



The Impact of COVID-19 on Trauma and Orthopaedics in Ireland

NATIONAL CLINICAL PROGRAMME FOR TRAUMA AND ORTHOPAEDIC SURGERY

Executive Summary:

The novel coronavirus causing COVID-19 subsequently named SARS-CoV-2 was identified by the World Health Organisation (WHO) in early January 2020.

The specialty of Trauma and Orthopaedics is one of the largest surgical specialties and accounts for 13% of the overall waiting list. It is responsible for one third of the acute bed days used and one third of the acute surgical procedures performed annually.

The National Clinical Programme for Trauma and Orthopaedic Surgery (NCPTOS) was established in 2012 and has been a key transforming force in delivering change through its model of care and clinical leadership.

The COVID-19 pandemic has forced change on the health service rapidly and without warning. Managing this sudden change is a challenge for all healthcare professionals.

For trauma and orthopaedic surgery in Ireland, one of the opportunities and threats is ensuring that the innovations that have improved patient care and safety in the middle of a crisis are recognised and are adopted as standard moving forwards.

This document is divided into four sections, which cover the following areas:

- ✓ Identify the impact that COVID-19 has had on patient care and service delivery for trauma and orthopaedic surgery in Ireland.
- ✓ The impact COVID-19 has had on the delivery of the Core Curriculum and Training Programmes and implications for same in relation to recruitment in the forthcoming years.
- ✓ Highlight quality improvement projects that have become embedded in clinical practice as a result of the pandemic e.g. TAC; ACT.
- ✓ Highlight the impact COVID-19 had had on established initiatives e.g. MSK Triage; IHFD; INOR; FLS.



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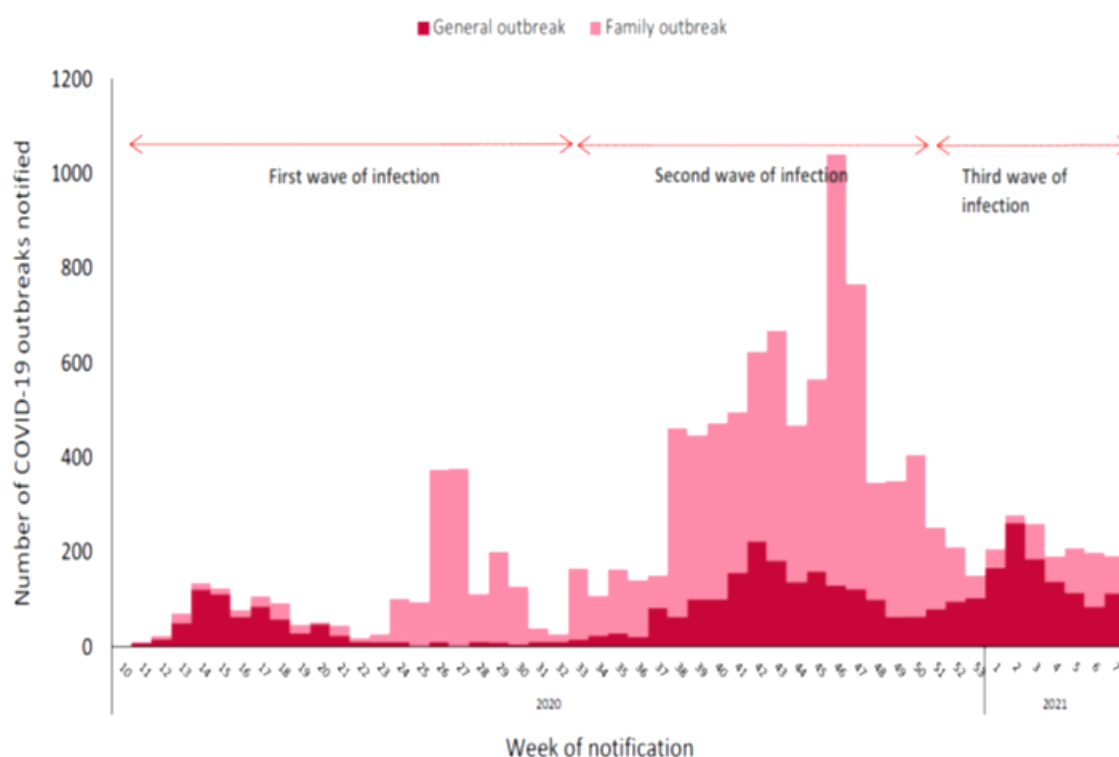
Completion Date of Report

30th August 2021

Section 1 – Impact of COVID – 19

On the 29th February 2020, the first case of COVID-19 was diagnosed in Ireland, with the first death being recorded on the 11th March. That same day WHO declared the COVID-19 outbreak a global pandemic. As of 26th July 2021, Ireland has undergone three waves of the COVID-19 pandemic, with 295,386 cases and 5,026 deaths. To date, 262,338 people have recovered from the virus. (Lima, V 2021).

Figure 1. - The three waves of infection in Ireland March 2020 – end February 2021 (HSE – HPSC)

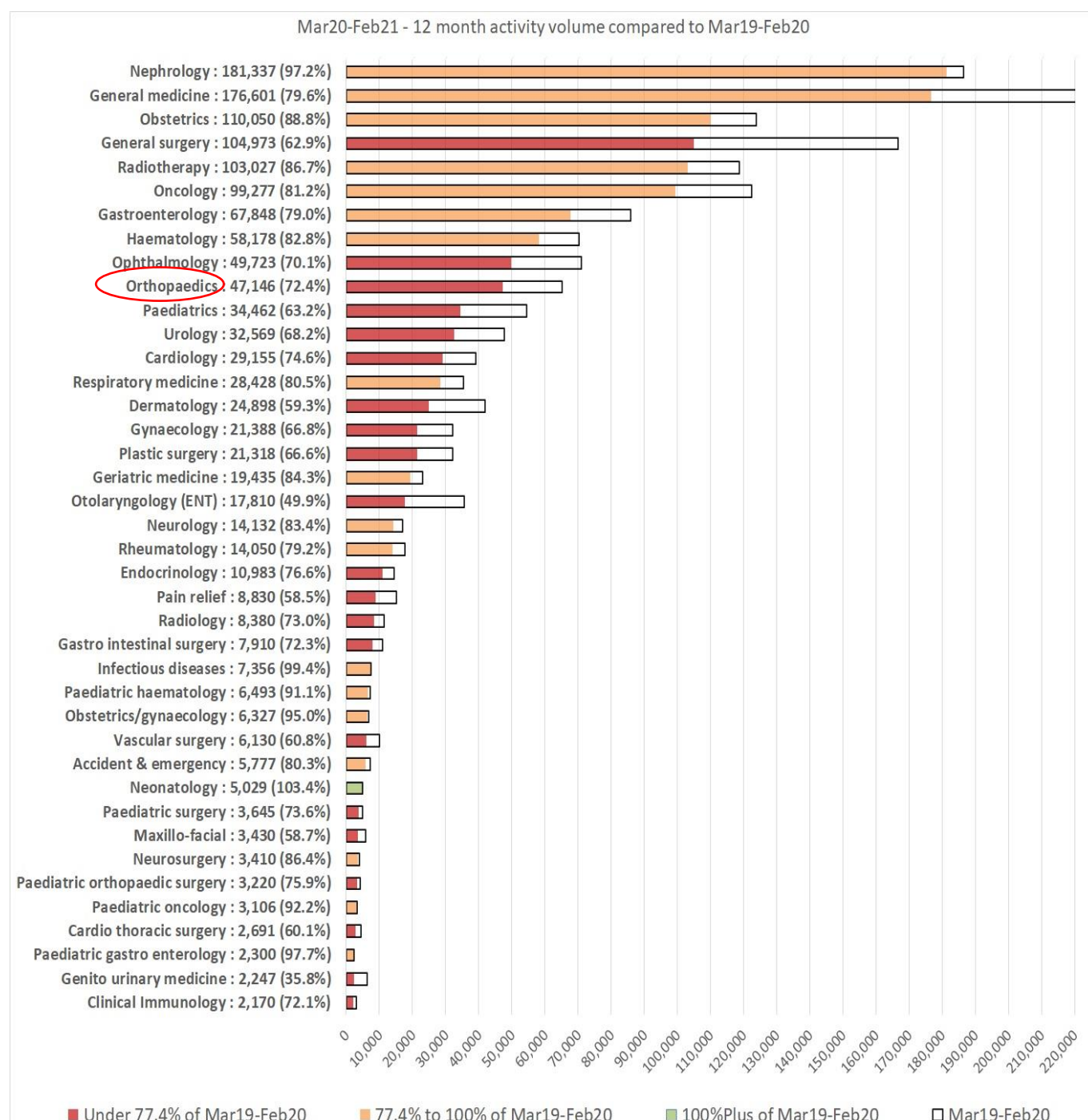


Each wave of infection has been accompanied by national public health restrictions including cocooning for all citizens aged 70 years or older, with the Health Service Executive (HSE), reconfiguring services to meet the unprecedented need. This included segregation of some services to improve patient flow, suspension of all scheduled care and redeployment of staff to critical areas for a period of time.

During the first wave, NCPTOS in conjunction with RCSI completed a number of advisory documents which are listed in Appendix A.

The impact of each wave of infection can be seen clearly in Figure 2, which compares activity for 30 specialties with the highest volumes from March 2019 – February 2021 inclusive. A reduction of 27.6% and 24.1% was seen in orthopaedic and paediatric orthopaedic activity respectively during this period.

Figure 2. – Comparison of Monthly Activity Volumes March 2019 – February 2021.



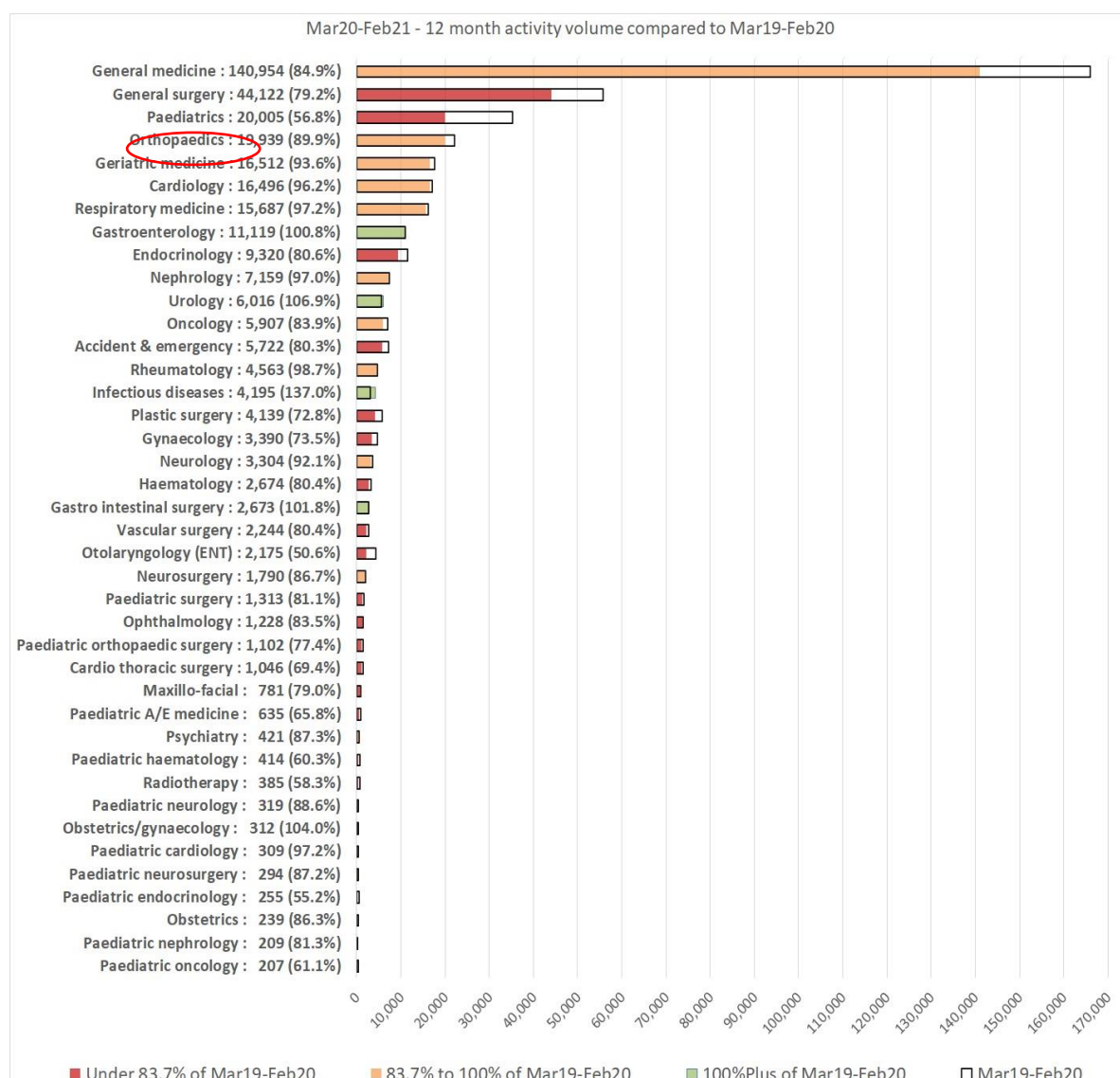
Orthopaedic Trauma

Given the transmissibility of the virus, the fear among the general population and the measures that were been implemented nationally by the government to aid suppression, it is not surprising that the numbers presenting to the Emergency Department for non-COVID-19 related conditions was reduced particularly during the first wave (March – August 2020).

However, internationally it has been reported that reduced and delayed presentations for non-COVID-19 illnesses have resulted in increased mortality and morbidity (Crowley & Hughes 2021).

Tilda – The Irish Longitudinal Study on Aging in Ireland (2020) surveyed 3,766 people and found that 69% of people aged 60 years and over reported leaving the house less often during the pandemic. Of this group, 22% were not meeting the minimum recommended levels of activity, with 43% reporting doing minimal exercise during the pandemic. Thirty percent of those surveyed reported delaying or not seeking medical care as required.

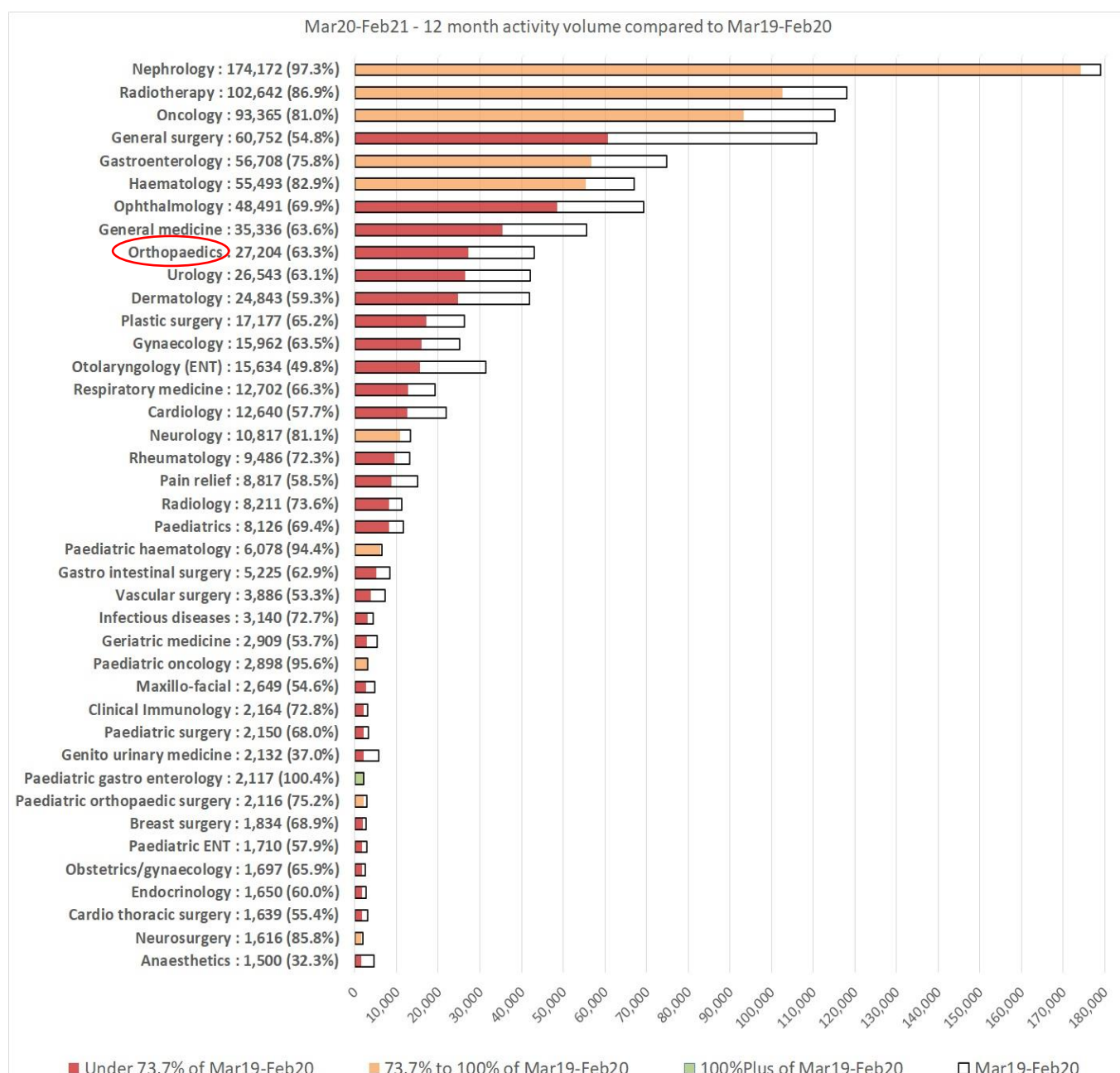
Figure 3. – Monthly Activity Volumes – Emergency Reported Discharges



Orthopaedic Scheduled Care

All scheduled inpatient procedures were cancelled in line with HSE guidance during each wave of the pandemic. This explains the reduction in activity volume when compared with the same period for 2019.

Figure 4. – Monthly Activity Volumes – Scheduled Inpatient Procedures



Scheduled orthopaedic care is always seen as discretionary within the system. For many patients the impact of having surgery cancelled early in 2020, with no indication as to when their surgery will occur has resulted in patients being critically compromised due to pain, general deconditioning and reduced activity levels as a result of COVID-19 restrictions. It is imperative that those patients who have now been on a waiting list for a prolonged period i.e. 12 months or longer, are treated expeditiously.

Figure 5a. – Total Number of Hip Arthroplasty Procedures completed in Ireland
January – December 2019 compared with 2020

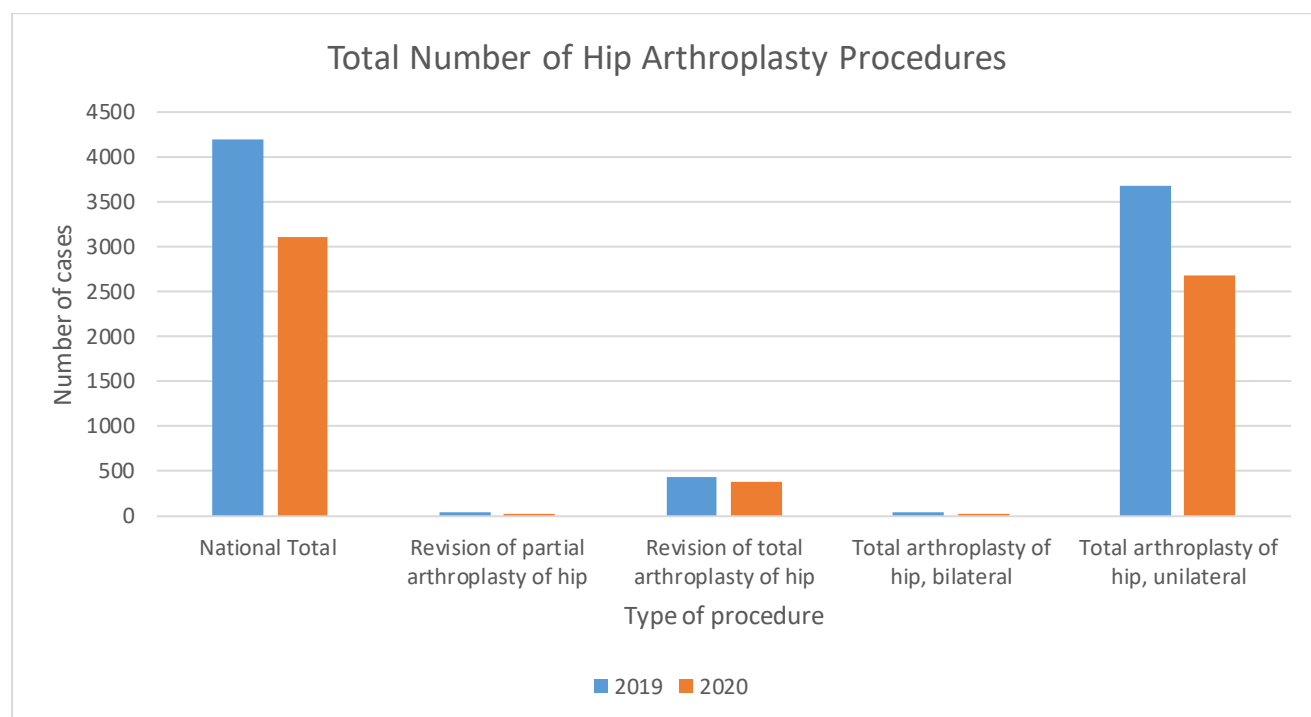


Figure 5b. - Hip Arthroplasty Activity January – May 2019, 2020 & 2021

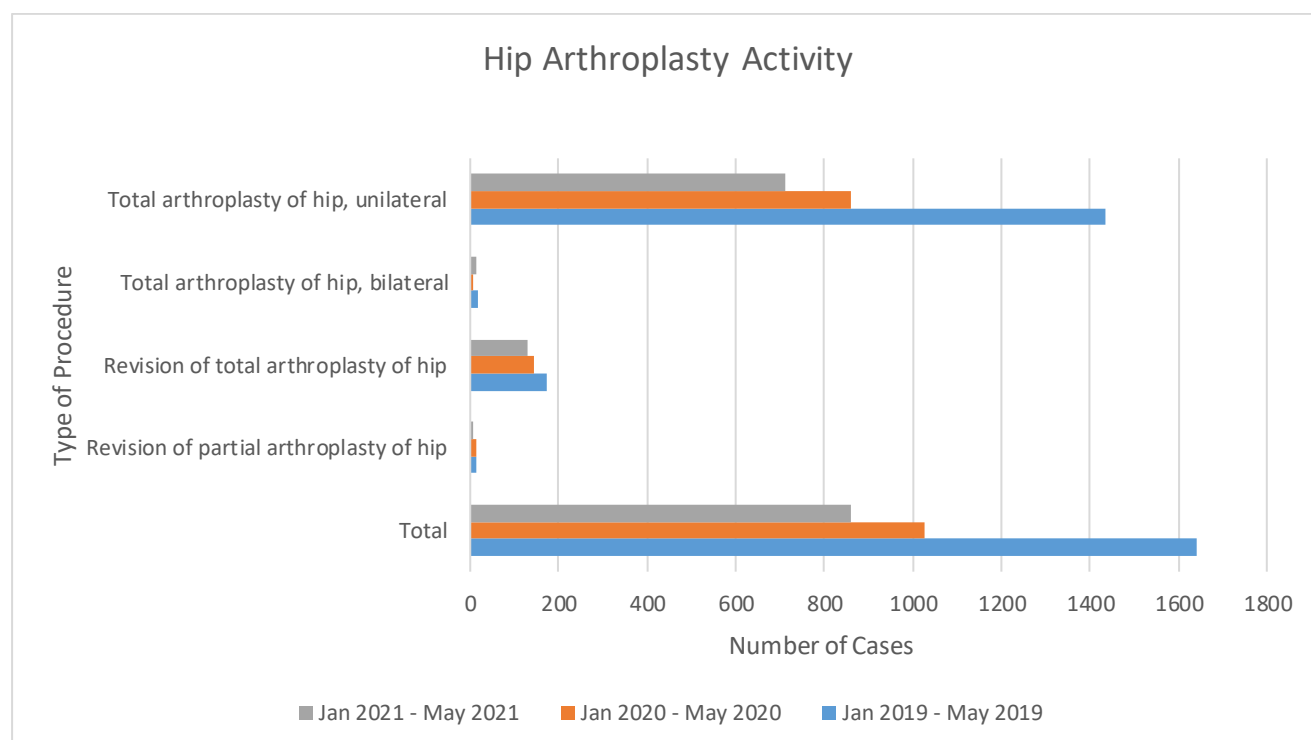


Figure 5c. - Total Number of Knee Arthroplasty Procedures completed in Ireland
January – December 2019 compared with 2020

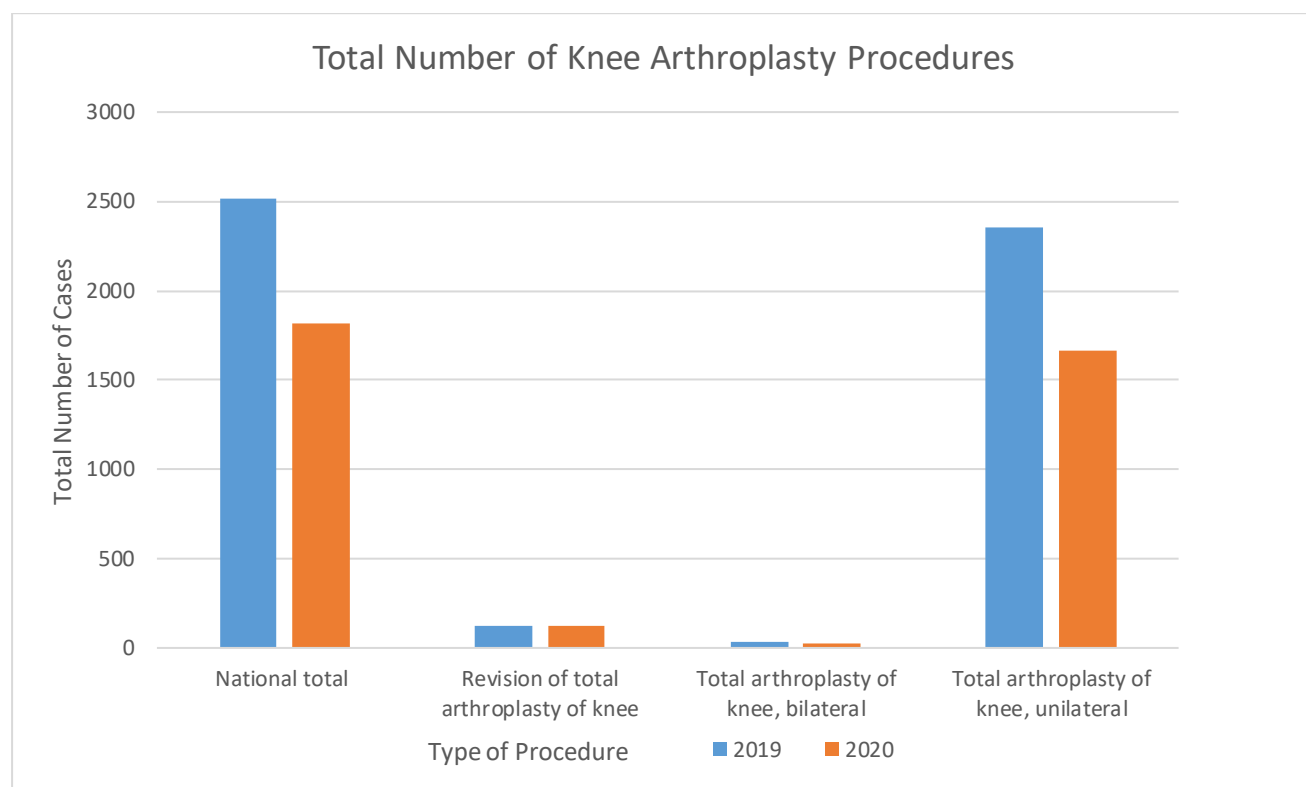
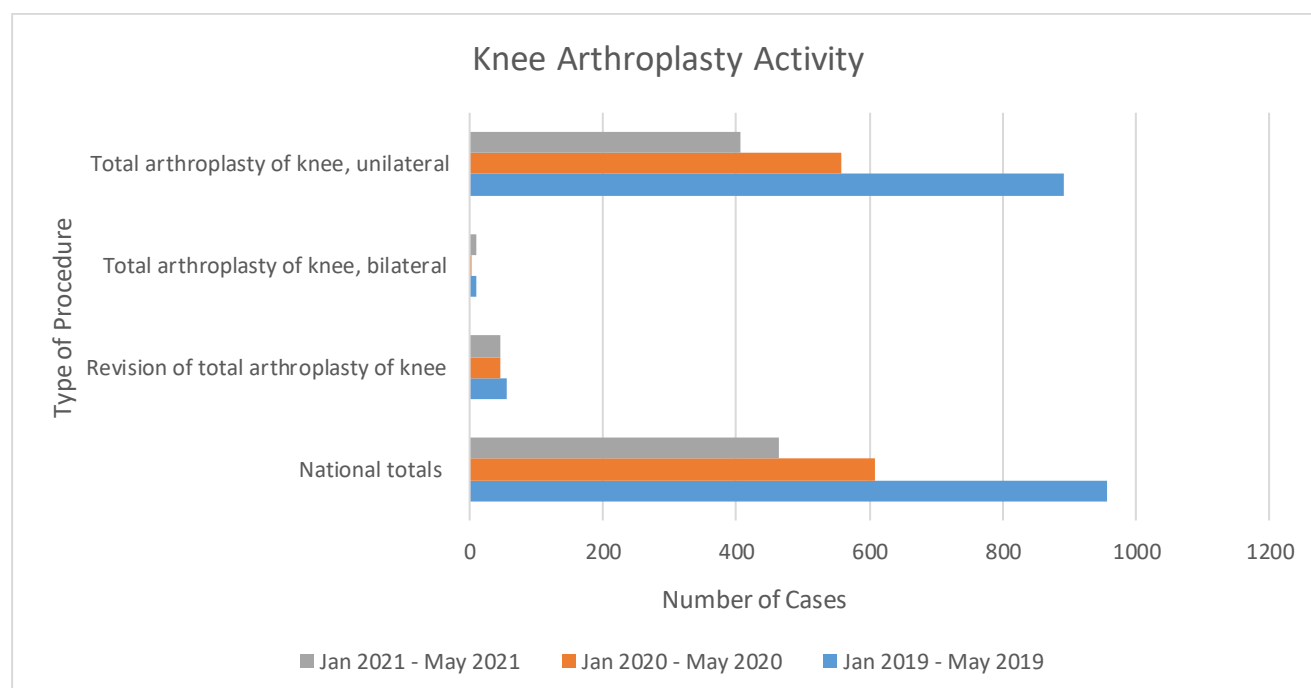


Figure 5d. - Knee Arthroplasty Activity January – May 2019, 2020 & 2021

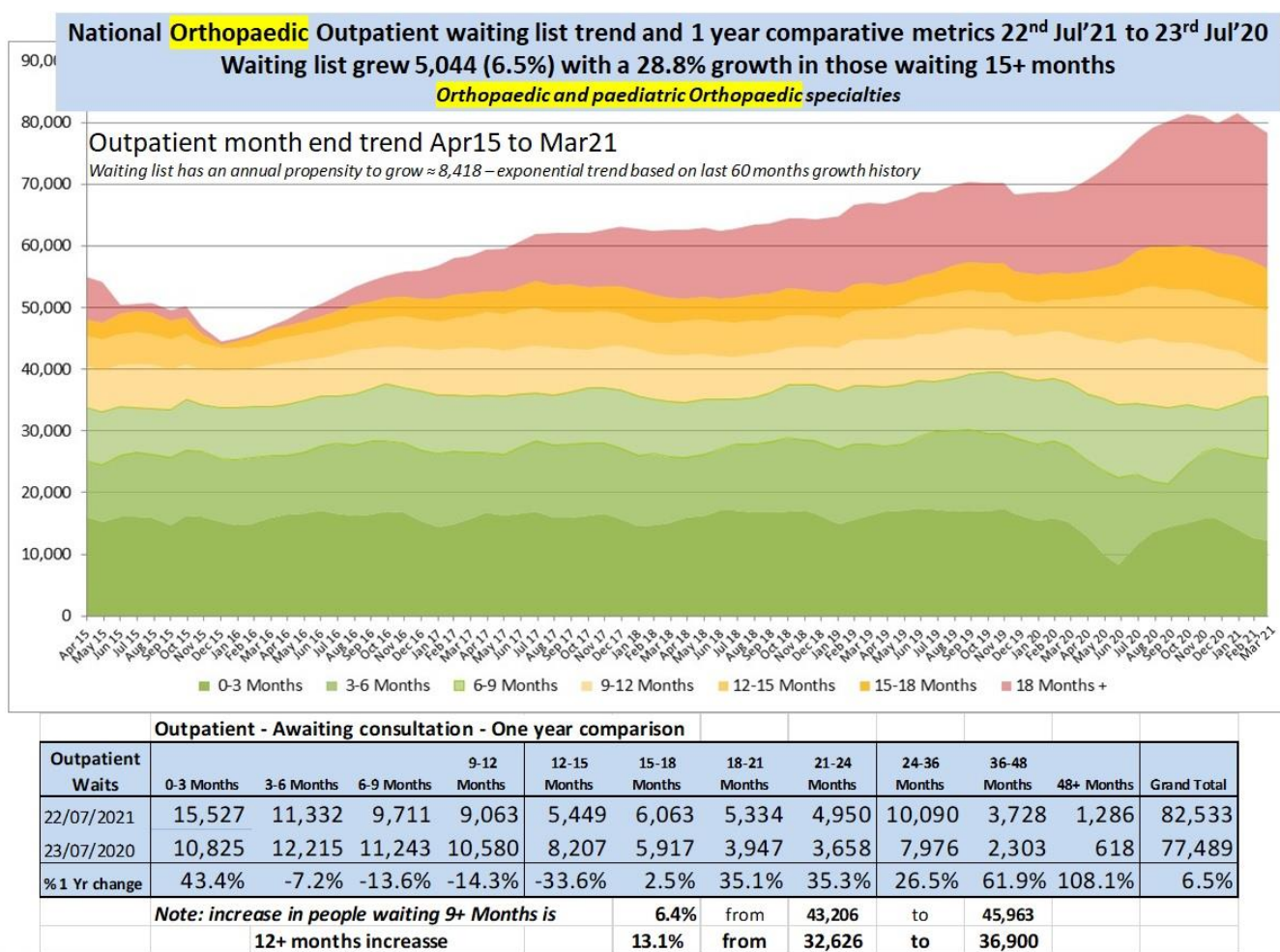


During the first wave in March 2020, there was significant concern that the acute hospitals would be overwhelmed with severe COVID-19 cases requiring specialist care. With this in mind, the orthopaedic consultants at the National Orthopaedic Hospital, Cappagh formulated a plan, to transfer and treat ambulatory trauma requiring surgery from the nearby acute hospitals. In the first seven weeks of the pandemic, 308 surgeries were completed using this model – 31.1% Upper Limb; 33.4% Lower Limb; 4.1% spinal and 14.1% urgent elective and 17.4% plastic surgery cases. The success in developing this pathway was facilitated by clear and timely communication channels, flexibility to adapt to changing practices and feedback from all stakeholders (Gibbons et al 2020).

Orthopaedic Outpatient Activity

The demand for orthopaedic outpatient appointments has continued to increase, as can be seen in Figure 6. During the pandemic, the OPD waiting lists have grown by 10,591 (15.1%) with a 61.4% growth in those patients waiting 12+ months.

Figure 6. – Orthopaedic Adult and Paediatric OPD waiting List



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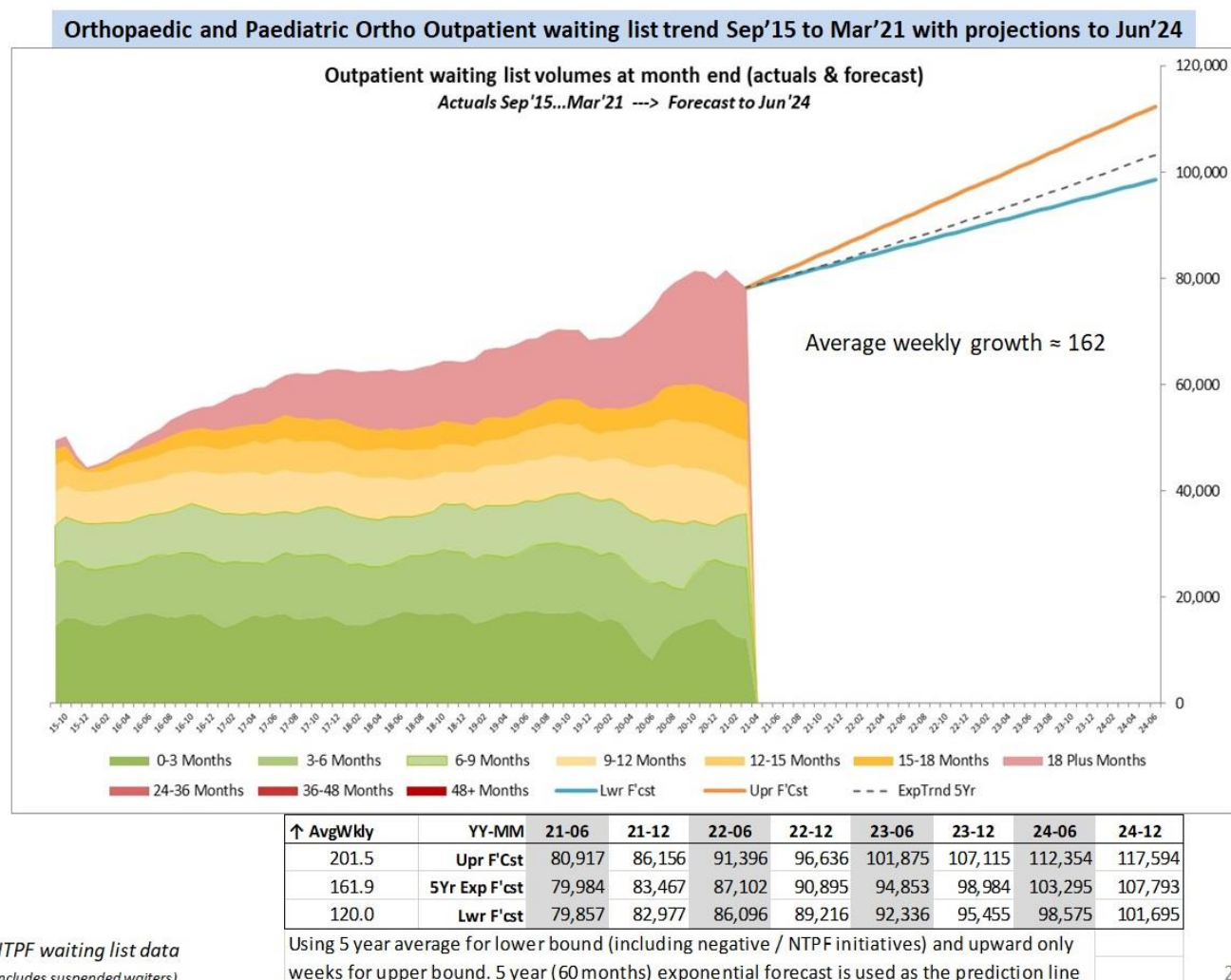
Although the 0-3 months referral rate decreased between March – June 2020, the most reasonable explanation for this is the significant decrease in patients presenting to their GP's with orthopaedic related conditions. This reflects the advice given by the government and public health for people to stay home "cocoon if over 70 years of age" and restrict their movements/activities.

At the time of writing this report, data regarding OPD waiting lists is only available to March 2021 due to a ransomware attack on the HSE IT systems in April 2021.

Since 2012, with the ever-increasing OPD waiting lists, the NCPTOS in collaboration with the National Clinical Programme for Rheumatology (NCPR) developed the Clinical Specialist Physiotherapist led MSK Triage posts. Between 2012 and 2019, 147,600 patients have been removed from the OPD waiting lists. This service was suspended nationally in March 2020.

However, NCPTOS is aware that given the projection of demand as outlined in Figure 7 that additional initiatives need to be piloted and implemented. During COVID-19, Active Clinical Triage was piloted as was the national implementation of virtual TAC.

Figure 7. – Projected Growth of Waiting List



Section 2 – Manpower - Impact on Training and Core Curriculum

The Medical Workforce Report 2020 – 2021 completed by the HSE’s NDTP has highlighted a need within orthopaedic surgery for an additional 80 consultant posts to be created to meet the increasing demand on the system. The NCPTOS advocates strongly for the appointment of these additional consultant orthopaedic surgeons to ensure patient care is being delivered safely and effectively.

Sláintecare Reform Programme 1 – Timely Access to Care, and Promoting Health and Well Being, focuses on the development of elective centres in Dublin, Cork and Galway (Project 4: 17-18). With this anticipated increase in the delivery of ambulatory care, there is a necessity to have appropriately trained consultant orthopaedic surgeons to deliver these services both in the short to medium term. It is imperative that trainees gain the experience required particularly following the disruptions to orthopaedic service delivery in the past 18 months.

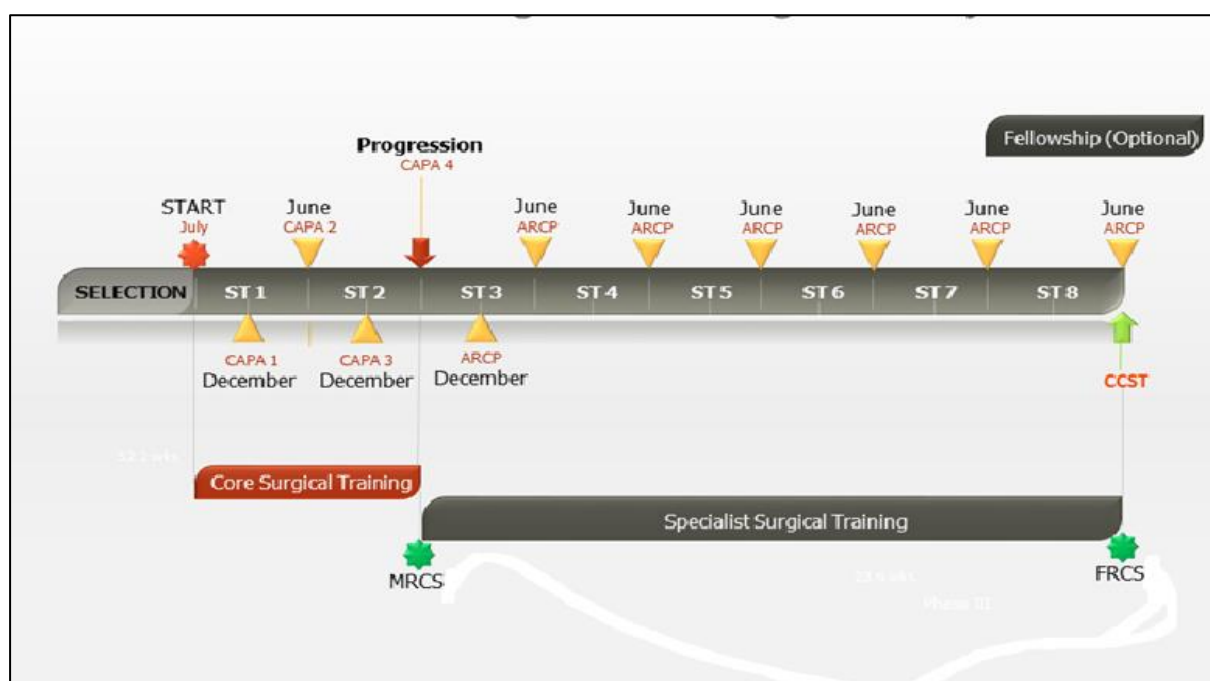
Given the rapid onset of the COVID-19 pandemic and the cessation of all “normal activities” in March 2020, it is not surprising that surgical training has been significantly impacted during this time.

	2019 – 2020	2020 – 2021
Total Number of Specialist Trainees at RCSI	61	60
Total Number of Trauma and Orthopaedic Specialist Trainees	10	8

The National Specialist Registrar Programme (SpR) selection interviews were scheduled earlier than normal given the changing situation with COVID-19, thus ensuring continuity of the orthopaedic workforce. Clesham et al (2021)

The process for Specialist Surgical Training is outlined below:

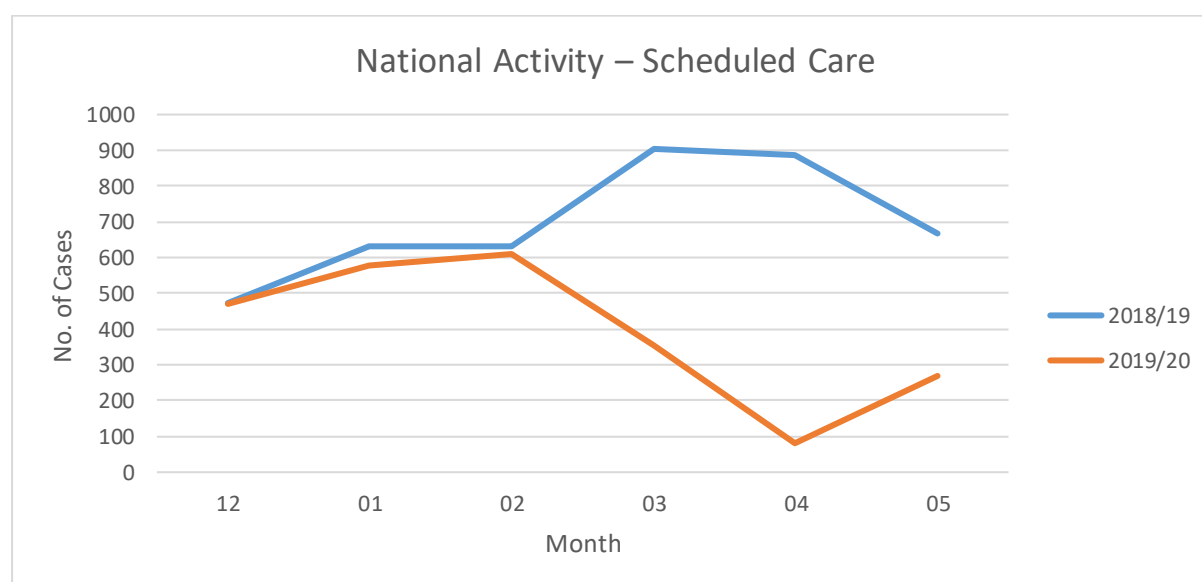
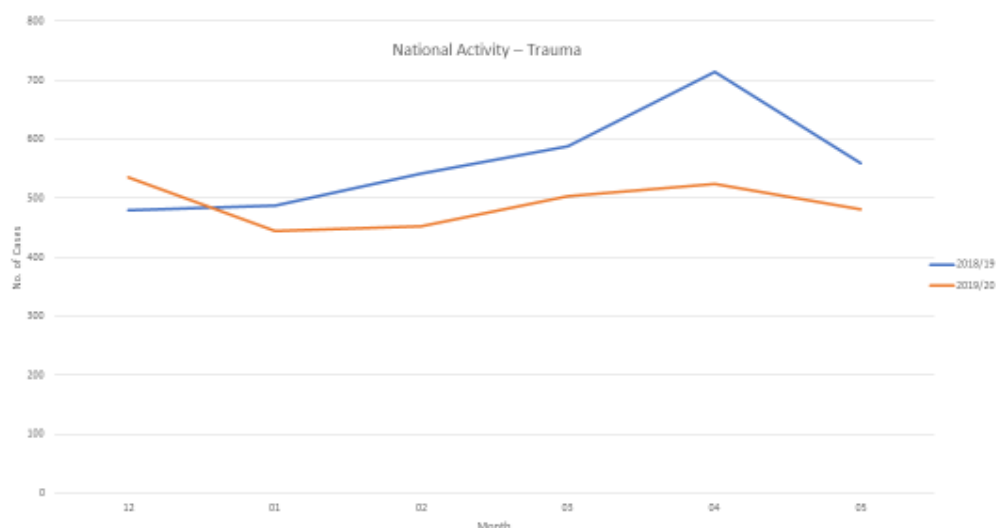
Figure 8. – Training Process (8- 10 years)



Orthopaedic trainees on the specialist registrar programme (SpR) rely on a high volume of patient interactions through both the trauma and elective clinics, procedures and acute management of patients to progress their training. Clesham et al (2020)

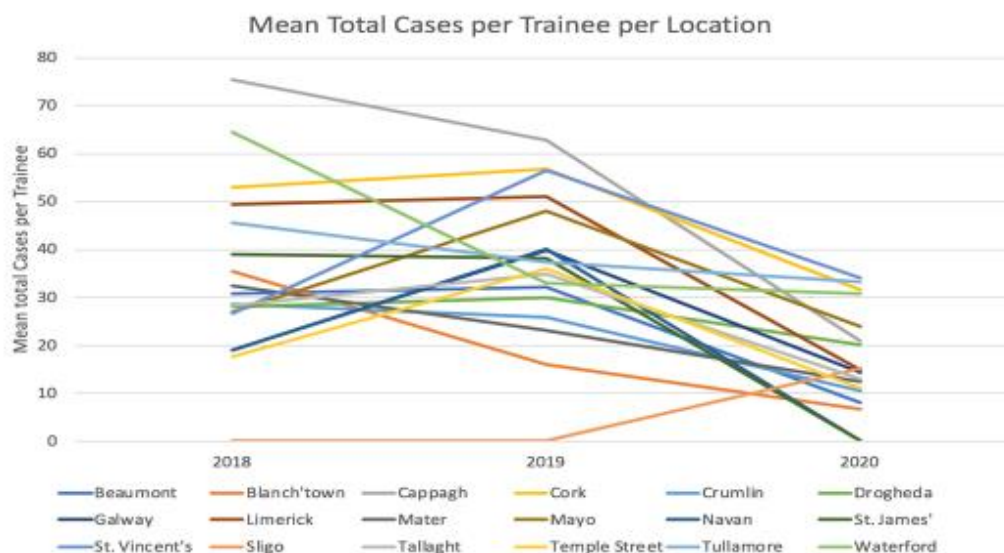
During the first wave of COVID-19 the reduction in both trauma and scheduled orthopaedic surgeries nationally can be seen below.

Figure 9. – Reduction in Trauma and Scheduled Procedures December – May 2018 - 2020



The impact on each trainee as a result of the pandemic is outlined below.

Figure 10. – Mean Total Cases per Trainee per Location

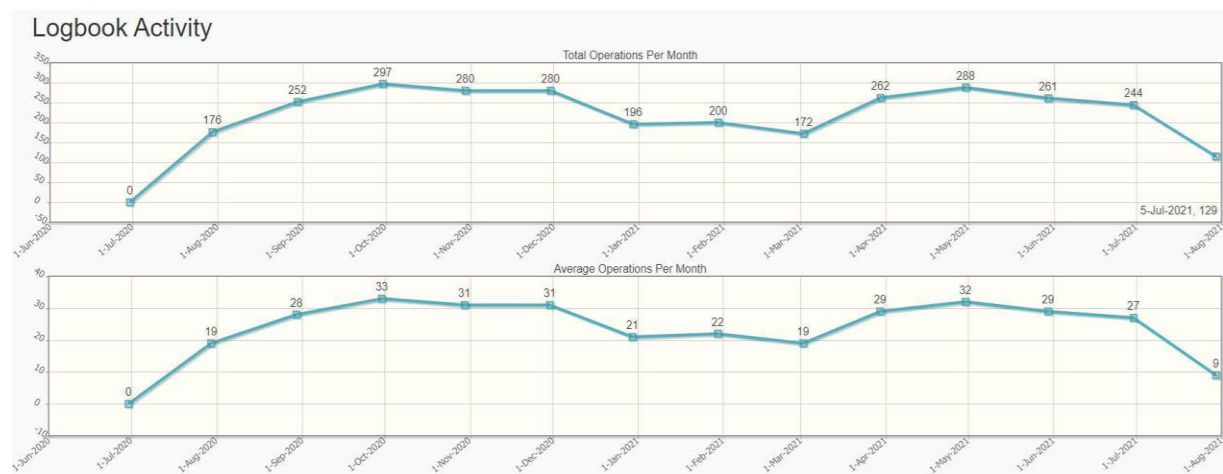


(From Presentation - G Sheridan 2020)

Trainees maintain an electronic logbook for all procedures carried out to document their surgical experience throughout their training from BST to HST level. This demonstrates the SpR's proficiency in performing a variety of procedures. Including 1800 orthopaedic cases with over 70% being performed as the primary surgeon. These cases include 80 major joint arthroplasties, 50 arthroscopies, 40 hemi arthroplasties for fractured neck of femur and 30 intramedullary nails. Clesham et al (2020)

Due to COVID-19, each trainee's logbook has reduced by 30% year on year. Due to limited activity as a result of prolonged restrictions it is estimated that ~ 20% of all trainees will need to extend their training by at least six months. The management of waiting lists via the National Treatment Purchase Fund (NTPF) will also limit training opportunities in the forthcoming months with public patients being treated in the private hospital setting.

Figure 11. – Logbook Activity



Core Curriculum Days are unique to orthopaedic trainees. These are mandatory day release training sessions, and are viewed as an essential theory based training modality, which aims to augment the practice based learning that occurs at each training site. Due to necessity during the pandemic Consultants and SpR's embraced technology and in particular teleconferencing and virtual reality simulation to ensure on-going education and skill acquisition. Telementoring commenced with an expert surgical trainer offering real-time supervision with trainees to teach, practice and assess a range of techniques as well as offering feedback. Davey et al (2020).

During the first wave (March – July 2020), eight weekly parallel topic based discussion groups were held. In the summer of 2020, a consultation process with all stakeholders was undertaken on how best to deliver training and meet the needs of everyone moving forwards. All participants surveyed confirmed that remote learning was easily accessible and beneficial with two thirds suggesting that it should be routinely offered post COVID-19. Ninety per cent of all trainees surveyed agreed that the video based learning was of the same quality or better than previously used teaching styles. Davey et al (2020)

With the third wave of COVID-19 (January – March 2021), the first three training modules were postponed, resuming online in April 2021. The first physical core curriculum training took place at Connolly Hospital in June 2021.

Moving forwards, the challenge for the surgical training programme will be how to optimise the use of technology with the required “apprenticeship” model of learning.

Section 3 – Responding to the Challenge of COVID-19

The onset of the pandemic demonstrated the need for healthcare systems to adapt rapidly in a very short period. Considerations needed to be given to capacity, infection prevention and control measures for all healthcare settings. Telehealth and the use of technology to deliver safe and effective patient care, has been a significant enabler throughout COVID-19.

The NCPTOS supported sites nationally in innovating and implementing smarter ways of working in delivering safe and effective patient care by providing clinical leadership, advice and support via online workshops and webinars.

This included the implementation of the following:

- Virtual Trauma Assessment Clinics (VTAC) are Virtual Fracture Clinics.
- Active Clinical Triage

Virtual Trauma Assessment Clinics (VTAC)

The VTAC service is the provision of a safe patient centred, efficient and cost – effective treatment via a multidisciplinary team approach. It is a proven method of ensuring that only patients who require follow up appointments at fracture clinics are scheduled for same. VTAC was pioneered and has been operational in Glasgow since 2011. This has been a strategic priority for the NCPTOS since 2015. The Midlands Regional Hospital, Tullamore (MRHT) was the first site to introduce VTAC in 2016.

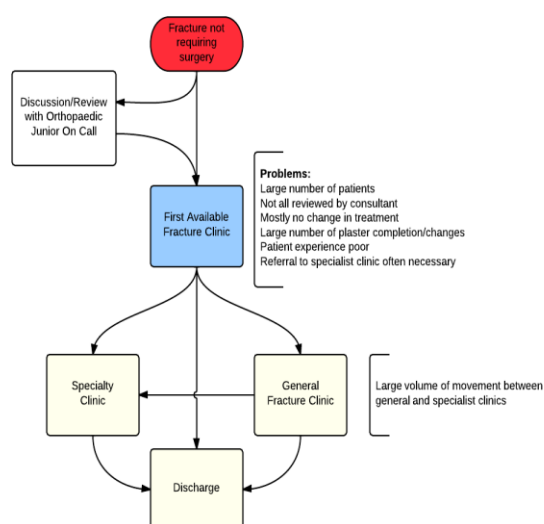
Pre-COVID-19, nationally ~ 55,000 patients would physically attend fracture clinics. Time from fracture to review could be four weeks or longer depending on the time of the year. Fracture clinics historically had high attendance numbers and protracted waiting times. On average, each patient would have 2.6 return visits. A cost analysis completed at MRHT revealed that the cost for a “traditional face to face” fracture clinic appointment was €129 compared with €28 for a VTAC appointment. This is a cost saving of €101 per consultation. O'Reilly & Sheehan (2020)

The BOA Standards for Trauma and Orthopaedics (BOAST's) recommends that all fractures are reviewed within 72 hours of presentation of injury at OPD.

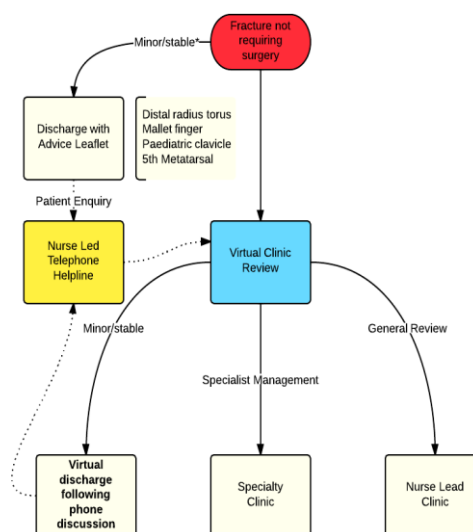
With the introduction of widespread restrictions including social distancing, cancellation of scheduled OPD clinics, Orthopaedic Consultants and their teams flexed rapidly to the use of telemedicine to deliver safe and effective patient care.

Figure 12. - Fracture Clinic Service Delivery

Old Process:



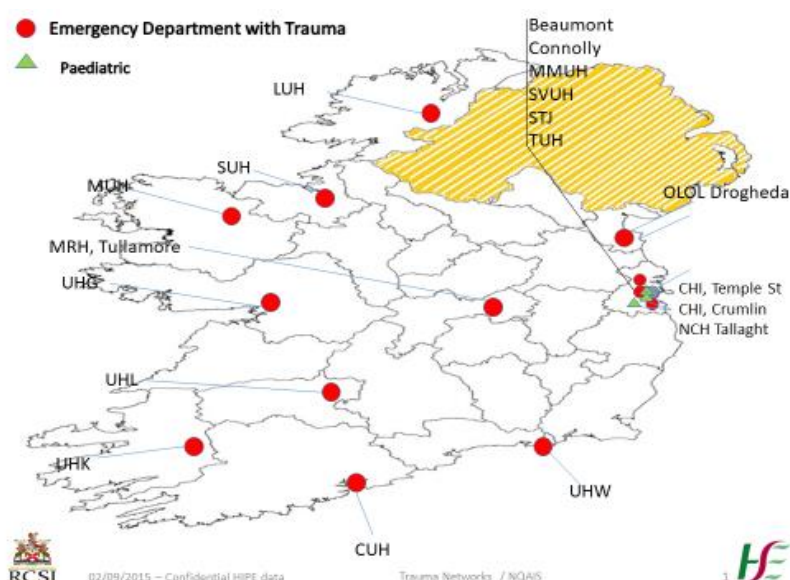
New Process



Ref: <http://www.fractureclinicredesign.org/>

VTAC is a consultant orthopaedic surgeon delivered multidisciplinary clinic with ~ 60% of patients managed in this way being discharged. Each site nationally will have its own specific needs depending on demand and geographical location. The MDT can vary to include a Staff Nurse/Clinical Specialist Physiotherapist/Occupational Therapist and Clerical staff. Successful and sustainable VTAC implementation is contingent on Consultant delivered clinics and agreed referral and management protocols with the Emergency Department. Murphy et al (2020)

COVID-19 presented the perfect opportunity for national implementation of VTAC. At present, all 18 sites have implemented VTAC.



Wait times for VTAC are significantly reduced compared to the traditional model – nationally at present this varies from five days – two weeks. Thirty six percent of all patients presenting with a fracture are referred to fracture clinic. Depending on the region, 26% - 44% of all patients managed through VTAC are discharged following physiotherapy interventions. A systematic review of the literature shows that the length of time a VTAC clinic was established had a bearing on efficiency. This is evidenced by the variance in discharge rates. Murphy et al (2020)

Patient satisfaction with the service is high with patients citing convenience, cost both financial and time and service efficiency. It is estimated that each patient treated through VTAC has an indirect cost savings to society of ~ €80. When surveyed 75% of VTAC patients would opt to be treated in the same manner while 65% of patients managed through a traditional fracture clinic would have liked to have been offered this option. McKenzie et al (2018) cited in Murphy et al (2020)

With the implementation of VTAC, consultant orthopaedic surgeons have been able to see an additional 10 OPD new patient appointment times for GP referrals. That can equate to ~ 460 new patient appointments being created **per site** per year.

National implementation of VTAC is a strategic priority for Sláintecare Implementation 2021 – 2023 under Reform Programme 1 – Improving Safe, Timely Access to Care, and Promoting Health and Wellbeing; Project 1 – Work stream 3 – Hospital Productivity (p 21). It is projected that the cost savings of implementing VTAC nationally would be in excess of €3.3million per annum. O'Reilly & Sheehan (2020)

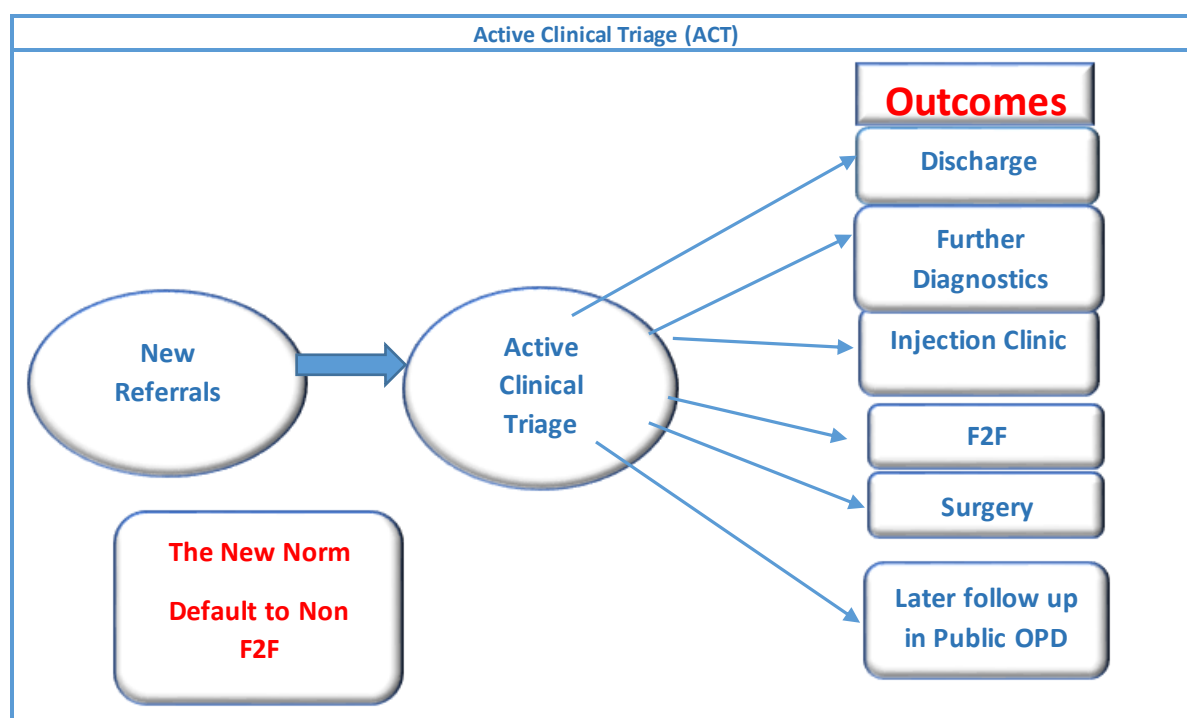
Active Clinical Triage (ACT)

This describes the process, which has been developed by the Scottish Access Collaborative in managing referrals to secondary care. The success of this initiative is dependent on the clinical leadership of the consultant orthopaedic surgeons.

Each referral is triaged to the optimal, evidence based, and locally agreed pathway, with a senior decision maker reviewing all the relevant electronic patient records (including imaging, lab results etc.).

Patients will only attend for a physical appointment if a clinical need has been identified. The consultant will call the patient or the GP if required.

Figure 13. – Active Clinical Triage



In October 2020, an ACT pilot was completed by the consultant paediatric orthopaedic surgeons from CHI Crumlin and Tallaght University Hospital. The Citywest complex was used to facilitate physical appointments given current COVID-19 restrictions.

Figure 14. – Results of ACT Pilot - October 2020

Clerical Validation & removal from waiting list			
	359		
Grand Total	359		
		City West Clinic F2F Outcome	
ACT Clinic – Virtual		Discharged	173
F2F Clinic with		Review Required	98
Diagnostics	242	Add to IWL	36
F2F Clinic	259	Did Not Attend	34
Discharged	234	Cancelled	6
Did Not Answer	44	(blank)	2
Elective Clinic	2	Grand Total	349
Grand Total	781		
		Total Discharged = 766 Added to Waiting List = 36	

Total Orthopaedic Wait List: 2,262 with 1,007 patients > 12 months

Current Waiting List: 9-12months n = 79;

Current Waiting List : > 12 months n = 97

This pilot demonstrates the efficacy for ACT in managing the waiting lists for orthopaedics (adult and paediatric), as services return to some semblance of “normality” following the COVID-19 pandemic. The HSE’s NSP 2021 (p 71) strongly advocates for the implementation of ACT as the first step in reforming patient pathways for scheduled care.

In order for sustainable implementation of ACT, the deficit in consultant numbers will need to be addressed. In November 2020, the HSE’s NDTP has highlighted a need within orthopaedic surgery for an additional 80 consultant posts to be created to meet the increasing demand on the system. The NCPTOS advocates strongly for the appointment of these additional consultant posts to ensure patient care is being delivered safely and effectively.

Section 4 – The impact of COVID-19 on Established Initiatives

The NCPTOS through its Model of Care (2015) has developed a number of initiatives that have improved patient access as well as improving patient care nationally.

These initiatives include:

- Clinical Specialist Physiotherapist led MSK Triage Clinics
- INOR – Irish National Orthopaedic Register – now based in NOCA
- IHFD – Irish Hip Fracture Database – now based in NOCA
- FLS – Fracture Liaison Service

COVID-19 has had a devastating impact on all aspects of service delivery nationally. All the initiatives stopped in March 2020 with some restarting later that summer. The cumulative effect of three waves of COVID-19 and ongoing restrictions around scheduled care delivery is still to be fully analysed by the HSE.

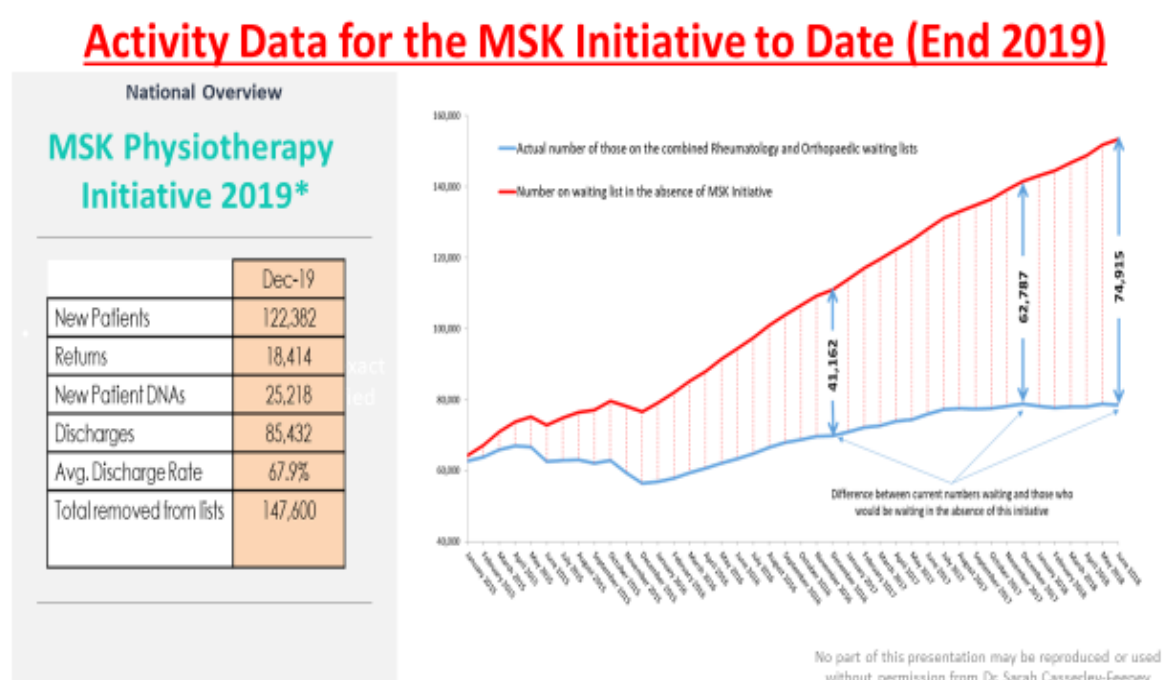
Staff redeployment, social distancing, infection prevention and control considerations have resulted in reduced physical capacity nationally to schedule appointments in OPD clinics. Ongoing new referrals to orthopaedics has seen a cumulative increase in waiting lists and times to receive an initial appointment with either a consultant orthopaedic surgeon or a Clinical Specialists MSK Triage Physiotherapist. (CSP)

Clinical Specialist Physiotherapist led MSK Triage Clinics

This initiative is a joint collaboration between the NCPTOS and NCPR. .

Prior to COVID-19, 147,600 patients had been removed from the OPD orthopaedic and rheumatology waiting lists. By the end of 2020, an additional 11,495 patients were removed giving a total of 159,095 patients removed from these OPD waiting lists.

Figure 15. – Activity Data for Clinical Specialist Physiotherapist led MSK Triage Initiative



In March 2020, with the cessation of all OPD activity, more than 76% of CSP's were redeployed to other clinical and/or administrative services to meet the anticipated surge.

From May 2020 onwards, CSP's in three of the 18 sites had returned to MSK Triage Services and commenced the delivery of a limited telehealth service.

By September 2020, partial MSK Triage services had resumed in 14 of the 18 sites. A NCPTOS survey completed in August 2020 regarding service impact, highlighted that ~ 54% of staff remained redeployed in front line services or cocooning due to medical reasons. This survey also estimated an average increase on MSK Triage waiting times of 17.2 weeks at that time.

By October 2020, 17 sites had re-started partial activity using a blend of telehealth and face-to-face appointments.

Factors that reduced and continue to affect service activity for both face-to-face and telehealth appointments, include infrastructural constraints i.e. physical space; IT hardware and software availability; social distancing measures; infection prevention and control requirements and lack of administrative support to facilitate more complex appointment scheduling and tracking requirements.

The use of telehealth was recognised as a considerable enabler for the resumption of the MSK Triage service from June 2020 onwards. This remains a component of the current blended approach to service delivery as face-to-face appointments gradually resume. The long-term efficiency and effectiveness of this blended approach is currently being reviewed and evaluated. Factors including patient suitability, reason for referral, numbers requiring review appointments with an MSK CSP are being monitored. Qualitative feedback from service users and providers is also currently being reviewed.

Currently service delivery nationally remains at < 60% of its Pre-COVID-19 activity levels.

Within the NSP 2021, the value of MSK Triage to date and the development of the next phase in this initiative – the MSK interface clinics was recognised as a key enabler in the redesign of scheduled care under the Scheduled Care Transformation Programme. NCPTOS and NCPR secured recurring funding for 35 posts, which will be implemented nationally throughout 2021.

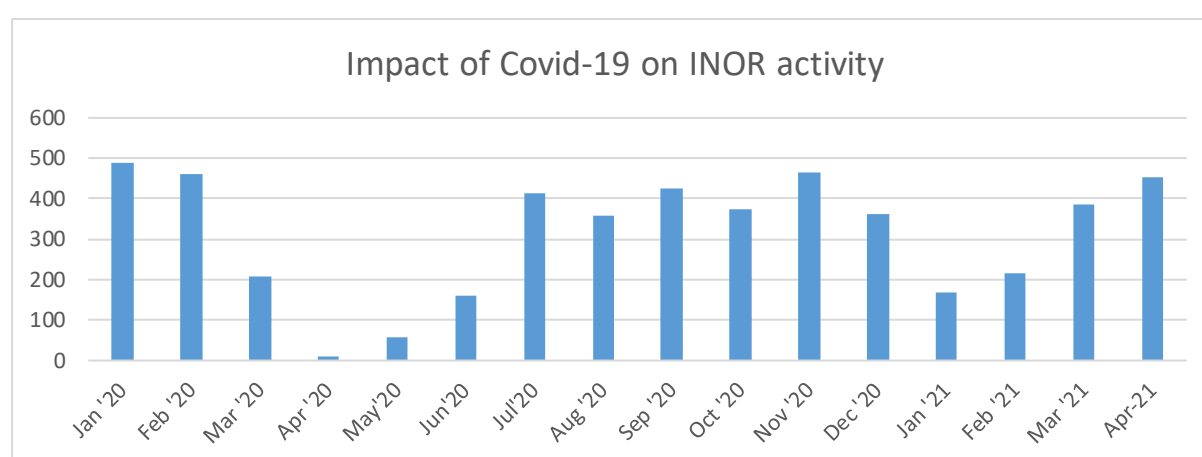
INOR – Irish National Orthopaedic Register

INOR was established in 2012, to “*monitor the performance of implants, institutions, and surgical teams. While hip and knee replacement surgery are very successful, outcomes can always be improve*” INOR 1st Report due October 2021.

Because of COVID-19, INOR activity reduced by 60-70% in March 2020. This correlates with the cessation of scheduled care at this time. Activity increased in July 2020 as services resumed slowly with INOR activity returning to expected levels by November 2020.

With the third wave of COVID-19 in January 2021, activity again decreased significantly as can be seen in Figure 12.

Figure 16. - Impact of COVID-19 on INOR Activity



Redeployment of local audit coordinator

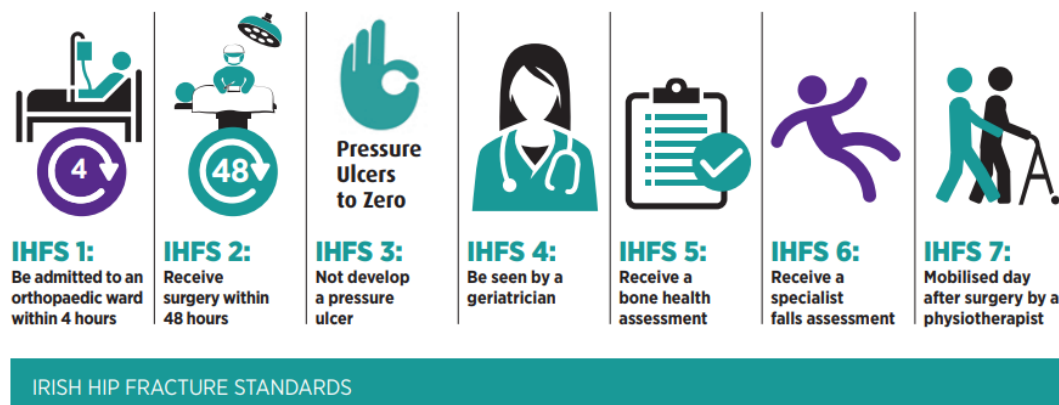
In March 2020, five of the eight hospitals participating in INOR had their local audit co-ordinators redeployed to the frontline. Three of the five co-ordinators were redeployed to the frontline for the entire COVID-19 period, whilst the remaining two were redeployed locally. This affected the support and advice available to patients post operatively. Understandably, most hospitals experienced a delay in patients' follow-ups during this period. INOR implementation of the remaining public hospitals has been significantly delayed by the pandemic.

The impact on the workload on the two audit co-ordinators who were redeployed will require four to six months to ensure patient follow-up is completed at the pre-defined follow-up timelines.

IHFD – Irish Hip Fracture Database

IRISH HIP FRACTURE STANDARDS (IHFS)

The Irish Hip Fracture Database measures key clinical steps in the care of hip fracture patients.



Despite COVID-19, the IHFD has reported 99% data collection for 2020 nationally in the 16 trauma hospitals. The dedication and commitment of all data collectors as well as all staff treating these patients have ensured the maintenance of the highest quality of patient care despite the challenges of the pandemic.

A noticeable improvement was noted for IHFS 1 since COVID-19 where increased communication including pre-alerts by the National Ambulance Service as well as stratifying patients through ED to improve flow has resulted in 33% of all patients being admitted to an orthopaedic ward within 4 hours.

During 2020, 62,684 acute bed days were used for Hip Fracture patients compared with 72,314 in 2019. The mean and median length of stay in 2020 was 17.5 and 11 days respectively. The reduction in length of stay most likely reflects the implementation of early supported discharge plans to minimise the risk of contracting COVID-19 for this vulnerable patient cohort.

Compliance with the best practice tariff was 20% during 2020. Within the 2020 report, 74 patients with a hip fracture also contracted COVID-19. This patient group did have an increased hospital length of stay and mortality rate.

An additional standard is due to be added imminently, which will measure the number of patients who are mobilised by a physiotherapist either on the day of surgery or day one post operatively. This will become part of the best practice tariff in 2022.

FLS – Fracture Liaison Service (FLS)

The NCPTOS in its 2015 Model of Care strongly advocates for a National Fracture Liaison Service. This is reiterated with Recommendation 15 of the report “A Trauma System for Ireland – Report of the Trauma Steering Group” 2018. To date, Fracture Liaison Services nationally remain patchy with not every service having a dedicated FLS co-ordinator. To further progress the business case at a national level an FLS data base has been established on a 2 year pilot project basis.

The Fracture Liaison Service Database (FLSDB) is a patient-centred audit that collects anonymised data about bone health investigations, treatment initiation, falls risk assessment and outcome monitoring for patients presenting with a fragility fracture. This is a real-time prospective audit, which started in 2020, with data submitted from individual sites around the country to a centralised system, allowing benchmarking and real-time performance feedback.

Prior to COVID-19, seven hospitals nationally were participating in this audit. With the pandemic FLS nurses were redeployed to support colleagues in critical areas of their hospitals. The length of redeployment has varied between sites for each wave of infection. As the vaccination programme commenced in early 2021, and hospital numbers began to subside, staff were returned to their original posts.

Given the impact of the pandemic, the current pilot audit project has been extended to September 2022.

Appendix A:

COVID-19 Guidance Documents

General management considerations for all units and subspecialties.

Management of patients with traumatic injuries and urgent orthopaedic conditions treated as outpatients during the coronavirus pandemic.

Management of patients with traumatic injuries and urgent orthopaedic conditions requiring inpatient care during the coronavirus pandemic.

Management of patients with hand injuries during the coronavirus pandemic.

Management of children with orthopaedic trauma during the coronavirus pandemic.

Management of children with non-traumatic orthopaedic conditions during the coronavirus pandemic.

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