Effect of home based child care & nutrition improvement program on child mortality and malnutrition in a tribal belt: Result of field cluster randomized control trial

Ashish Satav M.D.[1,2],

Abhijeet Bharadwaj D.Ch.[1],

Jayashree Pendharkar M.Sc.[1], Vibhawari Dani M.D.[1],

Kavita Satav M.S.[1,2], Yogesh Kalkonde M.D., M.Sc.[3],

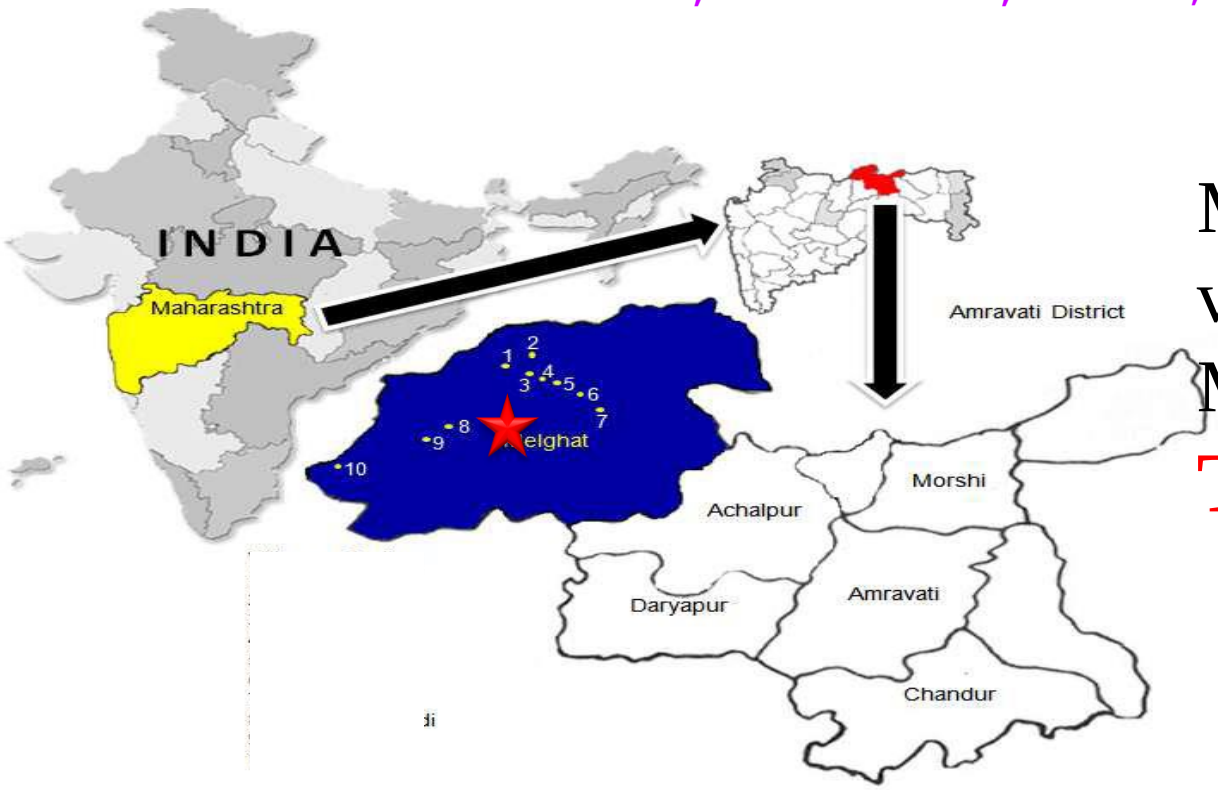
Annekoos Wiersinga (MD)[4]

1. MAHAN, Utavali ,

2. Kasturba Health Society, Sevagram 3. SEARCH , 4. Stichting Geron, Netherlands.

MAHAN

Meditation , Addiction , Health, AIDS, Nutrition

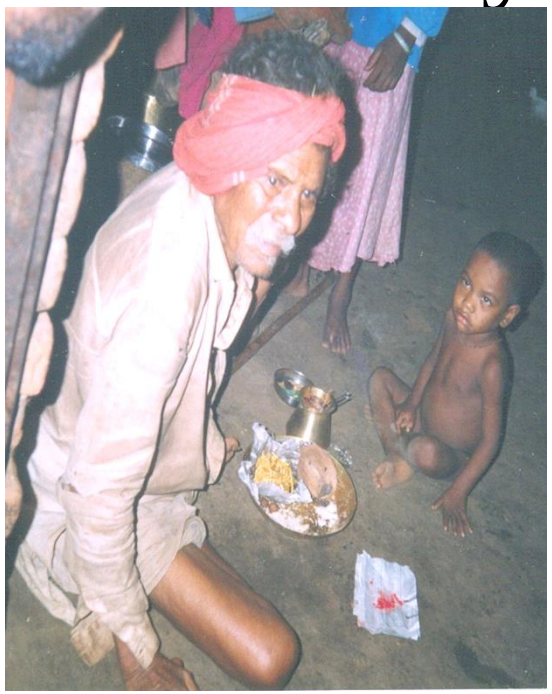


Melghat (320 villages) & Madhya Pradesh- **Tribal area.**

- Base hospital at Karmagram,
- 800 kms from Mumbai.



Why we are in Melghat ?





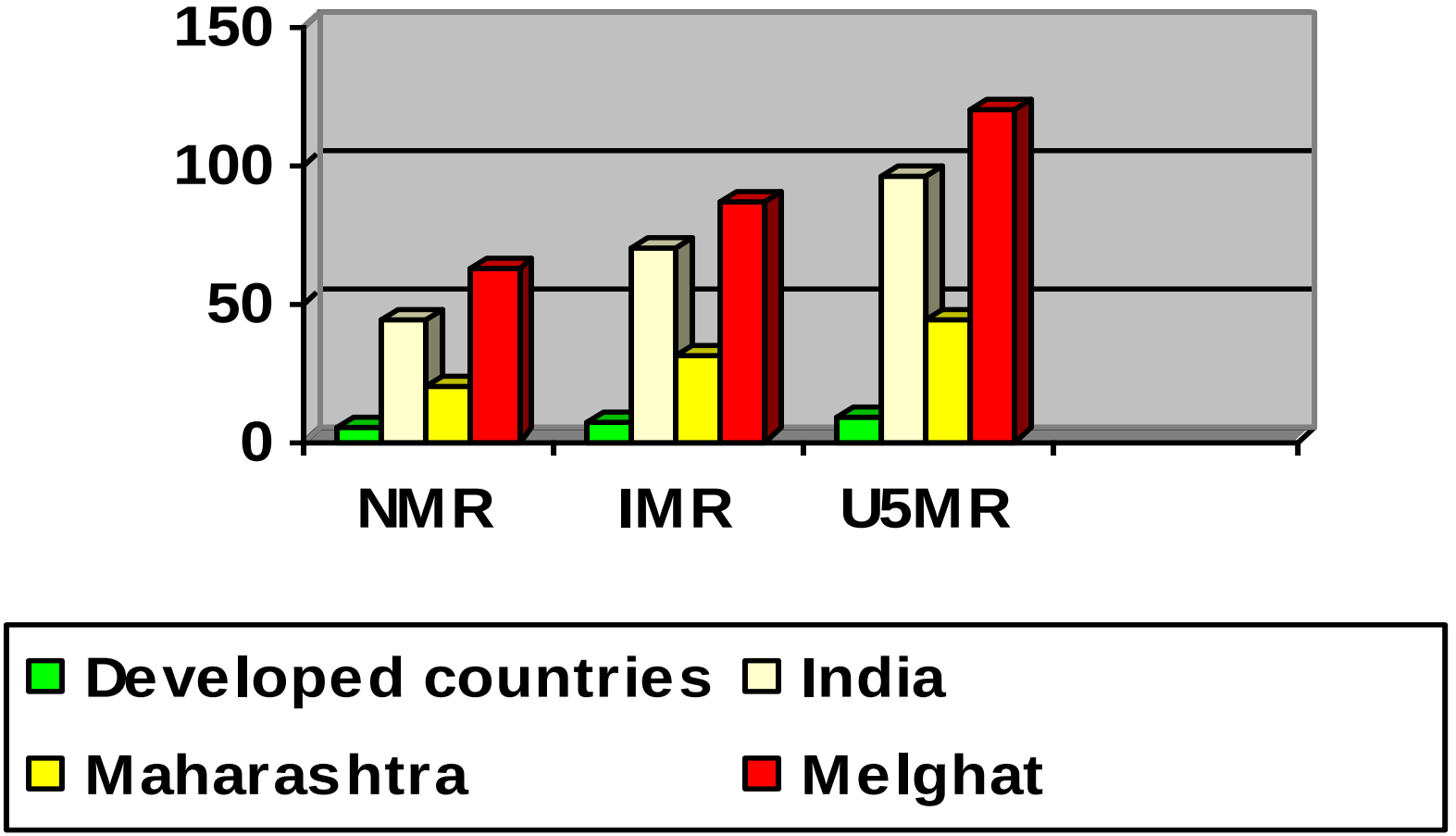
Damma

Traditional Health Care



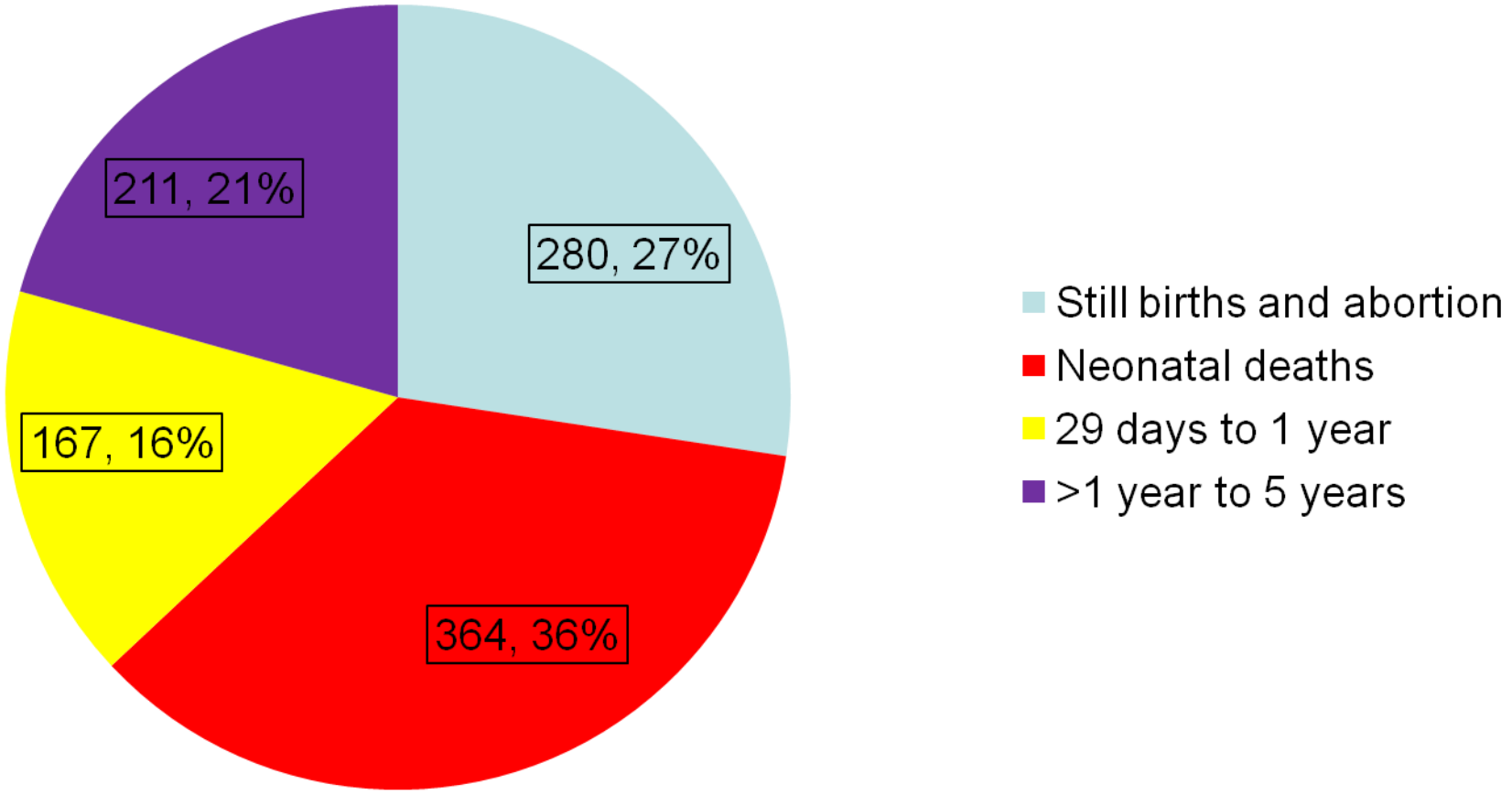
- Lack of proper Health facilities:(worst)in Melghat & superstitions.
- Tribal go to traditional faith healers/quacks (pujari & bhumkas) for treatment of illness.
- Very high child deaths & Malnutrition

Vital statistics (2004)

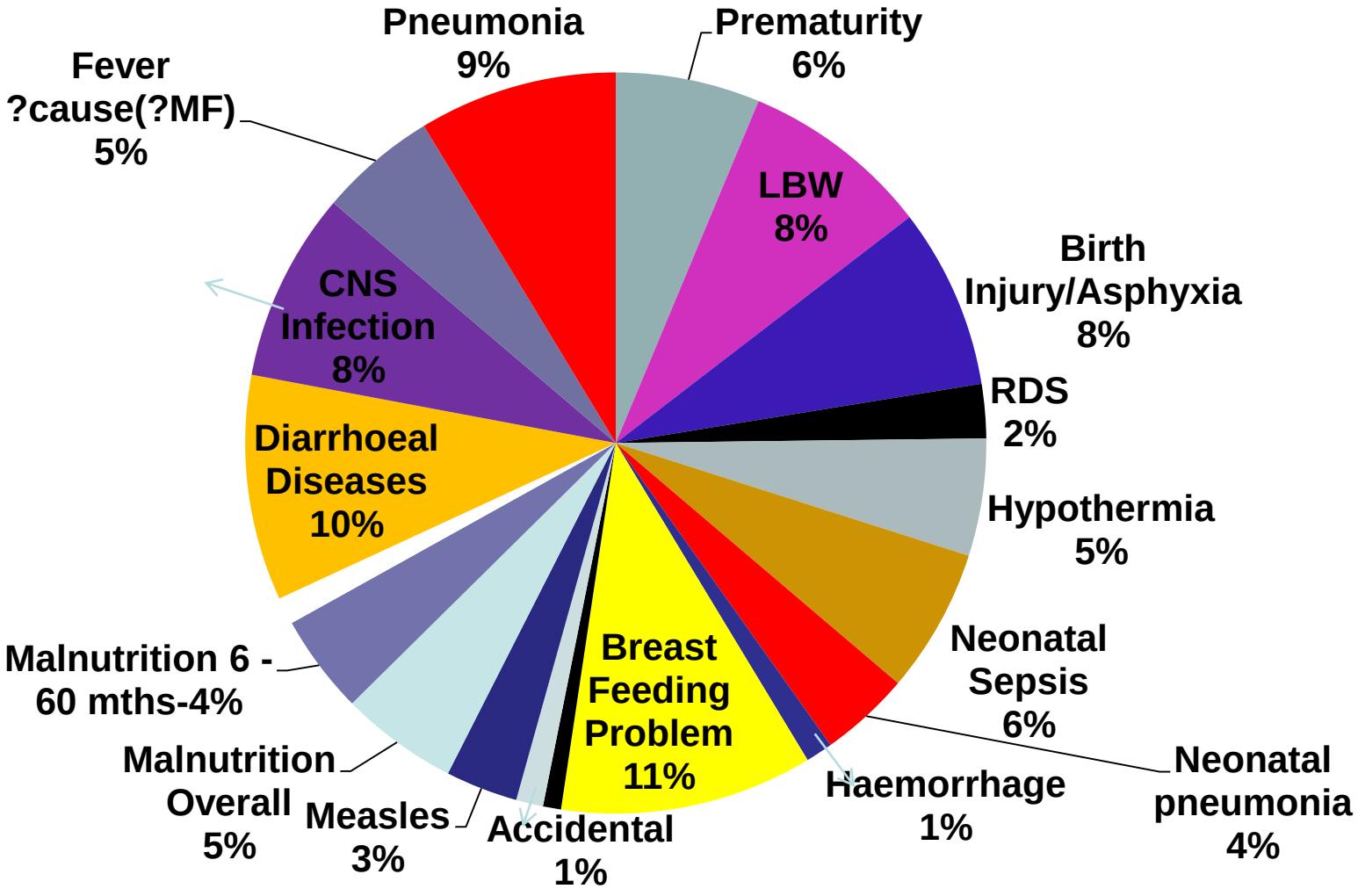


U5 C DEATHS : Age wise : 34 villages of Melghat : **2004-15**

N=1022



Causes of newborn, post Neonatal U5 C mortality : 2004 (Baseline)



Causes of high child deaths & malnutrition

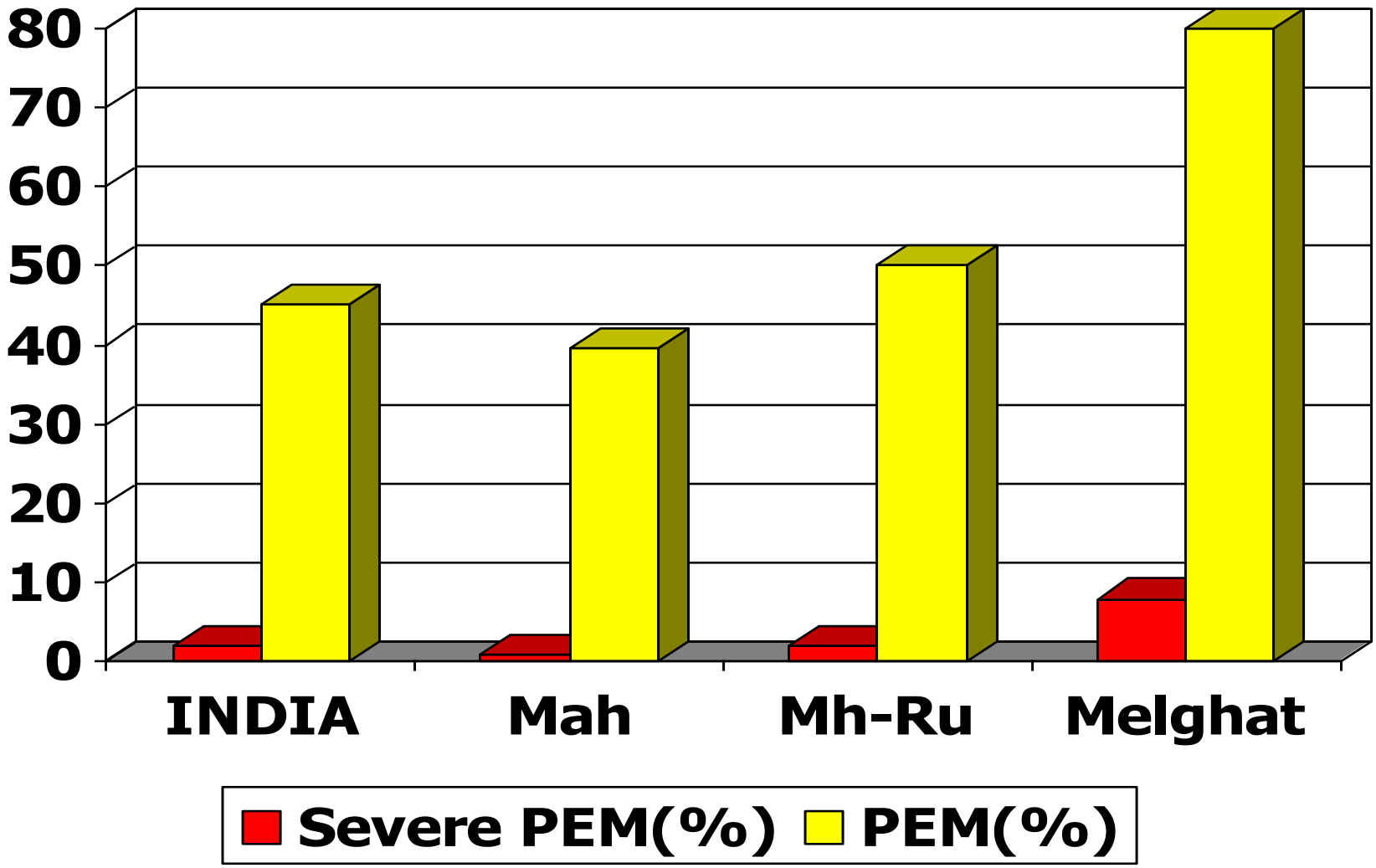
- Poverty
- Inadequate food
- Delayed complementary feeding
- Ignorance about health & nutrition(90%)
- Improper child care
- Unhygienic living conditions
- Lack of proper hospital facilities
- Early marriage age
- Unemployment
- Unapproachable villages

Causes of high child deaths & malnutrition : Big family size



Malnutrition status-baseline

(Ref: Bhavishya Alliance, Park-PSM, Dr. Satav.)



Why Home Based Child Care? HBCC

- Poor medical facilities in Melghat like:
  - no pediatrician at baseline.
  - M.B.B.S. Doctor -population ratio: 1:20000
  - Average distance of MBBS doctors-19 km.
  - No facilities for neonatal care.
  - No obstetrician, no facilities for cesarean surgery.
- Low health seeking behavior of tribal due to poor socio-economic conditions and superstitions.
- Lack of appropriate program to reduce child deaths and PEM.

Objectives

1. To reduce the Neonatal mortality rate , Infant Mortality rate & under 5 children mortality rate from 54, 90, 140 per 1000 live births respectively by at-least 35% in population of 14,120 of Melghat over a period of 3 years.

2. To reduce the prevalence of severe malnutrition (U5C) by at least 35%.

Hospital in beginning (1998-2007)







VHW Training -2004



Study design
Cluster Randomized Control Field Trial

	Intervention area	Control area
Villages	16	18
Population	14,120	16,310
Live Births (~)	2140	2365
C.B.R.	30.1	29.04
No. of U5 Children	3621	3973
% of U5 Children	11.9	11.3

Study Phases (2004-2010)

S. No.	Study Phases	Start of implementation
1	Baseline phase	Jan 2004
2	Post-neonatal disease management	May 2005
3	Normal & high risk neonatal care.	Nov 2006
4	Neonatal sepsis, birth asphyxia management & intensive nutrition education	May 2007

*** Interventions were implemented in the specified time periods and were continued subsequently.**

Inclusion Criteria

- All the births and deaths in the villages or in the hospitals. i.e. De-facto method.
- All children(<= 5 years) in the villages.

- **Exclusion Criteria**

  Deaths and births outside the villages.

Methods: Interventions

Home based child care by trained tribal female village health workers(VHWs)

- **Management of childhood illness:**

a. ARI, Diarrhea, Malaria , Malnutrition &

b. Neonatal diseases e.g. sepsis , birth asphyxia, hypothermia, low birth weight babies, premature babies, breast feeding problems.

- 7500 major illness : treated during study period

- **Normal neonatal care**

Methods: Interventions

- **Behavior Change Communication**
  a. Nutrition education
  b. Personal hygiene education
  c. Antenatal care education

- Govt. system mobilization

- Growth monitoring

Preventive Activities

Health education programme.



We conducted more than 2000 health education programs for more than 10000 people. Prepared CD & flipchart.

VHW Care Modified Kangaroo Mother Care







Vitamin K injection & Neonatal Sepsis treatment by VHW.



No episode of injection abscess after > 2500 injections.

Monitoring (indicators) & outcome measures :

1. Neonatal Mortality Rate
2. Infant Mortality Rate
3. Under 5 Children Mortality Rate
4. Prevalence of severe Malnutrition
   - The trial measured the changes in outcome measures between two areas from their respective baseline
   - Interim analysis were done yearly
   - Treatment monitoring by medical supervisors (1/15 days)
   - Data monitoring : SEARCH & Government

Data Collection

1. Prospectively by VHWs and confirmed by vital statistics supervisors-continuous process

2. Retrospectively by independent set of surveyors and confirmed by vital statistics supervisors-every 6 monthly.

3. Government health and ICDS department.

4. Death and birth were confirmed from parents, sarpanch (Village head) & police patil.

Intervention Area

Comparison : baseline vs. end of intervention.

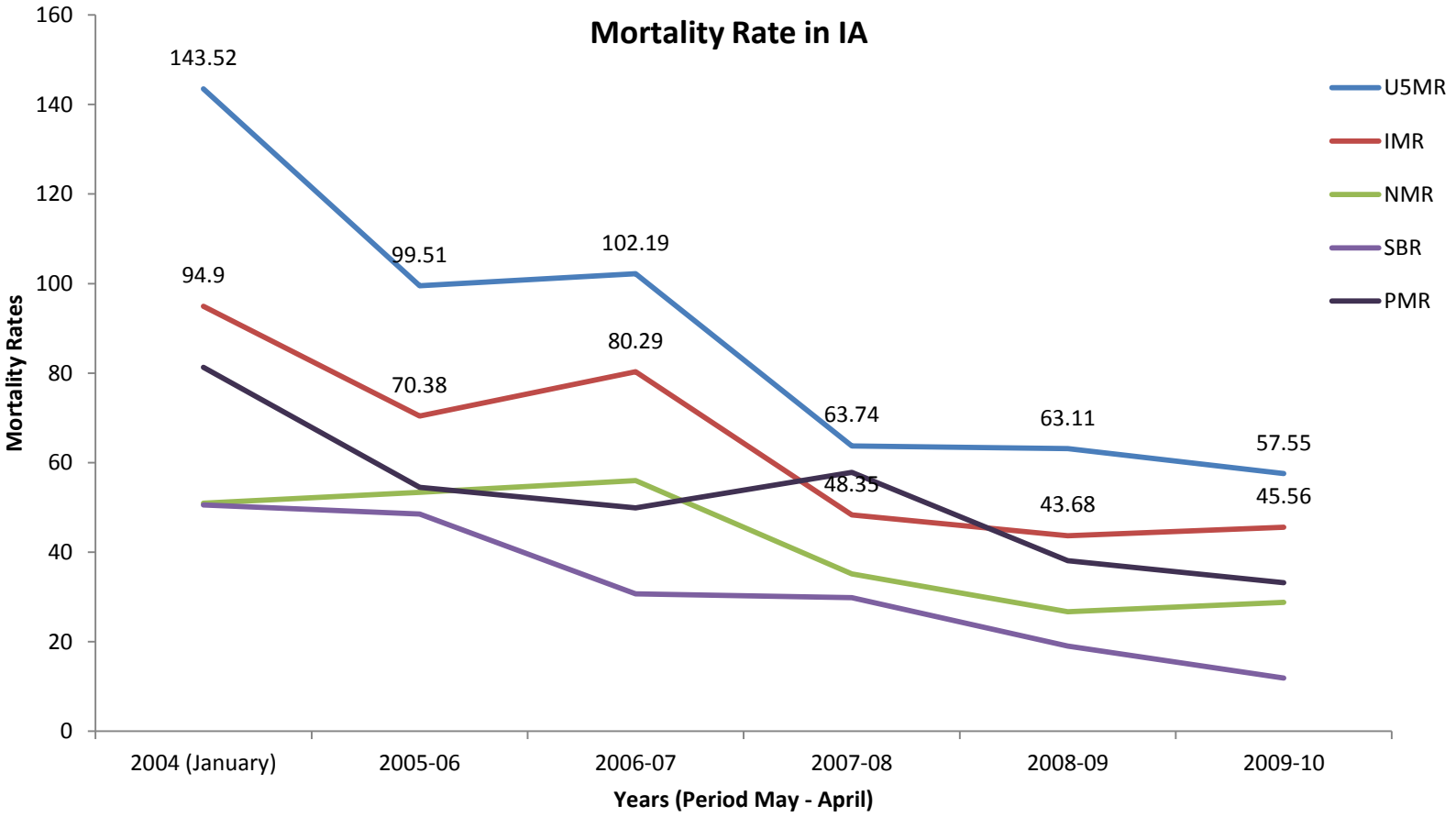
Indicators	Jan. to Dec. 2004	May 2009 to April 2010	Reduction in Mortality rates %	p value and (C. I.)
SBR†	50.55	7.13	-85.90	<0.001 (0.07, 0.02)
NMR	50.93	28.71	-43.63	<0.001 (0.05, -0.004)
PNMR‡	83.52	30.88	-63.03	<0.001 (0.08, 0.02)
IMR	94.91	45.45	-52.11	<0.001 (0.08, 0.02)
U5MR	143.52	57.42	-59.99	<0.001 (0.13, 0.05)
prevalence of SMC§	9.80%	3.63%	62.96	<0.001 (0.03, 0.01)

Intervention Area

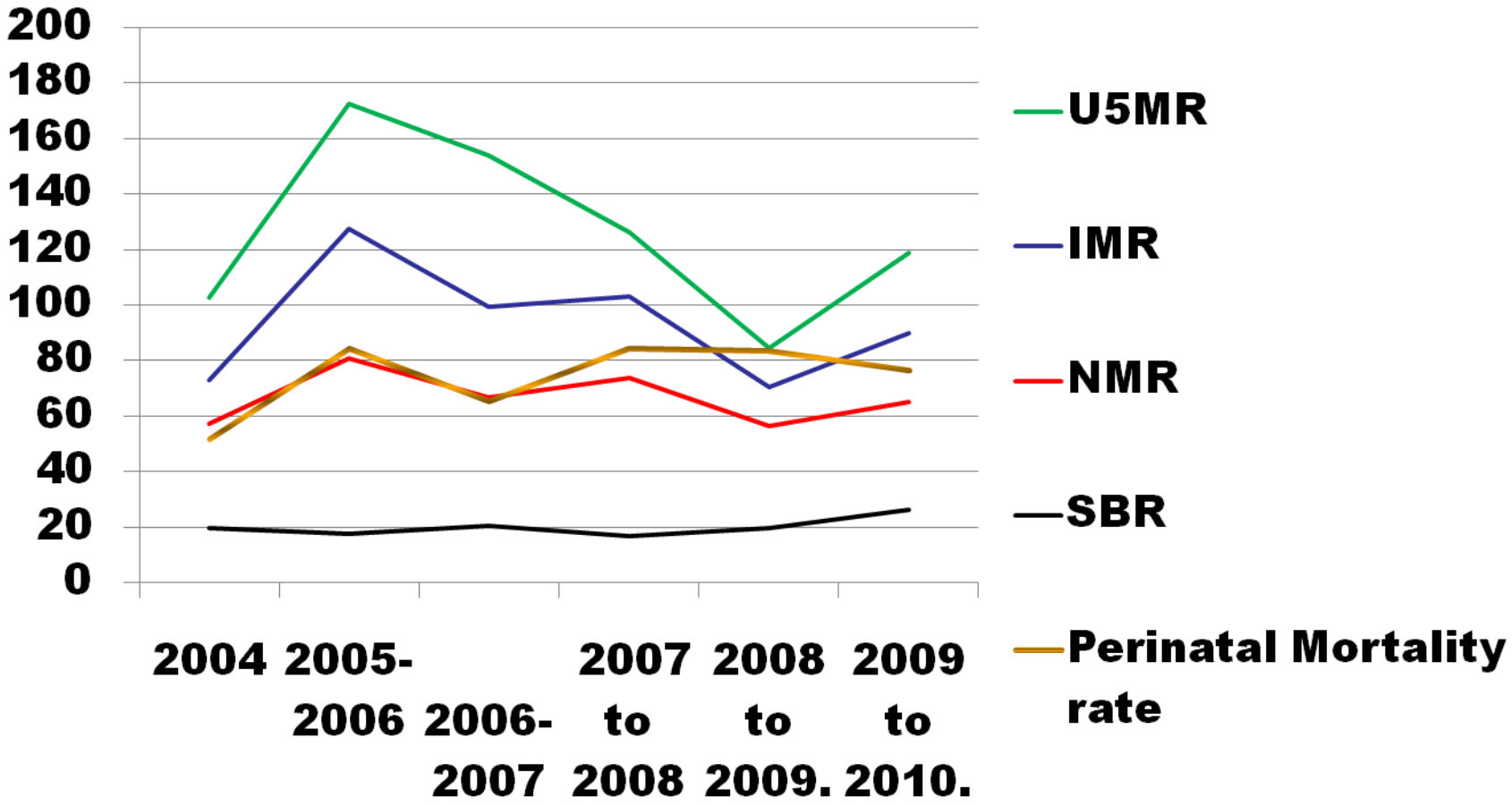
Comparison : baseline vs. end of service phase

Indicators	Jan. to Dec. 2004	Oct. 2014 To Sept. 2015	Reduction in Mortality rates %	p value and (C.I.)
SBR†	50.55	8.97	82.26	<0.001 (0.07, 0.02)
NMR	50.93	22.62	55.59	<0.001 (0.05, -0.004)
PNMR‡	83.52	22.42	73.16	<0.001 (0.08, 0.02)
IMR	94.91	45.24	52.33	<0.001 (0.08, 0.02)
U5MR	143.52	54.29	62.17	<0.001 (0.13, 0.05)
prevalence of SMC§	9.80%	3.64%	62.86	<0.001 (0.03, 0.01)

Changes in mortality rates in intervention area



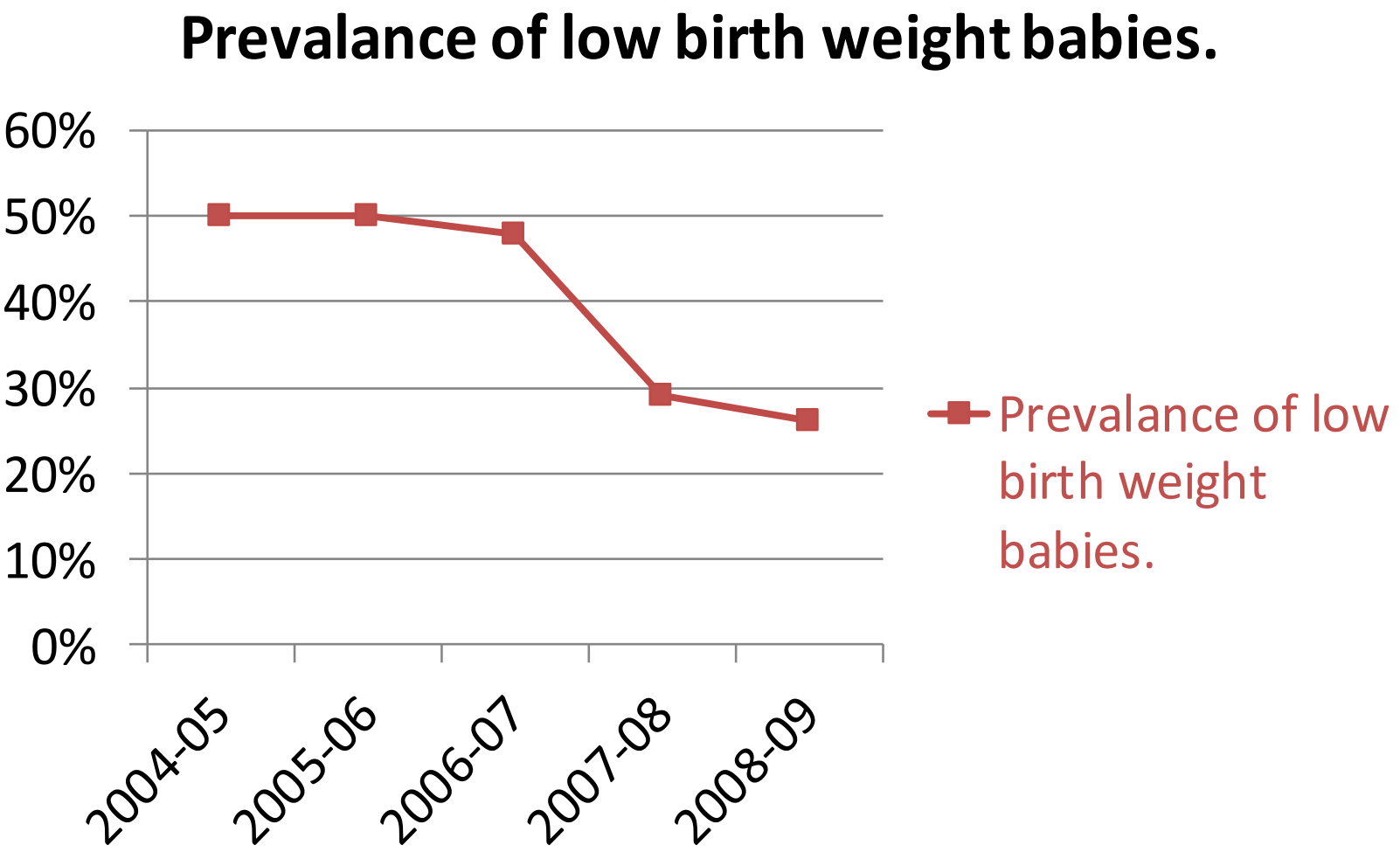
Changes in the mortality rates in the Control area



Change in prevalence of severe malnutrition in the intervention area



Change in prevalence of low birth weight babies in intervention area

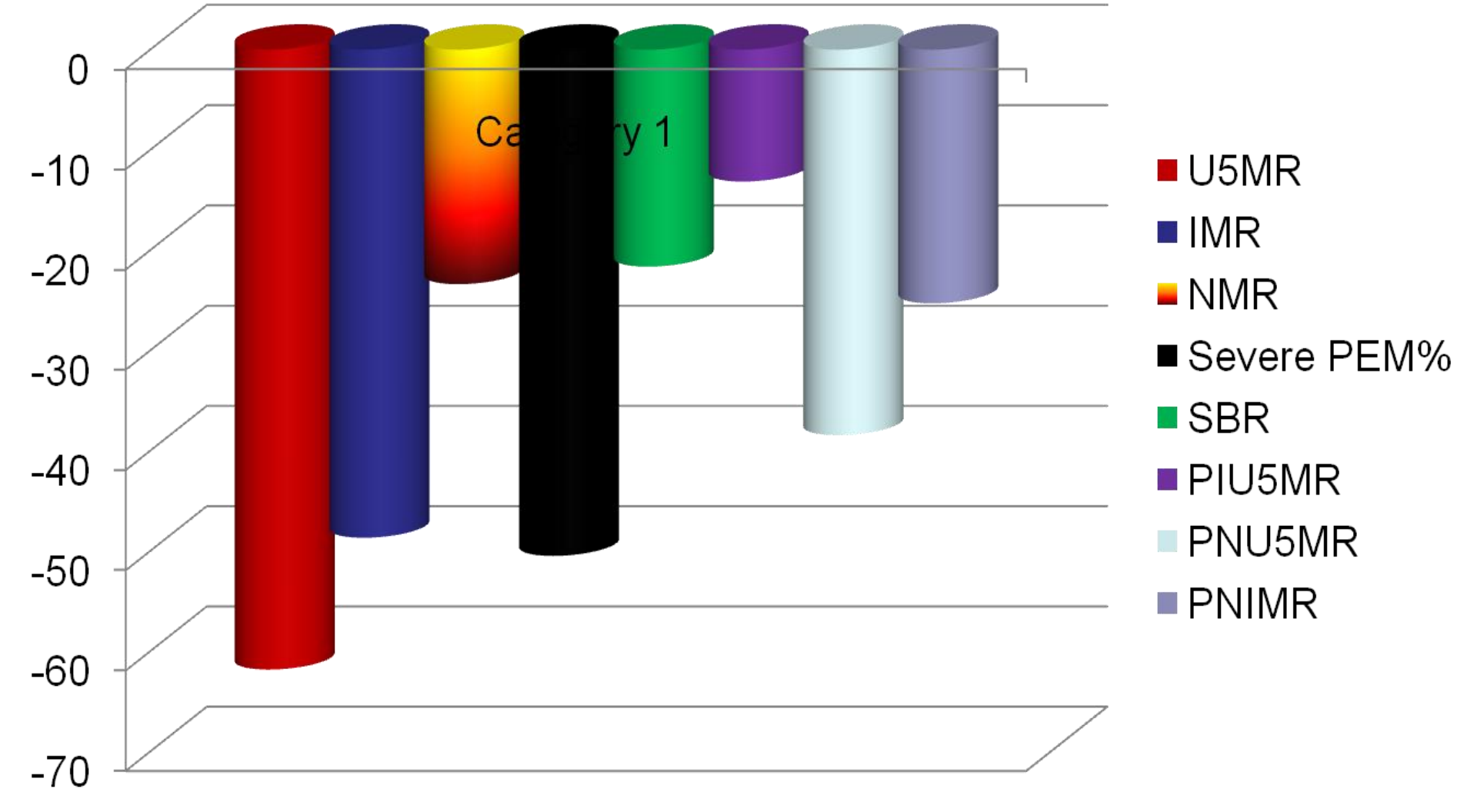


Net reduction in vital indicators from baseline to post intervention phase in IA vs. CA

Indicators	CA	IA	Net reduction in IA over CA.	p value
SBR	+35.44	-85.90	121.34	<0.0001
NMR	+7.24	-43.63	50.87	<0.0001
PNMR	+44.31	-63.03	107.34	<0.0001
IMR	+8.89	-52.11	61	<0.0001
U5MR	+8.83	-59.99	68.82	<0.0001
SMC	- 22%	-61.70%	39.70%	<0.0001

p values were calculated using Two-sample t test between percentages (t-statistic, degrees of freedom and 2 tailed p values were calculated

Net change in intervention area over control area during study period.



Improved behavior practices

Particulars	Baseline	After intervention
% of SMC receiving supplementary nutrition.	20-25	90
Initiation of Breast feeding within one hour of delivery.	<10%	85%
Presence of trained baby care taker during delivery.	<5%	>70%
Injection vitamin K to neonates	<5%	>85%
Aseptic precautions during delivery	<10%	>75%
Kitchen Garden-%(No. of houses)	<1.66%	>15%

Govt. Policy changes due to MAHAN

- Dissemination of Research, Analysis and Advocacy.
- Public Interest Litigation in state high court .
- Resulted into state govt. framing new policies and improving existing policies.

1)Proper surveillance for appropriate planning by state government:

- State Govt. Health & Nutrition Mission' and UNICEF, verified and accepted the MAHAN's surveillance report of severe malnutrition (>9%)& child deaths(IMR> 60/1000 live births) .

- State Govt. found similar findings in all tribal blocks.
-
- Impact:

1. State policies were changed for malnutrition management.
2. Benefitted >1 lakh severely malnourished children.

Malnutrition prevention and management

- **2) ‘Village Child Developmental Centres'** based on MAHAN model: implemented by govt. in Maharashtra since 2008-09.

- 3) **Fresh cooked food :** is being given in ICDS centres in Melghat Instead of Take Home Ration (prepared by industries).

- **4) ICDS Centers:** qualitative and quantitative improvement .

Expansion of criteria for management of severe malnutrition:

- 5) Hon. High Court of Maharashtra State directed state Govt. to use ‘SAM’ as well as ‘SUW’ criteria for management of severe malnutrition based on the scientific study in Melghat by MAHAN.

- **Replication of HBCC**
- in 59 tribal blocks of Maharashtra through Tribal mission

State Mother and Child Health and Nutrition Mission

- **RJMCHN Mission has been restarted** by government and UNICEF from 2011-12 due to directives by Hon. High Court in response to PIL by MAHAN and KHOJ.

- There was increment in the funds, number as well as rejuvenation of Village Child Developmental Centres & Child treatment centres in Maharashtra.
- It has benefitted >300000 severely malnourished children.

Antibiotics treatment by CHW (ASHA)

- Infectious disease mortality is very high in tribal area of Maharashtra due to lack of timely antibiotic treatment in villages.

- MAHAN participated and advocated state level policy making committee for ‘Antibiotic use by CHW ’ in community.

- Government empowered CHW to treat infectious diseases with antibiotic in tribal area.

Conclusions

- The study intervention resulted in **statistically highly significant reduction** in NMR, SBR, IMR , U5MR and prevalence of severe malnutrition, in intervention area.

- These results are **replicable** for reducing child mortality and malnutrition in other backward areas as it is safe, **affordable , acceptable, approachable & achievable with local manpower**.

Acknowledgement:

The study was supported by

A. Grants from

1. Stichting Geron & CORDAID -The Netherlands .
2. Tribal Development Department, Government of Maharashtra, India .
3. Caring friends.

B. Technical Guidance :

Dr. Abhay Bang, SEARCH, Gadchiroli.

C. Evaluation :

1. Baseline: Rajmata Jijau Women and Children, Nutrition and Health Mission of Govt. of Maharashtra and UNICEF.
2. Final : Government Medical College, Aurangabad. (PSM department).

Correspondence

Dr. Ashish Satav (M.B.B.S., M.D.)
President, MAHAN
Professor, MGIMS, Sevagram
Mahatma Gandhi Tribal Hospital, Karmagram,
Utavali, Dharni ,
Dist: Amaravati.-444 702, Maharashtra, India
Phone:91-9423118877, 91-7226-202291,
Email : drsatav@rediffmail.com


Thank you very much!