Overview of The Nutrition Status of Population In India and Disease Burden

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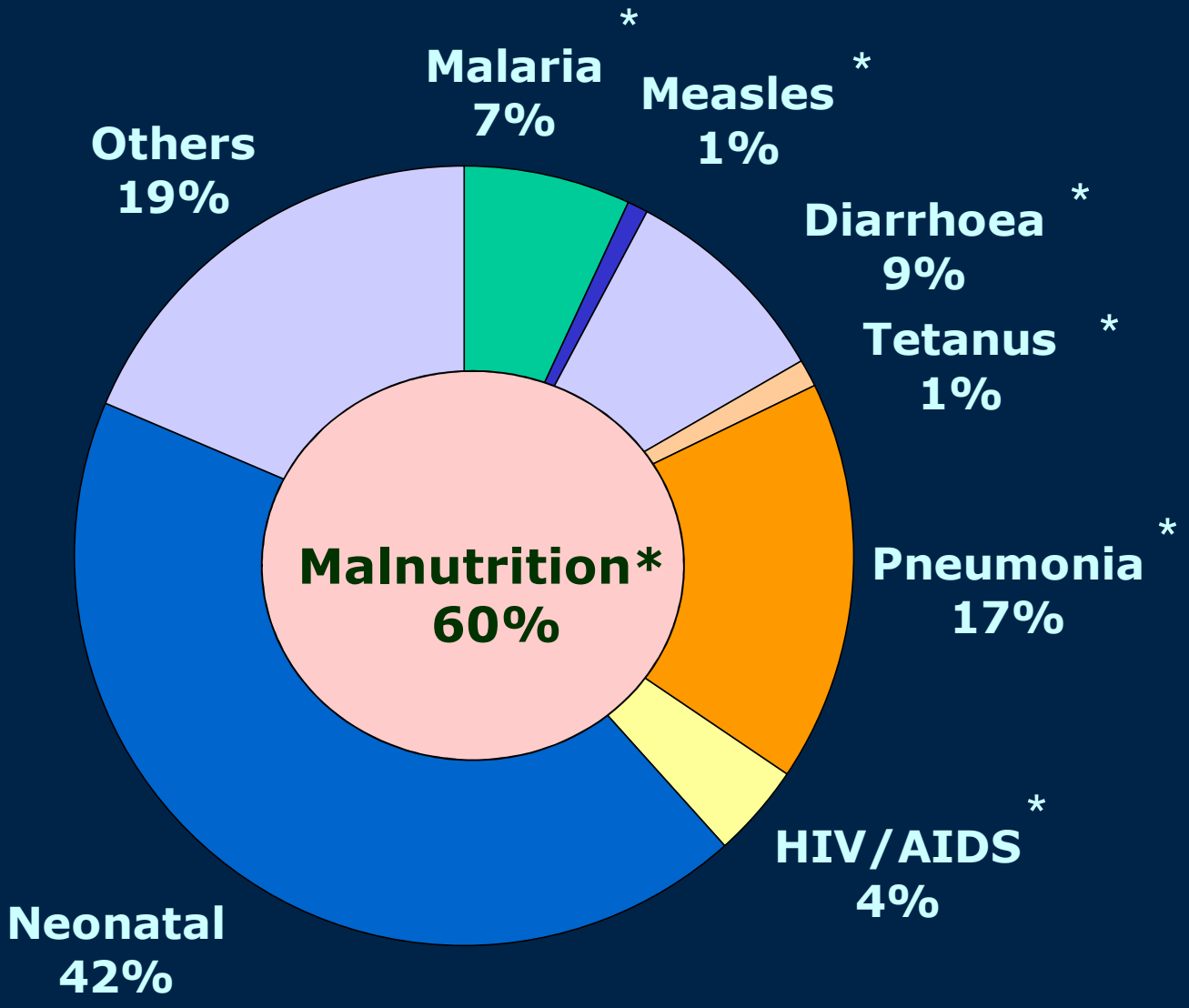
NUTRITIONALLY VULNERABLE GROUPS

- Infants and Young Children (<5 years)
- Adolescent Girls
- Pregnant & Lactating Women
- Elderly
- Socio-economically deprived Groups
  - Schedule Castes
  - Schedule Tribes
  - Communities in Urban Slum and Chronically drought prone rural areas

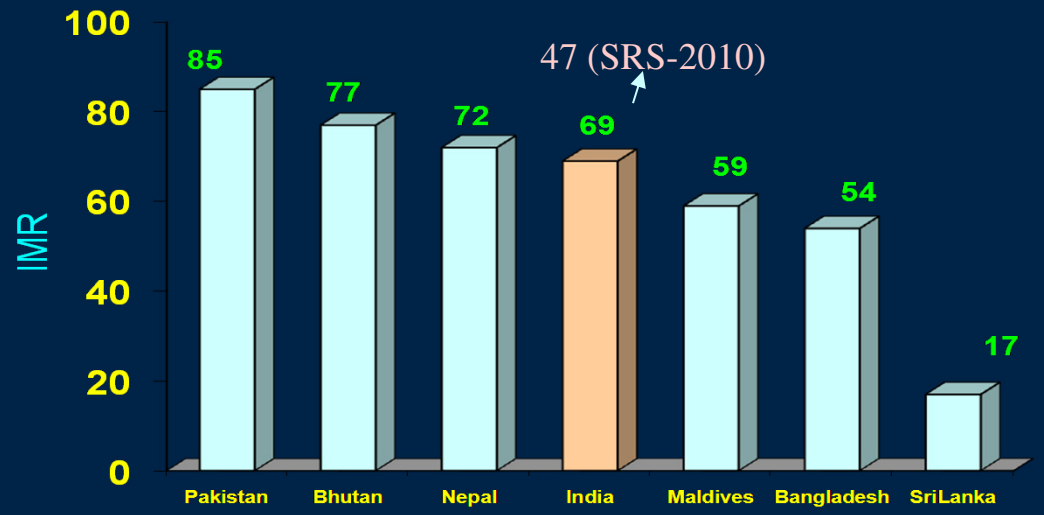
CAUSES OF DEATHS AMONG <5 YEAR CHILDREN IN DEVELOPING COUNTRIES



* Approximately 70% of all childhood deaths are associated with one or more of these five conditions

Source: UNICEF, 2010

Infant Mortality Rate (Per 1000 Live Births) in India and South-east Asian Countries

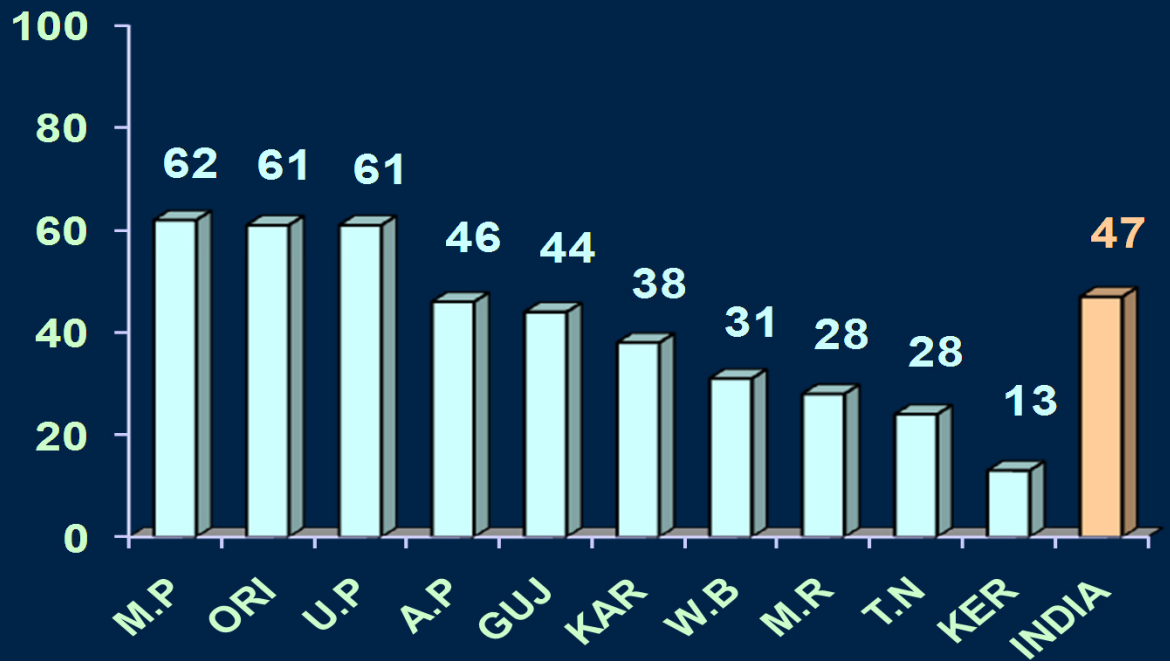


South-east Asian Countries

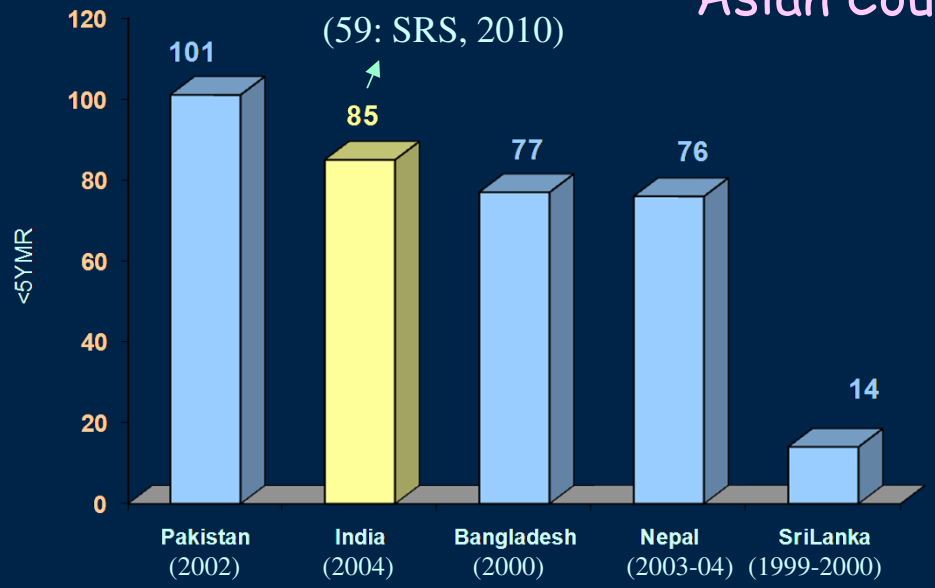
Source : WHO/SEARO 2000

India
(NNMB States)

Source: SRS, India - 2010



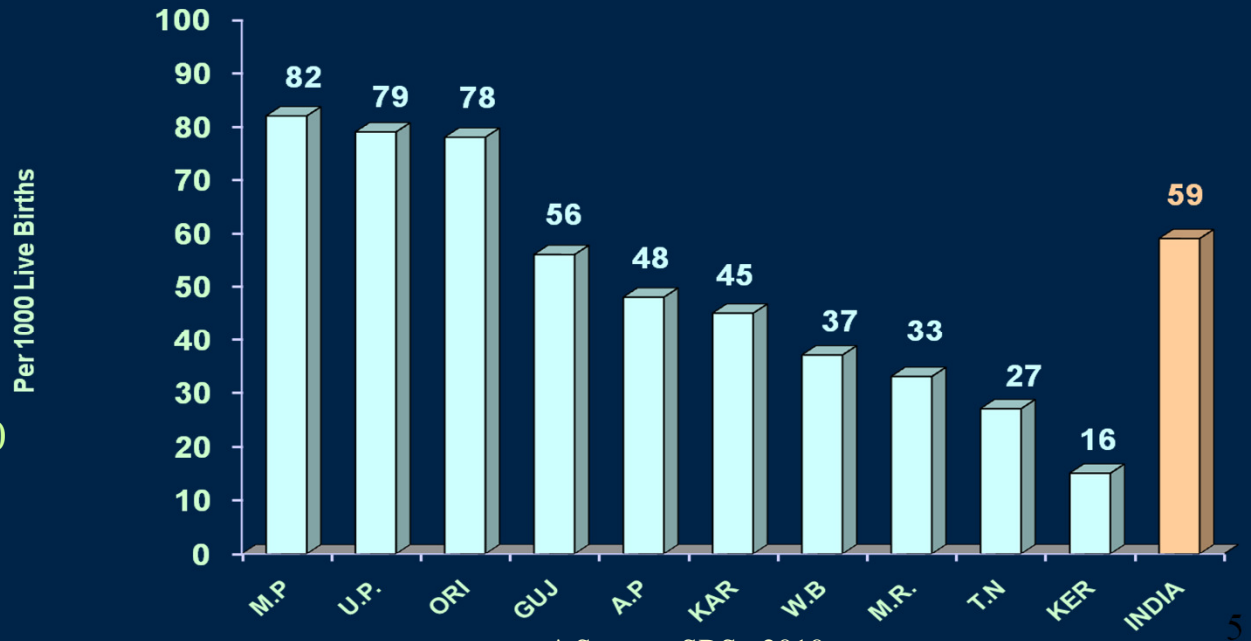
Under-five Mortality Rate (Per 1000 Live Births) in South-east Asian Countries & India



South-east Asian Countries

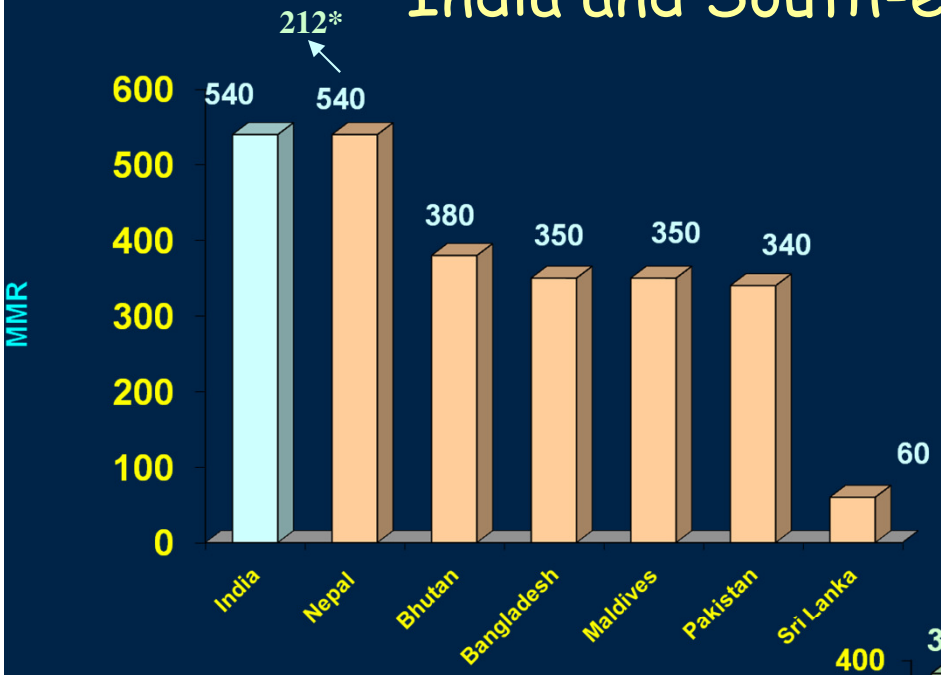
Source : World Development Report 2007

India
(NNMB States)
Source: SRS, India - 2010



* Source: SRS, 2010

Maternal Mortality Ratio (Per 100,000 Live Births) in India and South-east Asian Countries

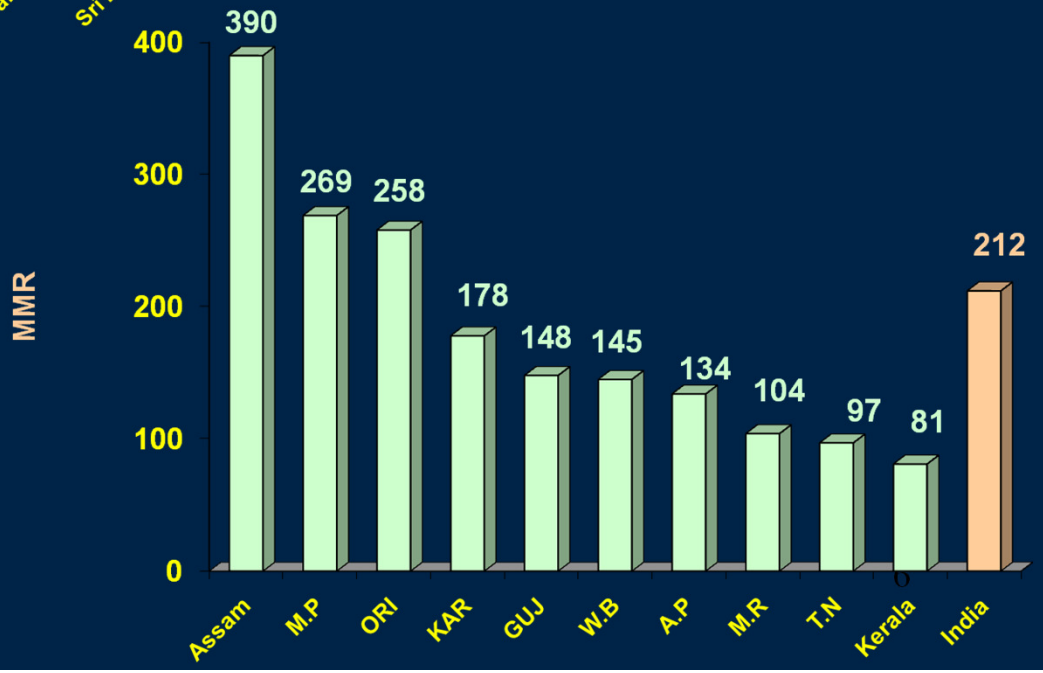


South-east Asian Countries

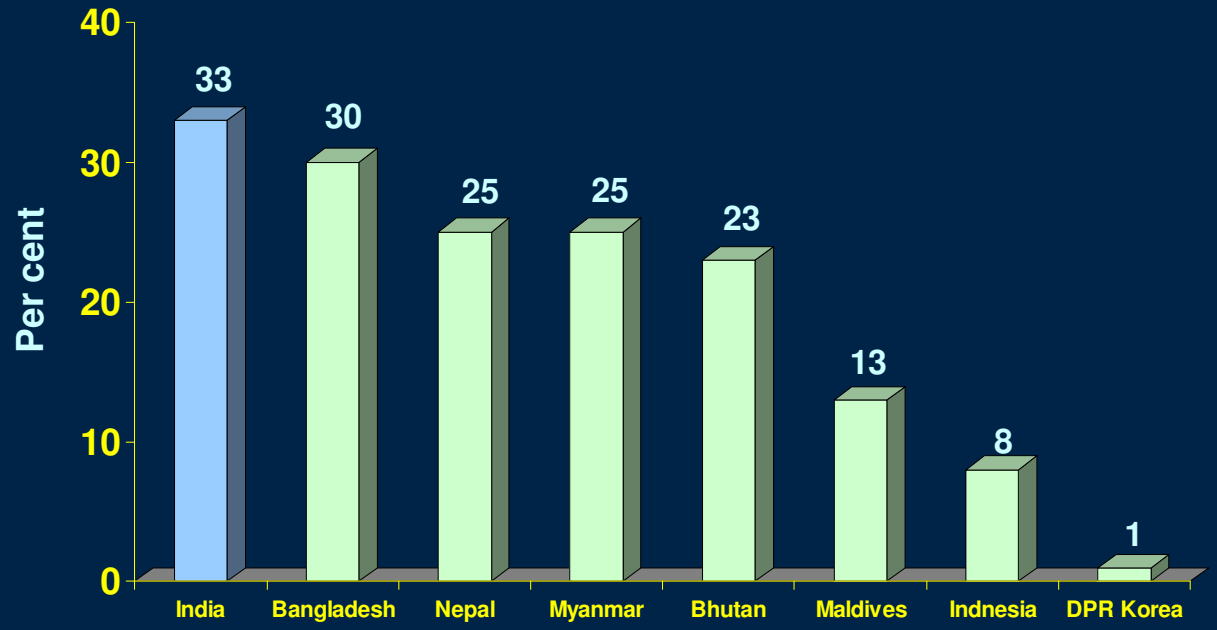
Source : WHO/SEARO 2000

India
(NNMB States)

Registrar General of India,
(2007-09, SRS-2011)



Prevalence of Low Birth Weight

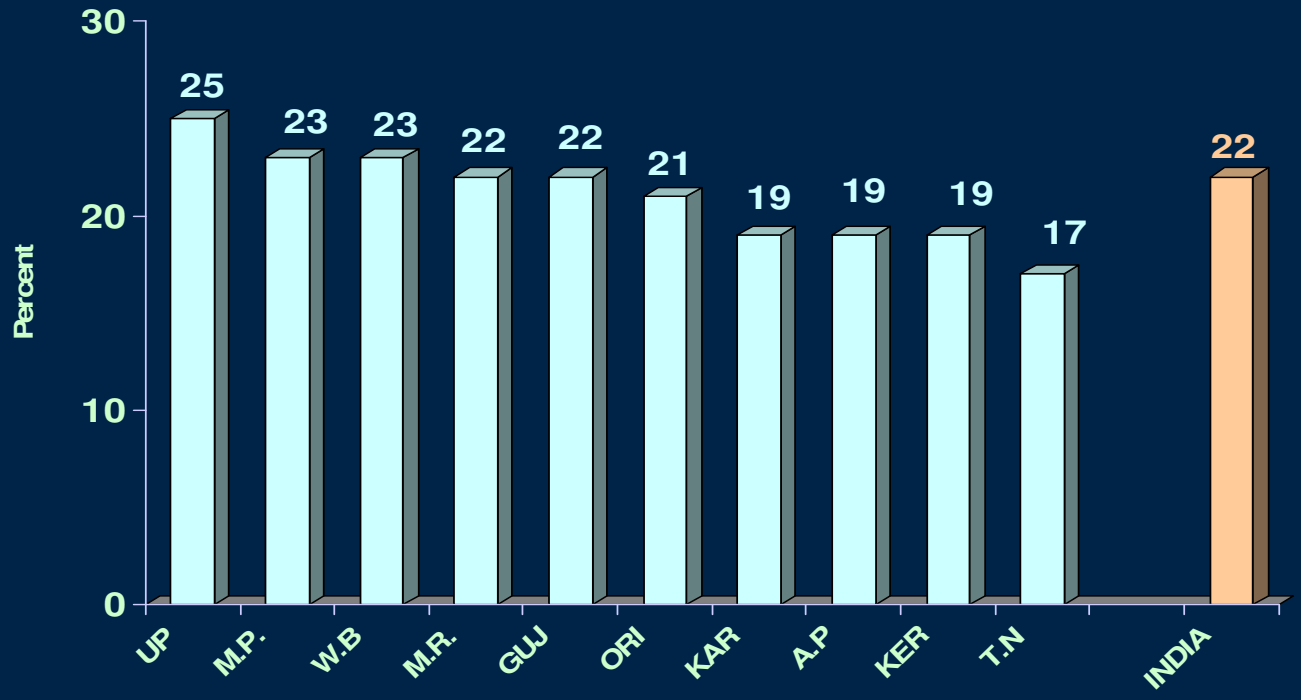


South-east Asian Countries

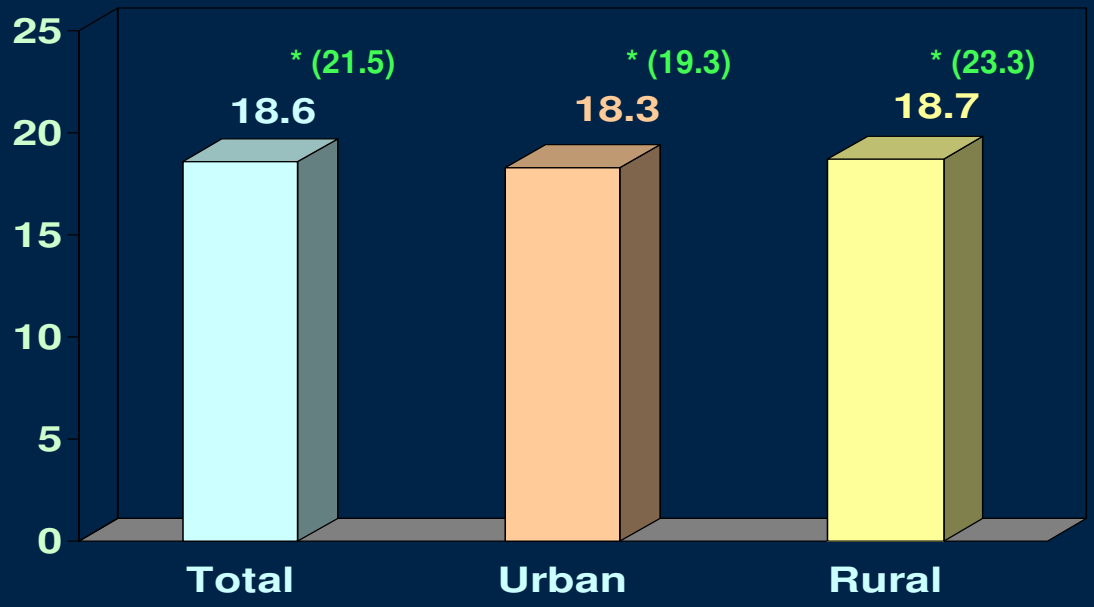
Source : WHO/SEARO 2000

India (NNMB States)

* Source: NFHS3, 2005-06

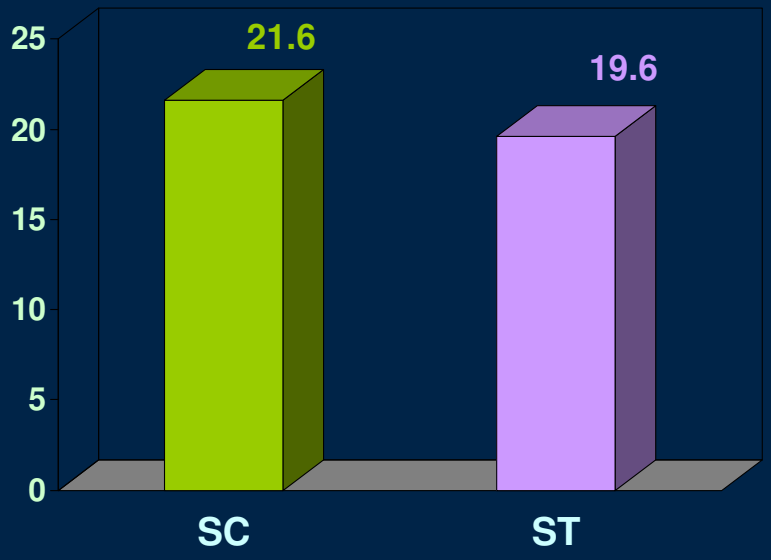


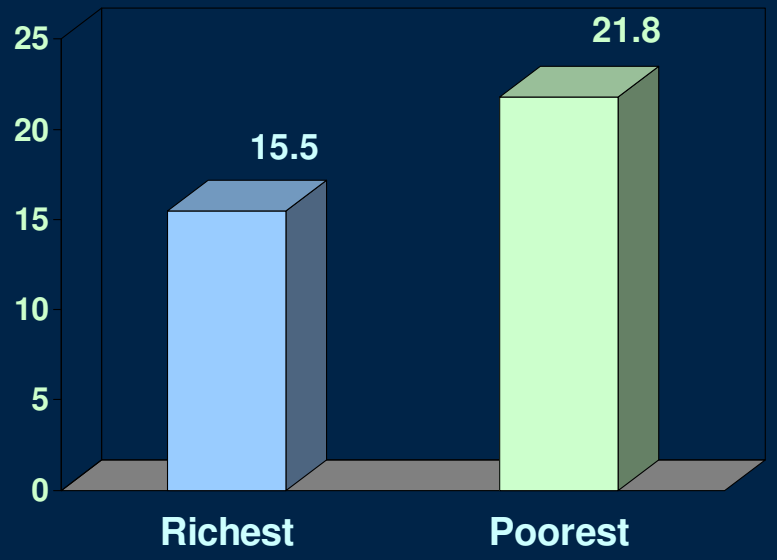
Prevalence (%) of Low Birth weight (<2.5 kg) : RSOC* 2013-14



* (NFHS-3 : 2005-06)

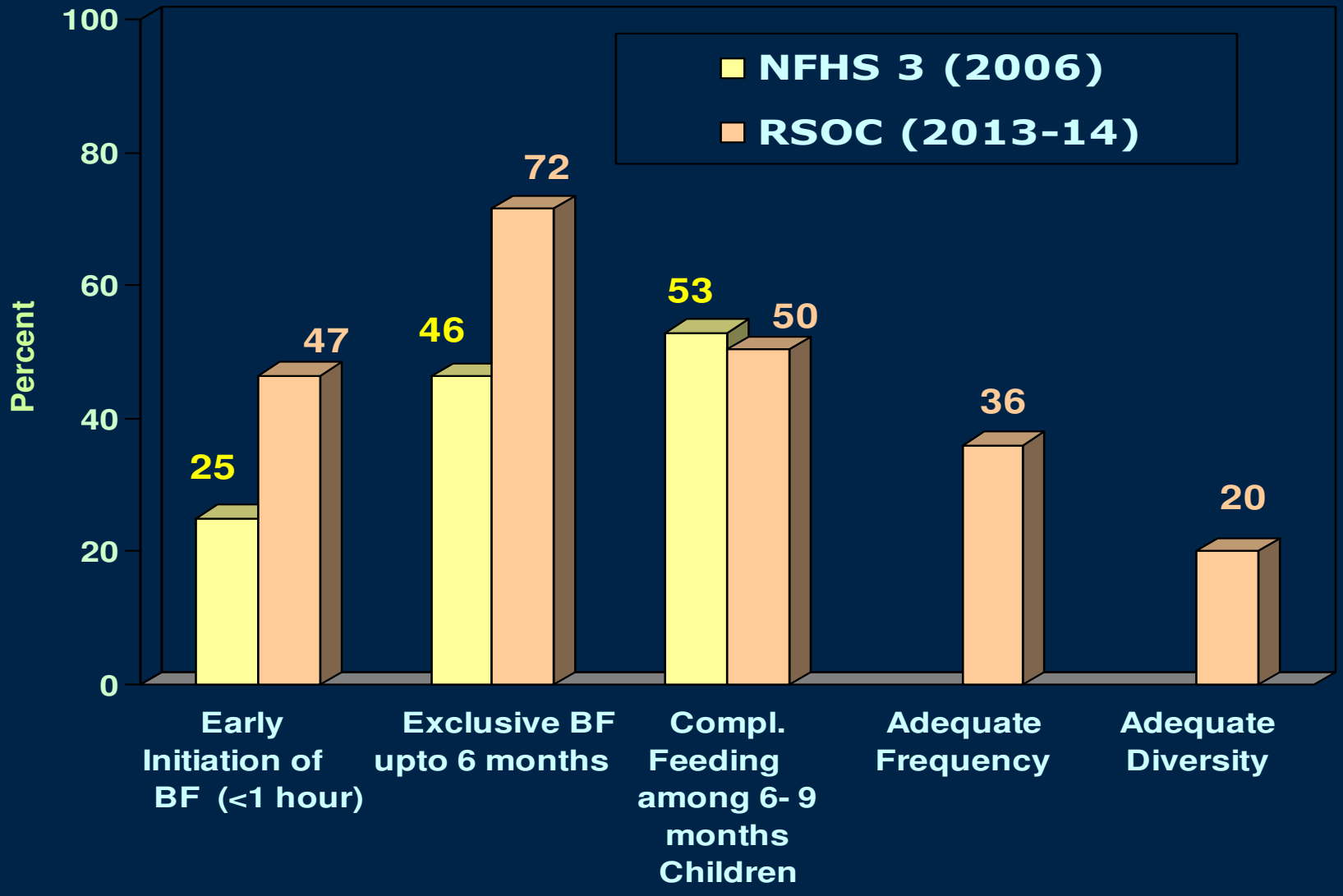
* Rapid survey on children



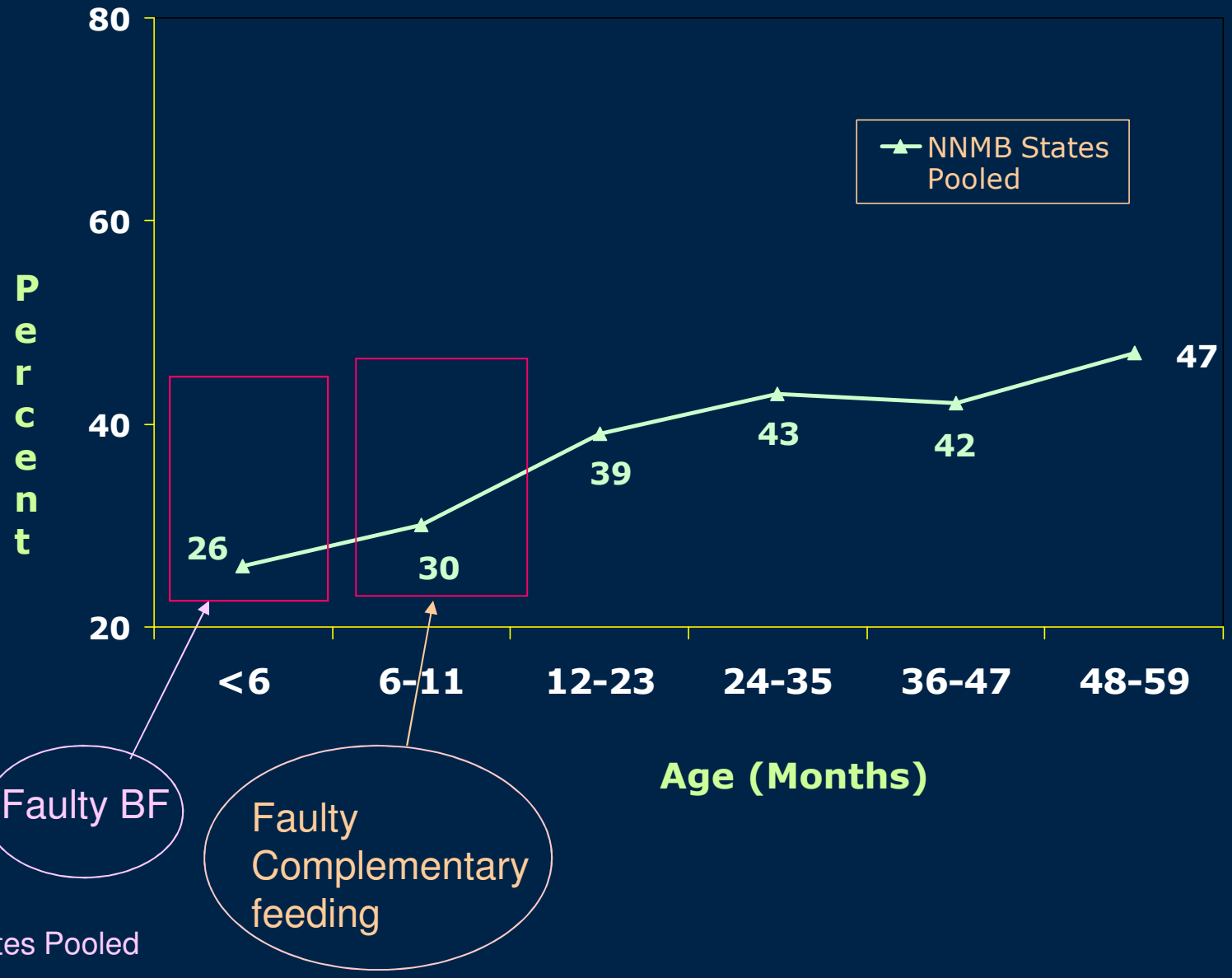


- Infant and Young Child Feeding Practices

Infant and Young Child Feeding Practices in India



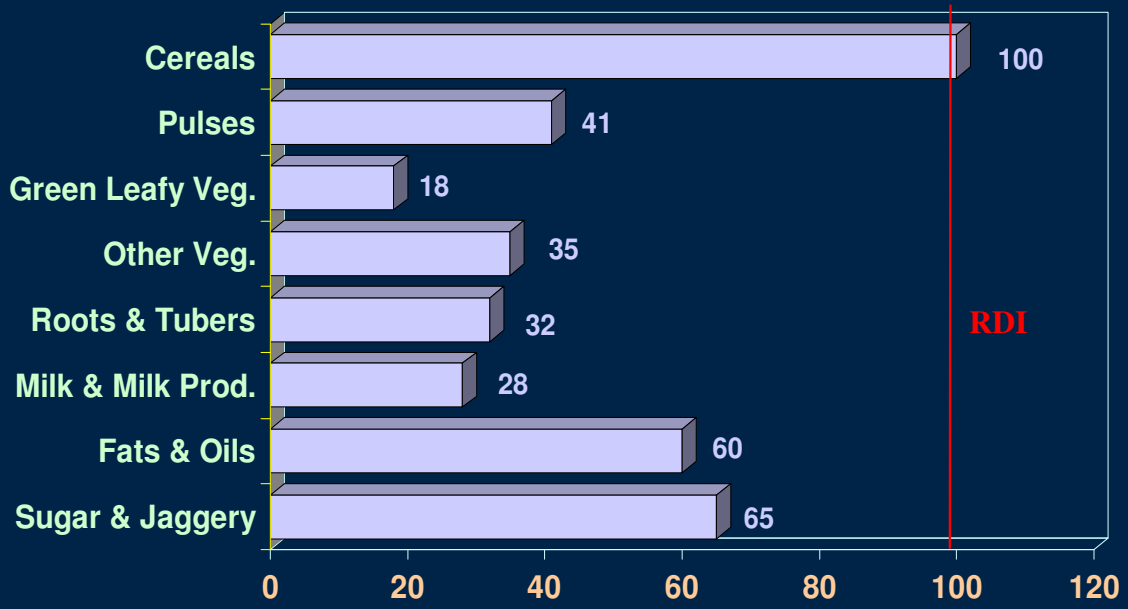
Prevalence of Underweight among 6-59 months children according to age* (by SD classification) using WHO Child Growth Standards



States Pooled

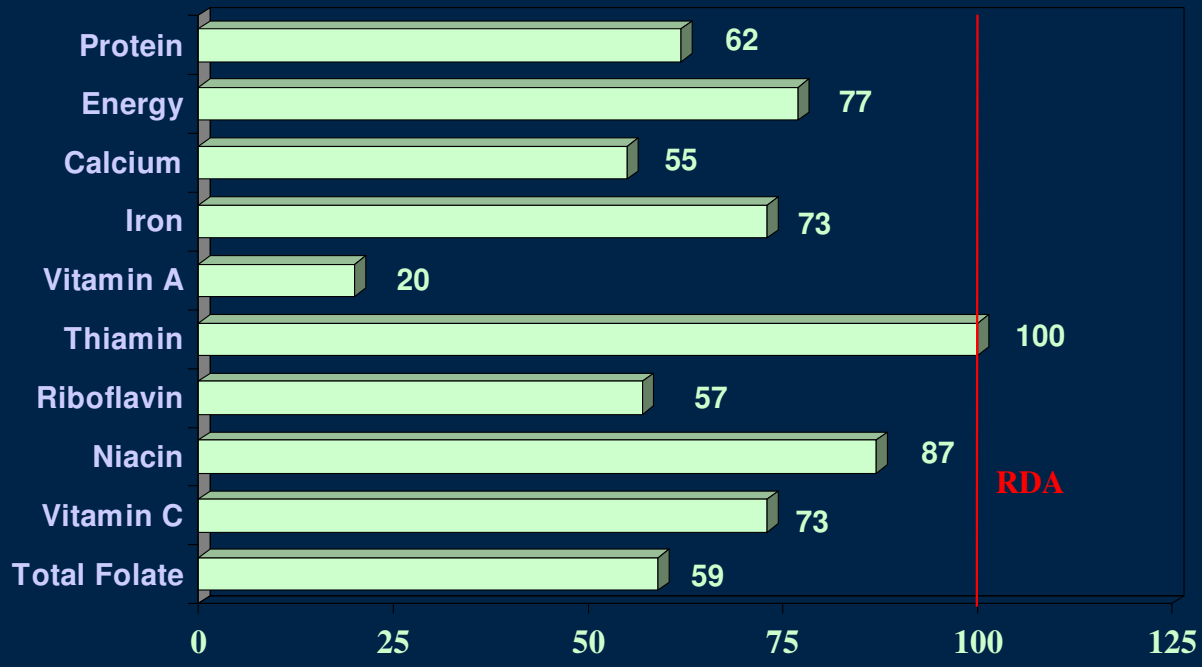
Food & Nutrient Intakes

Average Intake of Foods & Nutrients among Rural Households: Per CU/Day as % Recommended (ICMR-2010)



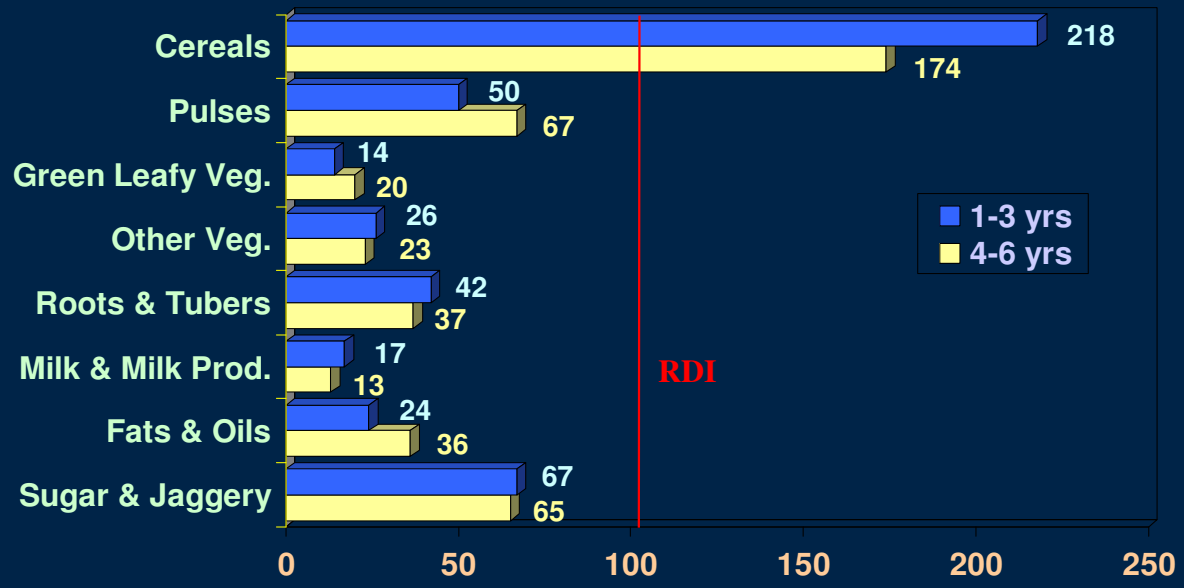
Mean intakes as % RDI,
(Dietary Guidelines for Indians, 2011)

Median Intakes as % RDA
for Indians (ICMR – 2010)



Source: NNMB, Tech Rep 26, 2012

Average Daily Foods & Nutrients Intake among 1-6 Yr Children : By Age Group (As % RDI : Balanced Diets – 2011)

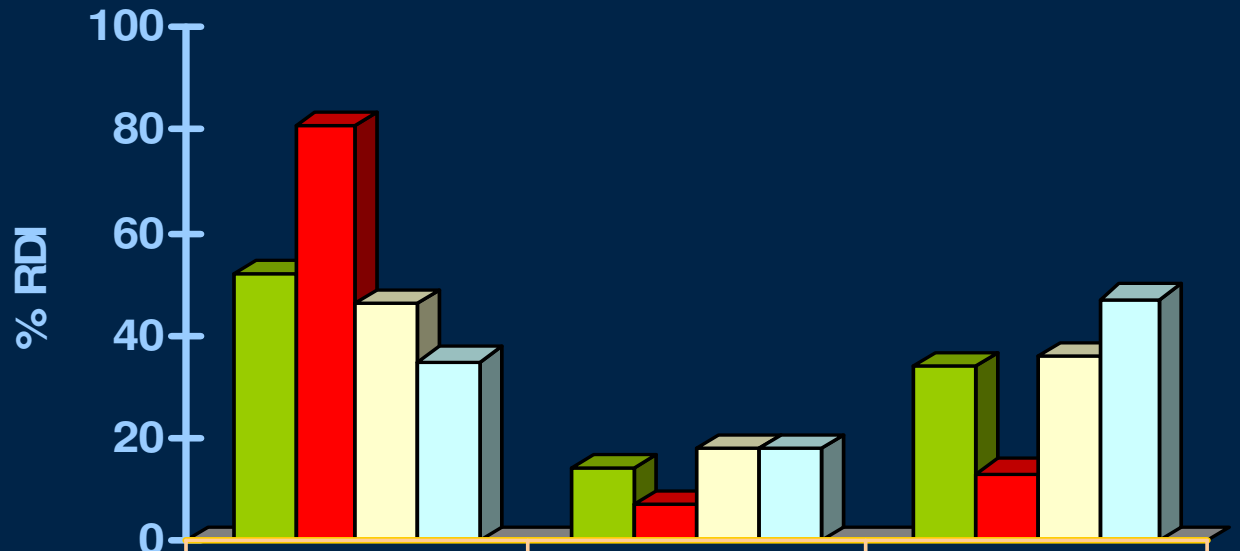


Mean intakes as % RDI,
(Dietary Guidelines for Indians, 2011)

Median Intakes as % RDA
for Indians (ICMR – 2010)

Source: NNMB, Tech Rep 26, 2012

Percent Distribution of 1-6 yr Children According to Daily Median Intake of Micronutrients



	<50% RDA	50-70% RDA	>=70% RDA
Riboflavin	52	14	34
Vitamin A	81	7	13
Iron	46	18	36
Total Folate	35	18	47

Source: NNMB, Tech Rep 26, 2012

Food & Nutrient Intakes -- Time Trends

Average Household Intake of foodstuffs (g/per CU/day): Time trends – States* Pooled

STATES	Period of Survey				RDI (Dietary Guidelines: 2011)
	1975-79	1988-90	1996-97	2011-12	
Cereals & Millets	505	469	450	368 ↓	375
Pulses & Legumes	34	32	27	33	75
Green Leafy Veg.	8	9	15	16	100
Other Veg.	54	49	47	48	200
Roots & Tubers	56	41	44	50	200
Milk & Milk Prod.	116	92	86	95 ↓	300
Fats & Oils	14	13	12	16	25
Sugar & Jaggery	23	29	21	14 ↓	20

*KER, TN, KAR, AP, MR, GUJ, ORI (7 States)

Source: NNMB, Tech Rep 26, 2012

Median Household Intake of Nutrients (per CU/day): Time trends – States* Pooled

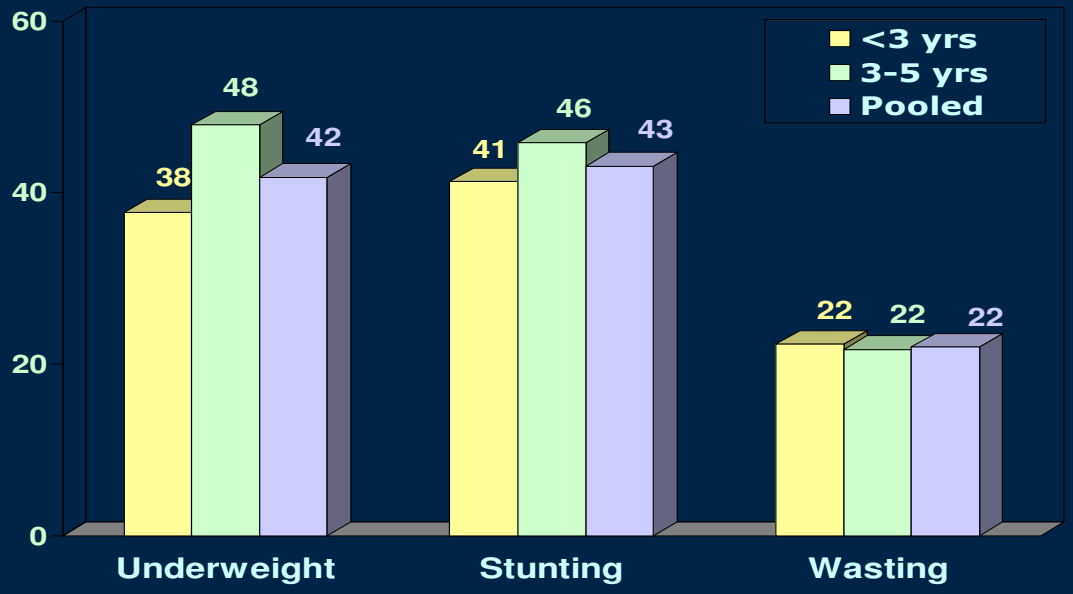
STATES	Period of Survey				RDA (2011)
	1975-79	1988-90	1996-97	2011-12	
Proteins (g)	61.5	58.4	53.7	49.0 ↓	60
Energy (Kcal)	2349	2283	2108	1852 ↓	2320
Calcium (mg)	606	565	521	433 ↓	600
Iron (mg)	17.2	15.5	14.2	13.4 ↓	25
Vitamin A (µg)	246	282	300	296	600
Thiamin (mg)	1.46	1.33	1.20	1.20 ↓	1.20
Riboflavin (mg)	0.81	0.87	0.90	0.80	1.40
Niacin (mg)	14.7	14.2	12.7	13.7	16
Vitamin C (mg)	39	37	40	46	40
Dietary Folate (µg)	-	-	153	127 ↓	200

Source: NNMB, Tech Rep 26, 2012

*KER, TN, KAR, AP, MR, GUJ, ORI (7 States)

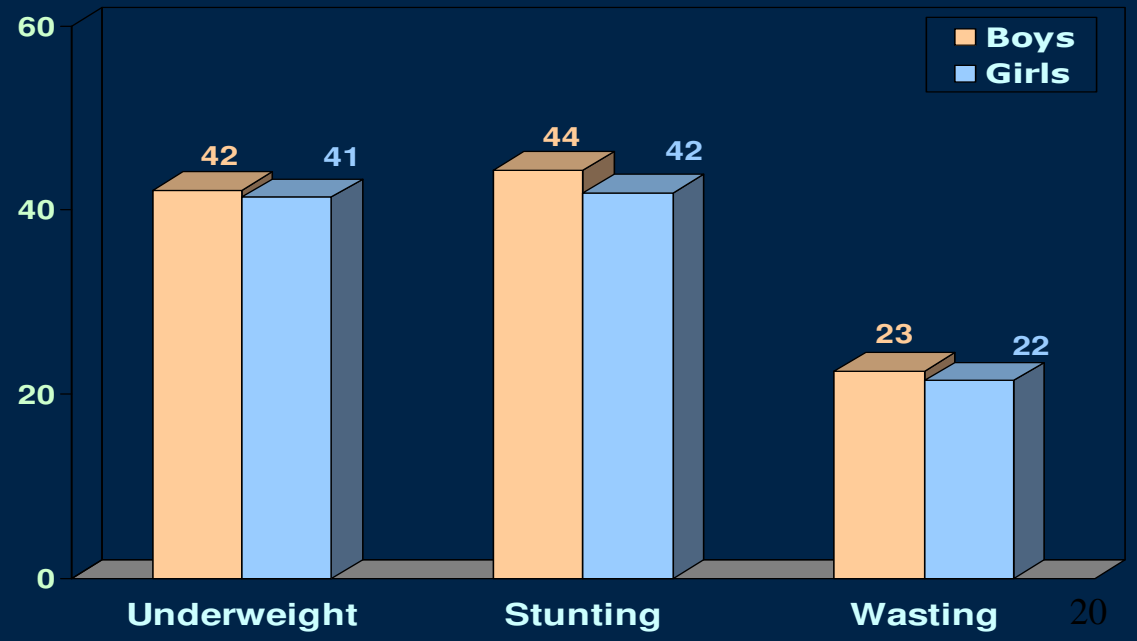
NUTRITIONAL STATUS
- Anthropometry

Prevalence (%) of Undernutrition Among 0-5 yr Children According to SD Classification (<Median - 2SD) : By Age Group & Gender



States Pooled

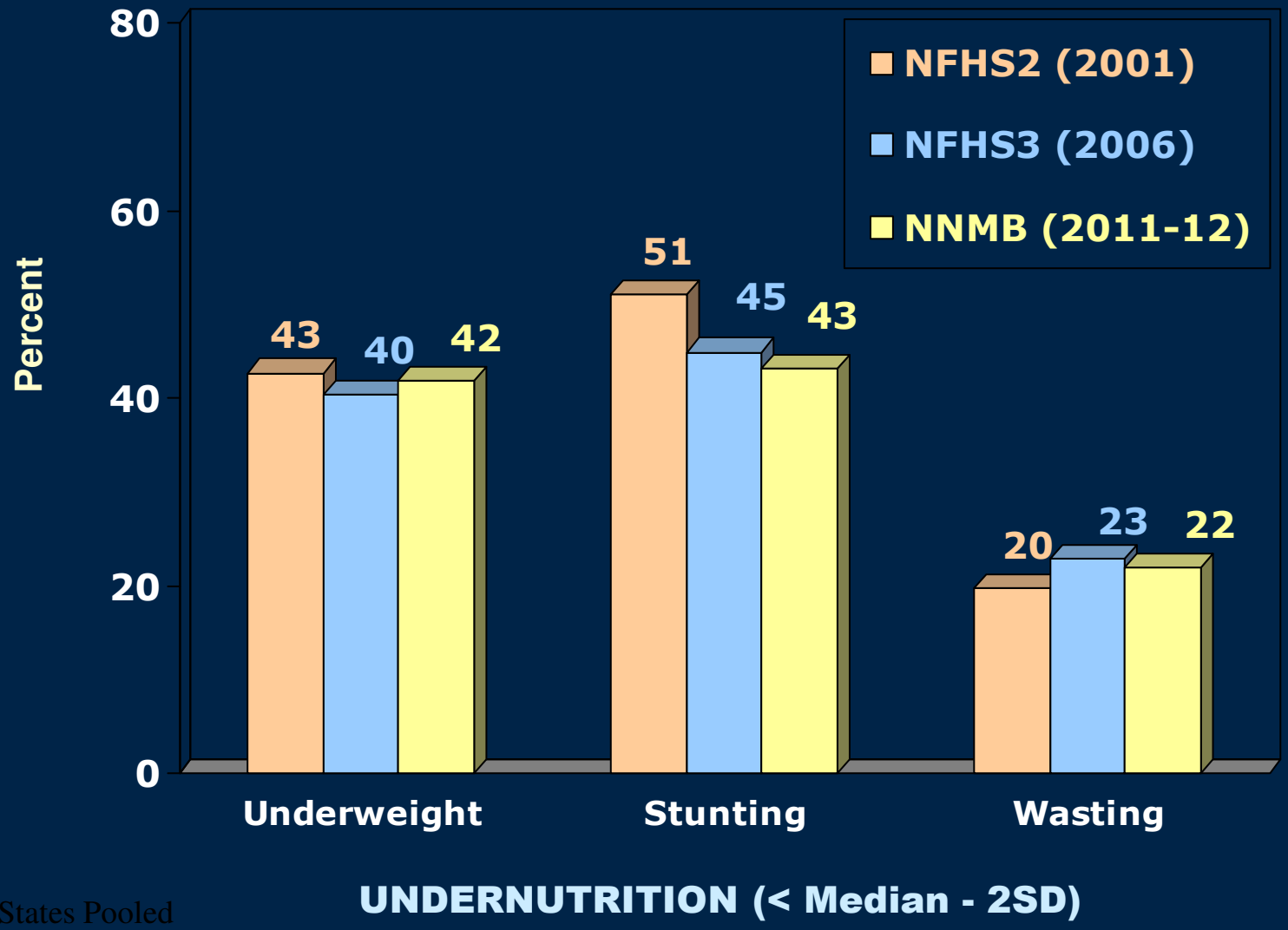
Using WHO Child Growth Standards



Source: NNMB, Tech Rep 26, 2012

NUTRITIONAL STATUS
- Time Trends

Distribution (%) of <5 Children by Undernutrition and Period of Survey (Using WHO / MGRS Values)



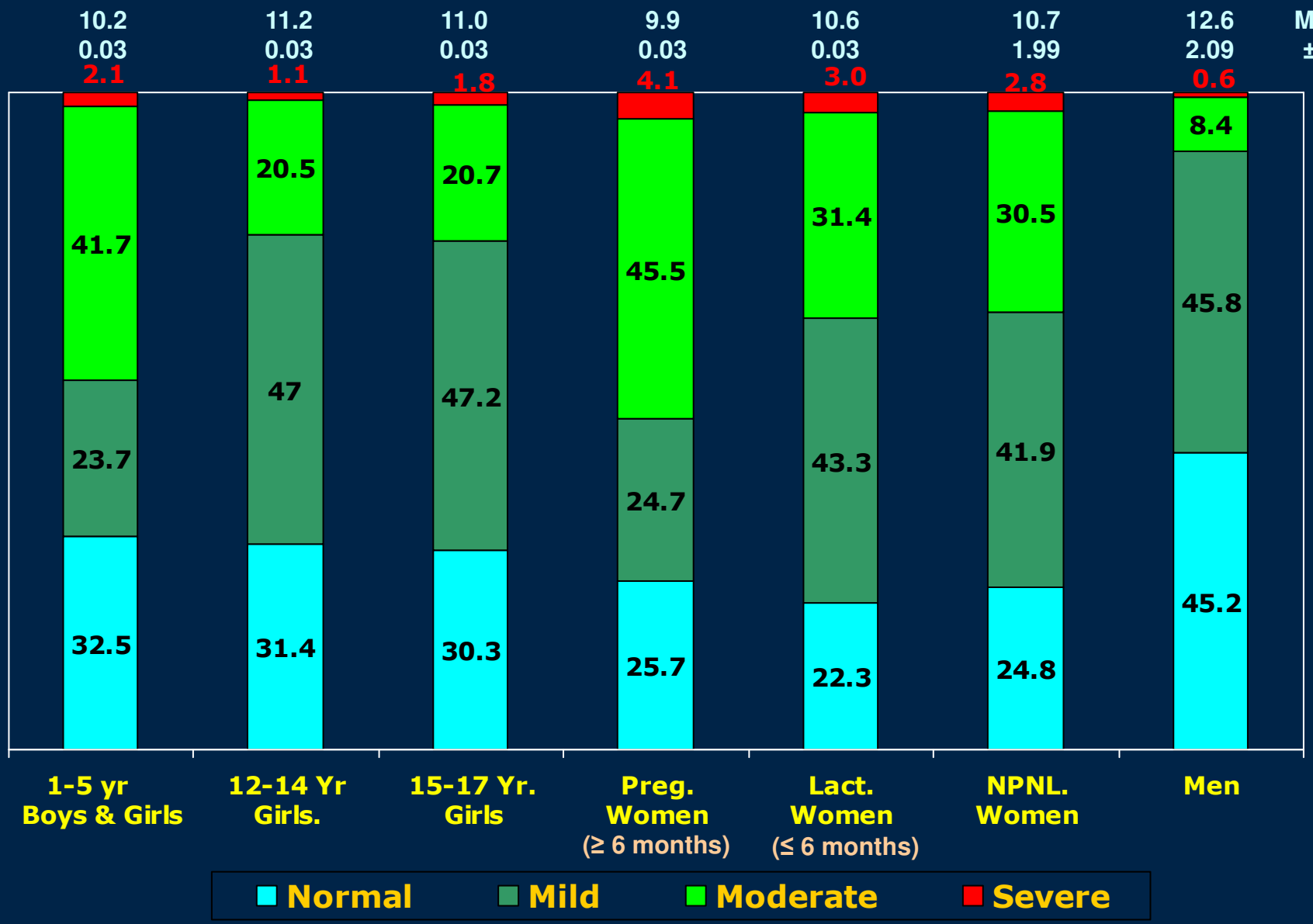
States Pooled

Micronutrient Deficiency Disorders of Public Health significance:

- *Iron Deficiency Anaemia (IDA)*
- *Vitamin 'A' Deficiency (VAD) and*
- *Iodine Deficiency Disorders (IDD)*
- *Vitamin D Deficiency*

Iron Deficiency Anaemia (IDA)

Prevalence (%) of Anaemia by Age, Gender & Physiological Groups



Source: MND-NNMB, Tech Rep 22, 2003

STRATEGIES FOR CONTROL & PREVENTION OF IDA/VAD

Short Term Strategies:

IDA:

Distribution of 'FOLIFER' (Iron & Folic Acid Tabs.) to Vulnerable groups viz.,

-- Pregnant Women
-- Lactating Women (< 6 months)
-- FP Acceptors
-- 1 to 5 Year Children

} @ 1 Tab. Adult/Child per day for100 days

Distribution (%) of Beneficiaries according to Receipt of IFA tablets

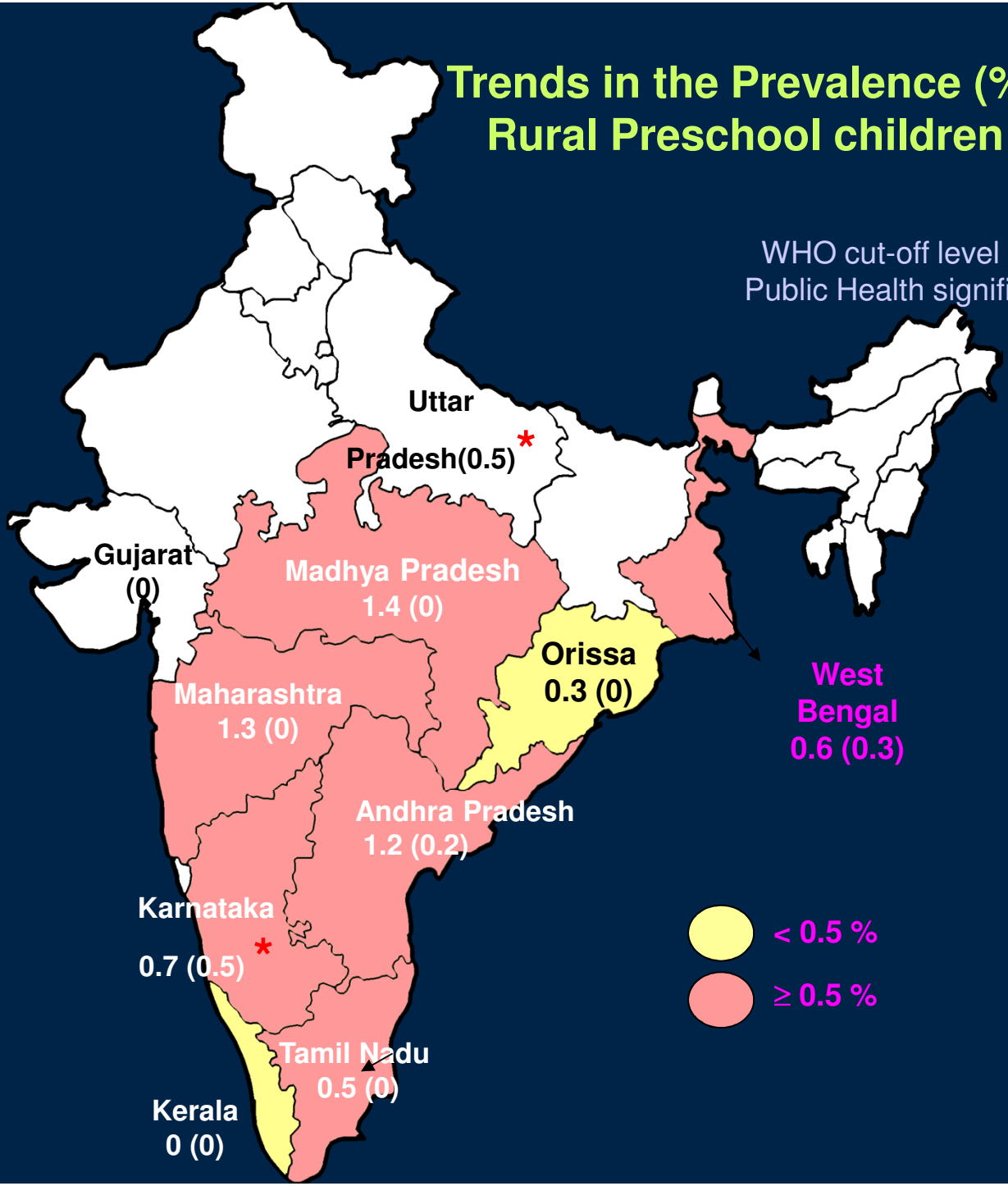
Particulars	Per cent		
	Pregnant (2053)	Lactating (2213)	Children (2178)
Received IFA tablets	62.2	12.3	3.8
No. of tablets received			
10 – 29	2.3	1.5	0.4
30 – 59	17.1	5.6	1.2
60 – 89	12.8	1.4	0.3
≥ 90	29.9	3.8	1.8

Figures in ( ) indicate numbers

Source: NNMB-MND Survey : 8 States, 2003

Vitamin A Deficiency (VAD)

Trends in the Prevalence (%) of Bitot spots Among Rural Preschool children: NNMB-2003 & (2012)



Source:

NNMB - MND Surveys in Rural India: 2003 & NNMB RegularSurvey-2012

States Pooled:
NNMB-2003: 0.8
NNMB-2012: (0.2)

STRATEGIES FOR CONTROL & PREVENTION OF IDA/VAD

Short Term Strategies (Contd..):

VAD:

Distribution of 'Massive Dose Vitamin A to 9-60 months children, once in 6 months:

-- First dose of 100 thousand IU at 9 months along with Measles Immunization

-- Second dose 200 thousand IU at 18 months along with DPT/Polio Booster

-- 3rd dose onwards 200 thousand IU every 6 months

Distribution (%) of 1- 5 Yr. Children with Blood Vit. A Levels of < 20 μG/dL, Median Dietary Intake of Vit. A (as % RDA) and Extent of Coverage for Suppl. of Massive Dose Vit. A – By State

STATES	Blood Vitamin A < 20 μg/dL	Dietary Intake of Vitamin A < 50% of RDA	Receipt of Massive Dose Vitamin A		
			1 or 2 Doses	No. of Doses	
				One	Two
Kerala	79.4	91.8	38.5	28.4	10.1
Tamil Nadu	48.8	81.9	50.6	20.2	30.4
Karnataka	52.1	90.4	56.6	42.1	14.5
AP	61.5	92.9	49.3	14.2	35.1
Maharashtra	54.7	88.8	52.1	29.4	22.7
MP	88.0	87.4	52.3	19.1	33.2
Orissa	57.7	77.5	80.0	38.8	41.2
West Bengal	61.2	80.6	50.6	46.8	3.8
Pooled	*61.8*	*86.3*	*55.4*	*30.3*	*25.1*

Source: NNMB - MND Surveys in Rural India: 2003

Distribution (%) of 1- 5 Yr. Children according to Coverage for Receipt of Massive Dose Vit. A during the year 2011-12: By State

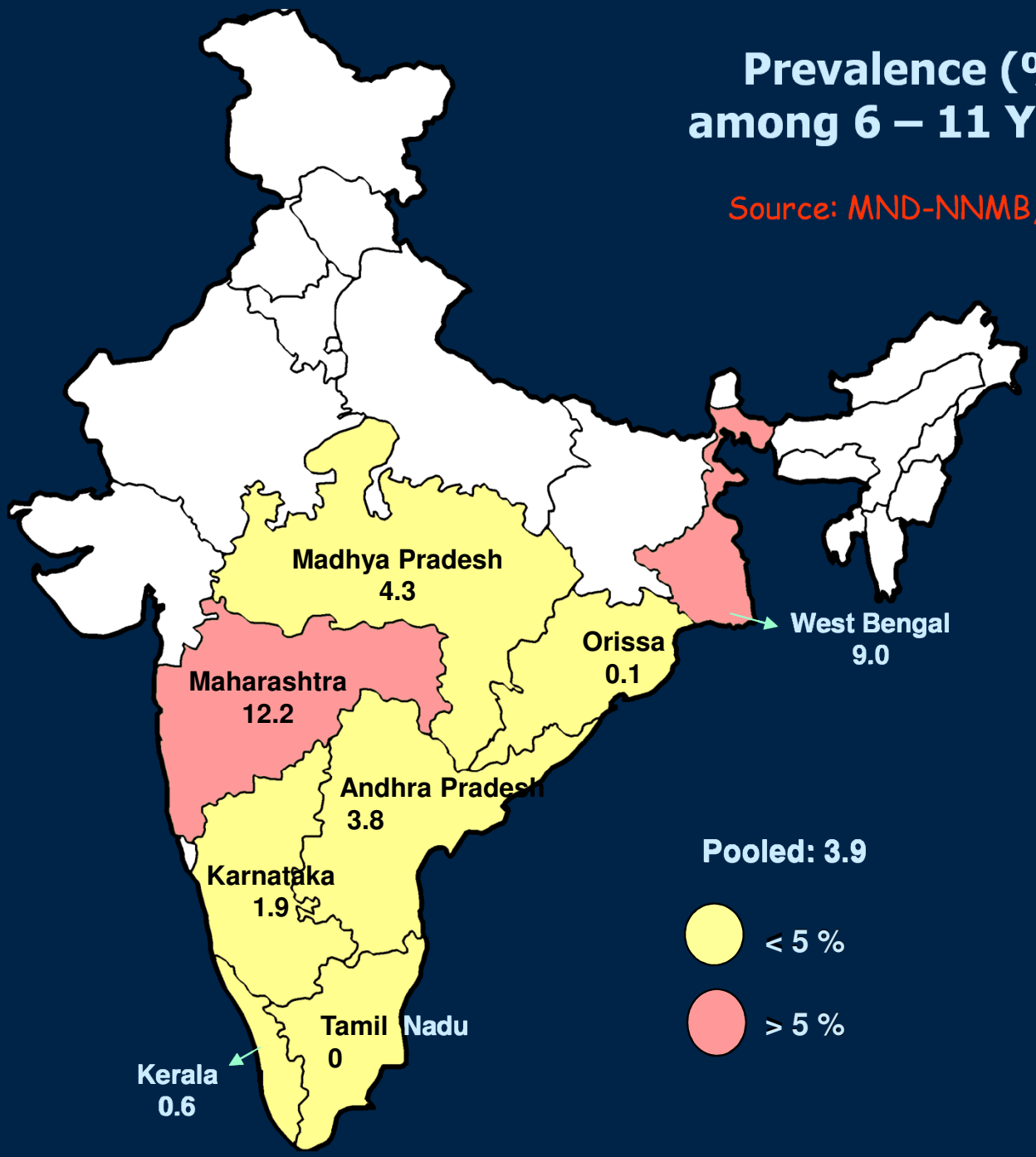
STATES	Receipt of Massive Dose Vitamin A		
	Received	No. of Doses	
		One	Two
Kerala	81.1	49.3	31.8
Tamil Nadu	66.0	30.2	35.8
Karnataka	94.4	40.6	53.8
Andhra Pradesh	90.6	36.2	54.4
Maharashtra	94.4	38.6	55.8
Gujarat	91.9	35.2	56.7
Madhya Pradesh	95.6	45.1	50.5
Orissa	93.1	39.5	53.6
West Bengal	89.8	32.5	57.3
Uttar Pradesh	57.8	26.7	31.1
Pooled	*85.0*	*36.5*	*48.5*

Source: NNMB, Tech Rep 26, 2012

Iodine Deficiency Disorders (IDD)

Prevalence (%) of IDD among 6 – 11 Year Children

Source: MND-NNMB, Tech Rep 22, 2003

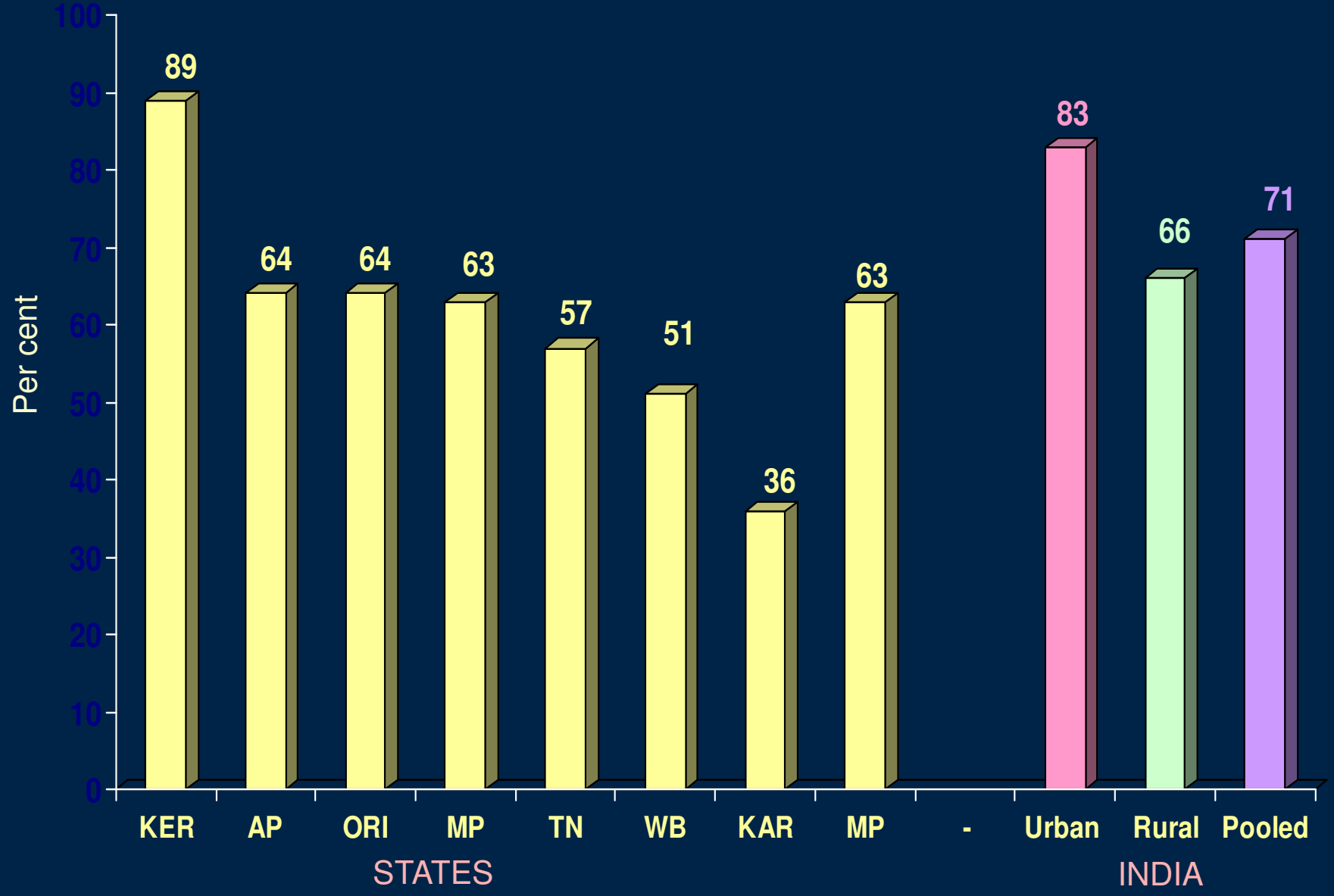


Prevalence of Total Goitre (%) in Select Districts of Different Regions of the Country

Dist-ricts	Northern		North-Eastern		Eastern		Central		Southern	
	PREV.	Current	PREV.	Current	PREV.	Current	PREV.	Current	PREV.	Current
1	41.6	10.4	65.8	5.4	35.2	22.9	44.0	3.4	54.0	12.4
2	41.2	9.6	40.2	4.6	33.2	23.1	36.6	14.5	64.4	11.5
3	27.4	8.5	26.5	8.4	64.3	40.1	40.9	14.5	28.0	9.3
4	44.7	17.2	68.6	4.8	20.9	21.9	35.0	8.2	32.9	9.5
5	45.7	14.4	68.6	5.2	37.8	26.7	55.6	10.2	32.1	7.7
6	30.0	6.9	50.2	8.6	37.8	23.7	41.8	16.2	41.1	7.2
7	52.3	20.6	25.9	5.0	21.6	21.8	22.0	9.2	21.0	12.8
8	24.5	19.3	25.9	6.5	30.3	39.6	13.7	9.9	44.4	11.2

Percent of HHs consuming adequately Iodised (≥15 ppm) Salt

Coverage Evaluation Survey: UNICEF - MoH&FW (GoI) 2009

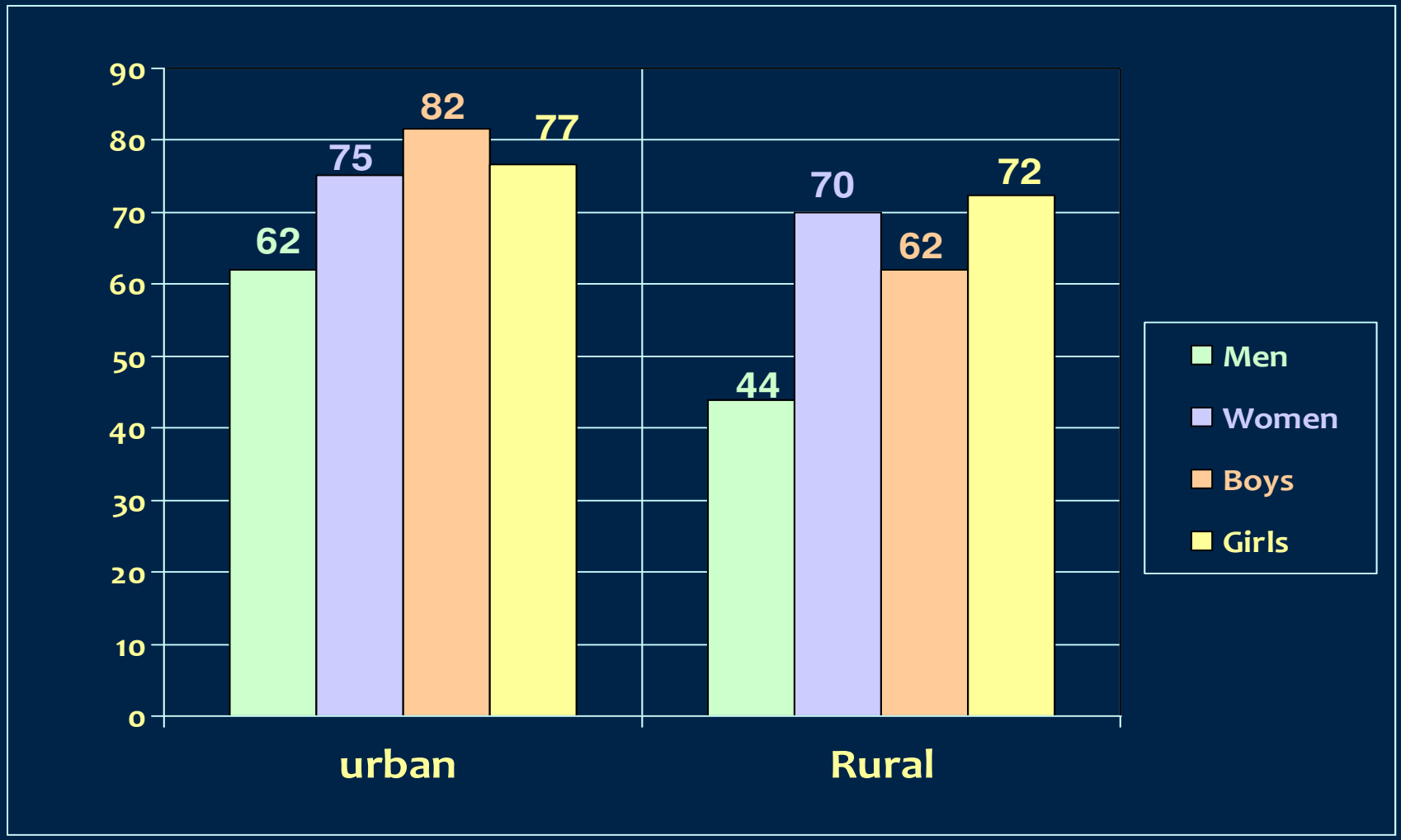


Vitamin - D Deficiency

Prevalence of VDD - Indian studies

Studies	Cut off point	Prevalence %
Delhi, Madhava Rao, Goswami, Adults-2006	< 20 ng/ml	94.3%
Seema Puri et al Adolescent girls	< 20 ng/ml	90.8%
Pregnancy, Term NIN study, 2008	< 20 ng/ml	51.8%
Cord blood, NIN, 2008	< 20 ng/ml	91%
Alok sachan et al pregnancy	< 10 ng/ml	42.5%
Harinarayan et al Tirupati, children	< 20 ng/ml	75%

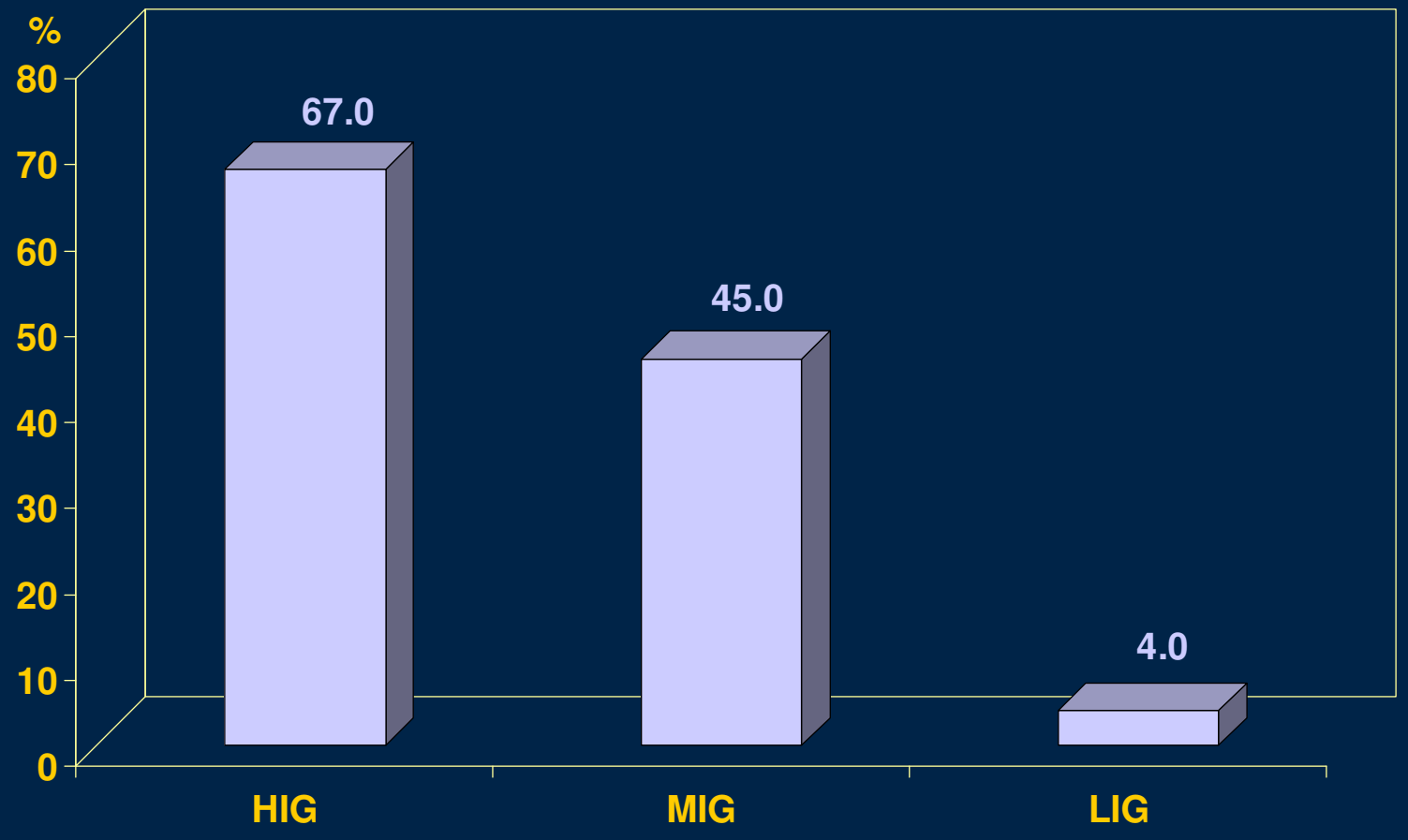
Prevalence of VDD in Tirupati, South India



Harinarayan et al, IJMR,2008

Prevalence of vitamin D deficiency (< 50 nmol/l) among Urban adult women (>=30 yrs) by income Category

(ICMR task force study- Hyderabad arm: 2008)



Strategies for Control & Prevention

SHORT TERM

- Strengthening supplementary feeding Programmes (eg. ICDS), in terms of :
  - Quantity and quality of Supplement
  - Regularity
  - Coverage of target population and monitoring
- National Programme for Control & Prevention of IDA:
  - Distribution of IFA Tablets to target population,
- National Programme for prevention of Nutritional Blindness:
  - Massive dose Vitamin A Supplementation,

Long Term Strategies

- Health & Nutrition Education
- Dietary Diversification – Beh. Cha. Commn.
- Development of Kitchen Gardens
- Agro-biodiversity, Bio-fortification,
- GM Foods
- Environmental Sanitation & Personal Hygiene
- Provision of Safe Drinking water
- Immunization
- Prompt treatment of Infections
- Income generating activities
- Improvement in HH food Security
- Promotion of Healthy Life styles
- . . . Population Control

Medium Term Strategies

Fortification of Foods with micronutrients

- Milk (Vit. A & Vit. D)
- Salt (Iodine, Iron)
- Cooking oils (Vit. A & Vit. D)
- Wheat Flour (Iron, Vit. A, Folic Acid)
- Rice (Iron, Ultra Rice [PATH])
- Supplementary foods under ICDS/MDM
- Ready to eat convenience foods

Advantages & Disadvantages of Various Strategies

STRATEGY	ADVANTAGES	LIMITATIONS
Short Term (Nutrient Supplemen-tation)	Immediate Benefit Very Effective, if properly implemented.	Expensive, Needs Manpower, Inadequate/Irregular Supplies, Inadequate/Irregular Coverage, Non-compliance, Not Sustainable.
Long Term (Nutrition Education/ Dietary Diversification)	Desirable, Sustainable, No cost involved.	Difficult to achieve, Time consuming.
Medium Term (Food Fortification)	Easy, Cost effective, Good compliance, Sustainable, Easy to Regulate.	Risk due to several foods being fortified


Thank you