ENERGY REQUIREMENTS DURING PREGNANCY AND LACTATION

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ENERGY REQUIREMENTS DURING PREGNANCY

Pregnant women have always been recognised as a nutritionally vulnerable group

Research Studies carried out in developed countries in the 1950 and 60s indicated that women gain about 10 kg during pregnancy and the birth weight of the offspring was 3.1 kg

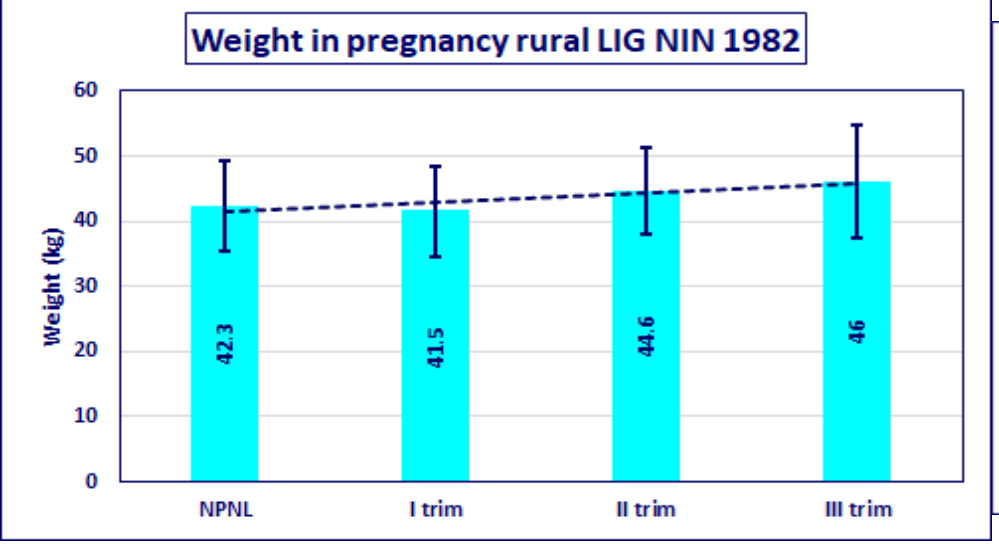
Pregnant women requires additional energy (and other) nutrients to meet the needs:

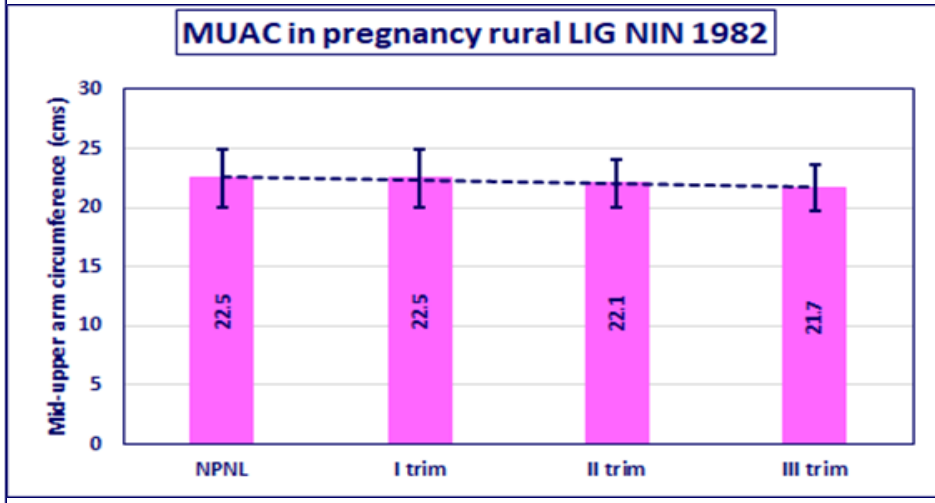
1. **of the growing infant (especially in the second and third trimester)**
2. **for the physiological changes during pregnancy in the mother**
3. **for carrying out daily activities when she has gained weight.**

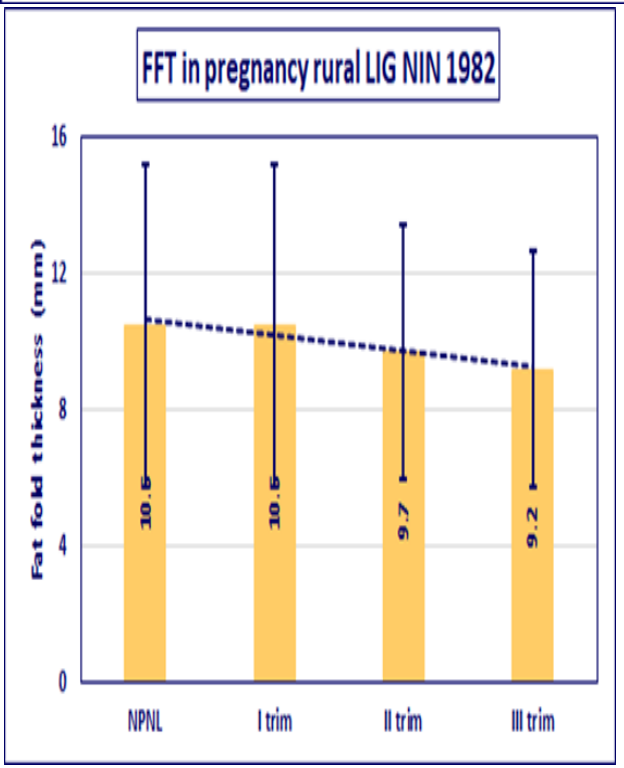
To meet all these requirements it was computed that pregnant women would need an additional dietary intake of 300 Kcal/day and similar increase in all nutrient in the second and third trimester

Since 1970s global and national recommendations for dietary allowances have used the factorial approach and recommended additional dietary intake of 300-350 Kcal/day in the second and third trimester of pregnancy.

NUTRITIONAL STATUS OF INDIAN PREGNANT WOMEN NIN 1977-1982







Longitudinal studies in rural low income group women in Hyderabad showed that

- **the mean height was 150cm**
- **1/3rd were under-nourished prior to pregnancy**
- **energy intake ranged between 1200-1600 Kcal**
- **there was no difference in energy intake between pregnant and non-pregnant women**
- **weight gain in pregnancy was between 4-6 Kg**
- **there was a reduction in MUAC of 0.8 cm and a reduction in FFT of 1.3mm during pregnancy**
- **Birth weight was 2.6 kg.**

IN THESE WOMEN BODY FAT WAS BEING MOBILISED TO MEET THE ENERGY REQUIREMENTS DURING PREGNANCY

In the 1970s India initiated comprehensive intervention programmes to improve dietary intake and nutritional status of all including pregnant women.

Intervention programmes initiated to reduce household food insecurity and improve nutritional status of the family include:

- **food for work programmes to improve purchasing power**
- **subsidised food grains were provided to poor families through the Public Distribution System**

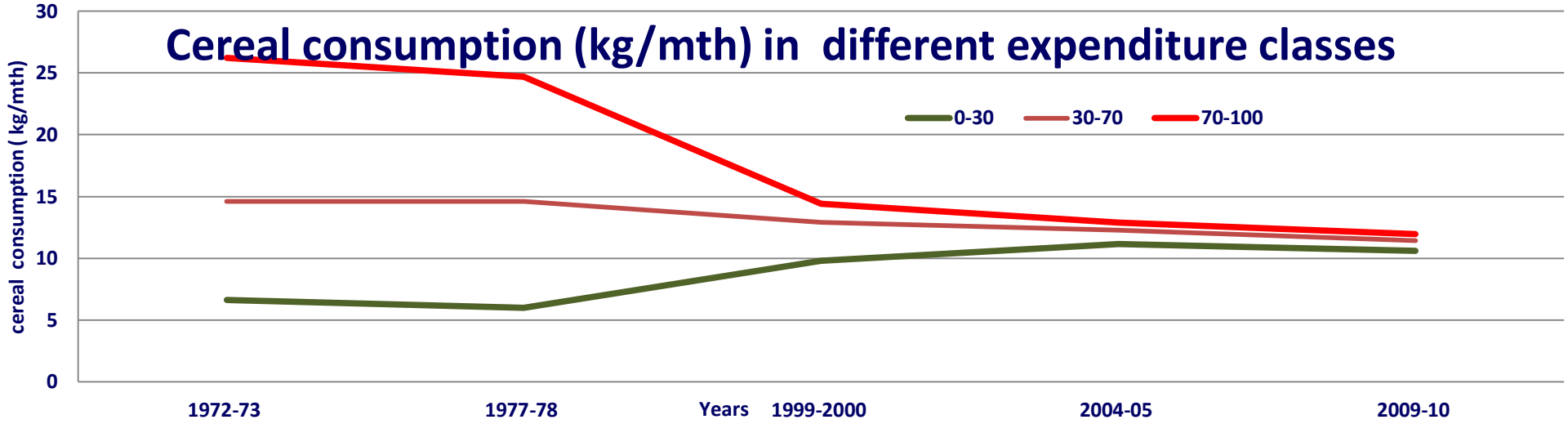
To bridge the gap between actual food intake & requirement during pregnancy, food supplementation programme through integrated Child Development services (ICDS) was initiated.

In a vast and varied country like India, it was inevitable that

- **there were substantial differences in the coverage, content and continuous supply;**
- **leakages in supplies;**
- **problems in effective implementation under all these programmes;**
- **the most vulnerable and needy segments of population did not get the expected benefit from these programmes.**

NUTRITION TRANSITION IN WOMEN

TIME TRENDS IN CEREAL INTAKE



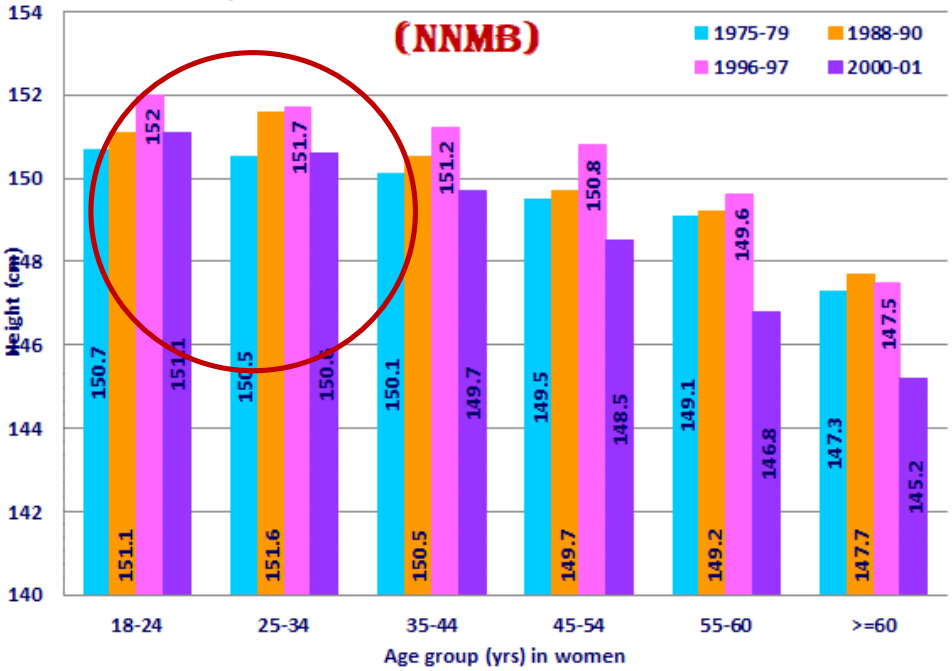
Cereals are the major source of energy in Indian diets.

Over the last four decades there has been a decline in cereal consumption (and energy intake) among the rich and increase in cereal consumption among the poor.

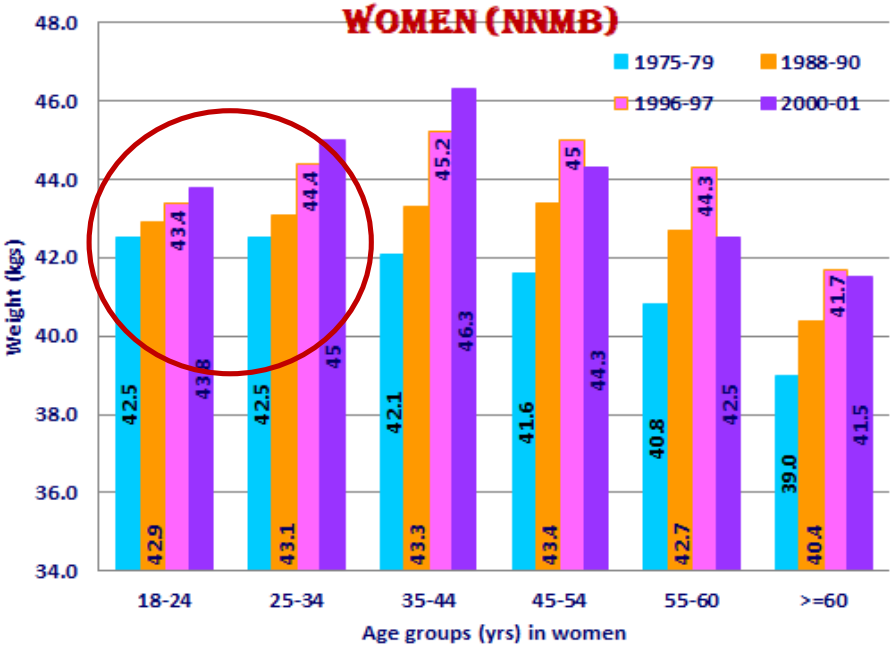
As of 2009-10 cereal intakes are essentially similar in all groups, and is sufficient to meet their requirements.

Perceptive Indian population changed their cereal and energy consumption before experts revised the RDA!

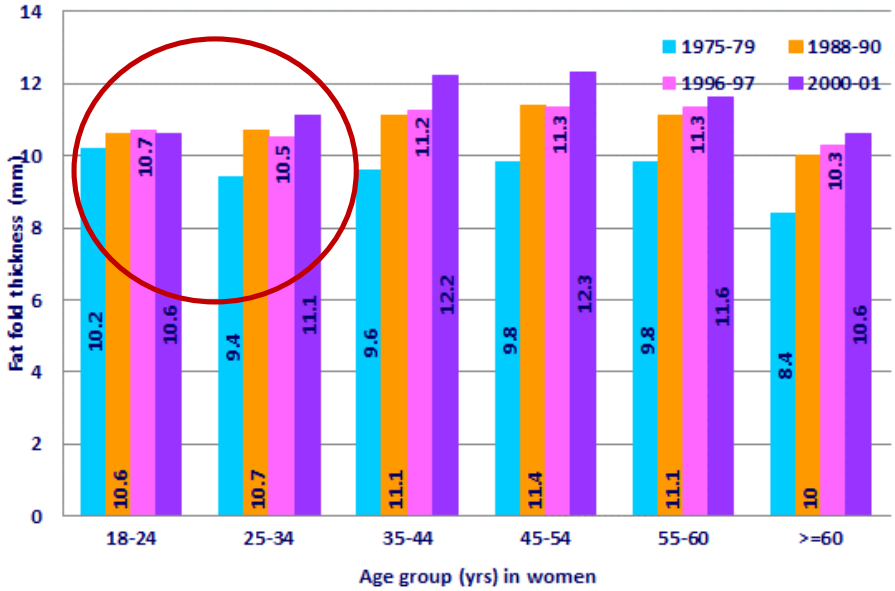
TIME TRENDS IN MEAN HEIGHT IN WOMEN (NNMB)



TIME TRENDS IN MEAN WEIGHT IN WOMEN (NNMB)



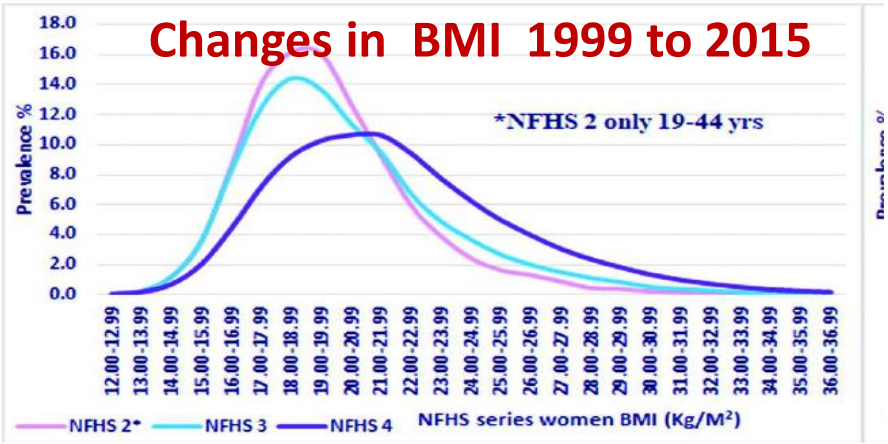
TIME TRENDS IN FFT IN WOMEN (NNMB)



NUTRITION TRANSITION IN WOMEN

IN THREE DECADES WOMEN GAINED ABOUT 2CM IN HEIGHT, FOUR KG IN WEIGHT AND 2-3 MM IN FAT-FOLD THICKNESS.

NUTRITION TRANSITION IN WOMEN



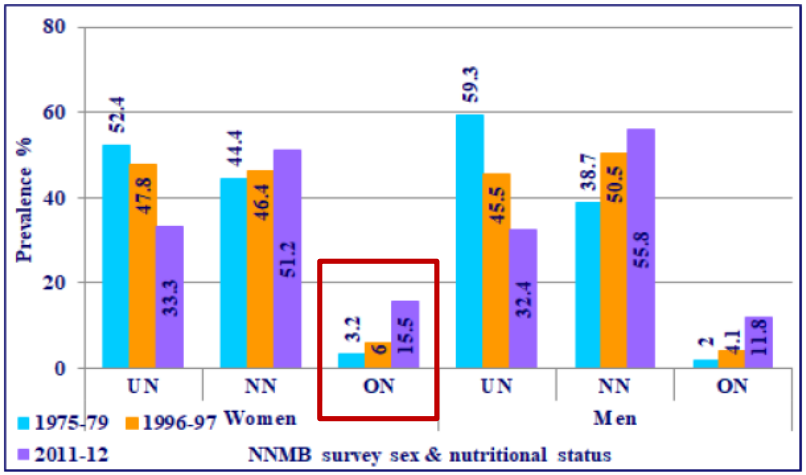
The shift to right in BMI has occurred across all BMI categories.

As a result there was reduction in under-nutrition and rise in over-nutrition.

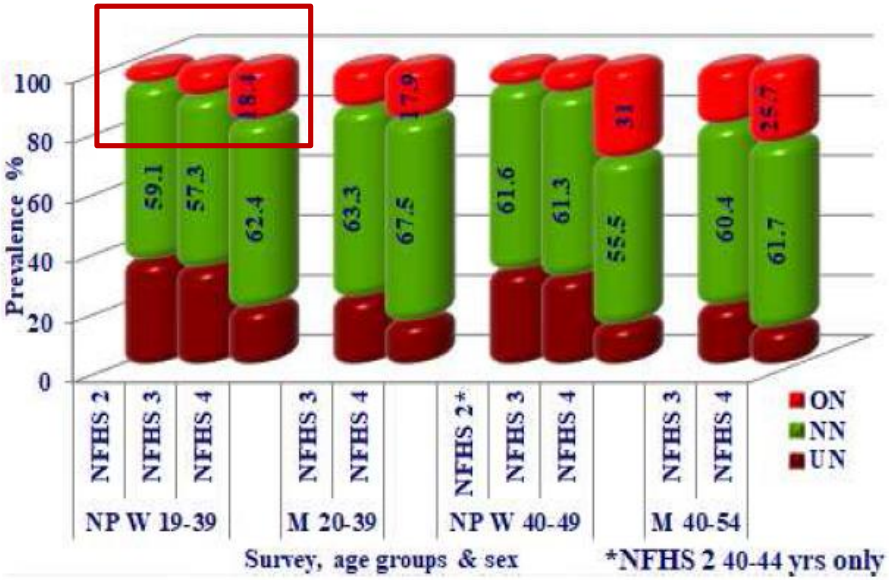
Between 1975 and 2012 there was a reduction in under-nutrition in women. Over this period there was five fold increase in over-nutrition from 3.2% to 15.5 %

Between 1995 (NFHS 2) and 2015 (NFHS 4) a similar fall in under-nutrition and steep rise in over-nutrition in women was reported.

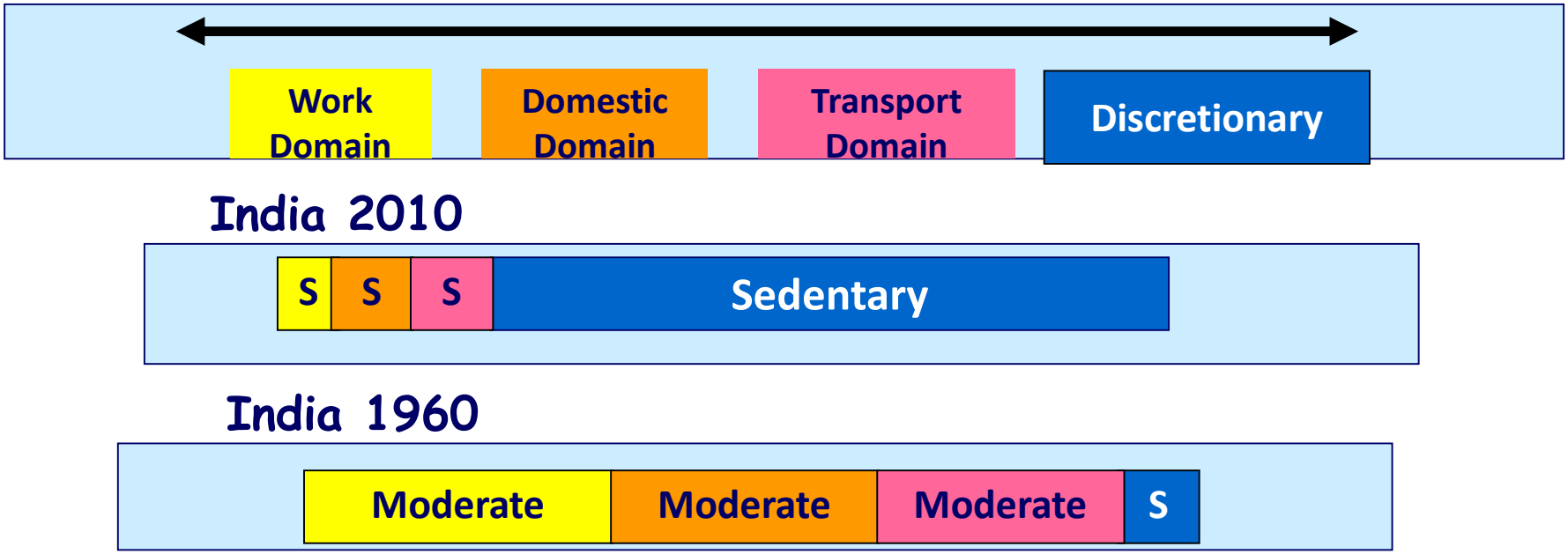
Nutrition transition in women 1975-2012



Nutrition transition in women 1999-2015



PHYSICAL ACTIVITY

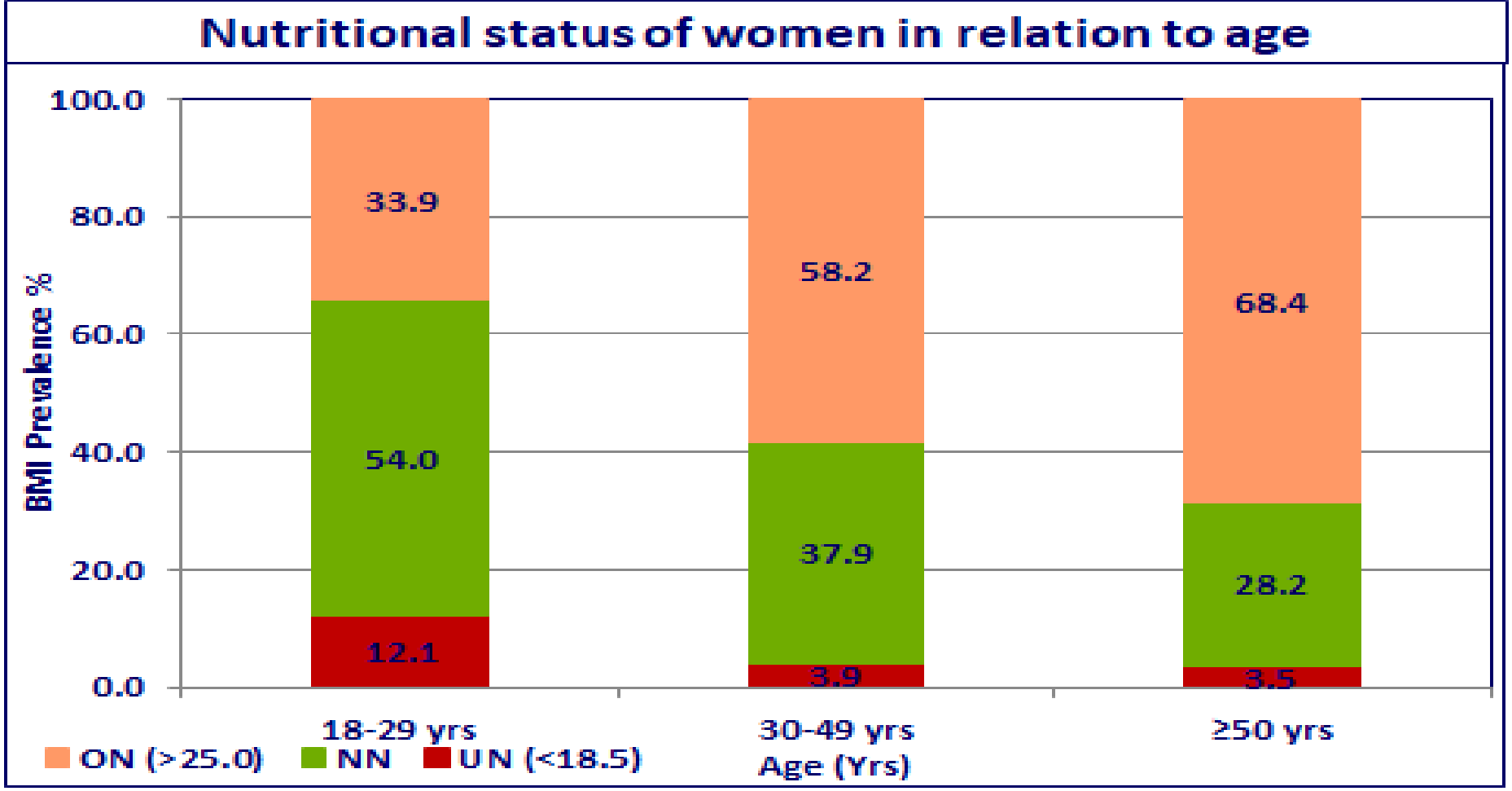


Until two decades ago Indians had adequate moderate physical activity in domestic occupational and transport domains.

So in spite of sedentary discretionary activity, overall physical activity levels in Indians was moderate

Over the last few decades physical activity in daily chores had declined. Discretionary physical activity continues to be sedentary.

Steep reduction in physical activity is the major factor responsible for positive energy balance and the rise in over-nutrition rates in India.



Studies carried out by NFI in urban low middle income group of women showed that in the 18-29 year age group prevalence of under-nutrition was low (1 in 6) but one-third of the women were over-nourished.

With increasing age over-nutrition rate showed further steep increase and over 2/3rd of women above 50 years were over-nourished.

REPORT ON NUTRIENT INTAKE OF REQUIREMENTS OF INDIANS 2010

Data from developed countries indicate that the optimal pregnancy outcome in terms of birth weight, infant growth and survival is seen when pregnancy weight gain is about 12-14 kg.

The FAO/WHO/UNU 2004 report computed energy requirements for an average of 12 kg weight gain and recommended additional energy intake of 300kcal in second and third trimester.

RDA 2010 considered weight gain in pregnancy to be 10 or 12 kg and recommended an average additional energy requirement of 350 kcal for second and third trimester.

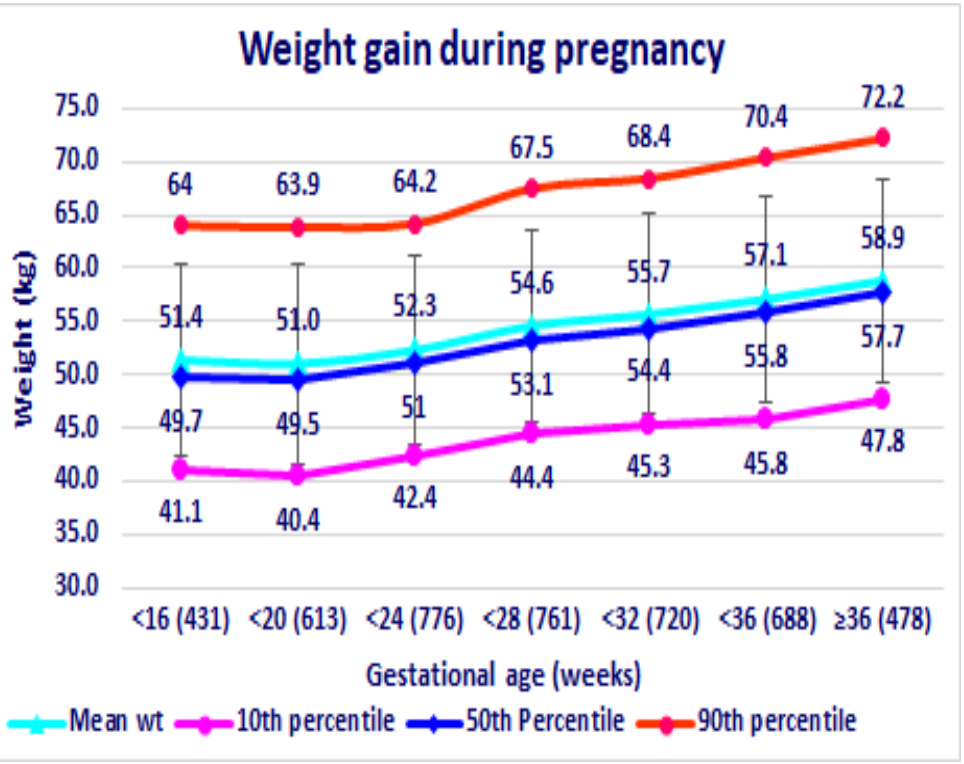
REPORT ON NUTRIENT INTAKE OF REQUIREMENTS OF INDIANS 2020

The Committee noted that there is no recent data on dietary intake, weight gain in pregnant Indian women being available,

In view of this, the 2020 committee recommended additional energy requirements of an Indian woman with pre-pregnancy weight of 55 kg and pregnancy weight gain between 10 -12 kg can continue to be 350 Kcal during the second and the third trimester of pregnancy.

Appropriate adjustments can be made to compute the requirements of average women with pre-pregnant weight of 47 kg, gestational weight gain (GWG) of 7- 8 kg, and birth weight of 2.8 kg especially in programmes for food supplementation intended to bridge the gap between the requirement and intake in pregnant women.

NFI'S STUDIES ON PREGNANCY WEIGHT GAIN BIRTH WEIGHT AND RESIDUAL PREGNANCY WEIGHT RETENTION



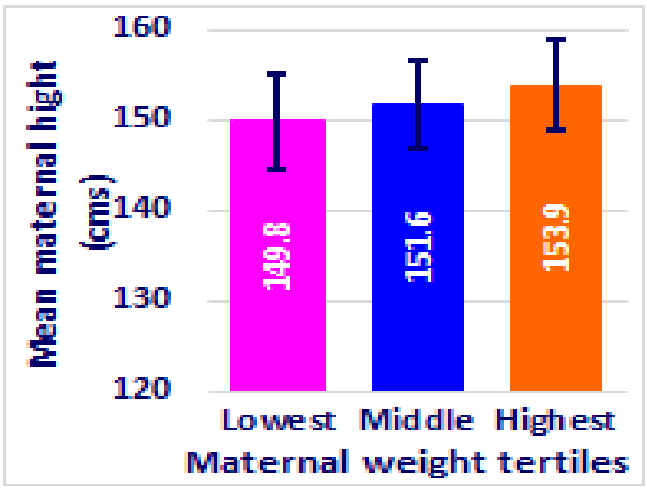
Mean weight gain in 2nd & 3rd trimester was 7.5 kg.

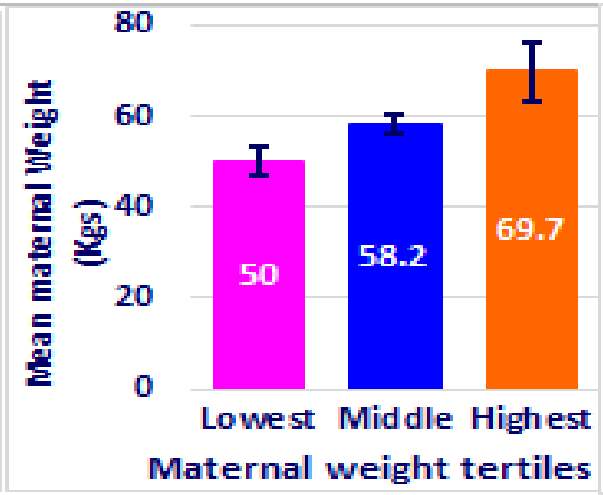
There was no difference in weight gain between different maternal weight centiles.

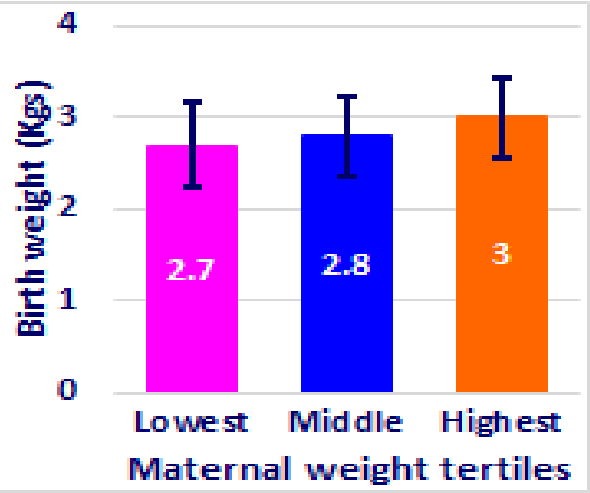
There is a gradient in maternal height and weight during different periods of pregnancy and birth weight.

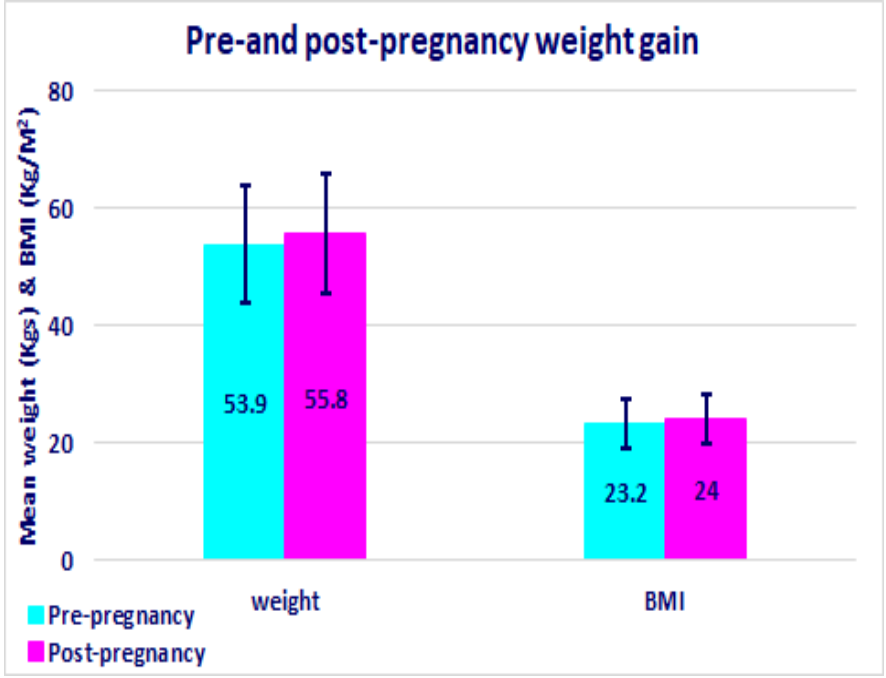
Low maternal stature is associated with low maternal weight during pregnancy and lower mean birth.

Maternal height & weight and birth weight in maternal weight tertiles at 36 weeks of pregnancy





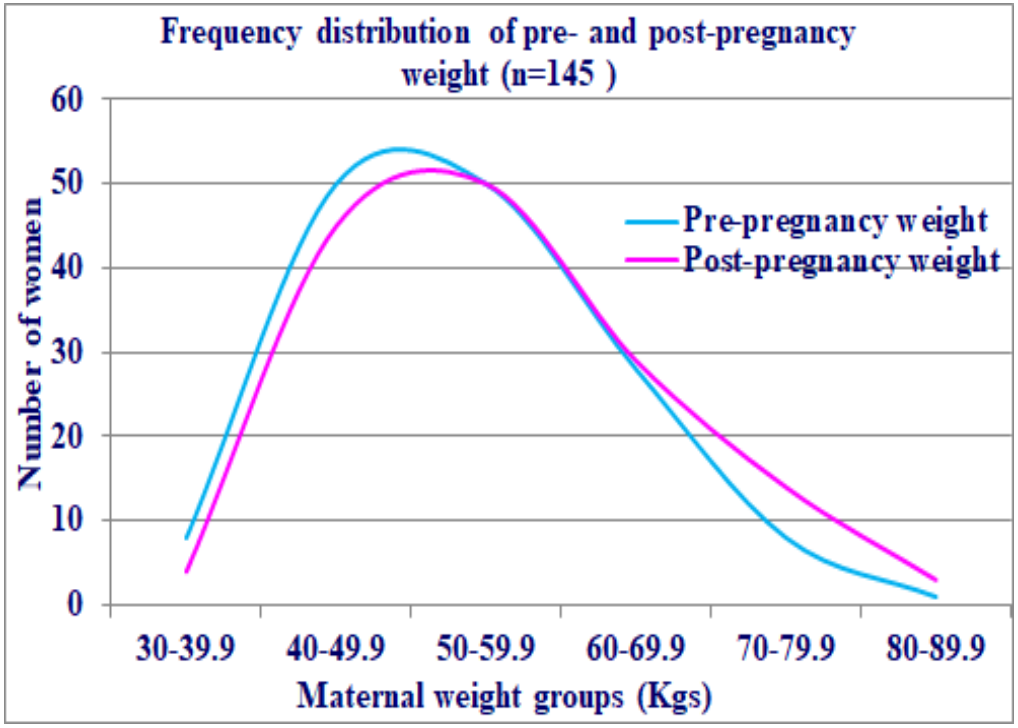




Even when weight gain during pregnancy was <8 Kg, there was a significant residual weight gain of 2 kg in the post-pregnancy period.

Residual weight retention after pregnancy was seen across all maternal weight groups.

Weight retention is beneficial in under-nourished women but detrimental in overweight women.



POLICY AND PROGRAMME IMPLICATIONS

TO ACHIEVE OPTIMAL WEIGHT GAIN IN PREGNANCY AND OPTIMAL BIRTH WEIGHT, IT IS ESSENTIAL TO IDENTIFY UNDERWEIGHT AND OVER WEIGHT WOMEN AND PROVIDE APPROPRIATELY TAILORED ADVICE REGARDING DIETARY INTAKE AND PHYSICAL ACTIVITY DURING PREGNANCY.

ENERGY REQUIREMENTS DURING LACTATION

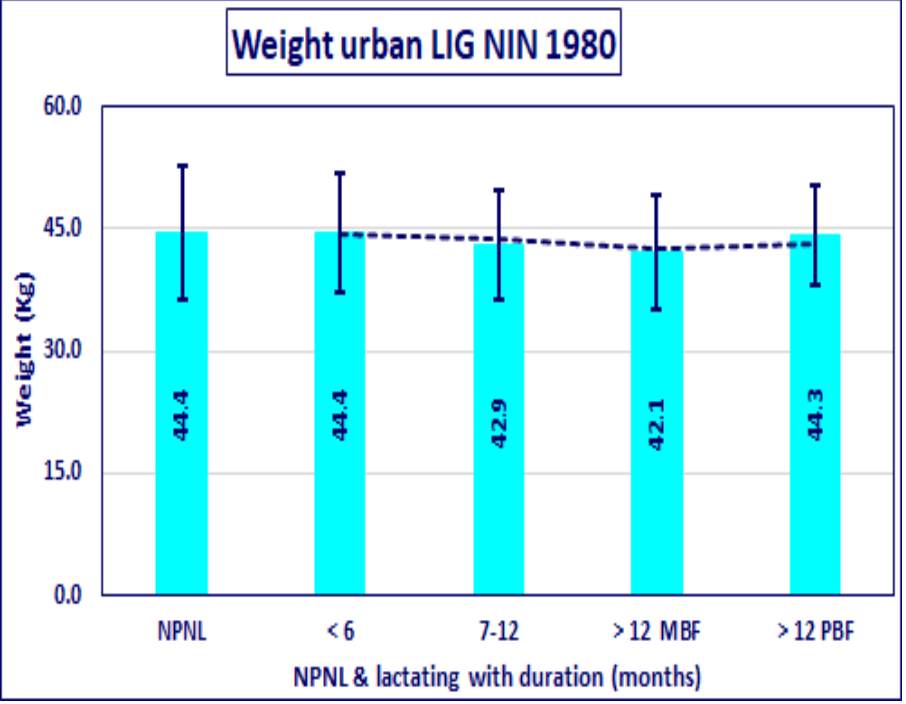
The importance of lactation in ensuring survival, growth and development of infant and young children especially among the poorer segments of population in developing countries has been well recognised.

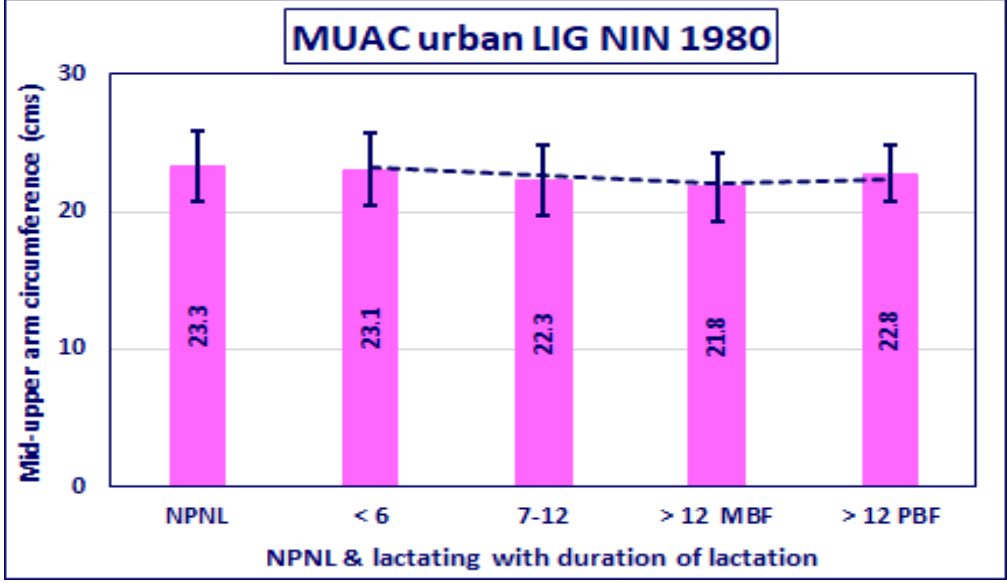
Lactation is nearly universal in India.
The average duration of lactation in India is 24 months.

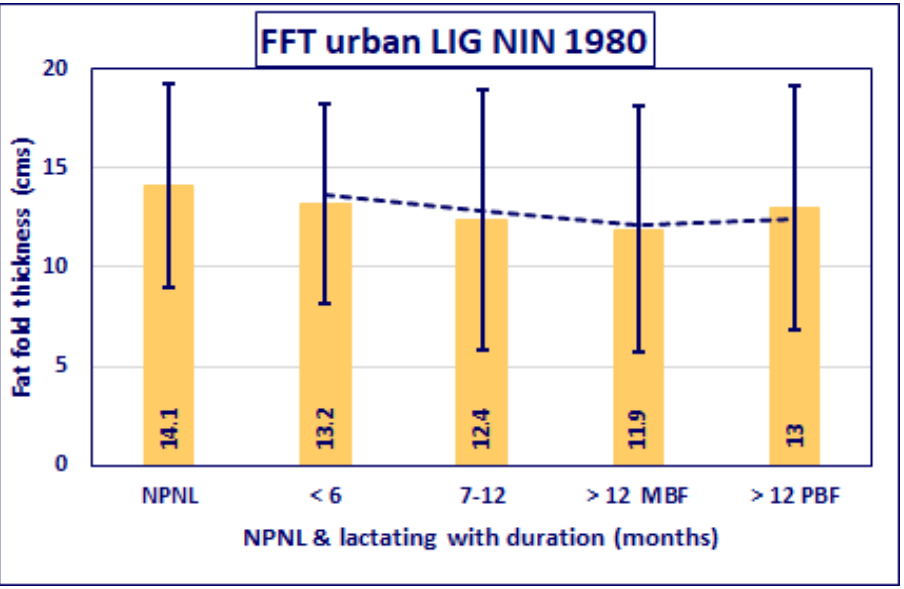
The mother secretes adequate milk to meet the nutrient requirements of solely breast infant in the first six months.
With the introduction of semi-solid complementary feeds the volume of milk secreted decreases.

Since 1970s global and national recommendations for dietary allowances have used factorial approach and recommended additional dietary intake of 500 Kcal/day during lactation.

NUTRITIONAL STATUS OF INDIAN LACTATING WOMEN NIN 1977-1980







Studies in lactating women from urban low income group women in Hyderabad showed that:

- **the mean height was 150cm**
- **energy intake was between 1200-1600 Kcal; there was no difference in energy intake between lactating and non lactating women**
- **during the first year of lactation there was weight loss of 1.5 kg and reduction in MUAC and FFT.**

IN THESE WOMEN BODY FAT WAS BEING MOBILISED TO MEET THE ENERGY NEEDS DURING THE FIRST YEAR OF LACTATION

REPORT ON NUTRIENT INTAKE OF REQUIREMENTS OF INDIANS 2010

NIN had carried out a study of energy requirement of lactating women in based on actual measurement of milk output

Average milk production of 624ml and average energy needed was 549 kcal.

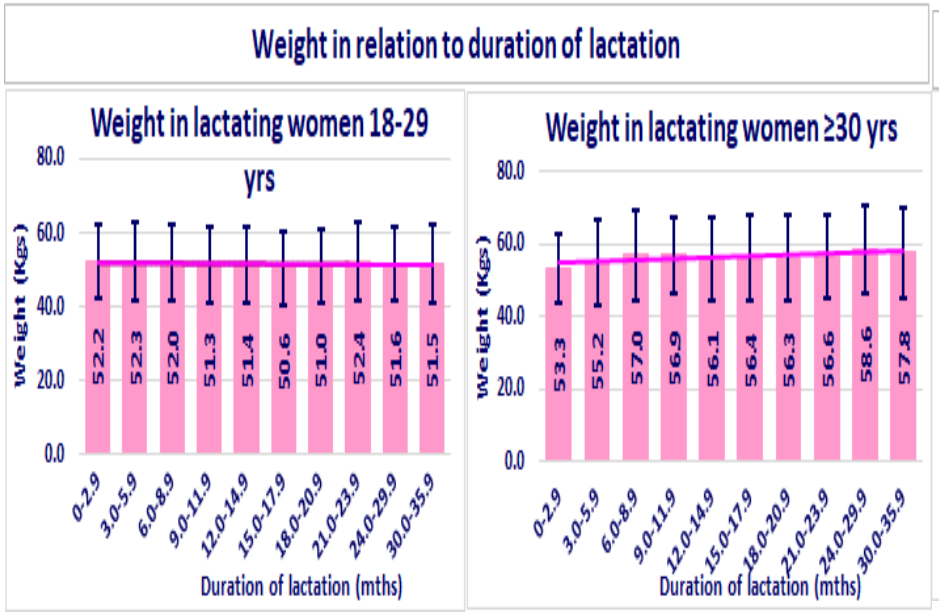
There was no change in TEE during lactation period over that in the non-pregnant period.

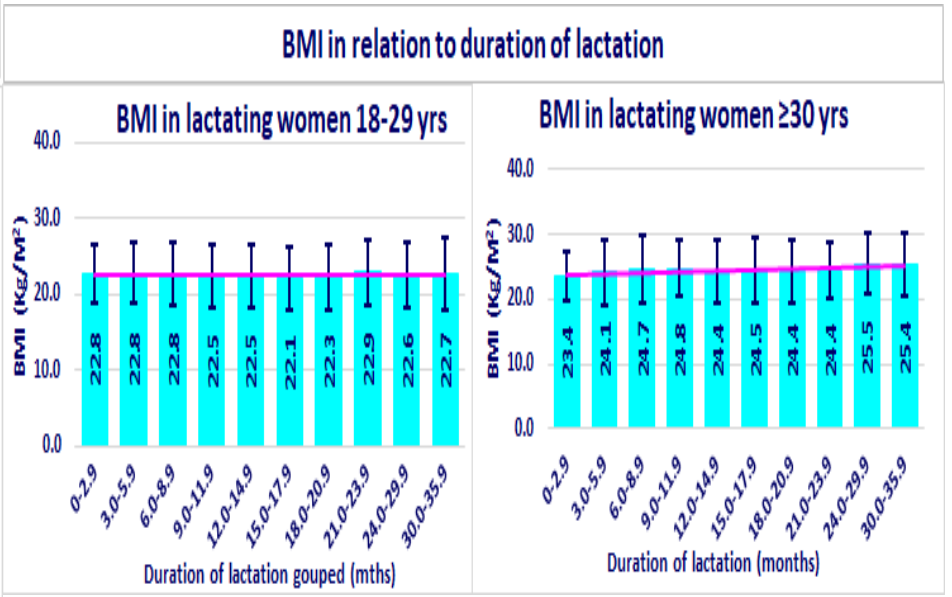
Frequent sitting for breast feeding itself could be an adaptation for energy conservation.

The efficacy of utilization of milk energy is 80%, which has to be corrected

A study on energy expenditure of Indian lactating woman indicates a negative energy balance, which could be corrected by the fat deposited during pregnancy.

Using factorial approach, it was recommended that lactating women should receive additional 500 Kcal for meeting the energy needs during lactation.

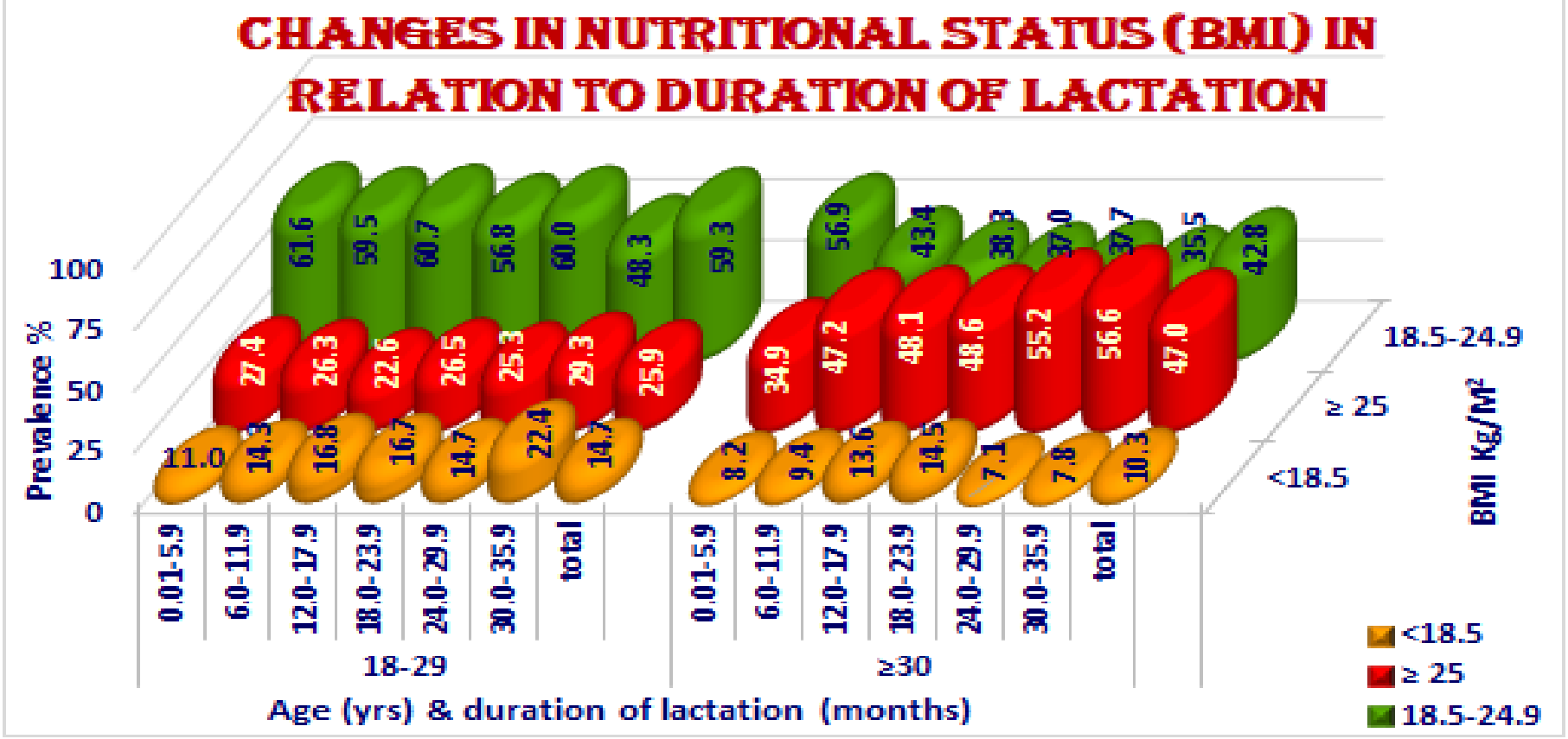




Data from NFI study showed that there was no significant reduction in weight or BMI in lactating women in the first year of lactation in women between 18 and 29 years.

There was an increase in mean body weight of about 2 kg between 0-36 months of lactation in women ≥ 30 years.

These women start lactation with the residual pregnancy weight gain of 2 Kg.



In lactating women aged 18-29 years:

- **Under-nutrition rates were low; there was no significant increase in under-nutrition with varying duration of lactation**
- **Over-nutrition rates remained unaltered with duration of lactation**

In lactating women aged ≥ 30 years

- **Under-nutrition rates were low; there was no significant increase in under-nutrition with varying duration of lactation**
- **Over-nutrition rates showed increase with waning lactation**

REPORT ON NUTRIENT INTAKE OF REQUIREMENTS OF INDIANS 2020

RDA 2020 recommended that utilisation of fat accreted during pregnancy should be taken into account while computing energy requirements during lactation in normally nourished and over-nourished women.

The fat store accumulated during pregnancy could provide 100 to 200 kcal/day for milk secretion during the first six months and therefore additional energy intake during lactation could be reduced from 500 to 300 Kcal/day to prevent an increase in overweight in lactating women in India.

POLICY AND PROGRAMME IMPLICATIONS

IT IS ESSENTIAL TO IDENTIFY UNDERWEIGHT AND OVER WEIGHT WOMEN AND PROVIDE APPROPRIATELY TAILORED ADVICE REGARDING DIETARY INTAKE DURING LACTATION.


Thank You