

# INDICATORS OF HEALTH



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# INTRODUCTION

- Health is defined as **“a state of complete physical, mental & social wellbeing, and not merely an absence of disease or infirmity”** (WHO)
- This statement has been amplified to include the ability to lead a **“socially and economically productive life”**
- Health cannot be measured in exact measurable forms
- Hence measurement have been framed in terms of illness (or lack of health), consequences of ill-health (morbidity, mortality) & economic, occupation & domestic factors that promote ill health- all the antithesis of health.

# INDICATORS OF HEALTH

- Indicator also termed as Index or Variable is only an indication of a given situation or a reflection of that situation.
- **Health Indicator is a variable, susceptible to direct measurement, that reflects the state of health of persons in a community.**
- Indicators help to measure the extent to which the objectives and targets of a programme are being attained.
- Numerical indication of the health of a given population derived from a specified composite formula.

# INDICATORS OF HEALTH

- **Health status indicators measure different aspects** of the health of a population. Examples include life expectancy, infant mortality, disability or chronic disease rates.
- **Health determinant indicators measure things that influence health.** Examples include diet, smoking, water quality, income and access to health services

# CHARACTERISTICS

- **Valid** – they should actually measure what they are supposed to measure.
- **Reliable** – the results should be the same when measured by different people in similar circumstances.
- **Sensitive** – they should be sensitive to changes in the situation concerned.
- **Specific** – they should reflect changes only in the situation concerned.
- **Feasible** – they should have the ability to obtain data when needed.
- **Relevant** – they should contribute to the understanding of the phenomenon of interest.

# USES OF INDICATORS OF HEALTH

- Measurement of the health of the community.
- Description of the health of the community.
- Comparison of the health of different communities.
- Identification of health needs and prioritizing them.
- Evaluation of health services.
- Planning and allocation of health resources.
- Measurement of health successes.

# SOURCES OF DATA

- CENSUS
  - Census Act 1948
  - Once in a decade
  - Extended de facto canvasser method used ( before 1931, synchronous de facto canvasser method used)
  - Two phases – House listing operations and Population Enumeration
  - Last census in 2011



# SOURCES OF DATA

- The Sample registration System
  - Annual information at national and state level
  - Cont. enumeration of births and deaths in selected sample units- resident part time enumerators (aanganwadi workers or teachers)
  - Independent survey every 6 months by SRS supervisors

**Sample units:**

**Rural – village or a segment of it if population is 2000 or more**

**Urban – census enumeration block , population 750-1000**

# SOURCES OF DATA

- National Family Health Survey
  - NFHS-1 : 1992-93
  - NFHS-2 : 1998-99
  - NFHS-3 : 2005-06
- District Level Household and Facility Survey
  - DLHS-1 : 1998-99
  - DLHS-2 : 2002-04
  - DLHS-3 : 2007-08
  - DLHS-4: 2012-13

# CLASSIFICATION OF INDICATORS

- Mortality Indicators
- Morbidity Indicators
- Disability Rates
- Nutritional Indicators
- Health Care Delivery Indicators
- Utilization Rates

# CLASSIFICATION (contd.)

- Indicators of Social And Mental Health
- Environmental Indicators
- Socio-economic Indicators
- Health Policy Indicators
- Indicators of Quality of Life
- Other Indicators

# MORTALITY INDICATORS

- **Crude Death Rate** is considered a fair indicator of the comparative health of the people.
  - It is defined as the number of deaths per 1000 population per year in a given community, usually the mid-year population
  - The usefulness is restricted because it is influenced by the age-sex composition of the population, socioeconomic and socio-cultural environment of the communities.
  - CDR India – 5.5 deaths/1,000 population (SRS 2017) Gujarat- 5.3 deaths/1,000 population

# MORTALITY INDICATORS

- **Expectation of life** is the average number of years that will be lived by those born alive into a population if the current age specific mortality rates persist.
  - It is a statistical abstraction based on existing age-specific death rates.
  - Estimated for both sexes separately.
  - Good indicator of socioeconomic development
  - **Life expectancy at birth:**
    - Male:** 64 years (WHO Global Health Observatory ,2012)
    - Female:** 68 years

# MORTALITY INDICATORS

## □ Infant mortality rate

- The ratio of deaths under 1yr of age in a given year to the total number of live births in the same year, usually expressed as a rate per 1000 live births
- Indicator of health status of not only infants but also whole population & socioeconomic conditions
- Sensitive indicator of availability, utilization & effectiveness of health care, particularly perinatal and postnatal care.
- Current IMR :India- 33 /1000live birth (SRS 2017)  
Gujarat - 30/1000live birth

# MORTALITY INDICATORS

## □ Under-5 Mortality rate

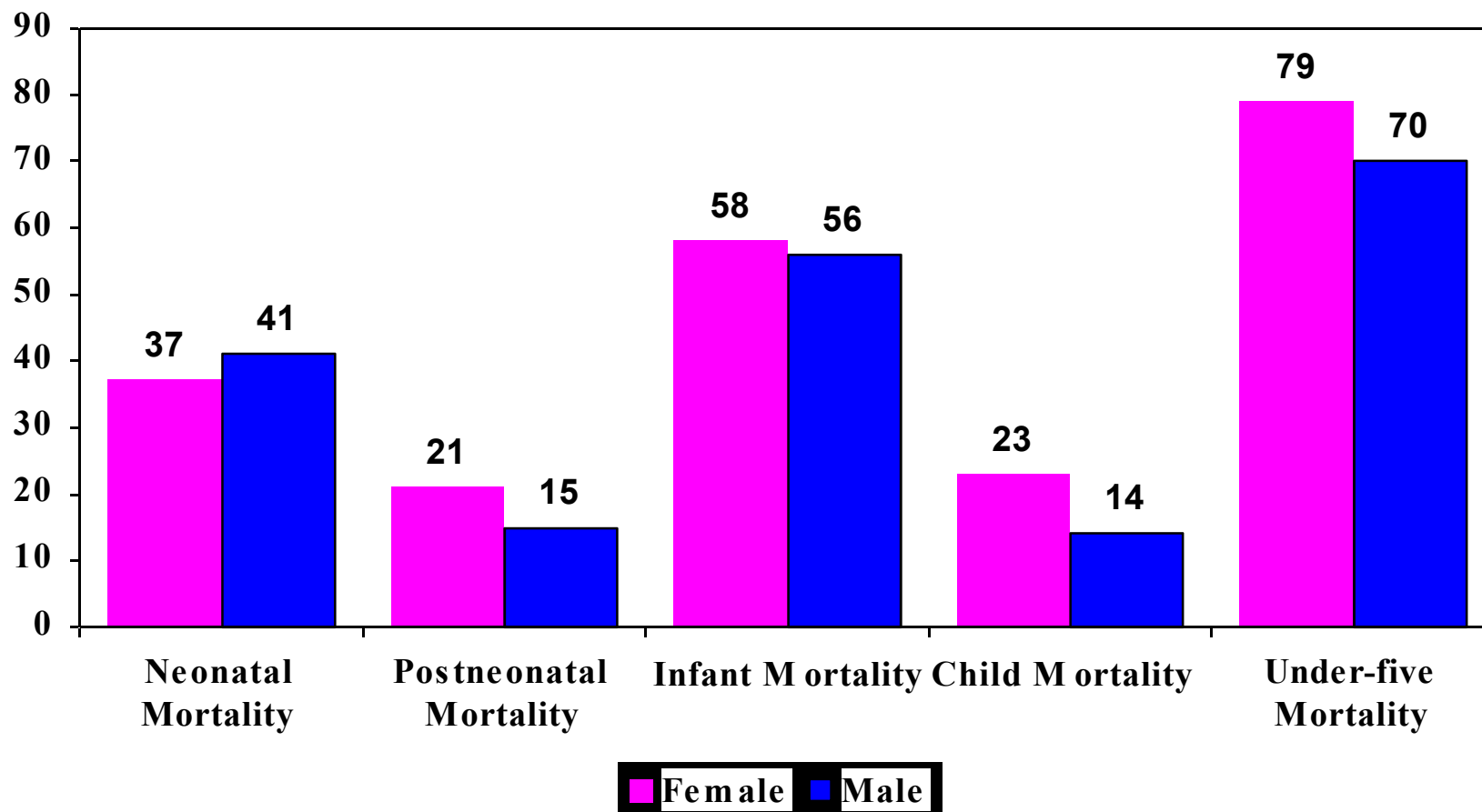
- Defined as no. of deaths occurring in the under-5 age group per 1000 live births.
- Reflects both infant and child mortality
- Current rate – 53/1000 live births (World Bank ,2013)



# CHILD MORTALITY RATE

- The number of deaths at ages 1-4yrs in a given year, per 1000 children in that age group at the mid-point of the year.
- Correlates with inadequate MCH services, malnutrition, low immunization coverage and environmental factors
- Current rate – 18/1000 (NFHS-3)
- Other indicators are Perinatal mortality rate, Neonatal mortality rate, Stillbirth rate, etc.
- Correlates with inadequate antenatal care and perinatal care.

## NFHS-3, India (2005-2006) (figures per 1000 live birth)



# MORTALITY INDICATORS

## □ Maternal Mortality Ratio

- Ratio of number of deaths arising during pregnancy or puerperal period per 100000 live births
- Accounts for the greatest number of deaths among women of reproductive age in developing countries.
- Current MMR – India -126/100000 live births  
Gujarat - 91/100000 live births  
(SRS 2017)

# MORTALITY INDICATORS

□ **Disease Specific Death Rate** is mortality rate which is computed for specific diseases.

□ **Proportional Mortality Rate** is the proportion of all deaths attributed to the specific disease

E.g. Coronary heart disease causes 25 to 30 % of all deaths in developed world.

# MORBIDITY INDICATORS

- **Morbidity Indicators** reveal the burden of ill health in a community, but do not measure the subclinical or inapparent disease states.

## 1. Incidence and Prevalence

### Incidence

- The number of new events or new cases of a disease in a defined population, within a specified period of time.
- Eg. The incidence of Tuberculosis in India is 176 per 100000.

# MORBIDITY INDICATORS

## **Prevalence**

- The total number of all individuals who have an attribute or disease at a particular time divided by population at risk of having attribute or disease at this point of time.
- Reflects the chronicity of the disease.
- Eg. The prevalence of Tuberculosis in India is 230 per 100000 population.

# MORBIDITY INDICATORS

2. Notification rates is calculated from the reporting to public authorities of certain diseases e.g. yellow fever , poliomyelitis
  - They provide information regarding geographic clustering of infections, quality of reporting system etc.
3. Attendance rates at OPDs and at health centers.
4. Admission, Re-admission and discharge rates.

# MORBIDITY INDICATORS

5. Duration of stay in hospital.
6. Spells of sickness or absence from work or school.
  - reflects economical loss to the community
7. Hospital data constitute a basic and primary source of information about diseases prevalent in the community.



# DISABILITY RATES

Disability Rates are of two categories

- **Event type Indicators**

- number of days of restricted activity
- bed disability days
- work-loss days within a specified period

- **Person type Indicators**

- limitation of mobility e.g. confined to bed, confined to house, special aid in getting around.
- limitation of activity e.g. limitation to perform the basic activities of daily living (ADL) e.g. eating, washing, dressing, etc.

# DISABILITY RATES

- **Sullivan's Index** refers to “expectation of life free of disability”.
- Sullivan's Index = life expectancy of the country - probable duration of bed disability and inability to perform major activities.
- It is considered as one of the most advanced indicators currently available.

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# DISABILITY RATES

## □ **HALE** is **Health Adjusted Life Expectancy**.

- Based on the framework of WHO's ICIDH (International Classification of Impairments, Disabilities, and Handicaps )
- Based on life expectancy at birth but includes an adjustment for time spent in poor health.
- It is the equivalent number of years in full health that a newborn can expect to live based on current rates of ill-health and mortality.

# DISABILITY RATES

## □ **DALYs: Disability Adjusted Life Years.**

- It is defined as the number of years of healthy life lost due to all causes whether from premature mortality or disability.
- It is the simplest and the most commonly used measure to find the burden of illness in a defined population and the effectiveness of the interventions

# DISABILITY RATES

- Two things needed to measure DALYs are
  - Life table of that country, to measure the losses from premature deaths
  - Loss of healthy life years resulting from disability; the disability may be permanent (polio) or temporary (TB, leprosy), physical or mental.
- $DALY = \text{years of life lost} + \text{years lost to disability}$

# DISABILITY RATES

## □ **Uses of DALYs**

- To assist in selecting health service priorities
- To identify the disadvantaged groups
- Targeting health interventions
- Measuring the results of health interventions
- Providing comparable measures for planning & evaluating programmes
- To compare the health status of different countries

□ One DALY is one lost year of healthy life

# DISABILITY RATES

- **QALY** is **Quality Adjusted Life Year**.
- It is the most commonly used to measure the cost effectiveness of health interventions .
- It estimates the number of years of life added by a successful treatment or adjustment for quality of life.
- Each year in perfect health is assigned a value of 1.0 down to a value of 0.0 for death.

# NUTRITIONAL STATUS INDICATORS

- ❑ Nutritional Status is a positive health indicator.
- ❑ **Newborns** are measured for their
  - i. Birth weight**
  - ii. Length**
  - iii. Head circumference**
- ❑ They reflect the maternal nutrition status
- ❑ Anthropometric measurements of **pre-school children**
  - i. Weight** – measures acute malnutrition
  - ii. Height** – measures chronic malnutrition
  - iii. Mid-arm circumference** - measures chronic malnutrition



# NUTRITIONAL STATUS INDICATORS

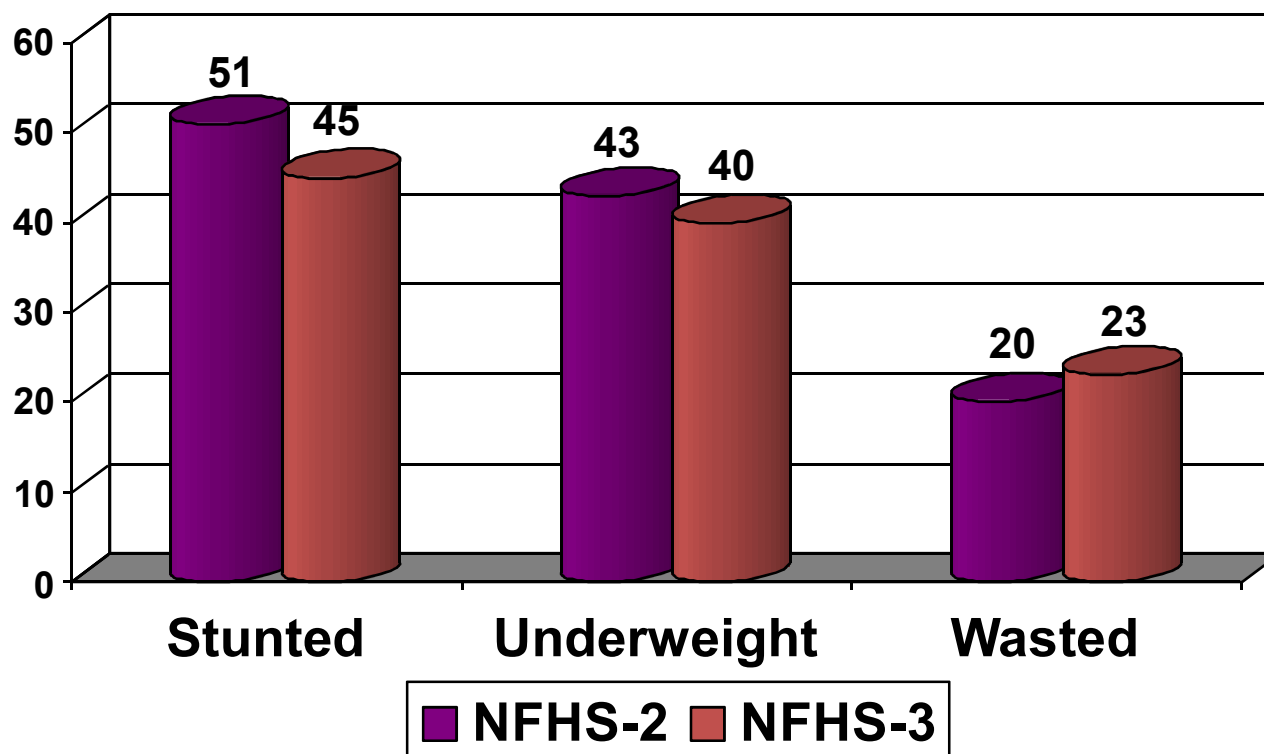
- **Underweight:** weight for age  $< -2$  standard deviations (SD) of the WHO Child Growth Standards median
- **Stunting:** height for age  $< -2$  SD of the WHO Child Growth Standards median
- **Wasting:** weight for height  $< -2$  SD of the WHO Child Growth Standards median
- **Overweight:** weight for height  $> +2$  SD of the WHO Child Growth Standards median

# NUTRITIONAL STATUS INDICATORS

- ❑ **Growth Monitoring of children** is done by measuring weight-for-age, height-for-age, weight-for-height, head & chest circumference and mid-arm circumference.
- ❑ In **adults** Underweight, Obesity and Anemia are generally considered reliable nutritional indicators.

# Trends in Child Nutritional Status

(figures in %)



# Health Care Delivery Indicators

- ❑ These indicators reflect the equity of distribution of health resources in different parts of the country and of the provision of health care.

- **The WHO Joint Learning Initiative has established a threshold of 25 health workers (doctors, nurses and midwives) per 10,000 population, with a WHO endorsed lower threshold of 23 workers per 10,000.**
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# Health Care Delivery Indicators

- Population per PHC – 34641 (Rural Health Statistics Report 2012)
- Population per Sub centre - 5615.

	Norms	Present Status
Sub centre	3000-5000	5615
PHC	20000-30000	34641
CHC	80000-120000	172375

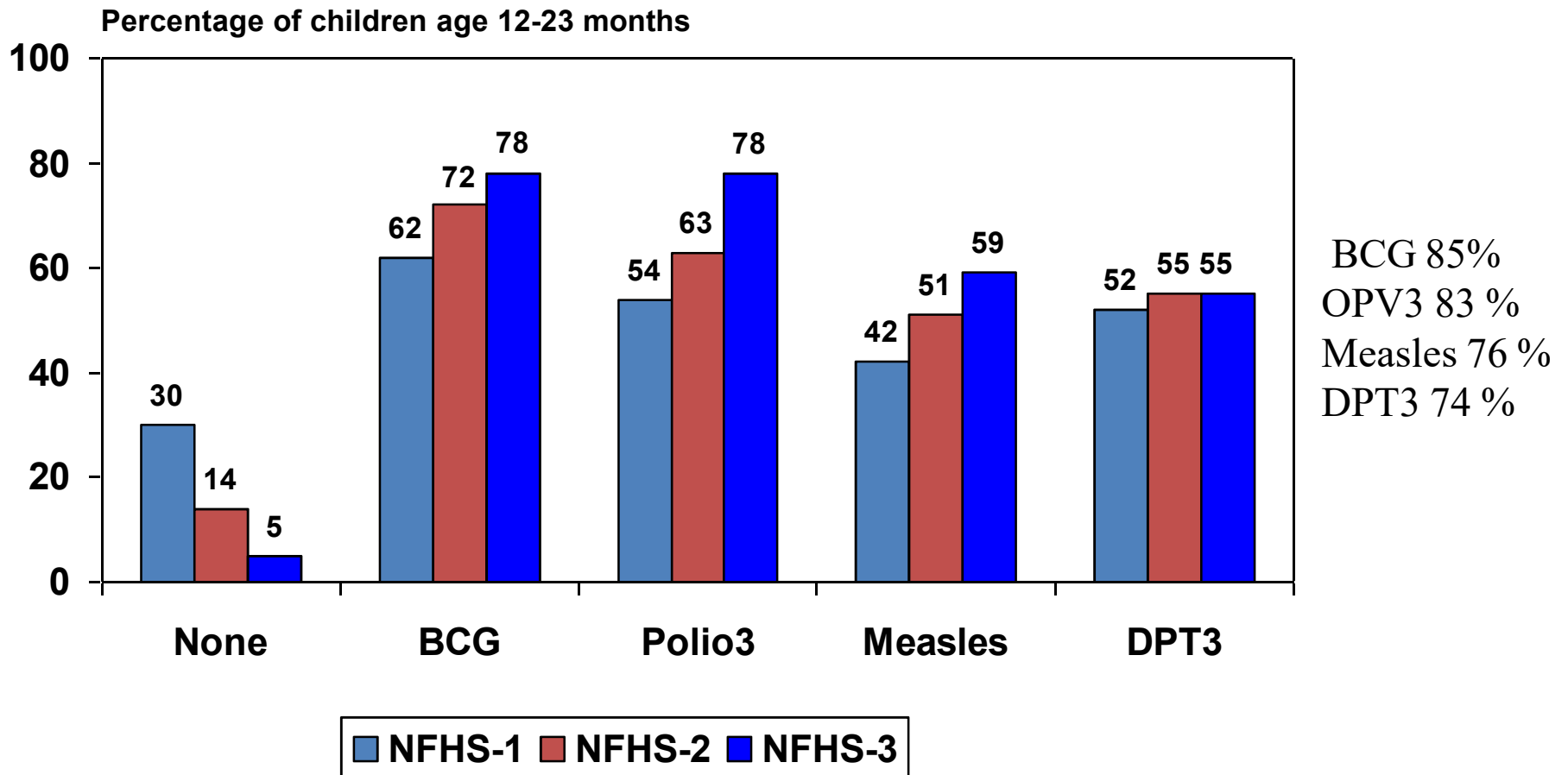
# UTILISATION RATES

- Utilisation Rates or actual rates is expressed as the proportion of people in need of a service who actually receive it in a given period, usually a year
- It depends on availability & accessibility of health services and the attitude of an individual towards health care system
- They direct attention towards discharge of social responsibility for the organization in delivery of services.

# UTILISATION RATES

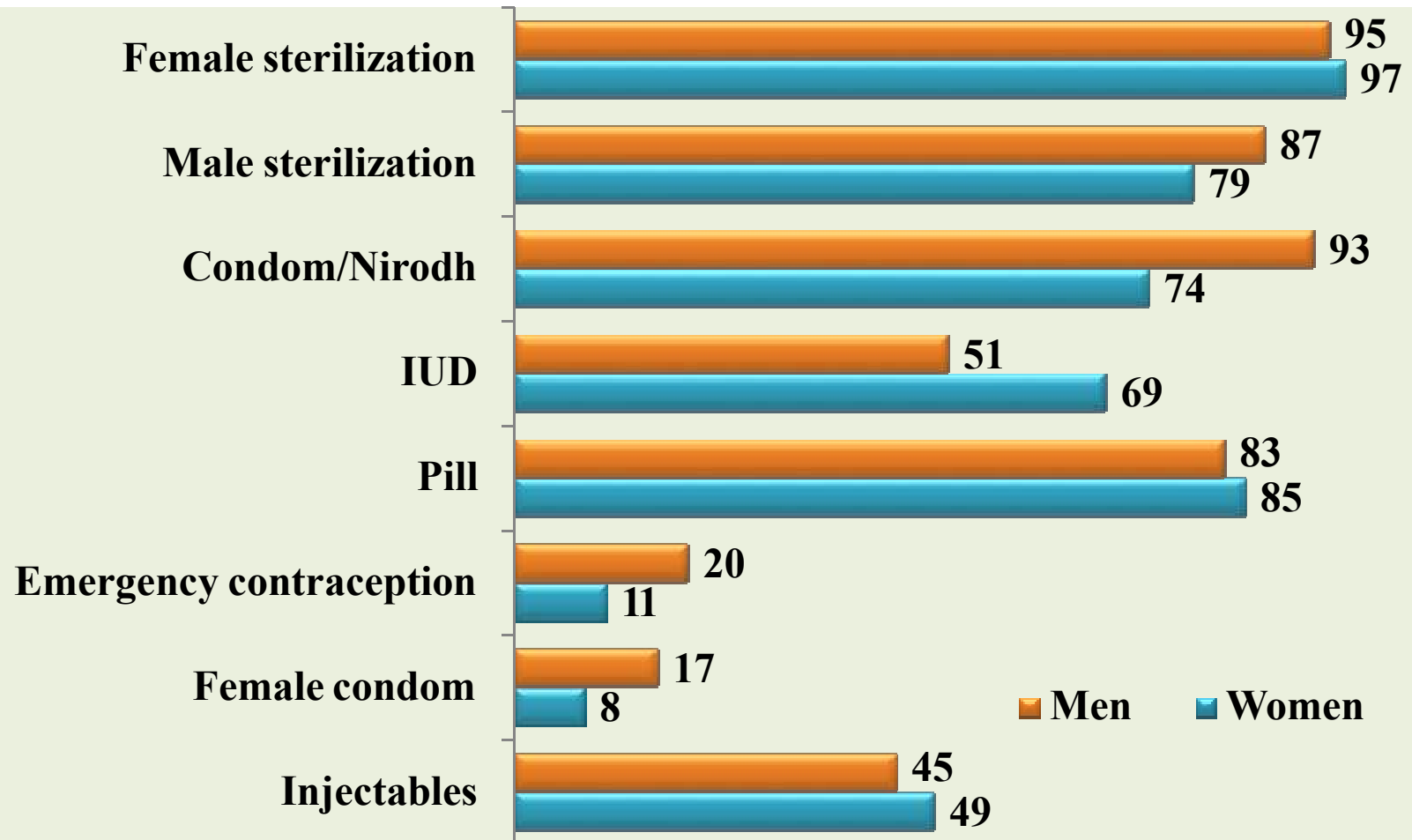
- Examples
  1. Proportion of infants who are fully immunized  
– 43.5% (NFHS-3)
  2. Proportion of pregnant women who receive ANC care or have institutional deliveries
  3. Percentage of population who adopt family planning
  4. Bed occupancy ratio, bed-turn over ratio, etc.

# Trends in Immunization



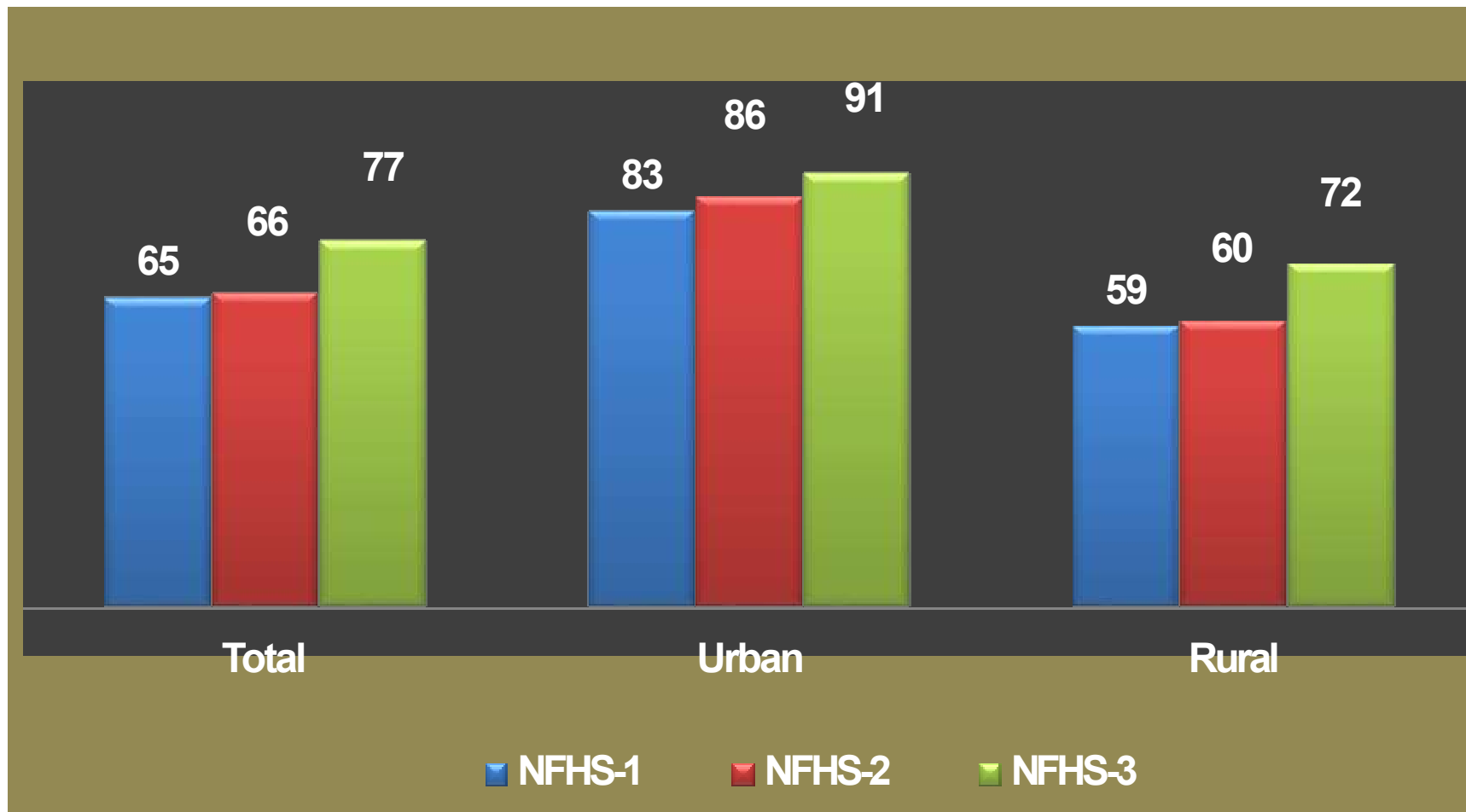


# Knowledge of Modern Spacing Methods (figures in %)



NFHS-3, 2005-06

# Women who received atleast 1 ANC (For birth in last 3 yrs)



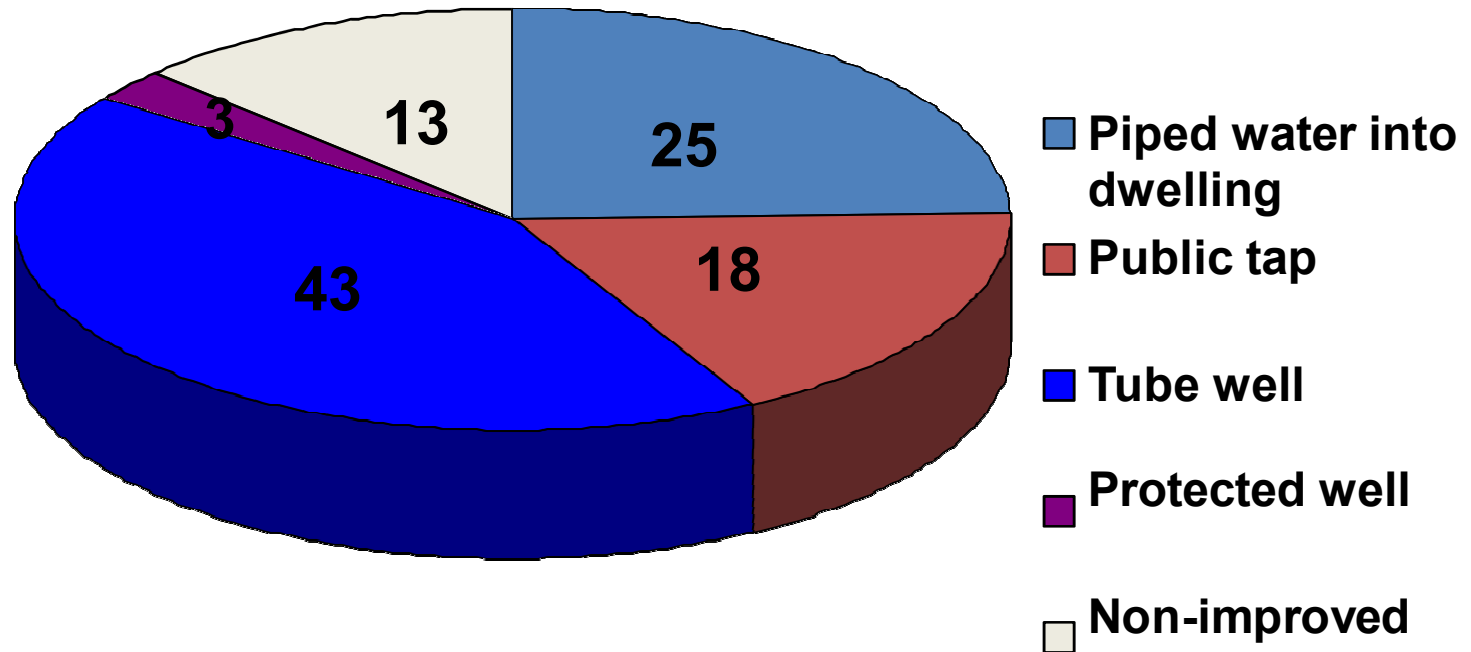
# INDICATORS OF SOCIAL AND MENTAL HEALTH

- These include rates of suicide, homicide, other crime, road traffic accident, juvenile delinquency, alcohol and substance abuse, domestic violence, battered-baby syndrome, etc.
- These indicators provide a guide to social action for improving the health of people.
- Social and mental health of the children depend on their parents.
- E.g. Substance abuse in orphan children

# ENVIRONMENTAL INDICATORS

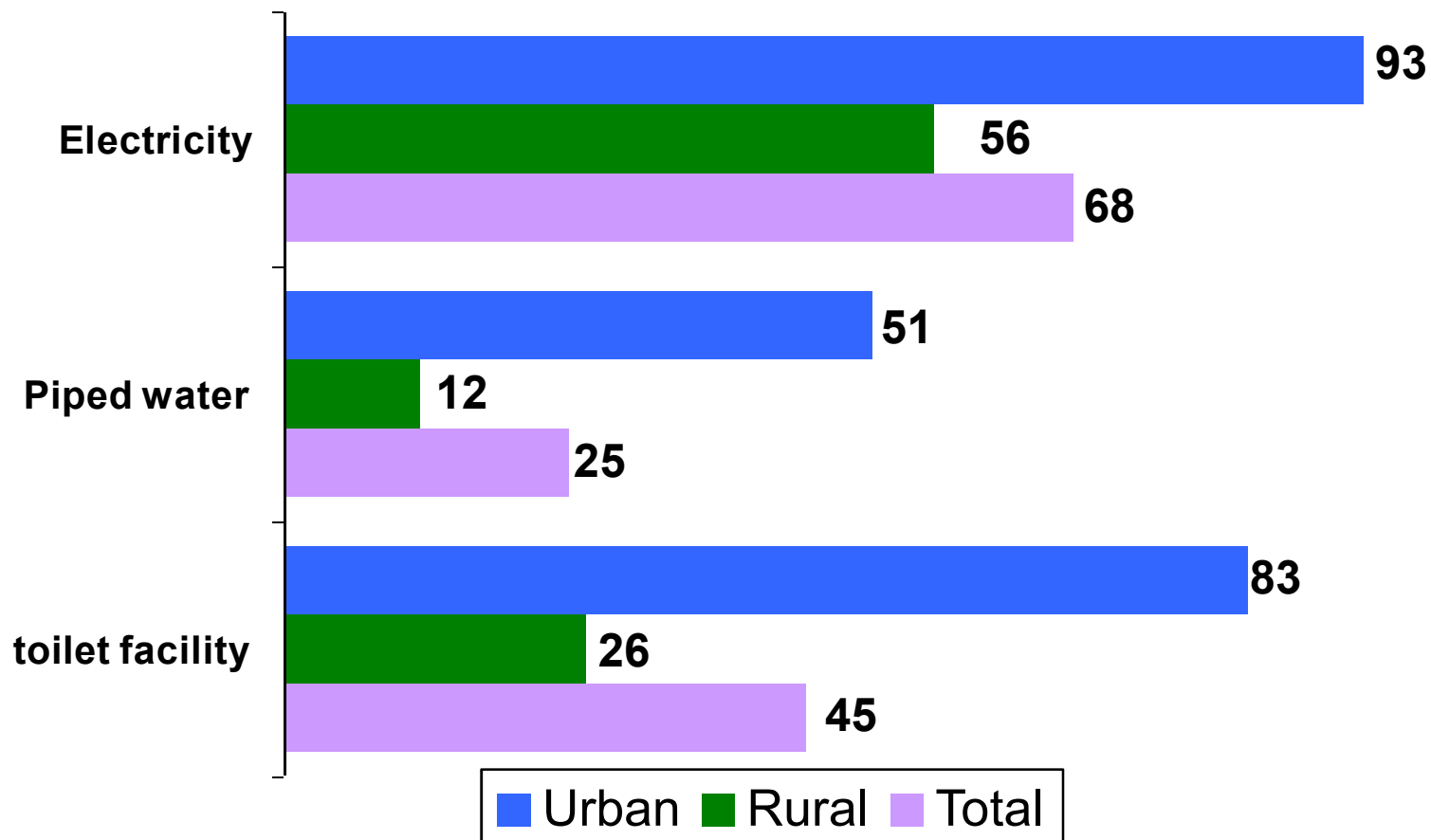
- These reflect the quality of physical and biological environment in which diseases occur and people live.
- The most important are those measuring the proportion of population having access to safe drinking water and sanitation facilities.
- These indicators explain the prevalence of communicable diseases in a community.
- The other indicators are those measuring the pollution of air and water, radiation, noise pollution, exposure to toxic substances in food and water.

# Percentage of Household by Improved Source of Drinking Water



According to WHO an improved source of drinking water includes water piped into dwelling/yard/plot, water available from public tap or stand pipe or a tube well or borehole, or a protected well or spring

# Selected Household Characteristics



NFHS-3 ,2005-06

# SOCIOECONOMIC INDICATORS

❑ These do not directly measure health but are important in interpreting health indicators.

❑ These are

- Rate of growth of population: India-decadal(2001-2011)-17.64%,
- Per capita GNI (gross national income) – 5350 US\$(World Bank 2013)
- Dependency ratio - 52

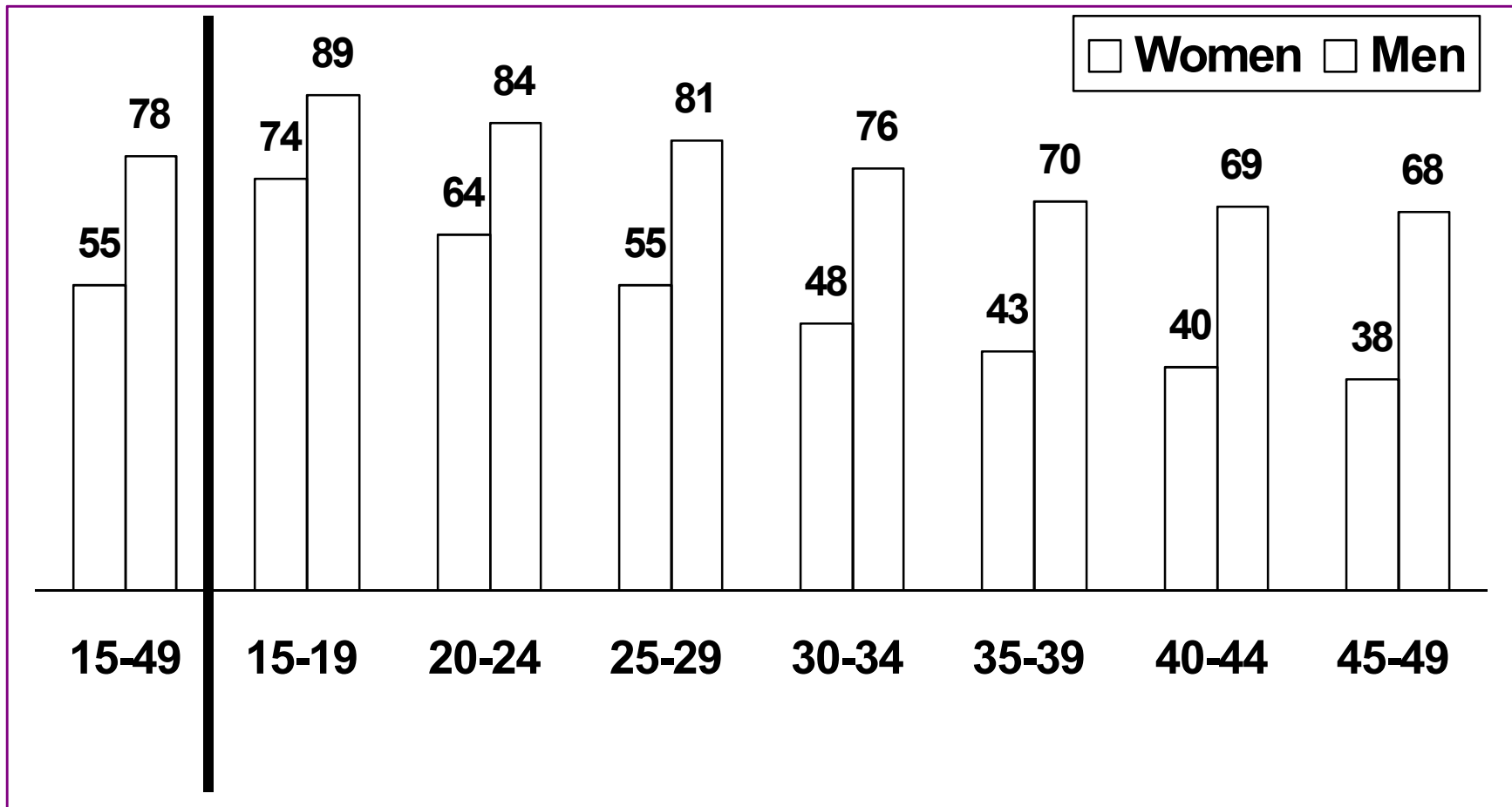
$$(Total) Dependency ratio = \frac{(number\ of\ people\ aged\ 0 - 14\ and\ those\ aged\ 65\ and\ over)}{number\ of\ people\ aged\ 15 - 64} \times 100$$

# SOCIOECONOMIC INDICATORS

- Literacy rates: India - 74.04% (2011) ,  
(source: [www.census.gov.in/2011](http://www.census.gov.in/2011))
  - Housing – the number of persons per room
  - Per capita “calorie” availability
- Countries with favorable socioeconomic indicators have reported less health related problems.

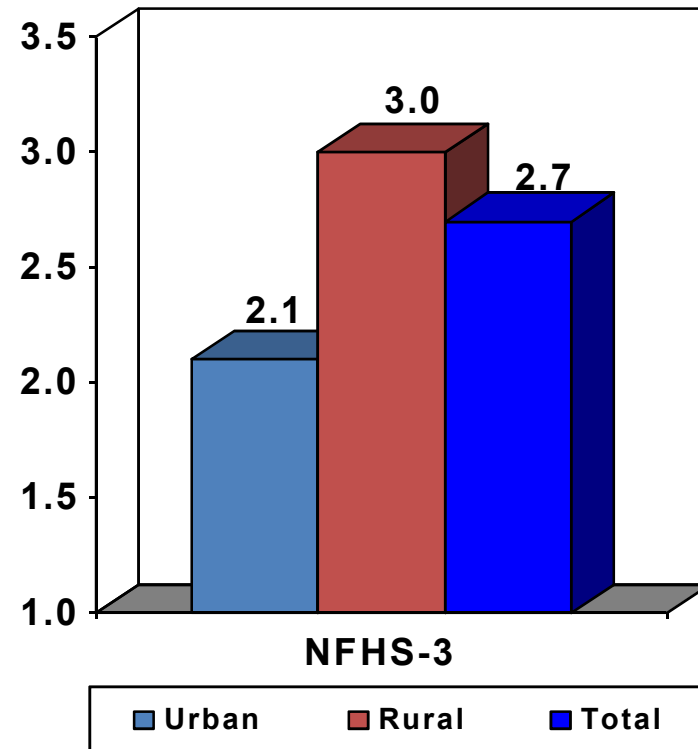
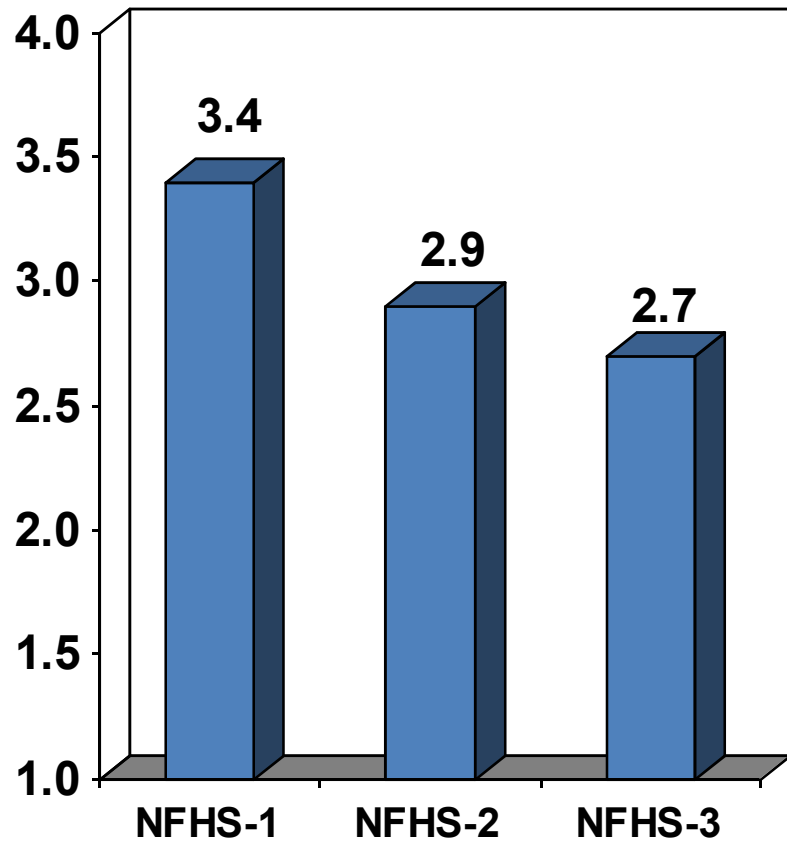


Literacy among women has doubled in 30 years; however, even among the youngest one-fourth of women and one-tenth of men are illiterate (figures in %)



Literacy rates -NFHS-3, India, 2005-06

# TOTAL FERTILITY RATE



# HEALTH POLICY INDICATORS

- ❑ The single most important indicator of political commitment is allocation of adequate resources.
- ❑ The relevant indicators are
  - Proportion of GNP(gross national product) spent on health services.
  - Proportion of GNP spent on health related activities like water supply and sanitation & housing and nutrition.
  - Proportion of total health resources devoted to primary health care.

# INDICATORS OF QUALITY OF LIFE

- ❑ Life expectancy is now less important.
- ❑ The Quality of Life has gained its importance.
- ❑ **Physical Quality of Life Index**
  - It consolidates **infant mortality, life expectancy at age of 1yr and literacy.**
  - For each component the performance of individual country is placed on a scale of 1 to 100.
  - The composite index is calculated by averaging the three indicators giving equal weight to each of them.
  - The result is placed on the 0 to 100 scale.
  - The PQLI does not consider the GNP.

# INDICATORS OF QUALITY OF LIFE

## □ **Human Development Index**

- It is defined as a composite index combining indicators representing 3 dimensions –
  - i. Longevity( life expectancy at birth)
  - ii. Education (mean and expected years of schooling)
  - iii. Gross national income (GNI) per capita
  
- The result is placed on the 0 to 1 scale
- **HDI for India was 0.702 (UNDP-2013)**
- **HDI ranking of India is 135**

# OTHER INDICATORS

## **Social Indicators: UN Statistical Office**

- Population
- Family formation
- Families & households
- Learning & educational services
- Learning activities
- Distribution of income
- Consumption & accumulation
- Social security & welfare services
- Health services & nutrition
- Housing & its environment
- Public order & safety; time use
- Social stratification & mobility

# OTHER INDICATORS

- **Basic Needs Indicators** are used by ILO and include calorie consumption, access to water, life expectancy, deaths due to disease, illiteracy, doctors and nurses per population, rooms per person, GNP per capita.

# OTHER INDICATORS

## □ **Health For All Indicators**

- For monitoring the progress towards the goal of Health For All by 2000 , the WHO had listed the following four categories of indicators.

### **1. Health policy indicators**

- Political commitment to HFA
- Resource allocation
- Degree of equity of distribution of health services
- Community involvement
- Organisational framework and managerial process



# OTHER INDICATORS

## **2.Social and economic indicators related to health**

- Rate of population growth
- GNP or GDP
- Income distribution
- Work conditions
- Adult literacy rate
- Housing
- Food availability

## **3.Indicators for the provision of health care**

- Availability
- Accessibility
- Utilisation
- Quality of care

# OTHER INDICATORS

## **4. Health status indicators**

- Low birth weight
- Nutritional status and psychosocial development of children
- Infant mortality
- Child mortality rate (1-4yrs)
- Life expectancy at birth
- Maternal mortality rate
- Disease specific mortality
- Morbidity – incidence and prevalence
- Disability prevalence

# MILLENNIUM DEVELOPMENT GOALS

- Adopted by United Nations in year 2000.
- Opportunity for concerted action to improve global health.
- The 8 MDGs, break down into 21 quantifiable targets that are measured by 60 indicators.

**Goal 4: Reduce child mortality**  
**Indicator 13. Under 5 mortality rate**  
**14. Infant mortality rate**  
**15. Proportion of 1 year old immunised against measles**

**Goal 5: improve maternal health**  
**Indicator 16. Maternal mortality ratio**  
**17. Proportion of birth attended by skilled birth personal**

**Goal 6: combat HIV/AIDS , Malaria and other diseases**  
**Indicator 18. HIV prevalence among young people**  
**19. Condom use rate**  
**20. No. of children orphaned by HIV/AIDS**  
**21. Prevalance and death rates associated with malaria**  
**22. Proportion of population in malaria risk areas using prevention**  
**23. Prevalence and death rates associated with TB**  
**24. Proportion of TB cases detected and cured.**

# SUMMARY

- Health not measured directly but using indicators.
- Indicator should be valid, sensitive, specific, reliable, relevant and feasible.
- Used in measuring, describing, comparing, identifying health needs and planning and evaluation of health services.

# SUMMARY

- No single comprehensive indicator of a nation's health.
- Each available indicator reflects an aspect of health.
- Search for a single global index of health status continues.
- Use of multiple indicators arranged in profiles or patterns used to make comparisons between areas , regions and nations.

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Thank You!

