

Original Article

Critical care bed capacity of Bangladesh: A Pre and Post COVID-19 pandemic survey

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Abstract:

Background: Intensive care unit (ICU) is the backbone of critical care service delivery in a hospital. Bangladesh has been lagging behind in critical care service delivery since first ICU was established in 1978. In 2017-19 an international study reported that Bangladesh had 0.7 Critical care (ICU and HDU) bed per one lac population. This was quite low compared to South Asian countries. Growth of critical care beds across our country has been reported to be heterogeneous. The aim of this survey is to determine current strength and growth of critical care beds before the beginning of recent COVID pandemic and also at the height of pandemic when additional COVID ICUs and HDUs were introduced.

Method: Data on number of ICUs and HDUs and their bed strength were obtained from different web sites of Govt. of Bangladesh as well through personal communication. Number of critical care beds were calculated at national and district level as number per one lac population. Ratio of critical care beds expressed in percentage with number of hospital beds in the hospital were calculated at national level. Data were also obtained on COVID ICU and HDU beds which were introduced temporarily from websites of ministry of Health, Govt. of Bangladesh.

Results: As of now we documented (pre COVID pandemic) 2139 ICU beds (965 in Govt. hospitals) and 717 HDU beds (315 in Govt. hospitals) among 208 hospitals (Govt. hospitals 79+ Private hospitals 129) during our survey. Number of critical care beds per one lac population across the country is found to be 1.70. In hospitals with critical care beds the average ratio of critical care beds (ICU+HDU) beds compared to hospital beds is 4.34% across the country. Thirty eight of total 64 districts have no critical care facility (non COVID/pre COVID) in their local hospitals. During peak of pandemic Govt. of Bangladesh introduced and approved 1186 COVID ICU beds, 695 COVID HDU beds both at Govt. and private level on temporary basis in different hospitals including in some critical care deprived hospitals.

Conclusion: Our survey concludes that growth and distribution of critical care beds (ICUS + HDUs) across Bangladesh is still heterogeneous and very much inadequate compared to the critical care need of the population. There was a temporary surge of new ICUs and HDUs to serve COVID patients at the height of COVID pandemic across the country. Health care planners of the country need to plan for developing adequate critical care man power as well as establish newer critical care facilities among existing hospitals who lack them.

Keywords : Critical care bed, COVID-19 pandemic, Bangladesh.

Introduction:

Critical Care Medicine (otherwise called Intensive care medicine) has been an officially recognized specialty in Bangladesh since 2007. In 1971 no Intensive Care Unit (ICU) existed in Bangladesh at the time of its independence. Critical care services were unknown in Bangladesh until 1978 when first officially recognized ICU was established at National Institute of cardiovascular disease, Dhaka.

Task force of World Federation of Societies of Intensive and

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Critical care Medicine (WFSICCM) has defined ICU and HDU (High Dependency Unit) as follows¹.

An ICU is a defined geographic area of hospital and organized system for provision of care to critically ill patients that provide intensive and specialized medical and nursing care, an enhanced capacity for monitoring and multiple modalities of physiologic organ support to sustain life during a period of acute organ system insufficiency.

HDU otherwise called intermediate care unit in some countries is defined by WFSICCM task force is a dedicated space within the hospital with a higher nurse to patient ratio than a regular ward, equipped to monitor vital signs and oxygen saturation intensively and electrocardiogram continuously and to provide noninvasive ventilation, short term invasive mechanical ventilation or simple mechanical ventilation for stable chronically ventilated patients. Official definition of ICU and HDU in Bangladesh is similar to the above definition. For the purpose of our study we have accepted the above definitions by WFSICCM.

First reported study on critical care bed capacity in Bangladesh was published in 2010². The study was done in

2007 and it involved 40 ICUs (including 4 Govt. run ICUs) in city of Dhaka, capital of Bangladesh. The study surveyed 424 ICU beds among 8824 hospital beds. There was no information on number of HDUs in that study.

In 2013 -14 another study was done in Bangladesh involving 51 ICUs as apart of broader international study named as AISP study³. The Bangladesh part of the study was done with data from districts of Dhaka, Sylhet, Chattogram, Mymensingh and Savar and it involved 748 adult, pediatric and neonatal ICU beds⁴.

In 2017-19 an international study involving Asian countries named ABC study reported that Bangladesh had 84 hospitals with ICUs and HDUs. Total critical care beds was estimated to be 1174 which included 296 HDU beds⁵. The study however failed to depict accurate information because of limited data collection resources. According to ABC study Bangladesh had 0.7 beds per 100000 population compared to India, Pakistan, Nepal, Sri Lanka which had 2.3, 1.5, 2.8, 2.3 critical care beds respectively. Taiwan had 28.5 critical beds per 100000 population and it was highest among Asian countries in that study.

According to an unofficial estimate by a daily newspaper of Bangladesh in 2019⁶ there were about 220 ICU beds in Govt. run hospitals and 1000 ICU beds in privately run hospitals in Bangladesh.

Islam MT et al⁷ reported in 2020 that there were 432 ICU beds under Govt. run hospitals and it included 110 beds outside city of Dhaka. The report also claimed that that private health care sector had additional 737 additional ICU beds for the whole population of the country.

Up till now there is no accurate and dependable data regarding critical care services documenting number of ICUs and HDUs in Bangladesh.

During recent COVID pandemic, Directorate of health under Director General of Health, Ministry of Health and family welfare published data regarding COVID dedicated facilities including COVID ICUs.

Our survey of critical care bed capacity in pre and post pandemic period also involved estimation of additional critical care bed capacity incurred to accommodate critically ill COVID patients during pandemic period over and above preexisting critical care bed capacity in Bangladesh. As such we have aimed in surveying current critical care bed capacity in Bangladesh keeping in mind estimation of temporary COVID ICUs and HDUs established during the peak of COVID pandemic which started first in China in Dec 2019⁸.

Methods of Survey

We conducted for the first time in Bangladesh an extensive survey on critical care bed capacity of Bangladesh including number of functioning ICUs and HDUs keeping in mind the bed capacity just before the COVID pandemic and extended bed capacity during the peak of pandemic. The survey period was during the month of May 2022 assuming that COVID pandemic in Bangladesh was over at the beginning of 2022. Only adult ICUs and HDUs were surveyed. Coronary care unit (CCU), Surgical, Pediatric ICU and Neonatal ICU were

excluded from the survey.

First of all we went through different websites of Ministry of health and family welfare Govt. of Bangladesh: www.mohfw.gov.bd, www.hospitaldghs.gov.bd, www.dghealth.gov.bd and obtained information on number of documented ICUs with number of critical care beds in different Govt. hospitals and private hospitals under different districts.

During COVID pandemic web sites from ministry of Health, Govt. of Bangladesh published number of COVID ICU beds in addition to number of dedicated COVID general beds in Govt. and privately run hospitals across the country. These data are described separately in our survey.

We found on Google search, websites of different private hospitals including some hospitals undocumented in Govt. database and obtained relevant information on critical care facilities. We also used personal contact at different districts and obtained relevant information on phone from different local physicians.

Relevant information on number of ICU beds were tabulated under headings of Govt. and private, under different headings of districts which were tabulated under headings of different administrative divisions.

Total number of ICU beds and HDU beds, total number of hospitals with critical care facilities and their general bed facilities in the whole country were documented

Number of hospital beds and critical care beds per one lac (hundred thousand) population were calculated.

Ratio of critical care beds to total hospital beds with critical care facilities expressed as percentage and ratio of critical care beds with total hospital beds in general across the country expressed as percentage were also calculated.

Data were obtained from web site of Govt. of Bangladesh (www.dghs.gov.bd) on introduction of new COVID dedicated ICUs and HDUs across the country during the peak of COVID pandemic (2020 - 2021).

Last of all number of critical care beds per one lac population in each of 64 districts of Bangladesh were calculated in a separate table.

RESULTS OF THE SURVEY:

CRITICAL CARE BED CAPACITY FROM DIVISION TO DISTRICT LEVEL JUST BEFORE COVID-19 PANDEMIC

Number of Govt. Hospitals, Govt. hospital bed strength and number of Govt. ICU beds & Govt. HDU beds are expressed in bold. Remaining are private hospitals, private ICU beds and private HDU beds.

Population of districts and divisions as per population projection by www.citypopulation.de/en/bangladesh/cities were noted.

SYLHET Division:

Hospitals with ICU/HDU-15-(4+11) in 4 districts ICU beds-137 (48+89), HDU beds-34 (14+20), Total population-12436000. General bed strength in 15 hospitals 4865 (2400+2465)

A) Habiganj district- Hospitals with ICU- 0, Population- 2640000

B) Moulvibazar district - Hospitals with ICU-2 (1+1), ICU beds- 8 (6+2).

Population- 2324000

Govt Hospital:

- 1) 250 bed Sadar Hospital.
ICU- 6 beds. Hospital beds 250

Private Hospital:

1. Life Line Hospital & Cardiac Center, Srimongol
ICU-2 beds. Hospital beds 40

C) Sunamgonj district-Hospitals with ICU-0, Population- 3091000

D) Sylhet district-Hospitals with ICU- 13 (3+10), ICU beds- 129 (42+87), HDU beds 34 (14+20), Population- 4408000.

See **Table 1** for details.

DHAKA Division:

Hospitals with ICU/HDU - 111 (30+81), ICU beds - 1335 (573+762), HDU beds - 483 (206+277) in 13 districts. Total population- 42607000. General bed strength in 111 hospitals 38450 (17335+21115)

A) Dhaka district- Hospitals with ICU/HDU- 96 (22+74), ICU beds- 1201 (487+714), HDU beds – 447 (188+259), Population- 13798000

See **Table 2** for details.

B) Faridpur district- Hospitals with ICU/HDU - 2 (2+0), ICU beds- 26 (16+10), HDU beds - 6 (6+0). Population- 2201000

Govt. Hospital:

1. **Faridpur Medical College Hospital**
ICU-16 beds. Hospital beds 650
2. **Bangobandhu Sheikh Mujib Medical College Hospital, Faridpur**
ICU-10 beds, HDU-6 beds. Hospital beds 500
Private Hospital: 00

C) Gazipur district- Hospitals with ICU-3 (1+2), ICU beds- 22 (10+12).Population- 4046000

Govt Hospital:

1. **Shahid Tazuddin Medical College Hospital.**
ICU-10 beds. Hospital beds 250

Private Hospital:

1. Dhaka Imperial Hospital, Tongi
ICU-7 beds. Hospital beds 80.
2. International Medical College Hospital.
ICU- 5 beds, Hospital beds 250

D) Gopalganj district- Hospitals with ICU-1 (1+0), ICU beds- 10 (10+0). Population- 1346000

Govt Hospital:

1. **Gopalganj General Hospital**
ICU-10 beds. Hospital beds 250

Private Hospital: 00

E) Kishoreganj district. Hospitals with ICU/HDU -2 (1+1), ICU beds- 18 (10+8), HDU beds - 15 (15+0). Population- 3648000

Govt Hospital:

1. **Shaheed Sayed Nazrul Islam Medical College Hospital,**
ICU-10 beds, HDU -15 beds. Hospital beds 250

Private Hospital:

1. Jahurul Islam Medical College & Hospital
ICU-8 beds. Hospital beds 500

F) Madaripur district. Hospitals with ICU- 0, Population- 1393000

G) Manikganj-Hospitals with ICU-2 (1+1), ICU beds- 7 (4+3). Population- 1640000

Govt Hospital:

1. **Manikgonj General Hospital.**
ICU- 4 beds. Hospital beds 250

Private Hospital.

1. Monno Medical College Hospital.
ICU- 3 beds . Hospital beds -500.

H) Munshigonj district. Hospitals with ICU- 0, Population- 1669000

I) Narayanganj district- Hospitals with ICU-1 (0+1), ICU beds- 10 (0+10), HDU beds 4(0+4) Population- 3490000

Govt Hospital: 00

Private Hospital:

1. Proactive Medical College Hospital
ICU-10 beds, HDU- 4 beds Hospital beds 450

J) Narsingdi district- Hospitals with ICU- 0, Population- 2685000

K) Rajbari district -Hospitals with ICU- 0, Population- 1201000

L) Shariatpur- district. Hospitals with ICU- 0, Population- 1385000

M) Tangail district- Hospitals with ICU/HDU -3 (2+1), ICU beds- 30 (22+8), HDU beds -4 (4+0), Population- 4105000

Govt. Hospital:

1. **250 Beded General Hospital, Tangail**
ICU-10 beds. Hospital beds 250
2. **CMH, Ghatail**
ICU- 12 beds, HDU -4 beds. Hospital beds 300

Private Hospital

1. KumudiniWomans Medical College Hospital
ICU-8 beds. Hospital beds 500

CHATTOGRAM Division:

Hospitals with ICU/HDU-35 (10+25), ICU beds-376 (141+235), HDU beds-84 (32+52), in 11 districts. Population-34747000. General bed strength in 35 hospitals 8975 (4100+4875)

- A) **Bandarban** district. Hospitals with ICU- 0, Population-469000
- B) **Brahmanbaria** district. Hospitals with ICU-0, Population- 3617000
- C) **Chandpur** district Hospitals with ICU-0, Population-2929000
- D) **Chattogram** district. Hospitals with ICU/HDU-25 (5+20), ICU beds-268(71+197), HDU beds-67 (20+47), Population- 8990000.

See **Table 3** for details.

- E) **Cumilla** district- Hospitals with ICU/HDU-7 (2+5), ICU beds-76 (38+38), HDU beds-13 (8+5), Population-6559000

Govt Hospital:

1. **Cumilla Medical College Hospital**
ICU- 20 beds. Hospital beds 500
2. **CMH, Cumilla**
ICU-18 beds, HDU -8 beds . Hospital beds 300

Private Hospital:

1. Cumilla Moon Hospital:
ICU- 10 beds. Hospital beds 150
 2. Cumilla Trauma Hospital
ICU-11 beds. Hospital beds 50
 3. Cumilla Medical Center
ICU- 5 beds. Hospital beds 30
 4. CD Path Hospital
ICU-5 beds. Hospital beds 40
 5. Central Medical College Hospital
ICU- 7 beds, HDU-5 beds . Hospital beds 250
- F) **Cox's Bazar** district. Hospitals with ICU/HDU- 2 (2+0), ICU beds- 22 (22+0), HDU beds - 4 (4+0), Population-2979000

Govt. Hospital:

1. **Cox's Bazar General Hospital: (Cox's Bazar)**
ICU- 10 beds Hospital beds 250
2. **CMH Ramu(Cox's Bazar)**
ICU-12 beds, HDU-4 beds. Hospital beds 300

Private Hospital: 00

- G) **Feni** district. Hospitals with ICU- 1 (1+0), ICU beds- 10 (10+0), Population- 1754000

Govt Hospital:

1. **Feni General Hospital**
ICU- 10 beds. Hospital beds 250

Private Hospital: 00

- H) **Khagrachari** district. Hospitals with ICU- 0, Population- 738000
- I) **Laksmipur** district Hospitals with ICU- 0, Population-2223000
- J) **Noakhali** district. Hospitals with ICU- 0, Population-3799000
- K) **Rangamati** district Hospitals with ICU- 0, Population-690000

MYMENSINGH Division:

Hospitals with ICU/HDU 5 (2+3), ICU beds-43 (32+11), HDU beds-24 (18+6), in 4 districts, Population-13457000.General bed strength in 5 hospitals 2500 (1650+850)

- A) **Jamalapur** district- Hospitals with ICU- 0, Population-2713000
- B) **Mymensingh** district- Hospitals with ICU/HDU - 5 (2+3), ICU beds- 43 (32+11), HDU beds - 24 (18+6), Population- 6378000

Govt Hospital:

1. **Mymensingh Medical College Hospital**
ICU- 20 beds, HDU- 12 beds.. Hospital beds 1500
2. **CMH, Momenshahi**
ICU- 12 beds, HDU - 4 beds. Hospital beds 150

Private Hospital:

1. Sayeem Clinic & Diagnostic Center
ICU-4 beds, HDU -6 beds. Hospital beds 100
 2. CBMCH
ICU beds – 5. Hospital beds 650
 3. Nexus hospital
ICU-2 beds. Hospital beds 100
- C) **Netrokona** district Hospitals with ICU-0, Population-2759000
- D) **Sherpur** district -Hospitals with ICU-0, Population-1607000

RAJSHAHI Division:

Hospitals with ICU/HDU-8 (4+4), ICU beds-80 (51+29), HDU beds-26 (6+20), in 8 districts, Population- 21607000. General bed strength in 8 hospitals 3260 (2250+1010)

- A) **Bogra** district. Hospitals with ICU/HDU-4 (2+2), ICU beds-33 (20+13), HDU beds-11 (6+5), Population-3903000

Govt Hospital:

1. **Shaheed Ziaur Rahman Medical College Hospital.**
ICU-4 beds . Hospital beds 500
2. **CMH, Bogra**
ICU-16 beds, HDU-6 beds. Hospital beds 500

Private Hospital:

1. Tesla General Hospital, Bogra
ICU- 3 beds Hospital beds 40
2. TMSS Medical College Hospital
ICU-10 beds, HDU -5 beds. Hospital beds 500
- B) Jaipurhat** district - Hospitals with ICU- 0, Population-1042000
- C) Naogaon** district- Hospitals with ICU- 0, Population-2977000
- D) Natore** district- Hospitals with ICU- 0, Population-1956000
- E) Chapai Nawabganj** district - Hospitals with ICU- 0, Population- 2003000
- F) Pabna** district - Hospitals with ICU- 1 (1+0), ICU beds- 4 (4+0), Population- 3019000

Govt. Hospital:

1. **Pabna General Hospital**
ICU- 4 beds. Hospital beds 250

Private Hospital: 00

- G) Rajshahi** district - Hospitals with ICU/HDU - 2 (1+1), ICU beds- 33 (27+6), HDU beds - 5 (0+5), Population- 3000000

Govt Hospital:

1. **Rajshahi Medical College Hospital**
ICU- 27 beds. Hospital beds 1500

Private Hospital:

1. CDM Hospital
ICU-6 beds, HDU-5 beds. Hospital beds 70
- H) Sirajgonj** district-Hospitals with ICU/HDU-1 (0+1), ICU beds- 10 (0+10), HDU beds - 10 (0+10), Population- 3707000

Govt Hospital: 00

Private Hospital:

1. Khaja Yunus Ali Medical College Hospital
ICU- 10 beds, HDU -10 beds. Hospital beds 400

BARISAL Division:

Hospitals with ICU/HDU - 2 (2+0), ICU beds- 22 (22+0), HDU beds- 5 (5+0), in 6 districts. Population- 9713000. General bed strength in 2 hospitals 1300 (1300 + 0)

- A) Barguna** district- Hospitals with ICU- 0, Population-1013000
- B) Barisal** district- Hospitals with ICU/HDU-2 (2+0), ICU beds-22 (22+0), HDU beds-5 (5+0), Population- 2776000

Govt Hospitals:

1. **Sher –e Bangla Medical College Hospital (Barisal)**
ICU-10 beds. Hospital beds 1000
2. **CMH, Barisal (Barisal)**
ICU-12 beds , HDU-5 beds. Hospital beds 300

Private Hospital: 00

- C) Bhola** district- Hospitals with ICU- 0, Population-2057000
- D) Jhalokati** district- Hospitals with ICU- 0, Population-778000
- E) Patuakhali** district - Hospitals with ICU- 0, Population-1823000
- F) Pirojpur** district - Hospitals with ICU- 0, Population-1266000

RANGPUR Division:

Hospitals with ICU/HDU-6 (4+2), ICU beds-62 (44+18), HDU beds-7 (7+0), in 8 districts, Total population- 18868000. General bed strength in 6 hospitals 3450 (2400+1050)

- A) Dinajpur** district-Hospitals with ICU-1 (1+0), ICU beds- 10 (10+0), Population- 3430000

Govt Hospital:

1. **Dinajpur M. Abdur Rahim Medical College Hospital**
ICU- 10 beds. Hospital beds 500

Private Hospital: 00

- B) Gaibanda** district -Hospitals with ICU- 0, Population-2975000
- C) Kurigram** district-Hospitals with ICU- 0, Population-2464000
- D) Lalmonirhat** district-Hospitals with ICU- 0, Population-1500000
- E) Nilphamari** district- Hospitals with ICU/HDU-1 (1+0), ICU beds-7 (7+0), HDU beds-2 (2+0), Population-2204000

Govt Hospital:

1. **CMH, Saidpur**
ICU-7 beds, HDU -2 beds. Hospital beds 150

Private Hospital: 00

- F) Panchagarh** district -Hospitals with ICU- 0, Population-1188000
- G) Rangpur** district- Hospitals with ICU/HDU -4 (2+2), ICU beds- 45 (27+18), HDU beds-5 (5+0), Population- 3439000

Govt Hospitals:

1. **Rangpur Medical College Hospital**
ICU- 10 beds . Hospital beds 1500
2. **CMH Rangpur**
ICU- 17, HDU – 5 beds. Hospital beds 300

Private Hospital:

1. Prime Medical College Hospital
ICU-6 beds. Hospital beds 500
2. Community Medical College Hospital
ICU-12 beds. Hospital beds 500

H) Thakurgaon district -Hospitals with ICU- 0, Population- 1668000

KHULNA Division:

Hospitals with ICU/HDU-8 (5+3), ICU beds-75 (54+21), HDU-37 (27+10), in 10 districts Total population- 18217000. General bed strength in 8 hospitals 2250 (1700+550)

A) Bagerhat district- Hospitals with ICU- 0, Population- 1675000

B) Chuadanga district- Hospitals with ICU- 0, Population- 1299000

C) Jessore district- Hospitals with ICU/HDU -1 (1+0), ICU beds- 20 (20+0), HDU beds 15 (15+0), Population- 3182000

Govt Hospital:

1. **CMH, Jessore**

ICU-20 beds, HDU – 15 beds. Hospital beds 500

Private Hospital: 00

D) Jhenaidah district- Hospitals with ICU- 0, Population- 2111000

E) Khulna districts-Hospitals with ICU/HDU -5 (3+2), ICU beds- 42 (26+16), HDU beds -14 (4+10), Population- 2650000

Govt Hospital:

1. **Khulna Medical College Hospital**

ICU- 4 beds. Hospital beds 500

2. **Shaheed AbuNaser Specialized Hospital**

ICU-10 beds. Hospital beds 250

3. **Navy Hospital Upasham**

ICU-12 beds, HDU-4 beds. Hospital beds 100

Private Hospital:

1. **Khulna City Medical College Hospital**

ICU-10 beds, HDU -10 beds. Hospital beds 250

2. **Gazi Medical College Hospital**

ICU-6 beds. Hospital beds 250

F) Kustia district- Hospitals with ICU- 0, Population- 2318000

G) Magura district- Hospitals with ICU- 0, Population- 1091000

H) Meherpur district-Hospitals with ICU- 0, Population- 750000

I) Narail district- Hospitals with ICU- 0, Population- 856000

J) Satkhira district. Hospitals with ICU/HDU -2 (1+1), ICU beds- 13 (8+5), HDU-8 (8+0), Population- 2285000

Govt Hospital:

1. **Satkhira Medical College Hospital**

ICU-8 beds. HDU-8 beds. Hospital beds 350

Private Hospital

1. **China Bangla Hospital**

ICU- 5 beds. Hospital beds 50

Table 1

District: Sylhet

Private/ Govt.	Name of hospital	ICU beds	HDU beds	Total hospital beds
Govt.	1. Sylhet M.A.G Osmani Medical College and Hospital	12	8	1500
	2. Shaheed Shamsuddin Ahmed Hospital	16	-	250
	3. CMH Sylhet	16	6	300
Private	1. Ibn Sina Medical College and Hospital	6	4	50
	2. Al- Haramain Hospital	10	8	250
	3. Nur- Jahan Hospital	4	0	35
	4. Mount Adora Hospital	8	4	250
	5. North East Medical College and Hospital	14	0	500
	6. Women's Medical College and Hospital	10	4	500
	7. Jalalabad Ragib Rabeya Hospital	16	0	500
	8. Park View Medical College Hospital	10	0	250
	9. Al- Rayan Hospital	4	0	50
	10. Oasis Hospital	5	0	40

Table 2

District: Dhaka

Private/ Govt.	Name of hospitals	ICU beds	HDU beds	Total hospital beds
Govt.	1. BSMMU	21	16	1500
	2. Shaheed Shawardy Medical Hospital	10	-	850
	3. DMCH	32	-	2500
	4. Sir Salimullah Medical College Mitford Hospital	10	-	850
	5. NIDCH	8	5	685
	6. NINS	12	8	500
	7. CMH Dhaka	111	70	1650

8. Sheikh Russel Gastro liver Hospital	16	-	500	17. Euro Bangla Hospital	6	-	60
9. Bangladesh Kuwait Moitree Hospital	16	-	250	18. City Hospital	6	6	100
10. Mugda Medical College Hospital	10	10	300	19. Japan Bangladesh Hospital	7	4	100
11. Dhaka Dental College Hospital	10	-	250	20. Renaissance hospital	10	-	40
12. NICRH, Mohakhali	13	-	500	21. Super clinic & Diagnostics, Savar	10	-	150
13. National ENT Institute	8	-	500	22. Sikder Medical College Hospital	14	-	500
14. NITOR	26	-	500	23. Millenium Hospital	8	4	40
15. NIKDU	4	-	500	24. Central Hospital	6	4	210
16. 16 Sheikh Hasina Burn & Plastic Surgery Institute	80	-	500	25. Centre for Kidney Disease & Urology Hospital	8	4	120
17. Kurmitola General Hospital	10	15	500	26. Impulse Hospital	15	10	400
18. Govt Employee Hospital	4	-	50	27. BIHS	8	8	250
19. DMCH Burn Unit	20	40	200	28. Asgar Ali Hospital	12	4	350
20. 250 Bed TB Hospital, Shamoly	4	20	250	29. Monwara Hospital	4	-	60
21. CMH, Savar	12	4	300	30. Rushmono Hospital	8	4	80
22. NICVD	46	-	500	31. Marks Medical College Hospital	8	-	320
Private 1. United Hospital	16	16	450	32. High Tech Multi Care Hospital	4	6	40
2. Evarcare Hospital	12	12	425	33. US Bangla Medical College Hospital	10	-	250
3. Square Hospital	28	20	400	34. Samorita Hospital	6	4	500
4. Lab Aid Hospital	14	8	250	35. Dhaka Central International Medical College & Hospital	10	-	300
5. Green Life Hospital	10	9	550	36. Central Police Hospital, Rajarbag	15	15	250
6. Comfort Hospital	8	-	80	37. Abeda Memorial Hospital	6	8	50
7. Dhanmondi Clinic	7	5	30	38. Uttara Crescent Hospital	6	11	64
8. SIBL Hospital	6	4	100	39. Lubana General Hospital	6	4	80
9. Anwar Khan Modern Hospital	10	-	750	40. Cardiocare Hospital	10	-	100
10. BRB Hospital	9	9	320	41. Hi Tech Care General Hospital	10	-	40
11. BIRDEM Generalm Hospital	34	-	800	42. Uttara Adhunik Medical College & Hospital	13	4	500
12. SFMMKPJ Specialized Hospital	4	2	250	43. Shaheed Monsur Ali Medical Hospital	10	-	500
13. Brighton Hospital	8	-	50	44. Islami Bank Hospital	12	-	232
14. IBN Sina Hospital	12	7	312	45. JahanAra Clinic	6	-	125
15. Popular Medical College Hospital	26	-	500	46. Metropolitan Hospital, Mohakhali	10	-	100
16. Eden Multicare Hospital	6	-	50				

47. Universal Medical College Hospital	10	6	250
48. Enam Medical College & Hospital	24	10	1000
49. Zaynal Haque Sikder Medical College Hospital	8	-	350
50. Better Life Hospital	8	12	200
51. Gono Shasto Nagar Hospital	10	8	400
52. Bangladesh Medical College Hospital	14	8	500
53. Delta Medical College Hospital	6	-	350
54. Shahbuddin Medical College Hospital	12	6	500
55. Al-Razi Islamia Hospital	6	-	100
56. Ad-Din Medical Hospital	10	-	292
57. Padma General Hospital	7	-	40
58. Al-Manar Hospital	6	4	100
59. Bangladesh Specialized Hospital	10	5	450
60. Ahsania Mission Cancer & General Hospital	9	-	500
61. Care Medical College Hospital	10	6	300
62. RMC Hospital, Uttara	2	-	40
63. Sirajul Islam Medical College Hospital	16	-	350
64. Ibn Sina Medical College Hospital	10	3	250
65. East West Medical College Hospital	8	4	250
66. Trauma Centre, Shayamoli	6	-	75
67. Global Hospital, Mazar Road	6	-	50
68. Alok General Hospital, Mirpur	6	4	100
69. Regent Hospital, Uttara	3	-	50
70. AMZ Hospital	4	4	50
71. Japan East West Medical College Hospital	12	9	350
72. Holy Family Hospital	20	12	750
73. New Life Hospital	10	-	60
74. Sajeda Foundation Hospital, Keraniganj.	5	-	50

Table 3**District: Chattogram**

Private/ Govt.	Name of hospitals	ICU beds	HDU beds	Total hospital beds
Govt.	1. CMCH	20	-	1500
	2. Chattogram General Hospital	18	6	250
	3. BITI Hospital	5	-	100
	4. CMH Chattogram	20	10	500
	5. Navy Hospital, Potenga	5	-	100
Private	1. Medical Centre	10	-	150
	2. Metropolitan Hospital	8	-	100
	3. National Hospital	10	-	100
	4. Max Hospital	5	5	100
	5. Ma & Shishu Medical College Hospital	18	6	500
	6. Diabetic Society Hospital	6	4	50
	7. USTC	10	4	750
	8. Surgiscope Hospital	6	4	60
	9. Marine City Medical College Hospital	10	-	250
	10. CSCR	6	-	100
	11. Imperial Hospital Limited	27	11	400
	12. Evercare Hospital, Chattogram	16	8	350
	13. Max Hospital Chattogram	10	-	200
	14. Ctg International Medical College Hospital	5	-	350
	15. Royal Hospital	8	-	50
	16. Chevron Hospital	5	-	65
	17. CSTC Hospital	5	5	30
	18. Diabetes Hospital, Chattogram	10	-	500
	19. Park view Hospital	14	-	200
	20. Holy Crescent Hospital, Chattogram	10	-	50

COVID DEDICATED CRITICAL CARE BEDS DURING PEAK OF COVID PANDEMIC (2020-2021)

As per information posted in web site of Director General, Directorate of Health, Ministry of Health and family welfare (www.dghs.gov.bd) during the peak of COVID-19 pandemic, announced introduction of 1186 ICU beds (**749** govt. + 437

private) and 695 HDU beds (582 govt.+113 private) and 13026 general hospital beds dedicated to COVID care across the country on temporary basis. According to unofficial information all or most of these facilities either became function less or ceased to exist after the pandemic was over in early 2022 both at Govt. or private level.

COVID dedicated critical care beds (both ICU and HDU) were established from the following sources.

- A) One and only newly established Govt. hospital named Dhaka City Corporation North (DNCC) COVID-19 Hospital with 212 ICU beds, 288 HDU beds and 554 General beds.
- B) Two already existing Govt. hospital with critical care facilities totally converted into COVID hospital eg. Kuwait Bangladesh Moitree Hospital, Sheikh Russell Gastro liver hospital, Dhaka.
- C) Non COVID ICU/HDU in Govt. Hospital converted into COVID ICU. Examples include Kurmitola General Hospital, Dhaka.
- D) New established COVID ICU/HDUs established in Govt. hospitals without prior non COVID ICU/HDU facilities. Eighteen such Govt. hospitals were provided with new COVID critical care services.
- E) Newly established COVID ICU/HDUs in Govt. and private hospitals in addition to existing non COVID ICU/HDU. For example: BSMMU, United Hospital, BIRDEM General Hospital, Ever care Hospital, Square Hospital Dhaka etc.

**CRITICAL CARE BEDS (PRE COVID):
DIVISION/DISTRICT LEVEL PER ONE LAC
POPULATION (TABLE 4)**

Table 4

Division	Districts	Critical Care Beds (ICU+ HDU)	Critical Care bed ratio per 100000 population
1) Sylhet		171 (137+34)	1.37
	1) Habigonj	00	00
	2) Moulvibazar	8 (8+0)	0.34
	3) Sunamgonj	00	00
	4) Sylhet	163 (129+34)	3.70
2) Dhaka		1842 (1342+500)	4.32
	1) Dhaka	1690 (1219+471)	12.24
	2) Faridpur	32 (26+6)	1.45
	3) Gazipur	22 (22+0)	0.42

4) Gopalganj	10 (10+0)	0.74
5) Kishoregonj	33 (18+15)	0.71
6) Madaripur	00	00
7) Manikgonj	7 (7+0)	0.24
8) Munshigonj	00	00
9) Narayangonj	14 (10+4)	0.40
10) Narshingdi	00	00
11) Rajbari	00	00
12) Shariatpur	00	00
13) Tangail	34 (30+4)	0.83

3) Chattogram 460 (376+84) 1.32

1) Bandarban	00	00
2) Brahmanbaria	00	00
3) Chandpur	00	00
4) Chattogram	335 (268+67)	3.72
5) Cumilla	89 (76+13)	1.36
6) Cox's Bazar	26 (22+4)	0.87
7) Feni	10 (10+0)	0.57
8) Khagyrachari	00	00
9) Laksmipur	00	00
10) Noakhali	00	00
11) Rangamati	00	00

4) Mymensingh 69 (45+24) 0.50

1) Jamalpur	00	00
2) Mymensingh	69 (45+24)	1.05
3) Netrokona	00	00
4) Sherpur	00	00

5) Rajshahi 106 (80+26) 0.49

1) Bogra	44 (33+11)	1.13
2) Jaipurhat	00	00
3) Naogaon	00	00
4) Natore	00	00
5) Chapai Nawabgonj	00	00
6) Pabna	4 (4+0)	0.13
7) Rajshahi	38 (33+5)	1.27
8) Sirajgonj	20 (10+10)	0.54

6) Barisal	27 (22+5)	0.28
1) Barguna	00	00
2) Barisal	27 (22+5)	0.97
3) Bhola	00	00
4) Jhalokhati	00	00
5) Patuakhali	00	00
6) Pirojpur	00	00
7) Rangpur	69 (62+7)	0.36
1) Dinajpur	10 (10+0)	0.29
2) Gaibanda	00	00
3) Kurigram	00	00
4) Lalmonirhat	00	00
5) Nilphamari	9 (7+2)	0.40
6) Panchagarh	00	00
7) Rangpur	50 (45+5)	1.45
8) Thakurgaon	00	00
9) Khulna	112 (75+37)	0.61
1) Bagerhat	00	00
2) Chuadanga	00	00
3) Jessore	35 (20+15)	1.10
4) Jhenaidah	00	00
5) Khulna	56 (42+14)	2.11
6) Kushtia	00	00
7) Magura	00	00
8) Meherpur	00	00
9) Narail	00	00
10) Satkhira	21 (13+8)	0.92
Bangladesh population as per worldometer 2022 : 167900000	2856(2139+717)	1.70

SUMMARY OF SURVEY (PRE COVID CRITICAL CARE BEDS)

Govt. hospital and ICU/HDU expressed in bold. Rest are privately run.

Total no of Hospitals with critical care beds (ICU and HDU) = 208 (79 +129).

Out of 208 hospitals only 86 hospitals (27+59) have both ICU and HDU facilities.

Total no of ICU beds = 2139 (965 +1174)

Total no of HDU beds = 717 (315+402).

Total no of critical care beds (ICU and HDU combined) in Bangladesh = 2856 (1280 +1576).

Total no of hospital beds (including Govt. and private) in 208 study hospitals = 65100 approx.

Total no of hospital beds in Bangladesh including hospitals with or without critical care facilities (as of 2019) = 143394 (includes 65100 beds of study hospitals).

Population of Bangladesh = 167900000(approx.) as per Worldometer 2022⁹

No of hospital beds per 100000 (one lac) population = 85.4

No of critical care beds-non COVID, per 100000 (one lac) population = 1.70

Percentage of critical care beds among total hospital beds in study hospitals = 4.34%

Percentage of critical care beds among total hospital beds across Bangladesh = 1.97%

Discussion

Bangladesh is a south Asian nation with a population of approx.167900000 (167.9 million) as per Worldometer 2022⁹. It is a lower middle income country with per capita income is 2824 US \$¹⁰. Critical Care bed capacity in Bangladesh is reflected in inadequate number of total hospital beds and it is reflected in low per capita income of our general population.

According to our survey we report 2859 non COVID (Pre COVID) critical care beds (ICU + HDU) for the whole population of our country. We have 1.70 non COVID critical care beds per one lac population as opposed to 85.4 general beds per one lac population in the whole country.

The critical care bed distribution across the country is very much heterogeneous. Dhaka district has the highest non COVID critical care bed concentration (12.32 per one lac population). Districts of Chattogram, Sylhet, Khulna, Faridpur/Rangpur, Cumilla, Rajshahi, Bogra, Jessore, Satkhira and Barishal have 3.72, 3.70, 2.11, 1.45, 1.36, 1.27, 1.13, 1.10, 0.97 and 0.92 critical care beds per one lac population respectively. Out of sixty four districts of Bangladesh thirtyeight districts with total population of 70518000 have no critical care beds within the geographic areas of the districts.

Dhaka district with the highest concentration of critical care non COVID beds with a population of 13798000 has 20 Govt. hospital and 74 private hospitals with critical care facilities. Chattogram district with second highest concentration of critical care beds with a population of 8990000 has 5 Govt. hospitals and 20 Private hospitals with critical care facilities.

In order to reach a bench mark (not determined yet) critical care bed capacity Bangladesh need to compare itself with other countries especially with lower middle income countries of Asia^{5,11}.

It is generally accepted that the number of ICU beds as percentage of total number of beds in a hospital shall be between 5% and 12%¹² depending on the level of care offered by the hospital. Lack of critical care beds may result in

delayed or refused admissions to ICUs for appropriate patients and increased preventable mortality¹³. Our survey found that there are 4.34% critical care beds among total study hospitals with critical care facilities across Bangladesh.

The discrepancy in critical care bed numbers across Bangladesh reflects overall health care disparity in different regions. We have observed that there are many districts with limited number of hospital beds also have no critical care facilities in those hospitals. It is also our observation from literature search that Bangladesh suffers from lack of sufficient trained doctors and nurses in critical care delivery⁴.

Until and unless Bangladesh is able to increase critical care bed capacity uniformly across the country we have to rely on stepwise introduction of service improvements in other health care areas of critical care deprived districts, leveraging human resources through training all over the country. We need to let go of developed practices that are currently hindrances including advanced technologies that cannot be readily maintained. We should patronize development of relevant technology that is affordable and maintainable¹⁴.

Results of our survey is expected to be an eye opener for health care policy makers of our country. Critical care bed concentration need to be decentralized by opening more ICUs in district and upozila (sub district) levels. Instead of closing down COVID critical care facilities that were established temporarily at the height of COVID pandemic, those facilities should be incorporated with the facilities which existed at the pre pandemic period. Our health care policy makers need to pay attention to developing required man power to run the existing ICUs and HDUs efficiently and also before planning to establish newer ICUs both at Govt. and private capacity and at district and upozila level.

We believe that two hundred general hospital beds per one lac population and five critical care beds per one lac population of Bangladesh within next 10 years is an expected and achievable goal considering current progress in per capita income in our country.

One significant limitation of our survey is that with the exception of few well known ICUs of big cities like Dhaka, Chattogram, Sylhet etc, we were not able to spot check accuracy of bed strengths of majority of critical care facilities, Govt. or private across the country.

Conclusion

Our survey concludes that growth and distribution of critical care beds (ICUs + HDUs) across Bangladesh are still

heterogeneous and very much inadequate compared to the critical care need of the population. Health care planners of the country need to plan for developing adequate critical care man power as well as establish more critical care facilities among existing hospitals and establish newer critical care facilities in critical care deprived areas.

References

- 1) Marshall JC, Bosco L, Adhikari NK, Conolly B, Diaz JV, Dorman T et al. What is an Intensive care unit; a report of the task force of the World Federation of Societies of Intensive and Critical care Medicine. *J. Crit Care* 2017; 37: 270-276.
- 2) Faruq MO, Ahsan ASMA, Fatema K, Ahmed F, Sultana A, Chowdhury RH et al. An audit of intensive care services in Bangladesh. *Ibrahim Med Coll. J* 2010; 4(1):13-16.
- 3) Arabi YM, Phua J, Koh Y, Du B, Al-Dorzi HM, Al-Hameed FM, et al. Structure , organization and delivery of critical care in Asian ICUs. *Crit Care Med.* 2016. Doi: 10.1097/ccm00000000001854.
- 4) Faruq MO, Nooruzzaman ARM, Tamanna RJ, Huda AKQ, Sultana A, Mallick UK et al. An analysis of structure, organization and delivery of ICU care in Bangladesh. *Bangladesh Crit. Care J.* March 2019; 7(1): 3-11.
- 5) Phua J, Faruq MO, Kulkarni AP, Redjeki IS, Mendasakhan N, Sann KK et al. Critical care bed capacity in Asian countries and regions. *Crit. Care Med.* May 2020; 48(5). Doi: 10.1097/ccm0000000000004222.
- 6) Tausia Tazmim. Govt. hospitals have increased number of beds but not ICU services. *News Report. The daily Banik Barta.* Jan 5 2019.
- 7) Islam MT, Talukdar AK, Siddiqui MN, Islam T. Tackling the Covid pandemic: The Bangladesh perspective. *J Public Health Res.* 2020, Oct 14, 9(4): 1794. Doi : 10.4081/phr2020.1794.
- 8) Huang C, Wang Y, Li X, Ren L, Zhao J, Hu Y, et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. *Lancet.* 2020; 395:497-506.
- 9) Bangladesh population: [https://www.worldomete.info>worldpopulation>Bangladesh](https://www.worldomete.info/worldpopulation/Bangladesh) population.
- 10) Bangladesh Bureau of Statistics : <http://www.bbs.gov.bd>
- 11) Murthy S, Wunsch H. Clinical Review: International comparisons in critical care- lessons learned. *Critical Care* 2012; 16: 218.
- 12) Kennedy P, Pronovost P, Shepherding change: how the market, health care provider and public policy can deliver quality care for the 21st century. *Crit. care Med.* 2006; 34: s1-6.
- 13) Dondorp AM, Iyer SS, Schultz MJ. Critical care in resource poor settings. *JAMA* 2016; 315 : 753-754.
- 14) Rivello ED, Letchford S, Acheng S, Newton MW. Critical care in resource poor setting: Lessons learned and future direction. *Crit Care med.* 2011; 39(4): 860- 867.