

INDICATORS OF HEALTH



Dr. Alpesh Patel

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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

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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

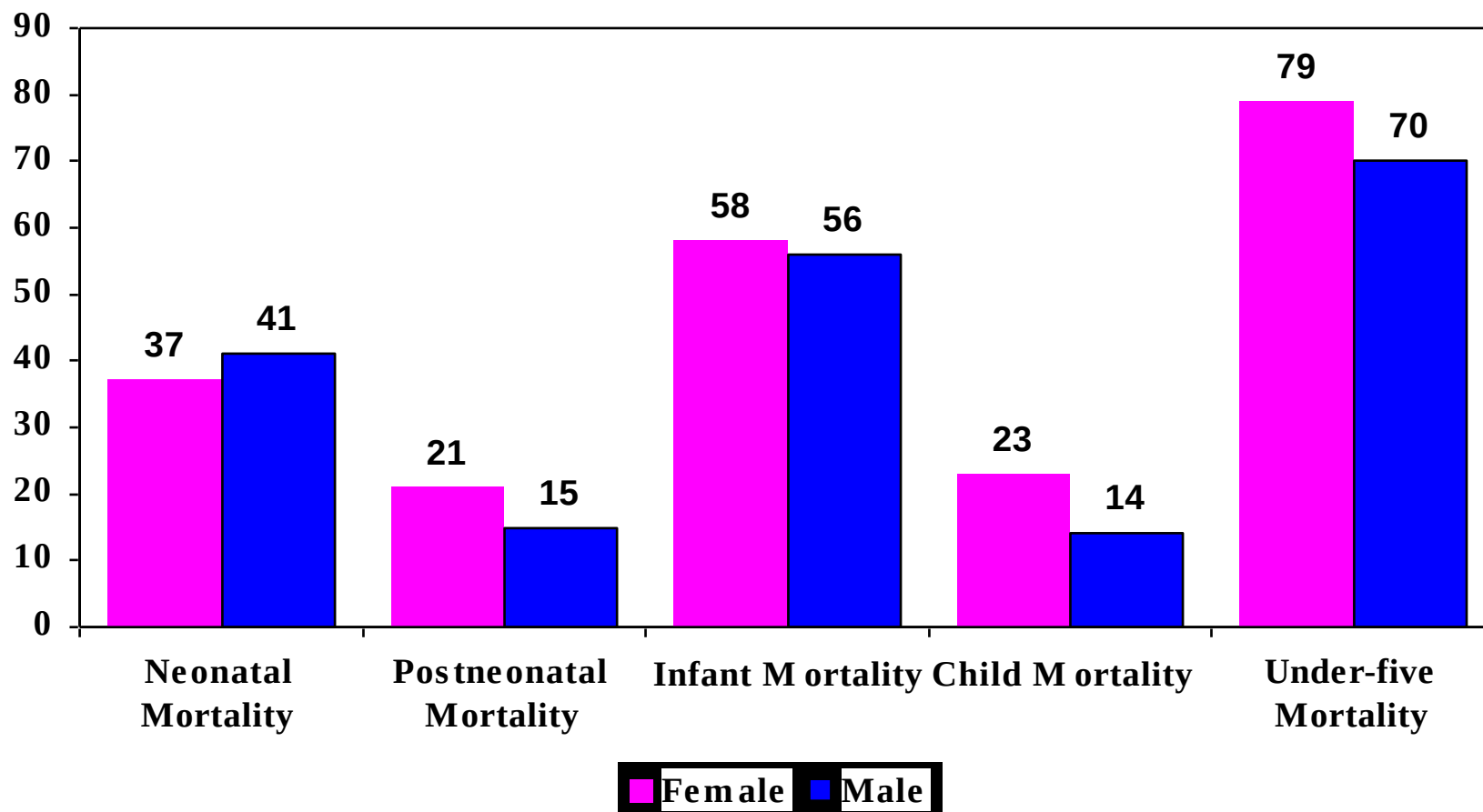
□ Under-5 Mortality rate

- 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

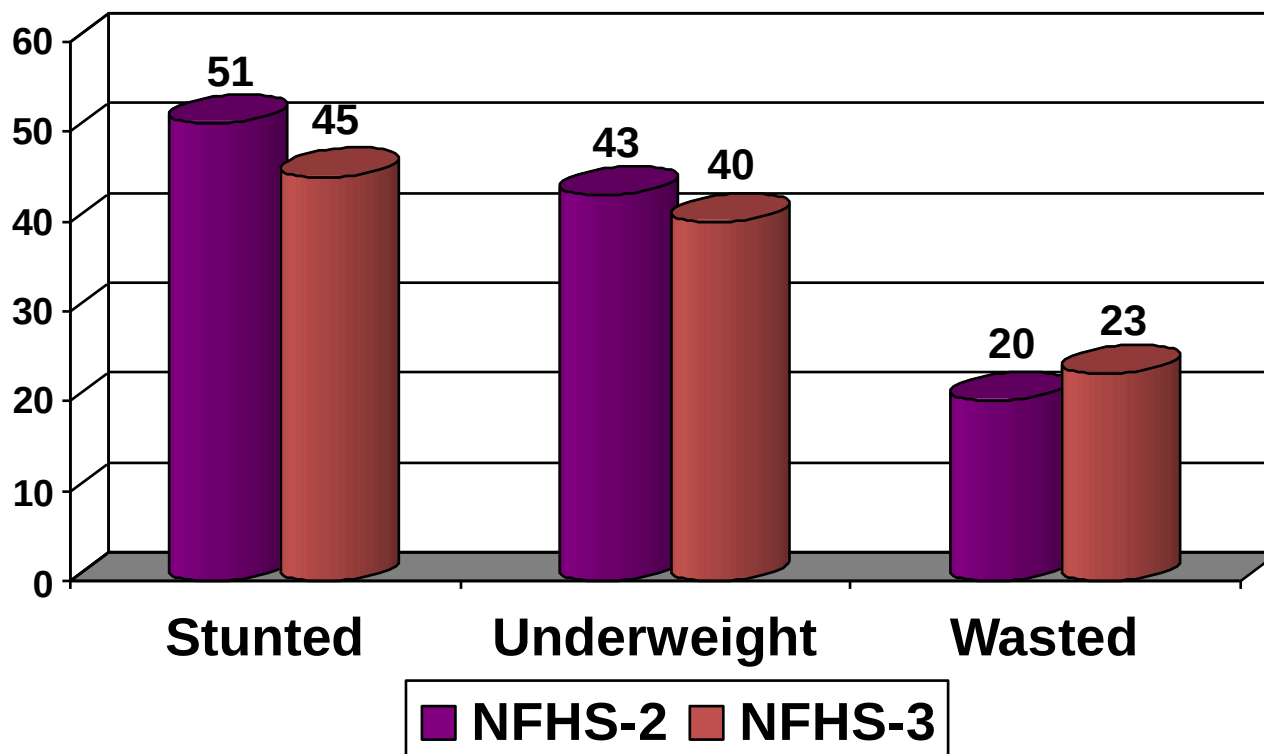
- **Underweight:** weight for age < -2 standard deviations (SD) of the WHO Child Growth Standards median
- **Stunting:** height for age < -2 SD of the WHO Child Growth Standards median
- **Wasting:** weight for height < -2 SD of the WHO Child Growth Standards median
- **Overweight:** weight for height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

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- **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

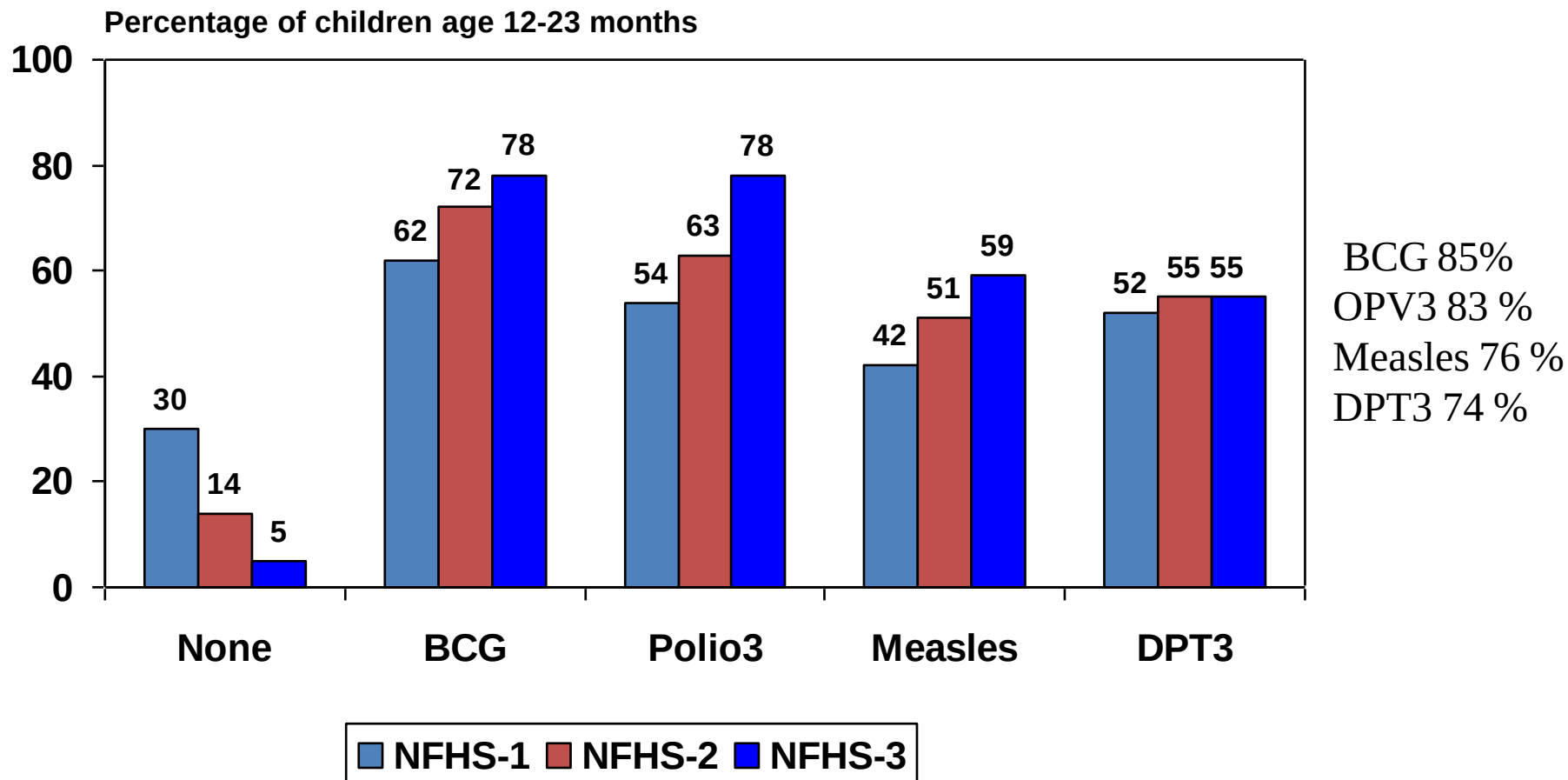
UTILISATION RATES

- 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.

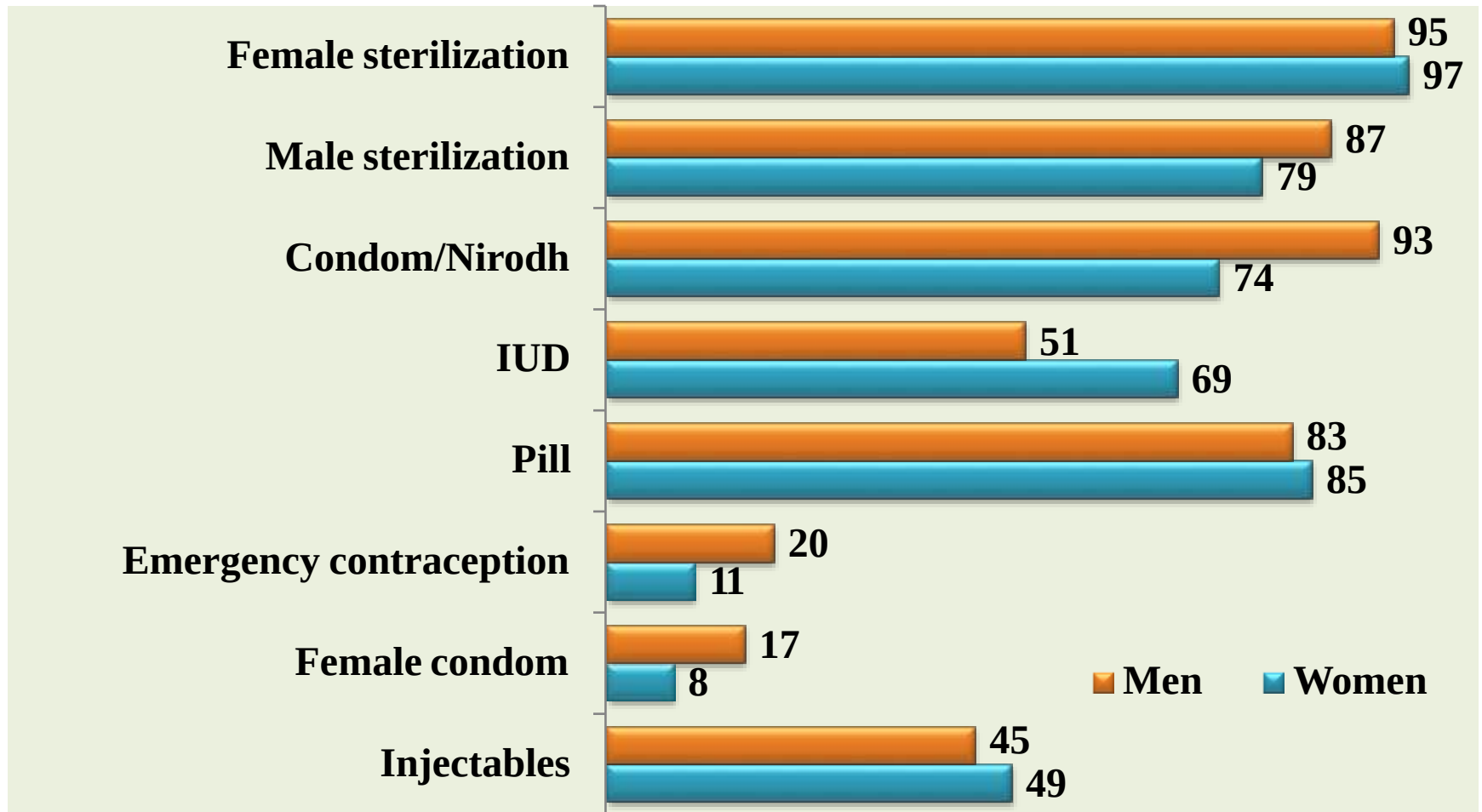
UTILISATION RATES

- 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

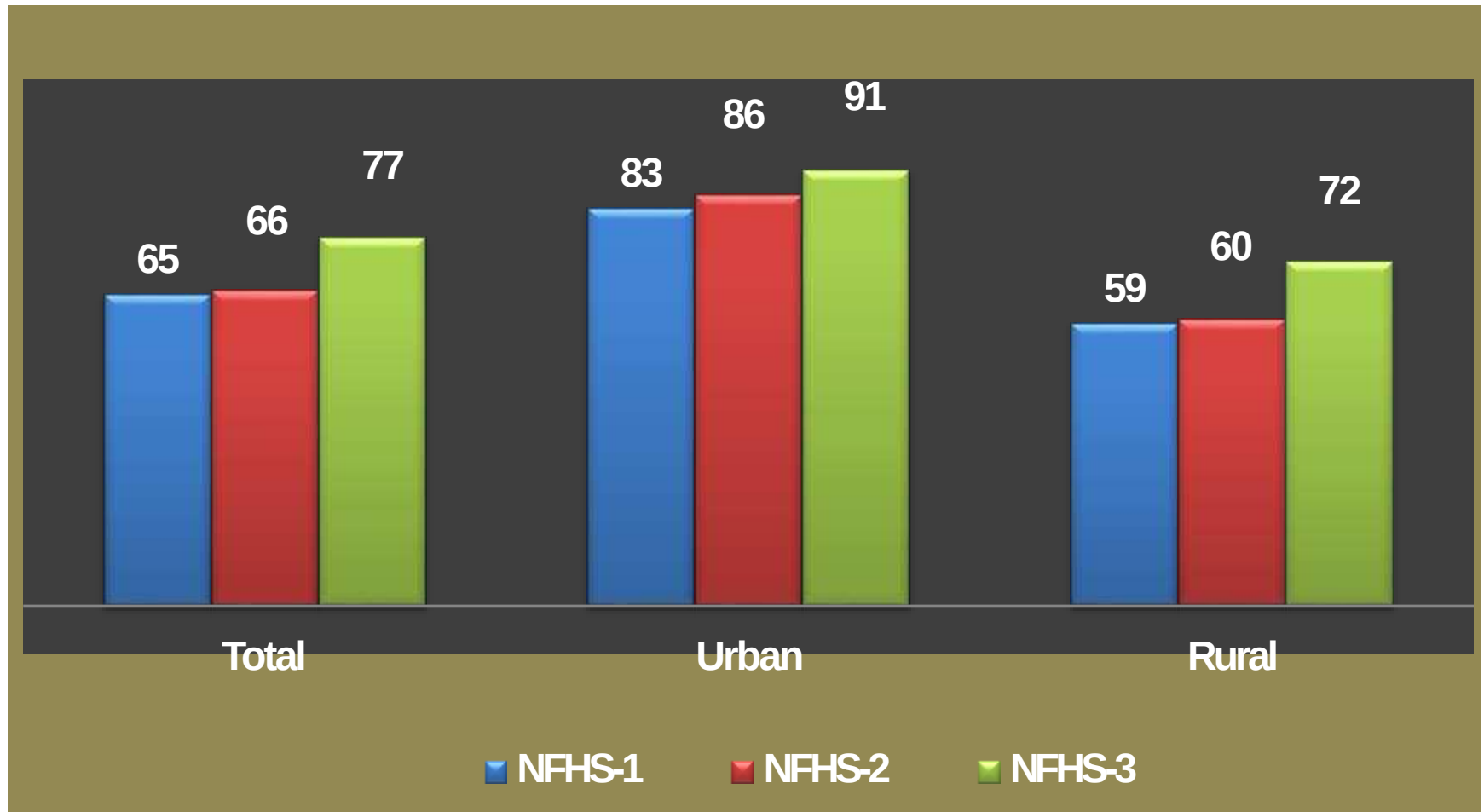


Knowledge of Modern Spacing Methods (figures in %)



NFHS-3, 2005-06

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



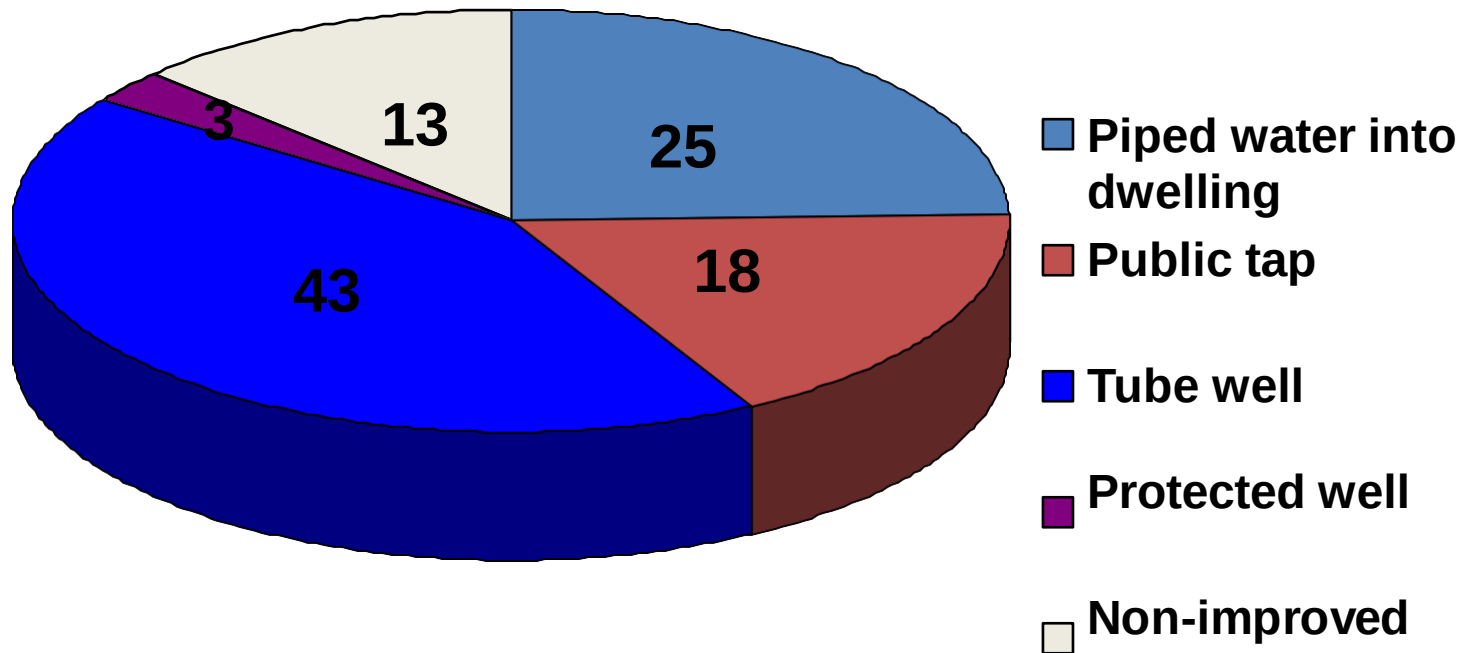
INDICATORS OF SOCIAL AND MENTAL HEALTH

- 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

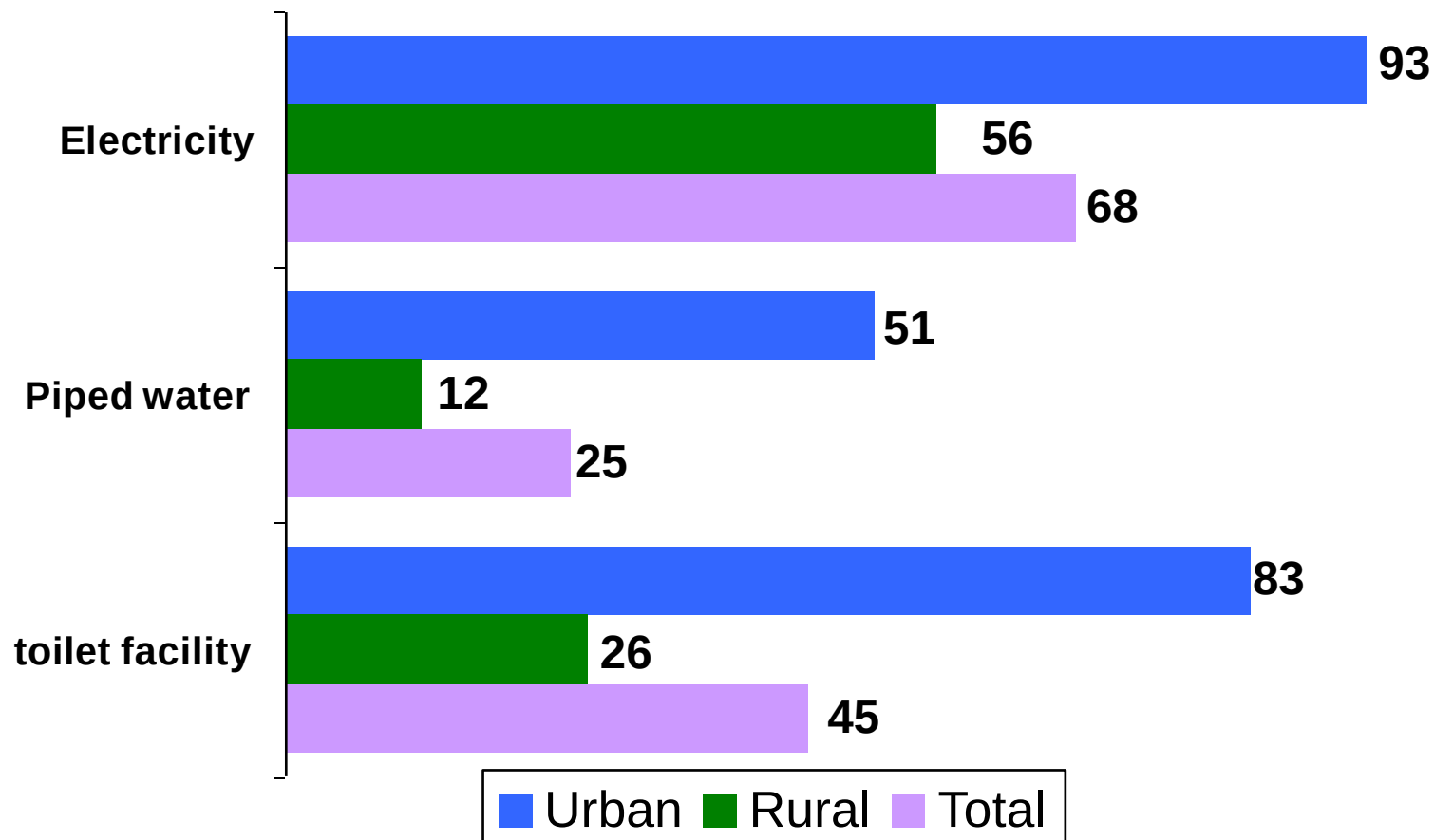
- These reflect the quality of physical and biological environment in which diseases occur and people live.
- The most important are those measuring the proportion of population having access to safe drinking water and sanitation facilities.
- These indicators explain the prevalence of communicable diseases 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

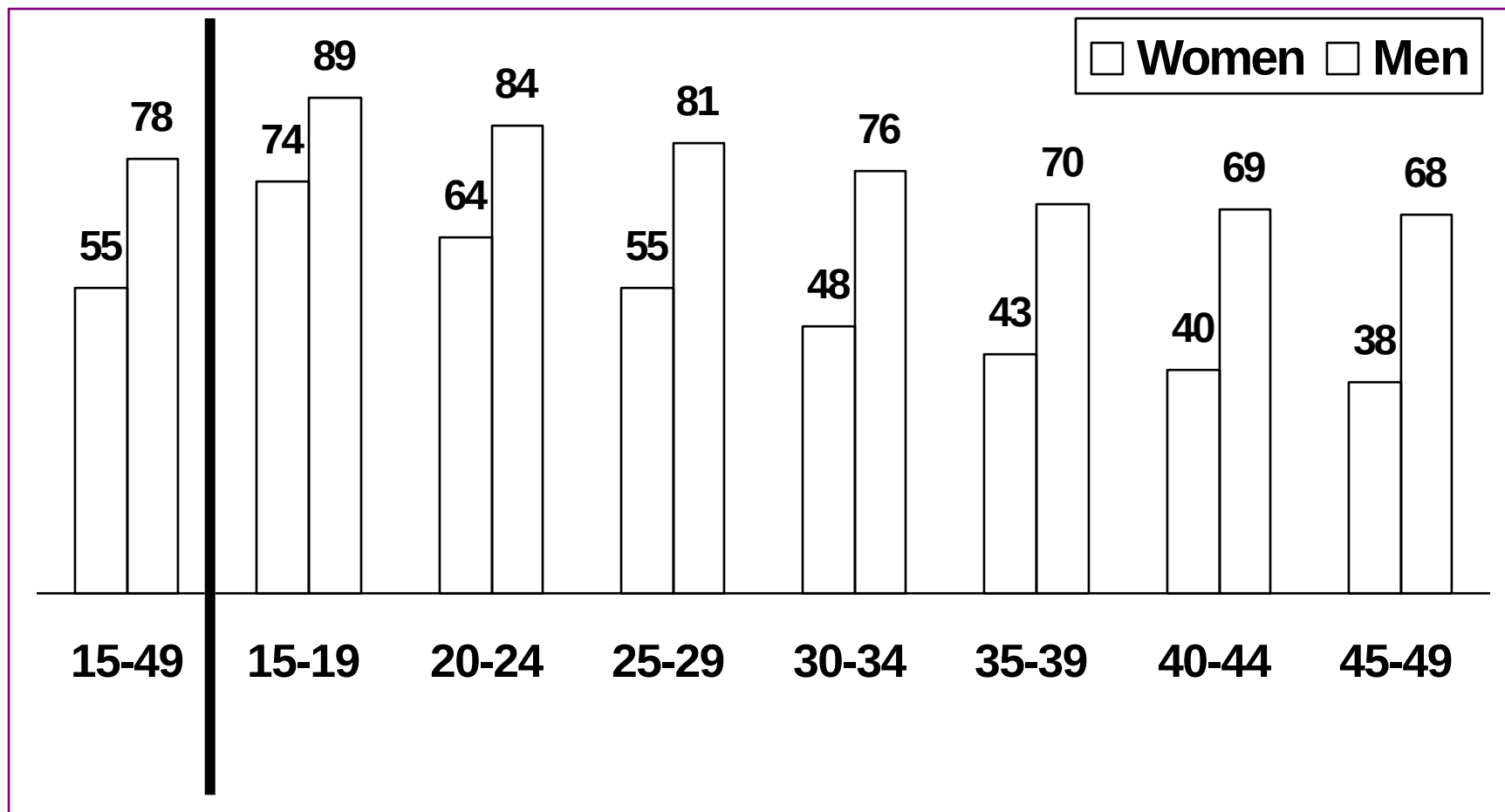
- ❑ These do not directly measure health but are important in interpreting health indicators.
- ❑ These are
 - Rate of growth of population: India-decadal(2001-2011)-17.64%,
 - Per capita GNI (gross national income) – 5350 US\$(World Bank 2013)
 - Dependency ratio - 52

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

SOCIOECONOMIC INDICATORS

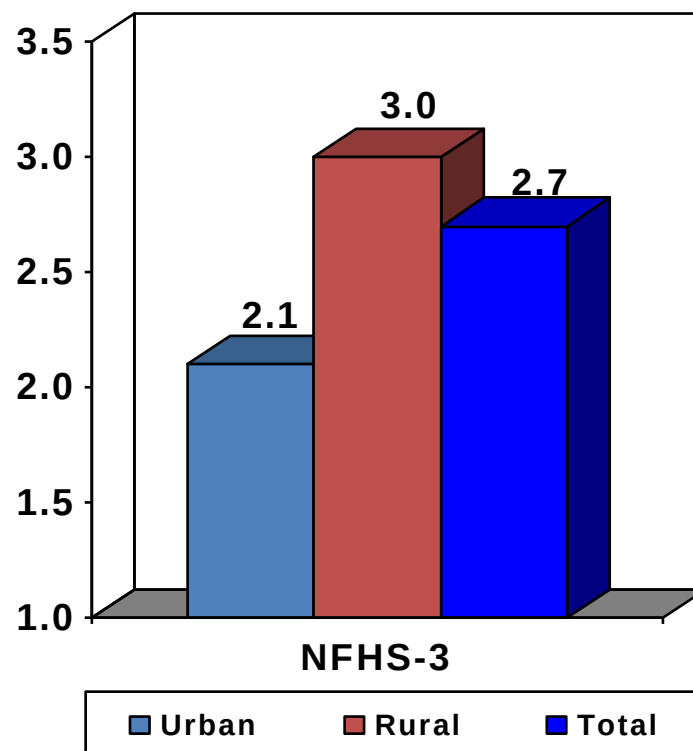
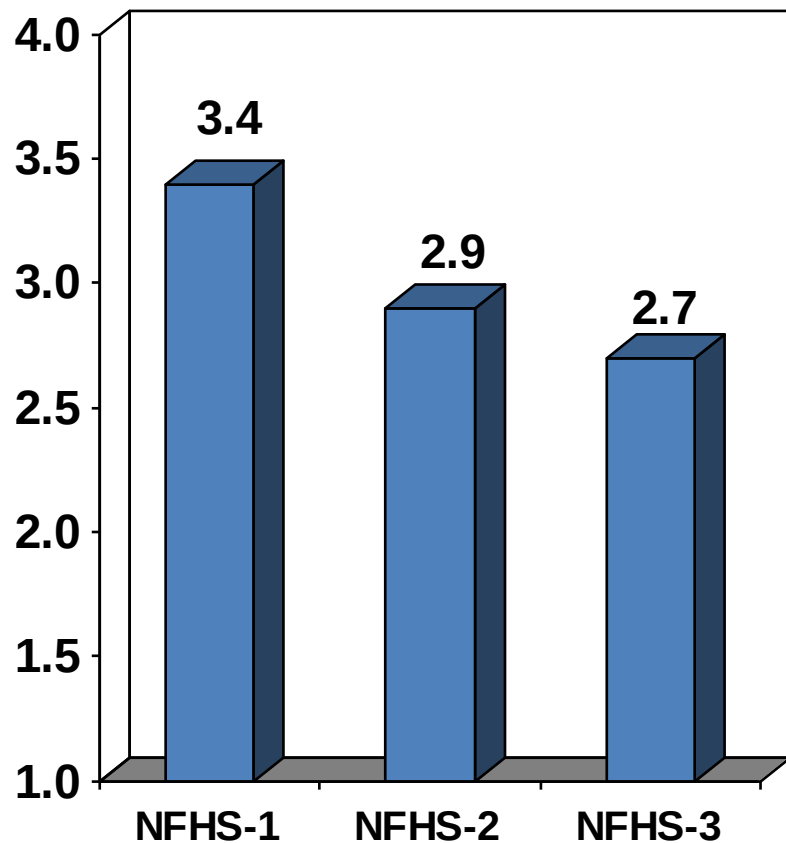
- Literacy rates: India - 74.04% (2011) ,
(source: www.census.gov.in/2011)
 - Housing – the number of persons per room
 - Per capita “calorie” availability
- Countries with favorable socioeconomic indicators have reported less health related problems.

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!

