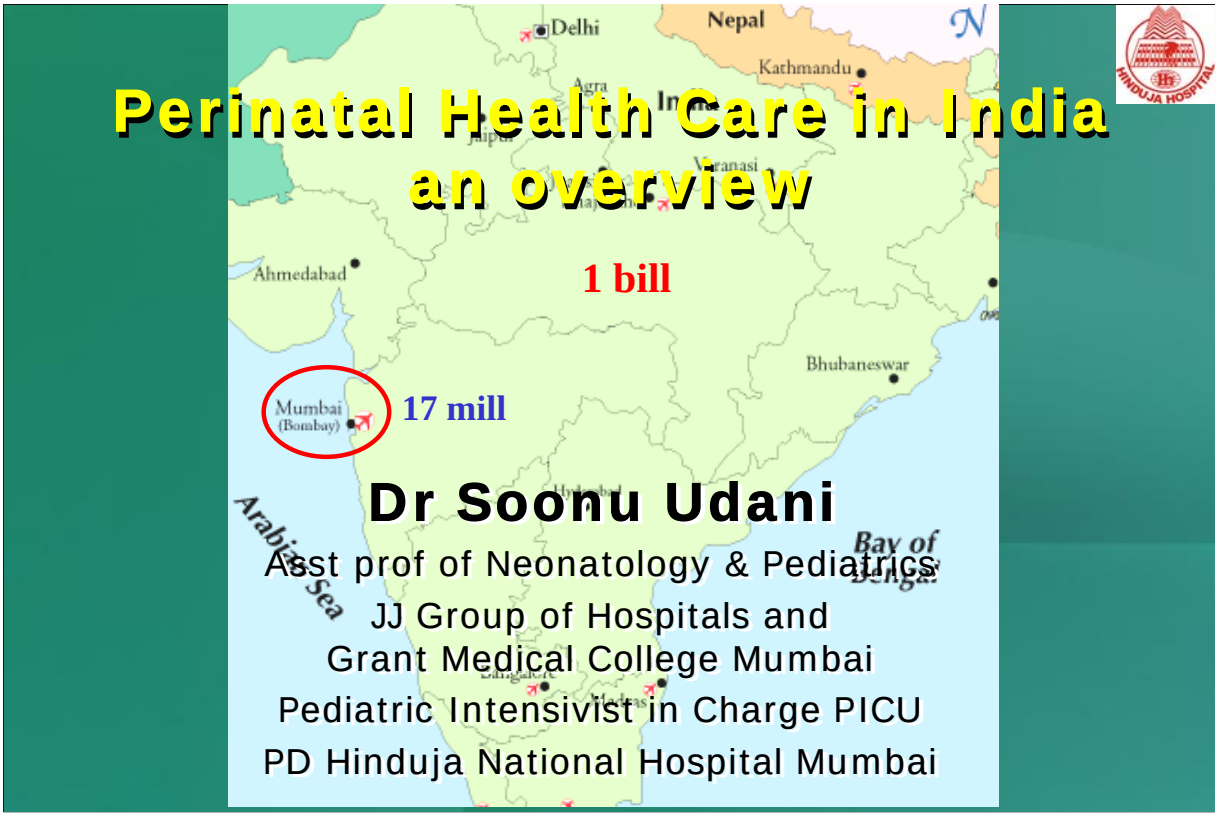


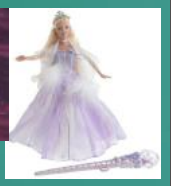
Good afternoon to all of you. Thank you, Dr. Marraro for your very kind invitation to this beautiful coastal town and your conference. This topic may be very different from what all of you have been discussing these few days but maybe it will be a refreshing change. I come from a coastal city like this one, started by fisher folk but now housing 17 million people. Half of them live in slums. But the city still is home to most of the country's millionaires and the financial capital of the world's largest democracy.

Greetings from the Presidents

- Indian Academy of Pediatrics (IAP)
  - Dr. Nitin Shah
- Federation of Gynaecological & Obstetrical Societies of India (FOGSI)
  - Dr Duru Shah
- National Neonatology Forum (NNF)
  - Dr. Arvind Saili

I bring you greetings from my colleagues in india who are involved in working towards reducing mortality in both women and children, the IAP, the FOGSI and The NNF. These are bodies to which almost all professionals belong and they work alongside the Government, but mainly with NGO and UN agencies as Governmental agencies have to much red tape.

Land of contrasts



- Contrasts in quality of health care
- Quantity of health care immunisations
- Who provides the health care
- What a person pays for the care
- Where the care will be rendered
- Will the child get any care at all!!

The contrasts of our land are apparent to any visitor and can be jarring. The cliched ones of rich vs poor extend into the health care system. What a person pays for the care, where it will be rendered, will the parents be willing to pay for the care? Is the child a boy or a girl? That too may effect care…

Birthing suites from 200-300 Euros/day

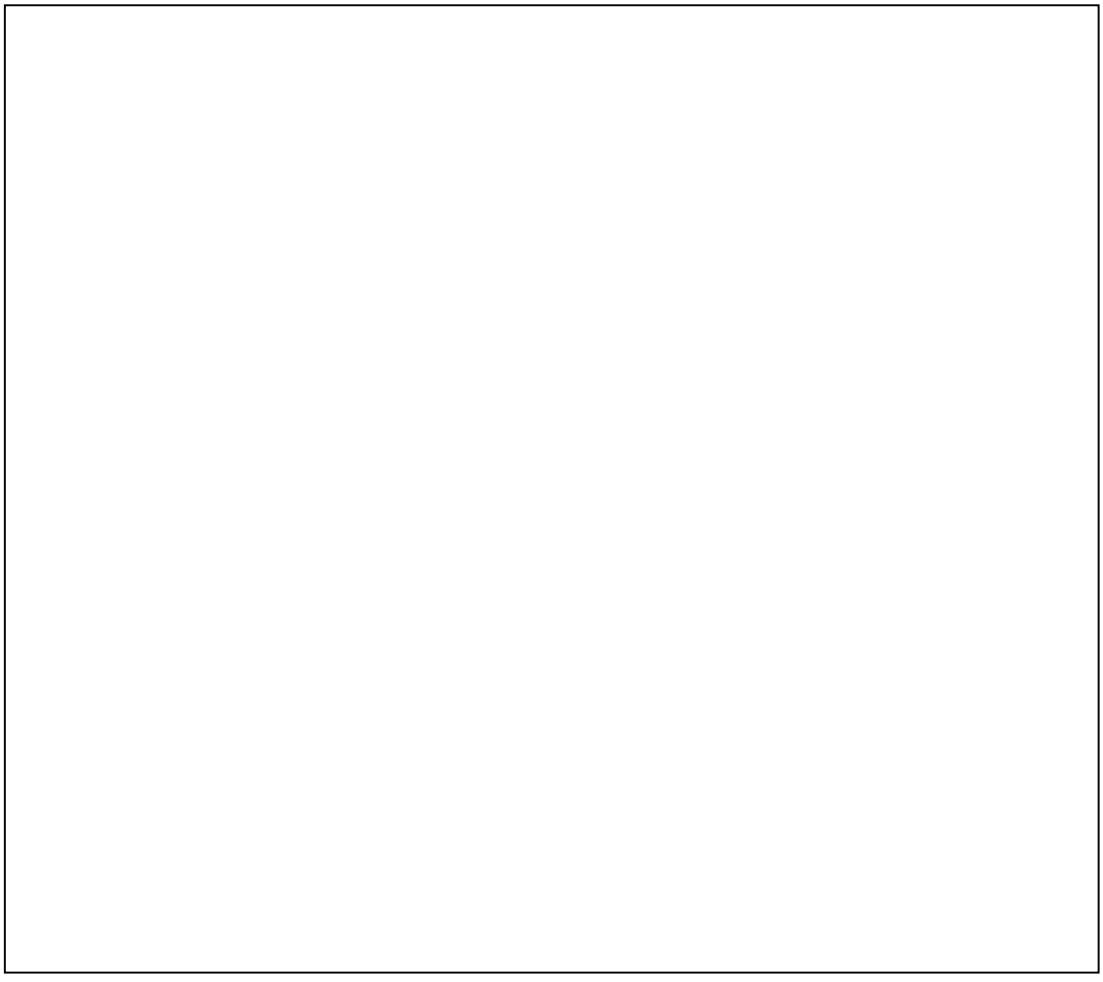
Mothers in a government hospital after delivering their babies

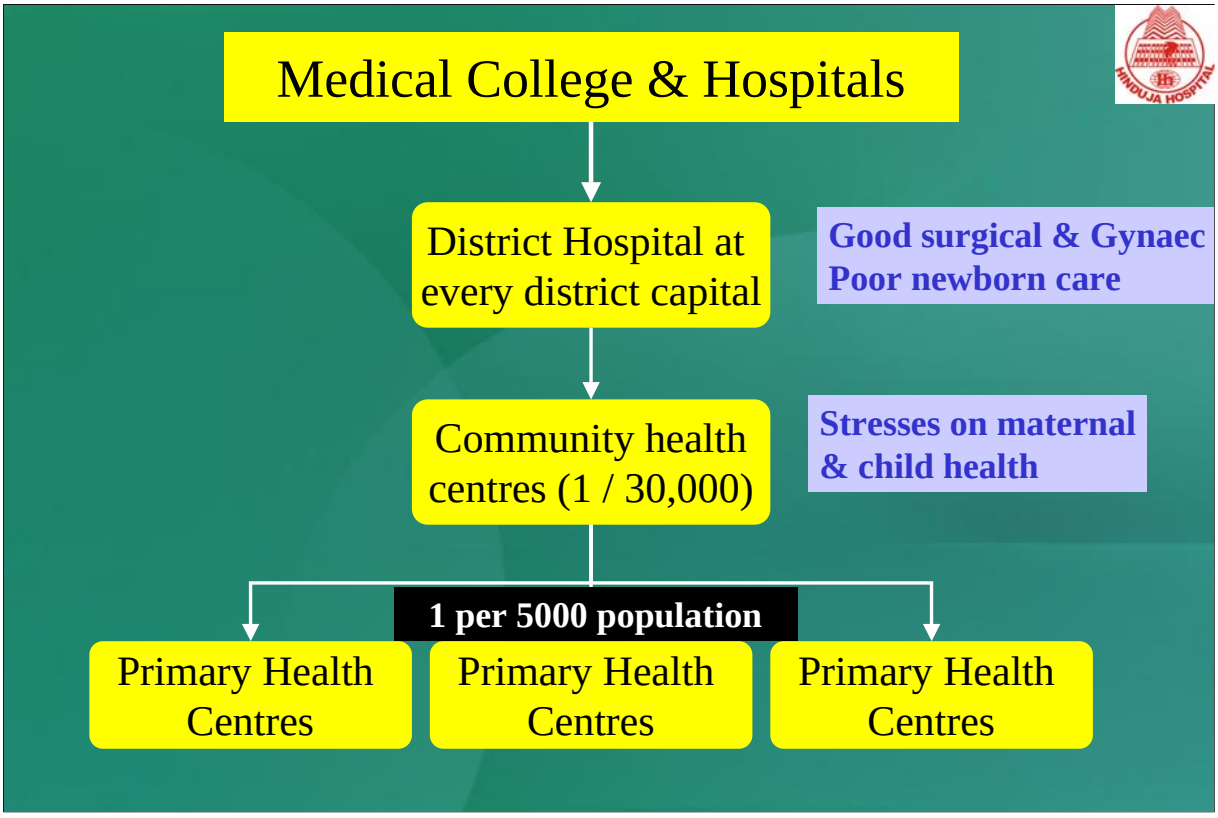
Quality of medical care may be the same or better in the govt hospt.

While the cost may be higher in a small nursing home, the quality of medical care may be better in the medical college hospital. If things go wrong for the baby or mother, the doctor may still transfer the patient to the medical college hospital.

Infrastructure for health

0.9-1.2% of GDP on health





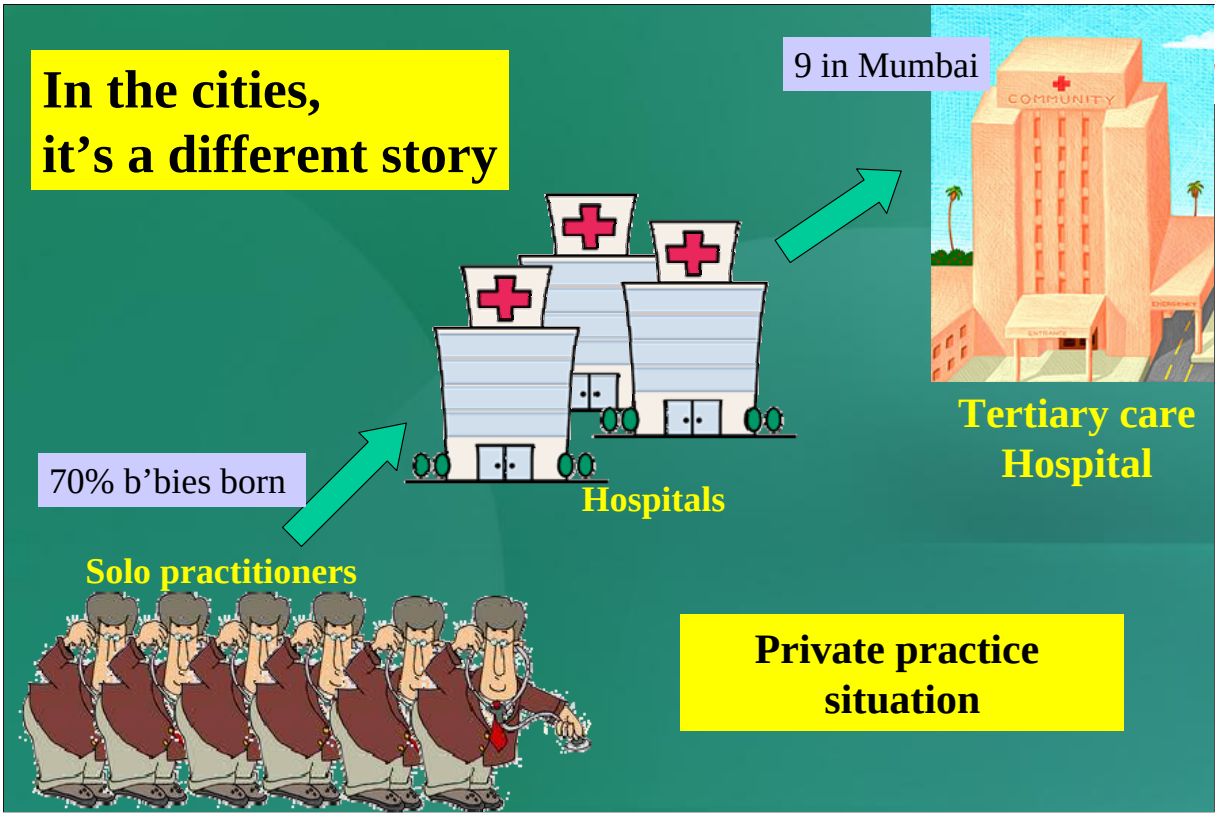
Our health care stucture is clearly split into 2 dichotmous systems. Government run and privately run. There is very little if any overlap. In the state run system, the medical college is the premier referral institution. The quality of these too vary with some institutions being far superior to others. Under these are the district hopsitals which are at the district headquarters. These are generally of poor standards regarding equipment and investigative facilities but offer good quality services for basic surgical, gyaenological and labour and delivery care. The Newborn care is variable at these area as usually a pediatrician is not posted there. The community and primary health centres have a mandate to immunise the entire population under their care.

Primary health centres

- Nurse midwives
- Auxillary health care workers
- Sanitary inspectors
- Anganwadi workers (child care)
  - Akin to the barefoot doctors of China

Immunisation and nutrition- main work
Also taught to recognise sepsis, respiratory distress, teach hygeine, WHO guidelines for pneumonia management reduced mortality

The workers are akin to the famous bare foot doctors of China . The program has been more successful though as the are from the local community and have not been forced into the villages from the cities. They work out of the health centres and also make regular home visits to newly born babies and sick mothers. Immunisation and nutrition is the main mandate but they are also taught to recognise early signs of illness, sepsis, respiratory distress and administer basic antibiotics like co-trimoxazole and amoxycillin according to WHO guidelines and teach hygeine



In the cities, it's a different story altogether. Even the poor, prefer to go to solo private practitioners. There is often a two step referral and in a large hospital. It is rare to get a direct admission from an Obstetrician. The newly born will usually have spent a day or two in a small hospital and then when the going gets really rough, will be transferred to a large centre.

India's child survival challenge

- Birth rate (2002)
  - 27mill neonates
- U5MR 95/1000 (1998-99)
  - 2.5 mill die before completing 5 years
- IMR 60 (2003)
  - 1.6 mill die before completing 1 year
- **NMR 40 (2002)**
  - 1.1 mill die before 4 weeks of age

Greatest burden in the world!

We have the greatest burden in the world in shear numbers in births and deaths. Both need to be brought down. Democracy means being unable to use certain direct measure like some nations have been able to use. Also the political problems and caste politics have ruined the scene for a truly rational family planning program acceptable to all religious communities.

FOGSI-awareness program

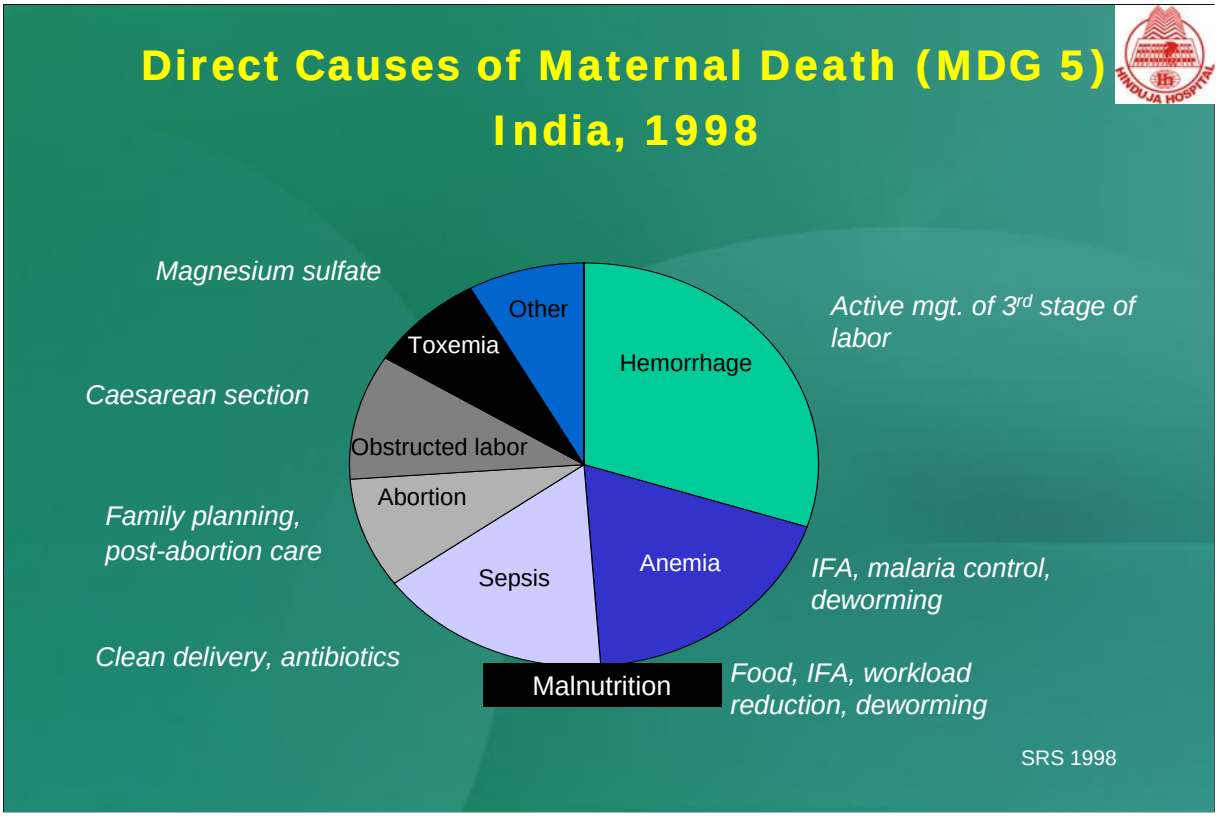
Federation of Obstetrical & Gynaecological Societies of India

- India dubious distinction of 3rd highest maternal mortality in S E Asia. 407/100,000 births and 25% of all global deaths.
- If a mother dies in childbirth-→the newly born → very low chance of survival
- Whole family suffers especially any girl children .

Perinatal care begins with the care of the mother India dubious distinction of 3rd highest maternal mortality in S E Asia. 407/100,000 births(as opposed to 40/100,000 even in Sri Lanka) and 25% of all global deaths.

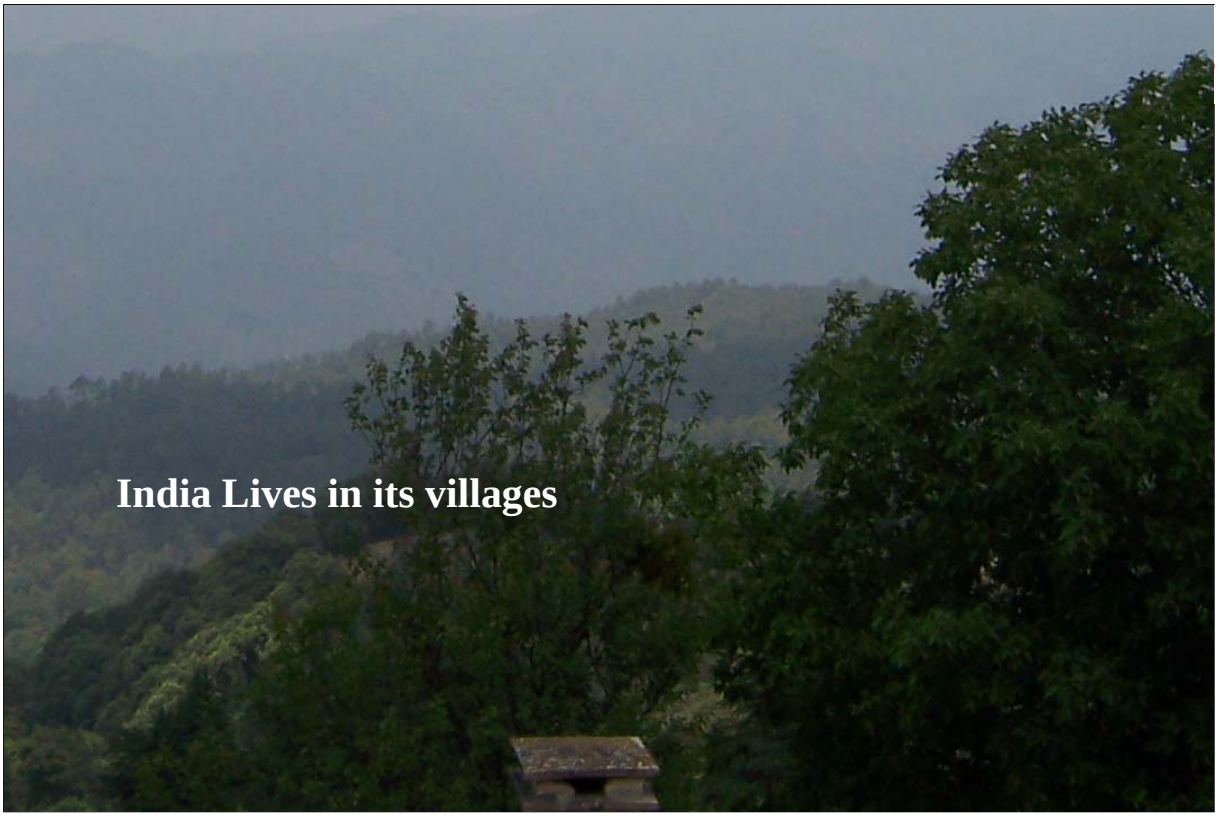
If a mother dies in childbirth, the newly born has a very low chance of survival

The quality of life for the rest of the children also deteriorates, especially for any girl



Severe anemia, post partum bleeding, unassisted labour, infection, malnutrition contribute to high maternal mortality

This is the most beautiful but most underdeveloped part of the country. The terrain is partly responsible. The level of female literacy here is only about 25% the national average now being about 58%. This awareness program was aimed at educating women and empowering them to better their own health and that of their families. Over the next 5 years, the change in statistics will be monitored.


India Lives in its villages

Myths and misconceptions

- **1st Myth :** Only developed countries with high GDP can reduce neonatal mortality.
- **Fact:** Many Countries have reduced neonatal mortality despite having fairly low GDPs.
- Low cost interventions have proved beneficial to family-community care, and facility-based clinical care.

India lives in it villages. Only by focussing on the numbers there, can we talk of the ground reality of neonatal care an improving mortality. **1st Myth :** Only developed countries with high GDP can reduce neonatal mortality.

Fact: Countries such as Honduras, Indonesia, Moldova, Nicaragua, Sri Lanka, and Vietnam have reduced neonatal mortality despite having fairly low GDPs.

These interventions can be bundled in very cost-effective packages for delivery in health systems through outreach, family-community care, and facility-based clinical care.

Myth 2 : High-tech interventions, impact neonatal mortality

- **Fact:** Mortalty reductions started before NICUs started
- tetanus toxoid vaccination,
- exclusive breastfeeding, kangaroo mother care for low
- birthweight infants,
- antibiotics for neonatal infections
- Local health workers.

Rural project teaches professors

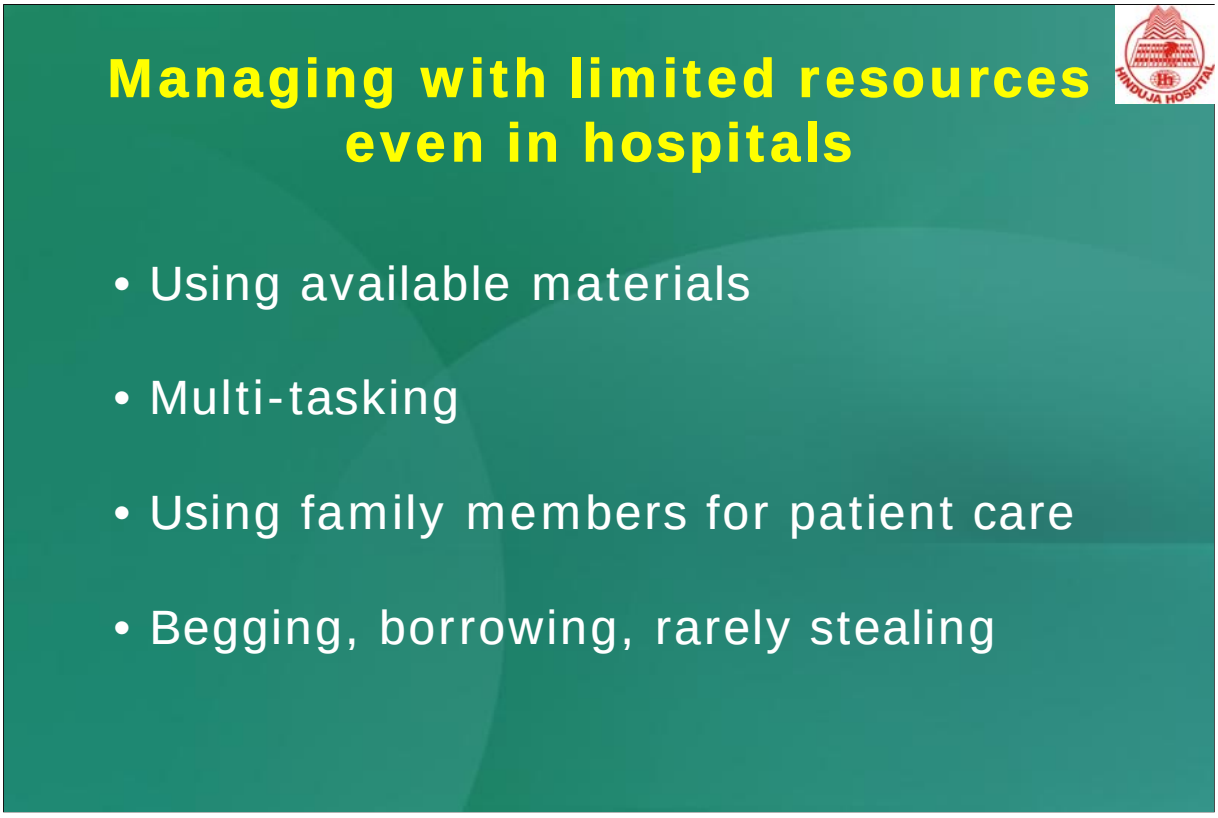
Drs Abhay & Rani Bang

Facts: 85% rurals births at home
42% <1800 gms
9/10 deaths in LBWs
52% need care
2.6% get it
0.6% go to hospital

83 villages others as controls
taught Rural health workers
Clean delivery practices
Cleaning secretions with mucous trap
warming babies
feeding practices

Results:
62% reduction in mortality
Incidence 16% to 2.8% in infections

This same issue was highlighted in India by this couple who work tirelessly with rural children. Once again the emphasis is on local workers taking the message to women. First they assembled the facts that were resulting in the problems: That 85% of births occur at home and 42% are LBW. Where most of the deatghs occur. Most of those who need the care don even reach the hospitals . Hemce they taught the village workers to administer the care atr home. To recognise problems and mor important, to prevent problems by using clean parctices for deliveries and resuscitation. The huge difference in sepsis and mortality shown has won them many accolades and Dr. bang is very much in demand on the speaking circuit.



Its not just in the villages but even in the civic hospitals, shortage of funds and materials and staff make it difficult to run a newborn nursery the ideal way. Hence we try to use innovative methods to overcome our lack of resources. Some of the methods we use are:

Mother does main nursing

Growing preterm athrogryposis

Vitamin fe,ca supplements

Cord care

Bulb suction

We use the mothers to help with the nursing. They give supplements to the baby, suction when needed, and this mother has done a remarkable job with physiotherapy on her baby with arthrogryposis

Government run hospital in Mumbai

- Shortage of nursing Staff
- Mothers learn fast
- Most motivated
- Help each other
- Tube feeding
- Oral meds
- Cleaning
- Apnea watch

They are the most motivated ad the most careful of nurses and also help each otheer out.

Cheap heating devices

Batteries for Solar energy storage
Initial expense may be high
Powers incubators,
heating elements
Entire nursery during power failure

Another innovation is in cheap equipment. This old style heater warms a room and may set you on fire if you go too close but we learn to be careful and it does its job of keeping the room warm on a winter night. The country can send up a satellite but even big cities suffer from power cuts so solar batteries are used to store ssolar power and can give power to the entire nursery.

Cheap innovations help save lives

Thermacol boxes with air vents
Used to transport and keep preterms warm
In rural india
Cost 2 Euros

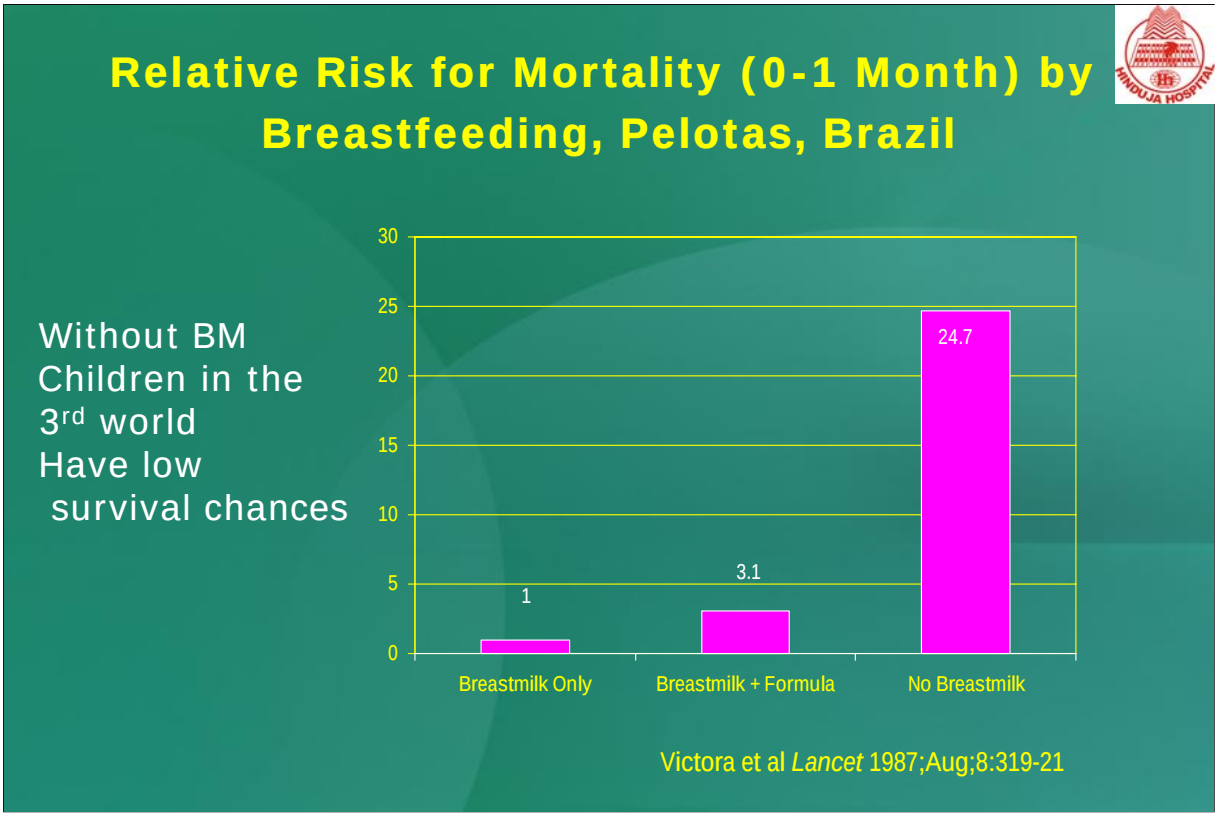
Transport incubator is too expensive for most places to afford
Big hospitals will have excellent transport ambulances but still good newborn transport facitilities are rare

Pressure Control Ventilator

PC
PEEP
No blender
Flow Mix FiO2
Cost:
1000 Euro

Locally made

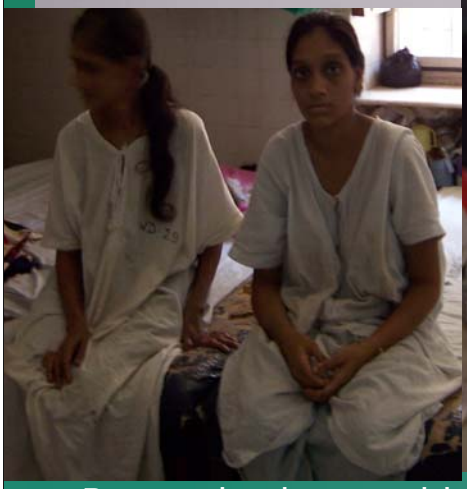
Cheap but rather primitive ventilators are locally made. They can perform basic functions but it is difficult to use them on complicated problems.



The absence of breast milk would sound the death knell for a child in India. Hence every effort is made to provide breast milk from some source. This bank was funded by a Rotary club as the Government would not come up with the money

HUMAN MILK BANK

Breast milk for ALL babies **Rotary Funding**



Pasteurised, stored in sterile conditions, used for all babies
NICU and wards use milk

.

Kangaroo Mother Care

- Practiced in urban and rural India
- Reduced mortality from infections by 51%(7-75%)

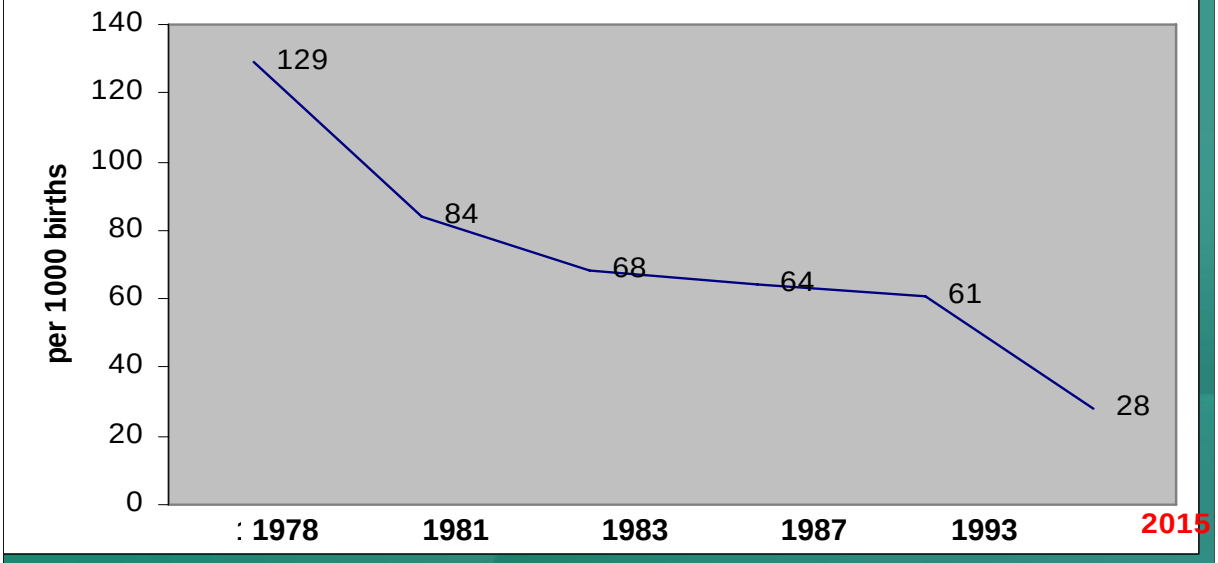
Allows discharge home at 1.2 Kg
Mother confident of care
Continue with housework

Unicef WHO Funding

3 hospitals in Mumbai
Practice it routinely

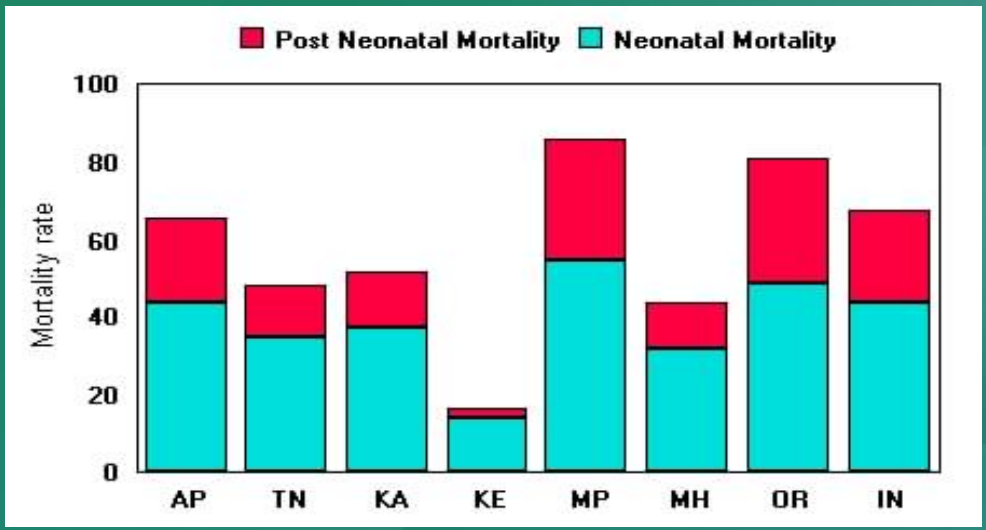
India cannot claim to have started this trend but it has become very popular as a method of discharging LBW babies home early. It can be done on even sick and ventilated babies but at present we are restricting it to growing babies and discharging babies at even 1.2 KG. It gives the mother confidence to look after the baby at home and continue with her house work as well she can even go out with the baby and feel perfectly safe.

National Perinatal Mortality



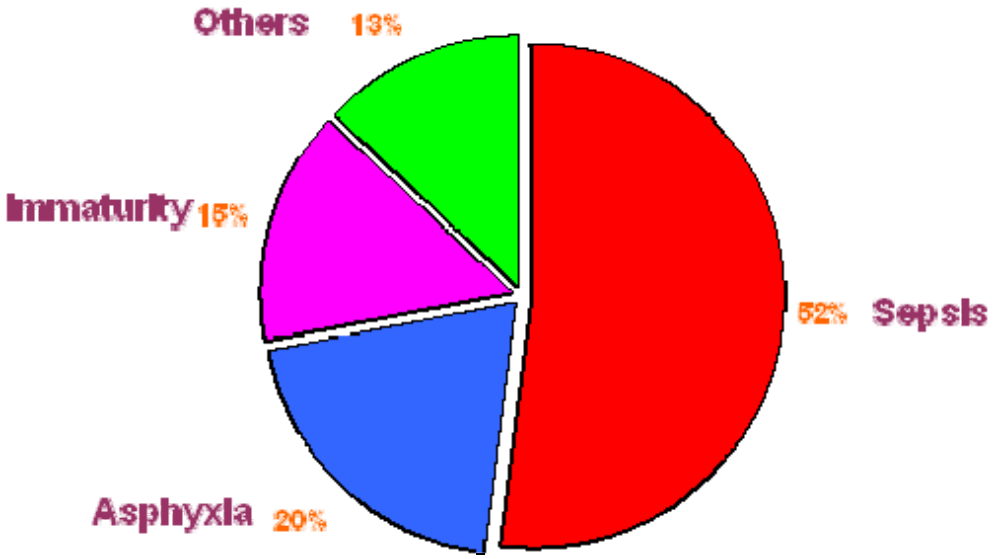
Aim to reduce to 28/1000 by 2015

National Perinatal Mortality

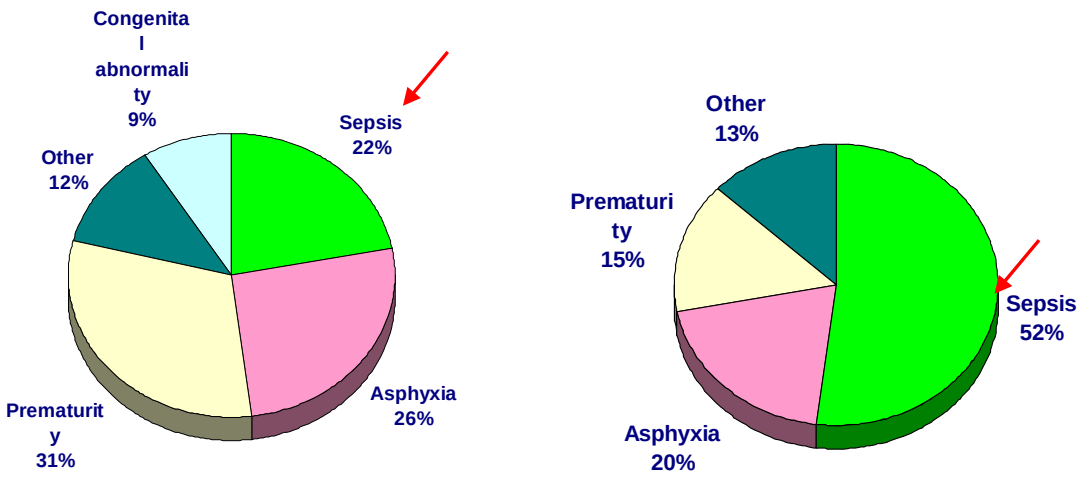


State wise perinatal mortality
Reflects varying levels of Literacy
Maternal education
GDP

Cause of neonatal deaths



Mortality In Hospital/ Community



Hospital ← Community

Tertiary level unit in India

500 level 3 NICUs with
US/European equipment
UK/Australia/US trained Drs
Full life support
5 Units with NO
NO ECMO units
>2000 small units with
1-2 ventilators
Basic monitoring equipment

Source: Survey of hospitals done for the Indian Society of Critical Care Medicine 2006 S Udani

Pediatric Critical Care

- **25 tertiary level care units (known to us)**
  - **Only 6 of these in Government institutions**
- 10 accredited training centres
- 3 dedicated neonatal cardiac surgery centres
- Several cardiac surgery centres. Results variable
- Excellent pediatric surgery results
- 3 liver transplant centres
- 3 Bone marrow transplant centres

Newborns in the PICU

(40% of PICU admissions all extra mural)

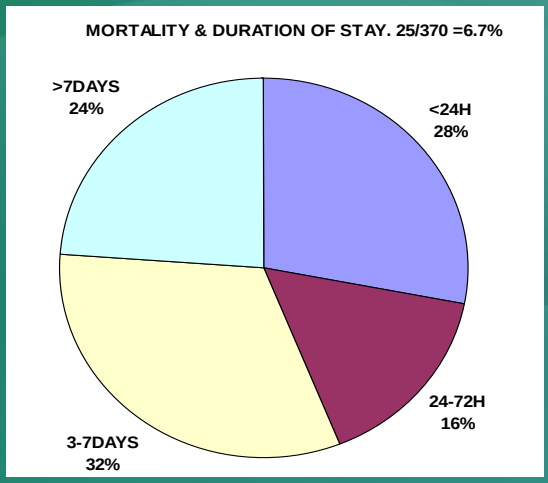
Diagnosis	N(110)	(%)
Sepsis	**55**	**(50)**
Birth asphyxia	9	(8.1)
Pneumonia	10	(9)
Congenital heart	7	(6.3)
Seizures	12	(10.9)
Hyperbilirubinem	4	(3.6)
Hypoglycemia	8	(7.2)
PPHN	5	(4.5)

Many are mixed units

PD Hinduja Hospital Mumbai 2004

Last 3 years deaths 25/370 total

12	Sepsis
4	Severe HIE
4	MAS + PPH
3	Cardiac
2	IVH Gr IV



PD Hinduja Hospital Mumbai

Low overall mortality of 6.7% because many the main admission diagnosis is sepsis.

Perinatal AIDS/HIV

- The Indian National Aids Control Organisation(NACO) estimates the 2005 HIV prevalence in India to be 0.91%(5.21 mill)
- 4059 reported perinatal cases at end 2005
- 1OX that number treated with Nevirapine

There is a very large Govt and WHO funded vertical transmission prevention program in place across the country which has gained momentum. The african model of single dose N is followed. The results are very encouraging and at our own centre we have seen a reduction in the transmission rate to about 3%.

- High risk populations HIV +vity 19-75%
- Prepregnancy testing rare
- Pregnancy testing common, consent rarely taken or rarely understoood
- Treatment consent taken
- Breast feeding consent usually given
- Mixed feeding usual as importance not understood
- Nevirapine program reduced vertical transmission to < 5%

Perinatal outcome indicators

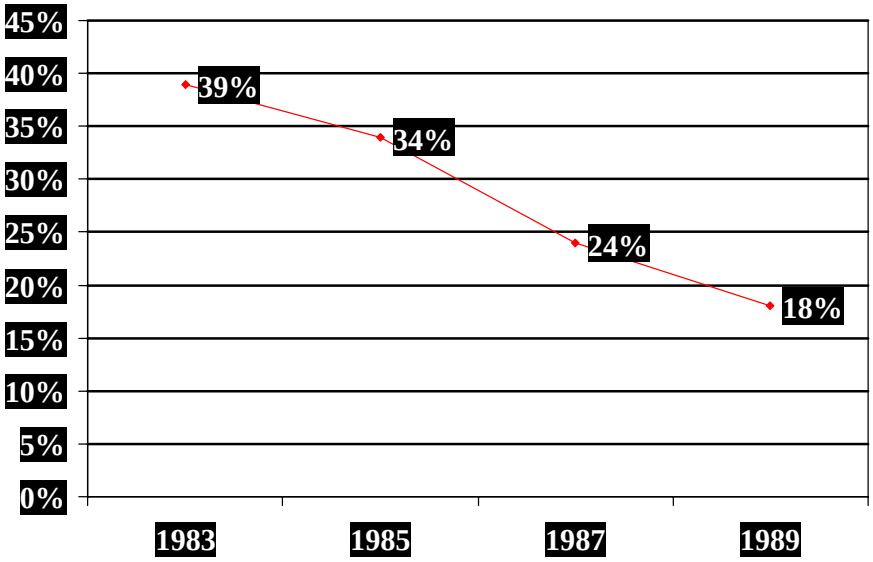
- Improving survival alone cannot be enough
- Quality of survival also counts
- Neurological disability

Neurologist's perspective

- Commonest cause of hydrocephalus in infancy was not IVH or aqueuctal stenosis but unrecognised ventriculitis from the neonatal period
  (Udani & Udani IP 2003)
- A prominent cause of epilepsy with onset in the first 3 years of life was neonatal hypoglycemic brain injury
  (Udani & Munot IP 2005)

Improving outcomes also seen

Kumari S, Sharma S, IJP 1993



- Percentage of babies below 1200 gms with neurological disability on 6 month follow up

Education

- 18,000 medical graduates per year
- State run Universities are heavily subsidised
- Privately funded universities are expensive
- Each individually is responsible for curriculum content
- Old outdated curriculum often exists
- National standards by Indian Medical Council

The reality

- National Board of Medical examinations- autonomous body- better respected –higher standard
- NNF sets guidelines on neonatal care
- Intensive Care Societies together set guidelines for Critical care
- Conduct examinations independently
- Accreditation of units and teachers done independently
- Students seek advanced training in the private sector

Generally less reliance on official governmental and university degrees and training

Ethical considerations

- Highly religious people
- Faith in God and acceptance of His will
- Faith healers, charlatans, alternative medicines, all tried alongside ICU care
- Family and Society pressures vary. Not one ethos

Ethics vs Financial considerations

- No insurance for newborns
- **Less spent on the girl child**
- Conflict between families
- Very young parents dependant on their parents
- Cost of health care unaffordable for most

No insurance companies over newborn care. Generally, couples marry very early and are often finacially still dependant on their familes. Decisions therefore often depend on family elders. In small towns in some states, there is not only a skewed birth ratio of male to females but also a skewed admission ratiio. Where very few girls are actually brought in for new born care.

Ethics....

- Major decisions often left to the doctor
- No clear guidelines or ethics committees
- Litigations on the rise
- Parents wishes are paramount
- Can stop treatment by taking patient away
- Resuscitation left to doctor – will depend on the comfort level with size of baby and facilities available

Medical decisions are almost always left to the doctor. Very few hospitals have ethics committes. There are no clear guidelines and drs often do what they think best. However. Litigations are on the rise and we try to keep our records meticulously. There are no guidelines on the smallest baby to resuscitate and this depends again on the comfort level of the doctor and what the unit can support. The courts also take a view of having" Done the best under the availabel circumstances".

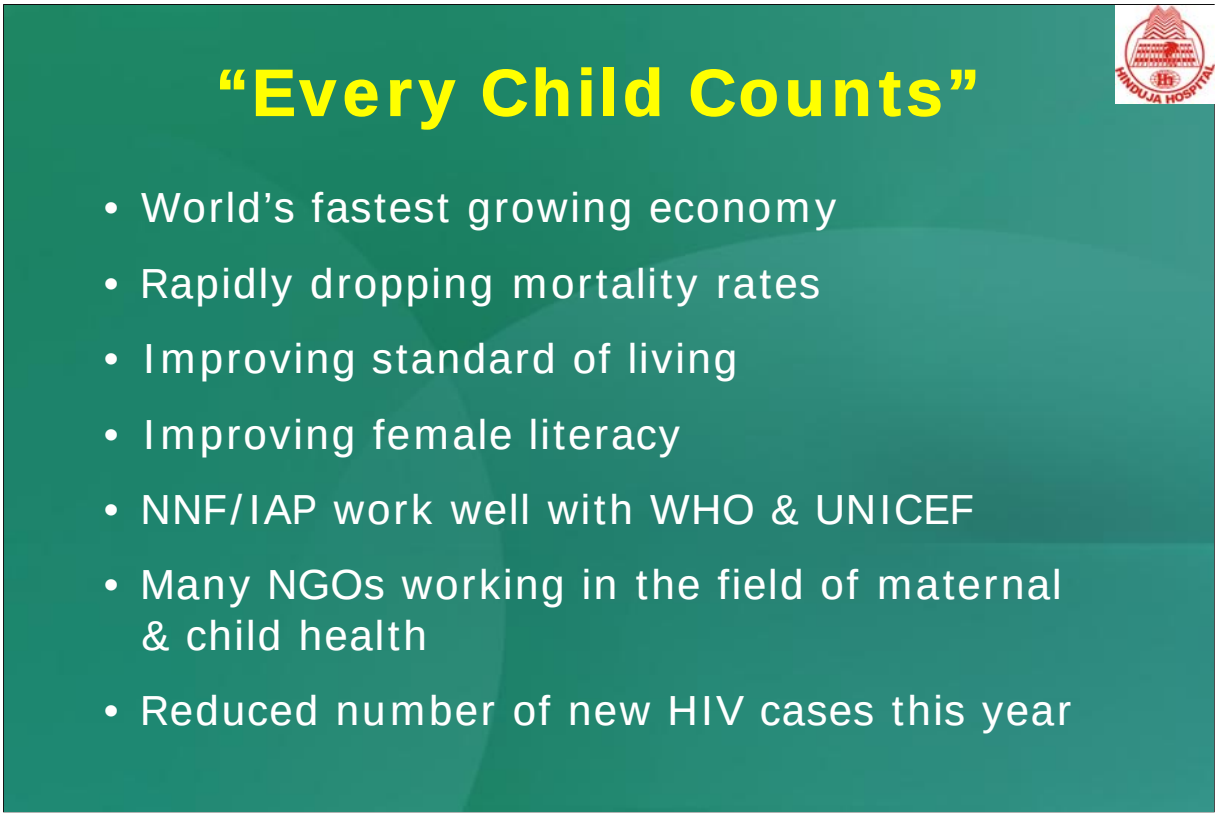
Young dr's aspirations vs country's needs

- 80-85% of all infants need care at Level I;
- 15-20% require Level II care;
- **1-5% need Level III care.**

S. Bhargav 2001

- 35 Pediatric residents surveyed showed the following results:
- 6/35 came from a large metropolis
- **14/35 from small towns**
- **15 from semirural/rural areas**
- 3/15 from rural area said they would go back and set up level I –II nurseries.
- Rest all wanted to either migrate to the UK/US or go abroad for training.

Most infants do not need tertiary care. However, the glamour of the NCU draws young drs into the field and even those born in small towns are reluctant to return to their roots. The lue of the big city and even the west is a major drain for the rural areas of India.



The Ind ac of Peds is working very hard to make this slogan into an reality. It is working closely with WHO and UNICEF to reduce the NMR and eradicate polio from India by 2015. The main work is done by the NGOs in India.

India has a bright future and will be an economic superpower with an excellent Hc system which will reach out to every citizen by 2015. Please come and visit us before that. This is my hospital a night