

**National Sample Survey (NSS) Rounds on Morbidity and Healthcare Utilisation: Reflections on Concepts, Definitions, Measurement and Analysis of Data**

GUMBER, Anil <<http://orcid.org/0000-0002-8621-6966>>

Available from Sheffield Hallam University Research Archive (SHURA) at:

<https://shura.shu.ac.uk/26375/>

---

This document is the Presentation

**Citation:**

GUMBER, Anil (2016). National Sample Survey (NSS) Rounds on Morbidity and Healthcare Utilisation: Reflections on Concepts, Definitions, Measurement and Analysis of Data. In: 5th Annual Conference of Indian Health Economics & Policy Association (IHEPA), Kolkata, India, 15-17 Dec 2016. Indian Health Economics & Policy Association (IHEPA). (Unpublished) [Conference or Workshop Item]

---

**Copyright and re-use policy**

See <http://shura.shu.ac.uk/information.html>

# **National Sample Survey (NSS) Rounds on Morbidity and Healthcare Utilisation**

*Reflections on Concepts, Definitions, Measurement and Analysis of Data*

***Dr Anil Gumber***

*Centre for Health and Social Care Research  
Sheffield Hallam University, Sheffield, S10 2BP (UK)  
Email: [A.Gumber@shu.ac.uk](mailto:A.Gumber@shu.ac.uk)*

***5<sup>th</sup> Indian Health Economics and Policy  
Association Conference, Kolkata  
15-17 December, 2016***

# ***Tribute to my Guru***

***Prof. Pravin Visaria (1937-2001)***



Who guided & mentored me to do Analytical  
Research using Population Census and NSS data

# Introduction

- The National Sample Survey (NSS) was set up by Gol in 1950 as a continuing system of multi-purpose surveys designed to fill gaps in the data required for planning economic and social development.
- In the last 65 years of its yearly socio-economic surveys, morbidity was given attention in **12 Rounds**
- Healthcare utilisation and cost of treatment in **5 Rounds**, starting from 35<sup>th</sup> Round (Jul 1980-Jun 1981)
- Before 35<sup>th</sup> Round (1980-81), the surveys on morbidity patterns were exploratory in nature.
  - The aim was to identify better data collection methods and instruments relating to **recall period**, **proxy respondents**, **definition of an illness**, and **items of information on use** of health services.

## Coverage of Morbidity and Healthcare in Various NSS Rounds **Pre- 1980**

Round (Year)	Title	NSS Report No./ Sarvekshana Vol.	Annual Morbidity Rate*	
			Rural	Urban
7(Oct.53-Mar.54)	Report on morbidity (recall 30 days)	Report 49 & 54	590 (777)	541 (741)
11(Aug.56-Jan.57)	Report on morbidity (recall 30 days larger sample)	Report 49	317 (380)	387 (427)
12(Feb.57-Jul.57)	Report on morbidity (recall 30 days larger sample)	Report 49	449 (681)	638 (977)
13(Sep 57-May 58)	Report on morbidity (recall 30 days larger sample)	Report 49	—	418 (504)
16(Nov 60-Oct 61)	<u>Special study</u> on morbidity (pilot in 5 villages/3 cities on repeat visits, proxy, probing)	Report 119	3492 (2052)	1572 (2052)
17(Sep.61-Jul.62)	Report on pilot enquiry on morbidity (larger sample- separately for 4 weeks covering 30 days recall period)	Report 129	1113 (3440)	1236 (3440)
28(Oct.73-Jun.74)	Survey on morbidity (2 weeks recall, chronic diseases)	Sarv.IV(1&2),1980	348 (605)	371 (612)

Note: \*Annual morbidity (incidence or prevalence) rate per 1000 population is computed as  $(IR / LRP) (365 / NV)$ ; where, IR - Incidence rate per 1000 population during the recall period, LRP -Length of the recall period, and NV - Number of visits during the year of survey. Figures in parentheses are prevalence rate.

# During 1980s

- Primary focus shifted from exploration of morbidity to utilization of health services for treatment during 1980s.
- Two major surveys were launched (35<sup>th</sup> round - 1980-81 and 42<sup>nd</sup> round - 1986-87) with two main objectives:
  - to make an assessment of the benefits received from public investment in health services, and
  - to understand the health needs of various sections of the society.
- These surveys gathered information on:
  - the extent of coverage under public health programmes (vaccination or immunization),
  - the provision of health care and nutritional supplement for mothers and children, and
  - utilization of medical services, including as inpatient, for the treatment of illness & injury and costs incurred for that purpose.

## **Measurement and pattern of morbidity and the utilization of health services: some emerging issues from recent health interview surveys in India.**

Gumber A, Berman P.

### **Abstract**

**PIP:** Both health planners and researchers have a particularly difficult time measuring morbidity, especially in developing countries. However, public health programs need information on the prevalence of disease in a community in order to take timely and appropriate measures to prevent, control, and eradicate disease. Moreover, the incidence of various types of disease indicates the potential need for resources such as hospitals, dispensaries, laboratories, rehabilitation centers, and home nursing facilities. Considerable variation can exist in the completeness of morbidity reporting both between and within countries. This paper examines nine recent health interview surveys in India in terms of their methodology and findings. The surveys deal specifically with morbidity patterns and the use of health services. Broad issues related to the empirical measurement of morbidity and its relationship with development are discussed, followed by a critical review of survey design methods, concepts, definitions, and procedures adopted in both national and regional health studies. The surveys' main findings on the incidence of morbidity, patterns of disease, and the use of and expenditure on health care are discussed.

PMID: 12293259

**Journal Renamed as World Health & Population**

Download: <http://www.longwoods.com/content/17484>



# Modifications in 52<sup>nd</sup> Round

- To standardise internationally - recall period for morbidity from 30 days to 15 days; **Point prevalence**
- Health behaviour & knowledge (preventive+promotive) (**immun-children&pregnant women, iodised salt,ort, insecticide spray**)
- Insurance coverage (life, medical, accident)
- Medical costs items expanded
- Direct and indirect costs (Out-of-pocket expenses) (**transport, lodging, attendant charges, medical appliances**)
- Means of financing healthcare costs
- Loss of income due to illness
- Sampling & Integrated questionnaire for preventive, promotive and curative healthcare for 10 sampled hhs **{42 Round - MCH(4)/Hospitalisation(2)/Ailments(2)}**



# WHO BENEFITS FROM PUBLIC HEALTH SPENDING IN INDIA

Ajay Mahal, Janmejaya Singh, Farzana Afridi, Vikram Lamba,  
Anil Gumber, and V. Selvaraju

August 2001



# Pattern and Determinants of Health Care Use and Expenditures at the End-of-Life in India

Anil Gumber, PhD

Senior Research Fellow, UK Centre for Evidence in Ethnicity, Health and Diversity,  
Warwick Medical School, The University of Warwick, Coventry CV4 7AL, UK. Email: [anil.gumber@warwick.ac.uk](mailto:anil.gumber@warwick.ac.uk)  
(International Health Economics Association, iHEA 5th World Congress on Investing in Health, Barcelona, Spain, July 10-13, 2005)

## BACKGROUND

Policy makers in India have not effectively addressed the issues of health and poverty. The burden of out-of-pocket expenditure on health care is unduly heavy on poor and vulnerable households. A national study shows that almost one quarter of households fall into poverty as a direct consequence of the medical expenses they pay after being hospitalized. Further, more than two-fifths of individuals who were hospitalized during the last year borrowed money or sold assets to cover the hospital expenses. Health and social insurance mechanisms in India have not been adequately developed to mitigate such adverse impact. The consequences on those households get elevated further when the hospitalization eventually results into a death event. One possible outcome could be pushing these families into a zone of permanent poverty.

The main objectives of the study are:

- to examine the type of medical attention received at the end-of-life
- to analyse differentials in the use of hospital care and expenditure on treatment at the end-of-life by socio-economic groups
- to compare financial burden of treatment (direct and indirect) on households reporting fatal and non-fatal outcomes.

## MATERIALS AND METHODS

The analysis is based on the all-India household survey of utilization of health services for treatment of illness and injury undertaken by the National Sample Survey Organization. The survey included households reporting a case of hospitalization during the last 365 days along with the information on outcome (discharged from the hospital or deceased). The multi-stage sampling procedure was followed to select about 121000 households from rural and urban areas. The survey was spread throughout the year. Beside socioeconomic characteristics of the household, for each member of the household who was ill or injured during the reference period, information was collected on the type and duration of ailment, type of health agency contacted and services availed of, and the detailed cost of treatment and sources of finance to meet such expenditures.

Table 1 Medical attention received and place of death

	Rural India	Urban India
<b>Place of Death (%)</b>		
At Home	79.6	66.4
During Transport	2.8	3.7
Government Hospital	7.8	12.8
Private Hospital	4.6	12.8
Others	5.2	4.3
<b>Type of Medical Attention before Death (%)</b>		
No Medical Attention	36.5	24.7
Medical Attention Received by		
Institutional - government	20.4	25.0
Institutional - others	7.6	11.2
Registered medical practitioner	17.8	28.3
Other medical practitioner	17.8	10.9
<b>Number of deaths</b>	2268	1252
<b>Number of fatal hospitalization episodes</b>	926	824
<b>Fatality rate in inpatient care (%)</b>	7.6	7.0

## RESULTS

Table 2 Non Receipt of Medical Attention at the End-of-Life

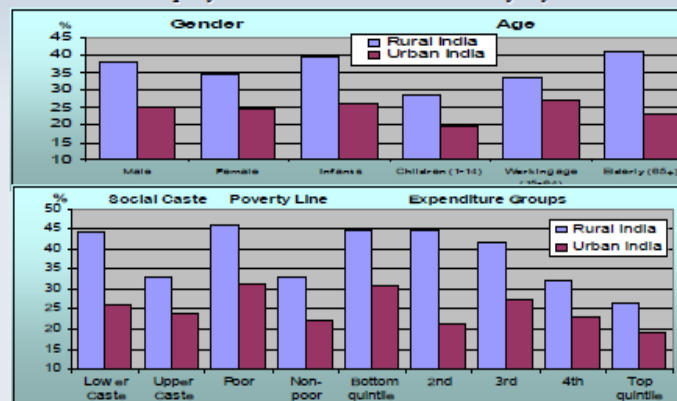
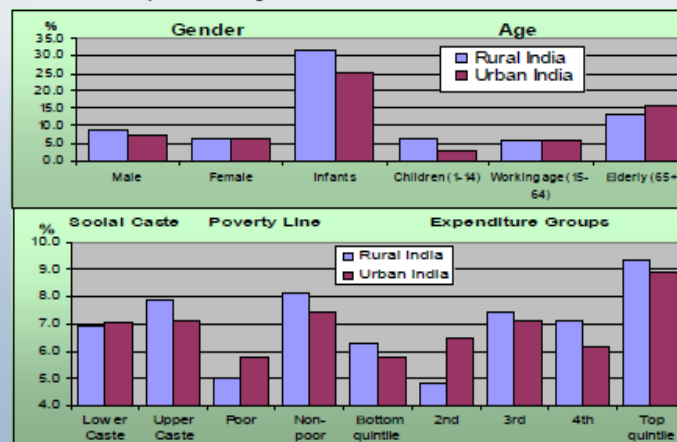


Table 3 Hospital Care Use by Fatal and Non-fatal Outcomes

	Rural India		Urban India	
<b>Inpatient Care Use</b>	Fatal	Non-fatal	Fatal	Non-fatal
Share of public hospital in treatment (%)	56.1	44.5	53.7	42.1
Share of inpatients received a free hospital bed (%)	51.2	42.4	44.9	38.8
Average duration of hospital care (days)	15.1	11.9	15.5	10.7
<b>Broad disease groups</b>				
1. Communicable & maternal	26.5	40.5	29.6	37.3
2. Non-communicable	41.5	27.0	46.9	30.5
3. Injury	3.9	7.4	3.6	7.2
4. Unclassified/others	28.1	25.2	19.9	25.1

Table 4 Fatality Rate in Inpatient Care



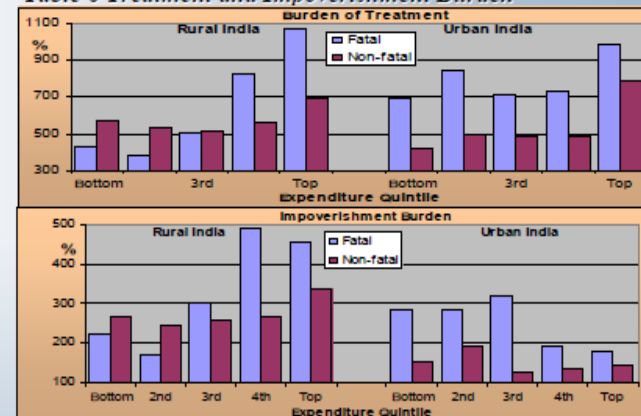
## RESULTS

Table 5 Expenditure and Burden of Treatment

The mean expenditure on inpatient treatment was higher for fatal cases. Burden of treatment, income loss as well as impoverishment (expressed as % of monthly per capita expenditure) was heavy for fatal than non-fatal cases.

	Rural India		Urban India	
<b>Expenditure and Burden of Care</b>	Fatal	Non-fatal	Fatal	Non-fatal
Monthly per capita expenditure (MPCE) (Rs)	568	445	778	641
Total expenditure on treatment (Rs)	5672	3116	7638	4076
Burden of treatment (cost as % of MPCE)	832	598	820	549
Share of sources in meeting cost of treatment (%)				
Current income	8.2	10.4	10.7	12.4
Saving	42.0	33.5	50.6	45.7
Sale of assets	8.3	8.2	4.9	4.0
Borrowing	35.0	40.0	20.6	17.6
Reimbursement	0.3	0.8	6.4	6.6
Other	6.2	7.1	6.8	13.7
Income loss due to hospitalisation (Rs.)	937	553	707	561
Income loss as % of MPCE	141	128	126	98
Impoverishment level (asset sale & indebtedness)	43.4	45.4	30.4	24.0
Impoverishment burden (borrowing & sold assets amount as % of MPCE)	404	290	243	149

Table 6 Treatment and Impoverishment Burden



## CONCLUSIONS

1. The poor and rural population persistently report lower levels of medical attention and use of hospital care at the end-of-life, thus pinpointing accessibility and equity concerns.
2. An incidence of hospitalization puts severe financial burden on a household and the burden becomes unduly heavy when resulting into death. In both rural and urban areas the burden rises with expenditure class, much sharply among fatal than non-fatal cases. Impoverishment burden is felt much more for rural than urban population.
3. There is need for a comprehensive health insurance coverage for poor and rural population to mitigate the adverse impact of meeting hospitalization costs.
4. To address the global agenda 'making poverty a history' further research is required to understand specific needs of population at the end-of-life.

# Declining Free Health Care and Rising Treatment Costs in India: An Analysis of National Sample Surveys 1986–2004

**Anil Gumber**  
**Biplab Dhak**  
**N. Lalitha**

Journal of Health Management  
14(2) 97–116

© 2012 Indian Institute of  
Health Management Research

SAGE Publications  
Los Angeles, London,  
New Delhi, Singapore,  
Washington DC

DOI: 10.1177/097206341201400202

<http://jhm.sagepub.com>



## Abstract

The article focuses on trends in health-seeking behaviour of people and choosing between government and private sources, reasons for not accessing health care and the cost of treatment by examining three rounds of NSS data on health care use and morbidity pattern during 1986–87, 1995–96 and 2004. With variation across states, treatment-seeking from public providers has declined and preference for private providers has increased over the period. Although overall health-seeking behaviour has improved for both males and females, a significant percentage of people, more in rural than urban areas, do not seek treatment due to lack of accessibility and consider that the illness is not serious enough to require treatment. The financial reason for not seeking treatment was also an important issue in rural

# Sampling Design

- Two-stage stratified sampling design (villages/urban blocks and households)
- Sample villages are selected with probability proportional to population, whereas sample urban blocks are selected with equal probability.
- Selected no. of sampled villages/urban blocks within each NSS region are divided into four sub-rounds (**1/4<sup>th</sup> of sample surveyed quarterly**).
- In each sampled village/urban block, house-listing is done to prepare a frame of households stratification:
  - households with at least one child aged < one year **(2)**,
  - of the remaining households, those reporting any episode of hospitalization during the 365 days preceding the date of survey **(2)**, and
  - remaining households **(6).....Thus total 10 households**



# Estimation Procedure

- 2-Stage Stratified sampling framework facilitates generating reliable population estimates where every district of the country has been represented at least in the rural sample. Sample is spread throughout the year, accounting the **seasonal variability**.
- Sub-stratification of households was considered necessary to ensure adequate number of MCH and hospitalisation cases in the sample.
- *To generate valid estimates we require use of “multipliers” or “inflation factors” at two levels. (a) at the household level: the inverse of sampling fraction for selecting the households ( $h_s/H_d$ ). (b) the other level is the inverse of sampling fraction for selecting the village/urban block from the NSS region ( $n_s/N_d$ ). And the final multiplier is attached to each household. Adding multipliers at the village/district/region/state levels show the respective **total count of rural households** (populations).*

# Concepts/Definitions

Morbidity (ailment or illness/injury) is defined while using **WHO definition** as any state of deviation from the state of physical or mental well-being. This is **self-perceived** morbidity as reported by the respondent. However, for better morbidity reporting, some **probing** was attempted:

- (a) During the reference period, did the person feel anything wrong relating to skin, head, ears, nose, throat, teeth, arms, hands, chest, heart, stomach, liver, kidney, legs, feet or any other organ of the body? (For women aged 12+ “anything wrong” was to include “women’s complaints” i.e. ailments of the reproductive system).
- (b) Does the person suffer from any disease of chronic nature relating to stomach, lungs, nervous system, circulatory system, bones and joints, eye, ear, mouth or any other organ of the body?
- (c) Whether person has any kind of hearing, visual, speech or locomotor disability.
- (d) During the reference period did the person take any medicine or medical advice for his/her own ailment or injury?

Injury was defined to include “all types of damages to any part(s) of body - cuts, wounds, hemorrhage, fractures, burns and bites”.

# Concepts/Definitions

Spell of ailment: A continuous period of sickness owing to a specific ailment is treated as a spell of ailment. A spell is generally identified with a specific cause of ailment. If a person was reported to have suffered from two or more causes of ailment during the reference period, it was recorded as two different cases of ailment.

Recall period: For morbidity treated as inpatient in a hospital, a recall period of 365 days from the date of survey was used whereas for short duration (not requiring hospitalisation) it was 15 days from the date of survey. At the same time to minimize recall lapse an additional question was asked for illness status on the day before the date of survey (which refers to point prevalence of morbidity).

Duration of ailment: Period between commencement of the ailment and termination by its recovery. Within reference period, **commencement is the first day of reference period**, if it was on a day beyond the reference period. Similarly, if the ailment was continuing on the date of survey, the day of **termination of the ailment as the last day of reference period**.



# Concepts/Definitions

Hospitalisation: A person is considered as hospitalized if he/she has availed of medical services as an indoor patient in any medical institution. **Hospitalisation of women for childbirth was not considered.**

Medical treatment: A person is considered to have received medical treatment if he/she consults a doctor anywhere (in OPD of a hospital, community health centre, private residence, etc.) and obtains medical advice for the ailment. **Self-doctoring or acting on the advice of a non-medical person are not considered as medical treatment.**

Expenditure for medical treatment: Total expenditure incurred for medical treatment received during the reference period (15 days for non-hospitalized and 365 days for hospitalisation) includes expenditure on:

(1) Hospital bed charges (with charges for food included in it), (2) Medicines (including drips) (3) Materials for bandages, plaster, etc. (4) Fees for services of medical & paramedical personnel (5) Charges for diagnostic tests (6) Operations and therapies (7) Charges of ambulance (8) Costs of oxygen, blood, etc.

**Not Covered: lodging charges of escort, attendant charges, transport other than ambulance, personal medical appliances but as OOP**

# Coverage of Morbidity and Healthcare in NSS Rounds **Post- 1980**

Round (Year)	Title	NSS Report No./ Sarvekshana Vol.	Annual Morbidity Rate*	
			Rural	Urban
35(Jul.80-Jun.81)	Utilisation of health services for illness & injury	Not Tabulated	--	--
	Maternity, child care and family planning	Not Tabulated		
42(Jul.86-Jun.87)	Morbidity & utilisation of medical services	Sarv.XV(4),1992	805	434
	Child, maternity care and family planning	Sarv.XIV(4),1991		
52(Jul 95-Jun 96)	Morbidity and treatment of ailments	Report 441, 1998	1059	1042
60(Jan - Jun 04)	Morbidity, health care & condition of the aged	Report 507, 2006	2141	2409
71(Jan - Jun 14)	Social consumption: Health	Report KI (71/25.0), 2015	2166	2871

Note: \*Annual morbidity (incidence or prevalence) rate per 1000 population is computed as (IR / LRP) (365); where, IR - Incidence rate per 1000 population during the recall period, LRP -Length of the recall period. Figures in parentheses are prevalence rate.

# Morbidity

## Number of ailing persons (per 1000 population) during last 15 days in rural and urban India

		1995-96	Jan-Jun 2004	Jan-Jun 2014
Rural	Persons	55	88	89
	Males	54	83	80
	Females	57	93	99
Urban	Persons	54	99	118
	Males	51	91	101
	Females	58	108	135

## Number of persons hospitalised (per 1000 population) during last 365 days in rural and urban India

		1995-96	Jan-Jun 2004	Jan-Jun 2014
Rural	Persons	13	23	35
	Males	14	23	34
	Females	13	22	36
Urban	Persons	20	31	44
	Males	20	31	41
	Females	20	31	46

# Coverage 35<sup>th</sup> to 71<sup>st</sup> Round

Round	Year	Villages	Urban Blocks	Households		
				Rural	Urban	All
35	July 80-June 81	8008	4500			
42	July 86-June 87	8379	4588			
52	July 95-June 96	7663	4991	71284	49658	120942
60	Jan-June 2004	4755	2668	47,302	26566	73,868
71	Jan-June 2014	4577	3720	36,480	29,452	65,932

# Equity Questions (MPCE Quintile, BPL/APL, SC&ST/Other)



Draft Report

## Analysis of National Sample Survey Data

(with particular reference to DFID priority states)

Anil Gumber  
Mark Pearson  
April 2002

# Equity Questions

- **Health Outcomes**

- Poor are less healthy (Illness rate, Acute, Chronic, Hospitalisation, Mortality)

- **Health Inputs**

- Poor spend a far higher % of disposable income on health

- **Access to Healthcare**

- Poor are less aware of appropriate health seeking behaviour
- Poor are less likely to immunise their children.
- Poor are less likely to access appropriate treatment

- **Health Behaviour**

- Poor abuse alcohol and tobacco more
- Poor are less likely to be insured

# Equity Questions

- **Choosing Healthcare Provider**
  - Poor are more likely to use the public sector
  - Poor are more likely choose public provider on grounds of cost
- **Quality of Healthcare**
  - Poor are more likely to self treat/not treat
  - Poor are less likely to access free treatment
  - Poor receive less intensive treatment
  - Poor are more likely to delay presentation at right facility
- **Healthcare Burden**
  - Poor face greater indirect costs
  - Poor are more likely to go into debt to pay for health services
  - Poor face heavier income losses



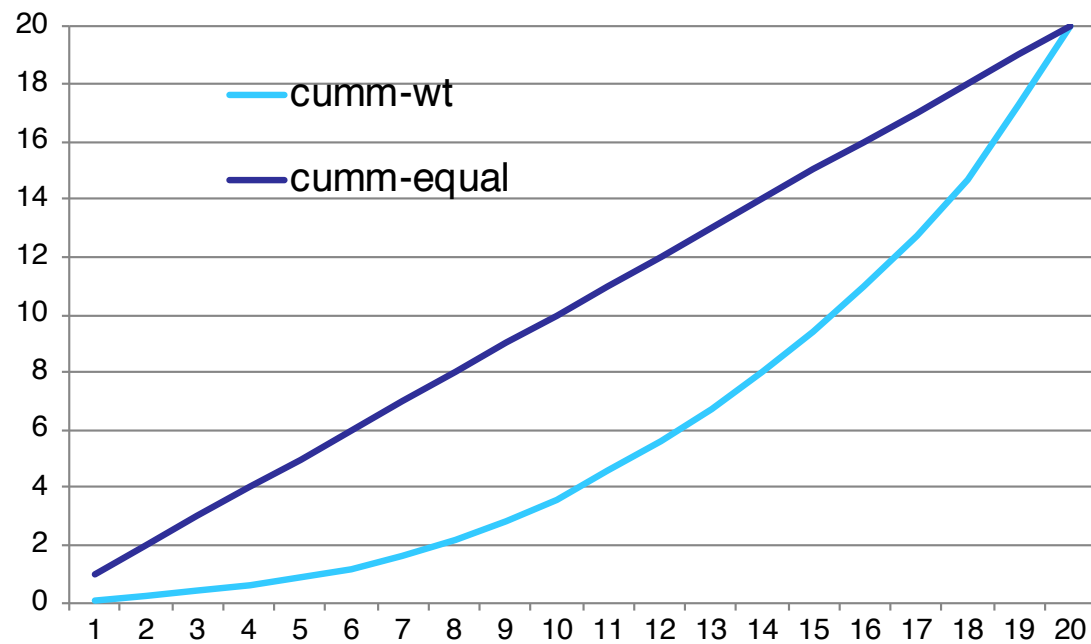
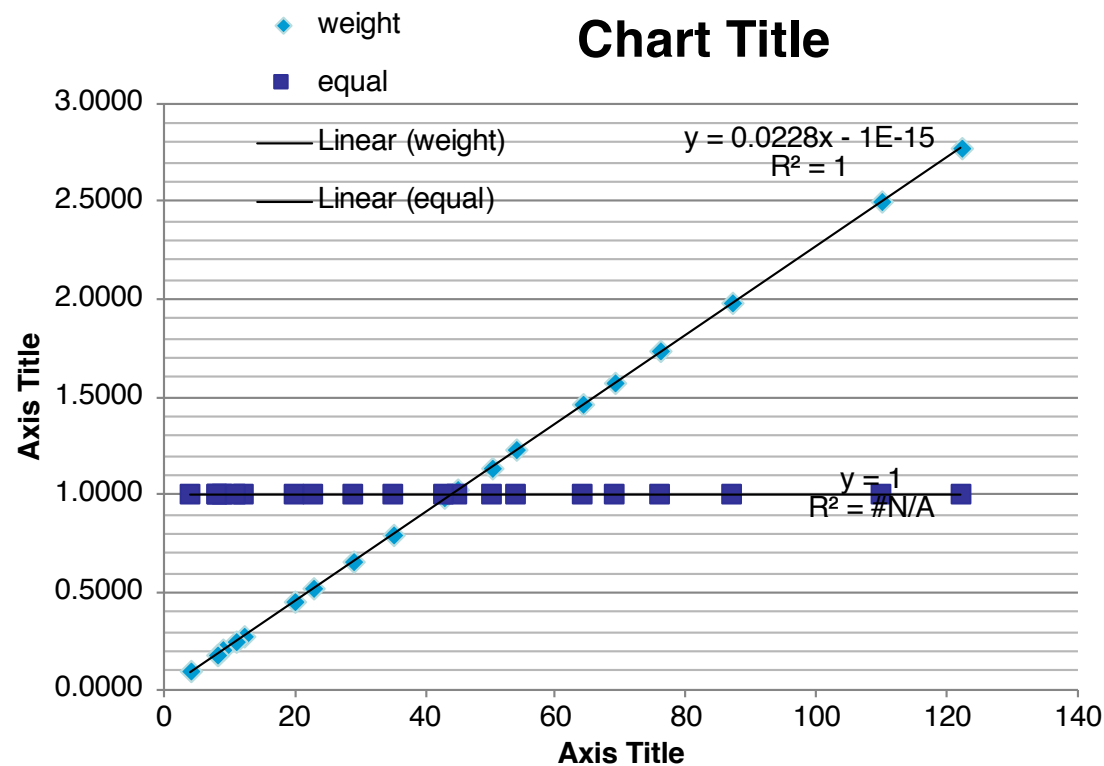
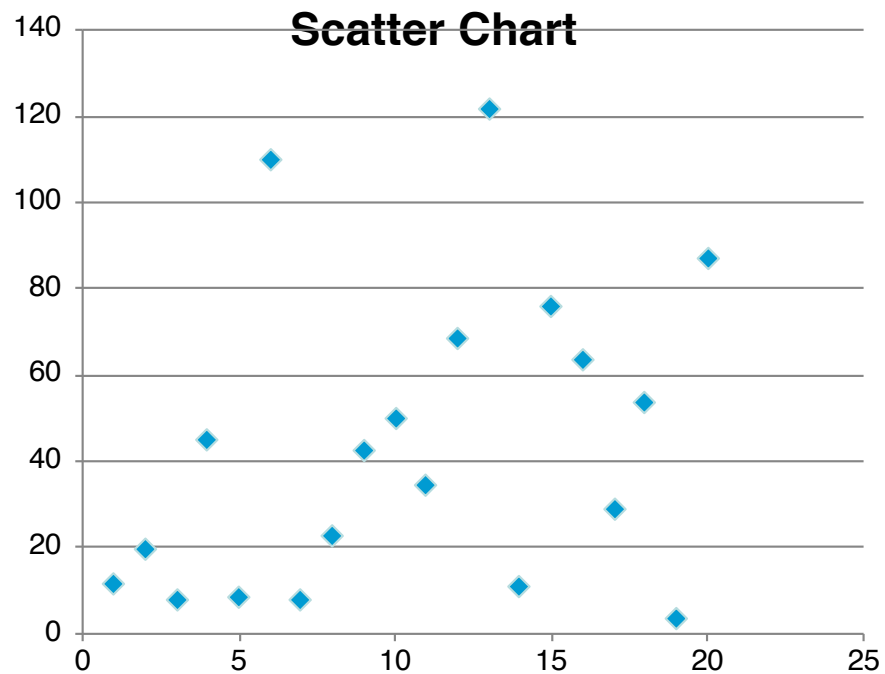
# Common Abuses of NSS data

- Not using appropriate multipliers (estimation population weight) for presenting Rate, Ratios, Percentages, Means or Counts
- For Example (a Quote from a Published Paper)

(Public-Private Dichotomy in Utilization of Health Care Services in India. *Consilience: The Journal of Sustainable Development*) "...National Sample Survey (2004) with its 250,862 sample size in rural areas and 132,638 samples in urban areas (out of which more than 40% of household members in both rural as well as urban areas had experienced any health problem in the last year and also received treatment as inpatients of hospitals) provided an opportunity to assess the utilization pattern of health care services empirically. Out of 43% of the population who experienced any health problem, 2% received services exclusively from public health sources, 53% exclusively from private sources and 45 percent from both, in rural areas. ....in urban areas, where there is 3 percent exclusive use of public health sources, 57% exclusive use of private health sources, and 40 percent use of both. ...we can say almost 97% inpatients in rural and 96% in urban areas received treatment at least once in private health services in the year before the survey.

# Not using weighted distribution in Multivariate analysis

ID Num	HH with Hospitalisati on	Equal weight	Proportion (hi/Sum hi)	Proportion X Sum of sampled hi	M	F		
1	12	1	0.0137	0.2730	1	0	0.273	0
2	20	1	0.0228	0.4551	1	0	0.4551	0
3	8	1	0.0091	0.1820	1	0	0.182	0
4	45	1	0.0512	1.0239	1	0	1.0239	0
5	9	1	0.0102	0.2048	1	0	0.2048	0
6	110	1	0.1251	2.5028	1	0	2.5028	0
7	8	1	0.0091	0.1820	1	0	0.182	0
8	23	1	0.0262	0.5233	1	0	0.5233	0
9	43	1	0.0489	0.9784	1	0	0.9784	0
10	50	1	0.0569	1.1377	1	0	1.1377	0
11	35	1	0.0398	0.7964	0	1	0	0.7964
12	69	1	0.0785	1.5700	0	1	0	1.57
13	122	1	0.1388	2.7759	0	1	0	2.7759
14	11	1	0.0125	0.2503	0	1	0	0.2503
15	76	1	0.0865	1.7292	0	1	0	1.7292
16	64	1	0.0728	1.4562	0	1	0	1.4562
17	29	1	0.0330	0.6598	0	1	0	0.6598
18	54	1	0.0614	1.2287	0	1	0	1.2287
19	4	1	0.0046	0.0910	0	1	0	0.091
20	87	1	0.0990	1.9795	0	1	0	1.9795
sum	879	20	1	20	10	10	7.463	12.537



# Thanks... Questions!

