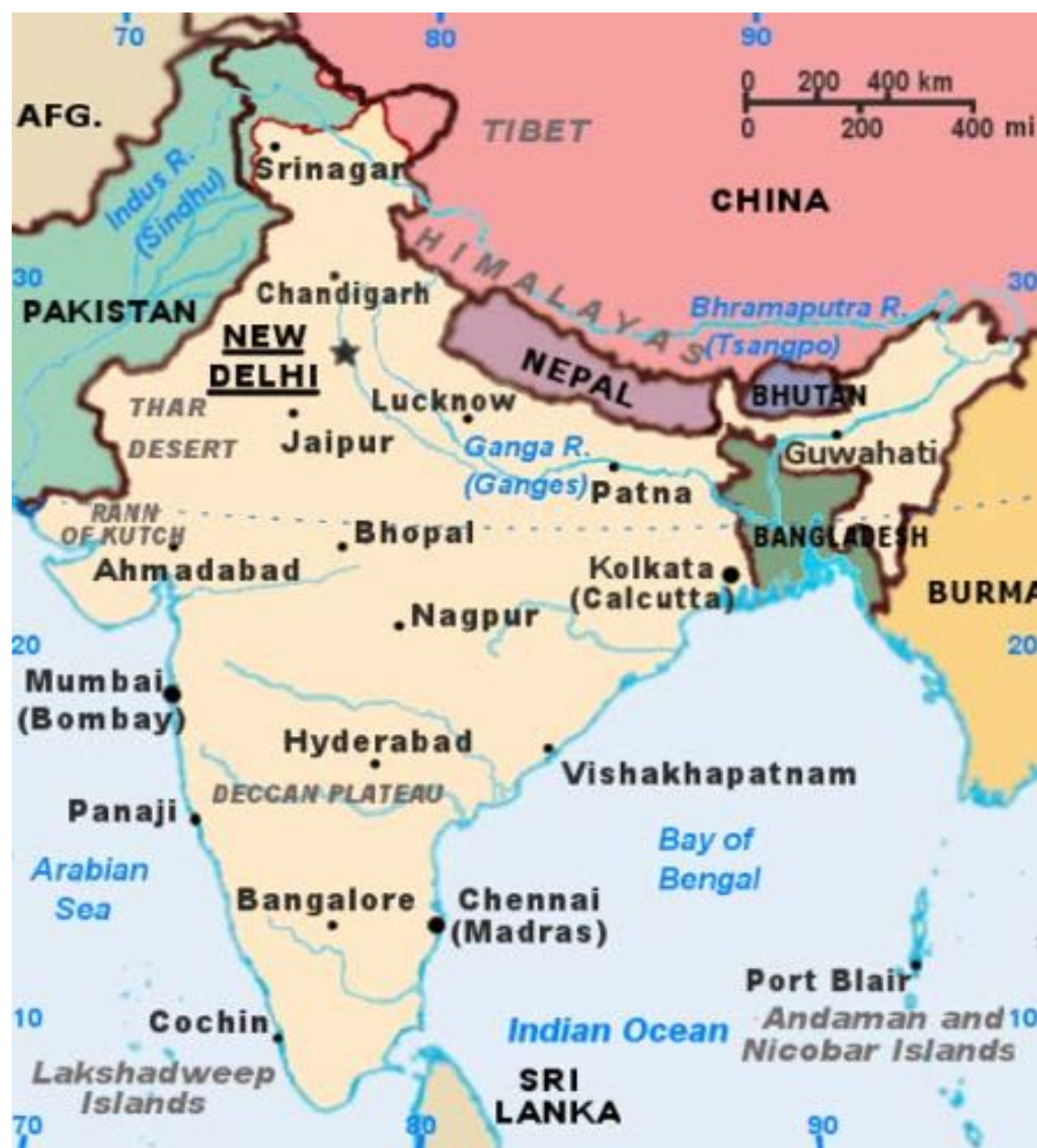


Pediatric intensive care Scenario in India



Sunit Singhi



Professional Bodies:

Indian Academy of Pediatrics (**IAP**) – **Intensive care chapter**
established in 1998

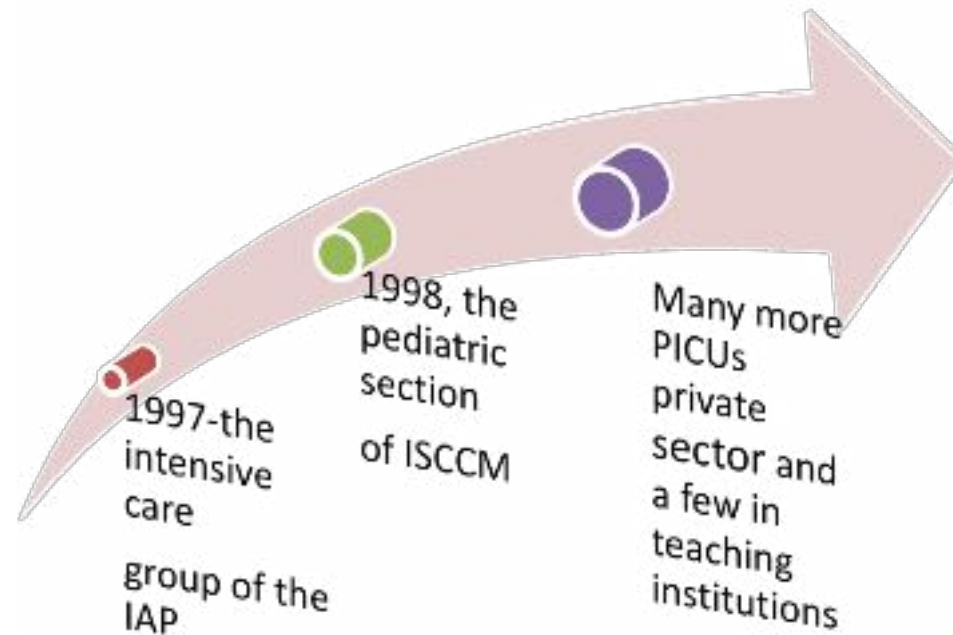


Indian Society of Critical Care Medicine (**ISCCM**) - **Pediatric section**

founded in 2000



PICU care in India



- ❖ Undoubtedly, these PICUs have been able to establish fairly high standards of care,
- ❖ Fulfilled their role in saving lives
- ❖ **Provided learning opportunities to resident doctors and other staff resulting in improved standards of care outside the PICUs as well.**

Indian Scene: Success so far

1989 –Several Neonatal intensive care units, NNF and formal fellowship programs in neonatology

- 1989 first PICU
- 1987- PALS course
- 1994- PALS Group
- 1995- PIC group of IAP
- 1999- first National Conference of PIC
- 2000- ISCCM- Ped Section
- 2012-Indian Journal of PIC
- 2002- PCC certificate course launched
- 2004 No. of PICUs crosses 100 mark
- 2007 NB Fellowship Program
- 2009 DM program
- Courses for Training Pediatricians
- **PICU Nursing Training**

Pediatric intensive care in India

Professional training:

1. Basic pediatric intensive care certificate course

- since 2000 (1 year training)

22 units all over India are accredited for training

2. DNB in pediatric critical care

- since 2007 (2 years training)

4 centres

3. DM (Fellowship) in pediatric critical care

- since 2009 (3 years training)

2 centres

Critical care research in India – the initiative

isccmresearch.net/login



Indian Society of Critical Care Medicine
ISCCM Research.Net



LOGIN

To access ISCCM Research web application



Username

Password

LOGIN

[Forgot Password?](#)

For Registration, please [click here](#).



Edit Institution

* fields are compulsory.

▶ Investigational Site Information

▶ General Information - Hospital

▶ General Information - Critical Care

▶ Quality Indicators - Critical Care

▼ **Research**

Are you currently involved in any studies on **Critical Care**?: Yes No

Do you have support staff at your facility to help you with the study?

a. Sub Investigator: Yes No

b. Study Co-ordinator: Yes No

c. Lab Technician: Yes No

Is your staff GCP trained?: Yes No

Do you have a specified room to help with monitoring?: Yes No

Do you have a local lab to conduct the investigations?: Yes No

Do you have a secured storage facility to store study drugs?: Yes No

ICU re-admission rate within 24 hour of transfer

Total Institutions / Hospitals : 297

Southern India: 74 (25%)

Western India: 93 (31%)

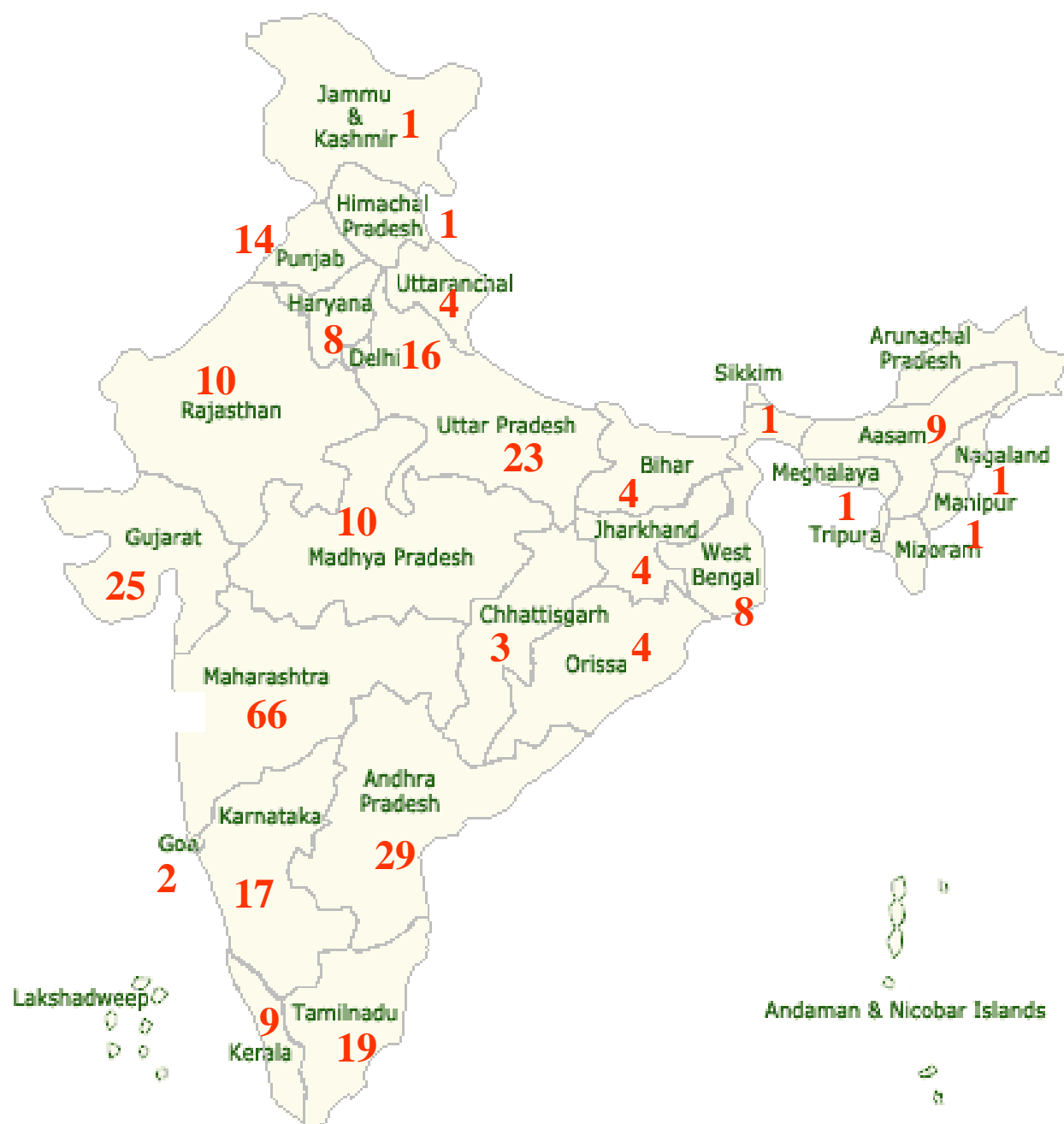
Central India: 13 (4.4%)

Eastern India: 20 (6.7%)

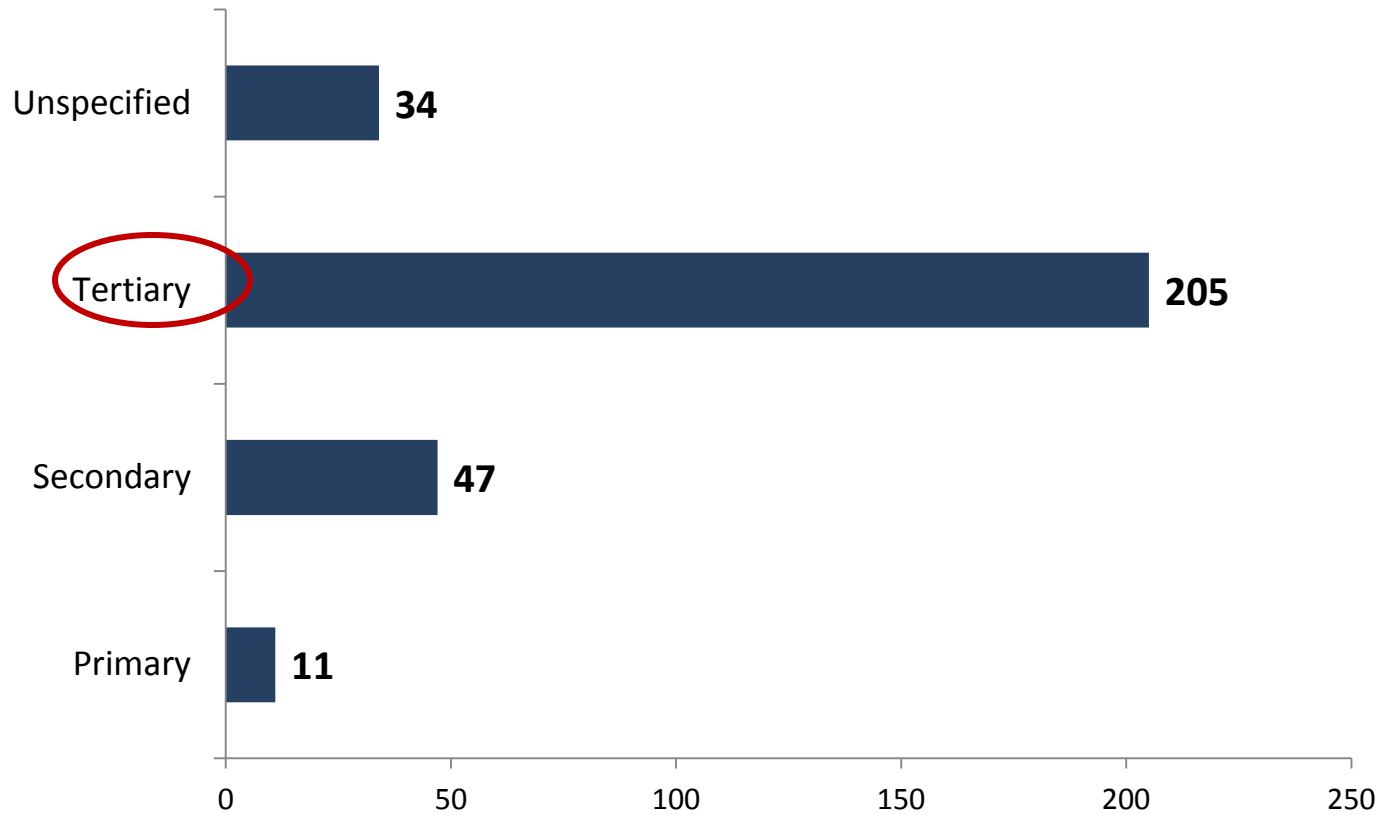
Northern India: 77 (26%)

North Eastern India: 13 (4.4%)

Union Territories: 11 (3.7%)

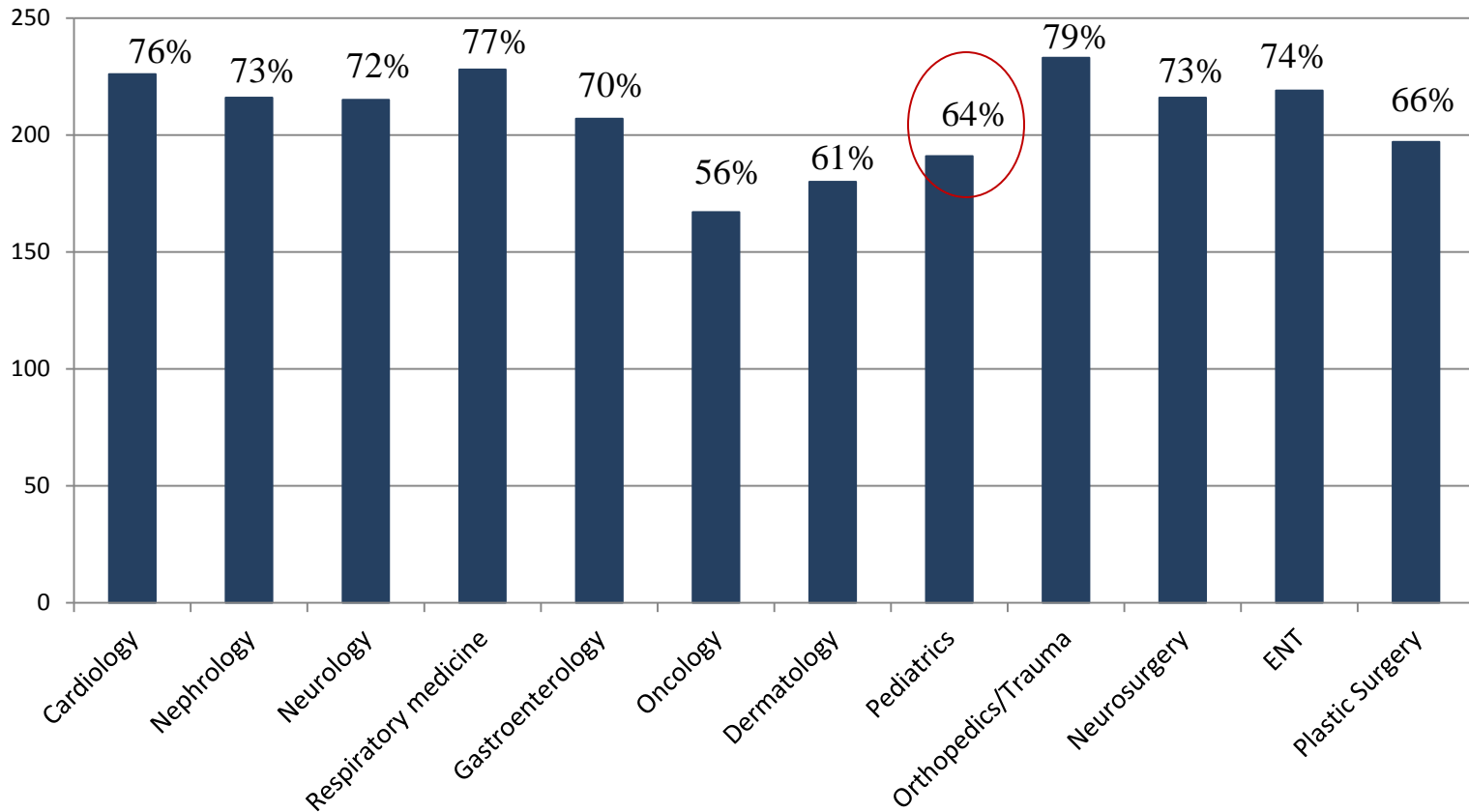


Institutes / Hospitals - Characteristics



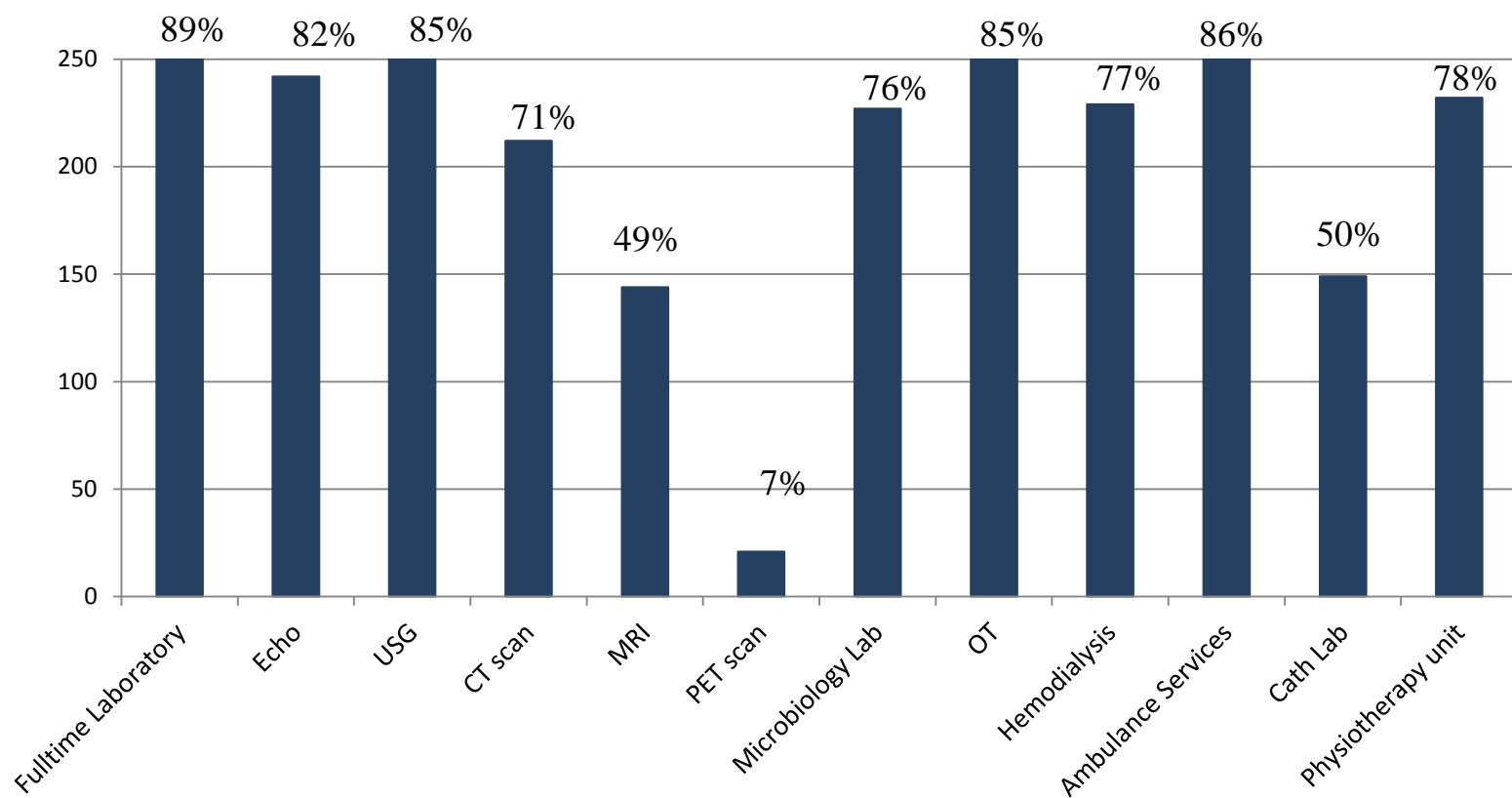
Institutes /Hospitals - Specialty availability

n = 297

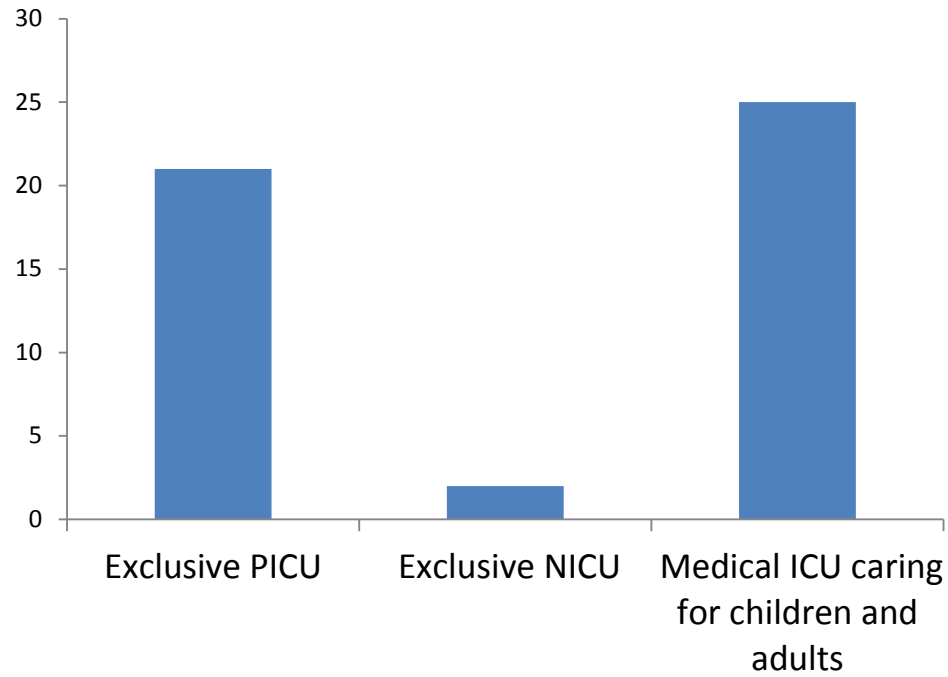


Institutes / Hospitals - Facilities availability

n = 297

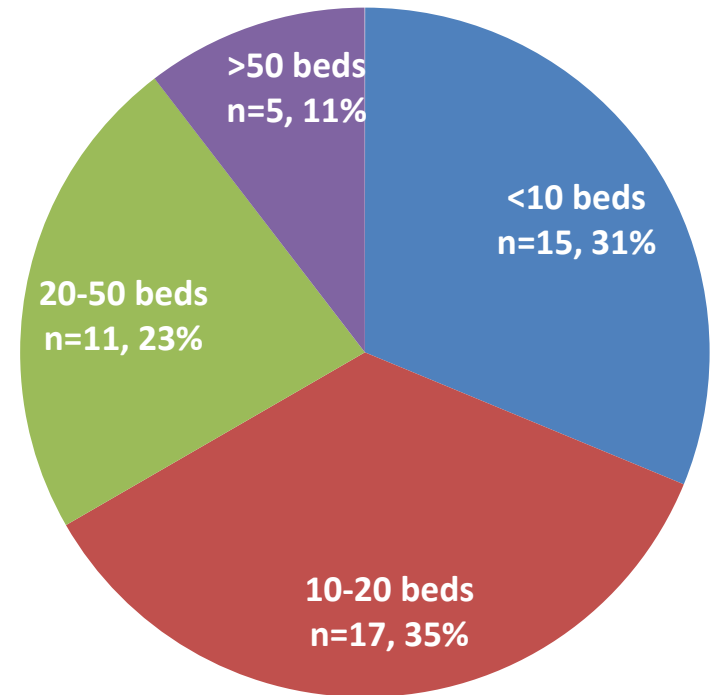


Total No. of PICUs *participated in survey*= **48**



PICU details – bed strength

No. of ICU beds Median (IQR) = 16 (10 – 30)



Middle care beds available in 16 units (33%)

Average no. of middle care beds = 9 (3 – 14)

PICU details – patients

No. of PICUs participated= 48

| | Median (IQR) |
|-------------------------------------|------------------|
| No. of patients treated per year | 318 (123 – 406) |
| No. of patients ventilated per year | 131 (50– 171) |
| Average mortality rate | 15% (7.5% - 31%) |

PICU details – Manpower

No. of PICUs participated= 48

Average no. of doctors per ICU = 4 (2 – 11)

Average no. of doctors per shift = 2 (2 – 3)

24 hour physician availability (n) = 44 (91.6%)

Qualification of ICU in charge MD – 38 (79%)

MBBS – 4 (8%)

Others – 6 (12%)

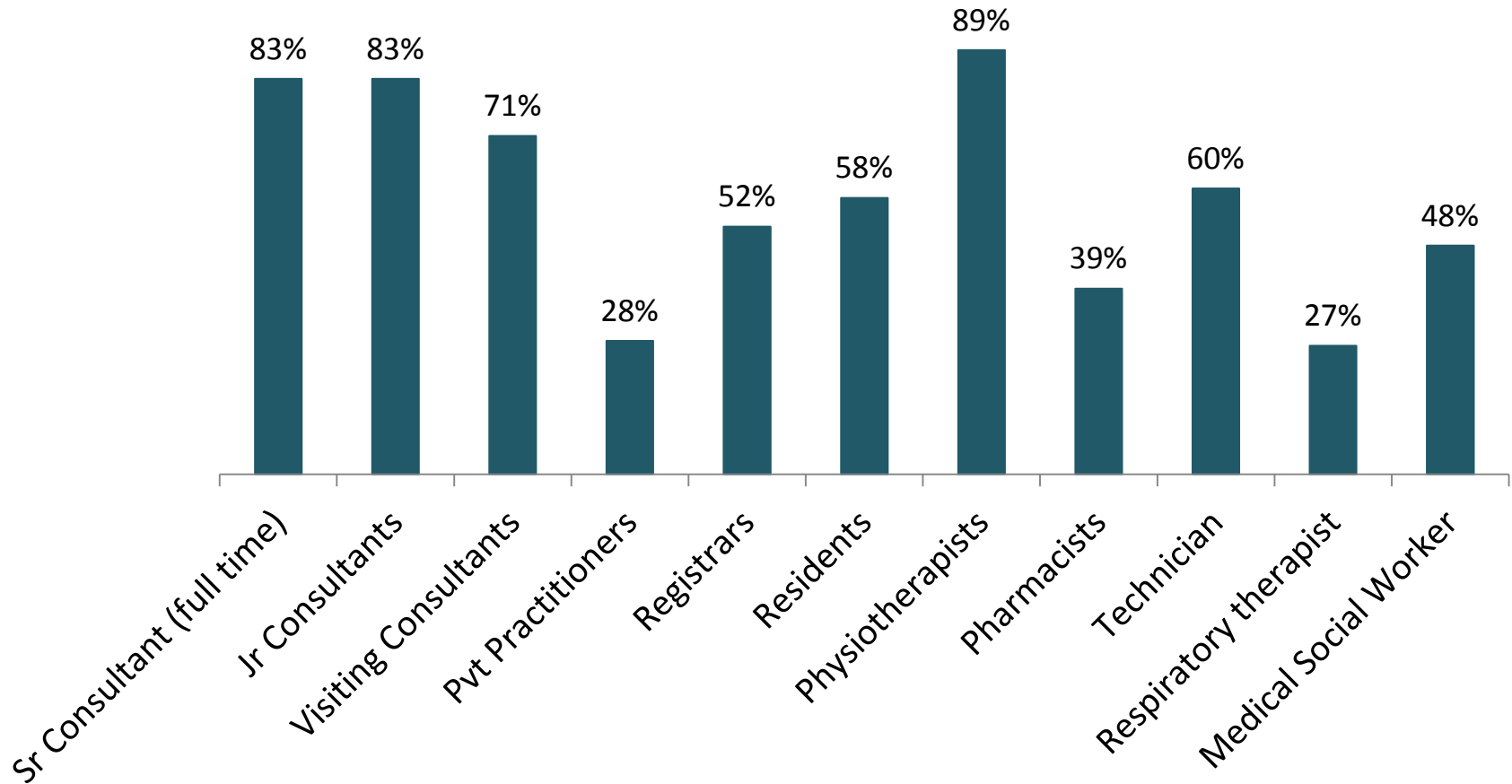
Average no. of nurses per ICU = 16 (8 – 27)

Average no. of nurses per shift = 6 (2 – 18)

Nurse-patient ratio = 0.8 (0.5 – 2)

PICU details – Manpower

Availability of manpower: Total 48 PICUs



PICU details – Materials

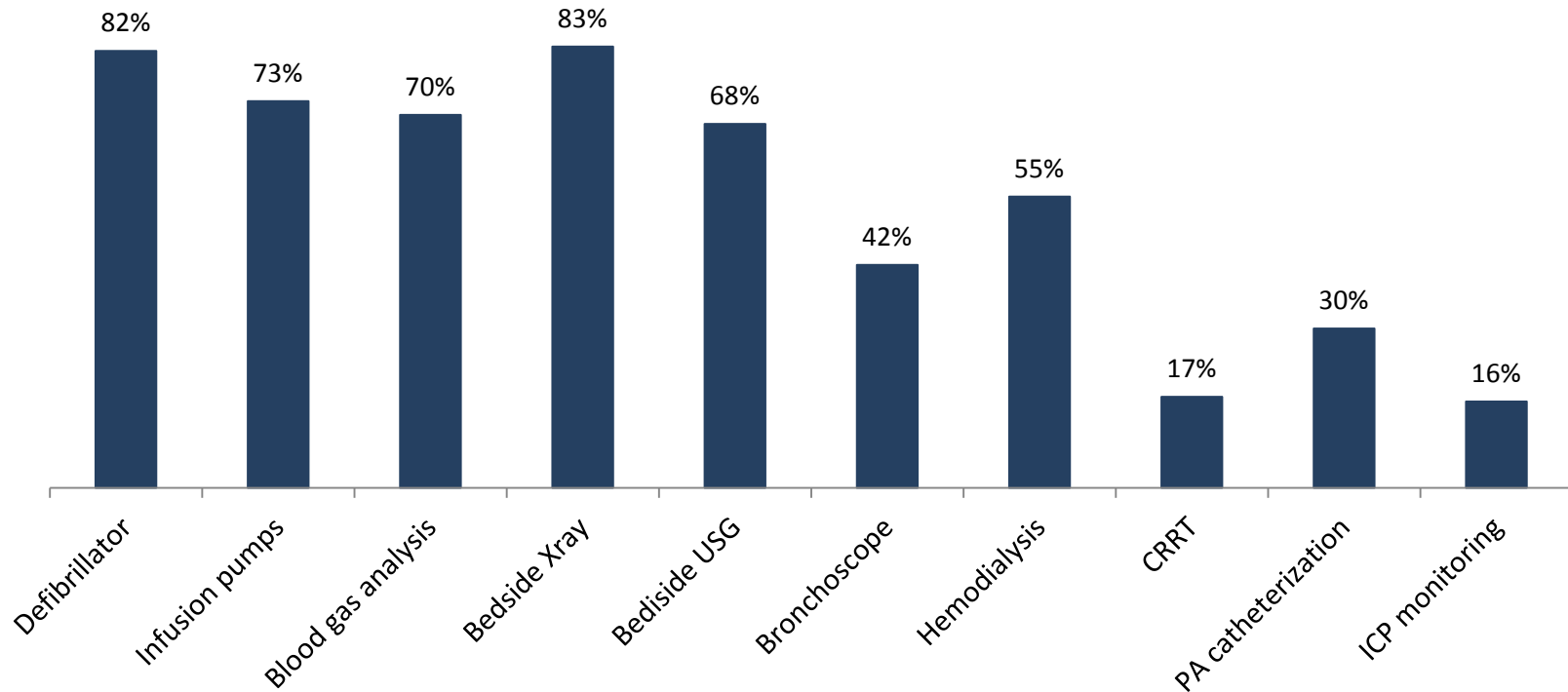
Ventilation:

Availability of conventional ventilation = 96%

Average no. of ventilators – 4.6 / unit

Availability of HFOV = 4%

PICU details – Materials



Institutes / Hospitals – Quality indicators

- Institutes / Hospitals measuring quality indicators = 105 (35.4%)

| | | |
|---|--------------------------------------|------------|
| Mortality parameters 83 (27.9%) | SMR | 45 (15.2%) |
| | Others | 27 (9.1%) |
| Morbidity parameters 69 (23.2%) | Iatrogenic pneumothorax | 34 (11.4%) |
| | Incidence of ARF | 26 (8.8%) |
| | Decubitus Ulcer | 60 (20.2%) |
| Patient safety parameters 85 (28.6%) | Patients fall rate | 60 (20.2%) |
| | Medication error | 77 (25.9%) |
| | Adverse event/error rate | 71 (23.9%) |
| | Needle stick injury rate | 72 (24.2%) |
| | Re-intubation rate (within 48 hours) | 74 (24.9%) |
| Process Parameters 73 (24.6%) | Length of stay | 61 (20.5%) |
| | ICU readmission within 24 hrs | 57 (19.2%) |
| Infection control parameters 93 (31.3%) | Ventilator associated pneumonia | 51 (17.2%) |
| | Blood infection (CLABSI /UTI) | 86 (29%) |
| Human Resource parameters 70 (23.6%) | Patient satisfaction | 66 (22.2%) |
| | Overall employee satisfaction | 0 (0%) |

Institutes / Hospitals – Research capacities

- Hospitals currently **involved in any studies on critical care – 61 (20.5%)**
- Hospitals with Ethics Committee (EC) - 84 (28.3%)
 - Median (IQR) time for EC approval - 3 (2 – 4) weeks
 - Median (IQR) fee - 25,000 (11,250 - 45,000) INR
- Equipped with
 - Sub-Investigator - 25%
 - Study co-ordinator - 24%
 - Lab technician - 31%
 - Local lab - 43%
 - Secure storage facility - 37%

Institutes / Hospitals – Research capacities

| | |
|---|-------------------|
| Carrying out research in last 5 years | 44 (14.8%) |
| 1 – 4 studies | 25 (8.4%) |
| 5 – 9 studies | 8 (2.7%) |
| > 10 studies | 11 (3.7%) |
| | |
| Publications in National journals | 36 (12.1%) |
| 1 – 4 papers | 16 (5.4%) |
| 5 – 9 papers | 13 (4.4%) |
| > 10 papers | 7 (2.3%) |
| | |
| Publications in International journals | 31 (10.4%) |
| 1 – 4 papers | 18 (6.1%) |
| 5 – 9 papers | 8 (2.7%) |
| > 10 papers | 5 (1.7%) |

Challenges for PIC care in India

- Transport
- Equipments
- Technology
- Lack of sustainability
- Electricity
- Trained personnel
- Lack of subspecialists expert support,
- Diagnostic facilities (laboratory and radiology),
- And appropriate medications

Intensive Care: What does it mean to a lay person?

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"I HATE TO TELL YOU THIS, BUT THAT SHOULD BE
INTENSIVE CARE."



Excessive Economic Burden

- Govt contribute to only 20% of health care spending, most is paid out of pocket
- Families continue spending out of duty, hope to buy a miracle, social pressure
- When care gets prolonged, costs multiply, patient not improving, should parents / family be left penniless to save a child who unlikely to have intact survival.
eg. severe brain injury.
- Is it ethical to have economically ruined family because of admission to ICU, when outcome is dubious?

Cost effectiveness and cost benefit are the major considerations

Management Structures

- ICUs are no income source for the hospital
- Substantial part of costs for drugs, laboratory tests, and ICU procedures must be covered by the patients or their relatives. In India a 78% of health care costs must still be paid by patients or their relatives
 - *(Parikh & Dilip 1999, JISCCM)*
- Substantially limits public accessibility to hospitals and in particular to ICUs.
- To avoid a tragic scenario with a bankrupt family mourning over their dead family member, therapies often remain inadequate.

Challenges for PIC care in India

- Transport
- Equipments
- Technology
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- And appropriate medications



Physicians' Frustration

Non availability of

- Emergency medical system
- Transport system- Long distances and high transportation costs, Travel may take days, inadequate monitoring,,
- Emergency care
- PIC units
 - Equipments
 - Technology

Where are ICUs and ICU beds?

- Many district and regional hospitals have units where severely ill patients can be separately cared for but major ICU are only in large hospitals or urban or metropolitan areas
- Striking differences in the quality of medical care between rural and urban areas
- Patients who would be urgently admitted to an ICU in industrialized countries do not have access to an ICU
- In rural areas, critically ill patients are often treated on regular wards

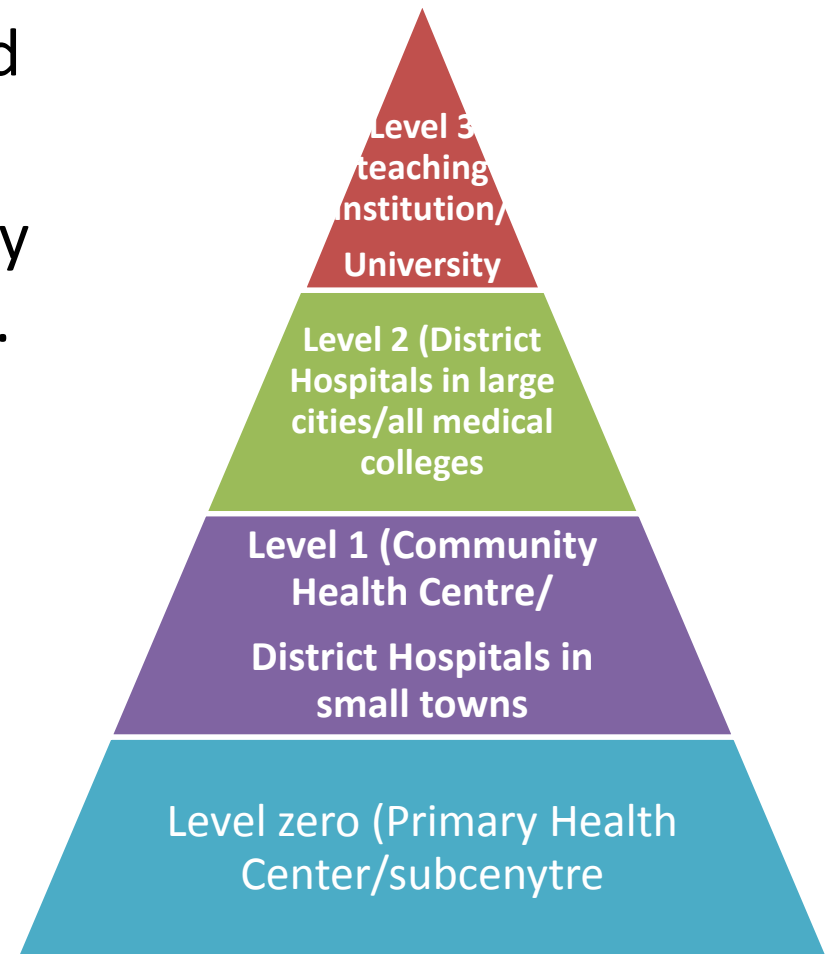
ICU beds rarely cover more than 2-3% of all hospital beds compared with 10% in industrialized countries.

Pediatric critical care services –next step

- Provision of Intensive care services through Pediatricians with the available resources in the communities
- Increased demand for intensive care
- Share the vision of Pediatric Intensive care with Pediatricians and training and teaching of principles and practice

What should we do: 4-tier system!

- Providing low-technology and low-cost interventions
- Establishing a 4-tier system by utilizing the existing network.
 - Primary health centers, community health centers, district hospitals and medical colleges
 - Build sustainable system
 - Rationing the resource allocation/ the intensive care units



Pediatric Fundamental Critical care Course, Delhi, 2012



Area to be addressed

- Setting up Formal Training of PICU nurses, and Resp therapists
- Effective triage protocols
- Transport systems
 - Ground (and Air)
- Emergency Medical System
 - In hospital and Network
- Consensus Guidelines to benchmark levels of Care
- Follow up after PICU care

Specific areas of intervention to advance quality of care in the PICU

- IOM `s 6 aims
 - Safety- Error reduction
 - Effectiveness
 - Equity
 - Timeliness
 - Patient -centeredness
 - Efficiency



Integrating the Institute of Medicine's six quality aims into pediatric critical care: Relevance and applications

Anthony D. Slonim, MD, MPH; Murray M. Pollack, MD, MBA

Pediatr Crit Care Med 2005; 6:264 –
269

Our Current Challenges and Future Directions

- Deliver timely and accessible, patient-centred care , which is safe, appropriate and evidenced-based care
- Ensure a responsive, flexible service system, Support the integration of intensive care services with the continuum of care
- Ensure the supply of an appropriately-trained and flexible workforce
- Ensure efficient and appropriate utilization of intensive care resources
- Utilize information technology and data management solutions
- Support continuous improvement, collaboration, innovation and research
- This future directions framework should focus on paediatric intensive care services in regional and rural public hospitals



**8th World Congress
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