (SID)

Numerous studies have now shown beneficial effects of introducing electronic Positive Patient Identification (ePPID) to Laboratory sample collection procedures (Lippi, 2016).

Through the Lean Academy Black Belt programme, a Mater Team has developed a prototype ePPID application (Safer IDentification – SID) which could be used during laboratory sample collections but also in multiple other workflows in the Hospital e.g. in the Emergency Department to ensure accuracy in patient identification when performing X-rays or CT scans.

The implementation of electronic Positive Patient Identification is key to reducing the risk of Serious Adverse Events at the hospital. Additionally, it is anticipated that the Mater will recoup more than 1,000 hours per year of staff time currently being lost to the follow up of laboratory sample labelling errors. Funding is required to further develop the prototype application in conjunction with an industry partner before it could be deployed to the live environment. In Q4 2020, the project team began meetings with potential funders with promising feedback to date.

Mater Lean Academy

Despite significant interruptions to the Mater Lean Academy programmes during 2020, the Academy had a very fruitful year in terms of numbers of participants subscribed, income generated and project outputs. Following three months of full redeployment of the entire team between March and May 2020, with suspension of all programmes, normal service resumed in June. In line with Covid-19 restrictions the Academy redesigned their programmes for delivery through a virtual platform which has received very positive feedback from both Mater staff and external organisations, leading to repeat bookings.

Demand for the Academy's courses continues to grow, both internally within the Mater and also nationally with courses booked up into 2021.



Mater Lean Academy Course	Description	Participants in 2020
White Belt (Six Fundamentals of Lean)	This one-day programme introduces improvement methodologies for healthcare staff including the Model for Improvement, Lean, Six Sigma and Person-centred care.	230
Green Belt (Professional certificate)	Six-month project based course. 12 projects teams formed for the 2020/2021 academic year – 4 Mater and 8 external. 17 Mater staff are allocated to 4 Mater project teams to work through the DMAIC - a data-driven improvement cycle used to improve, optimise and stabilise processes over 6 months. These are in the areas of Gynaecology-Oncology (pathway for ureteric stent exchanges), Neurology referrals, Haematology lab processes and Nursing post graduate processes and systems.	50
Black Belt (UCD Graduate Diploma Lean Six Sigma for Healthcare – NFQ Level 9)	One year project based Graduate Diploma. Two Mater employees completed their Black Belt qualifications in December 2020 (delayed due to Covid-19). The objective of the first Black Belt project was to standardise internal processes pertaining to Home care packages with goal of reducing lead time and delays in patient journeys and ultimately impacting on LOS. The second Black Belt project looked at scheduling within the Interventional Radiology department. Three external candidates were accepted onto the 2020/2021 programme which commenced 7th September.	2 completed report out (2019/2020 academic year) 3 subscribed for 2020/2021

Transformation Publications 2020

- ▶ Connolly, K., Teeling, S.P., McNamara, M. (2020) 'Live Well after stroke' International Practice Development Journal 10(2)pp.1-16.
- ▶ Teeling, SP., Dewing, J., Baldie, D. (2020) 'A Discussion of the Synergy and Divergence between Lean Six Sigma and Person-Centred Improvement Sciences', International Journal of Research in Nursing, 11, 10-23.
- ▶ Sanders, K., Marriott-Statham, K., Mackay, M., McMillan, A., Rennie, K., Robinson, B.A., Teeling, S.P., (2020), "The Student International Community of Practice: a critical reflection on the shared experience of being a member, using creative hermeneutics", International Practice Development Journal, vol. 10, no. 1, pp. 1-10.
- ▶ O'Connor L, Coffey A, Lambert V et al. Quality care process metrics (QCP-Ms) in nursing and midwifery care processes: a rapid realist review (RRR) protocol [version 2; peer review: 2 approved]. HRB Open Res 2021, 3:85 (<https://doi.org/10.12688/hrbopenres.13120.2>)
- ▶ Cunningham, U., De Brún, A., and McAuliffe, E. (2020) 'Application of the critical incident technique in refining a realist initial programme theory', BMC Medical Research Methodology, 20(1), p. 131. doi: 10.1186/s12874-020-01016-9.
- ▶ De Brún, A., Anjara, S., Cunningham, U., Khurshid, Z., MacDonald, S., O'Donovan, R., Rogers, L. and McAuliffe, E., (2020). The Collective Leadership for Safety Culture (Co-Lead) Team Intervention to Promote Teamwork and Patient Safety. International Journal of Environmental Research and Public Health, 17(22), p.8673. doi.org/10.3390/ijerph17228673



Clinical Services

Clinical Services

Quality care is about more than just the outcomes, it's about the patient experience throughout their entire journey

At the Mater, our clinical staff participate in research and continuous education so they can stay up on the latest innovations in healthcare

The Mater team prides themselves on providing patient centred clinical care that is delivered in a coordinated and integrated manner. Each specialty focuses on delivering individualised care with the purpose of achieving the best possible outcomes for patients. Quality and patient safety are the number

one priority for everyone at the hospital and we constantly assess and improve the care we provide. State of the art healthcare also requires a state of the art campus and our campus continues to extend and evolve to meet the ever changing needs of our patients.

Cancer

The Mater Misericordiae University Hospital is one of the eight nationally designated cancer centres, a designated centre for breast, lung, prostate and colorectal cancer as well as being a major cancer clinical trials centre.

The Cancer Directorate has an ambitious agenda to evolve into a world class cancer centre and has defined its key priorities over the next five years as to

- ▶ Work towards Organisation of European Cancer Institutes (OEI) accreditation as a Cancer Centre.
- ▶ Develop and Adolescent and Young Adult Cancer Centre.
- ▶ Collaborate with our community partners.
- ▶ Develop and Early Phase Clinical Trials Unit

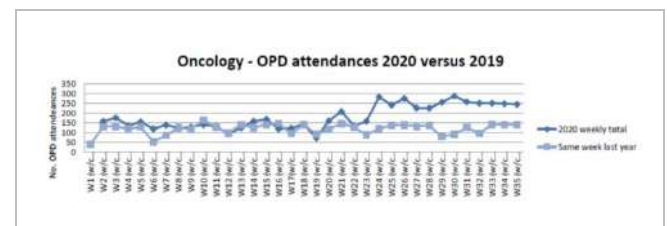


Departments within the Cancer Directorate

Covid-19 and Cancer Care

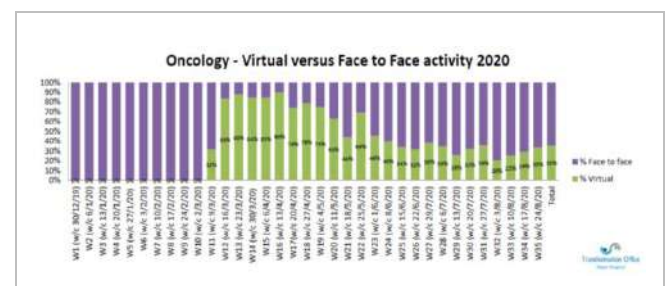
The Cancer Directorate provides tertiary medical

Oncology services and in an average week, the hospital accommodates approximately 150 clinic appointments and 300 systemic anti-cancer treatment (SACT) appointments to ambulatory patients. Virtual clinics (VC) or telemedicine was introduced for medical oncology outpatient clinics in March 2020 to minimise potential risk of exposure to Covid-19 amongst an immunosuppressed, high-risk population.



Oncology OPD Attendances 2019 and 2020 (weeks 1-35)

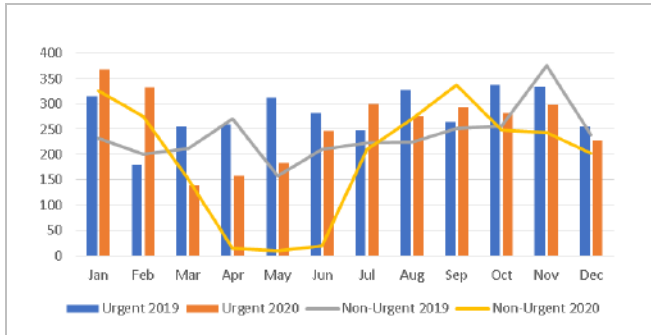
The introduction of virtual consultations whether by phone or video has been embraced by the team at the hospital and patient feedback has been very positive. Triage and screening protocol for patients attending the outpatient appointments or for surgery/ treatment continues for all patients coming into the Mater



Oncology Virtual vs Face to Face Activity 2020

Breast Cancer

Rapid Access Clinic

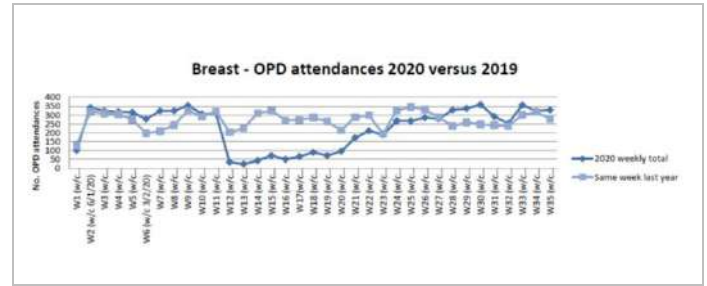


Rapid Access Breast Clinic Attendances (Urgent and Non-Urgent 2019 vs 2020)

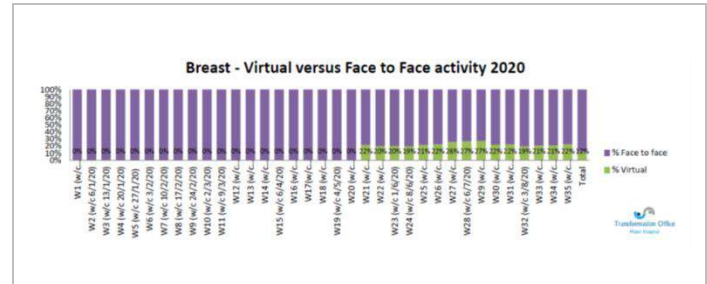
The Mater Hospital is one of the eight nationally designated cancer centres and provides rapid access cancer services for patients with suspected breast, lung and prostate cancer. Attendances at the Rapid Access Breast Clinic were impacted by the outbreak of the Covid-19 pandemic. Overall urgent referrals to the clinic were down by 8.7% in 2020 compared to 2019 with March, April and May 2020 being the most heavily impacted months (approx. 40% below the same time period in 2019).

Non-urgent referrals were even more heavily impacted with attendances 23.5% lower than 2019. April, May and June were the worst affected months with a total of 43 patients attending for those three months combined compared to 638 in the same period in 2019.

A similar picture can be seen in out-patient attendances to the breast service. Attendances were immediately impacted in the first months of the Covid-19 lockdown followed by a recovery over the summer months as restrictions are eased.



OPD Breast attendances 2019 vs 2020 (weeks 1-35)

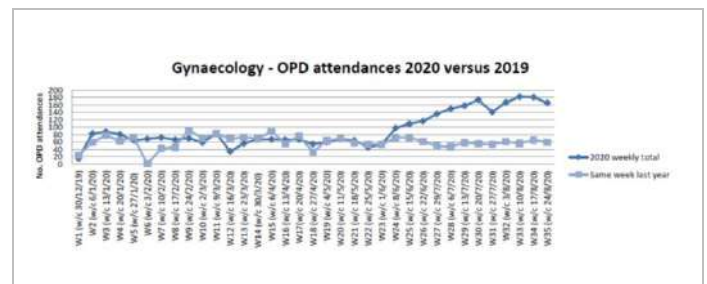


OPD Breast Virtual vs Face to Face Activity 2020

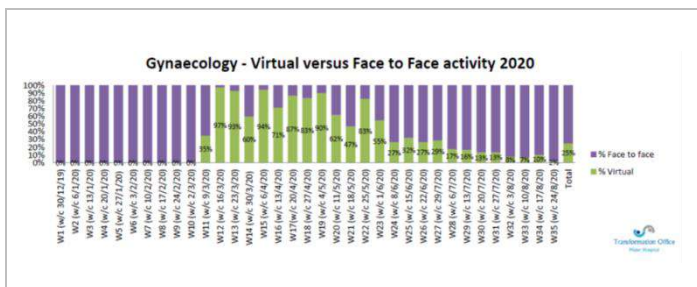
Gynaecological Oncology

The Gynaecology-Oncology service is a specialised sub-specialty of gynaecology and accepts tertiary hospital and GP referrals for confirmed gynaecological cancers. The Gynaecology-Oncology team consists of specialist gynae-oncologists, specialist nurses including a Clinical Nurse Consultant and team of allied health specialists including physiotherapy, psychologists, social work and nutrition & dietetics.

The Gynaecology-Oncology team adapted well during the first wave of Covid and embraced the move to virtual clinics. The majority of clinic visits during the April to June period were carried out virtually and supported an overall increase in attendances during 2020.



OPD Gynae Oncology attendances 2019 vs 2020 (weeks 1-35)



OPD Gynae Oncology Virtual vs Face to Face Activity 2020

European Society of Gynaecological Oncology (ESGO) Accreditation

In 2020 the Gynaecological Oncology Service at the Mater became the first and only Irish centre to receive the ESGO certification for Advanced Ovarian Cancer Surgery. The ESGO certification for advanced ovarian cancer surgery is an award attributed to institutions which can offer patients the specific skills, experience, organisation and dedication that are required to achieve optimal levels of surgical care.

The ESGO certification is based on the completion of 10 quality indicators and a scoring system that has been designed and internally validated with an International Expert Panel. Centres interested in getting certified must

- ▶ Complete and meet the ESGO quality indicators.
- ▶ Perform a minimum of ≥ 24 cytoreductive surgeries for advanced epithelial ovarian cancer per year and a minimum 12 primary debulking surgeries yearly (secondary and tertiary surgeries for recurrences are not included).

ESGO is the leading European organisation involved in the treatment, care and research of gynaecological cancer. Based on European standards of training and care, ESGO provides supervision of accredited training and has been running hospital recognition for excellence in training and care while accrediting centres across Europe.

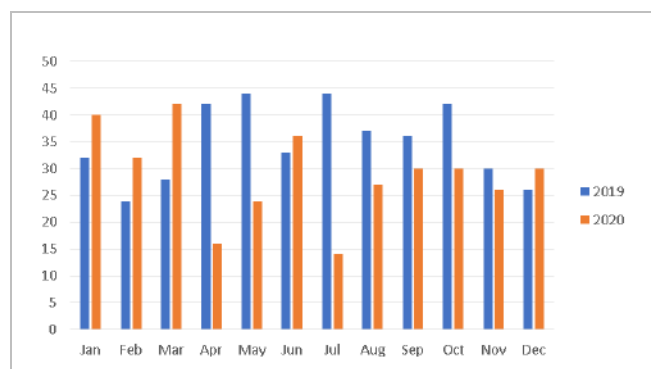
National Centre for Peritoneal Malignancy

The Mater Misericordiae University Hospital is the National Cancer Control Programme’s (NCCP) single National Centre for Peritoneal Malignancy. Prior to the services repatriation to Ireland from Basingstoke, UK in 2013, patients diagnosed with these forms of cancer had the very poor prognosis of a 6-month life expectancy. Patients can now benefit with improved survival, and importantly, improved quality of life, from this aggressive surgical approach. The vast majority of patients undergo surgery for pseudomyxoma peritonei, metastatic appendix adenocarcinoma or colorectal cancer peritoneal metastases. The programme has expanded to treat patients with advanced ovarian cancer and to selected patients with gastric cancer peritoneal metastases.

Lung Cancer

Rapid Access Lung Clinics

The Mater Hospital’s Rapid Access Lung Cancer Clinic is one of eight designated rapid access lung cancer clinics in the country. Similar to the Breast Cancer Rapid Access Clinic attendances in 2020 were lower than 2019 with April, May and July being the most heavily impacted months.

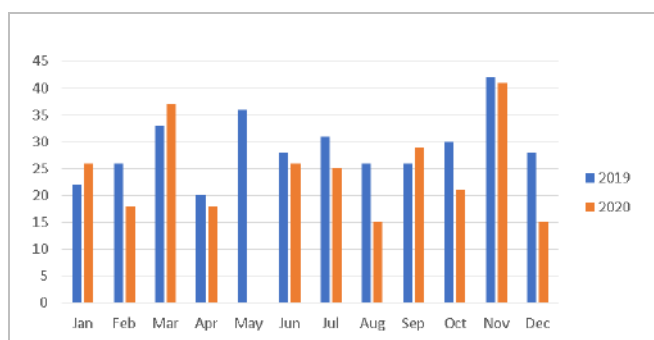


Rapid Access Lung Cancer Clinic Attendances 2019 and 2020

The National Cancer Control Programme designated KPI for Rapid Access Lung Cancer Clinics is “% of patients attending lung rapid access clinics who attended or were offered an appointment within 10 working days of receipt of referral in designated cancer centres”. The KPI is 95% which was exceeded by the rapid access team on every month in 2020.

Urological Cancer

The Mater Hospital's Urology Department is the national centre for urethral surgery, a national centre for prostate cancer surgery, a national centre for kidney cancers involving the inferior vena cava (IVC) and is a tertiary referral centre for minimally invasive renal surgery and pelvic oncology.



Rapid Access Prostate Cancer Clinic Attendances 2019 and 2020

The Mater Hospital is one of the eight National Rapid Access Clinics for patients with suspected prostate cancer. Rapid Access Prostate Clinics were established by the National Cancer Control Programme (NCCP) in 2012. Attendances at the service were 22% lower in 2020 when compared to 2019 driven by the Covid-19 pandemic.

The aim of the Rapid Access Clinic is to provide faster access to diagnosis and treatment for patients with suspected prostate cancer. The Key Performance Indicator set by the NCCP is that “Men with suspected prostate cancer referred to a Rapid Access Clinic shall be offered an appointment to attend within 20 working days of receipt of referral”. (Target 90%)

Colorectal Cancer

Colorectal Surgery

The Mater Hospital has five colorectal surgeons, with a special interest in colorectal cancer. The hospital is one of the national rectal cancer centres. Each year, over 250 colon cancers are diagnosed and treated at the Mater Hospital. The five surgeons in the Mater who treat the entire spectrum of rectal cancer from very early polyp cancers right through to advanced rectal cancer that has spread outside the rectum. The surgical team have specialist experience in laparoscopic (keyhole), endoscopic, major open and transanal (TAMIS, taTME) surgery, peritonectomy and HIPEC, extenteration and sacrectomy. The colorectal surgery department provides many innovative treatments to patients with cancer as well as patients with various benign (non-cancerous) conditions including

- ▶ **Pseudomyxoma peritonei and HIPEC** The Mater Hospital is the only centre on the island of Ireland offering cytoreductive surgery and heated intraperitoneal chemotherapy (HIPEC) for certain cancers such as appendix tumours, advanced colorectal cancers, and other rare intra-abdominal cancers. HIPEC is a highly concentrated, heated chemotherapy treatment that is delivered directly to the abdomen during surgery.
- ▶ **taTME (Transanal Total Mesorectal Excision)** taTME is a new minimally invasive robotic alternative to conventional surgery for patients with lower rectal cancer. The main benefit of this procedure is that it allows the surgeon to better visualise and remove the tumour in lower rectal cancers while avoiding a bigger incision on the skin.
- ▶ **TAMIS (Transanal minimally invasive surgery)** Transanal minimally invasive surgery provides a less invasive surgical option for patients with early-stage cancer. Previously, surgery to remove these tumours required an abdominal incision. Now using innovative approaches, certain early stage cancers or rectal polyps may be removed without a

surgical incision. Techniques such as this reduce pain and recovery time for patients.

Gastroenterology

The Mater Hospital is a tertiary referral centre and one of the National Leads in ERCP (Endoscopic Retrograde Cholangio-Pancreatography). In certain cases, patients require a more specialised endoscopic procedure with greater sensitivity and an ability to detect gastrointestinal abnormalities that a regular endoscopy may miss. ERCP is a diagnostic procedure used to examine the gallbladder, bile and pancreatic ducts. ERCP combines X-ray and endoscopy, allowing the consultant to obtain high-quality images of the anatomy.

ERCP is used when it is suspected that the person's bile or pancreatic ducts may be narrowed or blocked due to tumours gallstones that form in the gallbladder and become stuck in the ducts inflammation due to trauma or illness, such as pancreatitis infection valves in the ducts, called sphincters, that won't open properly scarring of the ducts, called sclerosis pseudocysts—accumulations of fluid and tissue debris

ERCP is a technically demanding procedure with the National Guidelines recommending between 200-300 procedures performed annually by each endoscopist to maintain the relevant competence level.

BowelScreen

In Ireland, bowel (colon, rectal or colorectal) cancer is the second most common newly diagnosed cancer among men and women with over 2,500 new cases reported annually. The number of new cases is expected to increase significantly over the next 10 years, due to the aging population. Colorectal cancer is currently the second most common cause of cancer death in Ireland.

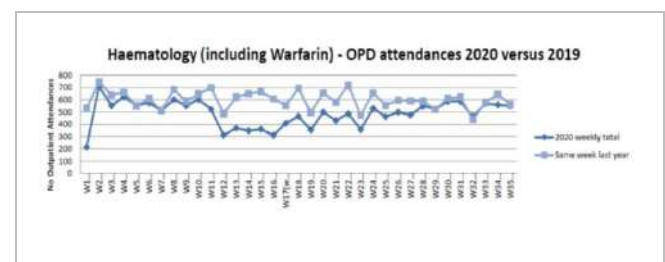
The national bowel cancer screening programme (BowelScreen) was set up as a national population screening programme for bowel cancer. It offers screening every 2 years to all men and women aged

60 to 69. Patients who have an abnormal screening test are offered a colonoscopy procedure. This investigational procedure is carried out in one of 14 designated hospitals around the country. The Mater is one of the 14 designated hospitals for BowelScreen and in addition it provides the full symptomatic service for patients that are diagnosed with cancer. The service at the Mater is accredited by the Joint Advisory Group on Gastrointestinal Endoscopy (JAG) whose purpose is to ensure that each endoscopy services have the skills, resources and motivation necessary to provide the highest quality, timely, patient-centred care.

Haematology

The haematology service in the Mater Hospital offers innovative treatment for a broad spectrum of blood disorders, both non-cancerous and cancerous, including

- ▶ Anaemias
- ▶ Bleeding disorders
- ▶ Clotting disorders
- ▶ Anticoagulation problems
- ▶ Myeloproliferative disorders (essential thrombocythemia, myelofibrosis, chronic myeloid leukaemia)
- ▶ Plasma cell disorders
- ▶ Platelet disorders

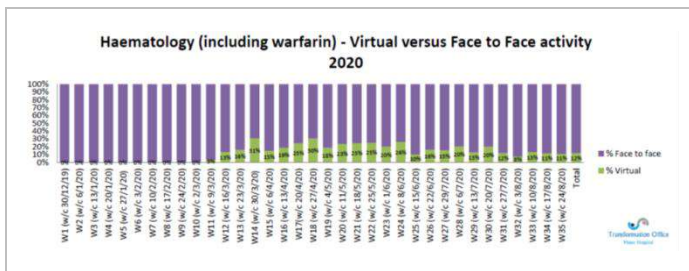


Haematology Clinic Attendances 2019-2020

Multidisciplinary working is integral to haematology and at the Mater this involves weekly multidisciplinary team meetings (MDT's) and work closely to utilise a variety of treatment strategies that will best meet the patient's individual needs, including

- ▶ Chemotherapies and combinations of existing treatments.
- ▶ Radiation therapies.
- ▶ Novel targeted therapies, which block specific molecules involved in the growth and progression of cancer cells.
- ▶ Immune therapies, such as vaccine and cellular therapy; and
- ▶ Bone marrow/stem cell transplantation, including traditional and reduced-intensity transplant, using related, unrelated or umbilical cord blood cells for transplant.

diagnosis, treatment and care of head and neck cancer. The team provides an integrated and unified service with St Vincent’s University Hospital which allows the pooling of resources and takes advantage of the breath of expertise in both units. Not only does this allow more efficient and flexible use of theatre time, ICU / HDU availability, it affords access to a broader range of specialties on-site for more complex cases. The direct benefit for patients has been the reduced waiting times for outpatient appointments and theatre access despite the high volume of Head and Neck cases passing through the new integrated service.



Haematology Virtual vs Face to Face Activity 2020

Head and Neck Cancer

The Head and Neck Cancer team at the Mater Hospital provides a comprehensive specialist service for the

A bi-weekly Head and Neck Multidisciplinary Team Meeting (MDT) is run in both hospitals with more complex cases discussed at the multi-site teleconferenced MDT across both hospitals.

For more complex surgical cases we take advantage of the broad mix of specialties and expertise with cases that require free flap reconstruction by our plastic surgery colleagues brought to the Mater Hospital for their surgery. While patients who require transoral robotic surgery (TORS) can have their surgery in St. Vincent’s or the Mater Hospital. Once functioning across both sites the Head and Neck will become a European centre for training and education in this field.

Cardiovascular, Respiratory, Renal, Diabetes and Endocrine

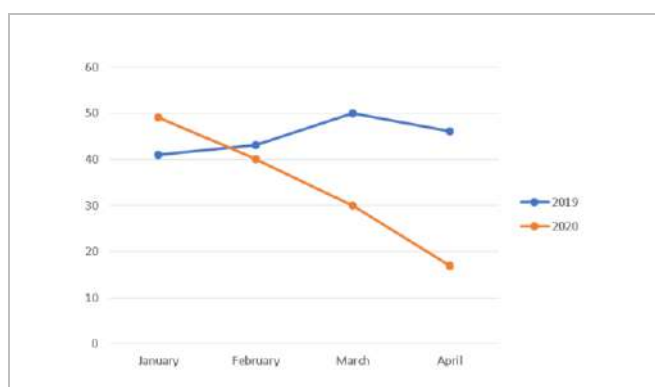
Cardiothoracic Surgery and Transplantation was significantly impacted by the arrival of Covid-19.

National Centre for Cardiothoracic Surgery

The significant repurposing of hospital services, in terms of both resource allocation and utilisation had a significant impact on cardiac surgery and heart and lung transplant services at the Mater. Service delivery was framed by the following considerations

- ▶ Intensive care availability.
- ▶ Patient Covid-19 exposure and the impact of that on the risk of concurrent major surgery; and
- ▶ Patient willingness to attend hospital for surgery.

In relation to transplantation the further considerations of confirmation of a safe donor and the vulnerability of the immunocompromised recipient needed to be factored in.



Total Cardiac and Transplant Cases performed January to April 2019 and 2020

The number of major cardiac surgery procedures in the first 4 months of 2020 was down 25% from 180 in 2019 to 136 cases in 2020.

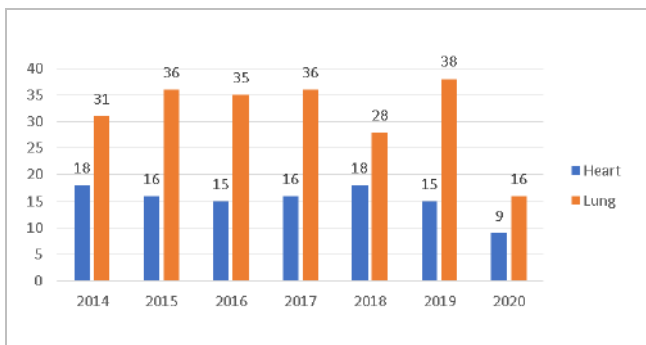
The impact of Covid-19 on service delivery is marked with January and February 2020 at similar activity levels to 2019 with the change occurring in March and April. Looking at March and April in particular: in 2019, 95 cases were performed in contrast with only 47 in 2020

Heart and Lung Transplantation

At any one time in Ireland there are between 550 and 600 people on waiting lists for organ transplants including heart, lung, liver, kidney and pancreas. There was a fall in the number of transplants in 2020 across all the national transplant programmes. Whilst the 190 transplants carried out were 84 less than in 2019.

The Mater Hospital is the National Centre for Heart and Lung Transplantation. In line with other transplantation programmes, the hospital saw a significant reduction in the number of transplants during the pandemic.

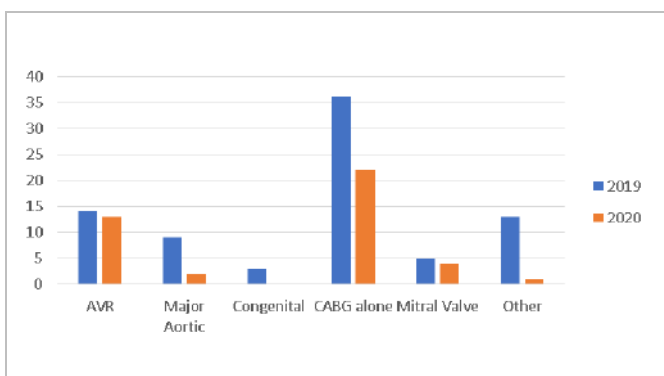
Heart transplants were down 40% while lung transplants were down by 58%. The impact of the pandemic was felt nationally with the total number of transplants carried out down from 274 in 2019 to 190 in 2020.



Heart and Lung Transplantations at the Mater Hospital 2014-2020

Cardiac Surgery

Cardiac surgery patients were also significantly impacted by the Covid-19 pandemic. These patients have high rates of hypertension and diabetes, two adverse risk factors for mortality with coronavirus infection and they require mechanical ventilation in the hours to days after surgery, requiring ICU level care.

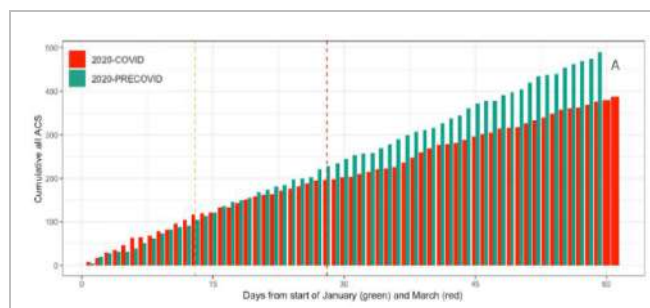


Breakdown of Cardiac Surgery Cases for March and April 2019 and 2020

The impact in the April and May 2020 was that 47% less procedures were carried out than in the same period in 2019. Of the 47 cases completed in the March and April 2020 period, 32 cases were performed on-site at the Mater Misericordiae University Hospital, while 15 were performed at outsourced locations.

Acute Myocardial Infarction

The Health Service Executive's Acute Coronary Syndromes Programme designates six primary percutaneous Coronary Intervention (PCI) centres in Ireland. The Mater is one of the two Dublin centres. In order to understand the impact of Covid-19 on primary PCI five of the six centres (Galway University Hospitals, Mater Misericordiae University Hospital Dublin, St James's Hospital Dublin, University Hospital Limerick and Waterford University Hospital) published their data in BMJ Open. The five participating centres in this study account for 79.7% of all ST Elevation Myocardial Infarction (STEMI) presentations in Ireland. Initial expectations were for an increase in acute coronary syndrome (ACS) presentations in line with existing evidence suggesting a link between respiratory infections and subsequent myocardial infarction. However, first reports during the initial phase of the Covid-19 outbreak showed a decline in presentations of ST-elevation myocardial infarction (STEMI) and hospital admissions for ACS, even where the healthcare system was not overwhelmed by Covid-19. As percutaneous coronary intervention (PCI) has a proven beneficial outcome in the management of ACS, there is a concern that a similar decline in PCI procedures during the Covid-19 pandemic could lead to incremental cardiac morbidity and mortality.



The cumulative incidence of PCI procedures for the treatment of all ACS, in 5 of the 6 national primary PCI centres, for 2 months preceding (green) and succeeding (red) the first confirmed COVID-19 case in Ireland

This data demonstrates a substantial reduction in PCI procedures performed during the initial stages of the Covid-19 pandemic in Ireland. During the 2 months since the first confirmed Covid-19 case, PCI rates for the treatment of all Acute Coronary Syndromes (ACS), Non ST-elevation acute coronary syndromes (NSTEMI) and STEMI dropped by 24%, 29% and 18%, respectively, compared to the prior 2 months. When compared with the same period in 2019 there was a 22% reduction of PCI for STEMI.

Heart Failure

The Heart Failure service at the Mater Hospital evaluates and manages a range of heart disease conditions that result in heart failure. Heart failure specialists use advanced therapies to treat patients with congestive heart failure and other conditions that might require a cardiac transplant. Our cardiologists are experts in diagnosing and treating heart failure, but also are well-versed in treating the following complex conditions

- ▶ Cardiac amyloidosis
- ▶ Cardiomyopathy
- ▶ Advanced congenital heart
- ▶ Cardiomegaly
- ▶ End-stage heart disease

The Mater Hospital runs a dedicated Heart Failure Clinic and Services for patients with heart failure. Heart failure services at the hospital covers the entire spectrum of care from medical management through device implantation and structural heart care to finally heart transplantation, if required. It is the provision of the complete range of services in one centre that make the Heart Failure services at the Mater unique.

Ventricular Device Programme

Ventricular assist devices are mechanical pumps that takes over the function of one or both ventricles of the heart. It is a temporary device designed to help the heart pump enough blood to the body. To accomplish support, blood flows from the heart to the

VAD (pump), and then back to the body. The patient may have a left ventricular assist device (LVAD), right ventricular assist device (RVAD) or biventricular assist device (BiVAD).

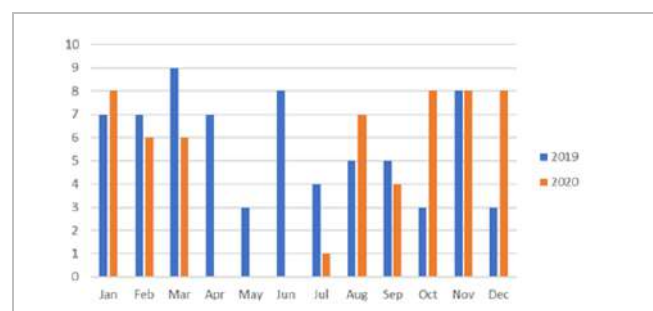
The devices are used as

- ▶ As a “bridge” to heart transplant surgery, increasing a patient’s survival time until a heart transplant can be carried out.
- ▶ In a small number of instances, the VAD may be inserted as destination therapy or the only available treatment for the patient.

The ventricular assist devices have reduced patients time spent in hospital awaiting transplant and has allowed for active rehabilitation before transplant.

TAVI Programme

The Health Information and Quality Authority (HIQA) in a published health technology assessment (HTA) review have recommended that the Health Service Executive (HSE) consider extending transcatheter aortic valve implantation (TAVI) — a minimally invasive alternative to open heart surgery — to patients with severe symptomatic aortic stenosis at intermediate and low risk of surgical complications.



Transcatheter Aortic Valve Implantation at the Mater 2019.

Currently TAVI is primarily offered as an alternative to surgical aortic valve replacement (SAVR) in patients that are otherwise inoperable or at high risk of surgical complications. For patients the main advantages of the technique is that the heart doesn't need to be stopped, so a heart-lung (bypass) machine

doesn't need to be used, and it avoids making a large cut (incision) in the patient's chest.

National Pulmonary Hypertension Unit

The Mater Hospital is home to the National Pulmonary Hypertension Unit, a specialised centre for pulmonary hypertension. Since the start of pandemic, the manner in which pulmonary hypertension is diagnosed and cared for at the Mater Hospital has changed significantly. A major concern is the impact of delayed diagnosis with the number of new patients being referred significantly down on previous years. A number of factors are contributing to this issue including people not having the opportunity to attend their general practitioner and subsequently their specialist for a confirmed diagnosis.

During the initial phase of the pandemic face to face outpatient visits were cancelled or deferred, and while they were soon restarted many people remain nervous about attending the hospital. The PH team responded to the challenge by exploring a number of ways to improve our ability to monitor patients remotely. The team launched a new mobile phone app called PHuman which allows patients to monitor their own symptoms and then forward them to the hospital so that we can review how things are going and perhaps expedite an earlier review.

Adult Congenital Heart Disease (ACHD) Centre

ACHD patients are complex patients with multi-faceted issues requiring integrated and coordinated care across specialities. The adult congenital heart disease service is a speciality service that provides

medical and surgical treatment to patients who were born with heart disease. This may include, abnormalities such as ventricular or atrial septal defects, anomalous pulmonary venous drainage, single ventricle, congenital mitral valve disease, bicuspid aortic valve disease in young patients and Marfan's syndrome.

The Mater multidisciplinary team (MDT) with representation from electrophysiology, the national pulmonary hypertension unit, national transplant team and the Rotunda obstetric team co-ordinates access for treatment for this complex patient group.

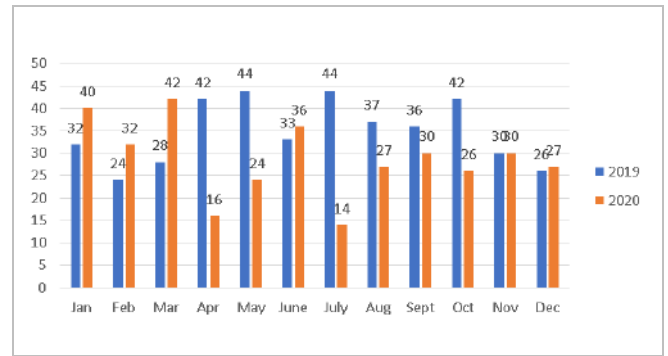
Hereditary Cardiac Syndromes

The Mater Hospital provides a national service for people with known or suspected inherited cardiovascular disease. The service diagnoses and manages the risk of inheritable cardiac risk and SADS (Sudden Arrhythmic Death Syndrome) in family run clinics. Clinical family screening can identify the cause of the SADS in approximately 25% of deaths, and genetic studies can help identify the cause in another 15-20%.

The team delivers a comprehensive evaluation for patients to understand their diagnosis and the potential genetic findings associated with the condition and provides a comprehensive education and a treatment plan based on their clinical diagnosis and specific needs. Experts in multiple disciplines including electrophysiology, cardiomyopathy, congenital heart disease, medical imaging, psychiatry and genetic counselling are brought together to provide the full spectrum of evaluation, clinical and genetic diagnostics and treatment modalities for adults and children.

Rapid Access Lung Clinics

The Mater Hospital’s Rapid Access Lung Cancer Clinic attendances were severely hit by the Covid-19 pandemic. 344 patients attended the service in 2020, down 17% on the 2019 number of 415. When comparing January to March 2019 vs 2020 the service grew from 84 attendances in the first quarter of 2019 to 114 in the first quarter of 2020. Over 97% of patients received an appointment within 10 days of referral to the Mater.



Rapid Access Lung Cancer Clinic Attendances 2019 and 2020

Critical Care, Anaesthesia, Elective Surgery and Theatres

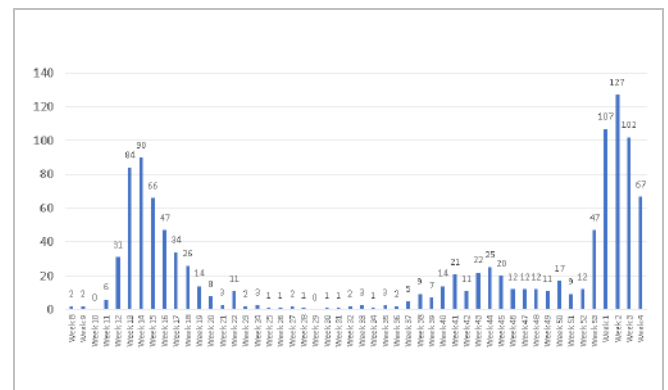
The Intensive Care service was established at the Mater in response to the development of the National Cardiac Surgery Unit and the increased number of critically ill patients being cared for by the hospital. .

The critical care service at the hospital includes the Intensive Care Unit (ICU) and the High Dependency Unit (HDU) and is one of Ireland's leading intensive care services in the country. The service admits critically ill patients from all disciplines from the Mater and Rotunda Hospitals and those referred from outside the hospital on a 24-hour basis.

Critical Care and Covid-19

Between February 2020 and Jan 2021 over 1,100 critically ill adult Covid-19 patients were admitted to ICUs and HDUs across the country. At the Mater 1,002 Covid-19 patients were admitted to the hospital's ICU over the course of 2020 with a consequent impact on capacity and other hospital services, including heart and lung transplant patients that would normally access the critical care service.

Nationally, the response to the increased numbers of critically ill Covid patients, was to increase the national adult critical care bed capacity increased by 25 beds to 280. The Mater added an additional two critical care beds as part of this increase.



Irish National Intensive Care Unit (ICU) Audit

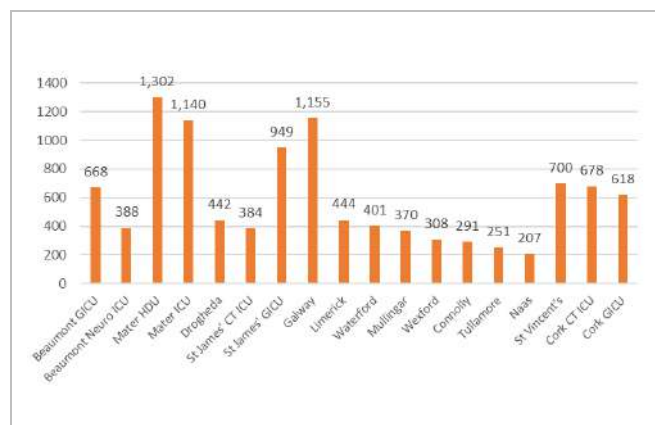
The Irish National ICU Audit was established by the National Office of Clinical Audit (NOCA) in 2013. It reports on the care of patients in adult Intensive Care Units (ICUs) and has the following objectives

- ▶ Measure the quality of care in ICU by benchmarking outcomes
- ▶ Use the Audit to drive improvements in the quality of care
- ▶ Measure activity to inform the configuration of critical care
- ▶ Provide data to support the Hospital In-Patient Enquiry (HIPE) system and activity-based funding (ABF)
- ▶ Audit healthcare-associated infection (HCAI), and
- ▶ Audit potential organ donors and organ donation.

The audit captures the following information

- ▶ Age and gender
- ▶ Pre-ICU admission data
- ▶ Source of admission
- ▶ Pre-existing medical conditions
- ▶ Clinical diagnosis including infection
- ▶ Children in adult ICUs
- ▶ Physiological details
- ▶ Organ support provided during ICU stay
- ▶ ICU interventions
- ▶ Organ donation

The mean age of patients was similar across different Units in Ireland was 61 which was the same as for units in the UK. At the Mater the mean age of patients in the High Dependency Unit was 62 and 59 in the Intensive Care Unit.



Number of Admissions to each Unit in 2019. Source: NOCA Irish National ICU Audit

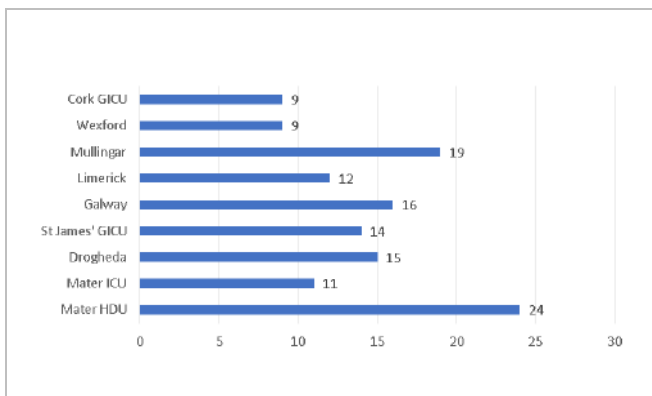
The numbers of bed days occupied in ICUs across the country were relatively consistent between 2018 and 2019. This is because bed occupancy is supply led rather than demand led and supply is fixed.

Exceptions were the Mater Misericordiae University Hospital HDU and University Hospital Limerick ICU, where the number of bed days occupied increased by 22% and 19%, respectively, as both units had opened additional beds since 2018.

The European Society of Intensive Care Medicine recommends a critical care bed occupancy rate of 75%. The Mater ICU bed occupancy for 2019 was 92% with the HDU at 91%. The average nationally was 90% which reflects the ongoing demand of patients who require admission to an ICU.

Obstetric Admissions to ICU 2019

In 2019 the Irish National ICU Audit captured admissions to ICU who were pregnant or recently (within the past 6 weeks) pregnant. These made up 1.3% of all ICU admissions in 2019. They were younger than the average ICU admission and had lower illness severity scores. The Mater provides ICU services to the Rotunda Hospital which is reflected in the figures below.



Obstetric Admissions to Critical Care Units 2019.
 Source: Irish National ICU Audit 2019

Extracorporeal Life Support Service (ECLS)

ECLS was established in the Mater in 2009 and provides advanced physiologic support for adult patients with acute severe potentially reversible heart or lung failure that have continued to deteriorate despite optimal conventional therapy. Specific equipment is required for ECLS but more importantly, continued high quality training is essential to ensure that our ICU nursing and physician staff acquire and maintain the necessary management skills to care for these very dependent patients. Approximately 15 – 25 patients are supported by ECLS in the ICU each year.

Hospital Readmissions

Hospital readmission rates are an important indicator of patient health outcomes and of the healthcare system performance. Low readmission rates in healthcare are regarded as an indicator of effective care and efficient co-ordination of services.

Surgical Re-admission target rate 2020	Surgical re-admission actual rate 2020
3%	2.3%

Surgical Readmission Rates Mater 2020

International studies and quality-reporting initiatives have shown that 15-25% of people who are discharged from the hospital will be readmitted within

30 days or less, and that many of these readmissions are preventable. The Mater Hospital has set the target for surgical readmissions at 3%.

Acute Pain Service

Poorly controlled acute pain results in increased pulmonary, cardiac, metabolic, gastrointestinal and metabolic complications. Post-surgical complications are a major cause of morbidity and mortality, in addition to increased length of stay, increased cost and patient suffering. Post-surgical complications are a major cause of morbidity and mortality, in addition to increased length of stay, increased cost and patient suffering. Many techniques used for acute pain management require specialist training and intensive monitoring. The acute pain service is at the forefront of staff educations and the safe delivery of care to patients. The activity of the acute pain service has increased over the past number of years.

Chronic Pain Service

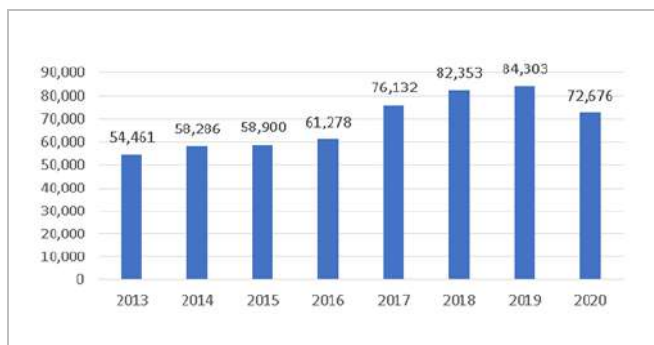
Chronic pain affects 35% of the Irish population. The role of tertiary service is to support, educate and assist primary care in managing patients suffering chronic pain. The demand for chronic pain service continues to grow. Patients experiencing chronic pain are vulnerable, conflicted, stigmatised and often among the greatest health care utilizers. It is therefore imperative that a whole person interdisciplinary approach is adopted when assessing and managing patients with established chronic pain. As a tertiary referral centre the Department of Pain Medicine offers a neuromodulation and intrathecal drug delivery system service to patients with intractable cancer pain or severe pain from benign causes such as post-laminectomy syndrome or complex regional pain syndrome. The establishment of the Mater Acceptance and Commitment Pain Program (MAPP) has been a major innovation in the last few years. The 8-week programme is delivered by Clinical Psychology and Physiotherapy in conjunction with the department of Pain Medicine.

Emergency and Speciality Medicine

The Emergency Department attendances (across the Mater Main Emergency Department, the Smithfield Rapid Injury Clinic and the Eye Emergency Department) were heavily impacted at the start of the pandemic.

Emergency Department

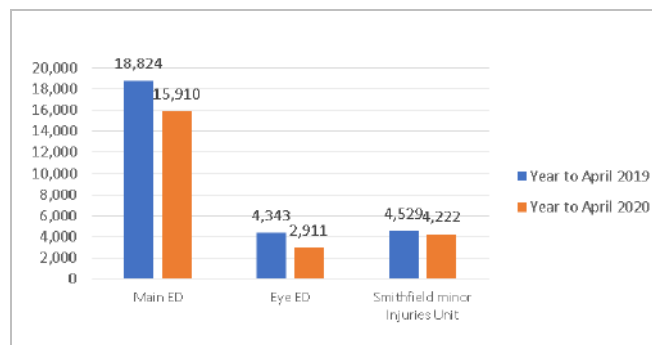
Attendances dropped by a third between February 2020 and April 2020 (the most heavily impacted month). In conjunction with the sharply reduced attendances in the March-April time period the hospital saw a sharp increase in the admission rate from approx. 31% in February 2020 to 38% and 39.5% respectively in March and April.



Emergency Department Attendances 2013-2019

The ED pathways which were modified and streamlined to support the Covid-19 pandemic admission process were rapidly put in place. The ED was segregated into 4 zones- Yellow stream (Covid Pathway), Blue stream (Clean non covid stream), Red Stream (Resus- a blend of Covid and Non covid) and the Green stream (GP led ambulatory stream). Forward triage services were led by Consultant/Senior decision maker enabling appropriate streaming of patients.

New pathways were developed to support new stream from triage to streamline the unscheduled medical admission pathway.



Attendances at the Mater Emergency Departments Year to April 2019 and 2020

By the end of April 2020 attendances at the combined Mater Emergency Departments was down 17% compared to the first four months of 2019. The main Emergency Department was down 15.5%, the Eye Emergency Department down by 32.9% while the Smithfield Minor Injuries Unit was down 6.7%. Over the summer of 2020 the Covid streams in the Mater decreased while the non-Covid stream steadily increased to almost pre Covid levels from June. The service continually adapted their streams and work processes to meet the changing demand. By late October a new challenge emerged as the Covid stream started to grow again while the non-Covid stream remained largely unchanged.

Neurology

European Stroke Organisation Certification

The Stroke Unit in the Mater Hospital has become the first such unit on the island of Ireland to receive European Stroke Organisation (ESO) certification, making it just one of 19 stroke units across Europe to

be certified. Founded in 2007, the European Stroke Organisation (ESO) is a pan-European society of stroke researchers and physicians, national and regional stroke societies and lay organisations that aims to reduce the burden of stroke by changing the way that stroke is viewed and treated.

To receive ESO Certification a stroke unit must meet a number of detailed criteria set out by the ESO that cover a stroke patient's journey from initial assessment at the Emergency Department through to discharge and rehabilitation. These criteria include diagnostics such as MRI scans etc, treatment, multidisciplinary care; the involvement of specialist stroke doctors, nursing staff, physiotherapists, occupational therapists, speech and language therapists etc, secondary prevention and rehabilitation post stroke.

The ESO Certification process aims to

- ▶ Improve the quality of patient care by reducing variation in clinical processes
- ▶ Provide a benchmark for quality of stroke management
- ▶ Provide an objective assessment of clinical excellence – based on the “European Stroke Organisation recommendations to establish a stroke unit and stroke centre”
- ▶ Creates a loyal, cohesive clinical team
- ▶ Promotes a culture of excellence across the organization

The Mater Hospital's acute stroke unit was set up in 2002 and was the first of its kind in Ireland. The unit provides specialist early-stage care for stroke. This includes any assessments required, as well as early rehabilitation.

The hospital specialises in providing acute services, focused on care for patients in the early stages after a stroke. Once the patient is medically stable, the Mater team will coordinate the patients ongoing care in other units including

- ▶ Isolde Stroke Rehabilitation Unit - A specialist stroke rehabilitation unit located in St Mary's Hospital in the Phoenix Park.
- ▶ The Royal Hospital, Donnybrook - Provide a dedicated stroke rehabilitation unit for patients.
- ▶ The National Rehabilitation Hospital - Based in Dun Laoghaire, the hospital provides a comprehensive range of specialist rehabilitation services.

StrokeLINK

StrokeLINK is a Slaintecare funded initiative that innovates how patients are supported as they transition from hospital to community post stroke. Patients are supported by a StrokeLINK nurse and a suite of tools to empower them in self-care post stroke. This project is a collaboration between the Mater Stroke Service, Mater Transformation Office and the National College of Art and Design. Despite recruitment challenges, followed by period of redeployment of key staff due to the pandemic in March, this project made excellent progress in 2020. Feedback from patients is extremely positive and preliminary data showed significant impact on patient outcomes, with reduced crisis visits to ED and avoidable readmissions. Due to redeployment as a result of the pandemic, the project will run until July 2021. The goal is to develop a fully tested, transferrable model for transitional stroke care which can be scaled nationally.

Dermatology Transformation Project

Access to OPD and consequent treatment and procedures were a major driver in the selection of dermatology to undergo a Transformation programme, with a significant OPD waiting lists of 3,455 as of Nov 2020. The changes in OPD initiated by the Covid-19 pandemic also provides opportunity to select for a whole system transformation and serve as a flagships for improvement and innovation in OPD. The programme was initiated in August 2020 with focus on the shared Skin Cancer Service and with Root and Branch analysis of both services being carried out

in parallel. Extensive data gathering was carried out in the month of September, including a weeklong GEMBA period where on the ground observational studies were carried out to understand and review current processes and practices.

A Value Stream Analysis event was carried out on the week of 5th October at which data was presented, analysed and solutions generated which was very well attended by all clinical teams and supported by senior management. What has emerged is a change programme for the service with 2 major improvement streams across Skin Cancer and Dermatology and Plastic.

A 30 Day Report Out to a Senior Management team took place on 10th December to provide update on the change programmes. An overview of the agreed target areas is given below.

Dermatology Improvement Programme	
Referrals to Triage	Standardising triage to allow equity in access for patients and ensure patients requiring urgent appointments have access to earliest available slot.
Streamlining Clinics	Introducing structures to optimise existing capacity Facilitating CNS led clinics Restructuring clinics to enable new and consolidated pathways
Streamlining Procedures	Optimising capacity in existing procedure room

Gastroenterology

The Mater Hospitals Gastroenterology service offers comprehensive, leading-edge care for patients with all types of diseases of the gastrointestinal tract. The team of gastroenterologists and surgeons use endoscopic procedures to diagnose and treat many

disorders of the gastrointestinal tract. These procedures include

- ▶ Gastroscopy
- ▶ Colonoscopy
- ▶ Flexible sigmoidoscopy
- ▶ Endoscopic retrograde cholangiopancreatography (ERCP)
- ▶ Endoscopic ultrasound (EUS)
- ▶ Percutaneous endoscopic gastrostomy (PEG)

The hospital is a tertiary referral centre and one of the National Leads in ERCP (Endoscopic Retrograde Cholangio-Pancreatography). In certain cases, patients require a more specialised endoscopic procedure with greater sensitivity and an ability to detect gastrointestinal abnormalities that a regular endoscopy may miss. ERCP is a diagnostic procedure used to examine the gallbladder, bile and pancreatic ducts. ERCP combines X-ray and endoscopy, allowing the consultant to obtain high-quality images of the anatomy. ERCP is used when it is suspected that the person’s bile or pancreatic ducts may be narrowed or blocked due to

- ▶ tumours
- ▶ gallstones that form in the gallbladder and become stuck in the ducts
- ▶ inflammation due to trauma or illness, such as pancreatitis
- ▶ infection
- ▶ valves in the ducts, called sphincters, that won’t open properly
- ▶ scarring of the ducts, called sclerosis
- ▶ pseudocysts—accumulations of fluid and tissue debris

BowelScreen

The national bowel cancer screening programme (BowelScreen) is a national population screening programme for bowel cancer.

It offers screening every 2 years to all men and women aged 60 to 69. This year marks a milestone for



Stop the Clot Roadshow – Winner of the prestigious Global Advocacy Award

VTE Dublin is a not-for-profit annual conference in Dublin every Autumn. It is organised by a multi-disciplinary group of clinicians passionate about improving VTE care. Members of the IEHG VTE Service Group organised and spoke at VTE Dublin 2020 which took place virtually between 30th September – 2nd October 2020). Areas under discussion include diagnostic and therapeutic advances in VTE with a particular focus on Covid-19. In conjunction with this event and world thrombosis day thrombosis island launched at 2020 thrombosis public awareness media campaign.

Care of the Elderly

Older people with complex illnesses and deteriorating health benefit from specialist care of the elderly services, provided in a dedicated ward by a multidisciplinary team.

In addition to improving patient outcomes and increasing service efficiency, the specialist service integrates the services in the Mater with those in the community. This has required the Care of the Elderly service to evolve over the last few years and includes a Rapid Access Clinic and a Post-Acute Care Service in St Vincent's Hospital, Fairview.

Rapid Access Clinic

The Medicine for the Elderly Clinic at Charter Medical is designed for patients who are over 65 years of age. It is run in a partnership with the Mater Misericordiae University Hospital, Beaumont Hospital and Charter Medical. The clinic is a recognised dementia friendly setting and guarantees access to patient appointments within 72 hours, upon referral from their GP. This clinic is under the governance of consultant geriatricians from Mater.

The Rapid Access Clinic is a public service is fully covered by the HSE. The main reasons for referral are

- ▶ Unexplained weight loss
- ▶ Possible stroke or concern about Stroke.
- ▶ Falls
- ▶ Fainting and dizziness
- ▶ New onset of cognitive decline

Post-Acute Service

The Mater is an acute hospital which specialises in treating patients who have urgent short-term medical needs. With some patients, they reach a point of being medically stable but are not quite ready to go home or to go to a nursing home. For these patients, we provide a specialised service called post-acute care where we provide support to patients and their family until they reach their full potential and can be discharged from hospital. The Care of the Elderly service also provides post-acute service for patients through the Synge, Yeats and Joyce units in St Vincent's Hospital, Fairview.

National Deep Brain Stimulation Service

Deep Brain Stimulation (DBS) is a long-term treatment option for adult patients with selected movement disorders including Parkinson's Disease (PD), essential

tremor and dystonia. Patients with PD account for a significant proportion of the referrals for DBS, which is a surgical procedure aimed at providing relief of motor function symptoms that are no longer controlled by drug therapy. It is referenced within the PD pathway in the Model of Care of the National Clinical Programme for Neurology.

Since 2018 the HSE has supported utilising the existing services at the Dublin Neurological Institute at the Mater Hospital to assess patients for suitability before referral of patients onwards to Belfast for surgery. Post-operative care is based in Eccles Street. The Covid-19 pandemic has significantly impacted the service reducing the numbers presenting to the service and impacting on the surgery services in Belfast.

Rheumatology

Gout and Crystal Arthropathy: The Gout and Crystal Arthropathy service at the Mater Hospital provides individualised, high-quality care to patients with gout, pseudogout, and other crystal arthropathies.

The diagnosis and treatment of gout and crystal arthropathy requires a careful review of the patient's symptoms, physical findings, and previous testing. Once the diagnosis is confirmed, our team delivers optimal gout care with a coordinated long-term approach that involves

- ▶ Patient education.
- ▶ Individualised lifestyle advice
- ▶ Appropriate use of anti-gout medications

Inflammatory Arthritis Service

The rheumatology team at the Mater provides an emergency review clinic that aims to quickly assess, and if appropriate, start treatment for patients with suspected inflammatory arthritis (IA). The clinic performs clinical assessments, laboratory investigations and imaging, including ultrasound examinations where indicated. This can be more sensitive than clinical examination alone for picking up the presence of inflammatory arthritis. The information from these investigations is used to optimise treatment and identify patients who are at high risk of developing erosive disease. These patients are offered treatment as early as possible, ideally within four months of their symptoms starting.

Rheumatology Research Group

The Rheumatology Research Group is a UCD based research group comprising on consultants from the Mater and St Vincent's University Hospitals. The research team have specific expertise in a wide range of musculoskeletal diseases including inflammatory arthritis, osteoarthritis, crystal-induced disease, vasculitis, connective tissue disease and sports and exercise medicine. The clinical research programme integrates clinical and basic research and engaging with pharmaceutical industry partners to create an innovative, globally competitive translational research facility attracting early stage clinical trials to Ireland. This Research Centre provides an integrated, multidisciplinary multi-institutional environment to coordinate clinical and basic research activities in the only IMB-certified CRC facilities in Ireland linked directly to the UCD Conway Institute.

Health and Social Care Professions

The Health and Social Care Professions are the second largest clinical grouping of the healthcare workforce, providing interventions in therapeutic, rehabilitative, re-ablement, health and social care and diagnostic services.

Audiology

The Mater Hospitals audiologists provides comprehensive, collaborative and patient-centred hearing healthcare for patients. Covid-19 significantly impacted service delivery over the course of 2020.

Approximately 2,500 new patients and 1,900 review patients were seen by the service in 2020. Despite the constraints the Direct to Audiology initiative, the St Vincent's University Hospital vestibular testing pathway, the inter-disciplinary neuro-vestibular clinic and the BAHA programme all remained in place for the year.

Audiologists assess patients hearing prior to consultation with the otolaryngologist, provide pre-operative and post-operative evaluations and assist in the diagnosis of hearing and vestibular problems. The service that includes precision testing, informed interpretation, and care plan development towards workable hearing loss solutions with aural rehabilitation and assistive devices including hearing aids and cochlear implants.

Balance Assessments

The audiology services utilise a range of diagnostic tests to assess an individual's balance including

- ▶ Posturography
- ▶ Videonystamography
- ▶ Caloric testing
- ▶ Video Head Impulse Test.

Bone anchored hearing aids (BAHAs)

The Mater Hospital is a leading centre for bone anchored hearing aid (BAHA). The BAHA is a surgically implantable system for treatment of hearing loss. The system works by enhancing natural bone transmission as a pathway for sound to travel to the inner ear — thus bypassing the external auditory canal and middle ear. The titanium implant is placed during a short outpatient surgical procedure. Over several months, the implant naturally integrates with the skull bone. The Audiology service at the Mater Hospital is one of four leading Irish sites that provide adult patients with BAHA fittings.

Dietetics

In 2020, while many ward beds were closed, and OPD face to face consultations reduced, dietetic total consultation activity increased by 7%. There was a 10% increase in inpatient consultations to 2,700, and a reduction in OPD consults of 590 or 15%.

This activity was related to

- ▶ An increase focus on renal patients- pre dialysis and dialysis and post-transplant renal patients. This was undertaken as it was recognised early in the pandemic that renal patients had a poor outcome if they contracted covid.
 - Mask wearing during dialysis was required, so the alternatives to the usual snack round provided during dialysis included a nourishing drink for those identified by the dietitian to be

at nutrition and/or hypo risk and a snack bag for all patients to bring home.

- Those post transplant patients under the care of the renal dietetic team were contacted by phone to advise on food safety and good nutrition when cocooning. The information developed in the Mater Hospital was used for the IrishKidneydiet.ie renal website that is supported by the Irish Nutrition and Dietetic Institute and the National renal office.
- Extra dietitian resource was assigned to support inpatient dietetic care of renal patients.
- ▶ A Covid-19 dietetic and catering team was established to provide service across the 6 Covid wards. The following areas were targeted: A review of food service provision to the Covid wards, using a brief nutrition screening tool. A suite of patient resources were developed, as well as a Covid nutrition guide for staff. Data was collected weekly on the numbers of patients screened and identified at malnutrition risk. From 4th May – 3rd July 2020, an average of 79% (range 63-92%) of isolated patients were referred to the dietitian, 49% (range 30-69%) of patients who had not been initially referred were identified at malnutrition risk
- ▶ Dietitian staff were re-assigned to Critical Care, where all patients who were intubated required enteral tube feeding or/and parenteral nutrition. Nutritional complications such as feed intolerance; hyperglycaemia, and renal failure were promptly acted on in order to maximise the nutritional adequacy for patients during their complex patient journey. The nutrition delivery to patients during Covid escalation was in line with international targets for volume, energy and protein delivery.
- ▶ Dietitian staff were re-assigned to PAC. As the care of the older person patients were transferred there.

Physiotherapy

Covid-19 response

During the initial Covid-19 response, the physiotherapy team changed its operational model from speciality based care to a team-based structure, initially with five inpatient teams created to work independently from each other, each working within a specific zone of wards. Each team had a rotating lead and deputy lead, with a combination of Covid-19 pathway wards and non-Covid-19 pathway wards. Outpatient staff were re-designated to support inpatient pathways.

The department adopted a tiered system to map the departmental skill mix and training needs. The tier system (T1-3) was used to identify training needs for each staff member and to provide a structure for training delivery. A newly designated clinical facilitator role was integral to the design and delivery of this training with support from other members of the education committee and senior respiratory and rehabilitation staff from T3. Innovative modes of CPD delivery, including cloud based platforms were harnessed to manage physical distancing and to facilitate training attendance by isolating staff to attend training sessions remotely and to keep abreast of the rapidly emerging international evidence.

Out- patient Physiotherapy services

With the curtailing of OPD services during the initial Covid-19 wave to urgent care only, the Physiotherapy OPD department was remodelled to accommodate social distancing and virtual treatment facilities. OPD activity levels in August 2020 were at 80% of activity delivered in August 2019, recovering to 90% by December 2020.

There was a sustained 60:40 split of treatment delivered face to face and virtually. T-PRO was the predominant platform used for individual video consultation, with SALASO supporting group-based interventions with additional exercise prescription functionalities.

An additional Physiotherapy service provided post Covid-19 care to patients requiring ongoing outpatient care due to ongoing Covid-19 symptoms.

Student placements

After an initial pause in physiotherapy clinical placements, UCD placements restarted in August with clinical education being delivered in a hybrid face to face and virtual model.

New developments throughout the year

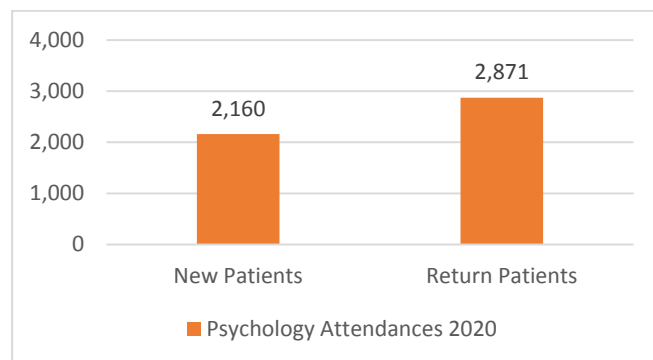
- ▶ **Record management plan** The Physiotherapy department record retention and destruction plan progressed in 2020 with scanning of records live as of 9th September 2020.
- ▶ **Quality Dashboard** The departmental Diveport dashboard went live in Q3 2020. The dashboard allows real-time analysis of patient-facing activity for the entire Physiotherapy service, specialty specific data or patient-level data as required, enabling physiotherapy to critically analyse referral, direct and indirect contact rates, response and wait times, DNA and Prioritised Out (PO) rates and monitor same over time.
- ▶ **Quality focus** Physiotherapy-led Quality project ‘patient profile to support patient focused care’ previously developed for the older persons’ service has been adapted for the stroke service.

Patient experience survey

Quarterly surveys of patient satisfaction for both in-patient and out-patient groups were completed, with data collated from 238 respondents over 2020. The service adopted the “You Said – We Did” model, as endorsed by the HSE, to act on the feedback received.

The survey results were presented in poster format and displayed in public areas of the physiotherapy department. External communication of results was completed via the physiotherapy department Twitter account.

Psychology



Psychology Attendance 2020

Service Development

- ▶ New post set up in Critical Care in July 2020 to cover ICU/HDU, post ICU clinic and post Covid-19 clinic.
- ▶ Psychology assisted with set up of post ICU clinic which is a significant step towards ‘gold-standard’ critical care as well as for future major trauma service delivery. Allowing for the early detection and intervention with patients with cognitive and psychological difficulties, leading to a reduction in disability for patients.
- ▶ There were over 300 patient contacts and over 160 patients seen in critical care between July – Dec 2020. A fortnightly post ICU clinic was also established.
- ▶ A new stroke psychology post commenced August 2020, with 129 patients referred to the service by year end.
- ▶ The patient support webpage www.mater.ie/wellbeing online videos on mindfulness and relaxation, and leaflets on coping with stress, low mood, pain, a cardiac event, headaches, OCD

Staff Support

- ▶ Staff support service set up with over 250 staff seen for support in drop in clinic and on the phone.
- ▶ Psychological First Aid sessions provided to teams on request to support coping with Covid-19
- ▶ Mindful Monday sessions offered to staff virtually.
- ▶ Staff Support offered by Critical Care Psychology to Critical Care staff & staff education
- ▶ Reflective Balint Group run by psychology to support registrars and nursing with processing challenges of patient care.
- ▶ Staff supports on the Mater intranet to supporting mental health and wellbeing of staff.

Speech and Language Therapy

Activity

During 2020, the Speech and Language Therapy (SLT) Department saw an average of 231 patients per month and provided 1,892 assessments and 7,923 reviews. Unlike previous years there was a 3% reduction in new assessments and 4% reduction in total patients seen in 2020 compared to 2019. This reduction in activity is as a result of the Covid-19 pandemic which significantly impacted SLT working, in particular in the area of dysphagia management given the high risk associated with both assessment and intervention, in addition to the reduction in outpatient services, scheduled care activity and instrumental assessment of swallowing services in 2020.

The demand for instrumental swallow assessments for inpatients in the hospital, patients in our catchment area and in our rehabilitation partner sites continued to increase. In 2019, the service increased access to Fiberoptic Endoscopic Examination of Swallowing (FEES) by 20%. Building on this, and responding to the demands of the service, an additional SLT commenced her endoscopist training in 2020.

The FEES service was significantly impacted by Covid-19. As an Aerosol Generating Procedure carrying

significant risk, the service ceased in line with national and international guidelines for a 3 month period in 2020. Four endoscopists carried out a total of 115 FEES in 2020 covering in-patients, out-patients and patients referred from Primary Community Care in North Dublin.

Staff developments in 2020 included the addition of a Clinical Specialist SLT in Stroke and Frailty in the third quarter of the year.

Speech and Language Therapy Team Response during Covid-19 pandemic

The SLT outpatient service was significantly impacted by the Covid-19 pandemic. From 13th March to 11th June 2020, the SLT and ENT OPD service in Clinic 8, Whitty Building ceased and the clinic converted to a Covid-19 testing pathway.

While a blended virtual and face to face approach is feasible in SLT, virtual consultation only rarely meets the needs of the patients assessed and treated. Assessment, diagnosis and treatment of communication, cognitive-communication, upper airway and swallowing disorders necessitates face to face intervention. Virtual consultations were provided and while there were initial challenges, the SLTs working in outpatient services with IMS Team assistance adapted, maximising the use of technology ensuring priority outpatients were assessed and treated as clinically indicated.

In response to the pandemic, the SLT team developed new policies and procedures ensuring on-going provision of safe, high quality person centred care in addition to a safe working environment for the team. Augmentative Alternative Communication (AAC) resources were developed to support patient and staff communication in Critical Care and on the wards.

The SLTs were instrumental in supporting patients with communication difficulties to communicate with their families through use of available technologies. The Yale Swallow Screening Tool was introduced in

the Stroke service reducing the risk to Nursing Staff when completing the screen.

In house training in the areas of supported communication, tracheostomy, FEES and Videofluoroscopy continued in 2020.

Education, Research and Innovation

Excellence in patient care necessitates parallel healthcare professional development. The SLT department is committed to continuous professional development, education and research. In 2020, five members of the SLT team engaged in post-graduate studies including MSc in Healthcare Leadership, Dysphagia, Palliative Care and Older Person Rehabilitation. The department contributes significantly to the profession at a national level with three members of the team contributing to Irish Association of Speech & Language Therapists (IASLT) position papers including Covid-19 guidelines, Practice Education guidelines and the SLT role in the Emergency Department.

In 2020, the team contributed to two research journal publications, a book chapter and three patient centred innovations. Finally, the department was successful in securing FEES and Stroboscopy systems funding through HSE to replace outdated equipment. This greatly enhances the services' ability to accurately diagnose voice and swallowing difficulties and ensure our patients have early access to targeted voice and dysphagia rehabilitation.

Occupational Therapy

Response to Covid-19

In 2020, the occupational therapy (OT) department responded to the challenges associated with Covid - 19, with an initial focus on the education of staff regarding hand hygiene, PPE and social distancing. Practical measures to comply with social distancing were adhered to for the safety of staff and patients. OT services were restructured from providing

specialty based care to ward based care in order to minimise the number of staff attending multiple wards and two therapists rotated every three weeks to cover the Covid-19 cohorted wards. Training was developed and delivered to the OT department to upskill staff on the role of OT in critical care. This was to prepare staff to be available to assist with increased numbers of critical care patients. Two staff grade OT's with oversight from a senior OT were redeployed to the Post-Acute Care Services in Fairview, providing rehabilitation to patients admitted from the Mater. Funding was also given for the purchase of equipment, such as supportive wheelchairs, cushions and splints. These were purchased to manage the postural needs and ensure quality care to critical care patients.

Use of platforms increased i.e. Silo for live sharing of patient information, and the set-up of the OT department twitter page. Telehealth training and policy was developed to reduce physical patient contact and risk of Covid 19 spread. Outpatient Senior OT's delivered virtual clinics instead of regular face-to-face outpatient clinics for orthopaedic, plastics and rheumatology patients requiring hand therapy and patients attending the Early Supported Discharge (ESD) for stroke service. Home visits were ceased unless determined to be absolutely necessary and virtual home visits were completed with patients and their families.

Initiatives Undertaken

By the end of the first Covid-19 wave, the team focused on restarting the local CPD cycle and participation in hospital wide projects. Initiatives were implemented, such as development of a waiting list initiative. This included opening all referrals within 48 hours and beginning initial assessment. Education was also delivered on the use of 'DOC' caseload management tool to bring focus on efficiently discharging patients with no active OT goals. Access was also increased to equipment essential for discharge through 'Assetrak'. This community database of recycled equipment and provides patients

with the correct equipment at the right time, to support hospital discharge.

OT also applied to the Mater Foundation for funding for bariatric equipment and secured funding for two specialised seating systems to meet the need of the bariatric patient cohort. 'The 100 Miles in August' fundraiser was completed by the Mater OT department in support of the Mater Foundation.

OT staff numbers increased in Q3 of 2020 with the introduction of new services, as a temporary OT was funded for the Post Covid Clinic, Critical Care and Fairview. A temporary Senior OT was also funded through Slaintecare, to complete a palliative care rehab project, in conjunction with the palliative care consultant and physiotherapist. Together they have been providing a rehab service spanning hospital and community palliative care. The commencement of the FITT and HASU services increased staffing levels to include a new permanent clinical specialist and senior OT.

Podiatry

Due to staffing constraints Podiatry was limited in 2020 to only treating the patients with the highest podiatric need (classed as Active under the National Foot Model). The acuity of these patients meant that Podiatry as an outpatient service had to continue throughout the Covid-19 pandemic.

Community Healthcare Organisation 9 community podiatry ceased providing care during the first seven weeks of the first Covid-19 lockdown, with Mater Podiatry experiencing a 25% increase in volumes between January/February and July/August. While this service was for a patient cohort of lesser acuity than Mater Podiatry, the cessation of service resulted in an increase ulcer reoccurrence rate of 15%. Podiatry numbers in November and December remained above pre-Covid levels, likely due to patients delaying contact with Mater podiatry and therefore presenting with a more complex diagnosis.

Major Trauma

The National Trauma Strategy recommends that a National Trauma System is required to deliver improved outcomes for trauma patients.

The strategy recommends the establishment of an inclusive trauma system and sets out key recommendations for the organisation of trauma care and the provision of patient-centred trauma services. The strategy takes a whole system approach addressing all elements of the trauma care pathway including prevention, pre-hospital care, acute hospital care, rehabilitation and supported discharge

- ▶ **Pre-Hospital** Pre-hospital care and transport protocols are required to ensure that individual trauma patients will be brought to the most appropriate facility – to receive the right treatment in the right place at the right time.
- ▶ **Major Trauma Centre/Networks** Two regional hub-and-spoke Trauma Networks, each with a designated Major Trauma Centre for the treatment of major trauma that requires access to specialised trauma care, will provide the appropriate structures to meet the needs of trauma patients in Ireland. Trauma care will also be provided in designated Trauma Units, hospitals which meet specified requirements for the provision of quality trauma care, and there will be clear roles for Injury Units and Local Emergency Hospitals in the Trauma Networks in the treatment of non-trauma related illnesses requiring urgent treatment and less severe traumatic injuries.
- ▶ **Rehabilitation** A strong focus on comprehensive, patient-centred rehabilitation services is required, with early assessment of rehabilitation needs, as well as enhanced acute, post-acute, regional and community rehabilitation, to enable patients to achieve their maximum functional potential.

The National Trauma Strategy recommends one Major Trauma Centre based in Dublin servicing the Central

Trauma Network and another based in Cork University Hospital servicing the South Trauma Network. It further recommends that each of these Major Trauma Centres will be linked to several Trauma Units throughout the country and that Dublin should have a maximum of two Trauma Units, in addition to the Major Trauma Centre.

Trauma can be classified using different classification systems, one of which is the injury severity score (ISS). This is an internationally recognised anatomical scoring system which retrospectively assigns a measure of severity ranging from zero to 75, with a score of ISS>15 signifying major trauma. Mortality increases with ISS, and a score of 75 signifies injuries which are unlikely to be survived.

ISS Classification	ISS Score	Examples of Injuries
Low severity injury	1-8	- Fractured wrist and ankle. - Simple skull fracture. - Small bleed in liver.
Moderate severity injury	9-15	- Fractured femur. - Small brain contusion.
Severe injury	>15	- Large subdural haematoma. - Fracture of the pelvis with large blood loss. - Severe injuries to multiple body regions.

The majority of the published data relating to the benefits of Trauma Systems relate to victims of major trauma, defined as ISS>15. Dedicated trauma care provided in a Major Trauma Centre or equivalent has

been reported to improve outcomes in the US,¹ Canada², Australia³, France⁴, Germany⁵ and England⁶.

Studies have consistently shown that concentration of major trauma into high volume dedicated Major Trauma Centres is associated with to better outcomes and that severely injured patients are 15-20% less likely to die if admitted to such an MTC than if admitted to other hospitals.

” *Major trauma involves complex injuries that have the potential to be life changing or life ending – on average, around 1,600 patients in Ireland suffer major trauma injuries each year*

The team at the Mater along with our colleagues in St Vincent’s University Hospital, the Ireland East Hospital Group and University College Dublin worked together to ensure a robust case was outlined for a Major Trauma Centre at the Mater campus and designated Trauma Unit at St Vincent’s University Hospital campus.



¹ Cohen M, Fath JA, Chung R, Ammon A, Matthews J. Impact of a dedicated trauma service on the quality and cost of care provided to injured patients at an urban teaching hospital. *Journal of Trauma: Injury, Infection, and Critical Care* 1999; 46: 1114–9.

² Liberman M, Mulder D, Jurkovich G, Sampalis J. The association between trauma system and trauma centre components and outcome in a mature regionalised trauma system. *Surgery* 2005; 137: 647–58.

³ Ursic C, Curtis K, Zou Y, Black D. Improved trauma patient outcomes after implementation of a dedicated trauma admitting service. *Injury* 2009; 40: 99–103.

⁴ Haider AH, David JS, Zafar SN et al (2013) Comparative effectiveness of in hospital trauma resuscitation at a French trauma centre and matched patients treated in the United States. *Ann Surg* 258(1):178–183

⁵ Westhoff, J, Hildebrand F, Grotz M, Richter M, Pape H, Krettek C. Trauma care in Germany. *Injury* 2003; 34: 674-83

⁶ Davenport R, Tai N, West A, et al. A Major Trauma Centre is a specialty hospital not a hospital of specialties. *British Journal of Surgery* 2010; 97: 109–17

Personalised Medicine

Medical genetics is a medical sub-specialty which provides a clinical genetics/genomics service, incorporating diagnosis and counselling for patients, affected by or at risk of a genetic condition.

Mater Genetics

Currently there are in excess of 7,000 rare genetics conditions identified. The service sees and manages families with genetic conditions, rather than individual patients. The most common referrals to the service include:

- ▶ Patients/Families affected by or at risk of hereditary cancer
- ▶ Patients/Families affected by or at risk of hereditary heart disease
- ▶ Patients/Families affected by or at risk of inherited neurological disorders
- ▶ Children/adults with congenital anomalies
- ▶ Children/adults with Intellectual disability
- ▶ Families affected by or at risk of chromosome disorders
- ▶ Families affected by inherited disorders such as cystic fibrosis
- ▶ Healthy family members seeking predictive genetic tests for the genetic disorder identified in their family

Overall, the population of adults diagnosed with genetic conditions is growing exponentially and will likely continue to grow for the foreseeable future. This is primarily due to

- ▶ Increased recognition and diagnosis rate
- ▶ Medical advances in treatments which has resulted in increased survival of children with genetic conditions previously considered fatal.

Many people now survive into adulthood with genetic conditions such as severe osteogenesis imperfecta

and inherited metabolic diseases such as Lysosomal Storage Disorders and mitochondrial disorders.

Inherited Retinal Degeneration: Target 5000 Project

The Mater Hospital along with the Royal Victoria Eye and Ear Hospital and the Royal Victoria Hospital Belfast are the primary sites for the Target 5000 project. Target 5000 provides a genetic and clinical diagnosis for people with Inherited Retinal Degeneration (IRD) and is supported by Fighting Blindness.

The project is developing a national registry for IRD and enables access to clinical trials and approved therapies for Irish patients.

Inherited retinal degenerations, also called inherited retinopathies refer to a group of often rare conditions in which defects in genes lead to photoreceptor cell death and associated vision loss. These conditions include

- ▶ Bardet-Biedel syndrome
- ▶ Best disease
- ▶ Blue Cone Monochromacy
- ▶ Choroideremia
- ▶ Cone-rod dystrophy
- ▶ Leber Hereditary Optic Neuropathy (LHON)
- ▶ Leber Congenital Amaurosis (LCA)
- ▶ Retinitis Pigmentosa (RP)
- ▶ Retinoschisis
- ▶ Rod-cone dystrophy
- ▶ Stargardt Disease
- ▶ Usher Syndrome

The goals of the Target 5000 programme are

- ▶ To provide a genetic and clinical diagnosis to people living in Ireland with an inherited retinopathy
- ▶ To develop a national registry of inherited retinopathies and enable access to clinical trials and approved therapies in Ireland and abroad
- ▶ To embed an excellent clinical management infrastructure
- ▶ To discover new genes responsible for inherited retinal degenerations

National Centre for Rare Diseases

Rare diseases are characterised by their relatively low prevalence (less than 1 in 2,000 people in the EU). Doctors may never have seen the condition before and hospital diagnostic services may struggle to identify the rare disease. In addition, once accurately diagnosed, people with a rare disease and their carers may face further challenges to find a suitably defined care pathway for treatment and to access therapies, which can become even more frustrating if a condition is ultra-rare (less than 1 in 100,000).

Rare Disease Ireland⁷ has identified some of the main characteristics of rare diseases

- ▶ Rare diseases are often chronic, progressive, degenerative, and often life-threatening
- ▶ Rare diseases are disabling: The quality of life of patients is often compromised by the lack or loss of autonomy/independence
- ▶ High level and complex levels of morbidity and care for the patient with a rare disease and his/ her family
- ▶ There are between 6-8,000 rare diseases worldwide
- ▶ 70% of rare diseases first appear in childhood and are life-long
- ▶ 64% of all deaths from the National Paediatric Mortality Register data for the years 2006-2016 were accounted for by rare diseases

- ▶ 72% of rare diseases have identified genetic origins.
- ▶ Rare diseases can also be man-made, for example prescription or recreational drugs (including alcohol) and prescription drugs with unintended side effects that cause birth defects.

The National Rare Disease Plan (NRDP)⁸ was published in 2014 and the National Rare Disease Office (NRDO) established in the Mater Hospital in 2015. In 2019 the National Clinical Programme for Rare Diseases', Model of Care was published. The National Rare Diseases Office is the co-ordination 'hub' for clinical rare diseases expertise in Ireland. The office is staffed by healthcare professionals who have significant experience working with people affected by rare diseases. It provides current, reliable information about genetic and rare diseases to patients, families and health and research professionals, The office also manages the Irish section of *Orphanet*, the European portal on rare diseases information and orphan drugs.

The Office is responsible for mapping the location and availability of clinical expertise and centres of expertise in Ireland. Over 75 Irish centres have been mapped and listed on Orphanet. The Office provides information about virtual cross-border consultations and centres of expertise in neighbouring EU Member States.

National Centre for Inherited Metabolic Disorders

The National Centre for Inherited Metabolic Disease (NCIMD) is a referral centre for people who are diagnosed with or suspected of having a metabolic genetic disorder. The paediatric service is based in the Children's University Hospital, Temple Street with the adult service is based at the Mater Misericordiae University Hospital. The Adult Unit in the Mater provides multidisciplinary care for patients with known or suspected metabolic disorders. The team at

⁷ Rare Diseases in Ireland and Consensus for Action February 2020.

⁸ National Rare Disease Plan for Ireland 2014-18

the hospital help patients to manage their conditions with optimal diets that match their metabolic needs.

The management of metabolic disorders is complex and demands dedicated input from the multi-disciplinary team led by a Metabolic Consultant. A holistic and family centred approach is used, with input from medical, nursing, dietetic, psychology, administration, social work, physiotherapy, laboratory staff and play specialist. Suspected cases of metabolic disorder are referred from hospitals across the country.

Colorectal Cancer Family Screening Clinic

Colorectal cancer can run in families, and about 5-10 % of colorectal cancer is thought to be hereditary. The team at the Mater offer family screening programmes for Hereditary Non-Polyposis Colorectal Cancer (Lynch Syndrome) and Familial Adenomatous Polyposis (FAP) to determine an individual's risk for colorectal cancer. The team follows patients who have an increased risk for polyps, colorectal cancers, gastrointestinal cancers, pancreatic cancer and related cancers. In excess of 90 families are referred annually to the screening service to evaluate cancer risk and

implement a screening and cancer prevention strategy.

Hereditary Cardiac Syndromes

The Mater Hospital provides a national service for people with known or suspected inherited cardiovascular disease. The service diagnoses and manages the risk of inheritable cardiac risk and SADS (Sudden Arrhythmic Death Syndrome) in family run clinics. Clinical family screening can identify the cause of the SADS in approximately 25% of deaths, and genetic studies can help us identify the cause in another 15-20%.

The team delivers a comprehensive evaluation for patients to understand their diagnosis and the potential genetic findings associated with the condition and provides a comprehensive education and a treatment plan based on their clinical diagnosis and specific needs. Experts in multiple disciplines including electrophysiology, cardiomyopathy, congenital heart disease, medical imaging, psychiatry and genetic counselling are brought together to provide the full spectrum of evaluation, clinical and genetic diagnostics and treatment modalities for adults and children.

Pharmacy and Medicines Optimisations

The Pharmacy & Medication Optimisation (PAMO) Directorate was established in 2019 and is integrated into the Mater Hospital Clinical Directorate structure.

The aims of the PAMO Directorate are to develop and advance the Hospital's pharmaceutical services and optimise medicines use for the hospital and patients. 2020 saw a change in the leadership structure in the PAMO directorate with the appointment of Jennifer Brown as the Head of Pharmacy Services following the retirement of Prof Ciarán Meegan after 26 years' service at the helm. Maríosa Kieran was appointed as the Pharmacy Head of Operations with the subsequent appointments of Aisling Beakey, Clinical Pharmacy, Marie O'Halloran, Dispensary and Deirdre Lenehan, Drug Safety as Chief II Service Managers in the directorate.

Drug Expenditure Monitoring Review Committee

The Drug Expenditure Monitoring Review Committee (DEMRC) aims to evaluate, monitor and measure drug expenditure in the hospital, review applications for drug use that will have a budgetary impact, maximise drug reimbursement and funding and ensure value for public expenditure principle is applied. The DEMRC updated the Drug Approval Application Policy in 2020. Drug Approval Applications with a financial implication are reviewed by the DEMRC, chaired by the Chief Executive Officer. In 2020, a total of 171 Drug Approval Applications were submitted to the DEMRC.

Additional actions of the DEMRC in 2020 included maximising Mater Hospital biosimilar adoption, including best value biologic adalimumab and etanercept. Biosimilar drugs as outlined by the National Cancer Control Programme *represent some*

of the ways forward to obtain sustainability and maximise the funding for new medicines to be made available for patient treatment. Following successful biosimilar switching of Rituximab in 2018, the PAMO Directorate led a tender process, in collaboration with St Vincent's University Hospital Pharmacy Department, for Trastuzumab biosimilar. Following awarding of the tender, the PAMO Directorate implemented a seamless switch in August 2020 that results in significant drug cost savings.

Frailty Intervention Team (FIT)

A new FIT pharmacist commenced in August 2020, operating within the wider FIT team. The Mater is the only Irish hospital with a full time FIT team pharmacist recognising the importance of polypharmacy evaluation in our elderly patients to avoid all possible adverse drug effects. The FIT pharmacist completes medicines reconciliation and a medicines optimisation review for eligible patients who meet FIT criteria. The proactive review aims to optimise medications and reduce polypharmacy, drug-related harm and readmissions. The FIT adopt a 'home first' approach, signposting appropriate community pathways for assessed patients where possible. For non-admitted patients, medication changes and suggestions are communicated to the GPs and community pharmacies to support seamless transition of care. The FIT pharmacy process also supports patient flow for admitted patients, as the medicines reconciliation and a medicines optimisation review is completed prior to drug chart completion. Review of patients before a decision to admit has been made is a new activity for the PAMO directorate.

Medicines Reconciliation Service

Medicines Reconciliation (MR) is the formal process in which healthcare professionals consult with patients to ensure accurate and complete medication information transfer at interfaces of care. The main objective of the PAMO MR Service on admission is to obtain a 'best possible medication history' (BPMH). The BPMH provides a detailed list of regular medicines including prescribed and non-prescribed, using a variety of information sources. The BPMH is then reconciled with what the patient is prescribed to identify intentional and unintentional omissions, additions or changes. In 2020, introduction of the FIT pharmacist further enhanced the PAMO MR Service. A MR form template was developed on Patient Centre to facilitate availability of an electronic patient MR record.

The PAMO MR Service follows the World Health Organisation High 5s Project guidelines on service implementation, including recommendations on the priority patient cohort and service measures. The priority patient cohort is patients aged ≥ 65 years admitted through the Emergency Department. The WHO recommends service measures to measure service capacity and quality. In 2020, the MR 1 measure, *Percent of Patients with Medications Reconciled within 24 hours of the decision to admit the patient was on average 69%*. An additional 16% of eligible patients received MR outside the target 24-hour timeframe meaning on average, 85% of Mater eligible patients had a MR completed by the pharmacist-led service alone.

Evaluation of the MR Service continues. In 2020, a snapshot review of MR patients aged < 65 years was conducted to ascertain the value of expanding the MR Service to include patients less than 65 years. A point prevalence study was conducted to assess if time of MR completion impacts the time of follow up intervention by NCHDs, and further study reviewed clinician follow up of discrepancies identified on MR in June 2020. A point prevalence study of information sources utilised by the MR Service was conducted in

March 2020. This work has progressed to an MSc study for completion in 2021.

Drug Safety Initiatives

The aim of the PAMO Drug Safety Service (DSS) is to promote patient safety, through safe drug use in the hospital. The DSS works with the Drug Safety Committee (DSC), the Drugs and Therapeutics Committee (DTC) and a wide range of stakeholders, to achieve this aim.

In January 2019, HIQA published a new guidance document relating to monitoring against the National Standards for Safer Better Healthcare with a specifically targeted Medication Safety Monitoring Programme. Preparations for HIQA Medication Safety Monitoring Inspections were on-going in 2020. Mater progress in HIQA measured medication safety included

- ▶ The inaugural Medication Safety Strategy 2020 - 2022 was developed to outline a clear vision for medication safety across the organisation.
- ▶ A hospital-wide procedural sedation policy and patient information leaflet were approved and published on the Maternet and Qpulse.
- ▶ Use of pre-filled Patient Controlled Analgesia (PCA), due for implementation in 2021.

Other drug safety projects implemented in 2020 include

- ▶ A Time Critical Medicines List was launched hospital-wide in January 2020. Medicine doses may be omitted or delayed in hospital for a variety of reasons. While often these events may not seem serious, for some critical medicines or conditions, delays or omissions can cause serious harm or death. In 2020, the PAMO Directorate undertook a quarterly audit of the use of the drug non-administration code '8' on inpatient drug charts. This audit ascertained the number of omitted and delayed doses in the sample group, the reasons for drug administration omission or delay, adherence

to Mater drug administration and supply policies when the non-administration code 8 was utilised and how many of the omitted / delayed doses were time critical medicines. The results are communicated to nursing, Drugs and Therapeutics Committee (DTC) and Quality and Patient Safety (QPS) for review to determine the required follow-up actions. Over the course of 2020, adherence to hospital drug administration and supply policies improved and the number of time critical medicines that were omitted or delay decreased significantly.

- ▶ The DSC insulin subgroup quality improvement initiatives in 2020 included
 - Point prevalence review of variable rate insulin infusion prescribing
 - Guideline on the Management of Insulin Preparations, the Daily Insulin Checklist, Aid to Insulin Prescribing Out-of-Hours updates
 - Development and pilot of a Continuous Subcutaneous Insulin Infusion drug chart for launch in 2021.
 - Updated the Mater IV Insulin Infusion Drug Chart to align with the updated Mater Diabetic Ketoacidosis Protocol for launch in 2021.
- ▶ Re- audits of concentrated electrolytes, and an audit of paracetamol prescribing and administration, both known high risk drugs, were completed in 2020.
- ▶ PAMO and QPS implemented a 'VANISH2' quality improvement project that includes audit and education on correct completion of the general drug chart.
- ▶ The Eye Drug Chart was updated and implemented hospital-wide in Sept 2020.

Transplant Pharmacy Service

The transplant pharmacist maintains on-going involvement in the National Clinical Programme for Cystic Fibrosis Post Transplant model of care. The transplant pharmacist is now a member of the leadership advisory forum for the international society of heart and lung transplant. This forum serves to provide representation for the varied geographic,

generational, gender, and specialty-based constituencies of ISHLT to discuss issues of interest and concern directly with the board.

Aseptic Compounding Service

Aseptic compounding of systemic anti-cancer therapy (SACT) for haematology and oncology patients was maintained throughout Covid-19. The Oncology – Haematology Day Unit relocated to the Centre for Nurse Education for infection prevention and control purposes, meaning that delivery processes for SACT were modified for the new location.

CATO® is the software system that facilitates electronic prescribing, manufacture and administration of chemotherapy. Chemotherapy prescribing errors and omissions have significantly reduced following the introduction of CATO® electronic prescribing in the Mater. Having successfully implemented CATO® in both in-patient and out-patient cancer services in the hospital the Aseptic Compounding Service (ACS) are engaged in the on-going system maintenance and development. In 2020, the ACS developed / reviewed 166 Chemotherapy Treatment Protocols. ACU pharmacists develop, review and update all CATO® protocols, including complex clinical trials, on behalf of the Oncology and Haematology consultants. The volume of protocol review escalated in 2020, including protocol development for the Prescribers' Guide Malignant Disease section.

Antimicrobial Stewardship Pharmacy Service

There is a structured antimicrobial stewardship (AMS) programme in hospital. The AMS rounds adapted to Covid-19 and moved to virtual platforms for some specialities. The Antimicrobial Pharmacists participate in consultant led multidisciplinary stewardship round across six areas; critical care, vascular, cardiothoracic, Meropenem prescribing, orthopaedics and haematology advising on appropriate choice, dose and duration of antibiotics and minimising adverse

effects of antibiotics. Overall the hospital consumption of antibiotics remained stable during 2020 versus previous years.

The Antimicrobial Pharmacists continued to prepare evidence-based antimicrobial prescribing guidelines with policy updates in 2020 including

- ▶ Surgical Antimicrobial Prophylaxis
- ▶ Antifungal Prophylaxis for patients with Haematological disease
- ▶ Gastroenteritis
- ▶ Clostridioides difficile treatment
- ▶ Extended infusion of meropenem in ICU
- ▶ Urinary Tract Infection
- ▶ CAPD Peritonitis

Medicines Information Service

The Medicines Information (MI) Service enquiry answering workload increased in 2020 with 1,736 enquiries processed. MI development of policies, procedures, protocols and guidelines (PPPGs) increased by 41% in 2020, partly due to the development and review of 262 new PPPGs. PPPGs are published for all Mater staff via the MaterNet and QPulse.

The MI Service Manager is the editor of the pharmacy sections of the MaterNet. A dedicated Covid-19 chapter was newly created in the Prescribers' Guide in March 2020 to contain PPPGs, Patient Information Leaflets (PILs) and Memoranda relevant to the evolving clinical environment for the management of coronavirus. A dedicated Drug Safety and Patient Information Chapter were established in September 2020 to streamline the storage of information on the 'Information on Drugs' page.

The MI Service also supports the management of drug shortages including reporting nationally to the Acute Hospital Drug Management Programme and the HPRA. Drug shortages continue cause problems but the Pharmacy Department has robust procedures in place to ensure continuity of supply to wards.

PAMO Awards and Achievements

Laura Dillon's, FIT Pharmacist developed a patient education video 'Managing your Medicines on Discharge from Hospital' that is now available on the MaterNet and is displayed on hospital public screens. There is no standardised process in Ireland or the Mater for educating patients on how to manage their medicines on discharge from hospital. This video aims to educate patients on medication management on discharge from hospital. Development of this video was shortlisted for the Sr John of the Cross award. The HSE and HIQA both requested access to the video for their potential use.

PAMO Educational Achievements

PAMO Lectures Delivered

- ▶ Patricia Ging and Mairéad Casserly delivered lectures on transplant and intensive care medicine to undergraduate RCSI pharmacy students
- ▶ Mairead Casserly, Karolina Holacka, Maríosa Kieran, Ciara Levey, Dearbhla Murphy, and Una Rice, delivered a workshop titled 'Pharmacy in the Hospital' to the UCD final year medical students as part of their Professional Completion module
- ▶ Dearbhla Murphy delivered a careers talk lecture to undergraduate Trinity College Dublin pharmacy students
- ▶ Laura Dillon conducted mock hospital Interviews with third year RCSI pharmacy students
- ▶ Maríosa Kieran delivered a lecture on 'Insulin Prescribing and Safety' as part of the Mater Endocrinology Teaching
- ▶ Maríosa Kieran delivered a lecture on 'the Mater Medication Variance Report' to the Nursing Quality Forum
- ▶ Karolina Holacka delivered a lecture as part of the UCD Graduate Diploma in Healthcare (Risk Management and Quality).
- ▶ Conor Moran delivered a lecture on Hepatitis C as part of the Irish College of General Practitioners training

- ▶ Máiréad O Connor delivered a lecture on Drug Development as part of the UCD Global Health Masters.
- ▶ Presentations were given to Microbiologists on the following areas following research of the literature by the Antimicrobial Pharmacists
 - Combination Antifungal Therapy in invasive aspergillosis and what not to combine
 - Duration of treatment for UTIs in men
 - The use of validated algorithms to de-label spurious penicillin allergy label

PAMO Research Publications

- ▶ Patricia Ging was one of the expert contributors to Critical Illness, a new publication from The Pharmaceutical Press. This publication supports the multi-disciplinary critical care team providing practical dosing guidance, administration advice, pharmacokinetic and pharmacodynamic information including advice on dosing in Extracorporeal Membrane Oxygenation (ECMO), dialysis and AKI.
- ▶ Patricia Ging publication: Report from the 2018 consensus conference on immunomodulating agents in thoracic transplantation: Access,

formulations, generics, therapeutic drug monitoring, and special populations. Cochrane AB et al J Heart Lung Transplant 2020;39:1050–1069. Expert Reviewer.

Mater Clinical Audit and Effectiveness Committee Poster Competition 2020

In July 2020, the Clinical Audit and Effectiveness Committee displayed audit posters submitted for a competition on Hospital Street in the Mater. The Pharmacy Department very well represented with 3 posters out of 13

- ▶ An Audit of Anticoagulant Prescribing. What has changed in 4 years? Tuthill J., Kieran M., Ging P., Brown, J.
- ▶ The Clinical Efficacy of Intravenous Immunoglobulin in Neurology - A Retrospective Cohort Study at the Mater Misericordiae University Hospital. McDonnell A, Murphy D, Brown J, Smyth S, Moloney P.
- ▶ Treatment outcomes of patients who did not complete their full Hepatitis C treatment course. Moran C, O'Connor M, Farrell J, Walsh C, Ging P, Stewart S, Lambert J.

Surgery

The reduction in elective activity is was a major element in creating the capacity for the Mater and the health system in general to manage the large volume of Covid-19 patients.

Covid-19

During the initial lockdown, all non-urgent elective surgery and non-time dependant surgery was deferred. Activity recovered over the summer months as Covid-19 numbers in the community dropped and guidelines were implemented to protect patients and staff from Covid-19.

Consequently over the course of 2020 we saw a large increase in the numbers awaiting procedures with a further build up of out-patients waiting for their initial consultation. Elective surgery for urgent cases continued throughout the year, but not at a rate that met demand.

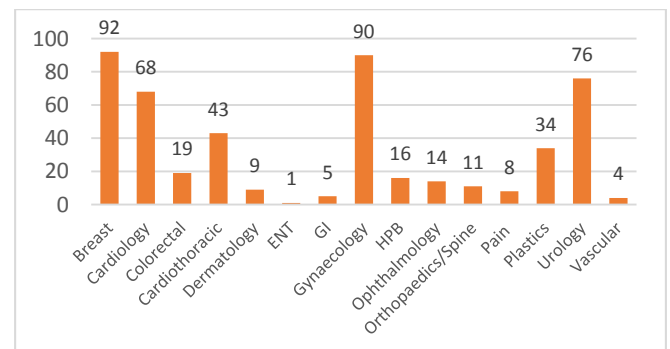
The reduction in surgical activity as a result of Covid-19 along with the existing backlog of patients waiting for elective surgery and unmet demand in outpatients' appointments will all put the hospital's services under further stress as we emerge from the pandemic.

Working with Partner Institutions

Collaborative agreements with the Mater Private Hospital (MPH) and National Orthopaedic Hospital Cappagh (NOHC) allowed for maintenance of urgent surgical pathways and discharge of some inpatients to those hospitals to support flow in Mater. The Mater's agreement with the Mater Private Hospital (MPH) to use its facilities, in advance of the national agreement regarding use of private hospitals, facilitated the transfer of non-Covid medical and surgical inpatients and released capacity within the Mater's main wards.

The cornerstones of this partnership was

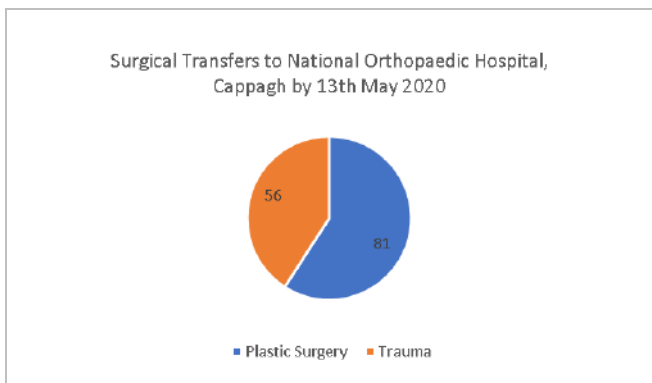
- ▶ Separate hospitals for Covid-19 and non-Covid-19 related care.
- ▶ Separation of surgical teams, to Covid-19 and non-Covid-19 related care.
- ▶ Screening questionnaires with targeted testing.
- ▶ Immediate transfer of Covid-19 related morbidity to the Covid-19 designated hospital.
- ▶ PPE with a minimum of FFP2 masks, face shields, full gown and gloves for all staff in theatre complex.
- ▶ Minimizing the number of staff present in theatre.



Surgical Transfers to the Mater Private Hospital as of 8th May 2020

The National Orthopaedic Hospital Cappagh (NOHC)

Similarly, the National Orthopaedic Hospital Cappagh (NOHC) supported Mater surgical patients requiring orthopaedic and plastics surgical intervention during the Covid period.



Pillar Centre for Transformative Health

National Spinal Injuries Unit

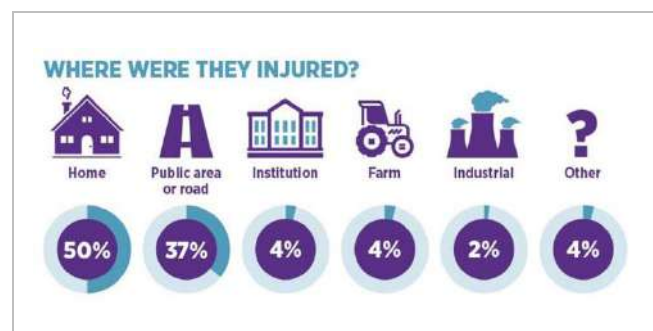
The National Spinal Injuries Unit at the Mater Misericordiae University Hospital are responsible for all patients, in Ireland who have a traumatic injury to the spinal cord. In an average year approximately 700 patients are referred to the service from hospitals around the country. The unit provides specialised, coordinated, interdisciplinary, medical and surgical care to patients with spinal cord injuries including

- ▶ Spinal trauma
- ▶ Spinal tumours
- ▶ Deformities
- ▶ Infections
- ▶ Degenerative spinal conditions

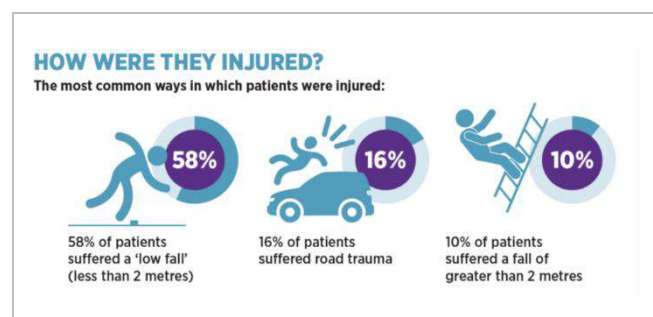
The delivery of the service for emergent surgery, elective surgery and outpatient assessment has been incredibly challenging in the Covid-19 pandemic. During the period of national lockdown there was a 47% decrease in the number of urgent referrals to the unit and a 61% reduction in the number of surgical cases performed. A particularly concerning finding was that for surgical cases there was a 400% increase in attempted suicide as the cause of injury with this cohort representing 11% of all surgical cases performed during the pandemic lockdown.

The National Office of Clinical Audit's Major Trauma Report 2019 indicated that over 700 patients sustained severe spinal injuries in that year. The National Spinal Unit has been located at the Mater Hospital since 1991. The unit provides specialised,

coordinated, interdisciplinary, medical and surgical care to patients with spinal cord injuries.



Injuries Sustained by location of injury. Source: Major Trauma Audit July 2020



How Injuries were sustained. Source: Major Trauma Audit July 2020

Digital Surgery

Ireland's first Digital Surgery Unit was officially opened at the Mater Misericordiae University Hospital on Thursday 25th July 2019. The unit is led by Professor Ronan Cahill and aims to break new medical ground through research into future modes of human-machine collaboration in the surgical theatre.

By researching the integration of medicine with new technologies such as Artificial Intelligence (AI), and by including data analysts as part of surgical teams, this work aims to create new ways to support surgeons to make better decisions, thus promising better outcomes for patients. This research is intended to contribute to a deeper bank of knowledge which can then be used to improve the patient experience for the next person undergoing such surgery. This project builds on the field-leading surgical practice which is already established at the Mater, where enhanced

digital visualisation assists in precision and safety in colorectal cancer surgery. Personalising operations in this way has already resulted in better care for patients.

Colorectal surgery and cancer are the initial focus of the Digital Surgery Unit. Each year in Ireland, more than 2,700 men and women are diagnosed with colorectal cancer, making it the second most common cancer after breast cancer for women, and the second most common cancer after prostate cancer for men. Surgery is the best chance of cure for this cancer; however, surgery has some potential dangers given the risks of infection post-surgery and also risks of damage to important organs such as the bladder or reproductive organs.

The research team, made up of collaborators from UCD, the Mater Hospital, RCSI and IBM Research Ireland, brings together leading research expertise in medicine, dye chemistry, computer science and mathematics with surgical excellence in the Mater. Currently, safe medical dyes, amplified by a surgical video camera, are used to help the surgical team assess the health of tissues surrounding a cancerous area. The next step is augmented cancer tissue identification and comprehension for improved precision in excision, which will help in the repair of the bowel after its removal. The research team will investigate bio-physical models, applied mathematics, video analytics and AI alongside novel dye technologies to progress real-time assistive technologies for improved, individualised precision during surgery.

Robotic Surgery

The da Vinci Surgical System is a robotic surgical system designed to facilitate complex surgery using a minimally invasive approach, controlled by a surgeon from a console.

Robotic surgery commenced in the Mater Hospital in 2019 with six surgical specialities have used the robot which brings the following benefits

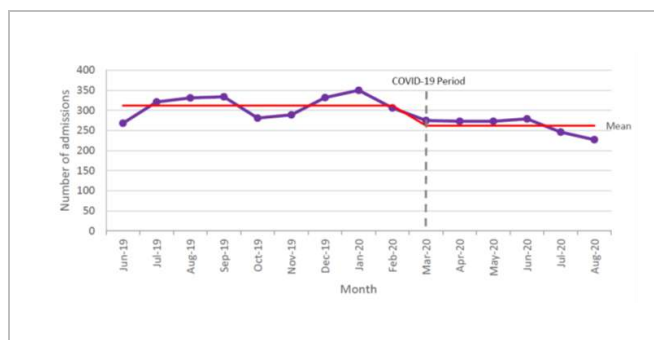
- ▶ **Urology** Significantly shortened recovery time for patients compared to both open and laparoscopic prostatectomy techniques.
- ▶ **Thoracic** Tumours previously only accessible by open chest approached can now be removed via a minimally invasive approach with reduced healing times.
- ▶ **Head and Neck Surgery** Posterior tongue tumours can be removed via the robotic approach as compared to the alternative of a very debilitating destructive open surgery with a hospital stay of 2-3 months.
- ▶ **Gynaecology** Cancer of the endometrium in women with extremes of body mass index are ideally performed via the robot as the open/laparoscopic technique is more difficult and brings a greater morbidity.
- ▶ **Colo-rectal Surgery** Very low rectal tumours usually down staged with chemoradiation have previously been extremely difficult to remove especially in the narrow male pelvis. The advanced robotic approach is ideal here.
- ▶ **Hepatobiliary Surgery** The robotic approach is ideal for the excision of metastatic lesions in various lobes of the liver. The shortened recovery time enables patients to resume systemic chemotherapy without delay.

Orthopaedics

Irish Hip Fracture Database

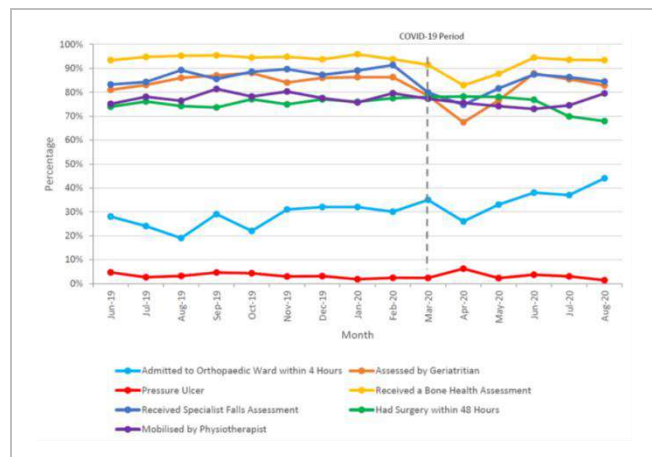
During 2020, patients with other illnesses continued to present to hospitals. Patients with trauma especially those with fragility fractures, such as hip fractures seen typically in older people, continued to present, national figures show that there was a 15% reduction in presentations in the March to May 2020 period .

This presented a new challenge to the well-established pathways of care for such patients. Emergency Departments (EDs) were split into Covid-19 and non-Covid-19 streams. Patients were screened for Covid-19 and isolated if they were admitted from a care facility such as a nursing home. Theatres developed processes to manage the additional infection risk between cases reducing theatre throughput.

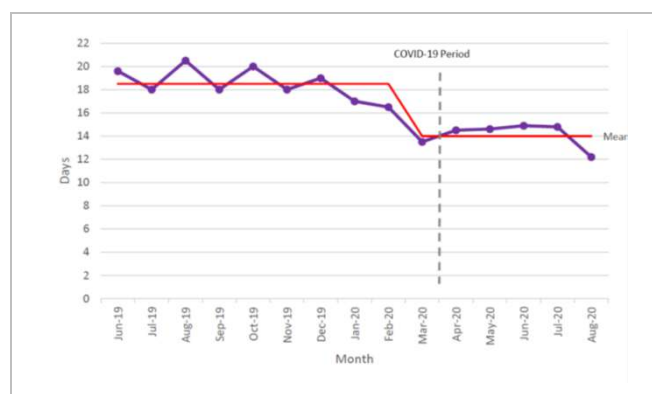


Monthly Hip Fracture Activity based on admission date (June 2019-August 2020). Source: IFHD National Report

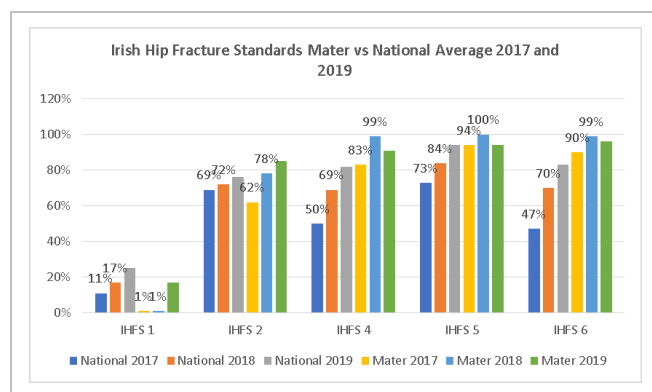
Data gathered by the National Office of Clinical Audit (NOCA) in May 2020 shows that during March and April many of the key specialists i.e. geriatricians, nurses, junior doctors and physiotherapists were redeployed to other services or had their practice altered to support the hospitals reconfiguration for Covid-19. This was a significant factor towards the change in compliance with Irish Hip Fracture Standards. Of note, the percentage of patients receiving operative treatments for their hip fracture was unchanged during Wave 1. Overall, there appeared to be a reduction in the compliance with many of the IHFS during wave 1 which seems to return to pre-Covid-19 levels by May 2020. There was widespread disruption to the pathway of care and staff redeployment.



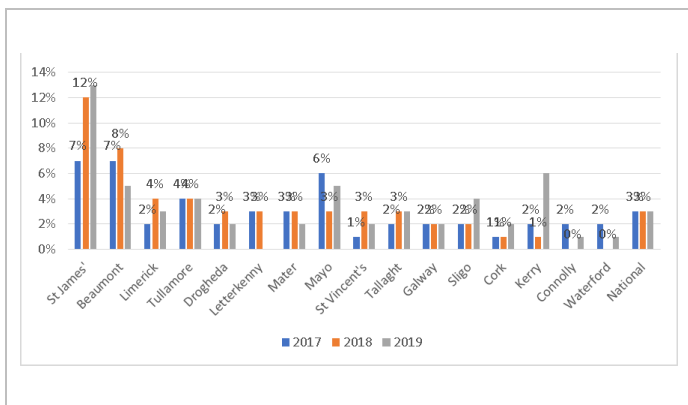
Percentage of Hip Fracture patients who met each of the seven hip fracture standards by month (July 2019 - August 2020)



Length of Stay of hip fracture patients (June 2019-August 2020). Source: IFHD National Report

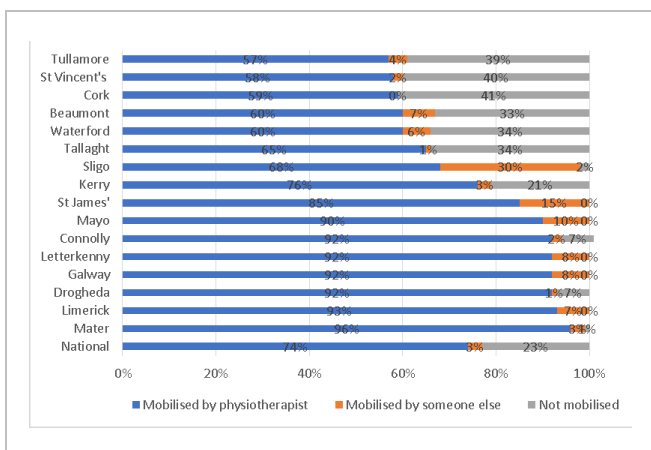


Irish Hip Fracture Standards 1,2,4,5 and 6 for the Mater Hospital performance vs National Average



Irish Hip Fracture Standard 3 - % of patients who develop pressure ulcers following admission

Early mobilisation of hip fracture patients is a key measure of the standard of care and is directly linked to better outcomes⁹. International guidelines recommend that all hip fracture patients receive a physiotherapy assessment on the day of or day after surgery¹⁰. Figure X shows that 99% of patients at the Mater Hospital were mobilised on the day of or the day after surgery, with 96% of patients were mobilised by a physiotherapist.



% of Patients Mobilised on Day of or Day after Surgery

IHFS 1	Time to orthopaedic ward <4 hours: Percentage of patients admitted to an orthopaedic ward within four hours of first presentation of admitted to the theatre from the emergency department within four hours.
IHFS 2	Time to surgery <48 hours: Percentage of patients receiving surgery within 48 hours of first presentation (and within normal working hours).
IHFS 3	Pressure Ulcers: Percentage of patients developing a pressure ulcer following admission.
IHFS 4	Review by Geriatrician: Percentage of patients reviewed by a geriatrician at any point during admission.
IHFS 5	Bone Health Assessment: Percentage of patients receiving a bone health assessment.
IHFS 6	Specialist Falls Assessment: Percentage of patients receiving a specialist falls assessment.

Irish Hip Fracture Standards

Colorectal Surgery

The Mater Hospital has five colorectal surgeons, with a special interest in colorectal cancer. The hospital is one of the national rectal cancer centres. Each year, over 250 colon cancers are diagnosed and treated at the Mater Hospital.

Innovative treatments

The colorectal surgery department provides many innovative treatments to patients with cancer as well as patients with various benign (non-cancerous) conditions including

⁹ Dubljanin-Raspopović et al., 2013; Hirose et al., 2010

¹⁰ Australian and New Zealand Hip Fracture Registry, 2014; NICE, 2011; Waddell, 2011; Scottish Intercollegiate Guidelines Network, 2009

- ▶ **Pseudomyxoma peritonei and HIPEC** The Mater Hospital is the only centre on the island of Ireland offering cytoreductive surgery and heated intraperitoneal chemotherapy (HIPEC) for certain cancers such as appendix tumours, advanced colorectal cancers, and other rare intra-abdominal cancers. HIPEC is a highly concentrated, heated chemotherapy treatment that is delivered directly to the abdomen during surgery. Prior to 2013, patients had to travel to the UK for this treatment. The first case was completed in Ireland at the Mater Hospital in June 2013 and since then, over 60 cases have been successfully completed.
- ▶ **TAMIS (Transanal minimally invasive surgery)** Transanal minimally invasive surgery (TAMIS or TaTME) provides a less invasive surgical option for patients with early stage cancer. Previously, surgery to remove these tumours required an abdominal incision. Now using innovative approaches, certain early stage cancers or rectal polyps may be removed without a surgical incision. Techniques such as this reduce pain and recovery time for patients.

National Centre for Urethral Surgery

The Mater Hospital is the national referral centre for urethral reconstruction surgery (urethroplasty). The service is a consultant-to-consultant referral service with the clear majority of patients referred to the hospital by urologists from around the country. Urethroplasty is the surgical procedure that repairs an injury or a defect within the walls of the urethra. The two main sources of patients for surgery are

- ▶ **Urethral stricture** A narrowing of the urethra most commonly from injury, previous surgery, infection and some non-infectious inflammatory conditions of the urethra. Patients can suffer with a range of complications with some patients suffering acute urinary retention.
- ▶ **Pelvic bone fractures** from motor vehicle trauma or crush injuries which result in urethral tears or disruptions. Often the urethra is completely torn

Patients who suffer traumatic urethral injuries (from road traffic accidents) often have associated vascular and nerve damage affecting the penis and urethra, and over half suffer erectile dysfunction as a result of the injury. A two-stage urethroplasty is indicated in patients with complex stricture disease

Ophthalmology

The Ophthalmology Department at the Mater Misericordiae University Hospital is the main hub for the provision of Ophthalmology services in North Dublin and the North East area. It has established clinical links with Eye Departments in Beaumont Hospital, Children's University Hospital Temple Street, Dundalk Hospital and Connolly Hospital Blanchardstown.

It is the main Ophthalmology teaching hospital for University College Dublin and is one of the main post-graduate training units in Ophthalmology and Ophthalmic surgery at both Basic Specialist Training and Higher Surgical Training levels. It also provides training for optometry students from DIT, Kevin Street.

The hospital provides a comprehensive Ophthalmology service and specialist, tertiary expertise in Retina, Glaucoma, Cornea and External Eye Disease, Eyelid, Lacrimal and Orbital Disease, Neuro-Ophthalmology, Strabismus, Cataract and Refractive Surgery.

National Programme

The National Clinical Programme for Ophthalmology (Model of Eye Care, May 2017) recommends the integration of hospital and community care, with clinicians and care providers working in teams, as the best approach to deliver care for patients and to address the structural deficits in the current system.

The integration of hospital and community care, with clinicians and care providers working in teams, is the best approach to deliver care for patients and to

address the structural deficits in the current system. The efficient operation of the multidisciplinary team (MDT) is central to the delivery of primary eye care. Implementing a more community-based model will improve access to care and will help address the current adult and paediatric waiting list crisis. The Mater took a first step on delivering an integrated community care model with the development of the ophthalmology service at the Grangegorm Primary Care Centre.

Eye Emergency Department

The Eye Casualty Department service works on a Monday to Friday basis from 8am to 8pm with the consultant team on call outside of those hours. The Mater provides accident and emergency treatment for urgent, sight-threatening problems and for issues that cannot wait for a routine appointment. Patients are assessed, on arrival, by a nurse who will determine the seriousness of the condition with patients treated in a clear and prioritised manner.

Inherited Retinal Degeneration Programme

The Inherited Retinal Degeneration (IRD) programme has been running between the Mater and the Royal Victoria Eye and Ear hospitals over the last few years. This multi-disciplinary programme is co-funded by the patient group Fighting Blindness and was established to provide world class standard in IRD care at clinical phenotyping, genotyping, support and counselling level.

Dermatology and Plastic Surgery Transformation Project

Access to OPD and consequent treatment and procedures were a major driver in the selection of these specialities to undergo a Transformation programme- both of which have significant OPD

waiting lists of 3,455 and 2,722 respectively (Nov 2020). The changes in OPD initiated by the COVID-19 pandemic also provides opportunity to select these specialities as a medical and surgical services respectively that will be subject to more whole system Transformation and serve as Flagships for improvement and innovation in OPD.

The programmes were initiated in August 2020 with focus on the shared Skin Cancer Service and with Root and Branch analysis of both services being carried out in parallel. Extensive data gathering was carried out in the month of September, including a week long GEMBA period where on the ground observational studies were carried out to understand and review current processes and practices.

A Value Stream Analysis event was carried out on the week of October 5th at which data was presented, analysed and solutions generated which was very well attended by all clinical teams and supported by senior management. What has emerged is a change programme for the two services with 3 major improvement streams across the Skin Cancer, Dermatology and Plastic Surgery Services – 16 project streams in total.

A *30 Day Report Out* to a Senior Management team took place on 10th December to provide update on the change programmes with work well progressed within each of the 16 Project Streams. An overview of the agreed target areas is given below.

Dermatology Improvement Programme

- ▶ Referrals to Triage
Standardising triage to allow equity in access for patients and ensure patients requiring urgent appointments have access to earliest available slot
- ▶ Streamlining Clinics
 - Introducing structures to optimise existing capacity
 - Facilitating CNS led clinics
 - Restructuring clinics to enable new and consolidated pathways

- ▶ Streamlining Procedures
 - Optimising capacity in existing procedure room
 - Improving accuracy in data capture

Plastic Surgery Improvement Programme

- ▶ Developing a Hub and spoke model:
Development of pathways to enable hub and spoke model to enable best use of model 4 services going forward and utilizing capacity in associated model 3 centres
- ▶ Clinic efficiencies
 - Improving information flow and planning for hand therapy patients, building up to therapy led clinics for hand patients to improve flow

- and increase capacity in clinics.
- Separating wound care clinic from general to enable additional capacity for complex and new patients at consultant led clinics
- Developing a model for tissue viability CNS to run same
- Separating skin cancer clinics and hand clinics
- ▶ Physical infrastructure
- ▶ Developing model to support current and future Plastics Surgery service

These streams will continue during 2021 building incremental improvements reporting out to senior management at key milestone events.



Education

Education

The Mater's academic partnership with University College Dublin goes back to the foundation of the hospital, covering undergraduate and postgraduate programmes and in recent years the development of the lean programme in healthcare, in the form of the Mater Lean Academy

Together the two institutions have demonstrated a commitment to stimulating a culture of learning and enquiry which has led to the establishment of one of the foremost centres for clinical training in Ireland.

Today, the Mater Hospital continues to work closely with UCD in providing world class undergraduate and postgraduate and specialist training programmes in surgery and medicine, nursing, physiotherapy and radiography. The Mater also works closely with other institutions including Trinity College and Dublin City

University and provides clinical placements and internships to hundreds of students every year, including pharmacists, nurses, clinical therapists, radiographers, psychologists, podiatrists' audiologists and lab technicians.

Undergraduate Education

The Department of Medicine and Therapeutics of the Mater Misericordiae Hospital, in cooperation with its counterpart at St. Vincent's University Hospital, provides an integrated teaching programme for students in their penultimate and final year of the UCD curriculum. In addition, the department collaborates with preclinical departments including Pharmacology, Physiology, Pathology, Microbiology and Anatomy, at earlier stages in the curriculum to integrate aspects of biological sciences with clinical medicine.

” Much of the educational programme is delivered in the Catherine McAuley Education and Research Centre, which was opened in 2004 as a partnership between UCD and the Mater Hospital

The teaching programme at the Mater Hospital consists of modules in cardiology, respiratory medicine, gastroenterology, nephrology, neurology, endocrinology, rheumatology, medicine for the elderly, infectious diseases, immunology, dermatology, therapeutics, intensive care medicine, molecular medicine and communication skills. These disciplines are taught through formal lectures, bedside tutorials, clinical clerkships with medical teams, and a residence period during which students live in the hospital and are exposed to emergency medicine and the care of the critically ill.

During their penultimate year, medical students are encouraged to participate in research projects to encourage a "bench-to-bedside" atmosphere that exposes students to developments in laboratory-based and clinical research.

Postgraduate Education

Developing postgraduate education on site allows flexibility for clinicians who wish to gain specific skills, knowledge or technical expertise in an active and vibrant level 4 teaching hospital environment. The Mater is committed to outstanding training for its medical professionals. The Postgraduate Medical Centre, located within the Catherine McAuley Centre, provides high quality, dynamic and innovative education programmes for consultants, Non-Consultant Hospital Doctors (NCHD's) and the North Dublin Faculty of the Irish College of General Practitioners. The centre strives to exemplify the Mater Hospital's commitment to outstanding training for medical professionals.

The centre plays a key role in providing for the training needs of NCHD's and facilitates the professional development of consultants within the hospital and beyond by developing a programme of continuing medical education relevant to medical staff in the Mater Hospital including in house multidisciplinary meetings and with regular teaching sessions designed for Interns and SHOs as well as providing education sessions to members of the North Dublin ICGP. All meetings overseen by the Centre of Postgraduate Medical Education are recognised and accredited by governing bodies such as RCPI, RCSI and ICGP.

Nursing Education

The Mater Hospital has been providing the highest quality nursing training since 1891. Nurses are offered a wide range of courses and subjects with the Centre for Nursing Education providing for both undergraduate and postgraduate education with specialist postgraduate programmes and professional development.

Centre for Nurse Education

The Centre for Nurse Education (CNE) is a purpose built centre responsible for the provision of quality

approved and evidence based ongoing professional and specialist nurse education programmes, delivered in response to clinical and professional need. The provision of education comprises mainly of 3 different arms; starting with a series of short continuing professional education courses, followed by a wide range of bespoke clinical CPD foundation modules, and finally a suite of specialist postgraduate diploma programmes linked to UCD as set out below

- ▶ **The 1st arm** includes 35-40 different short continuing education courses, ranging from corporate/nursing induction, to clinical skills development, such as venepuncture & cannulation, non- invasive ventilation, preceptorship to central venous access devices, all professionally approved by the nursing regulatory body, Nursing and Midwifery Board of Ireland.
- ▶ **The 2nd arm** involves a wide range of bespoke clinical foundation programmes, developed to support new staff employed to a clinical area from across the clinical directorates. The demand for these popular programmes, approved and accredited by UCD School of Nursing, Midwifery & Health Systems continues to grow in response to need. All clinical CPD programmes are educationally governed by the nurse education team in the CNE and clinically supported and

facilitated by the clinical facilitators across the respective clinical areas. Some bespoke clinical CPD foundation programmes are linked to a speciality postgraduate diploma programme; enabling learners' receive a full module exemption and a reduced fee from the overall programme fees.

- ▶ **The 3rd arm** of postgraduate education, include 9 different speciality postgraduate diploma programmes ranging from critical care to diabetes nursing. These formal programmes of learning operate using a shared governance model with UCD and the other partner organisations. These programmes include 2-3 clinical modules with significant contribution from the Mater staff, made up of educators, clinical facilitators and clinicians, regarding the delivery of specialist content, and participation in all formal and clinical assessments.

Significant reform is currently underway in moving the delivery of face-to-face content to a UCD online learning platform for the speciality postgrad students. In addition, many weeks of speciality clinical placements is provided by the clinical facilitators for the Mater and external registered nurses, undertaking these postgraduate programmes, exposing learners' to a vast array of model 4 level clinical expertise across the specialities.



Innovation

Situated in the iconic 1861 building at the Mater Misericordiae University Hospital, the Pillar Centre for Transformative Healthcare offers a unique, state of the art, interdisciplinary and multidisciplinary space for practical skills training, simulation and team-based learning.

The Pillar Centre for Transformative Health

Launched in 2018, this unique centre aspires to enhance the Education, Research and Innovation capability of Mater Hospital as outlined in *Doing what Matters* the Mater Hospital Strategic Plan 2018-2021. Through Partnerships, Innovation, Learning, Leadership, Academia and Research, the Pillar Centre for Transformative Healthcare strives to be a leader in Education, Research and Innovation with a particular emphasis on developing the potential of co-location on a hospital campus.

In October 2020, the Pillar Centre Strategic Plan 2020-23 was launched at the hospital. The plan seeks to advance training, research and innovation opportunities at the hospital and sets out five strategic priorities to achieve their vision of becoming “a leader in education, research and innovation”.

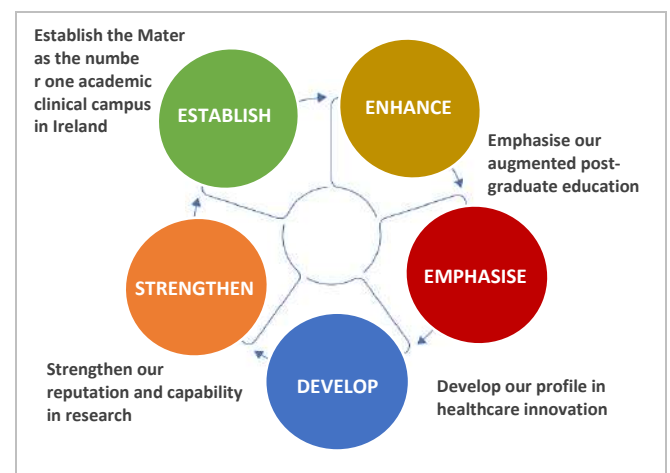
Pillar Centre Vision

To be a leader in education, research and innovation with a particular emphasis on developing the potential of co-location on a hospital clinical campus.

Strategic Goals

1. To enhance education, research and an innovation capability and as outlined in *Doing What Matters*, the Mater Hospital Strategic Plan.
2. To emphasise ‘added value’ postgraduate education.
3. To develop a profile in healthcare innovation.

4. To enhance our reputation and capability in research.
5. To be the number one academic clinical campus in Ireland.



Pillar Centre for Transformative Health

” We value our partnerships and collaborations and we believe that by working together, we can discover, develop, and deliver the best outcome for our patients

Alan Sharp CEO Mater Hospital

Genomics

The Pillar Centre for Transformative Healthcare and the Ireland East Hospital Group are developing a comprehensive clinical genetics programme to

support key services including cancer, cardiovascular disease, immunology, metabolic diseases, neurology and rare diseases. The opening of the Next Generation Sequencing Laboratory in the Mater has enabled the hospital to move from experience-based medicine to a precision medicine approach by identifying driver mutations in the Next Generation Sequencing (NGS) laboratory. The laboratory now has the capacity to introduce testing across multiple clinical specialties, including cardiology and ophthalmology.

Mater Innovation Office

The Innovation Office, led by an Innovation Manager, acts as a focal point for collaborations and exchange for our students, staff and industry. The Innovation Office provides support and advice to individuals, academics, pharmaceutical and medical device companies, and other groups who are developing innovative health products or technologies.

Academy for Healthcare Leadership

The Mater Hospital and UCD have developed a bespoke curriculum for an Executive Leadership programme, to provide healthcare staff with the knowledge to implement significant systems reform.

Co-Lab

Co-Lab is a co-working space for our partners in transforming healthcare that enables the Mater to scale up our collaborative partnerships by providing a practical environment for external partners and our staff to work together.

Pharmacy Undergraduate Collaboration

As a faculty of the RCSI School of Pharmacy, the Pharmacy and Medicines Optimisation (PAMO) Directorate continued to support undergraduate pharmacy education in 2020. The PAMO Directorate delivered leadership in hospital pharmacy workshops

for final year pharmacy students. Due to Covid-19 restrictions these seminars were delivered live online from the Mater Pillar Centre by a team of senior and chief pharmacists. In December 2020, PAMO virtually welcomed RCSI first year pharmacy students to the Mater Pharmacy Department. Videos demonstrating the state-of-the-art aseptic compounding unit, the role of the clinical pharmacist in patient education, the Mater drug supply systems and extemporaneous compounding were displayed. These new elements were added to our usual presentations showcasing the Medicines Information and Drug Safety Services.

Mater Lean Academy

The Mater Lean Academy are a team of healthcare professionals fully qualified in Lean Six Sigma who are committed to improving healthcare processes for patients and staff. The Lean Academy have trained over 2,000 healthcare staff in process improvement methodologies and supervised over 100 healthcare process improvement projects in over 50 different healthcare organisations around the country. All of the projects have as their primary goal a direct patient benefit or outcome in addition to cost savings.

The Mater Lean Academy and the UCD School of Nursing, Midwifery and Health Systems have a range of university accredited part-time programmes. The programmes offer a flexible educational pathway to an MSc in Leadership, Innovation and Management for Healthcare. The different programmes are tailored to suit different levels of experience and are suitable for all staff, clinical and non-clinical. The mission of the UCD and Mater Lean Academy programmes are to use the principles of Lean Six Sigma management and science to improve the quality of the healthcare experience for patients, their families and staff. The programmes offer quality improvement projects that incorporate consulting, coaching, and training services for all staff involved in healthcare delivery. The project work adopts a person-centred approach to deliver process improvement in a healthcare environment and offers a suite of Lean Programmes in Healthcare including

- ▶ Fundamentals of Lean for Healthcare (White Belt): Intensive One-Day introduction to Lean Six Sigma for Healthcare NMBI accreditation 6 Continuing Education Units (CEUs)
- ▶ Professional Certificate in Lean Six Sigma for Healthcare (Green Belt): Understand the principles and philosophy of Lean and apply them in your own healthcare organisation. Six Month, part time programme NFQ Level: 8; ECTS credits: 10
- ▶ Graduate Diploma in Lean Six Sigma for Healthcare (Black Belt): Develop process improvement, leadership, research and project management skills to drive the changes necessary for a

successful Lean healthcare transformation within your organisation. 1-year part time programme. National Framework of Qualifications (NFQ) Level: 9; European Credit Transfer System (ECTS) credits: 60

In December, 41 students from 8 different Irish healthcare organisations celebrated their academic achievement and received their Professional Certificates in Lean Six Sigma for Healthcare. The graduation ceremony was held in the Pillar Centre for Transformative Healthcare, Mater Hospital.



Research

Research

Since March 2020, the extraordinary challenges of the Covid-19 pandemic have seen our staff pivot to respond in a variety of ways

While clinical and support staff have been testing, treating and caring for those directly affected by the virus, our researchers, primarily in conjunction with UCD's Clinical Research Centre and colleagues in St Vincent's University Hospital have joined the pursuit of improved diagnostics, treatments and prevention.

The goal of the Covid-19 response was to leverage the existing research expertise and infrastructure in the Mater, our sister hospital St. Vincent's University Hospital and our academic partner University College Dublin to develop and conduct high quality Covid-19 research and to utilise that knowledge to inform best practice in patient clinical care and treatment.

Covid-19 and Research

In this unprecedented time of global pandemic, the importance of health research has never been more obvious. Scientists from around the world are working

collaboratively to develop new ways to prevent and treat Covid-19. Our researchers at the hospital, utilising the expertise and structures of the UCD Clinical Research Centre have been working collaboratively with St Vincent's University Hospital and other hospitals across the country to advance the national response to Covid-19. The Clinical Research Centre successfully pivoted and redirected its staff resources to facilitate and prioritise clinical research on Covid-19. Some of the studies include

All-Ireland Infectious Disease Cohort Originally established in 2012 the UCD Infectious Disease Cohort Project was developed to support the development of

high quality infectious disease research for patients with infectious diseases including viral hepatitis, HIV, skin and soft tissue infections and bone and joint infections. In response to Covid-19 an ethical amendment was submitted to establish a new cohort of Covid-19 patients. An application followed to the new National Research Ethics Committee in May 2020, which approved an additional 9 sites including Beaumont Hospital, Cork University Hospital, St Luke's General Hospital Kilkenny and Wexford General Hospital. The study was renamed the All Ireland Infectious Disease Cohort at this time. As of the end of December approx. 1,000 patients have been enrolled into the study with 12 research projects submitted to the AIID Cohort Oversight Committee. In addition, the AIID Cohort has partnered with a number of collaborations across Ireland, including the Irish Coronavirus Sequencing Consortium and the COVID BIOME project.

SOLIDARITY is an international clinical trial designed to find an effective treatment for Covid-19, launched by the World Health Organization. It is one of the largest international randomised trials for Covid-19 treatment, enrolling almost 12,000 patients in 500 hospital sites in over 30 countries. The SOLIDARITY Trial aims to globally test the efficacy of several antiviral and anti-inflammatory treatments. The trial is led by Prof Cormac McCarthy at St Vincent's University Hospital and Dr Aoife Cotter and Dr Eavan Muldoon at the Mater Misericordiae University Hospital.

SPRINT SARI is a global observational study of patients in hospitals and intensive care units with severe acute respiratory infection aiming to establish a research response capability for the future pandemics. The Mater Misericordiae University Hospital and St Vincent's University Hospital are among the recruiting sites.

Pre-ICU Trials University College Dublin sponsored two Covid-19 Pre-Intensive Care Unit trials – COVIRL001 and COVIRL002 with recruitment at the Mater Misericordiae University Hospital and St Vincent's University Hospital and supported by the

Clinical Research Centre at both clinical sites. The protocol and the preliminary results of the COVIRL002 trial – "Tocilizumab for management of severe, non-critical COVID-19 infection" have been published (Cotter et al., 2020; McCarthy et al., 2020).

Covid-19 and Pregnancy Professor Donald Brennan, Prof of Gynaecological Oncology (Mater Hospital and National Maternity Hospital) is leading a Covid-19 and pregnancy multidisciplinary study whose primary purpose is to develop a national registry of Covid-19 positive patients during pregnancy and characterise the strength and type of immune response to Covid-19 infection in order to provide insight into the durability of the antibody response, and the provision of transient immunity to the neonate. The study also assesses the impact of the pandemic on women's experiences of birth, and on mental health for women and clinicians and if this varies by place of birth or model of care.

Science Foundation Ireland

COVID-19 Rapid Response Research and Innovation Programme The funding from SFI focuses on the support projects addressing the immediate and pressing needs of society arising from the virus. Dr Barry Kevane successfully secured funding for his Cocoon Study.



Professor Fionnuala Ni Ainle, Professor Patricia Maguire and Dr Barry Kevane

Cocoon Study COVID-19 coagulopathy and thrombosis This multidisciplinary clinical and translational research study is led by Dr Barry Kevane, Consultant Haematologist at the Mater Hospital and was awarded just under €294,000 in funding. Dr Kevane is working with key collaborators Professor Patricia Maguire (UCD School of Biomolecular and Biomedical Science) and Professor Fionnuala Ni Ainle (UCD School of Medicine and Consultant Haematologist, Mater Hospital). The cocoon study is an international project which will examine blood coagulations in Covid-19 patients. Using advanced artificial intelligence and genomics technologies the project will deliver enhanced thrombotic prevention strategies and a rapid diagnostic platform for personalized risk assessment. The study aims to address urgent clinical dilemmas and to develop novel solutions for existing diagnostic and therapeutic challenges.

National COVID Biobank During 2020 Professor Tim Lynch (Consultant Neurologist, Mater Hospital and Chief Academic Officer Ireland East Hospital Group) along with his six Chief Academic Officer (CAO) colleagues from across the country launched a bid for a national biobank. The CAOs met regularly with colleagues in the Department of Health, Health Research Board and the HSE to discuss the possibility of creating a national biobank for Ireland. A national biobank would allow for the study of diseases in the Irish population, something our counterparts in other countries have been carrying out for some years. To date 20 countries across the EU have been successful in establishing biobanks and in creating the Biobanking and Biomolecular Resource Research Infrastructure – European Research Infrastructure Consortium (BBMRI-ERIC), the world's largest network of biorepositories of human samples that connects 600 biobanks across these states.

In relation to Covid-19 a national biobank would allow us to support our clinical researchers so they can distinguish symptomatic carriers, from the severely affected, to those more likely to have a meaningful immune response, as well as those survivors of severe Covid-19 who will go on to develop chronic

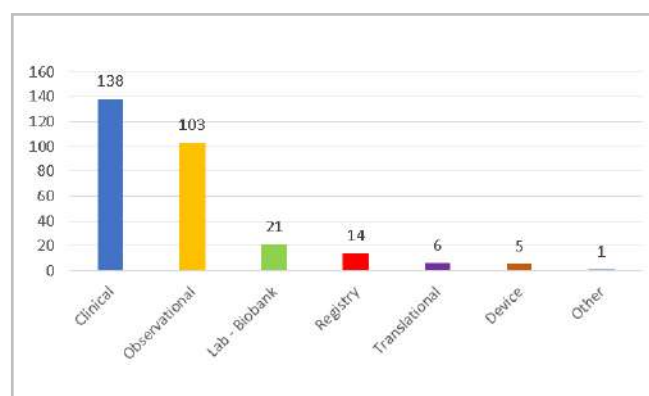
complications. It also supports the finding of a cure for the virus. It will allow clinicians to direct scarce resources intensive care beds and novel antiviral agents to those most in need.

UCD Clinical Research Centre

Since 1852 the Mater Hospital has worked hand in hand with our academic partner University College Dublin to deliver the clinical research and innovation as well as education and training.

The importance and impact of research has been underlined in 2020 with the advent of a worldwide pandemic. The establishment of the UCD Clinical Research Centre at the Mater in 2006 is a key component in the translation of research into meaningful patient benefits.

The Clinical Research Centre is an academic led, multi-site, patient-focused centre supporting high quality clinical and translational research and forms part of a research network across UCD, St Vincent's University Hospital and the Mater Misericordiae University Hospital. This network was a key part of the national response to Covid-19 with researchers from the three institutions being central to the development of a national response to Covid-19.



UCD's Clinical Research Centre's Studies by Type

The UCD CRC has a significant track record of supporting both investigator and industry-initiated clinical research projects.

The supports include

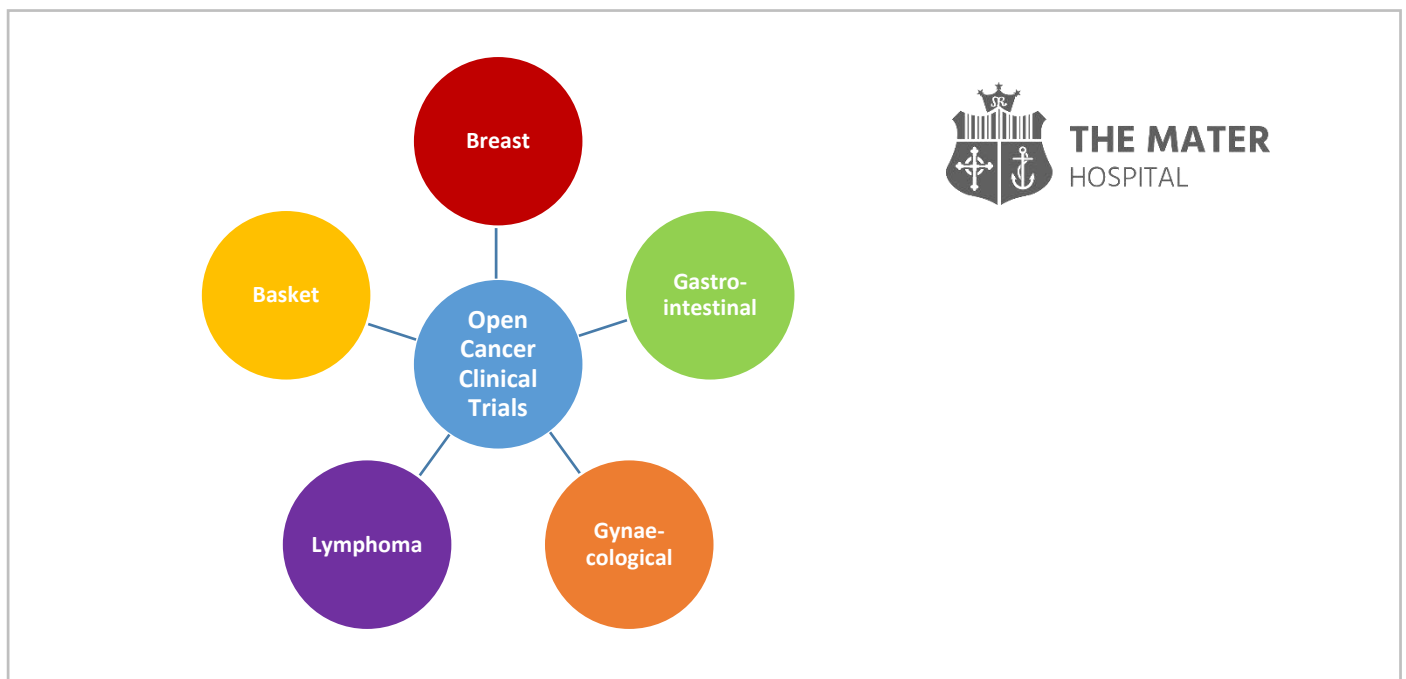
- ▶ State-of-the-art facilities within major acute hospitals for high quality clinical research
- ▶ An environment which is: Supportive to clinicians to undertake hypothesis-driven investigator-led clinical studies
- ▶ Recognised by regulators, pharmaceutical companies and clinical research organisations as being professional, of the highest quality and suitable for the conduct of clinical trials
- ▶ Attractive to patients and encourages participation in clinical research and trials by providing excellent clinical care and access to latest clinical interventions
- ▶ Managed under a dedicated and approved quality policy.
- ▶ A cohort of professional and experienced research scientists, data managers and clinical research nurses that can ensure studies are conducted and managed to the highest levels of quality
- ▶ Complete study management, oversight and sponsorship

Cancer Research

The Clinical Trials and Research Unit (CRTU) is a core component of the Cancer Directorate. The CRTU was established in 2000, under Prof John McCaffrey, and supports research in oncological and haematological malignancies. The CRTU has opened over 200 trials since it opened, providing treatment options to over 1,500 patients.

The unit supports academic, collaborative and industry sponsored trials with 15 studies actively recruiting in breast, prostate, hepatobiliary, gastric, melanoma, endometrial, ovarian, cervical and lung cancers as well as non-Hodgkin's Lymphoma, follicular lymphoma and chronic lymphocytic lymphoma.

Prof Catherine Kelly is the Medical Director of the CRTU and is supported by an experienced team comprising a CRTU manager, Nurse Lead, CRTU registrar, five research nurses, five data managers, two administrative assistants and two pharmacists.



Open Cancer Clinical Trials at the Mater. **Source** Cancer Trials Ireland

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FINANCE

**STATEMENT OF INCOME AND RETAINED EARNINGS
FOR THE FINANCIAL YEAR ENDED 31 DECEMBER 2020**

	2020	2019
	€'000	€'000
Turnover		
Revenue grants	341,776	307,752
Other income	50,380	47,605
Capital grant amortisation	3,690	3,362
	<u>395,846</u>	<u>358,719</u>
Costs		
Staff costs	(260,971)	(239,156)
Non pay costs	(131,023)	(117,560)
Depreciation	(3,690)	(3,362)
	<u>(395,684)</u>	<u>(360,078)</u>
Operating surplus/(deficit)	162	(1,359)
Exceptional item	-	-
Interest payable and similar charges	(18)	(34)
Surplus/(deficit) on ordinary activities before taxation 144	<u>(1,393)</u>	<u>-</u>
Taxation	-	-
SURPLUS/(DEFICIT) FOR THE FINANCIAL YEAR	<u>144</u>	<u>(1,393)</u>
Retained deficit at the beginning of the reporting period	(23,091)	(21,698)
Retained deficit at the end of the reporting period	<u>(22,947)</u>	<u>(23,091)</u>

BALANCE SHEET AS AT 31 DECEMBER 2020

	2020 €'000	2019 €'000
Fixed Assets		
Tangible assets	25,489	17,655
Financial Assets	-	-
	<u>25,489</u>	<u>17,655</u>
Current Asset		
Debtors and Prepayments	30,627	40,632
Stocks	14,130	9,061
Cash at bank and in hand	8,162	981
	<u>52,919</u>	<u>50,674</u>
Creditors: Amounts falling due within one year		
Creditors	(62,022)	(59,796)
Bank loans and overdrafts	(13,843)	(13,968)
	<u>(75,865)</u>	<u>(73,764)</u>
Net current liabilities	<u>(22,946)</u>	<u>(23,090)</u>
Total assets less current liabilities	<u>2,543</u>	<u>(5,435)</u>
Capital grants	(25,489)	(17,655)
NET LIABILITIES	<u>(22,946)</u>	<u>(23,090)</u>
Financed by:		
Capital and reserves		
Called up share capital presented as equity	1	1
Retained deficit	(22,947)	(23,091)
SHAREHOLDER'S DEFICIT	<u>(22,946)</u>	<u>(23,090)</u>

Financial review

Operating costs net of other income for the financial year amounted to €341.8 million, broken down as follows: - Pay €261 million, Non Pay €131.2 million, Income (€43.8 million) and Pensions €6.6 million. (2019: €307.8 million) which was an increase of 11% over 2019 reflecting increases in pay arising mainly from national pay awards including Consultant settlement and new service developments and increased non-pay costs.

The net surplus for the financial year was €0.144 million (2019: deficit of €1.393 million).

MMUH has a deficit of €23.1m coming forward from 2019. We achieved a balanced budget in 2020, thus we have not added to the historic deficit. 2020 was an extremely challenging year for the Hospital and its staff as we managed through the pandemic and continued to provide urgent and time sensitive care across a range of specialties. MMUH played a pivotal role in the fight against Covid19. Many processes and procedures and alternative patient pathways were put in place to safely manage patient care. There was significant cost associated with Covid19 care and this was captured on our financial system and was funded at year end by the HSE.

During the pandemic capital and revenue funding was provided to increase capacity across the following specialties

- ▶ 03 CTHDU beds (upgraded for conversion to critical care beds as required)
- ▶ 06 Bed Hyper Acute Stroke Unit (can be converted to critical care beds if required)
- ▶ 28 Bed Acute Medicine – Acute Floor
- ▶ 12 Bed Observation Unit
- ▶ 08 Medical Beds Renal and Respiratory
- ▶ 10 Bed Dialysis Unit

MMUH is the National Centre for Infectious Diseases hosting the National Isolation Unit. The hospital,

supported and approved by the HSE, has commenced a capital programme to deliver a 98 bed Emergency Ward Block. The addition of these beds will help the hospital and the health system deal with the challenge of access to services in a pandemic. The pandemic has created an urgent need to expand capacity to support the provision of safe services as a direct result of Covid19.

Review of Performance and Achievements for the Financial Year

Results

During 2020 the Hospital treated 22,143 inpatients and 56,692 day cases Table 1. 79,894 patients were treated in the Emergency Department including Smithfield Rapid Injuries Clinic and the Eye Emergency Department. Table 2. 209,475 patients were seen at the Outpatient Department Table 3.

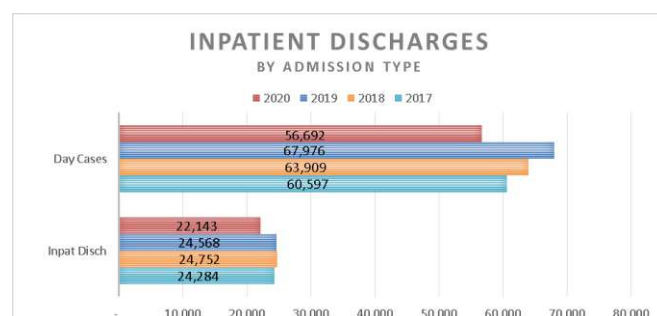


Table 1 Inpatient reduction of 10% on 2019 activity
Day case reduction of 16% on 2019 activity

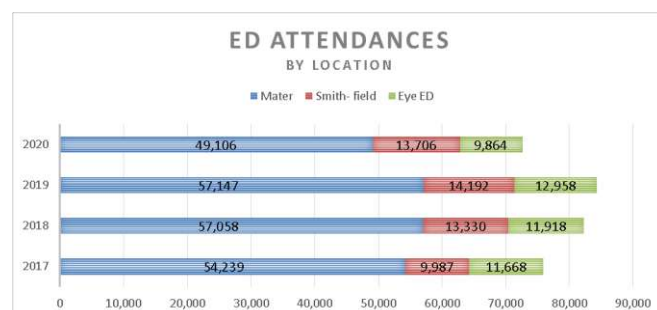


Table 2 Emergency department reduction of 14% on attendances

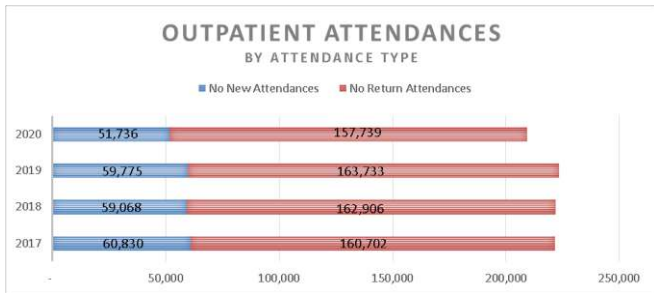


Table 3 OPD reduction of 6% on attendances (70% of patients attended virtually)

Activity Based Funding

The clinical value of the company's inpatient and day case activity for 2020 was €24.7m less than the target value set. The target value was based on 2019 activity levels.

The pandemic impacted on day case activity where discharges fell from 66,105 to 51,800 a decrease of 14,305. Scheduled inpatient activity also decreased by 1,017. The hospital was enabled through agreements with the Private Hospitals and the Safety Net national agreements to have urgent complex surgeries carried out for our patients in private hospitals. The hospital continued to treat urgent high acuity patients during the pandemic, including Cardiac, Transplant and Oncology.

The hospital recovered quickly in July and continued with a normal level of activity until October at commencement of the 3rd surge. During 2020 the hospital continued to outsource activity to the private hospitals.

