



Have we heard ?

Inflation

WPI, CPI – AL, CPI – U/R

Export & Import Indices

SDG Indices

Population Indices

GDP/GNP



IIP, ISP

Index Number

A statistical device designed suitably to measure the relative change in the level of a phenomenon with respect to time, geographical location or any other characteristic.

Price Index

$$I = \frac{P_1}{P_0} \times 100$$

where,

P_0 = price at the base time

P_1 = price at a specific time

History

After first world war - socio economic surveys – Bihar, Sholapur, Ahmedabad

In 1931 – Royal commission on Labour – CLI – FBE in Bombay, Madras, United Provinces

Second world war – Rau court of enquiry 1940 under Trade disputes act 1929 – DA for railway employees - recommended Gol

Minimum Wages Act 1948, CPI for AL 1950-51


Index Number requires

- **Characteristic for comparison**
- **Base period, Current Period**
- **Commodities List**
- **Weights**
- **Average – AM, GM**

Basic Problems Involved

- **Purpose**
- **Selection of Commodities**
 - Only relevant items
 - Standard items
- **Data – source and principles**
- **Base Period**
 - Normal Period
 - Not too distant
- **Average to be used**
- **Selection of Weights**

Steps

- 
- Defining scope and Coverage
 - Family Budget Enquiry
 - **Sample of families**
 - **Follow up their budget**
 - **Appropriate time**
 - Nature, quality and quantity of Commodities and classify them
 - Proportion of Expenditure on each item within a subgroup, subgroup to a group, group to all
 - The retail prices
 - Price Relative = $(\text{price today} / \text{price in base period}) * 100$
Index = weighted average of price relatives

Consumer Price Index (IW)

- Labour Bureau,
Shimla

Prerequisites of CPI Nos.

Item Weights - CES



Base Prices – Price Collection Machinery
Current Prices – Weekly/monthly/six monthly
and yearly collection

Working Class Family Income & Expenditure Surveys



Coverage of Population

Selection of Centres

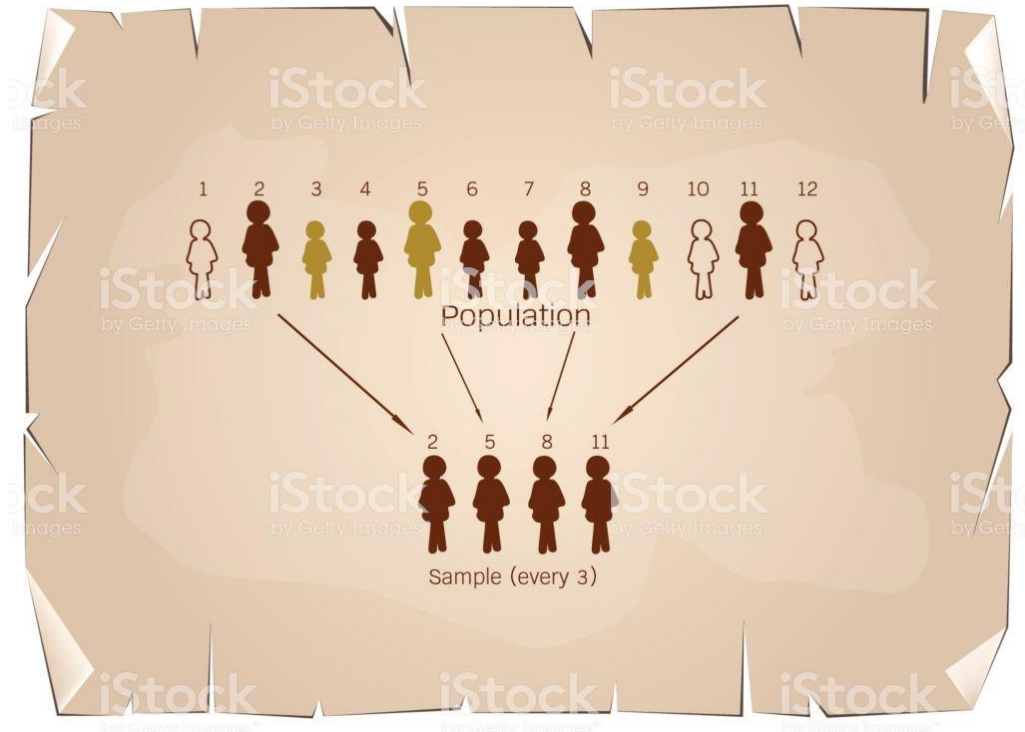
Fixation of sample size

Preliminary survey by NSSO

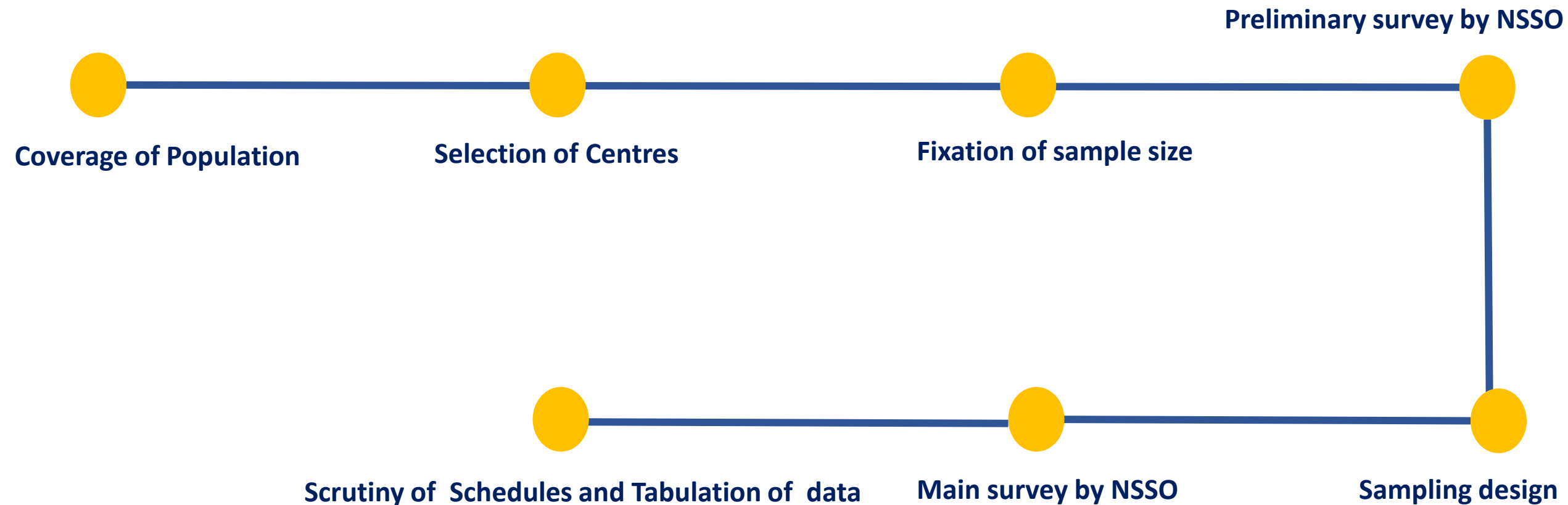
Sampling design

Main survey by NSSO

Scrutiny of Schedules and Tabulation of data




Working Class Family Income & Expenditure Surveys



Weighting Diagram

- 
- Classification of items
 - Only consumption expenditure accounted for weights
 - Weights are relative importance of items in overall spending

- 
- Mandatory to retain items with 1% or more expenditure at sub-group level
 - Popular items also to be retained
 - Remaining items are imputed to similar items

Group 1 Food, Beverages and Tobacco

Cereals and cereals products
Pulses and pulses products
Oils and Fats
Meat, Fish and Eggs
Milk and milk products
Condiments and Spices
Vegetables
Fruits
Sugar, Honey etc.
Non-alcoholic Beverages
Prepared meals and refreshments
Pan, Supari, Tobacco etc.

Group 2 Fuel and Light

Group 3 Housing

Group 4 Clothing, Bedding and Footwear

Clothing and Bedding
Footwear

Group 5 Miscellaneous

Medical care
Education
Recreation and Amusement
Transport and Communication
Personal care and effects
Household requisites
Others

All-India Group Weights

Group	1960=100	1982=100	2001=100
I – Food	60.9	57.0	46.20
II – Pan, Supari, Tobacco & Intoxicants	4.8	3.15	2.27
III - Fuel & Light	5.8	6.28	6.43
IV - Housing	6.3	8.67	15.27
V - Clothing, Bedding & Footwear	8.5	8.54	6.57
VI - Miscellaneous	13.7	16.36	23.26
Total	100.0	100.00	100.00

Price Collection Set Up

Organization of price collection work before base year

Selection of markets

Selection of shops

Selection of Items/ Varieties / Specifications/ Units etc.

Price Collection day/time

Appointment of Price Collectors, Price Supervisors and State Coordinators

PDS Items

- **Statutory, Informal and TGD**
- **Average price of items supplied through PDS is weighted average of price in fair price shops and that in open market**

$$P = pf.a + pm(1-a)$$

Where :

P = Weighted Average Price

pf = Fair Price

pm = Open Market Price

a = Off-take Ratio

Weighted Price of Rice

Base year requirement per Family	=	8 kg	
Admissibility Scale	=	10 kg per card/Per family	
Availability per Family	=	2 kg	
Fair Price Ratio	=	25% $\frac{(2*100)}{8}$	
Open Market Ratio	=	75% (100 - 25)	
Fair Price	=	6.00	
Open market Price	=	20.00	
Weighted Price	=	$\frac{25 \times 6.00 + 75 \times 20}{100}$	= 16.50

Average of Prices

	M-1	M-2	M-3	Average
W-1	8.00	8.50	8.25	
	8.00	8.50	8.25	
W-2	8.00	8.50	8.25	
	8.00	8.50	8.25	
W-3	8.00	8.50	8.25	
	8.00	8.50	8.25	
W-4	8.50	9.00	8.50	
	8.50	9.00	8.50	
Average	8.13	8.63	8.31	8.35

Index Formula

Laspeyre's index formula in modified form is used in the compilation of these indices:

$$I_n = \frac{\sum P_n Q_o}{\sum P_o Q_o} \times 100$$

or
$$I_n = \frac{\sum \left(\frac{P_n}{P_o} \times 100 \right) P_o Q_o}{\sum P_o Q_o}$$

or
$$I_n = \frac{\sum W_o \left(\frac{P_n}{P_o} \times 100 \right)}{\sum W_o}$$

Where :

I_n = Index for the current period

P_n = Price for the current period

P_o = Price for the base period

Q_o = Quantity for the base period

$$\frac{P_n}{P_o} \times 100 = \text{Price Relative}$$

$P_o Q_o = W_o = \text{Weight of a particular item.}$

Σ = Denotes summation over all the items.

Compilation of Index

The index is compiled at different stages:

- **Sub-group index**
- **Group Index**
- **Centre Index**
- **All-India index**

Cereals & Products

<u>Item</u>	<u>Weight</u>	<u>B.P.</u>	<u>C.P.</u>	<u>P.R.</u>	<u>P.M.</u>
Rice	27.56	11.90	12.03	101.0924	2786.1065
Wheat	26.61	7.18	7.55	105.1532	2798.1267
Wheat	37.97	8.11	12.43	153.2676	5819.5708
Atta					
Bread	4.43	7.00	8.50	121.4286	537.9287
Grinding	3.43	40.42	61.25	151.5339	519.7613
charges					
sub-group	100.00				12461.4940
index					124.6149
					125

FOOD GROUP

<u>Sub-Group</u>	<u>Weight</u>	<u>Index</u>	<u>P.M.</u>
Cereals & Products	19.01	124.6149	2368.9292
Pulses & Products	6.83	141.7956	968.4639
Oils & Fats	6.44	166.9778	1075.3370
Meat, Fish & Eggs	4.22	156.1929	659.1340
Milk & Products	26.08	127.1503	3316.0798
Cond. & Spices	5.46	126.6331	691.4167
Veg. & Fruits	14.54	107.0251	1556.1450
Other Food	17.42	115.5606	2013.0657
Food Group	100.00		12648.5713
Index			126.4857
			126

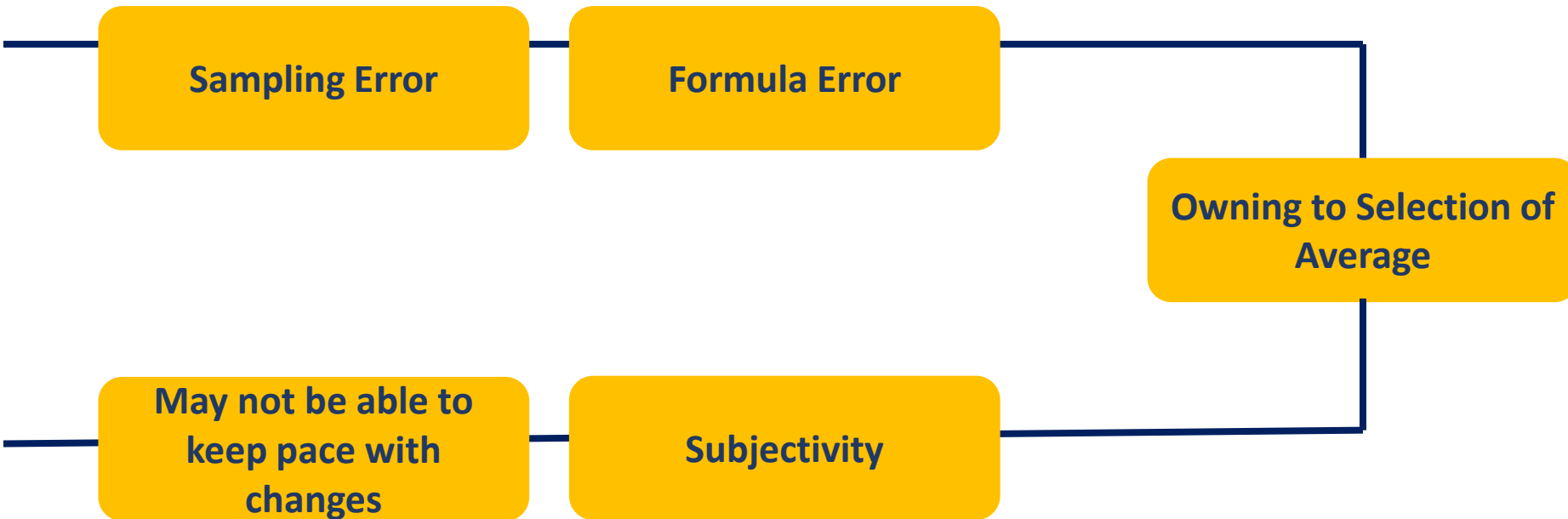
GENERAL INDEX

<u>Group</u>	<u>Weight</u>	<u>Index</u>	<u>P.M.</u>
Food	43.75	126.4857	5533.7494
Pan, Supari etc.	2.12	119.2176	252.7413
Fuel & Light	5.39	149.5710	806.1877
Housing	20.72	122.9717	2547.9736
Clothing etc.	5.68	113.4386	644.3312
Miscellaneous	22.34	136.3478	3046.0099
General Index	100.00		12830.9931
or			128.3099
Centre Index			128



All India Index

<u>Centre</u>	<u>Weight</u>	<u>Index</u>	<u>P.M.</u>
Delhi	1.99	128.3099	255.3367
Mumbai	9.57	137.3762	1314.6902
Chennai	2.31	127.6658	294.9080
Kolkata	1.51	134.9360	203.7534
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General	100.00		13412.9633
Index			134.1296
			134


Errors and their Sources



Applications



Purchasing Power Parity Formula = $\frac{\text{Cost of good X in currency 1}}{\text{Cost of good X in currency 2}}$



- real value = nominal Value / PI
- Automatic Escalation Clause in Contracts and Projects
- 1 dollar = 17.12 rs.
- Dearness allowance calculation
- Salary revaluation
- Deflation in National Accounts



Applications

● Cost of Living Index

● Tax authorities - determine capital gains tax

● CPI AL – MNREGA wages (Minimum Wages Act 1948)

● MSP Considered as Economic Barometers

● Studying Trends and Tendencies







A good thing never ends.

Mick Jagger