

MATERNAL HEALTH PROGRESS 1990-2015 AND ONWARDS TO 2030

K. KALAIVANI
NFI

Women's health is vital for ensuring the health and well-being of the family

During pregnancy and delivery women are at higher risk of health complications

Universal antenatal care and delivery by skilled health personnel are advocated as essential health care needed for early detection and effective management of health problems to minimise the adverse impact on maternal and child health

MDG Goal 5 was to Improve Maternal Health

Target set was: Reduction of the Maternal Mortality Ratio by three quarters between 1990 and 2015

There were two indicators used for assessing progress

Impact indicator: Maternal Mortality Ratio

Process indicator: Proportion of births attended by skilled health personnel

In this presentation the following aspects will be dealt:

Global changes in maternal mortality ratio

Changes in maternal mortality ratio in India

- ☐ **SRS based**

- ☐ **National Survey based trends**

- ☐ **Inter regional differences**

Changes in Institutional delivery rates

- ❖ **Survey based data**

Relationship between maternal mortality and institutional delivery

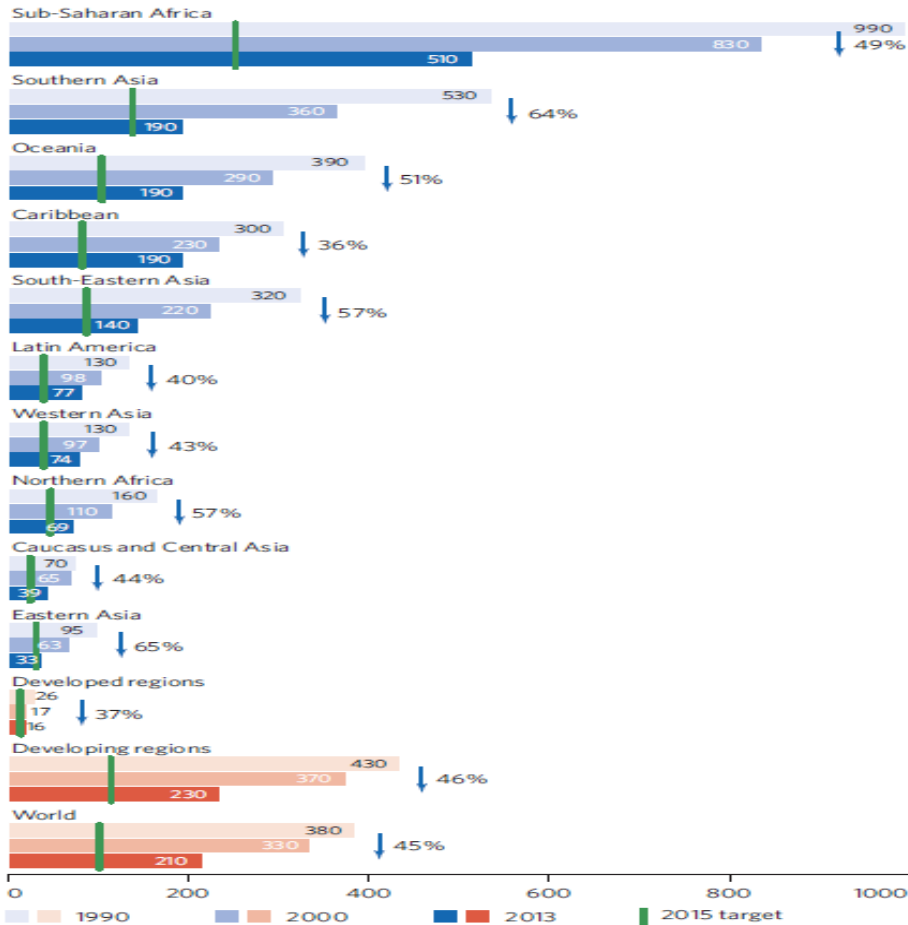
Role of antenatal care (coverage, content and quality) and referral services in reduction of maternal mortality

Way forward to SDGs

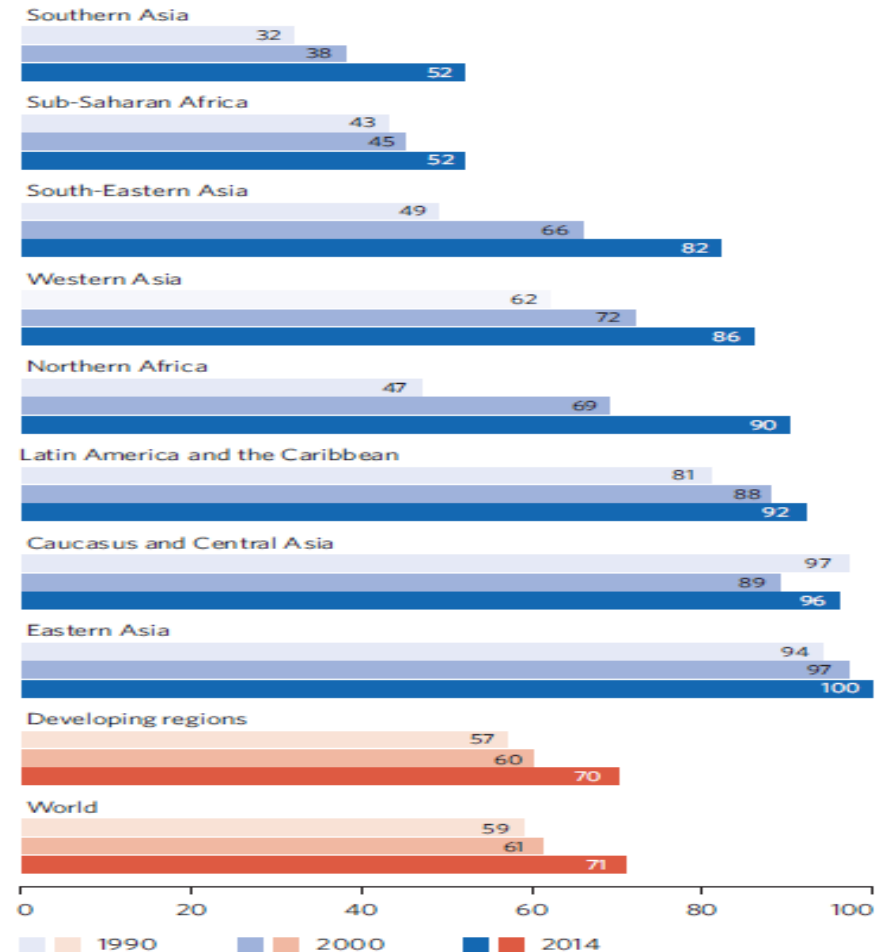
TARGET: 75% REDUCTION IN MATERNAL MORTALITY

Maternal mortality ratio, 1990, 2000 and 2013

(maternal deaths per 100,000 live births, women aged 15–49)



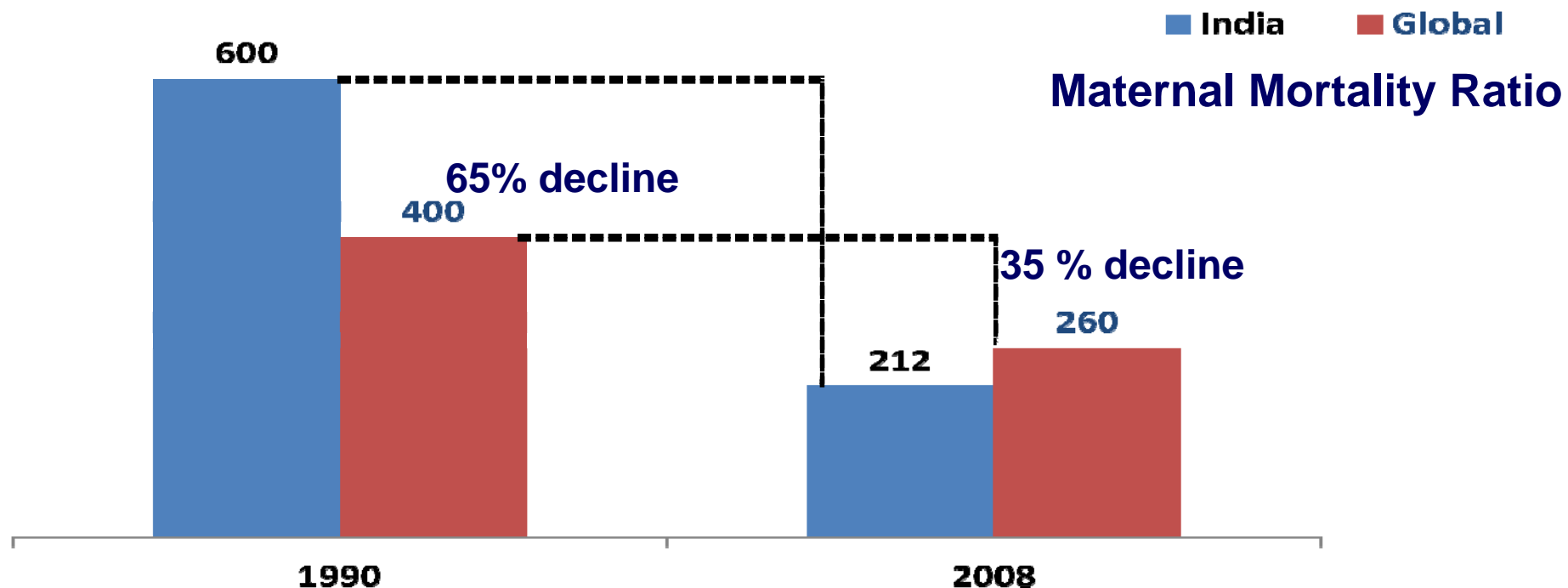
Proportion of deliveries attended by skilled health personnel, 1990, 2000 and 2014 (percentage)



There has been substantial reduction in maternal mortality and improvement in the deliveries attended by skilled persons

However the MDG of 3/4th reduction in maternal mortality was not achieved.

INDIA'S PROGRESS ON MDG 5 IN GLOBAL CONTEXT

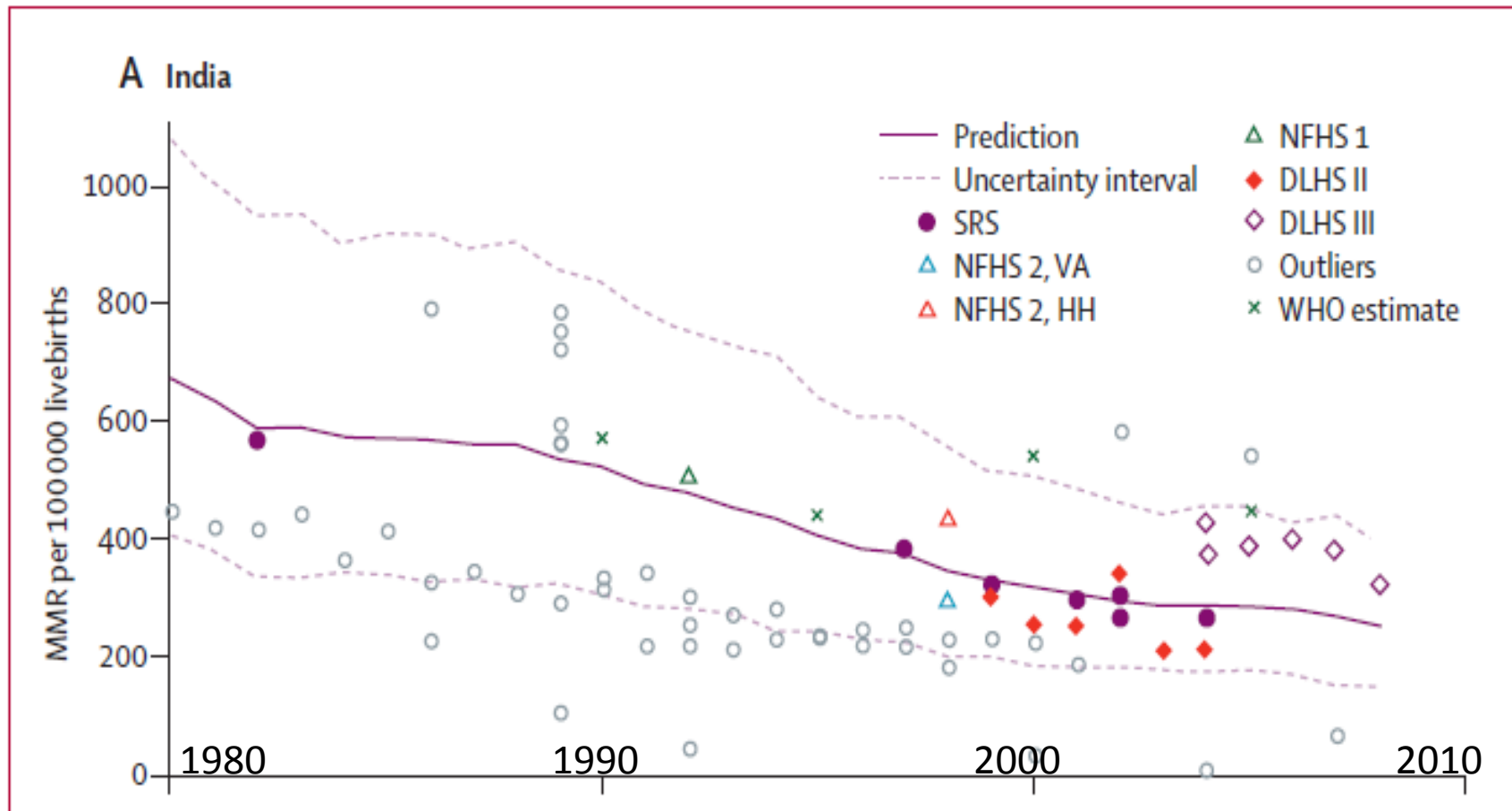


Year	India	World*	India's share (%)
1990	149,000	5,46,000	27.3 %
2010	56,000	287,000	19%

*Source: Trends in maternal mortality: 1990–2008, WHO, UNICEF, World Bank

Reduction in maternal mortality in India has been steeper as compared to the global reduction

TIME TRENDS IN ESTIMATED MATERNAL MORTALITY RATIO IN INDIA

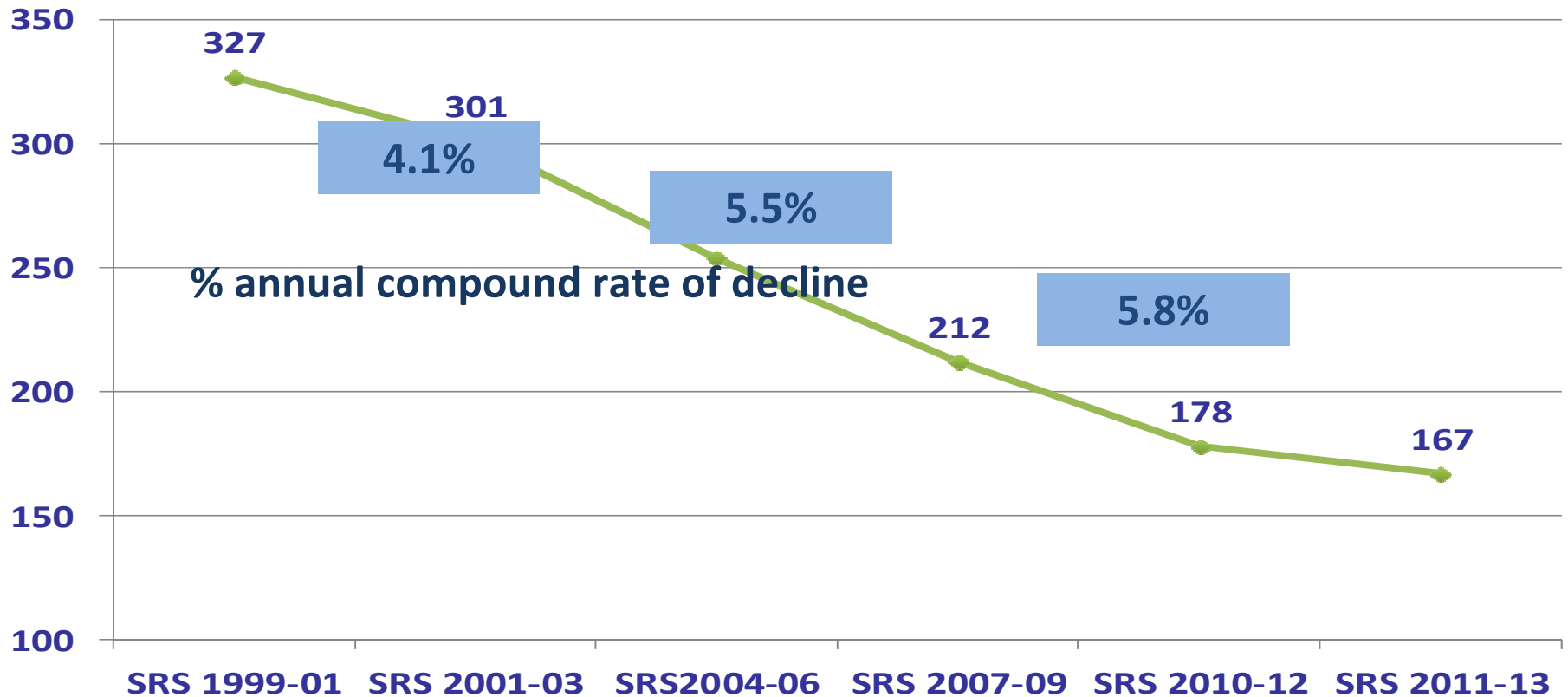


This data published in Lancet led to the debate of which data base is to be used for monitoring progress in reduction in maternal mortality ratio.

After discussion the decision was taken that for monitoring progress towards MDG SRS data will be used.

INDIA'S PROGRESS ON MDG 5

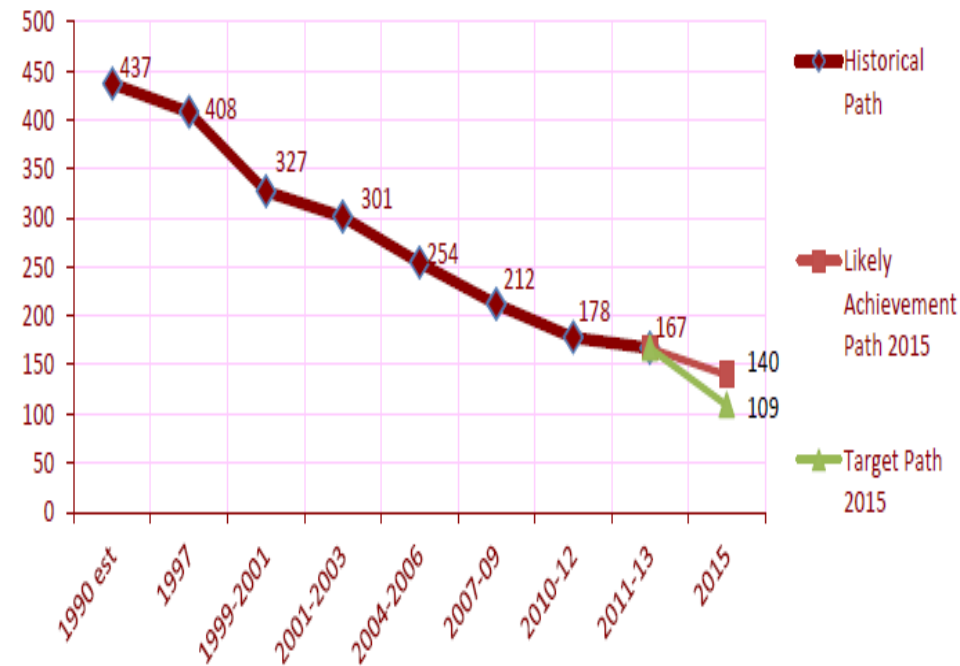
Decline in Maternal Mortality Ratio



**Four major States; KL, TN, MH, AP achieved MDG target of <100 till 2011-13;
two other states Gujarat and WB are very close
Eight major states showed higher than national rate of decline in MMR of
5.8% during 2007-09**

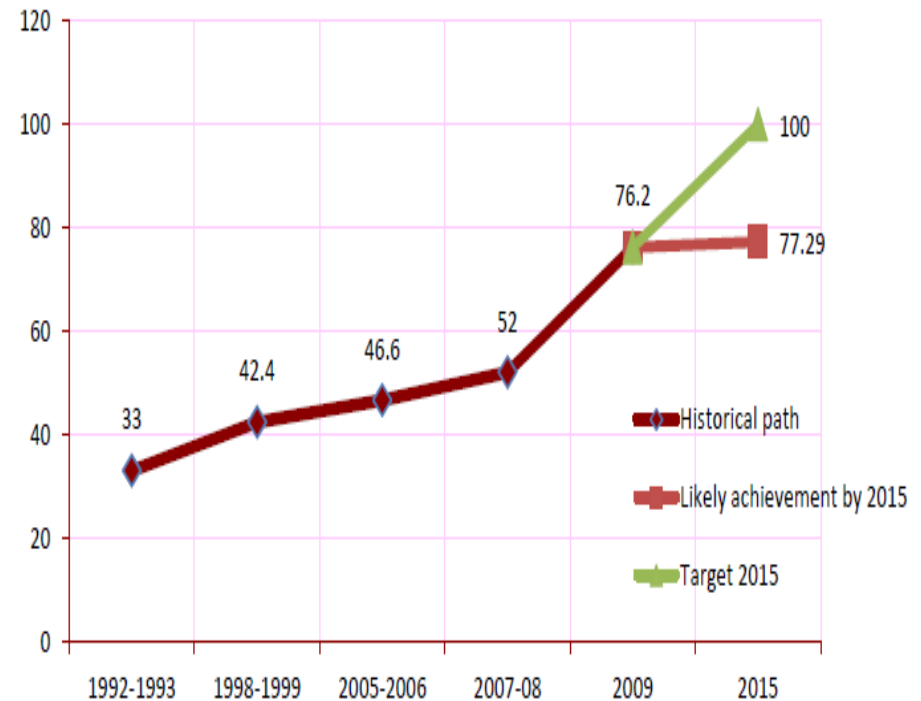
TARGET: 75% REDUCTION IN MATERNAL MORTALITY

Trend in Maternal Mortality Ratio



Source: Sample Registration System, Office of Registrar General of India

Percentage of births attended by skilled health personnel

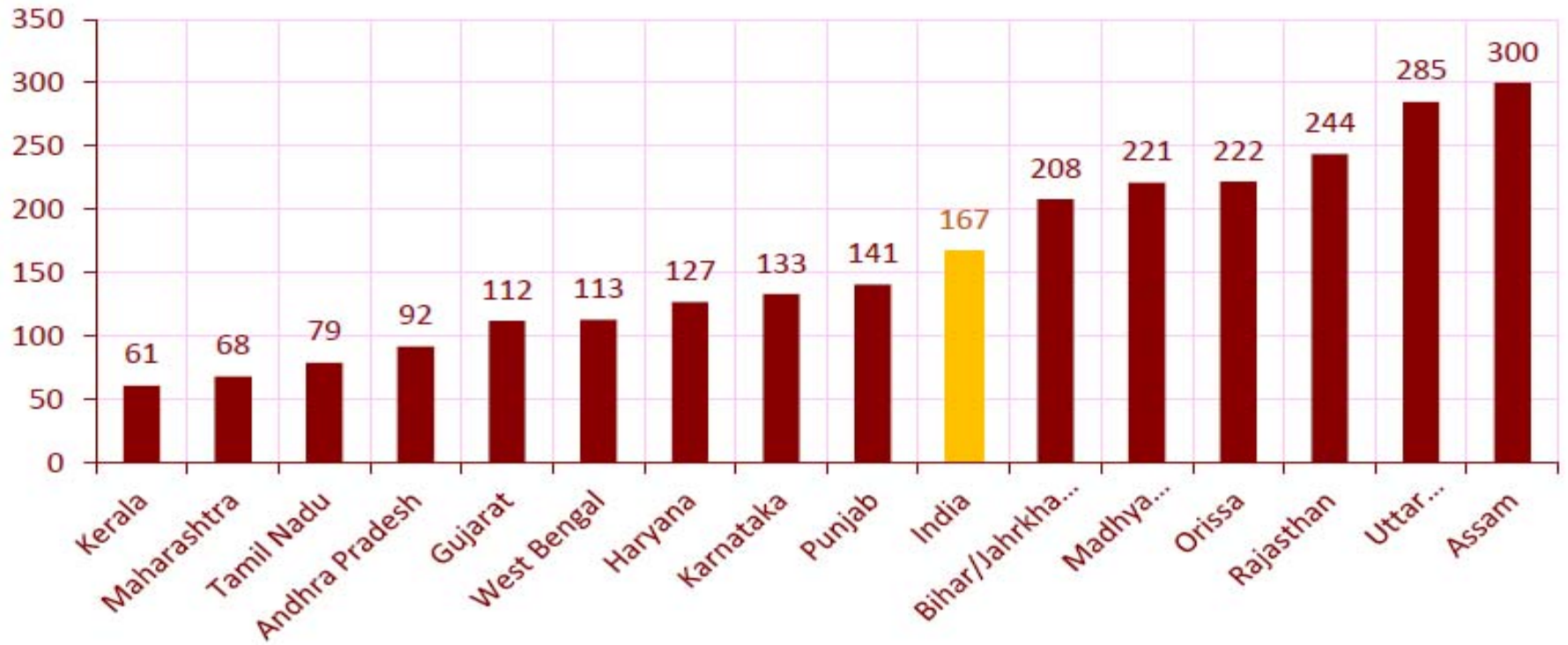


Source: NFHS, DLHS, CES

There has been a steep rise in the institutional deliveries and substantial decline in maternal mortality

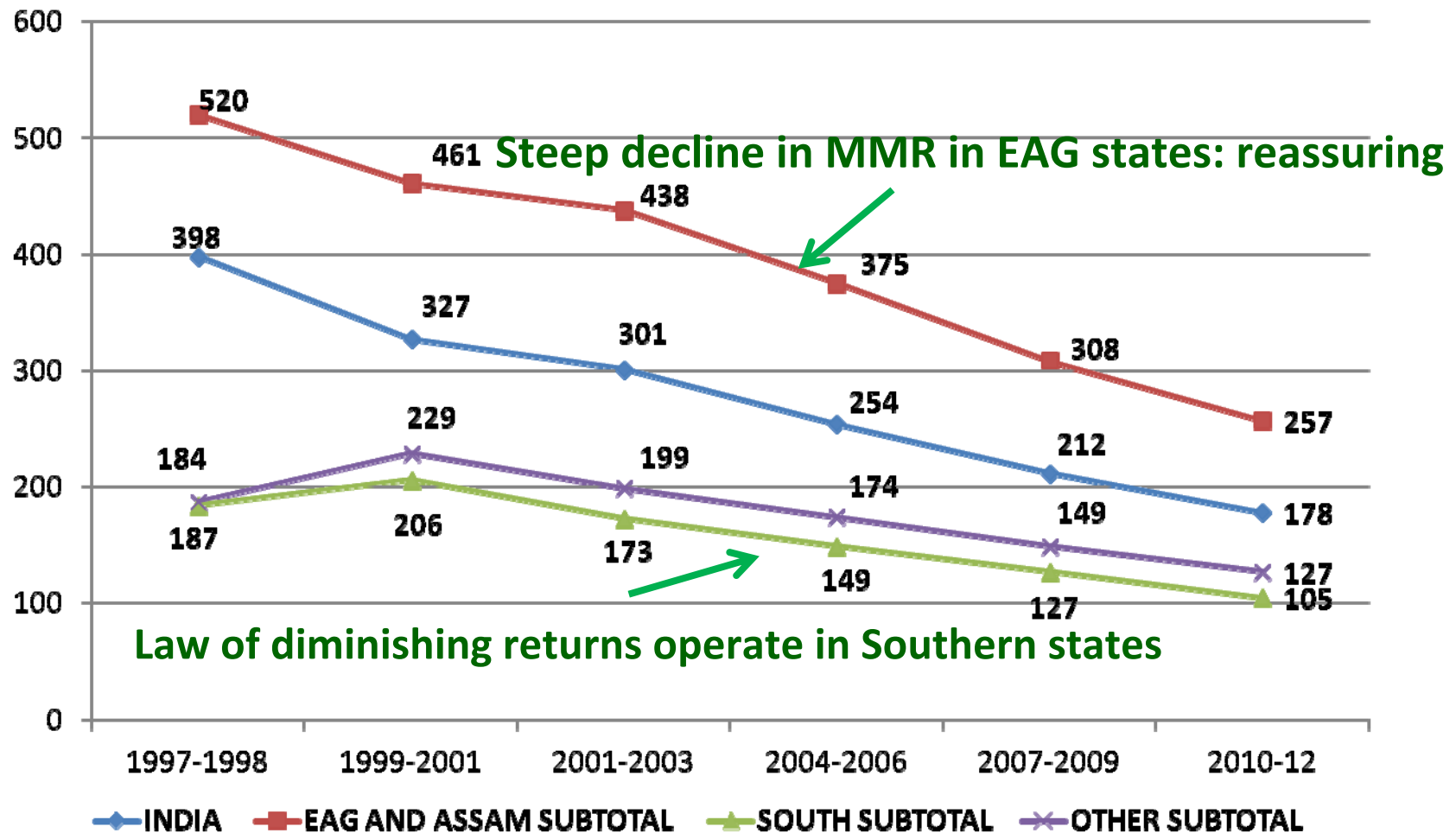
However India will not achieve either universal institutional deliveries or the target of 75% reduction maternal mortality

Fig. 7.6.1: Status of MMR - India and Major States 2011-13

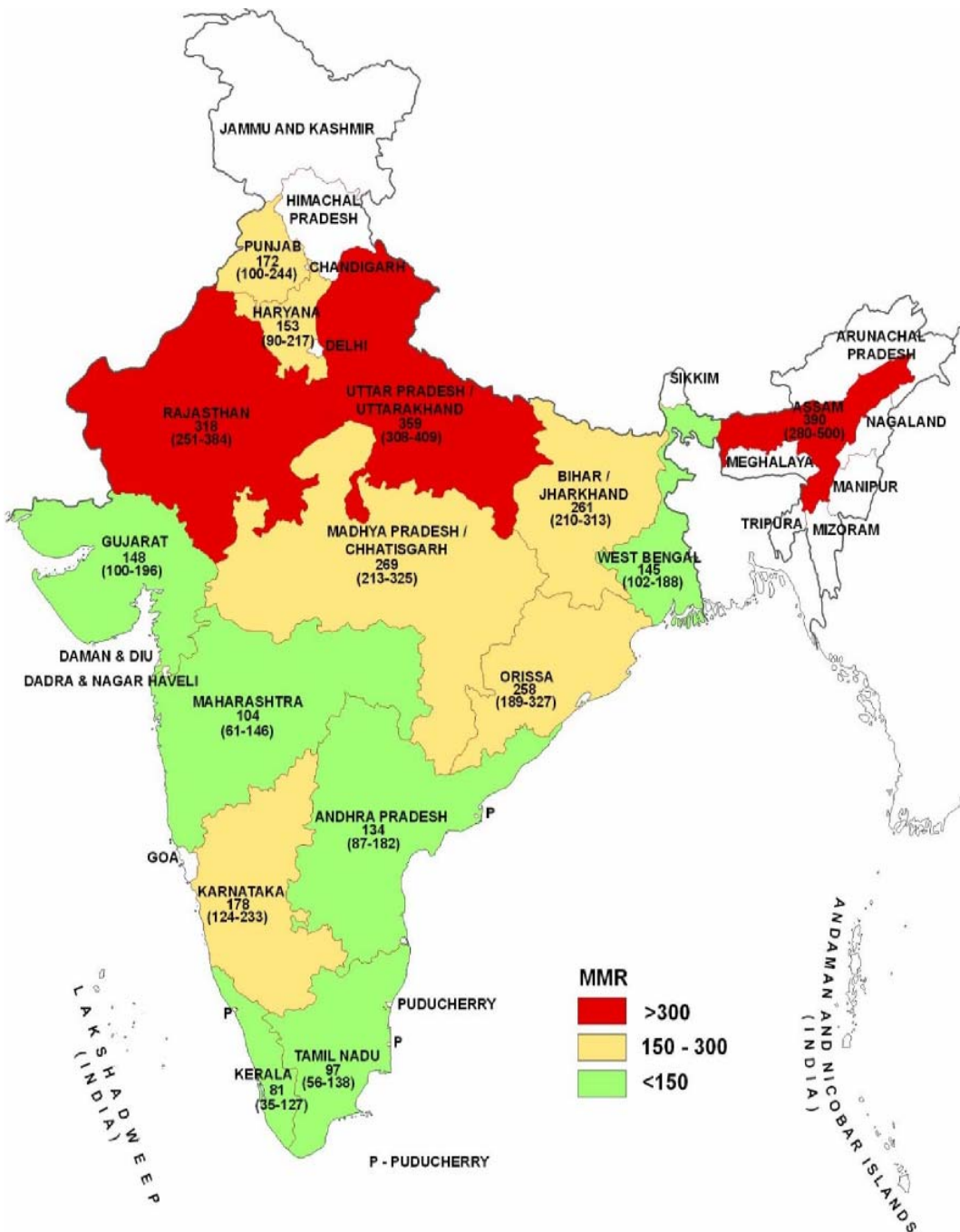


There are massive interstate differences in maternal mortality ratio

Levels of Maternal Mortality Ratio (MMR) by Regions, 1997-2012



Focused intervention under RCH programme has resulted in steeper decline in MMR in EAG states. Decline in Southern states was slower. During the next 15 years there has to be more intensive interventions in all states to reach the SDG goals of reduction in MMR of below 70.

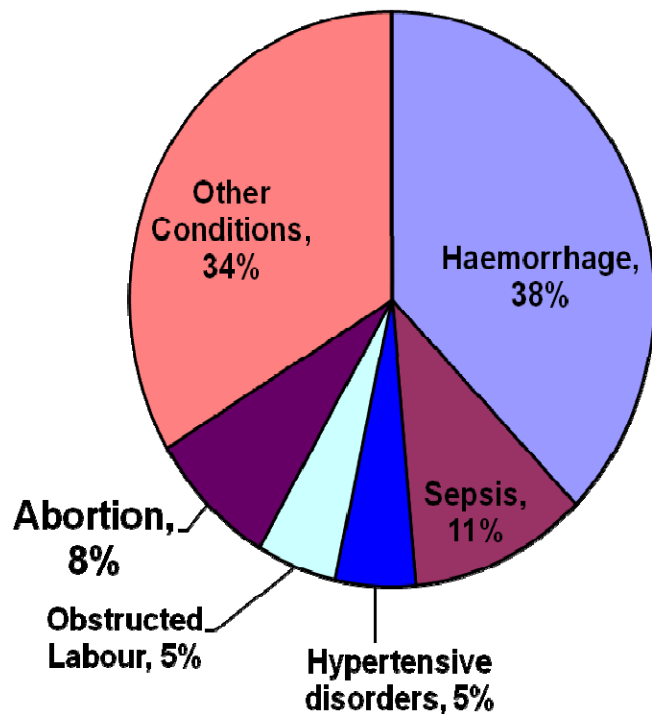


There are substantial inter-state and inter-regional differences in maternal mortality ratio.

This might be partly due to socio-demographic factors and partly due to variations in access to essential antenatal, natal and post-natal care.

CAUSES OF MATERNAL MORTALITY - ISSUES

MATERNAL DEATHS UNACCEPTABLE NUMBERS



Causes-Source: RGI-SRS 2001-03

Maternal Mortality: Magnitude of Problem

1. About 30m pregnancies per year in India.
2. 27m deliveries per year in India
3. 15% of these are likely to develop complications.
4. Complications cannot be predicted.
5. 56,000 maternal deaths per year

Others conditions e.g. Ectopic Pregnancy, Severe Anemia, Embolism, Anesthesia etc

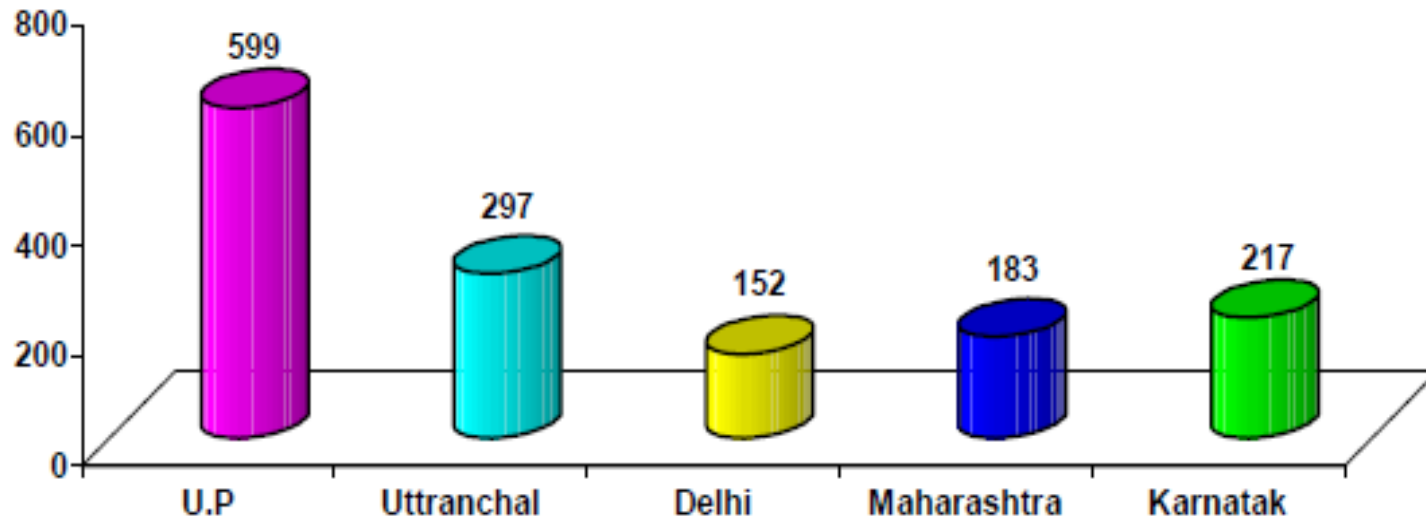
Indirect causes:

- ☐ Malaria,
- ☐ Anemia and
- ☐ Heart & Chest diseases etc.

One third of deaths are attributed to other conditions.

It is essential to find out what are the conditions which are clubbed under this so that appropriate interventions can be taken up.

Maternal Mortality Ratio

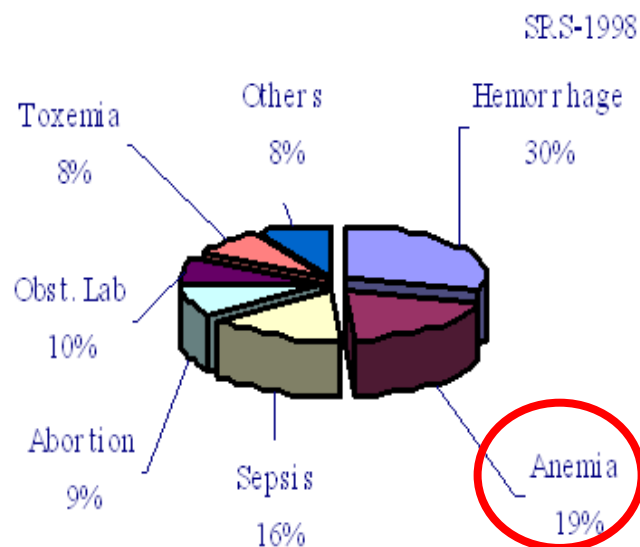


Are causes of death similar between these states?

AHS and DLHS 4 data analysis will provide some information about these

It is essential that the data is analysed and used for ensuring that state specific interventions are initiated

CAUSES OF MATERNAL MORTALITY



Anaemia does not figure as cause of death in 2003

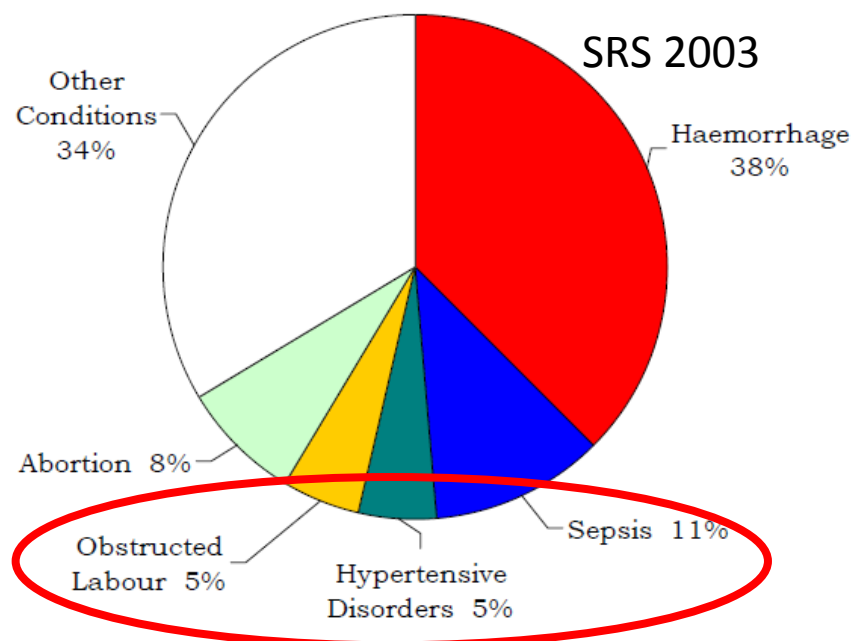
Obstetricians: There has not been any reduction in anaemia or maternal deaths due to anaemia; where did anaemia as a cause of death go?

Demographers: It went into others because it is so ill-defined.

Demographers: There is reduction in proportion of deaths due to obstructed labour, PIH and sepsis in 2003

Obstetricians: We have not seen such a shift in hospitals; perhaps these are not very easy to ascertain and so many of the deaths due to these causes went into others which has increased from 8 to 34%.

Chart 3: Causes of Maternal Death in India



TIMING OF MATERNAL DEATHS

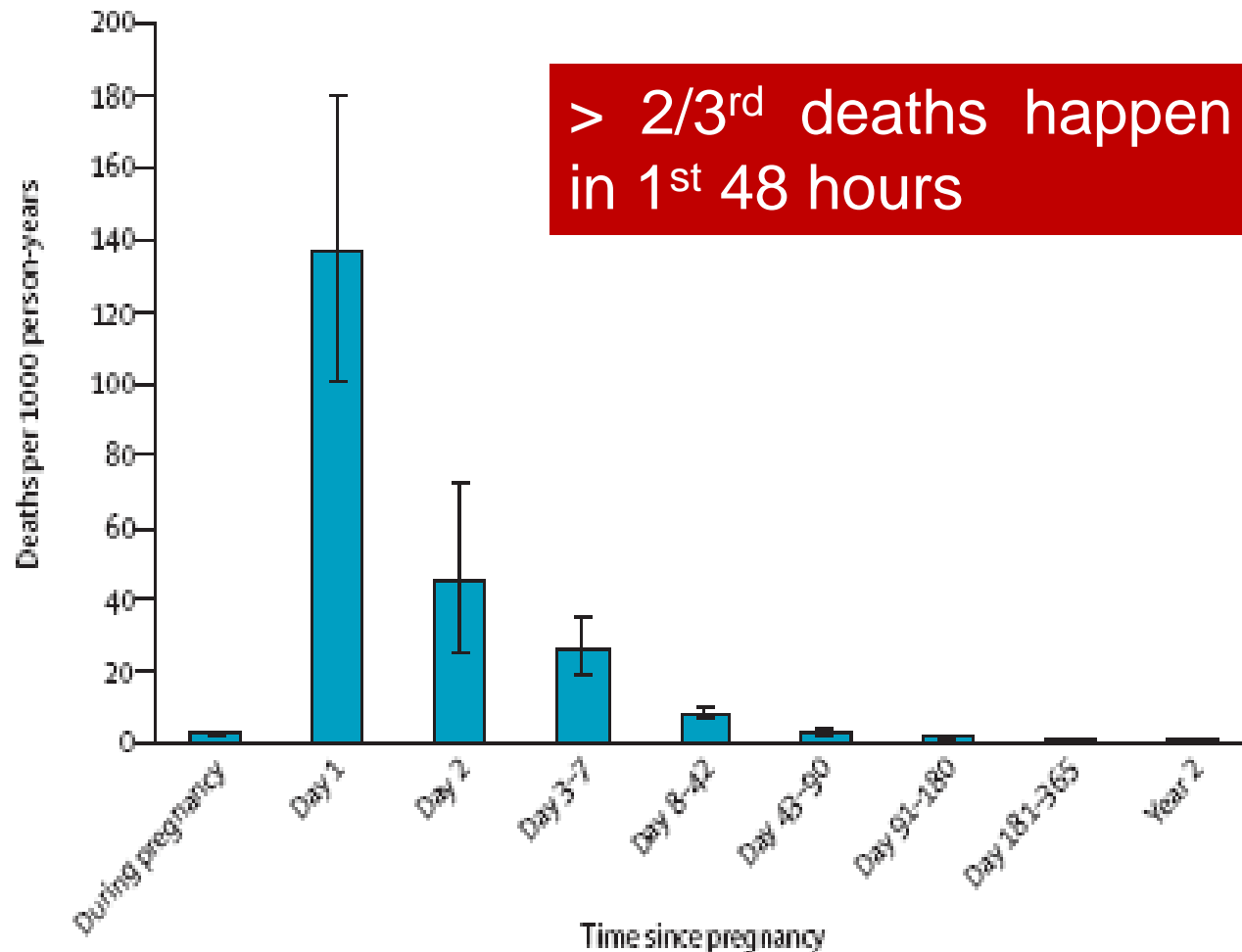
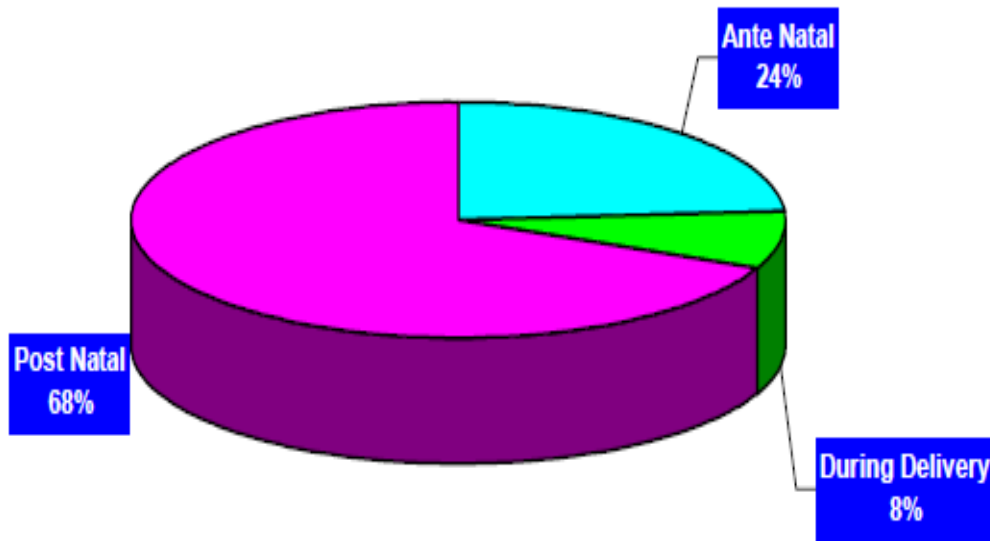


Figure 4: Mortality during pregnancy and by time since end of pregnancy in Matlab, Bangladesh
Data from reference 3. Black lines show 95% CI.

Maternal Deaths
Different Stage Of Pregnancy



Policy makers: We have provided for ANC & ANC coverage is improving; still nearly one fourth of deaths occur in AN period.

Obstetricians: Content and quality of ANC is poor. BP measurement, Hb estimation and abdominal exam have to be done to identify those with problems and referring them to hospitals; all these are critical for reduction in MMR.

Policy makers: So far we have focussed on delivery as the critical time when more care is needed but very few deaths occur during labour. Most deaths occur in the post-partum period; so do we need better care during post-partum period?

Obstetricians: Delivery is the critical time when most problems occur or get aggravated; these complications may lead to death in the post-partum period; effective interventions are required in AN and IP period to prevent the deaths.

Programme implications: Where ever possible programme interventions should continue to focus on increasing delivery preferably in well equipped

Table 5: Causes of Maternal Deaths from 2001-03 Special Survey of Deaths

Maternal Causes	ICD-10 Code	India		EAG and Assam		South		Other	
		%	95% CI	%	95% CI	%	95% CI	%	95% CI
Haemorrhage	O44-O46, O67, O72	38%	(34-41)	37%	(33-42)	30%	(17-44)	40%	(33-47)
Sepsis	O85-O86	11%	(9-14)	11%	(8-14)	17%	(6-28)	10%	(6-15)
Hypertensive Disorders	O10-O16	5%	(3-6)	4%	(2-6)	13%	(3-23)	6%	(2-9)
Obstructed Labour	O64-O66	5%	(3-6)	5%	(3-7)	9%	(1-17)	4%	(1-7)
Abortion	O00-O08	8%	(6-10)	10%	(7-12)	4%	(-2-10)	3%	(1-6)
Other Conditions	O20-O43, O47-O63, O68-O71, O73-O84, O87-O99	34%	(30-37)	33%	(29-37)	26%	(13-39)	37%	(30-44)

Source RGI

Programme officers' query: Is death due to haemorrhage high in EAG and others because of delays and poor access to delivery care and low in South due to less delay and more effective treatment because of higher institutional delivery?

Obstetrician's answer: Yes, this is the likely explanation.

Programme officers' query: Why such high sepsis and hypertension and obstructed labour in South in spite of better ANC and inst delivery?

Obstetrician's answer: Women have ANC and so PIH is recognised. Primipara form half of all deliveries in Southern states; hence PIH rates may be higher. Women are delivering in hospital so sepsis, PIH and Obstructed labour are correctly identified and certified as causes of death.

SUCH DIALOGUES SHOULD BECOME A ROUTINE FEATURE

Table 5: Causes of Maternal Deaths from 2001-03 Special Survey of Deaths

Maternal Causes	ICD-10 Code	India		EAG and Assam		South		Other	
		%	95% CI	%	95% CI	%	95% CI	%	95% CI
Haemorrhage	O44-O46, O67, O72	38%	(34-41)	37%	(33-42)	30%	(17-44)	40%	(33-47)
Sepsis	O85-O86	11%	(9-14)	11%	(8-14)	17%	(6-28)	10%	(6-15)
Hypertensive Disorders	O10-O16	5%	(3-6)	4%	(2-6)	13%	(3-23)	6%	(2-9)
Obstructed Labour	O64-O66	5%	(3-6)	5%	(3-7)	9%	(1-17)	4%	(1-7)
Abortion	O00-O08	8%	(6-10)	10%	(7-12)	4%	(-2-10)	3%	(1-6)
Other Conditions	O20-O43, O47-O63, O68-O71, O73-O84, O87-O99	34%	(30-37)	33%	(29-37)	26%	(13-39)	37%	(30-44)

Prog officers: Why such high abortion deaths in EAG ?

Obstetricians: We do not know; perhaps because of lack of facilities for both safe abortion and contraception

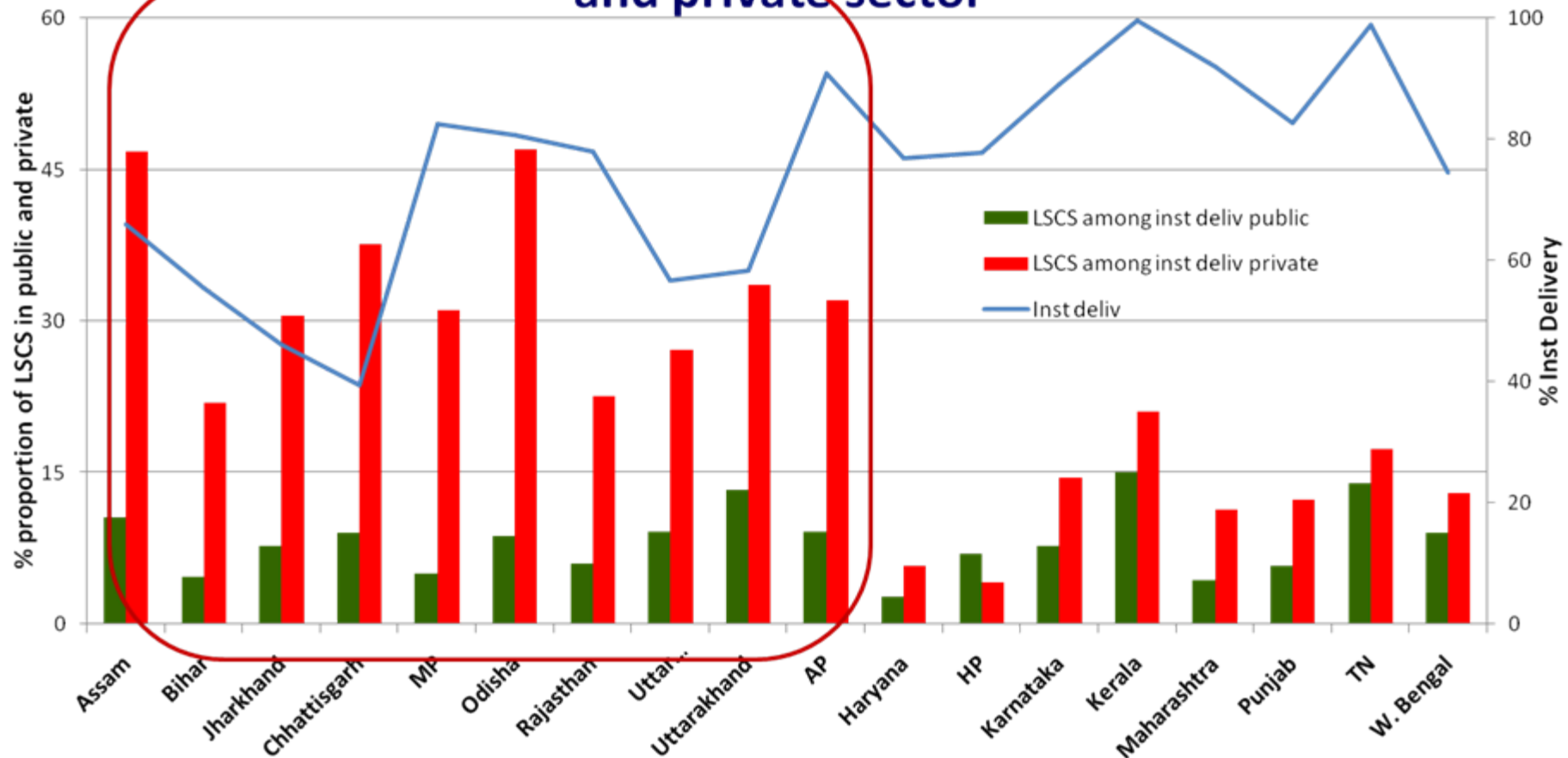
Prog officers: Deaths due to Sepsis, PIH and Obstructed labour are low in EAG states; that is a good sign.

Obstetricians: This may be because majority do not have ANC or institutional delivery and so actual cause of death cannot be clearly ascertained and such deaths may get clubbed under other causes.

CORRECT ASCERTAINMENT OF CAUSE OF DEATH IS CRITICAL FOR INITIATING APPROPRIATE INTERVENTIONS; USE OF PARAPROFESSIONALS IN SURVEYS FOR COLLECTION OF TECHNICAL DETAILS MAY HELP IN IDENTIFYING ACTUAL CAUSES AND HELP MID-COURSE CORRECTION.

QUALITY OF INTRAPARTUM CARE

Proportion of LSCS in Institutional delivery in public and private sector



In recent years there has been tremendous concern over high CS rates and its potential adverse consequences on mother & baby. CS has an increased risk of neonatal, infant and also maternal mortality. WHO expert committee with large number of experts from India recommended that CS rates should not exceed 15% in any country or population; majority of developed countries have CS rates of about 45% - 50%.

In India there have been studies which showed CS rates in some states especially in private institution was as high as 50%. In the last few years the potential adverse consequences of such high CS rates on maternal & child health through professional bodies and academic publications.

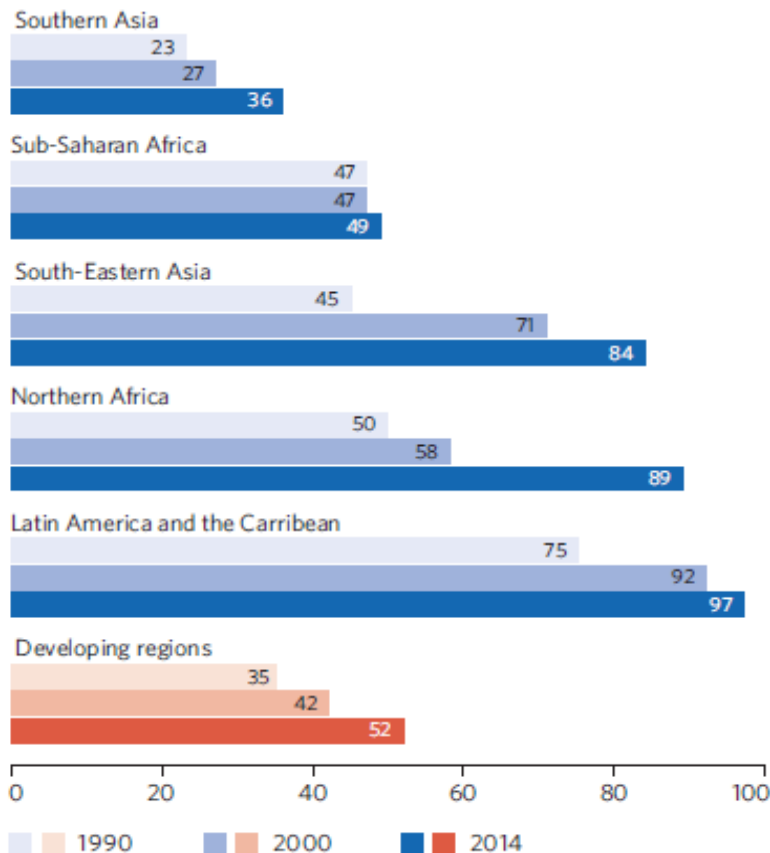
Some of the data from DLHS IV/AHS show that CS rates in better performing states with high institutional delivery both in public and private sector has moderated. However among the poorly performing states the CS rates especially in the private sector is still a problem. This needs to be combated with more awareness both among the professionals and the public.

ACCESS TO REPRODUCTIVE HEALTH SERVICES

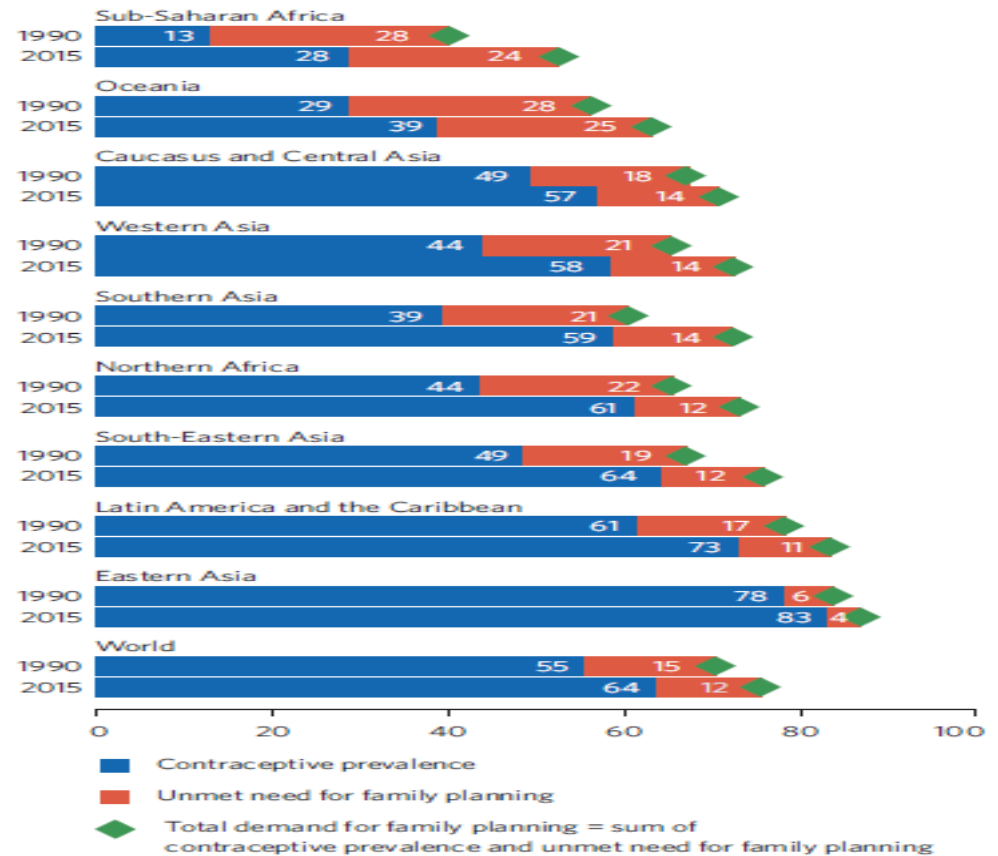
TARGET

UNIVERSAL ACCESS TO REPRODUCTIVE HEALTH CARE

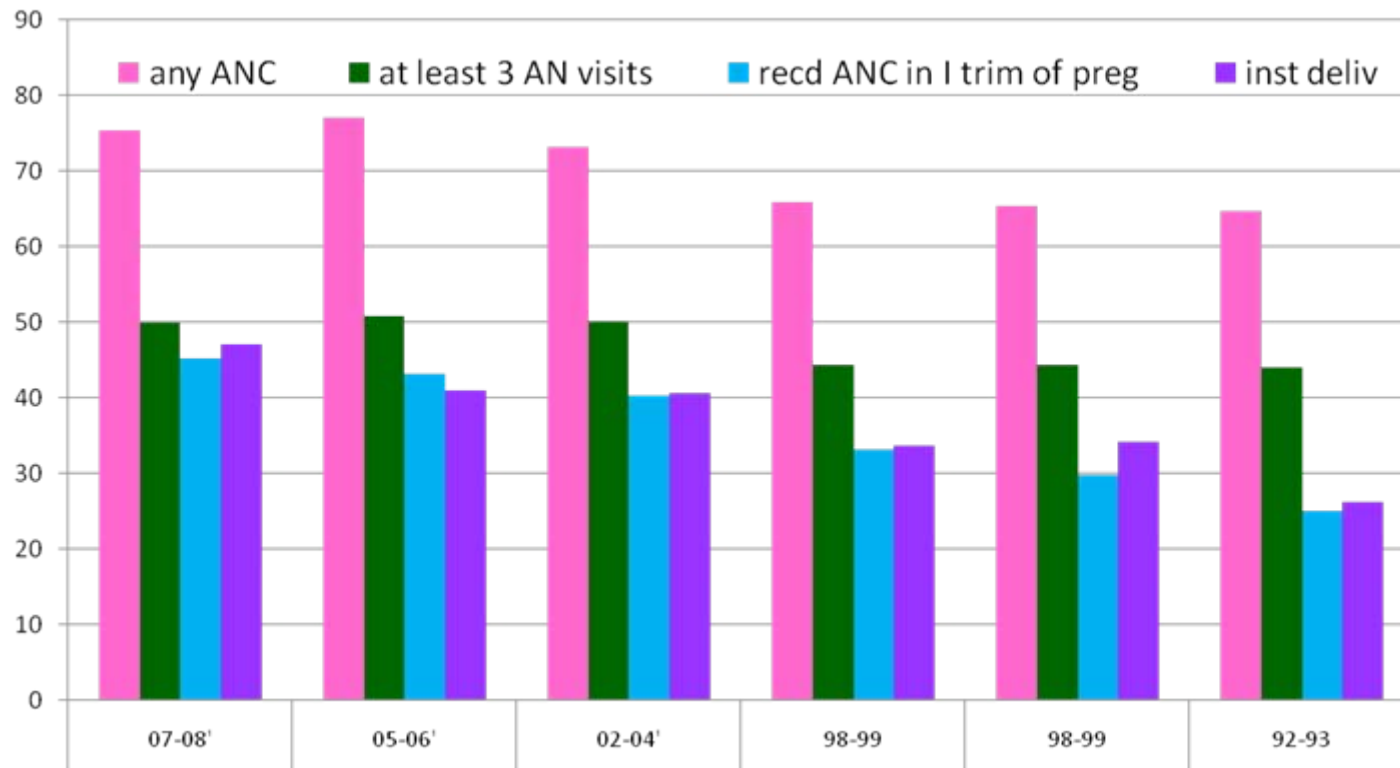
Proportion of women aged 15-49 attended four or more times by any provider during pregnancy, 1990, 2000 and 2014 (percentage)



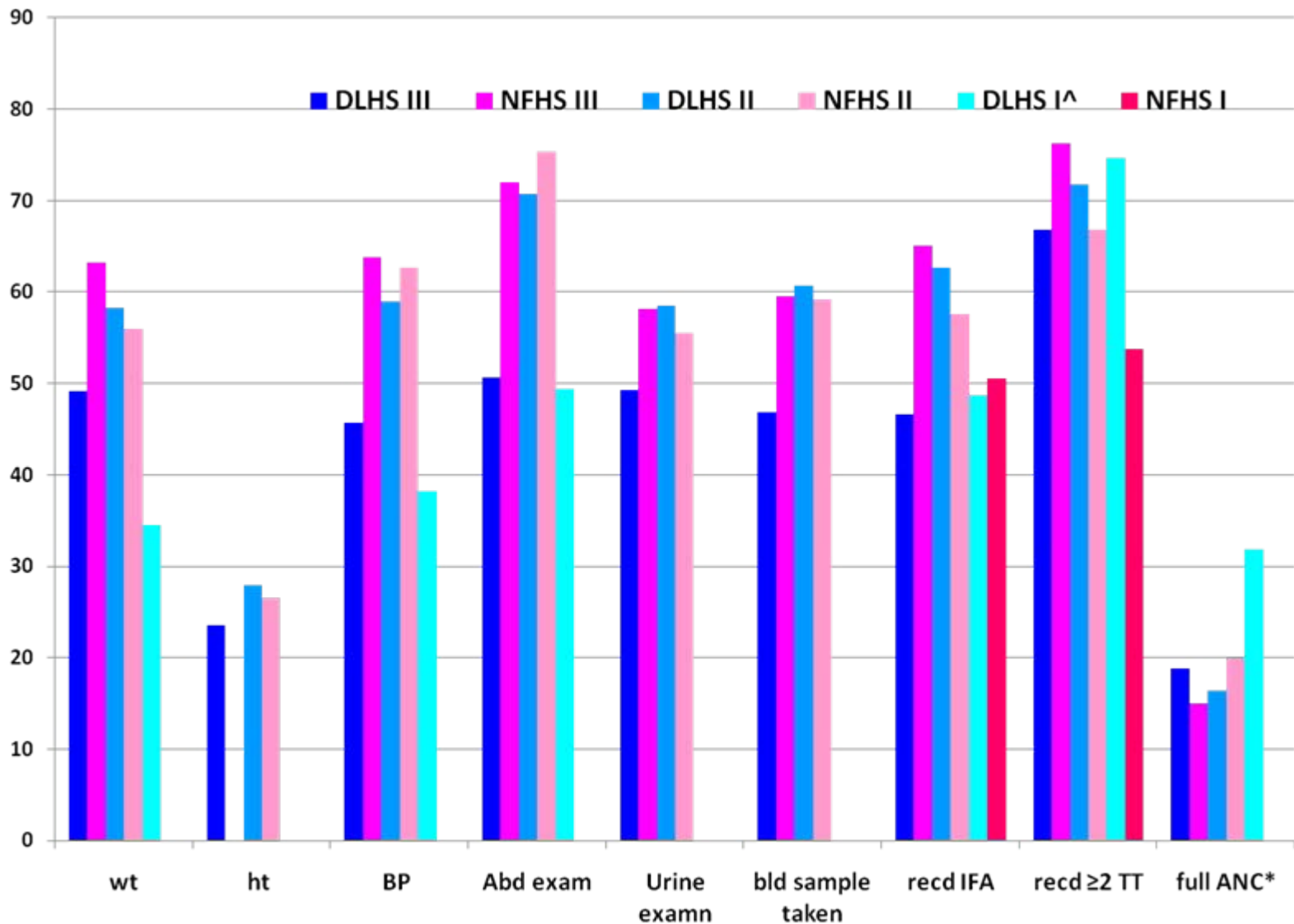
Proportion of women aged 15-49 worldwide, married or in union, who have an unmet need for family planning or who are using any method of contraception, 1990 and 2015 (percentage)



Over years there has been improvement in the access to antenatal care and access to contraception
 However the MDG of universal access to reproductive health services has not been achieved.



All surveys indicate that there has been substantial improvement in antenatal care and institutional deliveries



Over time there has been an improvement in the content of care
 But whether this lead to early diagnosis of problems and
 appropriate treatment has to be ascertained

Status of some major indicators related to maternal health			
Indicators	DLHS II 2002-04	DLHS III 2007-08	CES 2009
Mothers who received any ANC %	73.6	75.2	89.6
Mothers who had 3 or more ANC %	50.4	49.8	68.7
Mothers who had full ANC check-up %	16.5	18.8	26.5
Institutional Delivery %	40.9	47	72.9
Safe Delivery %	48	52.7	76.2
IFA consumed for 100 days %	20.5	46.6	
Mothers who received post natal care within 2 weeks after delivery %		49.7	60.1
Source MoHFW			

Further reduction in MMR would require improvement in content of antenatal care (weight, BP and abdominal examination to be done at every visit, Hb estimation by accurate method) and appropriate management of problems detected – (appropriate dose of oral iron/or IM iron therapy for treatment of anemia, detection and management of PIH and gestational diabetes as well as other obstetric complications like malpresentations etc.

Deliveries attended by skilled personnel DLHS IV & AHS

Better performing states DLHS IV

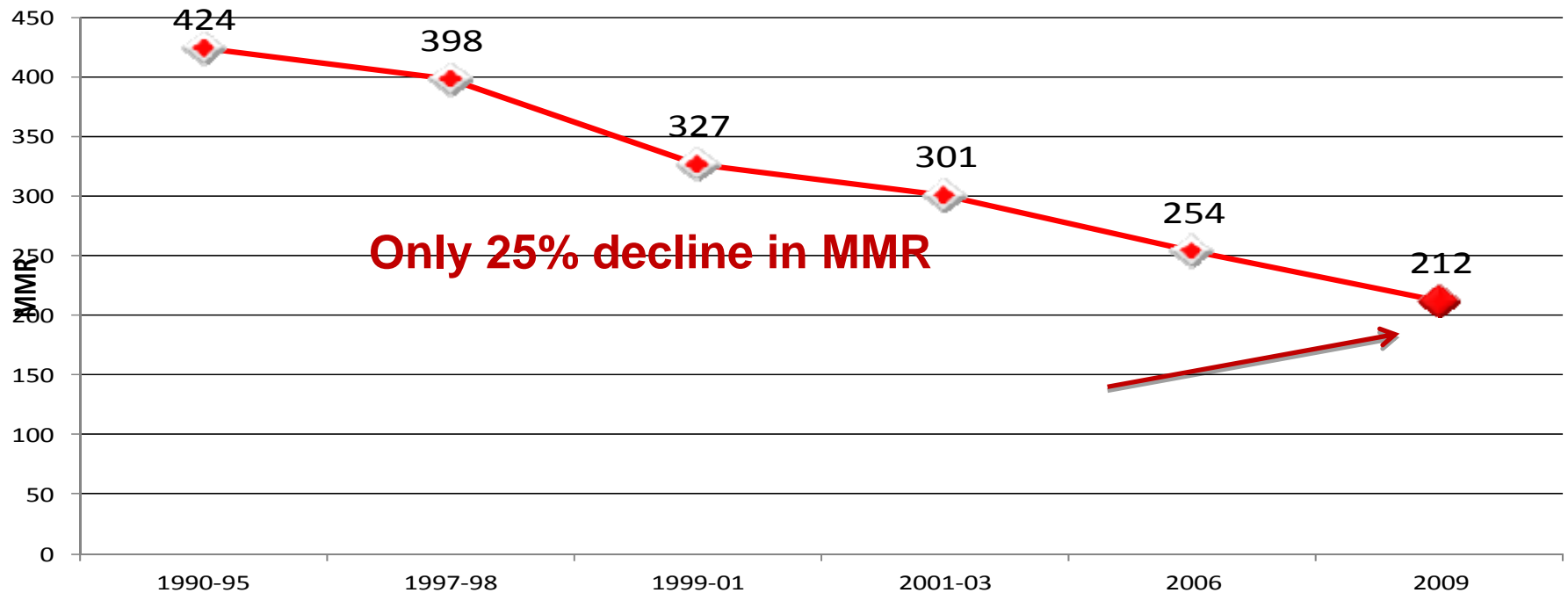
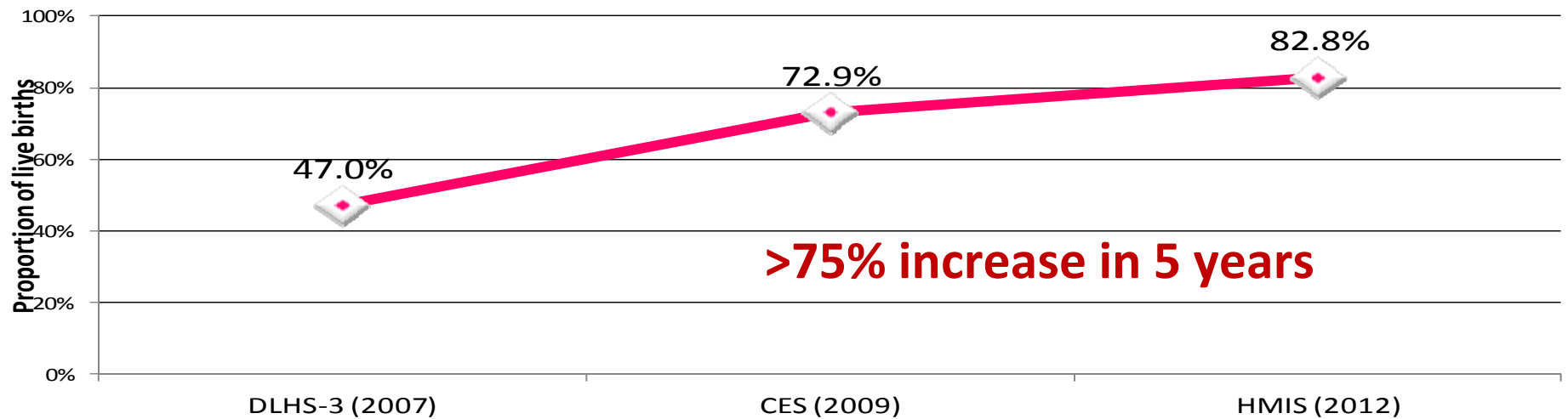
State	Total	Rural	Urban
Kerala	99.7	99.5	99.9
Tamil Nadu	99	99	99
Andhra Pradesh	94.9	93.5	97.7
Himachal Pradesh	93.5	92.8	100

Poor performing states AHS

Bihar	64.5	63.0	78.1
Assam	71.6	68.9	87.9
Uttar Pradesh	63.3	61.5	71.6
Madhya Pradesh	89.2	87.1	94.5

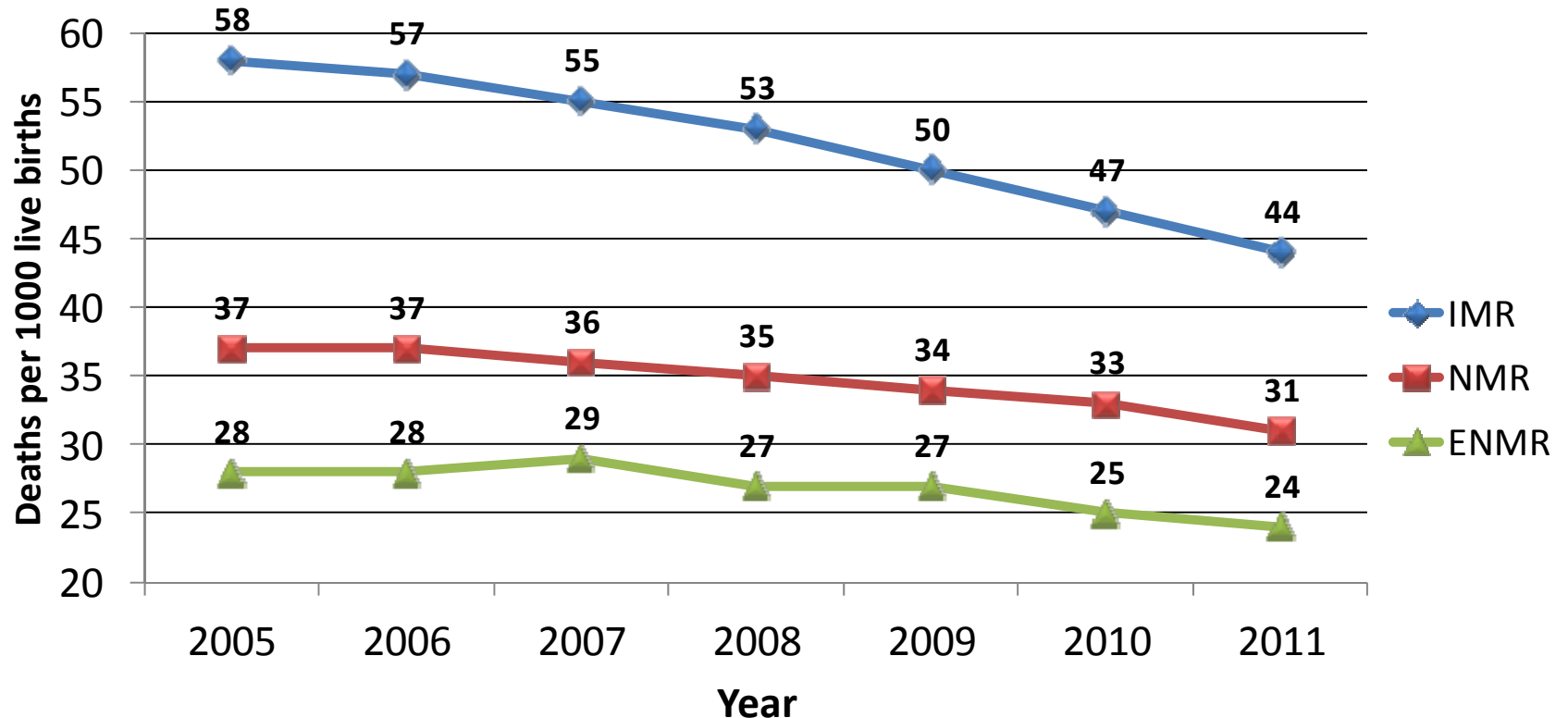
There are large variation in institutional delivery between states and also between various socio-demographic factors like place of residence. Kerala and Tamil Nadu have near universal delivery by skilled personnel with practically no variation between urban and rural population.

Need to aim for universal institutional delivery with near elimination of variation by any socio-demographic factors.



Institutional delivery rates increased after JSY but MMR decline was not commensurate with the increase in institutional delivery rates

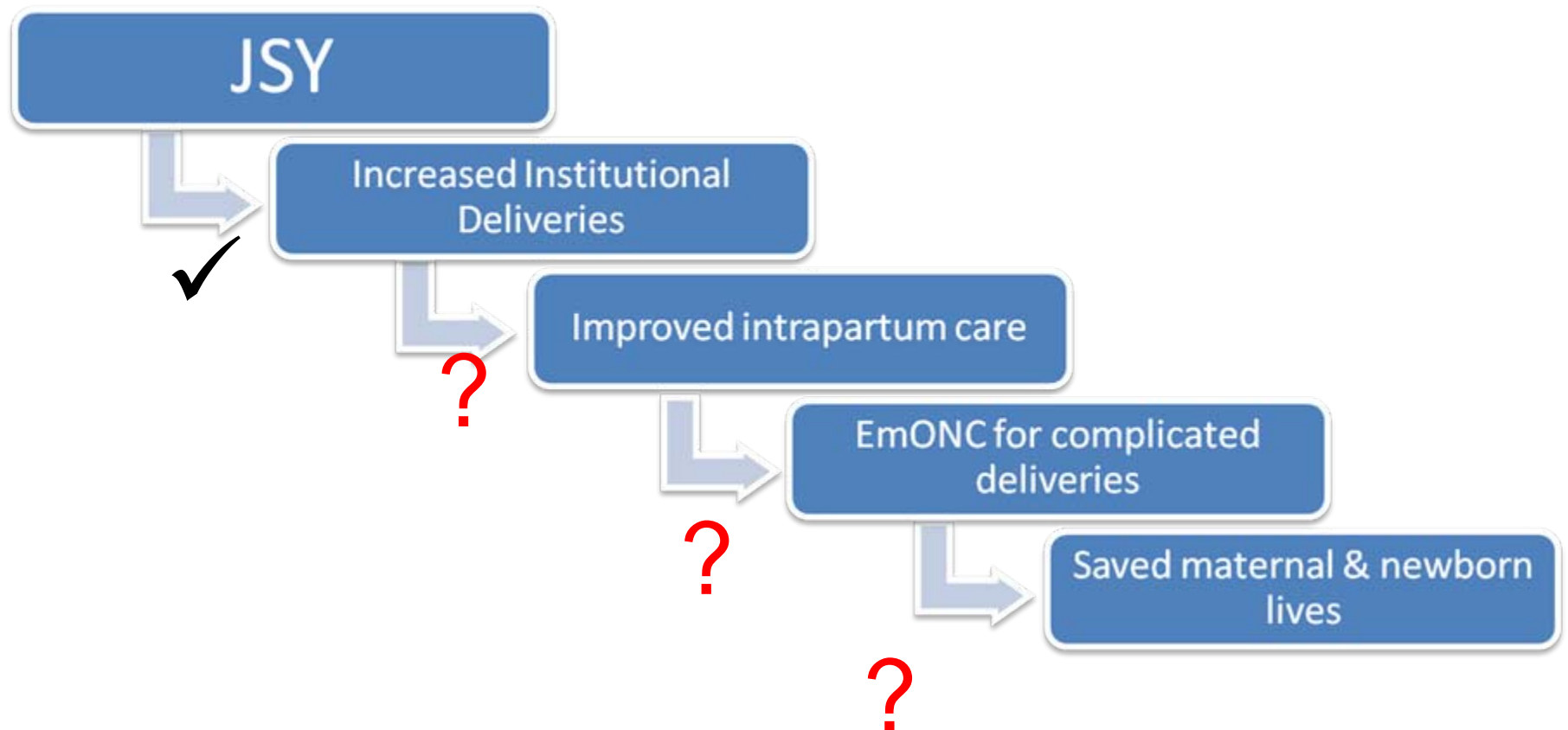
Decline in ENMR is even lower; there is a need to improve quality of care (both antenatal and intrapartum)



~ 15% decline in NMR and ENMR in the corresponding period

What went wrong?

Expected result chain after JSY



INDIA: OUTCOME OF INCREASED INSTITUTIONAL DELIVERIES

Why is there little association between institutional delivery and MMR in India???

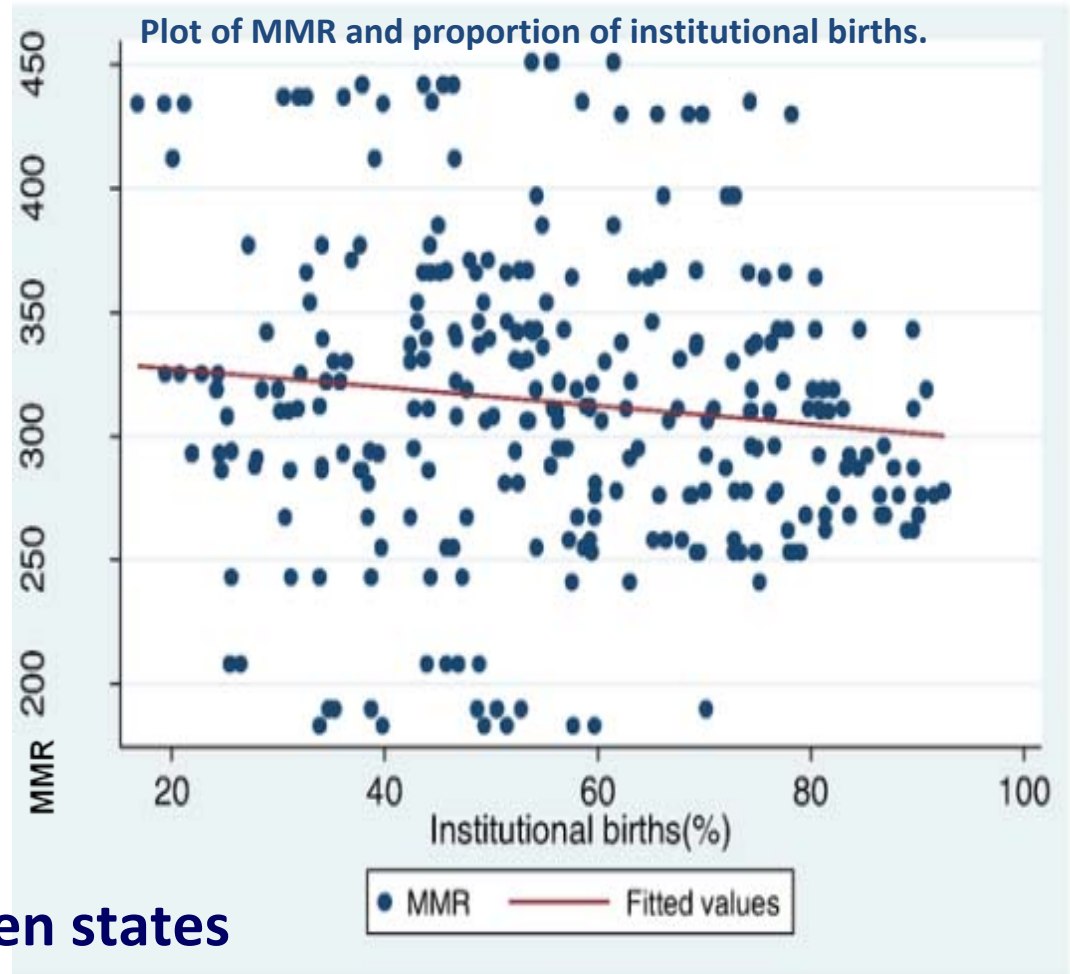
Randive B, Diwan V, De Costa A (2013) India's Conditional Cash Transfer Programme (the JSY) to Promote Institutional Birth: Is There an Association between Institutional Birth Proportion and Maternal Mortality?. PLoS ONE 8(6): e67452.
doi:10.1371/journal.pone.0067452
<http://www.plosone.org/article/info:doi/10.1371/journal.pone.0067452>

The reasons may include:

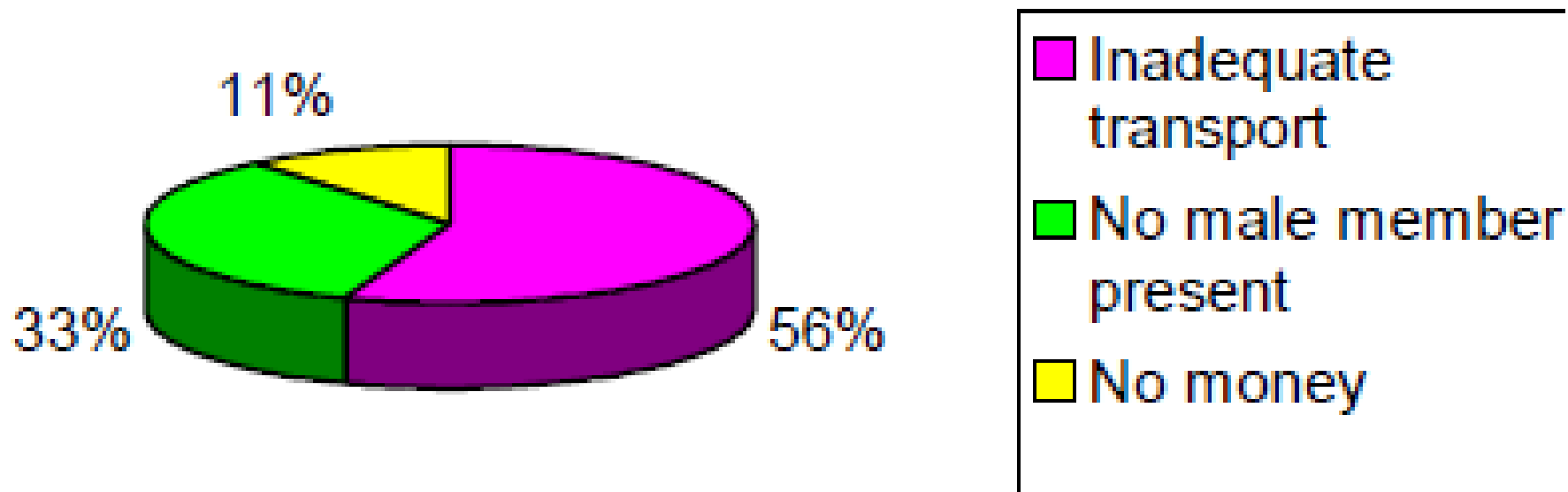
➤ **massive differences between states**

- **in the content and quality of institutional delivery**
- **Coverage, content and quality of antenatal care varies**

➤ **Poor referral either in antenatal or intra-partum period leading to 'at risk' women not reaching the institutions that can provide needed care**



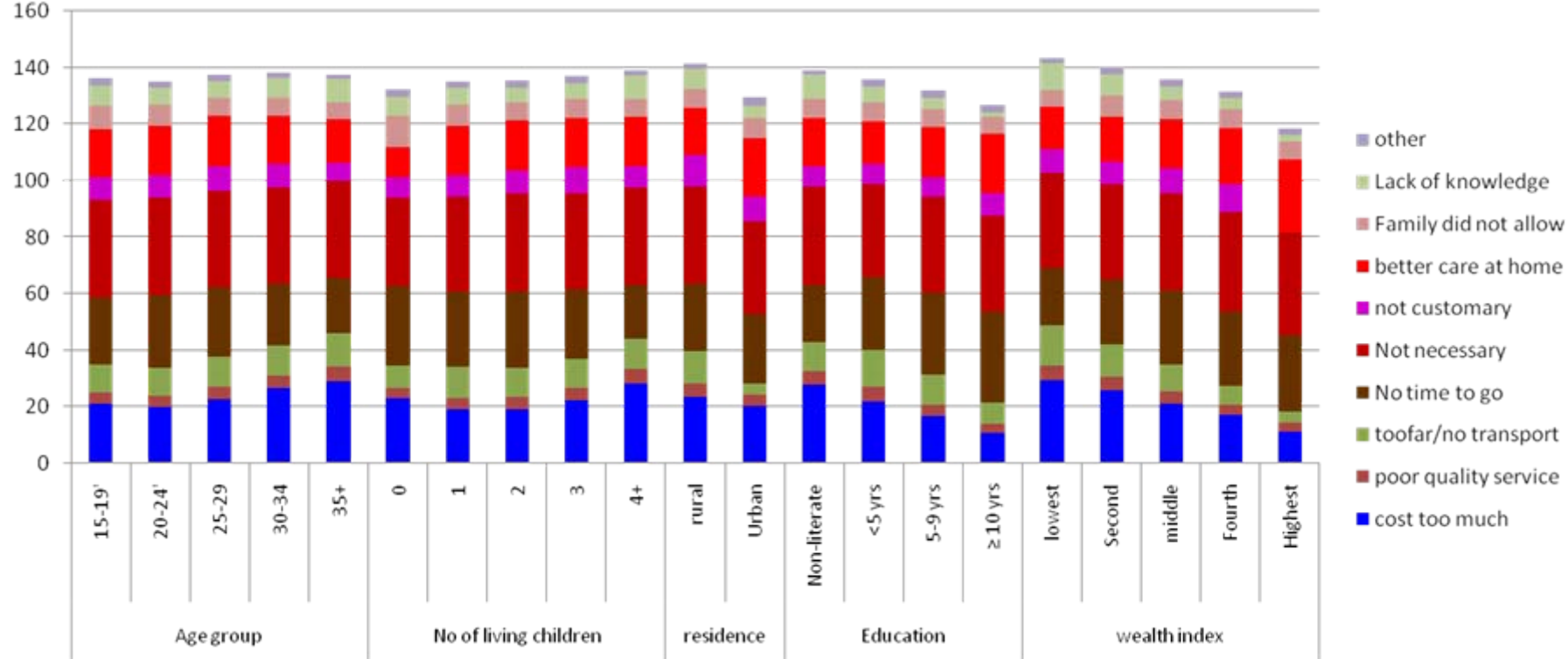
CAUSES OF DELAYS WHICH LED TO DEATH



Data from earlier national surveys have reported that inadequate transport is a major problem which led to delays resulting in death.

JSY was initiated to cope with these problems.

The impact of JSY in reducing the delays due to lack of transport or lack of money can be assessed from the AHS/DLHS.



As per DLHS III inadequate transport is not a very significant factor for not opting to go to institutions for delivery; major causes are 'not necessary' and 'no time to go' across age, parity residence and wealth indices. If so why did instn delivery go up subsequent to JSY need to be analysed in detail using raw data of AHS/DLHS IV.

Data need be provided by the MoHFW/IIPS/ORGI early so that the analysis is not just an academic study but is of use for programmatic corrections to be suggested and considered.

OPPORTUNITY IN WAY AHEAD

No of facilities in		
	1990	2015
Sub-centre	130165	153655
PHCs	18671	25308
CHCs	1910	5396

Position in 2015	
S/C with at least one ANM	145231
PHCs 24X7	9173
other health facilities above S/C but below block level functioning 24X7	2273
CHCs 24X7	4494
Facilities other than CHC at or above Block level but below District Level functioning 24X7	1691
DH	763
Number of District level Health Facilities other than District Hospital	289

Source MoHFW Rural Health Statistics 2014; NRHM 2015



India has Done Difficult Part Better...

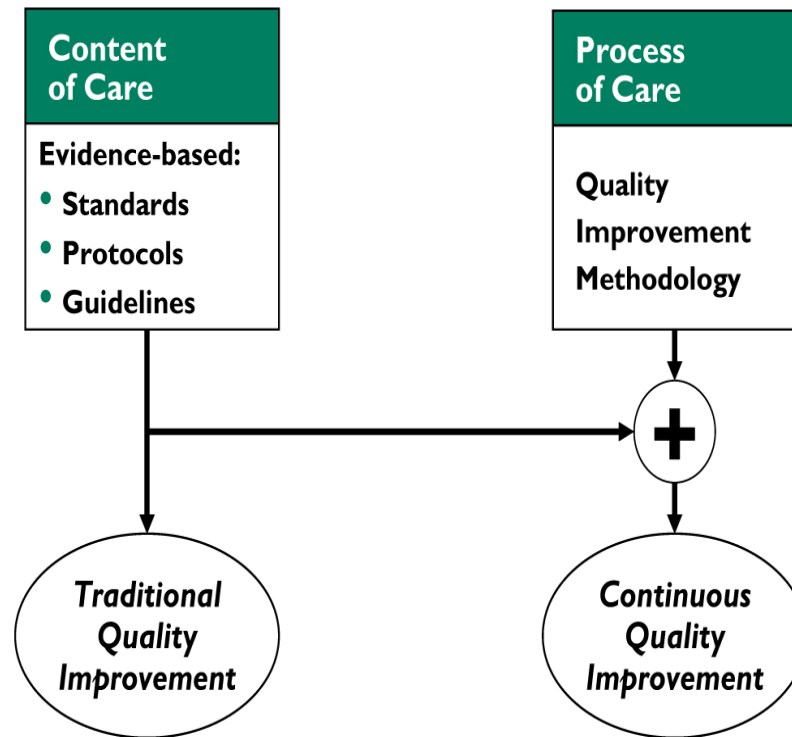
Globally gaps are more around institutional care and services around child birth

But...

India achieved institutional delivery of 73% in 2009

Integrating Content and Organization of Care

Quality Improvement Integrates Content of Care and the Process of Providing Care



Adapted from Batalden and Stoltz (1993)

WHAT HAS NOT BEEN ACHIEVED:

MMR target; RCH access;
Content and quality of services
Referral linkages

WHAT HAS BEEN ACHIEVED:

Significant improvement in facilities with infrastructure
(manpower; skills, equipment and consumables)
Significant improvement in coverage of services

We need to ensure optimal content and quality of care (identification of problems in pregnancy, labour and PN period and take appropriate action according to requirement) for attaining the goals of SDG.

This is achievable in the Indian context within India's resources.

India has in place the infrastructure, manpower with skills equipment and consumables required for the further improvement in maternal health indices to meet the SDG goals and targets. All that is required is to ensure that the health care system in both urban and rural areas function optimally as a system.

We can achieve this and show the world that it is possible to achieve good quality of health care at costs that are affordable to the individual, family state and the nation as a whole.

Thank You