

DUAL NUTRITION BURDEN IN INDIA: CURRENT STATUS AND SDG TARGETS



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ACHIEVEMENTS UNDER MDG

The major focus of global and national efforts under the MDG was to reduce under-nutrition, morbidity due to communicable diseases and improve maternal and child health

Targets were set for developing countries to achieve the goal of reduction of these problems.

Globally and nationally the period between 1990 and 2015 witnessed the steepest fall in the prevalence of under-nutrition, morbidity due to communicable diseases and improvement in maternal and child health

But during this period there was a substantial increase in the prevalence of over-nutrition and non-communicable diseases

Non-communicable diseases are emerging as the major causes of morbidity and mortality

Currently all countries of the world have to gear up to combat the familiar triad of persistent poverty, under-nutrition and morbidity and rising trends in over-nutrition and associated non-communicable diseases.

PARADIGM SHIFT IN SDG

SDG recognises that in the post-2015 era dual nutrition burden is a reality

Currently both under- and over-nutrition are major public health problems

There is a need to take up programmes to combat both under- and over-nutrition

SDG recognises that globally there has been a health transition

Currently both communicable diseases and non-communicable diseases are major public health problems

Over-nutrition is a major factor responsible for rising prevalence of non-communicable diseases

Nutrition interventions aimed at prevention, early detection and effective management of over-nutrition will be the major enabling factors for prevention of rise in non-communicable diseases.

Each country will have to prioritise interventions to combat over-nutrition and NCD related health problems and implement them effectively.

SDG TARGETS FOR COMBATING UNDER-NUTRITION

Persistent under-nutrition and micro-nutrient deficiencies continue to require scaling-up and effective implementation of ongoing interventions.

Four global nutrition targets for reduction in under-nutrition to be achieved by 2025 are:

- 30% reduction in low birth weight (LBW);**
- increase in the rate of exclusive breast-feeding (EBF) in the first six months up to at least 50%;**
- 40% reduction in the number of under-five children who are stunted;**
- childhood wasting to be brought down and maintained at less than 5%.**

PROBLEMS IN COMBATING OVER-NUTRITION AND NCD

Over-nutrition as well as under-nutrition in childhood predispose to over-nutrition and increase in risk NCD in adult life.

Prevention, early detection and effective management of childhood nutritional problems should be given high priority

The rise in overweight, obesity and associated increased risk of non-communicable diseases (NCDs) requires immediate implementation of newer interventions for prevention, early detection and effective management.

Majority of NCDs are asymptomatic in the early phases.

Currently neither the population nor the health care system in India are equipped to undertake the massive periodic screening of the population for detection of NCD in the asymptomatic phase.

NCD management require sustained lifestyle change and life long compliance with drug therapy.

Currently even those who had been detected to have the NCD in the early phase do not sustain the lifestyle change nor comply with life long treatment regimens

SDG TARGETS FOR COMBATING OVER-NUTRITION

SDG aims at reduction in the projected premature mortality from NCD by 2030 by combating both over-nutrition and rise in NCD

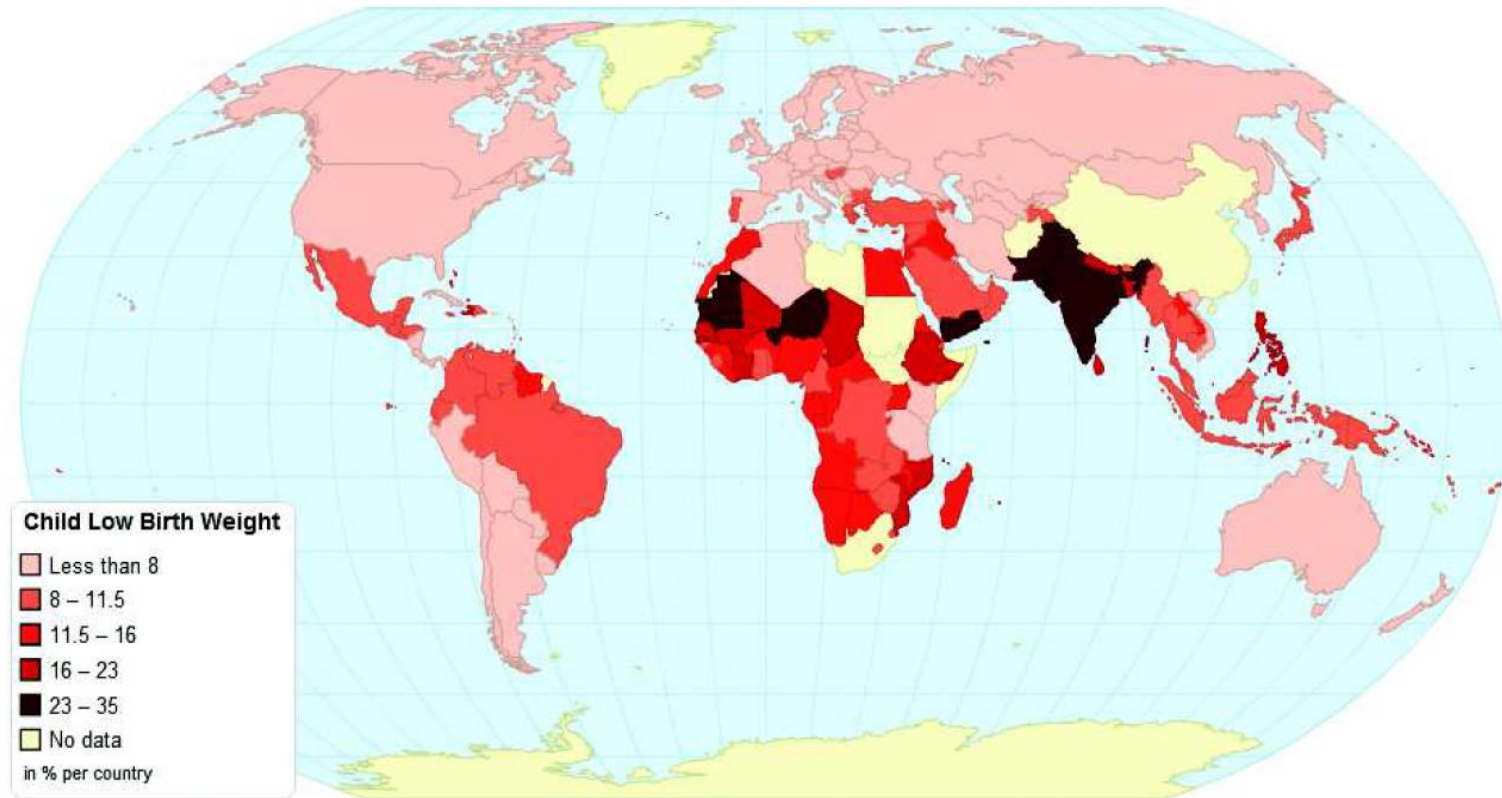
Nutrition is a major enabler for achieving the SDG targets for reduction in the premature mortality due to NCD

SDG nutrition targets to be achieved by 2025 are:

- Prevent rise in child over-nutrition**
- Halt rise in over-nutrition in adults**
- Halt rise in diabetes**
- Taking into account national priorities:**
 - Halt rise in hypertension or**
 - Achieve 25% reduction in prevalence of hypertension,**
- 30 % reduction in the population mean sodium intake.**

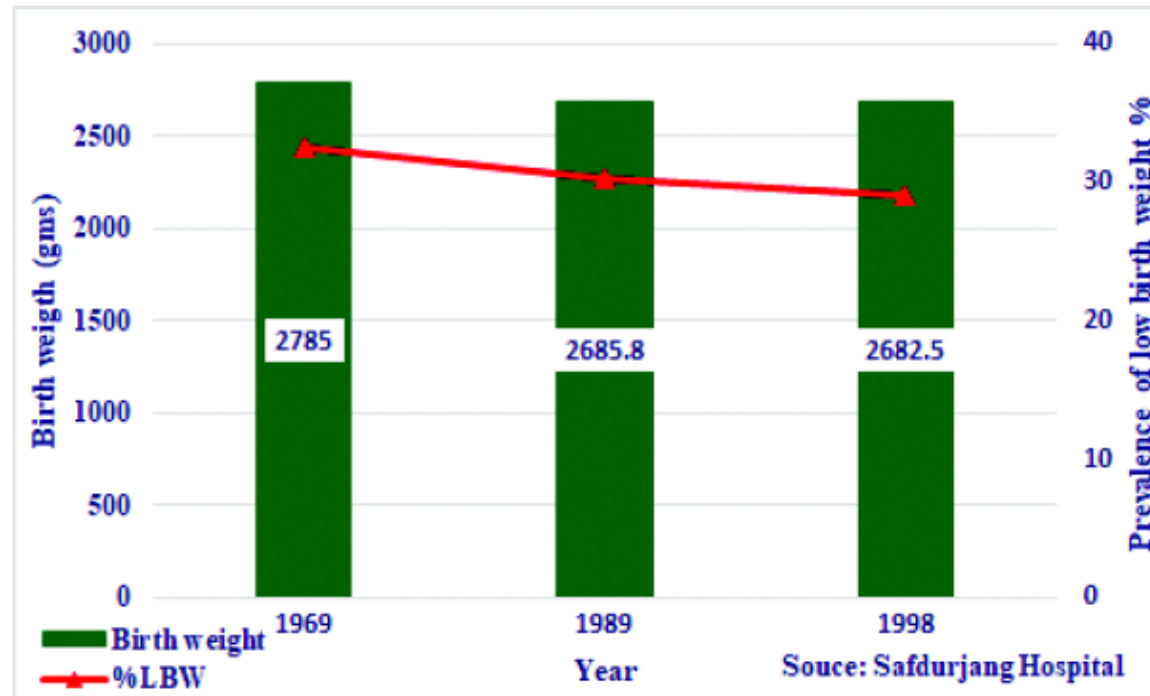
**TARGET 1: ACHIEVE A 30% REDUCTION IN LOW BIRTH
WEIGHT (LBW)**

GLOBAL PREVALENCE OF LOW BIRTH WEIGHT (UNICEF 2004)



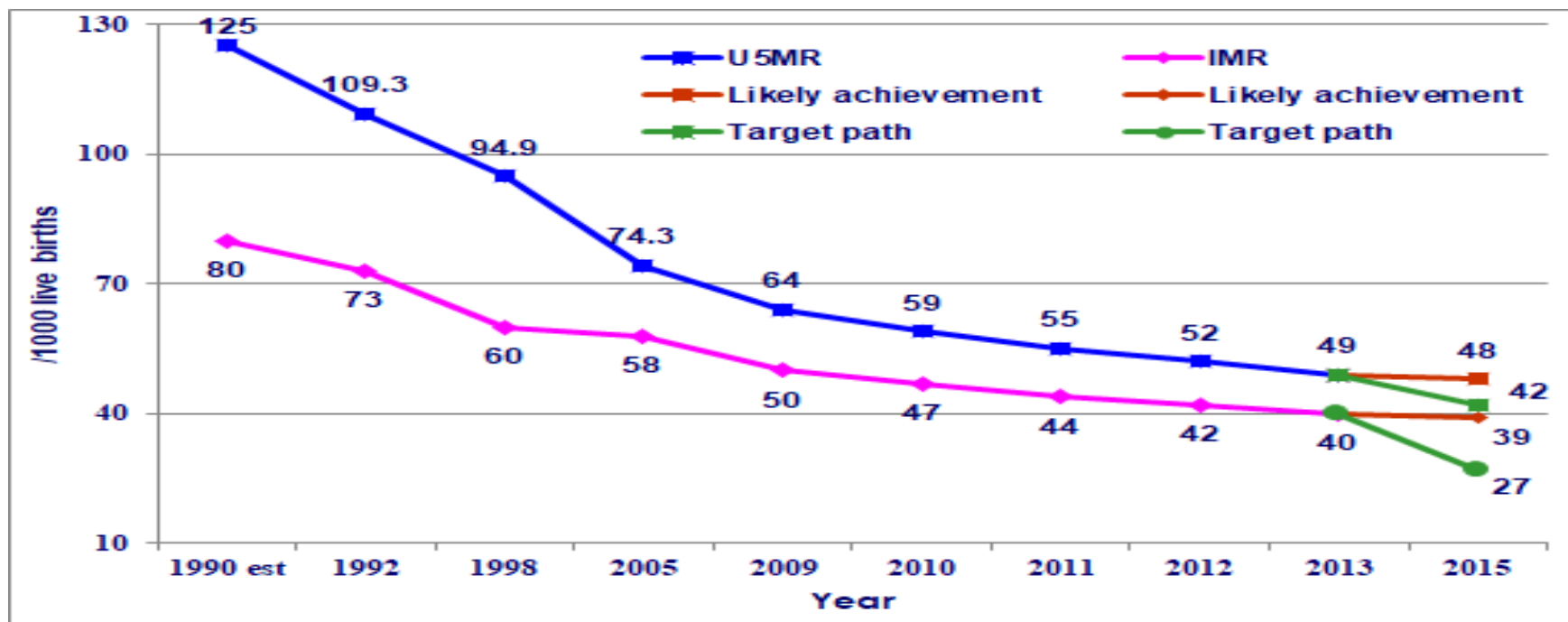
**Prevalence of low birth weight in India is highest in the world
India is the home of largest number of low birth weight infants in
the world**

TIME TRENDS IN LBW IN SAFDARJANG HOSPITAL (NFI 2008)



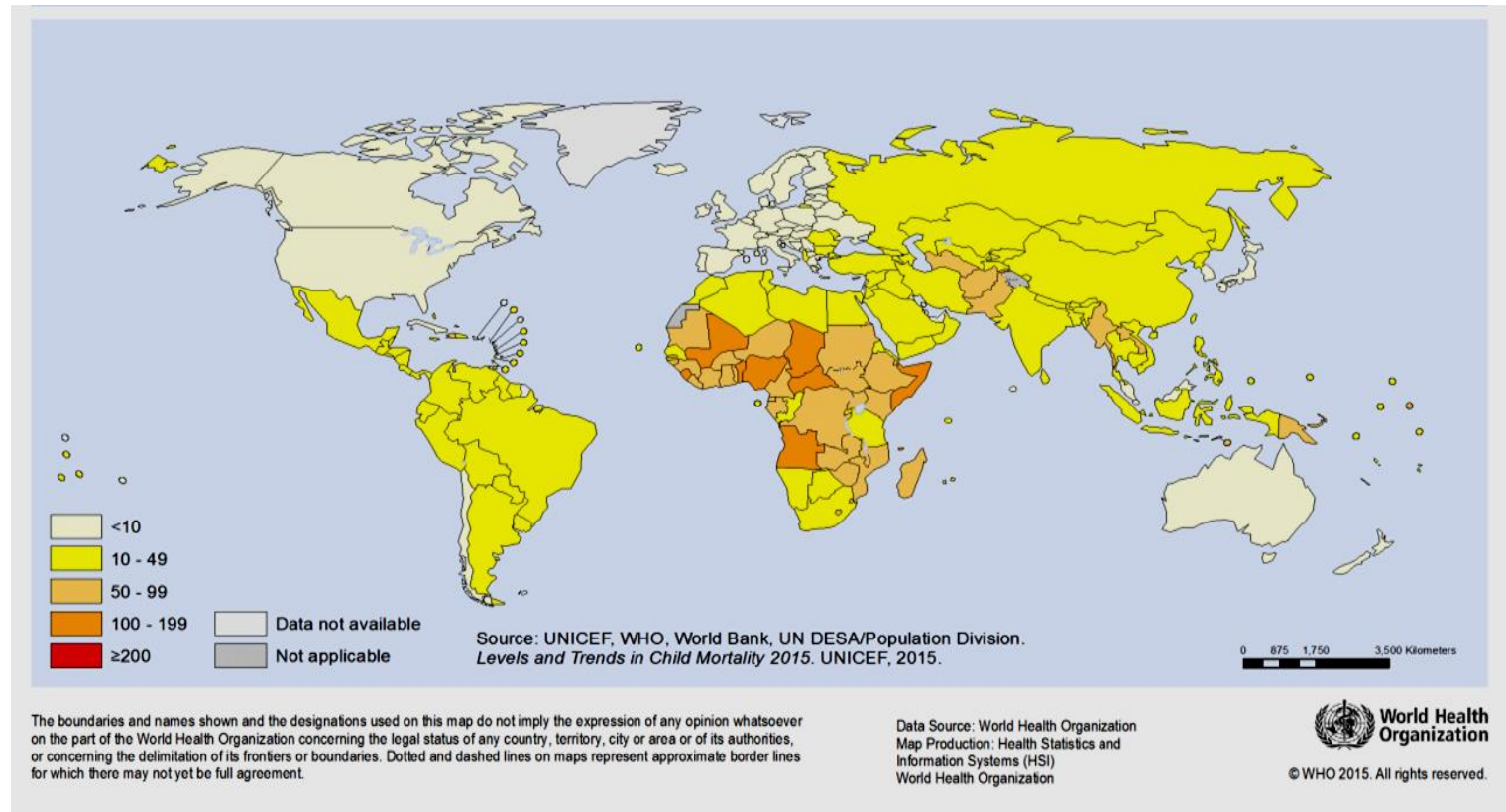
Over the last seven decades there has not been any substantial reduction in the incidence of low birth weight in India
It will not be possible for India to achieve reduction in LBW rates by 30% by 2025.

TIME TRENDS IN INFANT AND UNDER-FIVE MORTALITY



The major reason for the concern over LBW is its association with IMR
Over the last seven decades there has not been any substantial reduction in the incidence of low birth weight in India
However there has been substantial reduction in infant and under-five mortality in the country
This is due to the fact that small but mature Indian infant survives when given essential new born care, breast-feeding and prevention of infections.

UNDER-FIVE MORTALITY RATE 2015

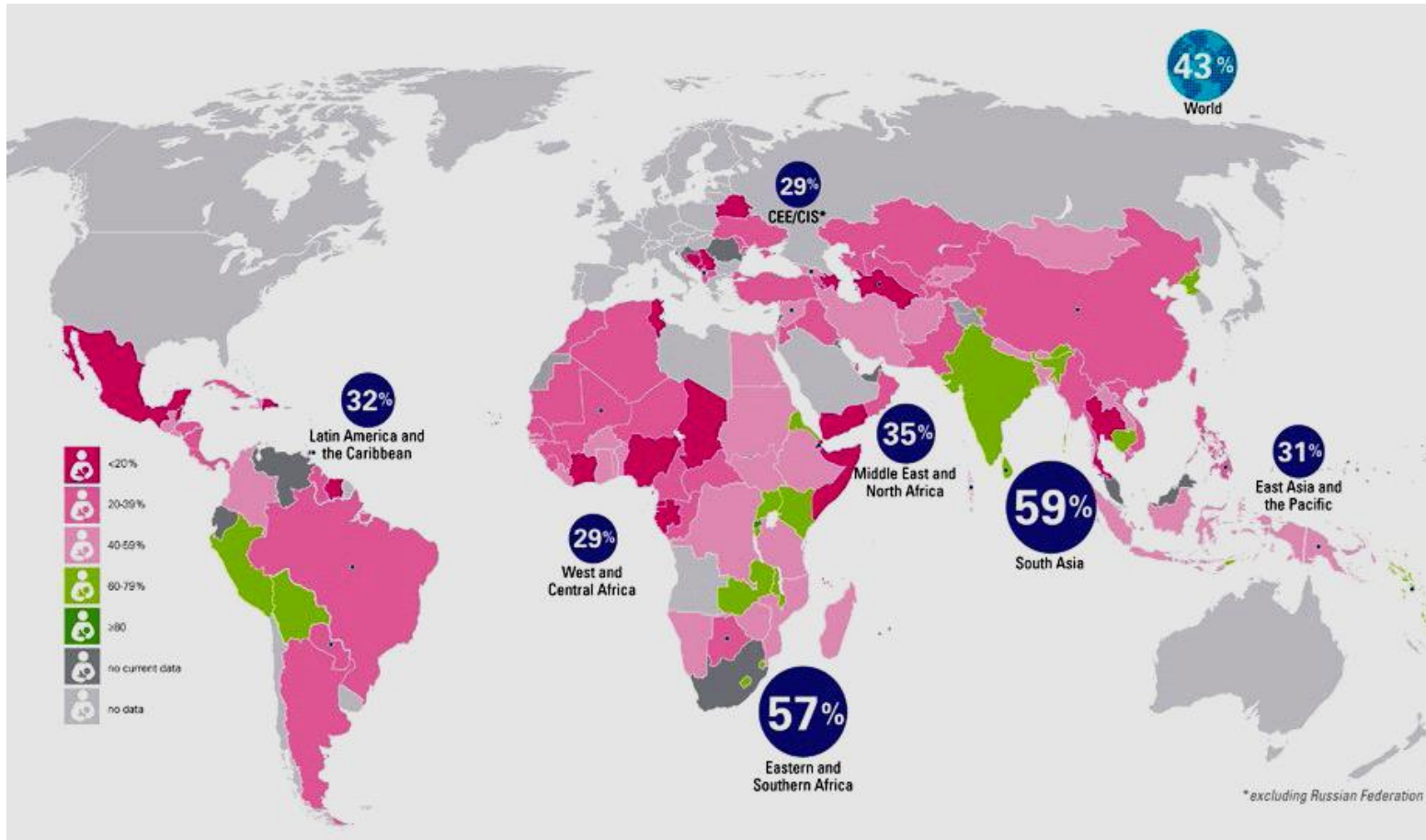


Despite very high low birth weight rates and child under-nutrition rates, under-five mortality in India is comparable to other middle income countries

In spite of the fact that the country will not be able to achieve steep reduction in low birth weight rates, India will be able to achieve the SDG target for reduction in under-five mortality

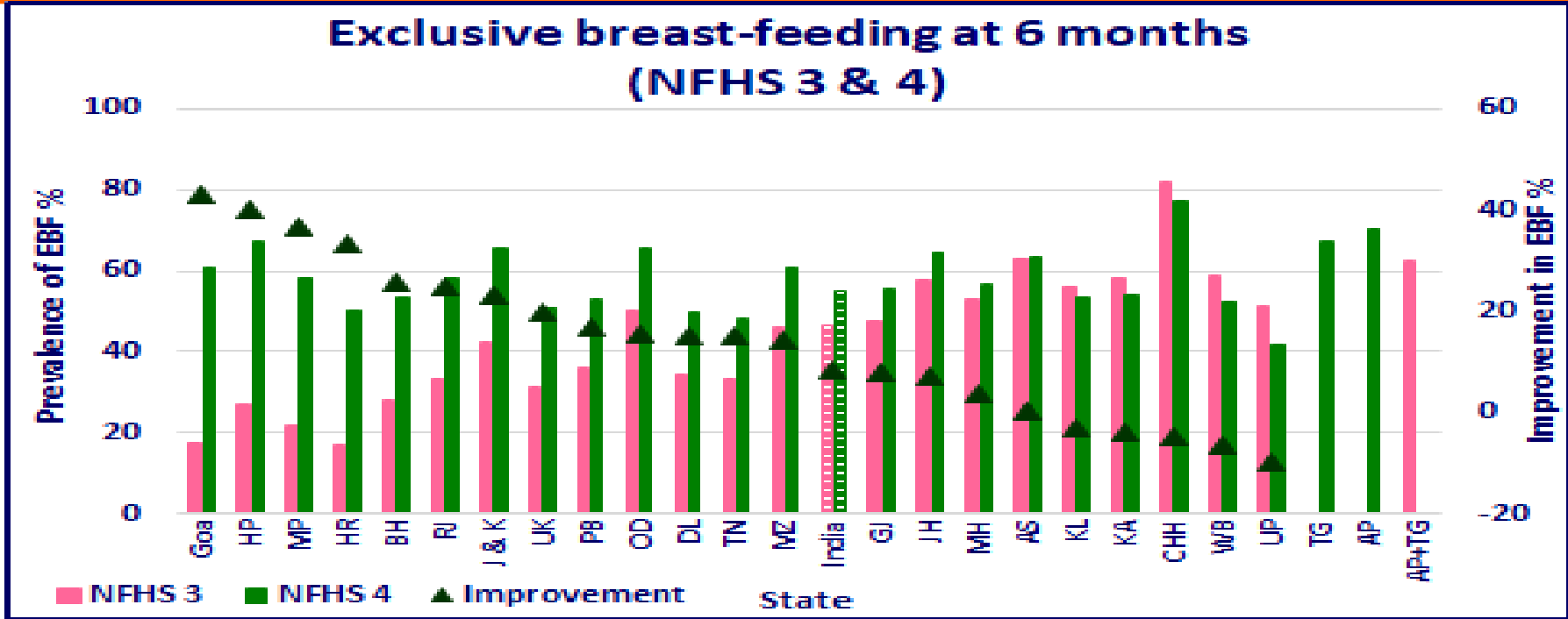
**TARGET 2: INCREASE EXCLUSIVE BREAST-FEEDING
AT SIX MONTHS TO 50%**

EXCLUSIVE BREAST-FEEDING AT SIX MONTHS OF AGE (UNICEF 2016)



Exclusive breast-feeding rates in India are the highest in the world
Indian babies get a good start in life because of universal breast-feeding and high exclusive breast-feeding in the first four months of life

EXCLUSIVE BREAST FEEDING AT 6 MONTHS (NFHS 3 & 4)



There are considerable inter-state and urban rural differences in exclusive breast-feeding rates.

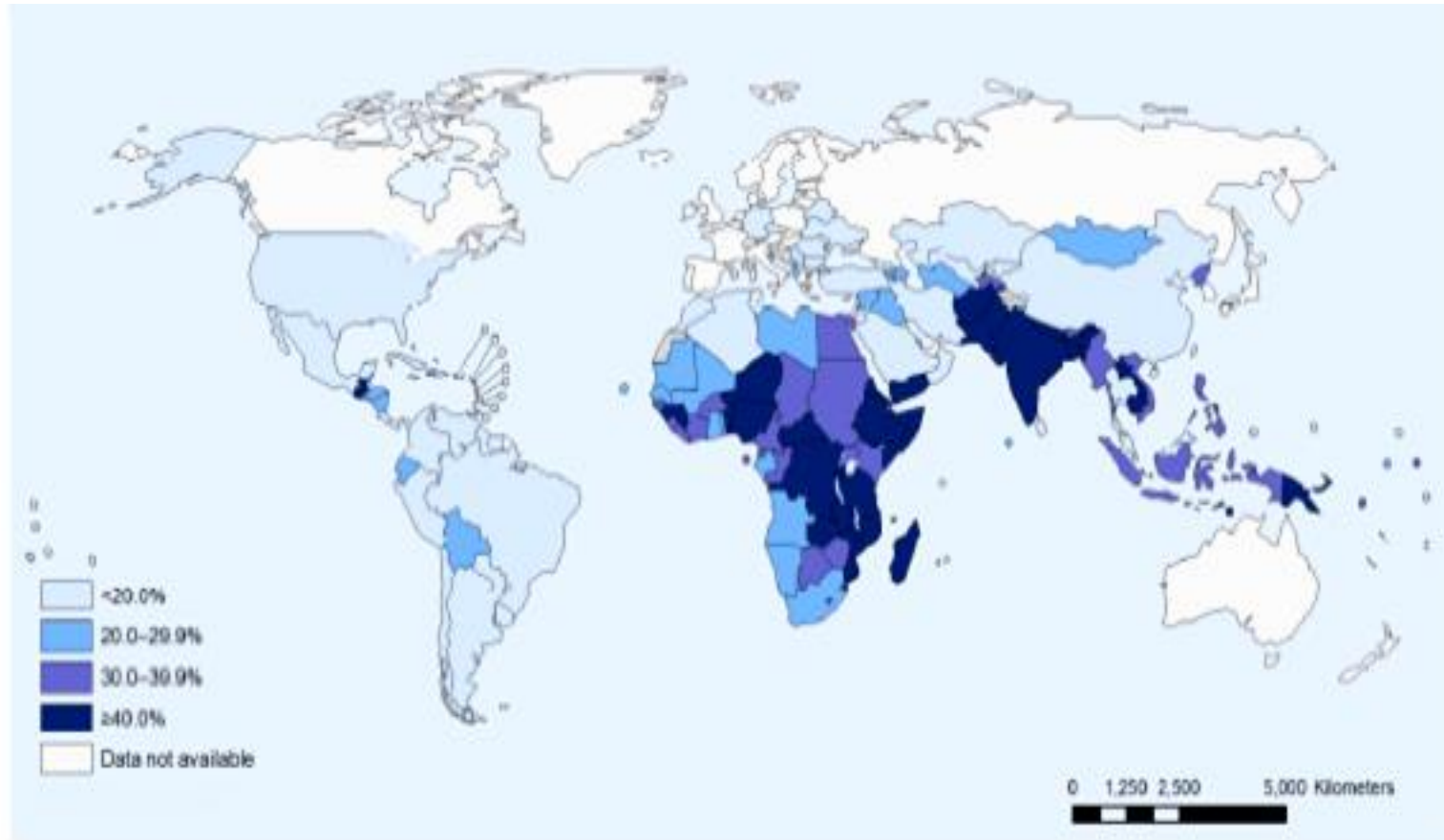
In Chhattisgarh around 80% of women exclusively breast-feed their infants for up to six months

Over the last decade there has been considerable improvement in exclusive breast-feeding rates in states like Goa, HP, MP & Haryana

It is possible to ensure that this improvement continues and the country achieves near universal exclusive breast-feeding rates for up to six months by 2025

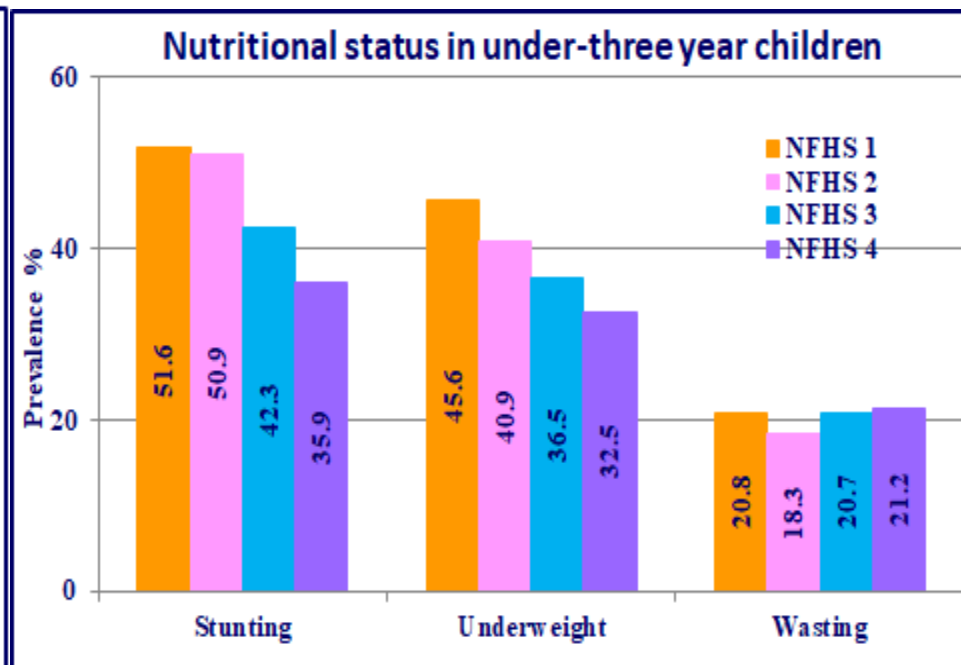
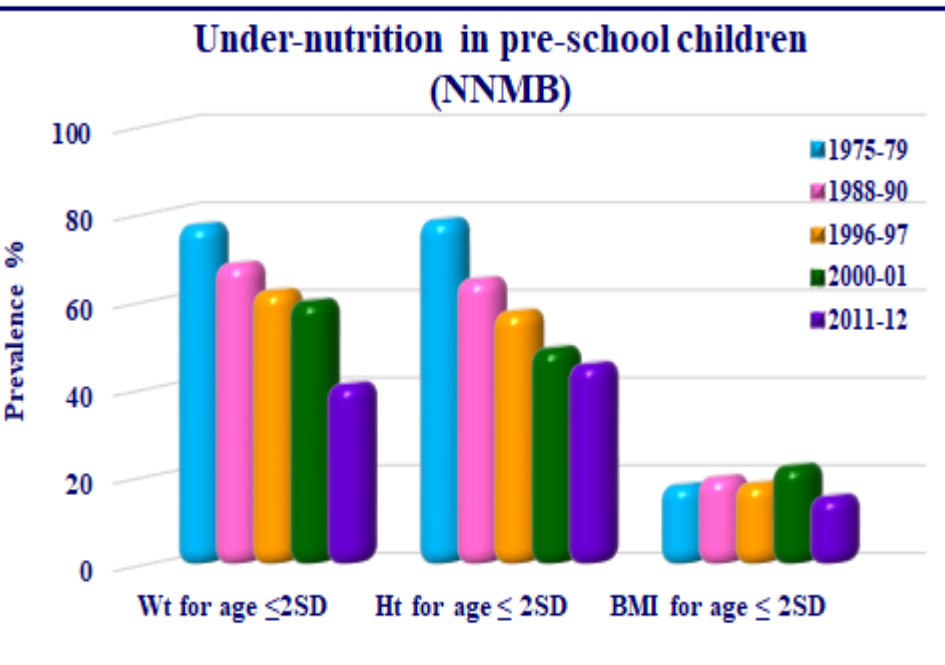
**TARGET 3: ACHIEVE 40% REDUCTION IN STUNTING BY
2025**

PREVALENCE OF STUNTING (WHO 2015)



**Prevalence rates for stunting in India are the highest in the world
India is the home of largest number of stunted children in the world.
Stunting in Indian children is not due to chronic food insecurity
Stunting is mainly due to low birth length; short neonates grow along
a lower linear growth trajectory and remain short through childhood**

TIME TRENDS IN STUNTING RATES (NNMB)

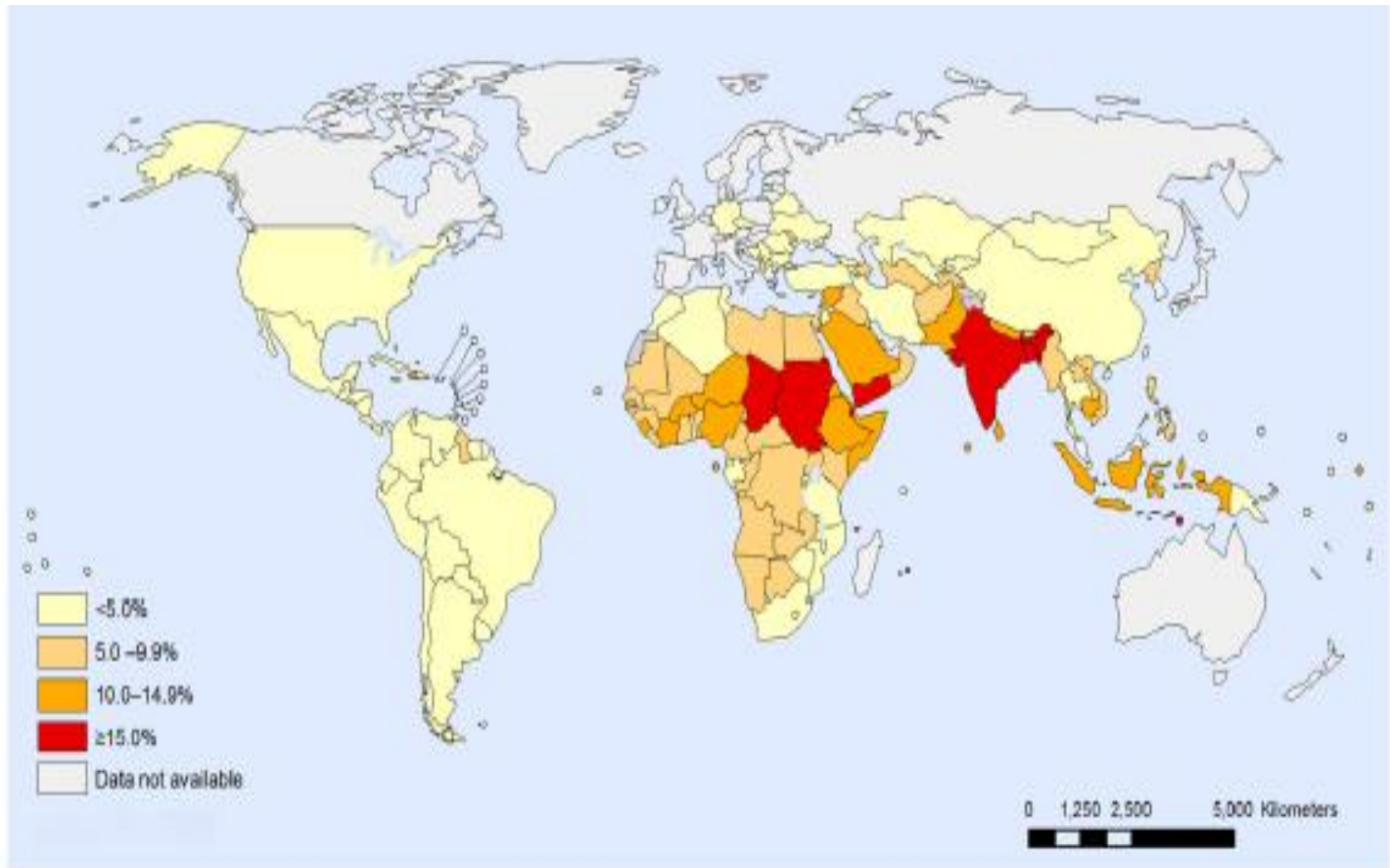


Over the last four decades there has been a steady reduction of 1%/year in stunting rates.

It will not be possible to accelerate reduction in stunting rates to 4%/year and achieve the SDG target of 40% reduction in stunting rate by 2025.

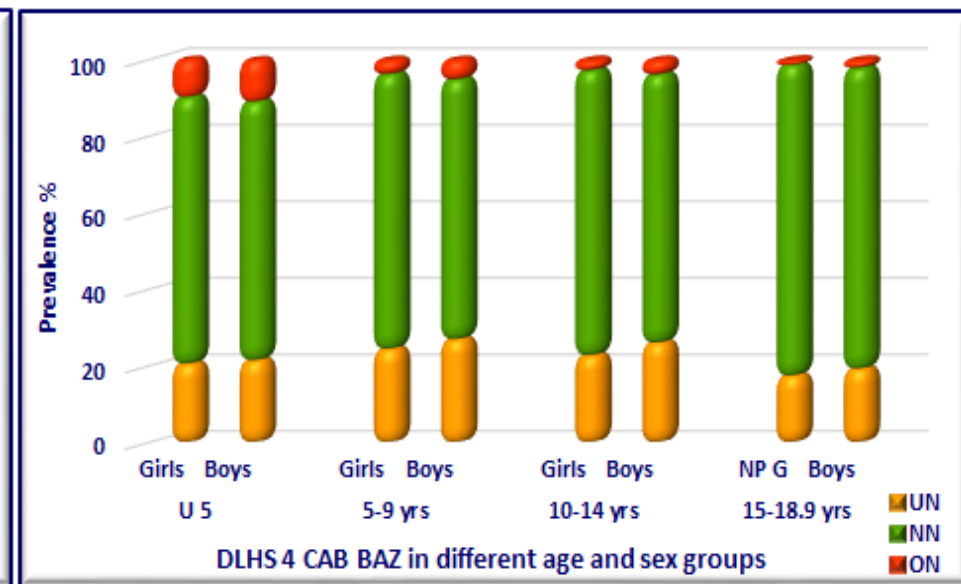
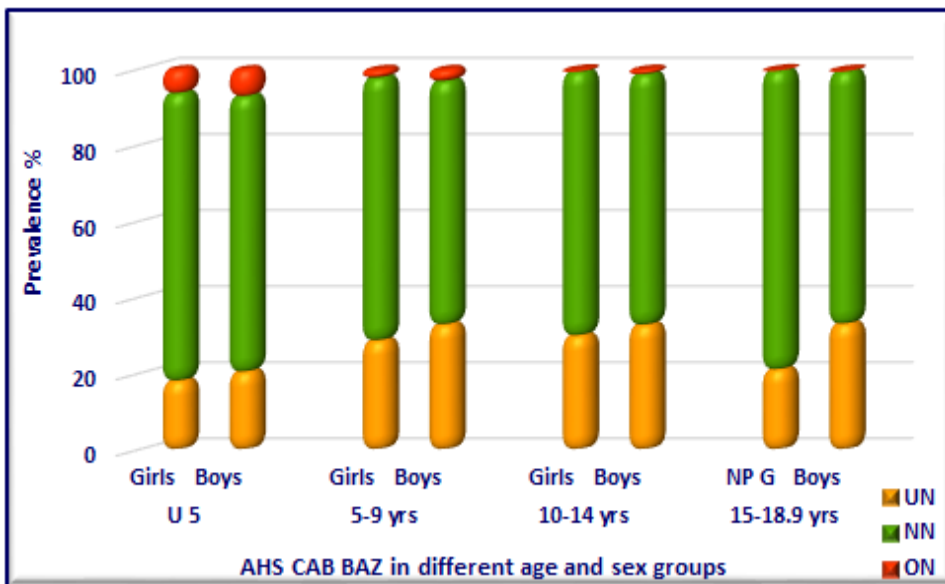
**REDUCE AND MAINTAIN CHILDHOOD WASTING TO LESS
THAN 5% BY 2025**

PREVALENCE OF WASTING IN PRE-SCHOOL CHILDREN (WHO 2015)



**Prevalence of wasting in India is the highest in the world.
India is the home of largest number of wasted children.**

PREVALENCE OF WASTING IN PRE-SCHOOL CHILDREN (AHS AND DLHS 4)

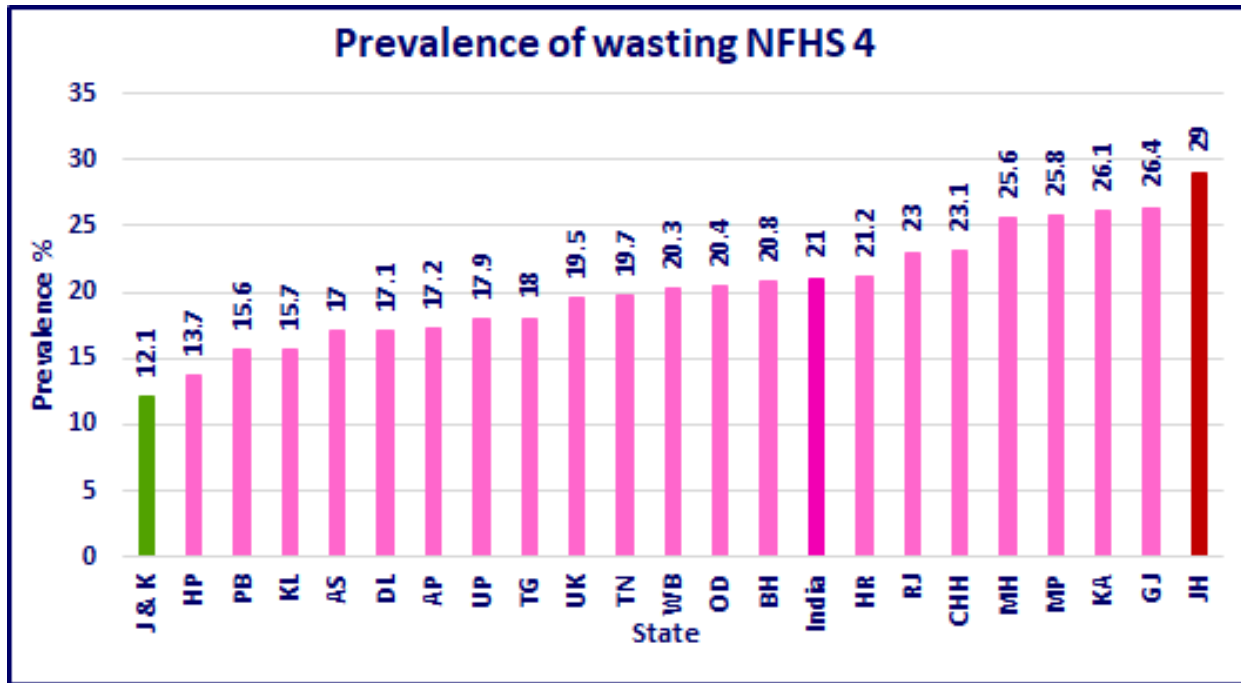


As compared to stunting and under weight rates in India, prevalence of wasting is relatively low - less than 20% in under-five children.

But there is a progressive increase in prevalence of wasting with increase in age.

This can and should be prevented by appropriate interventions.

INTER-STATE DIFFERENCES IN PREVALENCE OF WASTING IN PRE-SCHOOL CHILDREN



There are substantial inter-state differences in wasting rates in pre-school children

It will be possible to bring down prevalence of wasting to less than 5% in states with relatively low wasting rates and sustain it

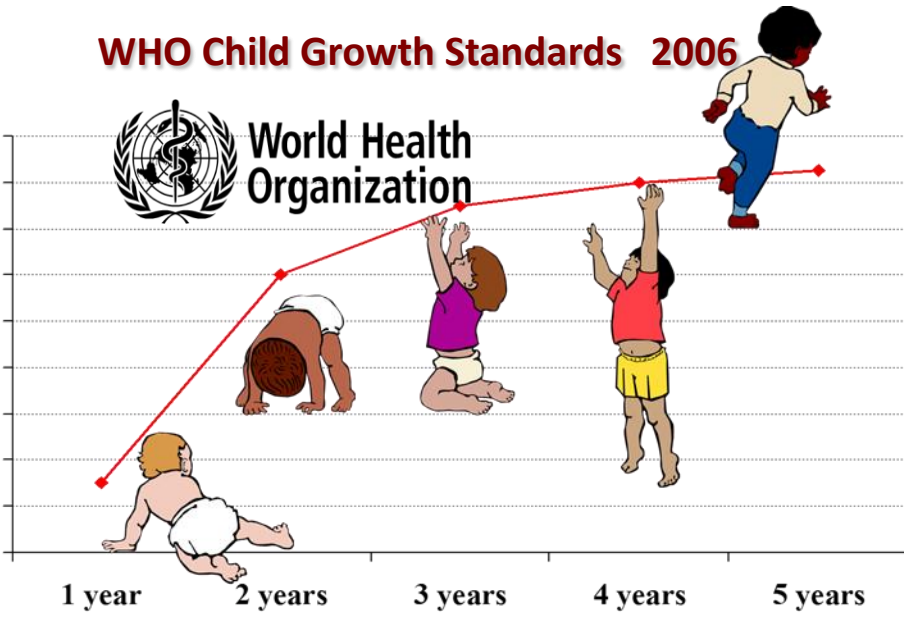
But it may not be possible to achieve and maintain wasting at less than 5% by 2025 in all states or at national level.

**ENSURE THAT THERE IS NO INCREASE IN CHILDHOOD
OVERWEIGHT**

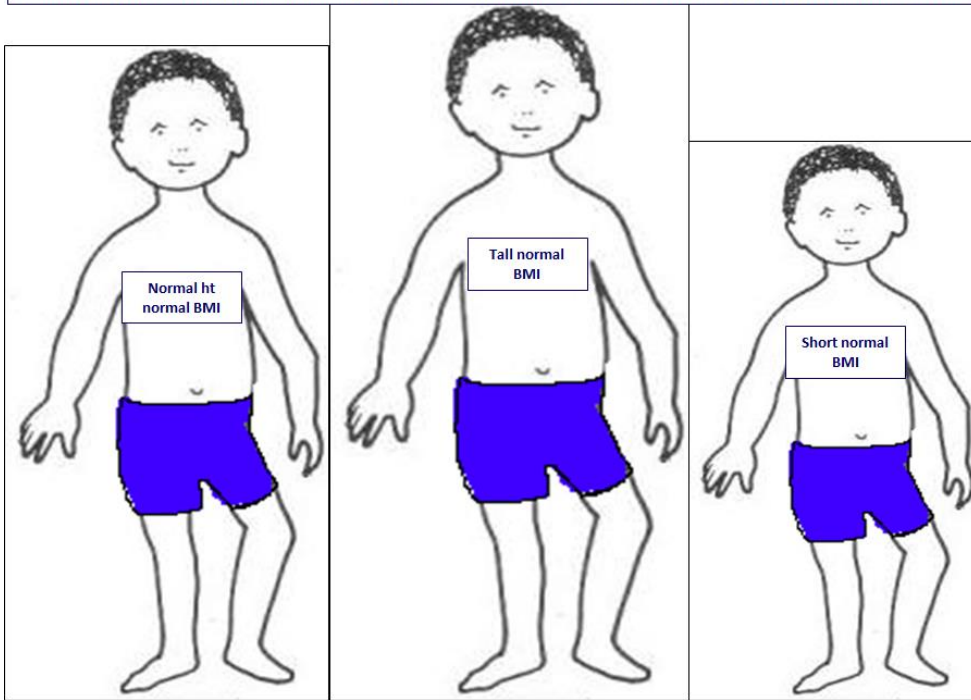
WHO Child Growth Standards 2006



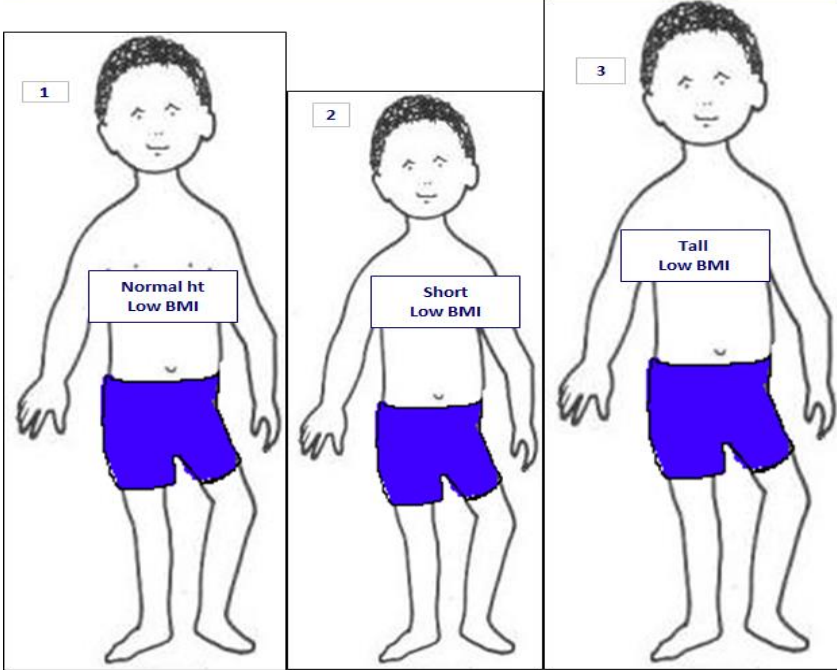
World Health Organization



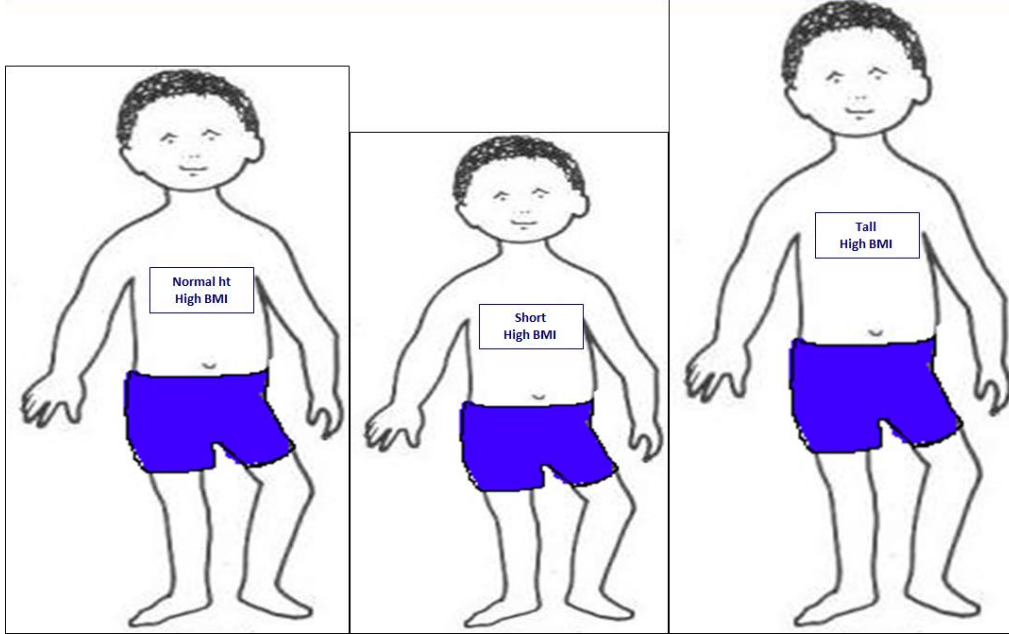
Children with normal BMI can be normal in height, tall or short. Children with normal BMI do not require nutritional interventions



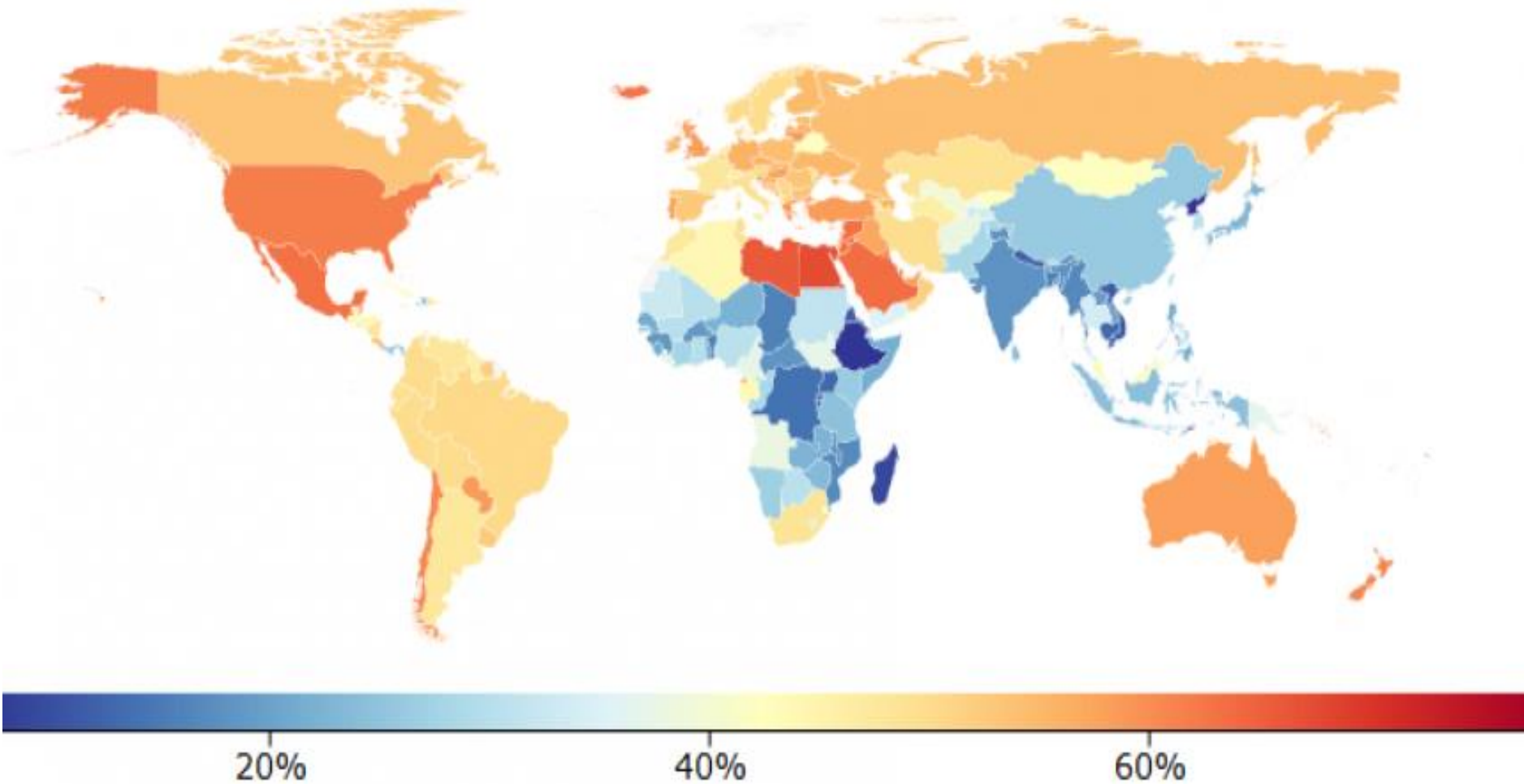
Children 1, 2 & 3 have low BMI. Children with low BMI can have normal height, be tall or short. They **all** require additional energy intake to ensure their linear growth trajectory



All these children have high BMI. Children with high BMI can have normal height, be tall or short. They all require adequate physical activity to reach normal BMI.

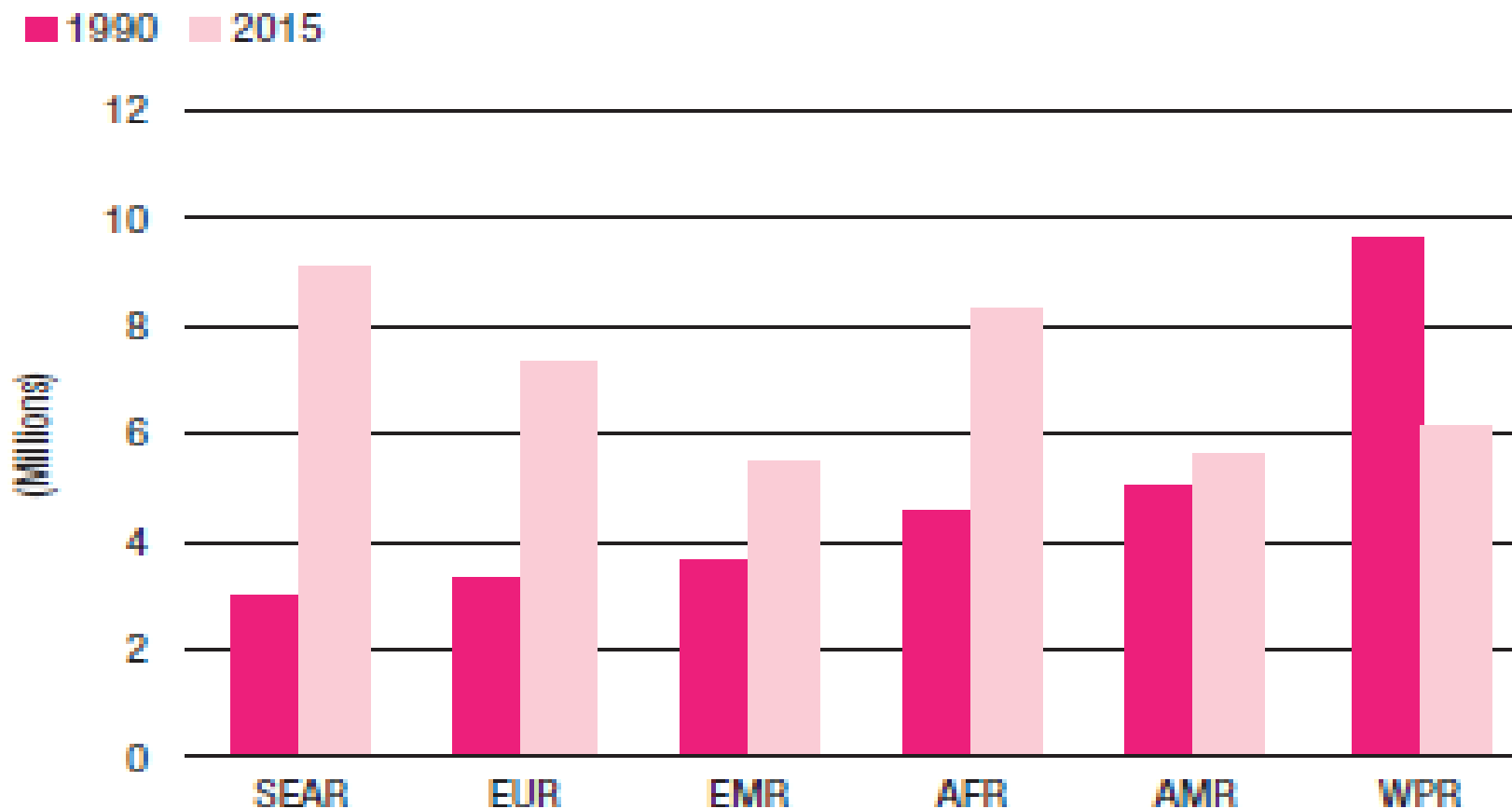


PREVALENCE OF OVERWEIGHT CHILDREN (WHO 2015)



Prevalence rate of over-nutrition in children are relatively low in India

Number of overweight children under five by WHO region,^a 1990 and 2015^b



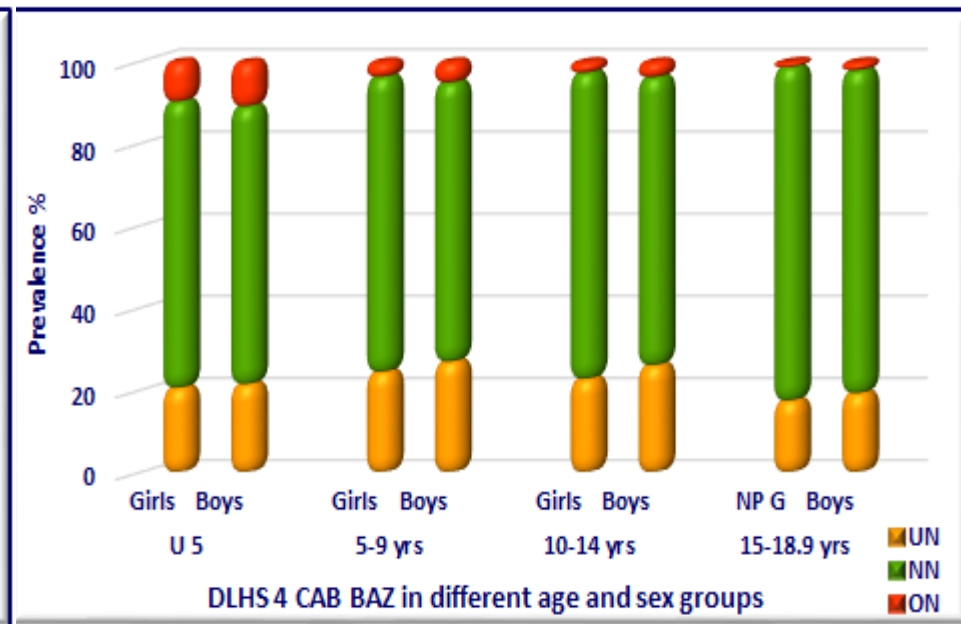
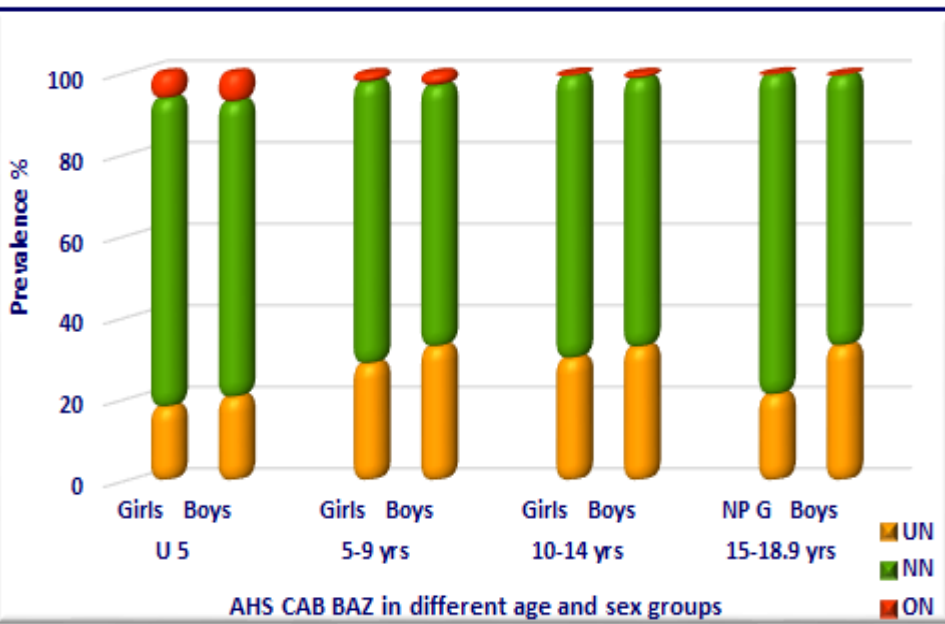
^a Estimates for the European Region have low population coverage.

There has been a substantial increase in number of overweight children in SEAR

In terms of numbers SEA region has the largest number of overweight children

India is the home of largest number of overweight children in the world

PREVALENCE OF OVERWEIGHT CHILDREN (AHS & DLHS 4)



Prevalence of overweight is relatively low - less than 5% in 0-18 year children
There is no progressive increase in prevalence of overweight with increase in age in children

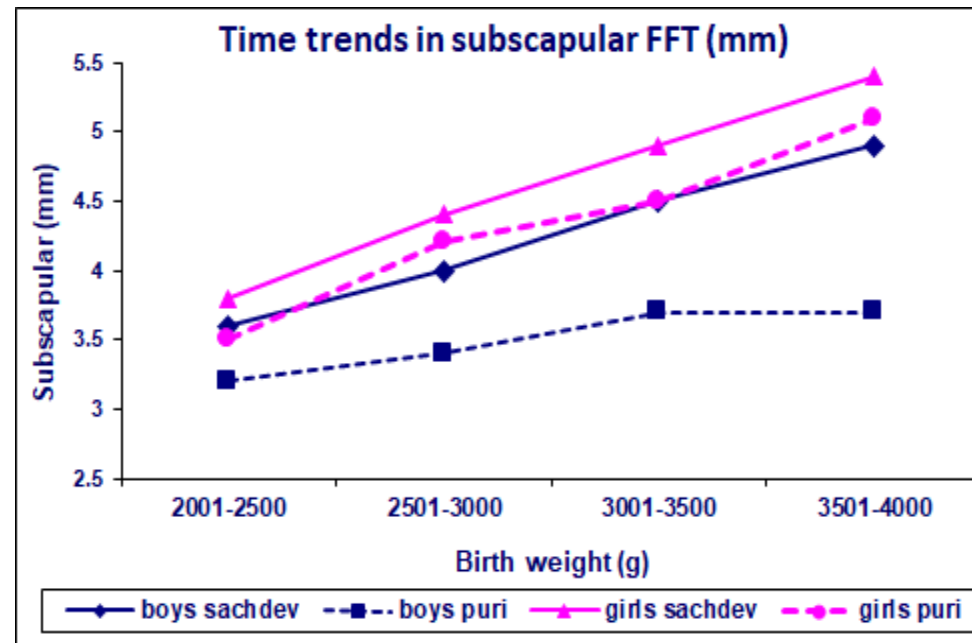
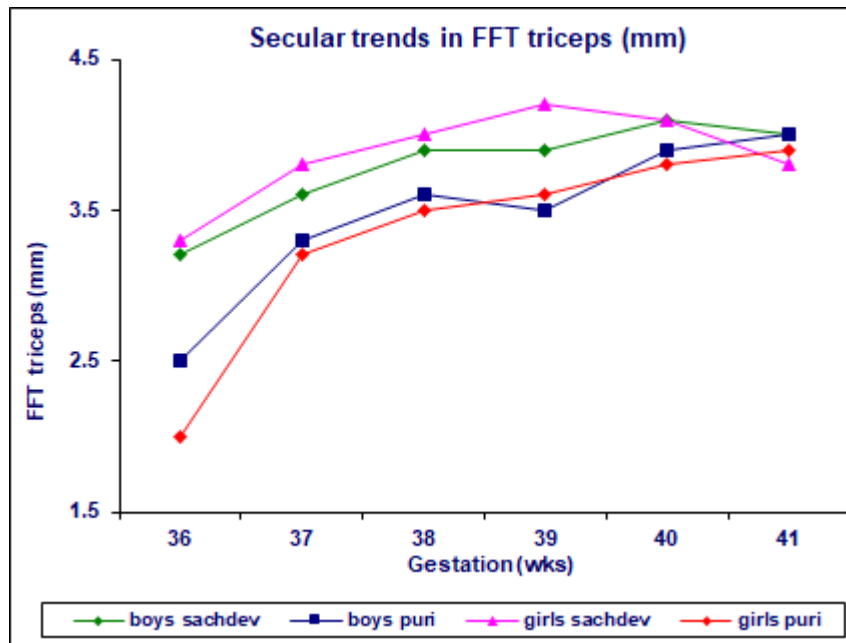
Increase in overweight rates in children can be prevented by appropriate well targeted interventions at this stage.

It is possible to achieve the SDG target of prevention of increase in overweight in children.

This in turn will help in achieving some reduction in overweight in adults and prevent NCD related morbidity

HALT RISE IN OVER-NUTRITION

THE THIN-FAT INDIAN NEONATE

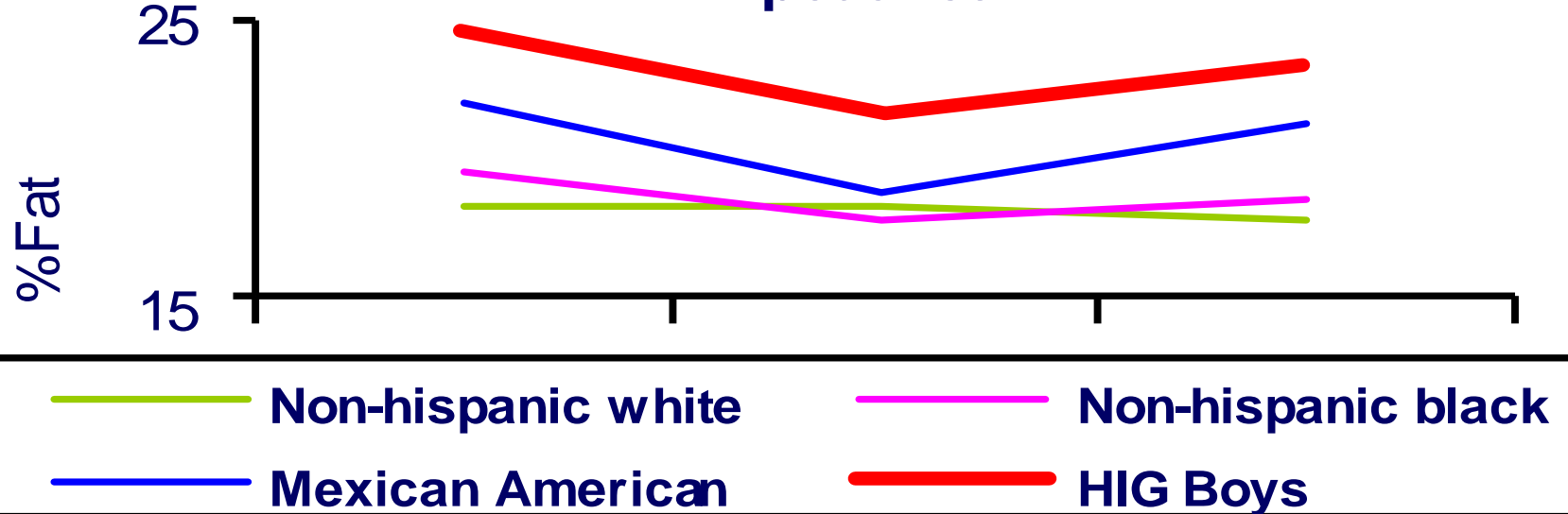


Indian neonates are short and wasted; they have low muscle mass but fat mass is spared.

Over the last three decades there has been no change in birth weight but there has been an increase in fat fold thickness of neonates - in boys and girls, in all gestational age and birth weight categories

Indians' proneness for adiposity begins in utero

% fat for boys estimated using bioelectrical impedance



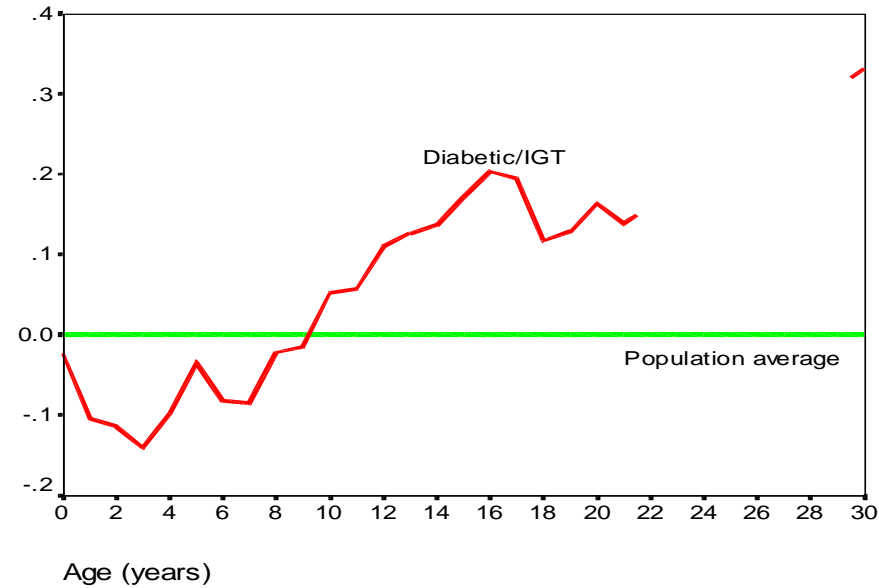
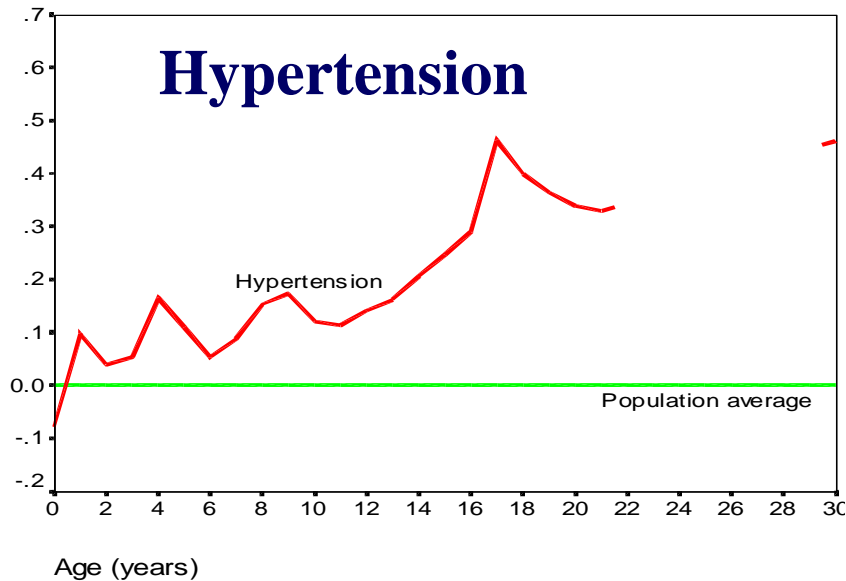
Over years there has been an increase in adiposity in school age children both in urban and rural areas

Comparison of data on % fat in Delhi urban high income group adolescent boys with Non-Hispanic white, Non-Hispanic black and Mexican Americans showed that % body fat was highest in Indian boys.

Adiposity in adolescents is associated with adiposity in adults.

Adult men and women have higher body fat for a given BMI as compared to Caucasians

EARLIER GROWTH AND ADULT DISEASE

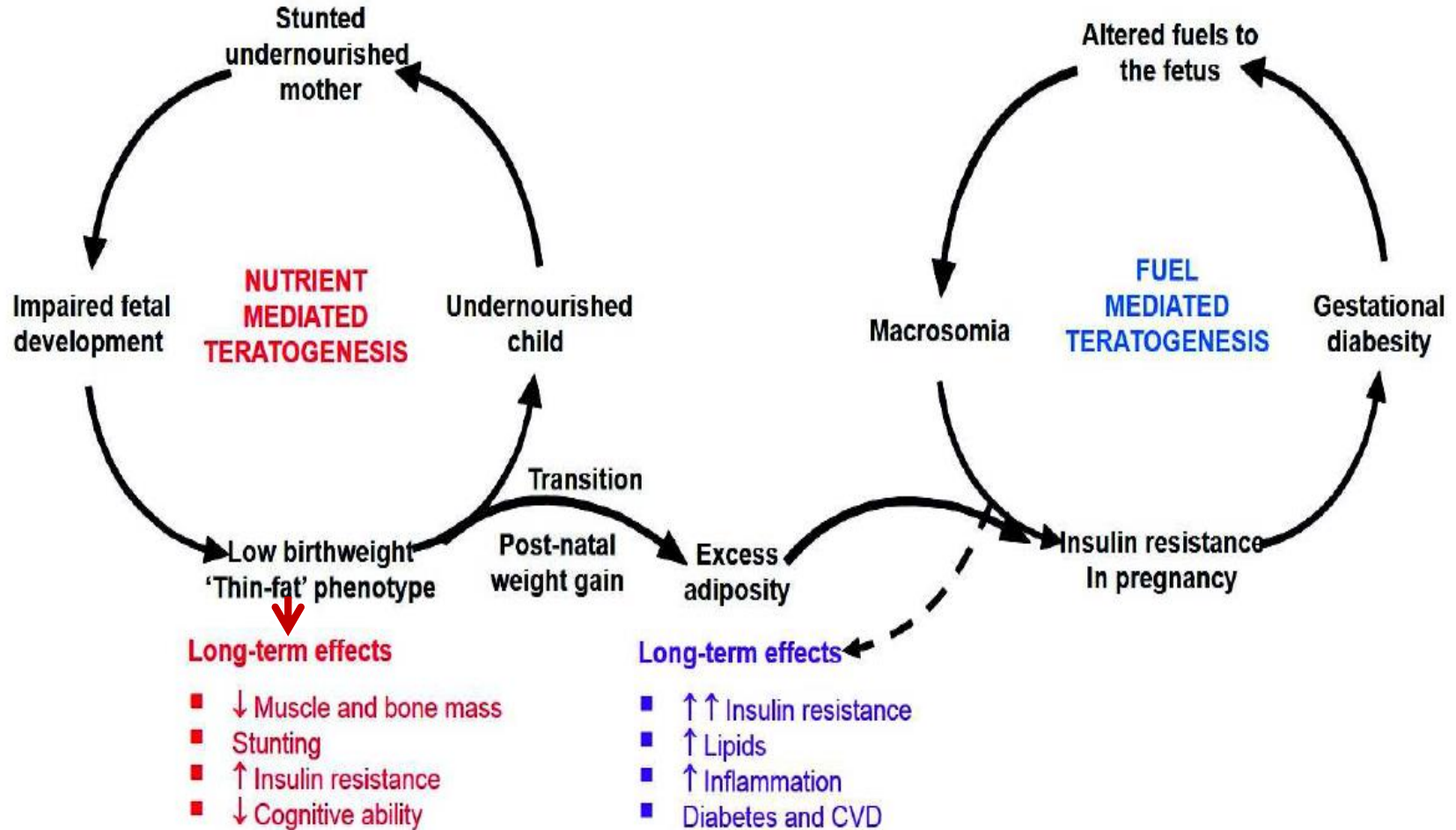


Bhargava SK, Sachdev HPS, *et al.* New Engl J Med 2004; 350: 865

Risk of hypertension and diabetes was higher in adults who had gained more weight and BMI (mainly body fat) in childhood and adolescence.

Childhood under-nutrition and later access to adequate food may predispose to over-nutrition in adult life and also predispose to hypertension and diabetes.

DUAL NUTRITION BURDEN AND RISK OF NCD



Both maternal under-nutrition and over-nutrition are associated with changes in foetal development

Both predispose to increased risk of NCD in adult life

ASSESSMENT OF NUTRITIONAL STATUS IN ADULTS

For adults, BMI has long been used as the indicator for assessment of both under- and over-nutrition.

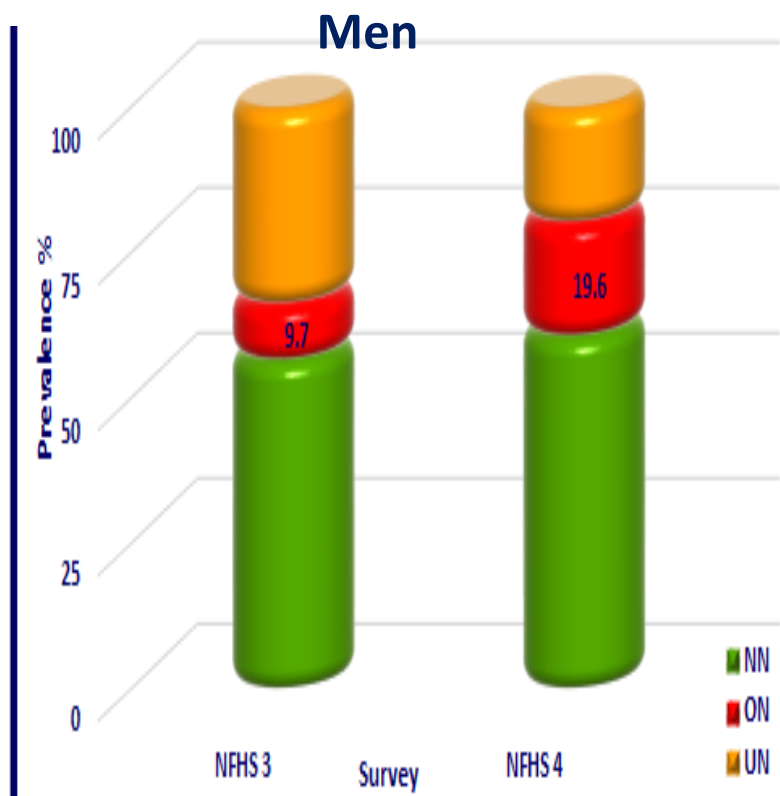
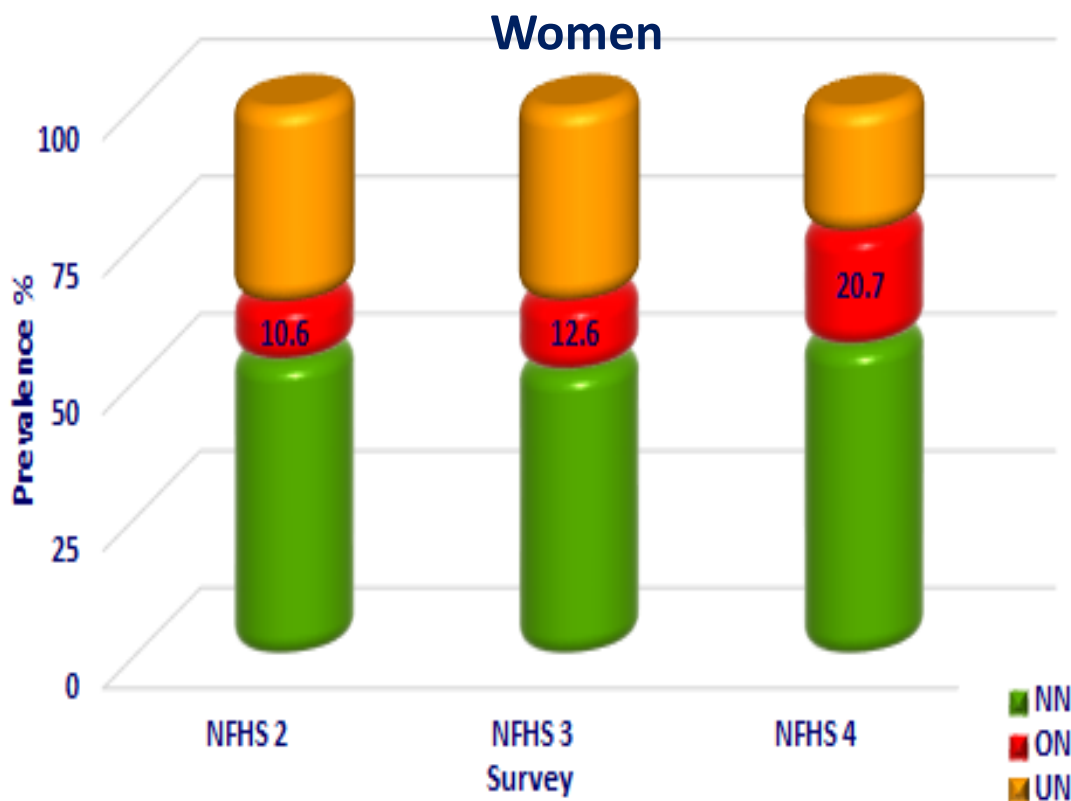
WHO had recommended that adults with BMI <18.5 should be classified as under-nourished, those with BMI between 18.5 and 24.9 classified as normal, between 25 and 29.9 should be classified as over-nourished and those with BMI ≥ 30 classified as obese.

Indians have higher body fat for any given BMI as compared to the Caucasians and the increase in CVD risk occurs even before BMI of 25 is reached.

It has therefore been suggested that Indians with BMI of ≥ 23 be classified as over-weight, those with BMI ≥ 27 as obese.

However currently all the national surveys continue to use BMI of 25 for classifying adults as over-nourished.

NUTRITION TRANSITION IN ADULTS (NFHS 2, 3 & 4)



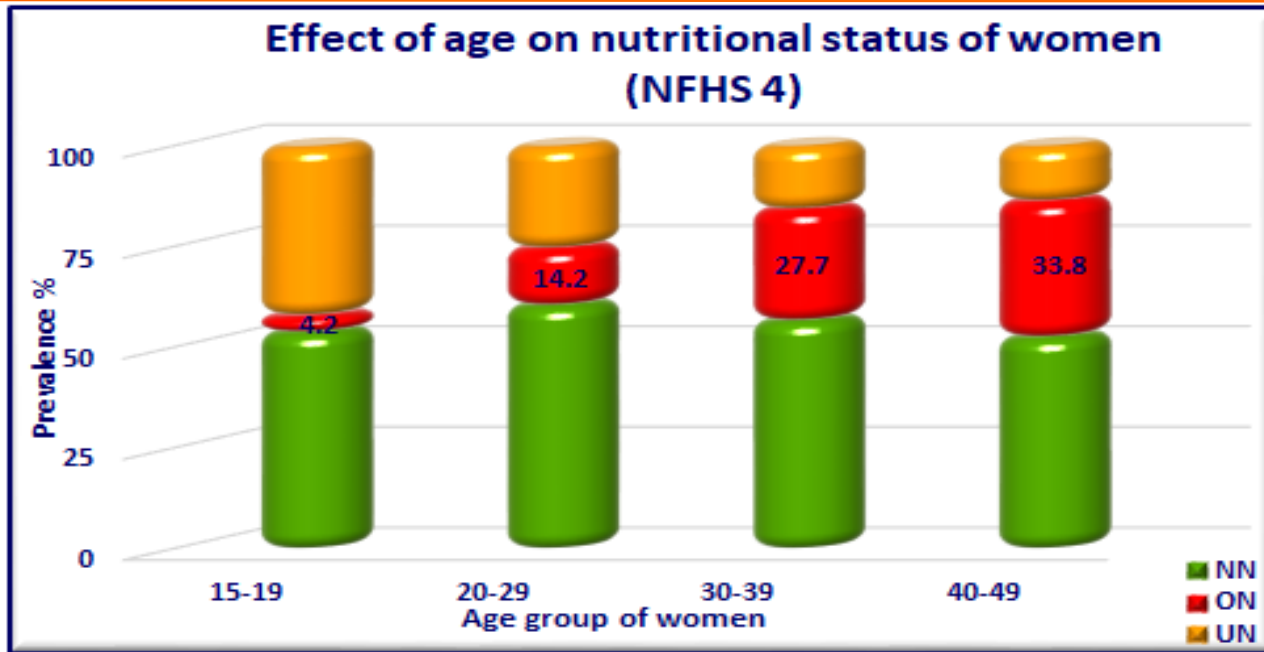
In the last two decades there has been a progressive reduction in under-nutrition both in men and women.

Under- and over-nutrition rates are higher in women as compared to men

Over-nutrition rates in men and women has doubled in the last decade

Over this period the proportion of normally nourished persons have remained unchanged

EFFECT OF AGE ON NUTRITIONAL STATUS OF WOMEN



Most women have children in 18-29 years of age.

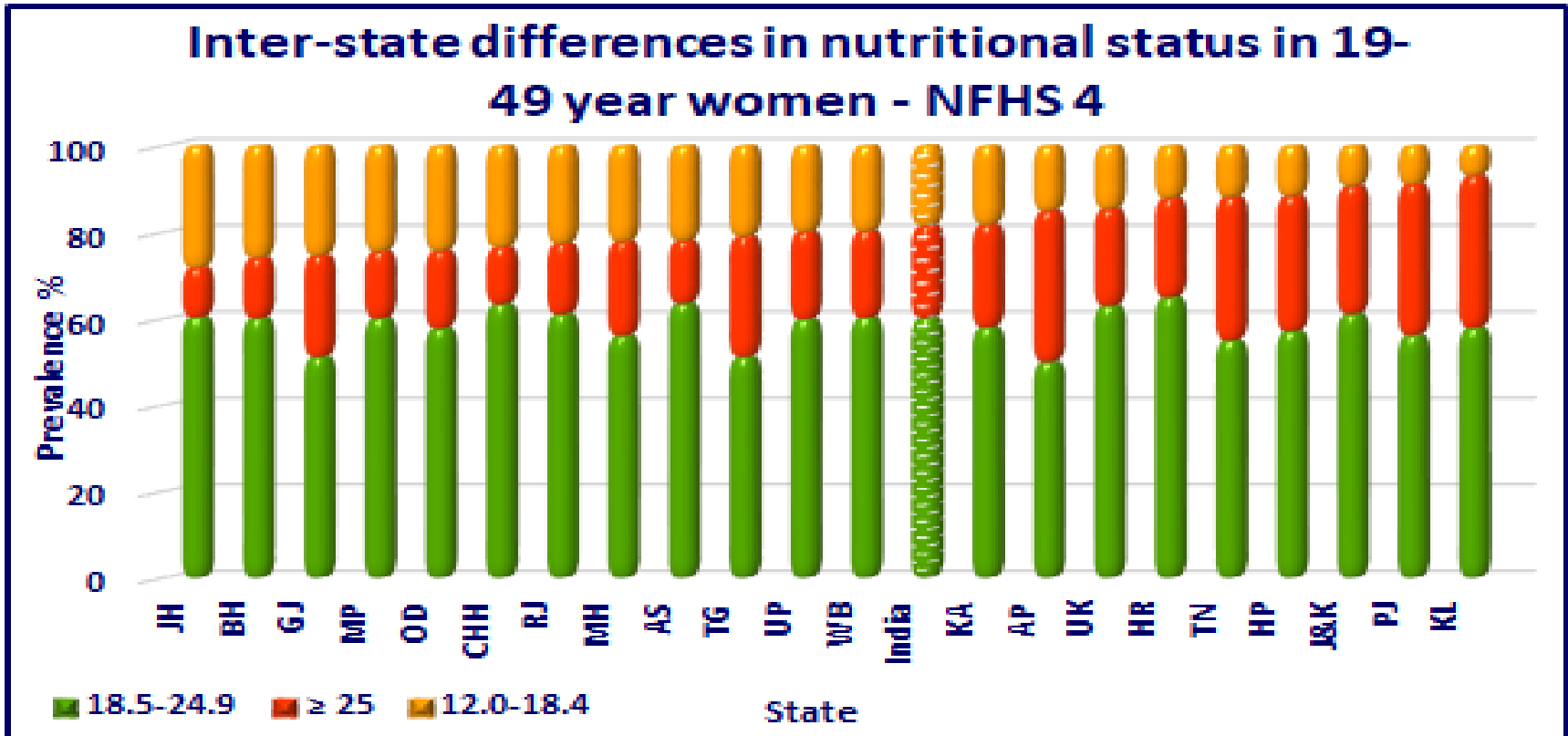
Under-nutrition in women is higher in under thirty women

Maternal under-nutrition is associated higher low birth weight rates

Over-nutrition rates are high in women beyond 40 years of age. Women tend to ignore such weight gain because they believe that it is menopause related

They do not seek any nutrition or health advice and incur the risk of NCD and complications associated with NCD

PREVALENCE OF OVER-NUTRITION IN ADULTS

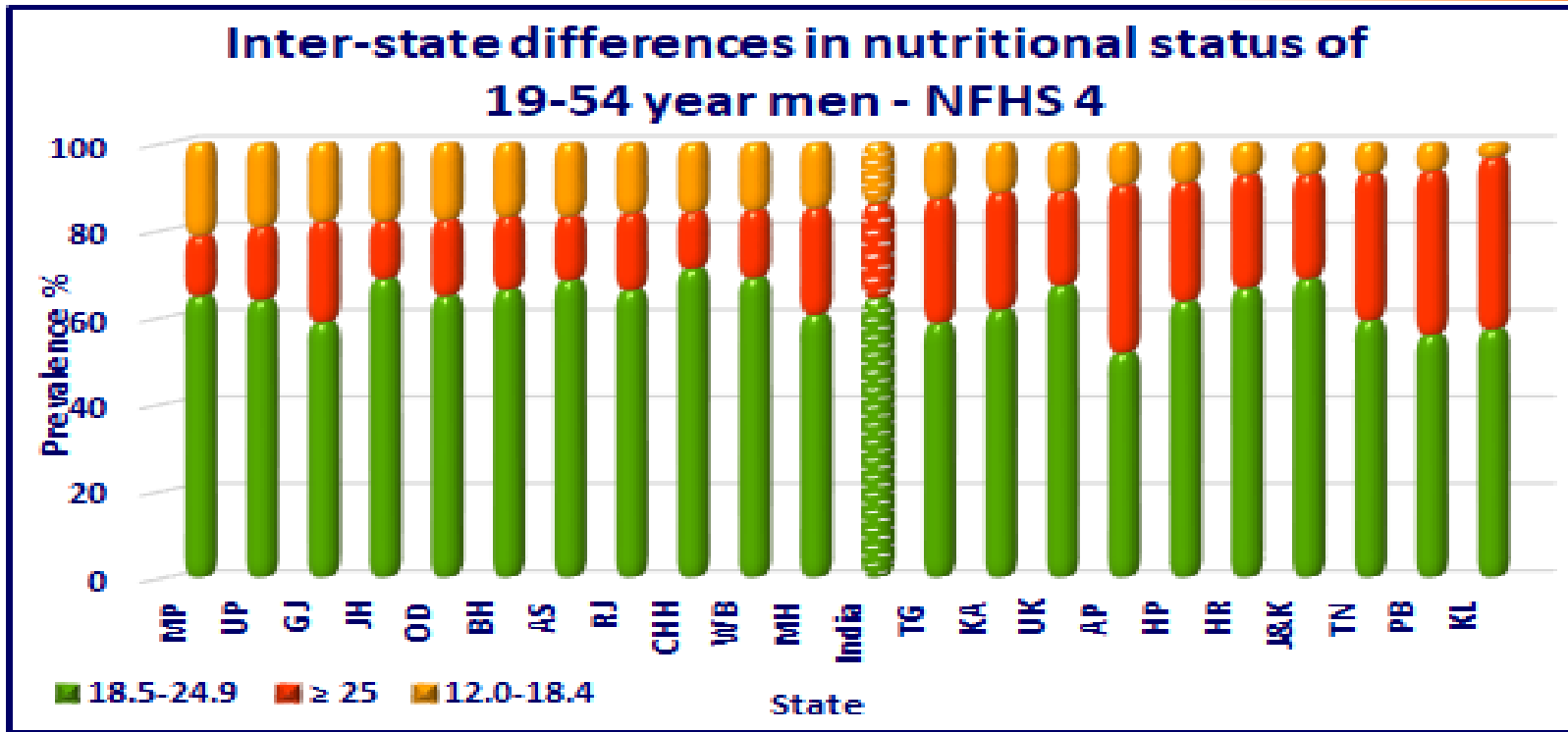


There are substantial inter-state differences in under- and over-nutrition rates in women

In most states lower under-nutrition rates is associated with higher over nutrition rates, so that the proportion of women who are normally nourished is essentially similar

It is important to initiate interventions to ensure that fall in under-nutrition is not accompanied by rise in over-nutrition rate.

PREVALENCE OF OVER-NUTRITION IN ADULTS



There are substantial inter-state differences in prevalence of under- and over-nutrition in men.

However in all states nearly 60% of men are normally nourished

In states with lower under-nutrition rates, over-nutrition rates are higher

In most of the states with higher over-nutrition rates, longevity is higher.

These states have to take up screening of persons beyond 30 years of age for hypertension and diabetes, in order to detect NCD in the early asymptomatic phase and initiate appropriate management

HALT RISE IN DIABETES AND HYPERTENSION

In India, under-nutrition and its health consequences and poor maternal and child health indices are still public health problems.

Most of these health problems are symptomatic and acute; they can readily be treated.

Over-nutrition and associated non-communicable diseases are now emerging as major public health problems

Most of the non-communicable diseases are asymptomatic in the initial phases.

Patients seek care mostly when complications set in

NCD management requires lifestyle modification and life long medication.

India's health system has to reorient and gear itself up for successfully managing prevention, early detection and effective management of dual nutrition and disease burden

PROGRAMMES FOR COMBATING DUAL NUTRITION BURDEN

ASSESSMENT OF NUTRITIONAL STATUS

Screen by anthropometry to detect under- and over-nutrition

Assess dietary intake & physical activity

EFFECTIVE MANAGEMENT OF DUAL NUTRITION AND HEALTH BURDEN

Provide appropriate nutrition education & care, monitor improvement

Assess health problems; provide appropriate and affordable health care

- **Assessment of nutritional status is an important component of both public health interventions and care of individuals seeking health care.**
- **Ideally nutritional assessment should be carried out periodically in all individuals and more often in vulnerable segments of population such as children, adolescents, pregnant and lactating women and elderly citizens.**
- **Neither nutrition and health services nor our population, are geared for such routine periodic assessment and appropriate counselling for early detection and effective management of nutritional deficiencies and excesses before clinical problems arise.**
- **Therefore assessment of nutritional status should be carried out as and when there is an opportunity - when any person seeks health or nutrition care or as a part of community-based nutrition surveys**

Once assessment is done appropriate advice should be given depending upon their nutritional status:

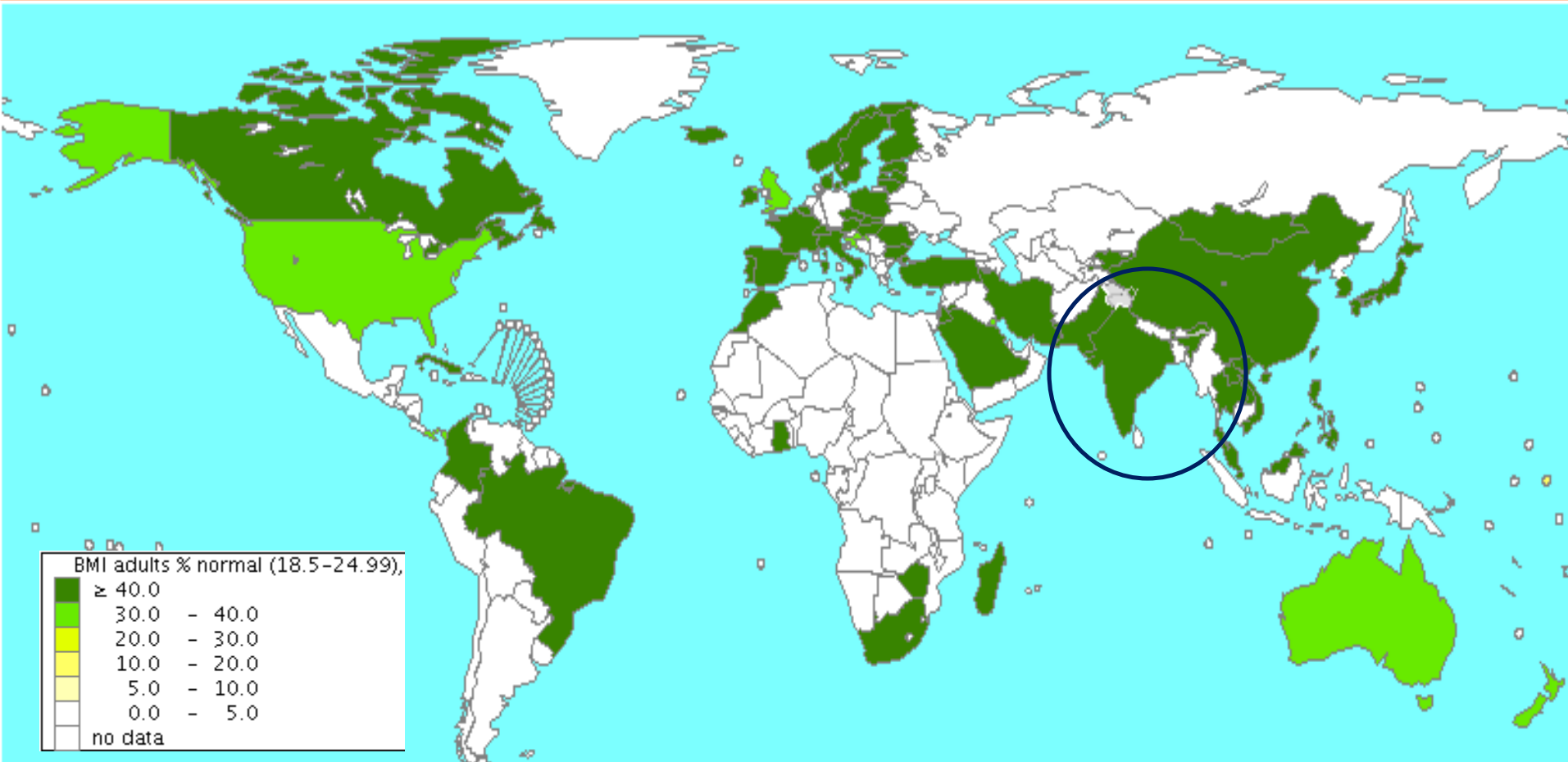
- normally nourished persons - promote their current lifestyles and provide support for continued normal nutrition and health status**
- those who are under- or over-nourished and are at risk of health problems - provide appropriate nutrition and physical activity counselling, if required nutritional supplementation and monitor improvement**
- those with illness - identify nutritional problems, provide appropriate health and nutrition therapy to restore normal health and nutrition and monitor response.**

Nutritionists and physicians have to play a critical role in combating the dual nutrition and disease burden by appropriate nutrition and life style counselling and nutrition and health care

Promoting synergy between health and nutrition services will enable the country to achieve rapid improvement in health and nutritional status of the population and achieve the SDG targets for both nutrition and health

TAKE HOME MESSAGES

PREVALENCE OF NORMAL NUTRITION (BMI)



More than 80% of under-five children and 50 % of the adult population in India are normally nourished. This is a major advantage.

We should endeavour to see that majority of Indians remain normally nourished and healthy right from childhood through adolescence and adult life

THANK YOU!

