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**CRITICAL  
CARE**

**NATIONAL ADULT CRITICAL CARE CAPACITY**  
**CENSUS 2021 REPORT and RESOURCE ALLOCATION FRAMEWORK**

National Clinical Programme for Critical Care, HSE

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## **Summary**

Between February 2020 and July 2021 just over 1,500 critically ill adult COVID Patients (number = 1,566) were admitted to the ICU setting in Ireland.

Of these critically ill Patients, sadly, four hundred and seventy-one Patients did not survive ICU stay.

National Clinical Programme for Critical Care joins Clinical and Administration Colleagues and the People of Ireland to offer sympathy to the bereaved loved ones, families and friends of the four hundred and sixty-six deceased ICU Patients and of the over 5,000 people in Ireland who have died since COVID began.

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In response to the increased numbers of critically ill COVID patients, Government / DH / HSE / Hospital Groups / Hospitals increased critical care bed capacity from 2020 to 2021. The annual national adult Critical Care Bed Capacity Census 2021 Report finds between February 2020 and August 2021 the national adult critical care bed permanent capacity increased from 255 to 302 – an increase in baseline permanent critical care bed capacity of 47 or a substantial 18% increase.

Government's ***Critical Care Strategic Plan*** announced by Minister Donnelly 18<sup>th</sup> Dec 2020 and the subsequent HSE *National Service Plan 2021* (both copied below) are welcomed by National Clinical Programme for Critical Care as plans to increase the national adult critical care capacity permanent baseline by 66 from 255 to 321 by year end 2021.

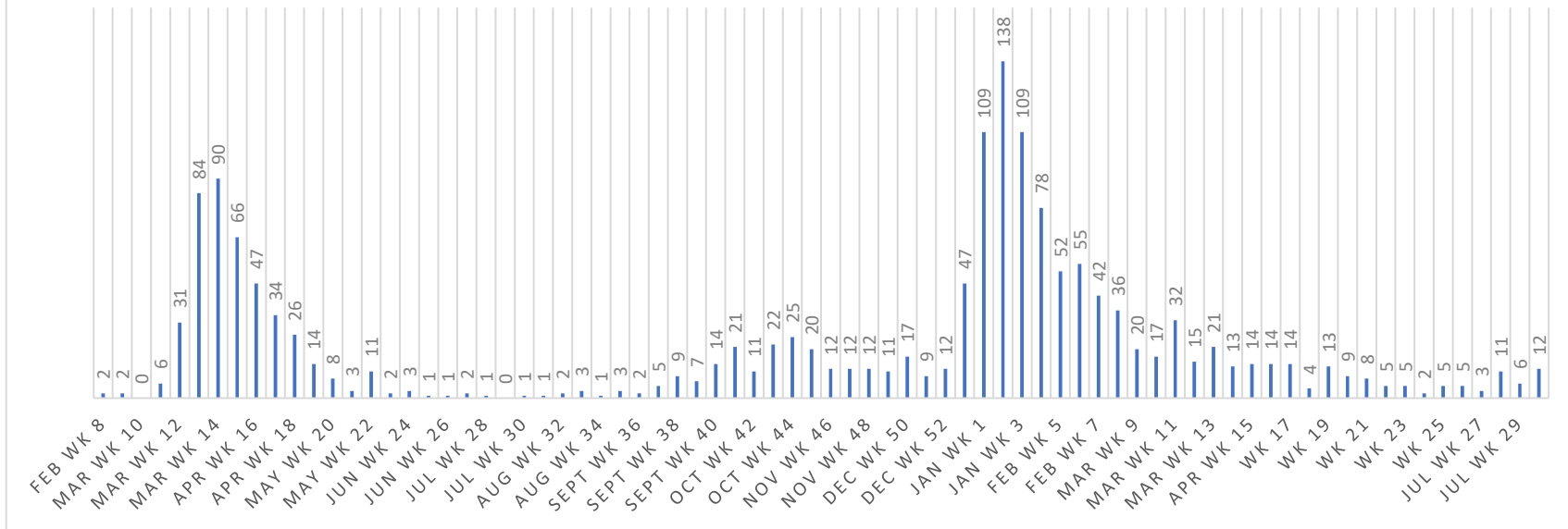
The national adult critical care capacity building measures announced by Minister Donnelly 18<sup>th</sup> Dec 2020 in Government's *Critical Care Strategic Plan* – Nursing Outreach, Transport Medicine, Critical Care Nursing education and training resource, 5 x critical care facility new build feasibility studies – are also welcomed by National Clinical Programme for Critical Care.

With regard to Phase 2 of Government's ***Critical Care Strategic Plan***, an allocation of an additional 117 adult critical care bed capacity, the Intensive Care Medicine professional bodies (in a Memo, see Appendix 3 below) propose a ***Critical Care Capacity Resource Allocation Framework*** based on the principles of population-based, activity-based and specialty-based allocation — where critical care capacity resource allocation aligns with National Clinical Programmes' Models of Care.

### **The cohort of critically ill adult COVID Patients presenting to the ICUs in Ireland from February 2020 to July 2021**

Between February 2020 and July 2021, in the three COVID surges, just over 1,500 adult critically ill COVID Patients (number = 1,566) were admitted to the ICU setting in Ireland.

## HSE HPSC COVID ICU SURVEILLANCE ACTIVITY REPORTS 2020 2021



Graph. Volumes of critically ill adult COVID Patients admitted to ICUs in Ireland from Feb 2020 to Jul 2021 (Data courtesy of National Office of Clinical Audit NOCA, ICU Bed Information System ICU-BIS; HSE Health Protection Surveillance Centre HPSC, COVID ICU Surveillance Programme)

Sadly, from February 2020 to Jul 2021, 471 COVID patients did not survive ICU stay.

The Irish National ICU Audit (INICUA), National Office of Clinical Audit (NOCA) will complete a risk-adjusted analysis for all adult patients COVID and nonCOVID admitted to ICUs in 2020 and 2021 and will publish in due course.

## **Critical care capacity availability and Critical Care Clinical Risk Stratification Framework**

Critical care bed capacity is described in terms of clinical staff, clinical space, clinical equipment, oxygen supply and Hospital / Hospital Group / HSE system support.

Critical Care clinical staff comprise the Establishment of Critical Care Nursing staff, Intensive Care Medicine staff, Health Social Care Professionals. Critical Care clinical staff depend on and collaborate closely with Hospital Clinical Specialty staff, Hospital / Hospital Group / HSE Administration staff and support system staff.

### **Critical care capacity availability**

Periodically, ICU Bed Information System (ICU-BIS), National Office of Clinical Audit (NOCA) completes a count of available ICU / HDU adult critical care bed capacity.

On 21<sup>st</sup> Jan 2021 ICU-BIS completed an ICU capacity count – published below.

<b>NOCA / ICU-BIS adult critical care bed capacity count</b>	<b>ICU / HDU bed capacity count 21<sup>st</sup> Jan 2021</b>
<b>Baseline capacity</b>	<b>276</b>
<b>Additional surge capacity- redeployed staff – clinical scenario manageable</b>	<b>+ 70 = 350</b>
<b>Capacity unavailable</b>	<b>&gt;350</b>

Table. ICU bed capacity count 21<sup>st</sup> Jan 2021 (ICU-BIS)

The ICU-BIS ICU capacity count shows the baseline permanent ICU capacity increased up to 276 by Jan 2021, up from 255 in April 2020.

The Jan 2021 ICU capacity count also showed that owing to ICU-experience Hospital Nursing staff redeployment, an additional critical care bed capacity, a surge capacity equivalent of 74 critical care beds, provided an ICU / HDU bed capacity up to 350 beds on 21<sup>st</sup> Jan 2021. Figures provided by Hospital Groups CDoNs corroborated this and showed that 406 WTE ICU experience Hospital Nursing staff were redeployed in the Hospitals from existing Hospital services to the ICU settings to meet the needs of the critically ill COVID and nonCOVID patients alike. Redeployment of ICU-experience Hospital Nursing staff however had a negative impact on nonCOVID Patient Scheduled Care activity with delayed Patient diagnoses and outcome consequences.

Lastly, the Jan 2021 ICU capacity count shows that critical care capacity is not available for critically ill Patients, COVID or nonCOVID, in the Hospital system where ICU occupancy exceeds 350.

### **Critical Care Capacity Clinical Risk Stratification Framework**

The clinical risk of Critical Care Capacity is graded or stratified into three strata (see clinical risk table below)–

- baseline capacity, day-to-day variance, normal clinical risk – 'green' risk stratum
- additional surge capacity scenario, the clinical needs of additional critically ill patients met with additional redeployed Nursing staff, clinical risk manageable – 'amber' risk stratum
- capacity unavailable, critically ill patient needs unmet, overwhelming clinical risk scenario – 'red' risk stratum

### Critical Care Capacity Clinical Risk Stratification Table

Hospital critical care clinical risk profile	Adult critical care capacity (21 <sup>st</sup> Jan 2021)	Clinical activity	Hospital clinical risk profile
Green = 276	Baseline adult critical care bed capacity (established, funded, operational) = 276 in Ireland	Normal day-to-day variances	Normal critical care clinical risk profile
Amber = 350	Additional critical care contingency surge capacity – staff redeployment = 350 in Ireland	Clinical activity surge – clinically manageable	<p>Clinical risk of additional surge of critically ill patients managed with redeployed Hospital clinical staff</p> <p>Considerable impact on and curtailment of Hospital Scheduled Care clinical activity (redeployed staff missing) with negative impact – delayed patient diagnoses and outcome consequences)</p>
Red > 350	Additional staff not available	Overwhelming clinical activity surge - clinically unmanageable	<p>Unsafe clinical risk scenario</p> <p>Evacuate patients – inter-ICU transfer/transport with MICAS</p>

Table. Critical Care Capacity - Clinical Risk Stratification Table (ICU-BIS NOCA critical care bed capacity count 21<sup>st</sup> Jan 2021)



### 'Green' - Normal clinical risk

Where the needs of the cohorts or volumes of critically ill patients presenting are met by baseline or permanent critical care capacity, the experienced critical care clinical professional staff (the Establishment) manage the normal day-to-day clinical and patient variances. This scenario is the normal day-to-day critical care clinical risk profile. (See 'green' stratum in clinical risk table above).

### 'Amber' - Clinical risk manageable

However, in COVID in 2020 and in Jan 2021, in surges 1 and 3, the volumes of critically ill patients exceeded the normal variance of baseline critical care activity by a distance. In response, ICU-experience Hospital Nursing staff redeployment was required to meet the need. With redeployment the clinical needs of the increased volume of critically ill patients were met. (See 'amber' stratum in clinical risk table above).

### Increased clinical risk associated with curtailed Scheduled Care

The consequence of redeployment of ICU experience Hospital Nursing staff is considerable impact on and curtailment of Scheduled Care activity in Operating Theatres, Endoscopy and Cardiology across the Hospitals. It is known curtailment of Scheduled Care activity is associated with delays in cancer diagnosis which in COVID context have been associated with increased mortality (Maringe C et al; *The impact of the COVID-19 pandemic on cancer deaths due to delays in diagnosis in England, UK: a national, population-based, modelling study*; Lancet Oncol 2020; 21: 1023–34).

## **Red** - Overwhelming clinical risk scenario

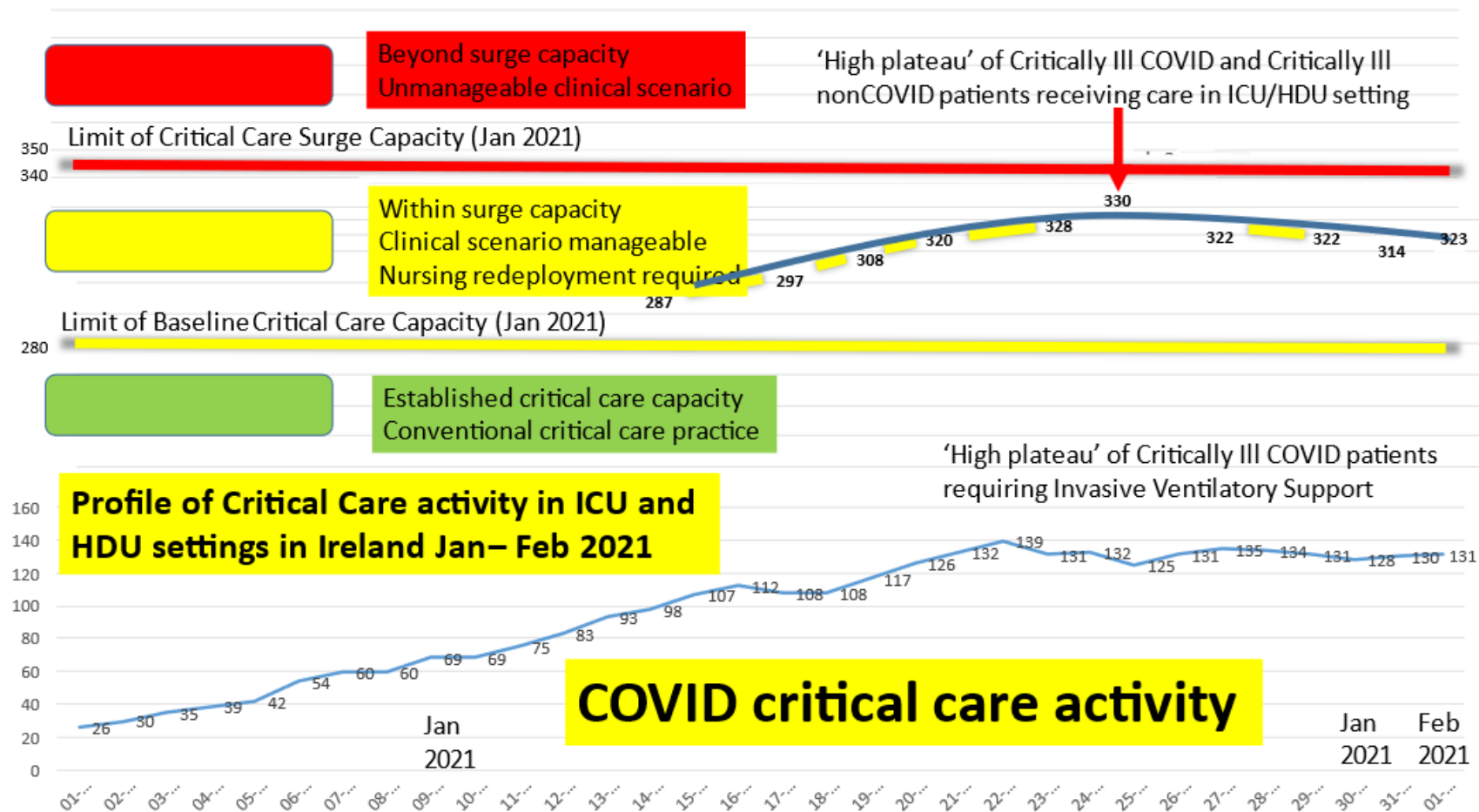
The ICU-BIS critical care capacity count on 21<sup>st</sup> Jan 2021 found critical care capacity was unavailable above a bed capacity of 350.

On Jan 24<sup>th</sup> 2021, ICU occupancy peaked with 330 patients critically ill patients in the ICUs. The additional ICU bed capacity availability on that day was 20 (data courtesy of ICU-BIS NOCA).

Although peak occupancy did not 'breach' the 350 figure at a national level, nevertheless, many Hospitals experienced overwhelming surges of critically ill COVID patients exceeding Critical Care Nursing staff availability. Surges of critically ill patients occurred locally following geographic clusters of COVID patients. In these hospitals appropriate Critical Care Nursing staff ratios were unavailable, the care of critically ill patients was not assured and the clinical situation in these Hospitals quickly became overwhelming. In rapid response, the Mobile Intensive Care Ambulance Service MICAS transported 100 critically ill adult patients in January 2021, triple the expected month-on-month MICAS activity. If MICAS had been unavailable, these Hospitals would have been overwhelmed. (See **red** risk stratum in clinical risk table above).

On 24<sup>th</sup> Jan 2021 national ICU occupancy peaked at 330 on a day where additional national adult ICU bed availability was

20



Graph. ICU occupancy peaked at 330 on Jan 24<sup>th</sup>

**Government *Critical Care Strategic Plan* announced by Minister Donnelly 18<sup>th</sup> Dec 2020**

Government's ***Critical Care Strategic Plan*** was announced by Minister Donnelly 18<sup>th</sup> Dec 2020 and the subsequent HSE *National Service Plan 2021* was announced (both copied below). Both are welcomed by National Clinical Programme for Critical Care as plans to increase the national adult critical care capacity permanent baseline by 66 from 255 to 321 by year end 2021 in response to the surges of critically ill adult COVID Patients.

In the event of a subsequent COVID surge, an increase in permanent baseline critical care capacity to 321 in 2021 would ease reliance on redeployed Hospital Nurses and consequent negative impact on nonCOVID Patient Scheduled Care activity with the avoidable consequences of diagnosis delay and negative outcome.

National Clinical Programme for Critical Care welcomes the capacity building measures announced by Minister Donnelly in Government's multi-annual ***Critical Care Strategic Plan*** – Nursing Outreach, Transport Medicine, Critical Care Nursing education and training resource, facility new build feasibility studies.

## **National Adult Critical Care Bed Capacity Census 2021**

The annual National Adult Critical Care Capacity Census 2021 identifies the adult critical care bed capacity permanent baseline stands at 302 (17<sup>th</sup> Aug 2021) - an increase in permanent critical care bed capacity of 47 or 19% increase since February 2020.

### **Ratio Level 3 ICU beds to Level 2 HDU beds –**

Census 2021 reports 247 x Level3 ICU bed capacity and 56 x Level2 HDU bed capacity – a ratio of just under 4.5 x ICU beds to 1 x HDU bed. (This ratio has increased since Census 2020 where ratio was 3 x ICU beds to 1 x HDU bed).

**CRITICAL CARE BED CAPACITY CENSUS (V1.3 17th Aug 2021)**

CRITICAL CARE BED CAPACITY CENSUS (V1.3 17th Aug 2021)	<u>CRITICAL CARE SERVICE</u>  (following <i>National Standards 2019</i> , Joint Faculty of Intensive Care Medicine of Ireland, CAI)						
	Level 3s (specialty) ICU Bed Capacity	Level 3 ICU Bed Capacity	Level 2 HDU Bed Capacity	Critical Care Bed Capacity 2021 = 302	Critical care bed capacity - commissioned / funded / non- operational = 34	JFICMI <i>National Standard</i> outlier	Critical Care Bed Capacity 2020 Census = 276
<b>RCSI Hospital Group</b>				50	0		(+4) 46
Cavan ICU		3	2	5	0		(+1) 4
Drogheda ICU		7	2	9	0		9
Beaumont Neuro- Specialty ICU, General ICU, Gen ICU2	9	20		29	0		(+2) 27
Connolly ICU		7	0	7	0		(+1) 6

<b>Dublin Midlands Hospital Group</b>				63	13		(+7) 56
Naas ICU		4	0	4	0		4
Portlaoise ICU		2	0	2	0	JFICMI National Standard outlier	2
Tullamore ICU		6	0	6	0		6
TallaghtUH ICU / HDU		14	2	16	12	(Government Critical Care Strategic Plan Phase 1 funded 18/12/20)	(+3) 13
St James ICU/HDU, CT KS ICU, Burns ICU	10	25		35	1		(+4) 31
<b>Ireland East Hospital Group</b>				70	11		(+4) 66
Mater Gen / CT /	17		16	33	3+8		33

ECLS ICU/HDU					3 existing funded ICU beds non-operational  PLUS  8 additional funded ICU beds non-operational <b>(Government Critical Care Strategic Plan Phase 1 funded 18/12/20)</b>		
Mullingar ICU		5	1	6	0		6
Navan ICU		2		2	0	JFICMI <i>National Standard outlier</i>	2



St Vincents ICU/HDU		18		18	0		(+2) 16
SLHKilkenny ICU		6		6	0		(+2) 4
Wexford ICU		5		5	0		5
<b>South-South West Hospital Group</b>				48	0		(+5) 43
STGHClonmell ICU		5		5	0		(+1) 4
UHWaterford ICU		6	4	10	0		10
Cork CUH General ICU CT ICU	6	16		22	0		(+3) 19
MercyUH ICU		6		6	0		(+1) 5
UHKTralee ICU		5		5	0		5
<b>Saolta Hospital Group</b>				43	10		(0) 43
LetterkennyUHICU		6		6	0		6
Ballinasloe ICU		4	3	7	1		7
Castlebar ICU		3	2	5	3		(+2) 3
Sligo ICU		5		5	1		5

Galway UHG General ICU/HDU, CT ICU	4	10	6	20	5		(-2) 22
<b>UL Hosp Group</b>							
UHLimerick ICU/HDU		12	16	28	0		(+6) 22  <i>(Government Critical Care Strategic Plan Phase 1 18/12/20 – implementation completed)</i>
<b>TOTAL</b>	<b>Level 3s (specialty) ICU bed capacity</b>	<b>Level 3 ICU bed capacity</b>	<b>Level 2 HDU bed capacity</b>	<b>Critical Care Bed Capacity 2021 = 302  Total Level 3s + Level 3 + Level 2 = 302</b>	<b>Critical care bed capacity - commissioned / funded / non- operational = 34</b>	<b>JFICMI National Standard outlier</b>	<b>Critical Care Bed Capacity 2020 = 280</b>

## Table. Adult Critical Care Bed Capacity as at 17<sup>th</sup> Aug 2021

### Census Table Legend

 *National Standards JFICMI - in scope*

 *National Standards JFICMI - outlier*

### **Critical Care Capacity Census 2021- methodology note**

On behalf of HSE Acute Operations, Critical Care Programme completes an annual critical care bed capacity Census.

As part of Census procedure, each hospital's Census return is verified locally and countersigned by the Hospital CEO, Hospital Clinical Director, Hospital Director of Nursing, Hospital ICU Director, Hospital ICU CNMIII, Hospital Group CEO, Hospital Group Chief Clinical Director and Hospital Group CDoN- multiple Hospital / Hospital Group signature verifications. This co-signed individual Hospital critical care capacity profile report is thus collated, reconciled and validated by CCP Census Working Group.

Thus, the annual adult national critical care (ICU and HDU) commissioned bed capacity is ascertained by the Critical Care Census process.

The *National Standards for Adult Critical Care Services 2019*, Joint Faculty of Intensive Care Medicine of Ireland (JFICMI), the Office of Nursing and Midwifery Services Directorate (ONMSD), HSE and the HPSC, HSE, respectively, define the medical, nursing and HPSC staff requirements to commission a Critical Care Service.

Where a Hospital operates outwith the *National Standards for Adult Critical Care Services 2019*, e.g lacks dedicated designated Intensive Care Medicine Consultants or Duty ICU Consultant roster the Census finds the Hospital is a *National Standard* 'outlier' (see above).

## **Appendices**

1. Government announcement - ***Critical Care Strategic Plan*** announced by Minister Donnelly Dec 18<sup>th</sup> 2020
2. HSE ***National Service Plan 2021*** – Critical Care Capacity planning extract
3. ***Critical Care Capacity Resource Allocation Framework - “Memo re ICU bed allocation”***, Advisory Group, National Clinical Programme for Critical Care, July 2021

**Appendix 1 - Government announcement - *Critical Care Strategic Plan* announced by Minister Donnelly**

**Dec 18<sup>th</sup> 2020**



Press release

**Minister for Health announces plan to expand critical care capacity to 446 beds**

From Department of Health



Published on 18 December 2020

The Minister for Health, Stephen Donnelly TD, has today announced a strategic multi-year plan to expand adult critical care capacity from 255 beds to 446 beds.

Work on Phase One of the plan has already begun and will see 321 adult critical care beds in place by the end of 2021, compared to 255 at the start of this year. This will be funded by €52 million allocated in Budget 2021. This funding will also allow for education and training initiatives to increase the critical care workforce and for investment in critical care retrieval services. Under Phase One, an additional 8 beds will be created in St. Vincent's University Hospital in 2022, subject to completion of the necessary infrastructural development and planning processes, and with funding to be sought within the 2022 estimates process.

Completion of Phase Two will see a further 117 beds added through the development of new build capacity at five prioritised sites, subject to necessary approval processes. These sites include Beaumont Hospital, St James's Hospital, the Mater Misericordiae University Hospital, St Vincent's University Hospital and Cork University Hospital.

The multi-year plan was noted by Government this week. As well as addressing historical under-capacity, the plan supports wider strategic reform and service improvement. When implemented, it will fully address the recommendations of the 2018 Health Service Capacity Review.

Minister Donnelly said:

"Ensuring the right resources are in place for our most critically ill patients is a priority for me and for this government. This plan is a major milestone in the expansion of our critical care capacity. At the start of this year, there were 255 adult critical care beds in the country. We are increasing this number to 321 by end of 2021 – a 25 per cent increase. To put this in context, the 2019 National Adult Critical Care Bed Capacity Census reported an additional 21 beds opened over

the three-year period from 2017 to 2019, an average of seven per year. The plan will ultimately bring us to 446 critical care beds, not only addressing but exceeding the 2018 Health Service Capacity Review recommendation of 430 beds."

Minister Donnelly added:

"This investment will help our health service to deliver the right care in the right place at the right time. This plan will also support strategic reform and service improvement in areas including trauma and transplant where we know that access to adequate critical care capacity is core to delivering best outcomes. I also want to take this opportunity to thank our frontline workers who have cared for patients in our critical care units, and indeed across our health system, throughout the pandemic. Their commitment and dedication during this enormously challenging time has been remarkable."

Dr Michael Power, National Clinical Lead for the Critical Care Programme, said:

"Thousands of critically ill people are cared for in our critical care units every year across Ireland. The clinicians in the critical care community delivered top class critical care to critically ill COVID and non-COVID patients in very challenging circumstances over recent months. The significant investment provided now in Budget 2021 and the plan to address the overall adult critical care capacity deficit are vital to enable access and the best outcomes for our critically ill patients. The focus on critical care workforce, education and training is a key part of the critical care plan."

**ENDS**

**Notes**

## **Detail of the Critical Care Capacity Expansion Plan**

A strategic multi-year plan for additional critical care capacity has been developed to ensure readiness of the health system for response to the ongoing COVID-19 pandemic and to support a long-term strategic goal of increasing overall critical care capacity to 446, slightly in excess of the pre-pandemic recommendation of 430 beds in the Health Service Capacity Review.

The plan is clinically led and aligns with the hub-and-spoke model of care set out by the National Clinical Programme in Critical Care. It addresses the recommendations of the Health Service Capacity Review in respect of critical care, is in line with the vision set out in Sláintecare of "right care, right place, right time", and will also support strategic and service reform over time. Critical care is a key component in the implementation of key strategies including trauma, cancer and maternity care, and in the provision of specialist care including organ transplant. The strategic development of critical care capacity aligns with the strategic direction envisaged in these strategies and with the delivery of highly complex specialist care.

This sets out two phases of capacity expansion to address the immediate and long term needs in our public hospital system, as follows:

### **Phase 1 2021**

-retain permanently the 40 adult critical care beds put in place as part of the response to COVID-19



- provide an additional 26 beds in the Mater Misericordiae University Hospital (8), Tallaght University Hospital (12) and University Hospital Limerick (6)
- develop the critical care workforce by increasing the numbers of onsite critical care nurse educators and by increasing access to critical care nurse education at foundation and post-graduate levels
- increase the number of hospitals with critical care outreach teams to improve patient care and reduce re-admissions to critical care units
- increase the capacity of the National Ambulance Service's critical care retrieval services
- overall, funding of €52m has been provided in Budget 2021 to deliver the additional 66 beds in 2020 and 2021, a key step to ensuring the readiness of the health system for provision of critical care to COVID and non-COVID patients as part of the continued response to the COVID-19 pandemic
- Phase 1 also envisages the provision of an additional 8 beds in St. Vincent's University Hospital in 2022, subject to completion of the necessary infrastructural development and planning processes, and with funding to be sought within the 2022 estimates process

## **Phase 2**

- development of new build capacity at five prioritised sites (Beaumont Hospital, St James's Hospital, the Mater Misericordiae University Hospital, St Vincent's University Hospital and Cork University Hospital) to support the delivery of an additional 117 beds
- the second phase supports the ambitious long-term strategic goal of increasing overall critical care capacity to 446 beds, fully addressing the critical care recommendations of the Health Service Capacity Review
- these developments are subject to completion of the necessary capital strategic assessments and preliminary business cases, in line with the Public Spending Code. The Capital Plan for 2021 allocates €5m to allow for the commencement in 2021 of the strategic appraisals and business cases
- it is intended that these capital developments will substantially increase the overall complement of critical care beds in hub hospitals to meet the needs of national specialties. These national specialties including the solid organ transplant programmes (kidney, liver, and heart and lung), the national burns service, neurosurgery, interventional neuroradiology (thrombectomy), ECMO and major trauma services

**Appendix 2. HSE National Service Plan 2021** – extract (p73-74)

**Acute Hospital Care**

**National Strategies**

**Critical Care**

The development of critical care bed capacity is a key priority in order to strengthen the immediate response to the challenges posed by COVID-19, and to progress the initial phase of the strategic multiannual plan to address long standing deficits in critical care capacity. Critical care expansion will also support wider strategic reforms such as the Trauma Strategy and the Health Service Capacity Review and enable the further development of national services such as organ donation and transplant.

**Priority Areas for Action 2021**

**Increase critical care bed capacity**

- Increase the baseline of 255 critical care beds by permanently funding the 40 additional adult critical care beds opened in 2020 and by adding a further 26 beds at University Hospital Limerick, Tallaght University Hospital and the Mater Misericordiae University Hospital (to bring the total number of adult critical care beds to 321 by end of 2021)
- Develop the critical care work force by increasing the numbers of on-site critical care nurse educators and by increasing access to critical care nurse education at foundation and post-graduate levels
- Improve patient care and reduce re-admissions to critical care units by increasing the numbers of hospitals with critical care outreach teams
- Increase the capacity of the NAS critical care and retrieval services

**Appendix 3. Critical care resource allocation framework - “Memo re ICU bed allocation”, Advisory Group, National Clinical Programme for Critical Care, July 2021**



**Memo re ICU bed allocation: Critical Care Advisory Group, July 2021**

**Joint Faculty of Intensive Care Medicine of Ireland  
College of Anaesthetists of Ireland CAI  
Intensive Care Society of Ireland  
Irish Standing Committee, Association of Anaesthetists of Great Britain and Ireland**

**Summary:**

The Critical Care Advisory Group (CCAG) has reviewed the HSE proposal on the allocation of the additional 117 critical care beds as Phase 2 of increasing national critical care capacity. The CCAG is fully supportive of the proposal and is of the opinion that it should proceed without delay. CCAG supports the 5 new capital builds. The proposed bed expansion has the capacity to transform the delivery of critical care to Irish patients and expand critical care capacity to 8.8 beds per 100,000, population albeit 25% below the Prospectus 2009 recommendation and considerably below the EU average of 12 per 100,000.

The CCAG examined the proposal from a number of perspectives including regional distribution, distribution relative to apparent current demand, compliance with JFICMI *National Standards for Adult Critical Care Services 2019*, the National Clinical Programme for Critical Care *Adult Critical Care Model of Care* (with particular reference to the 'hub-and-spoke' model), the 2009 *Prospectus Report "Towards Excellence in Critical Care"* 2009, the National Trauma Strategy and minimising the number of new builds necessary for critical care expansion to happen.

The 2009 *Prospectus* report was the last in-depth study of critical care requirements in Ireland. The CCAG is of the view that although all its recommendations remain valid, it would be useful to have an expert group (such as the *Prospectus* group) update its report. It is crucial that such a review should not delay the much-needed expansion of capacity or the new capital builds.

We would also advise strongly the Critical Care Advisory Group remains central to proposal's implementation given its broad representation from professional bodies relevant to critical care.

These considerations are included below -

**1: Regional Distribution of GICU beds if HSE Phase 2 recommendations implemented (with proportional assignment of specialist critical care beds as per Prospectus report 2009) :**

*SláinteCare* includes a recommendation that healthcare should be evenly distributed throughout the different regions. This is most usefully assessed by looking at Critical Care bed capacity across hospital groups.

The 2009 *Prospectus* report 2009 performed an in-depth analysis of the needs of Irish patients for critical care capacity. This can be divided into the need for specialist critical care beds (e.g. cardiothoracic, neurointensive care, Major Trauma Centre beds etc.) which

should be distributed to the hospitals providing those services, and the General ICU (GICU) beds which should be more evenly distributed by region, although some variability is appropriate based on individual hospital profile and activity.

**Table 1:** Phase 2 allocation of critical care beds to Hospital Groups as per 2020 HSE proposal; variability in allocation for GICU beds (after identification of beds for specialist services as per Prospectus report 2009)

		Total ICU/HDU beds after proposed Phase 2 allocation						
	Population		Neuro	CT	Liver/Burn	Trauma, ID, ECMO	GICU beds	GICU Beds per 100,000
IEHG	1,100,000	122		12.5	5.0	18	86.5	7.9
RCSI	875,000	68	30.2				37.8	4.3
Mid-Leinster	800,000	89		5	3.5		80.5	10.1
<b>Dublin/Leinster HG's</b>	<b>2,775,000</b>	<b>279</b>	<b>30.2</b>	<b>17.5</b>	<b>8.5</b>	<b>18</b>	<b>204.8</b>	<b>7.4</b>
SSWHG	900,000	86	11.3	8.6		8	58.1	6.5
Saolta	830,000	44		5.3			38.7	4.7
ULHG	473,000	28					28	5.9
Total	4,978,000	437						6.6

**Modelling for assignment of beds to Hospital Groups by population**

*Relies on using Prospectus assignment to specialist services + assumptions re recent DOH decisions re allocation of ICU beds for new specialty areas (Trauma, ID and ECMO)*

Official population Ireland 2021 = 4,982,907

Level 3 beds; Prospectus recommended 322 general beds + 94 specialty beds = 416 (72%)

Level 2 beds; Prospectus recommended 132 general beds + 31 specialty beds = 163 (28%)

Prospectus Total 579 beds

HSE Critical Care proposals assign 437 beds total = 8.8 beds/100,000 population.

Pre-allocated for new services:

16 beds for Trauma (CUH/MMUH)

8 for infectious diseases

2 for ECMO

Total: 26 beds

411 remaining beds for GICU/ Other specialty

+ 8 beds not required for Neuro (covered by Trauma allocation)

= 419 beds

Prospectus specialty beds = 125/579 = 21.6% of 419 total beds = 90.5 - 8 beds pre-assigned for Neuro = 82.5 beds for CT/Neuro/  
Burns/Liver

### Neuro

Prospectus recommends 69 = 69/579 = 11.92%.

11.92 % of 419 (437 - 26 specific beds assigned for Trauma, ID, ECMO) = 50 beds - 8 for trauma (estimated) = 42 Neuro beds between  
BH/CUH

BH catchment area = 3,605,000 = 72% of population = 30.19 beds

CUH catchment area = 1,373,000 = 28% of population = 11.74 beds

### Cardio-thoracic

Prospectus recommends 44 = 44/579 = 7.6%.

7.6% of 419 beds = 31.84 beds between MMUH/SJH/UHG/CUH

CUH catchment = 27.7% of population = 8.82 beds 8.82 beds CUH

UHG = 17% of population. 17% of CT beds = 5.41 beds 5.41 beds UHG

SJH = 16% of population. 16% of CT beds = 5.09 beds 5.09 beds SJH

MMUH catchment = 40% of population = 12.74 beds 12.74 beds MMUH

**Burns / Liver**

*Prospectus*

Burns	5	5/579	= 0.086%; of 419 beds	= 3.60 beds	SJH
Liver	7	7/579	= 1.21%	= 5.07 beds	SVUH

*\*Prospectus recommendation*

**2. Allocation of beds based on existing bed days utilised for invasive ventilation (IPPV) and IPPV episodes in each hospital as per 2019 NOCA ICU Audit report. (Fig. 1, Fig.2)**

Bed days utilised for invasive ventilation is regarded as a robust measure of Level 3 (ICU) care requirement but does not account for Level 2 (HDU) care (it can be misleading when used to measure activity in units where both Level 3 and Level 2 care are provided).

The NOCA ICU Audit 2019 report has no data from 6 non-participating hospitals.

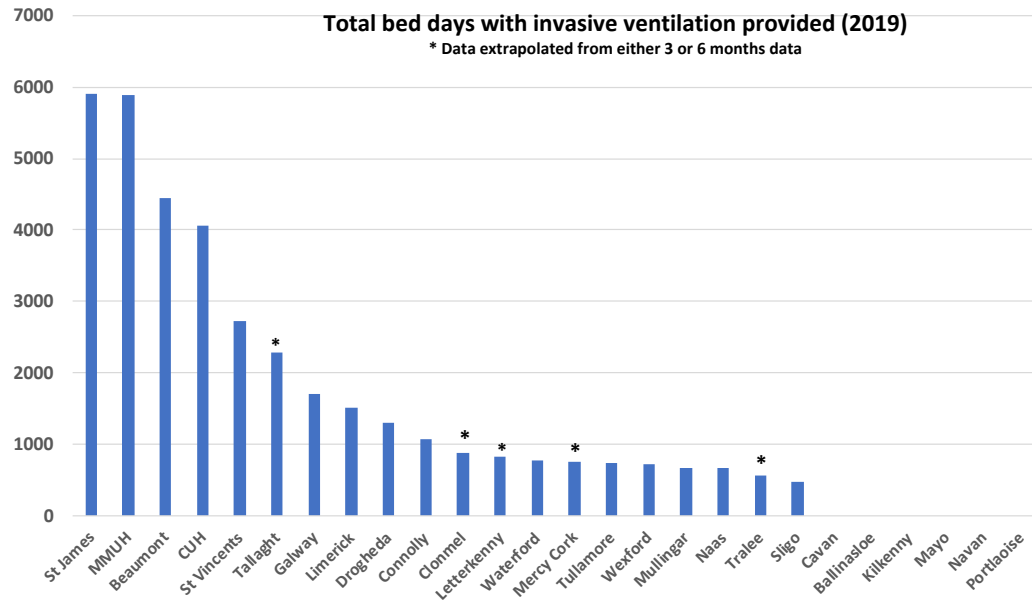
A substantial workload is identified in all hospitals identified for Phase 2 expansion using this metric. All of these hospitals had high proportions of patients undergoing IPPV and ICU bed occupancy above recommended levels (NOCA ICU Audit Report, 2019).

**Figure 1:**

Number of patient bed days undergoing invasive mechanical ventilation by hospital during 2019.

\* Denotes centre with incomplete data or where data for 12 months were extrapolated from reports covering only 3 or 6 months.

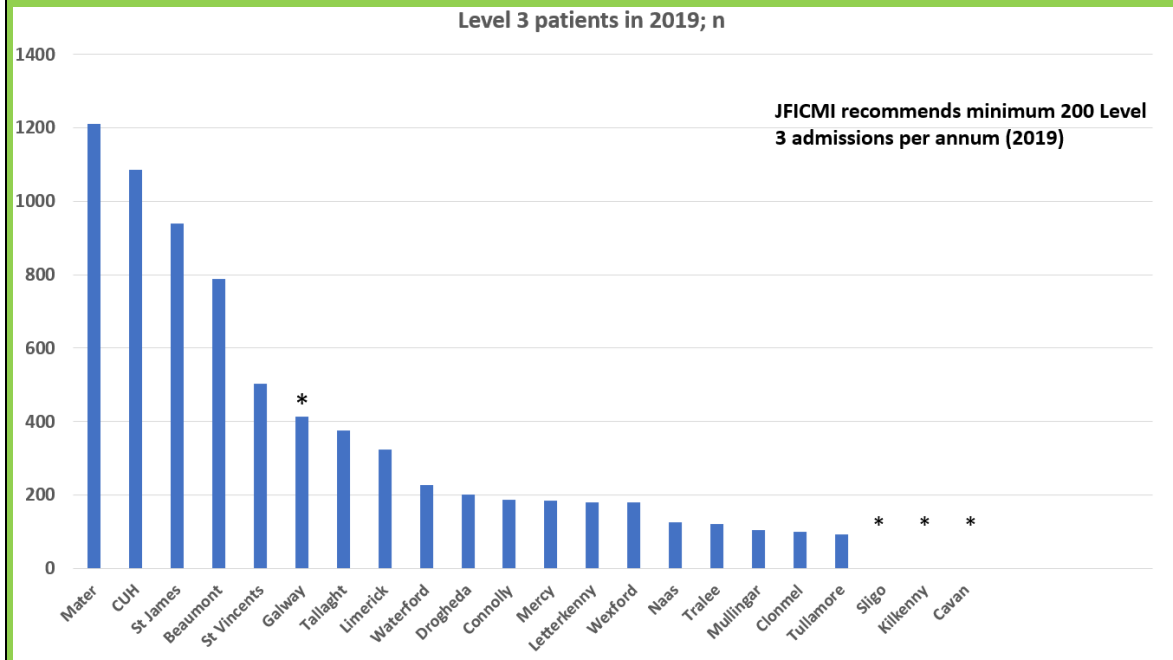




The graph above indicates that the 5 hospitals identified for increased capacity in Phase 2 were the 5 hospitals with the greatest ICU workload based on the above parameter.

**Figure 2:**

Total Number of patients requiring Invasive Positive Pressure Ventilation:



Similar to Figure 1, this graph indicates that the 5 hospitals identified for increased capacity in Phase 2 were the 5 hospitals with the greatest ICU workload based on the IPPV episodes.

\* Denotes centre with incomplete or no data.

### **3.Alignment with CCP Model of Care, JFICMI *National Standards for Adult Critical Care Services 2019* and recommendations of Prospectus report 2009:**

The CCP Model of Care identified the need for a “Hub and Spoke” model for provision of critical care. The Allocation in Phase 2 allows the hub and spoke model to develop by creating adequate capacity in the prioritised hubs. All the prioritised centres are compliant with the JFICMI Standards for adult critical care services specifically in terms of volume of practice, medical and nursing staffing and availability of specialist input.

#### **References:**

Proposal for additional adult critical care bed. COVID and Post-COVID healthcare  
HSE. June 2020

NOCA ICU Audit Report 2019.

[http://s3-eu-west-1.amazonaws.com/noca-uploads/general/INICUA\\_Interim\\_Report\\_2019\\_Final18.12.20.pdf](http://s3-eu-west-1.amazonaws.com/noca-uploads/general/INICUA_Interim_Report_2019_Final18.12.20.pdf)

Prospectus report 2019 “Towards Excellence in Critical Care”

<https://www.hse.ie/eng/services/publications/clinical-strategy-and-programmes/towards-excellence-in-critical-care-report.pdf>

JFICMI standards for Adult Critical Care Services:

<https://jficmi.anaesthesia.ie/wp-content/uploads/2019/09/National-Standards-for-Adult-Critical-Services-2019.pdf>

#### **Abbreviations**

CCAG; Critical Care Advisory Group; Advisory Group, NCPCC

CCP; HSE Critical Care Programme, National Clinical Programme for Critical Care

HDU; High Dependency Unit (for ICU Level 2 care)

ICU; Intensive Care Unit (for ICU Level 3 care)  
IPPV; intermittent positive pressure via endotracheal tube or tracheostomy  
JFICMI; Joint Faculty of Intensive Care Medicine in Ireland  
NOCA; National Office for Clinical Audit

Advisory Group, National Clinical Programme for Critical Care, Membership -

Dr John Bates, Chair, Ex Dean Joint Faculty of Intensive Care Medicine of Ireland  
Dr Coleman O'Loughlin, President, Intensive Care Society of Ireland  
Prof. George Shorten, President College of Anaesthetists of Ireland,  
Dr Rory Dwyer, Clinical Lead, Irish National ICU Audit, NOCA  
Dr Brian Marsh, JFICMI delegate to NDTP for ICM Workforce Planning,  
Dr Vida Hamilton, NCAGL, Acute Operations  
Dr Michael Power, Clinical Lead, National Clinical Programme for Critical Care  
Dr Michael Dockery, Clinical Lead, National Clinical Programme for Anaesthesia  
Dr Wouter Jonker, Convenor Irish Standing Cte, Association of Anaesthetists GB&I  
Dr Dermot Doherty, Clinical Director NAS-CCRS  
Dr Andrew Westbrook, Dean JFICMI

Ends

Dr Michael Power, Clinical Lead, National Clinical Programme for Critical Care, 17<sup>th</sup> Aug 2021