

# INDEX OF MULTIPLE DEPRIVATIONS AS A MEASURE OF POVERTY IN KARACHI

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## Abstract

Poverty is a complex phenomenon, and different measures give different perspectives as to its size and evolution. A variety of alternative measures have been developed to correct these limitations: these include measures based on the subjective appreciation by individuals of their own ability to satisfy basic needs and those measuring objective conditions like ownership of consumer goods and access to various goods and services. We describe the main concepts and methodological issues underpinning the study of deprivation. We discuss the deprivation as one way of measuring poverty. Much of the interest in measuring deprivation stems from the work of Townsend (1979). Townsend related the concept of deprivation to the broader notion of inability of living a decent life. The importance of this paper comes from the importance of the subject itself, as it is the first of its kind that addresses deprivation in Pakistan. Such studies are highly needed to decision-makers who are in charge of drafting policies leading to reducing poverty problems which are not synthesized in ordinary poverty studies. This study has employed several indicators using methodological measures for deprivation including: employment deprivation, housing deprivation, education deprivation and health deprivation. Then, combines indices to produce what is called Index of Multiple Deprivation (IMD). The IMD was derived from the indicators to reflect the overall conditions of the people by each locality in Karachi. Once four sectoral indices have been calculated, an overall Index of Multiple Deprivation (IMD) is derived. Having considered various options, it is decided to

employ the criteria used by UNDP in deriving Human Poverty Index (HPI). A Survey of 600 families was done in all the five district of Karachi but after scrutiny of the questionnaire we found a sample of 500 families is correct for this study.

**Key Word:** Index, Multiple Deprivation, Employment, Education, Health, Housing, Karachi

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## 1. Introduction

Poverty is a complex phenomenon, and different measures give different perspectives as to its size and evolution. On the one side, comparative research relying on an income threshold set at half of the median suggests that poverty affects over 10% of the OECD population, and that it has increased slightly over the past two decades. On the other, evidence from the studies based on alternative measures suggests that a much smaller minority of households does not satisfy their basic needs and that their incidence has declined even when income poverty was rising (Callan *et al.*, 1996).

These differences in appreciation conveyed by different measures partly reflect the different thresholds used in the analysis but also differences in the underlying constructs. Income measures of poverty are generally based on cross-section data that offer a snap-shot of the individual's situation combining transitory and persistent features. Further, income measures do not provide a full picture of command over resources. Thus neglecting individuals' ability to borrow, to draw from accumulated savings and to benefit from help provided by the family or friends, as well as consumption of public services such as education, health and housing. For these reasons, income provides only a partial description of the individual's ability to enjoy an acceptable life.

We describe the main concepts and methodological issues underpinning the study of deprivation. We discuss deprivation as one way of measuring poverty. While each of the approaches to poverty measurement has advantages and shortfalls as well, they all complement each other (Ringgen 1987, 1988; Nolan and Whelan, 1996). The main justification for the joint use of monetary and non-monetary indicators is that poverty is multidimensional (Kolm, 1977; Atkinson and Bourguignon, 1982; Maasoumi, 1986; and Tsui, 1985). For example, various sub-groups of the population may experience different forms of poverty e.g. food, clothing, shelter, income, etc., leading to low correlation between monetary and non-monetary indicators of poverty (Muffels, 1993; Nolan and Whelan 1996). Sen (2000) argues that an integrated approach to measuring poverty should account for its multiple causes and consequences, with a focus on individuals' command over resources, capabilities and the resulting outcomes functioning. This approach provides a framework for investigating the links between the different aspects of poverty.

Much of the interest in measuring deprivation stems from the work of Townsend (1979). Townsend related the concept of deprivation to the broader notion of inability of living a decent life. Following Townsend, other scholars have emphasized the notions of shame and inability to live a decent life with dignity. Today, most authors define deprivation as exclusion from the minimum acceptable way of life in one's own society because of inadequate resources. (Callan *et al.*, 1993; Nolan and Whelan, 1996; Kangas and Ritakallio, 1998; Layte *et al.* 2001; Whelan *et al.* 2002; Perry, 2002). Another common definition refers to the lack of socially perceived necessities. (Bradshaw and Finch, 2003; Nolan and Whelan, 1996). While all these definitions are consistent with both absolute and relative for Interpretations of poverty, they retain the notion that the household is the fundamental unit within which resources are shared and needs satisfied.

The importance of deprivation as a key component of social inequality has been recognized for a long time. It is widely accepted that deprivation increases the risk of early death and is associated with higher rates of illness from certain diseases. For example, in relation to cardiovascular health, socioeconomic

deprivation is associated with higher rates of admission to hospital and case fatality in heart failure.

The publication of the Independent Inquiry into Inequalities in Health Report in 1980 gave a new impetus to the study of the relationship between poverty and health. In the years following its publication, alternatives to social class - as a general measure of relative material comfort or poverty in a society - were increasingly investigated such as unemployment and single parenthood. Several different ways of combining variables taken from the census or elsewhere were developed as a means of categorizing deprivation within the populations of small geographically defined areas (census enumeration districts, local government wards, or postcode sectors). The methods in the most common use until recently were those developed by Townsend et al, Jarman, Carstairs and Morris. All used methods of combining variables to generate a summary score to reflect the socioeconomic status of a locality relative to the distribution of scores obtained for all localities.

There are clearly many links between deprivation and health inequalities. The section on health inequalities summarizes the Scottish Government's approach tackling health inequalities, which focuses on alleviating deprivation and its impact on health.

Subsequent contributions have both criticized and extended the measurement approach followed by Townsend. Piachaud (1987) questioned the failure to distinguish between the lack of a good (or an activity) due to a voluntary choice of individuals from that resulting from financial constraints. Ringen (1988) criticized Townsend's approach for trying to assess material deprivation (a *direct* measure of poverty) through an income's threshold (an *indirect* measure of poverty). Other authors have raised questions on the arbitrary list of items used and on the failure to take into account the seriousness of different forms of deprivation (Gordon et al 2000).

A variety of alternative measures have been developed for correction of these limitations: these include measures based on the subjective appreciation by individuals

of their own ability to satisfy basic needs, and those measuring objective conditions like ownership of consumer's goods and access to various goods and services. A common feature of these non-monetary measures is their ambition to capture the individual's capacity to afford a decent standard of living with respect to dimensions those are likely to last over time (for example, in terms of housing conditions). An additional feature of these approaches is that they are based on a hierarchy of needs that individuals or communities consider as necessary to live a decent life.

Much theoretical and empirical work has been devoted in the past few decades for the task of measuring poverty. Although taking a variety of perspectives, all approaches to the measurement of poverty rely on the specification of:

- A threshold separating the poor and the non-poor; and
- An index that expresses how far from the threshold the poor are.

More recent approaches to the definition and measurement of deprivation include Callan *et al.* (1993), who selected indicators of deprivation for Ireland starting from the basic idea that items have to be market-valuable, *i.e.* acquired by the use of people's disposable income. Callan *et al.* further examined how different dimensions of deprivation correlate with each other and whether clusters of correlated items could be employed to characterize the deprivation experience of particular groups of the population. Based on this analysis, they identified three groups of deprivation items: basic life-style, housing and availability of consumer durables. Later research has relied on similar classifications.

By applying their summary index to the original Townsend's dataset, Desai and Shah (1988) identified a significant relationship between income and deprivation scores, and between deprivation scores and socio demographics characteristics of the respondent.

Objective dimensions of deprivation refer to the capacity of individuals and households to satisfy four types of needs:

1. Satisfaction of basic needs refers to those items (*e.g.* food, clothes, ability to keep the home warm during winter, etc.) whose availability is essential for physical survival.
2. Capacity to afford basic leisure and social activities. (*e.g.* having a week of holiday away from home at least once per year, or occasionally inviting friends and relatives at home for drinks or meals) refers to items that, while not essential for physical survival, are critical for enjoying a decent quality of life.
3. Availability of consumer durables refers to items that are essential to perform every-day life activities (*e.g.* having a telephone) or that significantly ease housework and other domestic tasks (*e.g.* having a microwave oven).
4. Housing conditions relate to both the physical characteristics of the dwelling (*e.g.* availability of electricity, water supply, or indoor flushing toilet, or whether parts of the dwelling are deteriorated or damaged) and to the broader environmental characteristics of the areas where dwellings are located (*e.g.* exposure to noise, indoor pollution etc.). Subjective dimensions refer to people's appreciation of their conditions. These include:
  5. Appreciation of own personal conditions, in terms of their financial stress and ability to make ends meet, subjective perception of whether they consider themselves as poor and individual's satisfaction with respect to life and its domains (*e.g.* work, housing and health).
  6. Characteristics of the social environment where individuals live, in terms of features of their neighbourhood (*e.g.* exposure to specific hazards, fears of crime and of availability of public services such as schools and hospitals) and social networks of individuals *e.g.* ability to rely on support from others in case of need).

Van den Bosch (2001) provides a comprehensive discussion of the subjective dimensions of deprivation and a

detailed description of methods used for the subjective assessment of poverty. Gallie and Paugam (2002) provide useful discussions of issues related to the social environment.

The importance of this paper comes from the importance of the subject itself, as it is the first of its kind that addresses deprivation. Such studies are highly needed to decision-makers who are in charge of drafting policies leading in reducing poverty problems which are not synthesized in ordinary poverty studies.

### **Multiple Deprivations**

It is a general deprivation index consists of many domains, since we can not view deprivation through low income only but it considers many other variables or elements which reflect the general deprivation status of a person comparing with the conditions of the society that person lives with. The indicators of deprivations such as income, employment, education and training, housing, health care, access to services have to be combined to produce one index. Every domain is given a specific weight, according to its importance, totaling 100%. Each of these domains consists of integrating several sub statistical indicators to produce a hierarchical compound of deprivation dimensions. Jarman used health indicators to show the deprived areas in order to increase resources for doctors working there. Jarman also developed a measurement consists of eight indicators among which is unemployment, room crowdness, single parents, elderly single parents and race etc.

### **Deprivation Domains**

Indicators for each domain were integrated to produce deprivation indices for each geographical area and integrate the five domains to produce multiple deprivation standards by using the following weights:

<b>Index</b>	<b>Weight %</b>
Employment	25
Health	25
Education	25
Housing	25

Most of the studies conducted in European countries indicated that multiple deprivation indices includes six sub deprivation indices, each consists of a group of statistical indicators but we used four which are as follows:

#### **Employment Deprivation Domain**

This domain can be measured through the number of persons who are not working, willing and able to work. It can be computed through calculating the number of unemployed persons waiting to get a job for a long time (up to two years) as compared to those who wait for the job for a month or so. This domain was derived from the related indicators such as:

- Unemployment counts
- Seasonal variation in unemployment
- Partners of unemployment claimants
- People out of work but in training
- “Long Term” incapacity benefit recipients below pension age
- Severe disability allowance recipients below pension age
- Quality of employment (e.g. unsociable hours, multiple jobs over time and at any time etc.)

#### **Education Deprivation Domain**

This domain is measured by considering those who don't have training and educational qualifications from all age groups. The measurement of this domain can be improved by calculating those, who work without educational qualifications or low educational level.

The domain was derived from the following indicators:

- Working age adults with no or low qualifications
- Children aged 16 and over in full-time education
- Teacher turnover
- Students with special needs
- Exclusions (Permanent and Temporary)

- Young people (16-18) not in education, training or employment
- Students not enrolled in basic education

### **Health Deprivation Domain**

This domain is measured by considering those who are suffering from the danger of drugs, alcohol and others. The domain is derived from the following indicators:

- Percentage of male death under age 65 years.
- Number of persons who are handicapped or as percentage of the total population.
- Percentage of persons of work age (16-59) who incapable or strong handicapped.
- Percentage of persons who are sick for long time (standardized according to age and sex)
- Percentage of births under normal weight (2500 gm)

### **Housing Deprivation Domain**

This domain is measured by considering persons who don't own houses with necessary amenities needed for a person or a family. Also through the number of persons per room (overcrowdness). The more the number of persons per room indicates deprivation from housing and its health conditions. The domain is derived from the following indicators:

- Number of families who don't have shelter or live in a temporary house
- Number of overcrowding families
- Number of poor families who live in special housing
- Housing lacking amenities

This study constructed indices of deprivation to express various domains. Prior to construct of these domains, proposed indicators for each domain were suggested by the researchers in a format of a questionnaire and sent to actual families and some experts in social science, economics, sociology and statistics for comments on the suitability of domains on the social- economic

living culture. Comments were received and incorporated in the final domains and their indicators.

## **2. Study Objective**

The main objectives of the study are represented in the followings:

- To define the concept of deprivation and its kinds in the developing countries? and apply this concept in developing countries like Pakistan?
- To identify indicators which comprise the domains and indices for socio-economic deprivation in Pakistan? The main purpose of this study is to describe the overall picture of multiple deprivations, based on the combined education, health, housing quality and employment sectoral indices.

## **3. Methodology**

Data is collected by a survey using a questionnaire from six hundred persons in Karachi but after the scrutiny we find that five hundred questionnaire are complete for data analysis while one hundred questionnaire are not suitable for data analysis.

This study has employed several indicators using methodological measures for deprivation including: employment deprivation, housing deprivation, education deprivation, health deprivation. Then, combines indices to produce what is called Index of Multiple Deprivation (IMD). The IMD was derived from the previous indicators to reflect the overall conditions of the people by each locality in the Karachi.

At stage 1, indicators in each sector were combined to create Sectoral Indices. Except person per room, all the four mentioned indicators are simple rates (percentage of the population affected by the type of deprivation) and may easily be combined. Person per room is standardized with the minimum and maximum. We assign equal weight to each indicator in a

particular sector. After assigning these weights, four sectoral indices are computed and then ranked in order to compare deprivation levels across districts and provinces. Once four sectoral indices have been calculated, an overall Index of Multiple Deprivation (IMD) is derived. Having considered various options, it is decided to employ the criteria used by UNDP in deriving Human Poverty Index (HPI).

The following formula is used to derive IMD.

$$\mathbf{IMD} = 1/4 * \{ (\mathbf{E}) + (\mathbf{HQ})^a + (\mathbf{HS})^a + (\mathbf{EM})^a \}^{1/a}$$

Where;

IMD = Index of Multiple Deprivation

E = Index of Education Deprivation

HQ = Index of Deprivation in Health Quality

HS = Index of Deprivation in Housing Services

EM = Index of Deprivation in Employment

a = 3

The value of  $\acute{a}$  has an important impact on the value of the index. If  $\acute{a} = 1$ , the IMD is the average of its four sectors. As  $\acute{a}$  rises, greater weight is assigned to the sector in which there is most deprivation. Following UNDP, the value of  $\acute{a}$  is set at 3 to give additional but not overwhelming weight to the area of greater deprivation. This gives an elasticity of substitution of 1/4 between any two indices and places weight on those dimensions in which deprivation is larger (UNDP Human Development Report 1997).1.

Results

Data is collected by a survey using a questionnaire from six hundred persons in Karachi but after the scrutiny we find that five hundred questionnaire are complete for data analysis while one hundred questionnaire are not suitable for data analysis.

**Table 1. Gender Wise Distribution of the Sample**

	Frequency	Percent	Cumulative Percent
Valid male	268	53.6	53.6
Female	232	46.4	100.0
Total	500	100.0	

We have 268 males (53.6% ) and female 232 (46.3%) included in sample of 500 (Table 1). We approximately equally weight the gender in our sample.

**Table 2. Age Wise Distribution of the Sample**

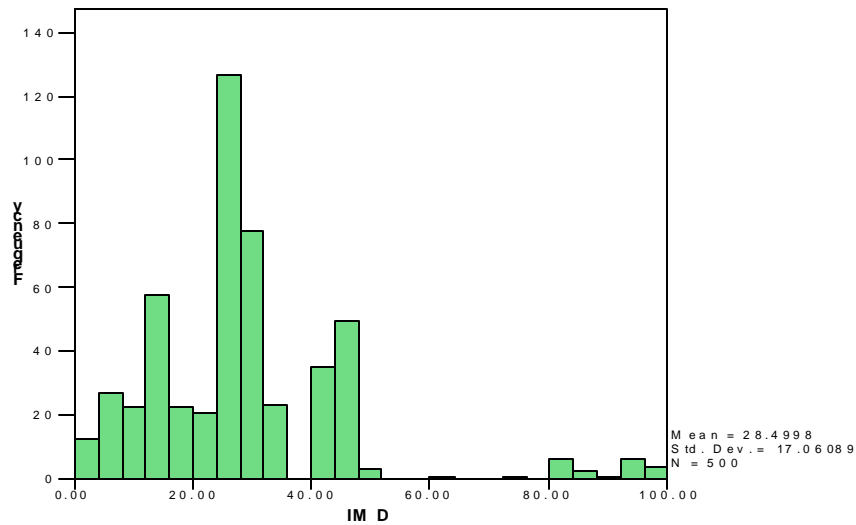
	Frequency	Percent	Cumulative Percent
Valid less then 20 years	2	.4	.4
21-30	85	17.0	17.4
31-40	275	55.0	72.4
41-50	113	22.6	95.0
51and above	25	5.0	100.0
Total	500	100.0	

Table 2 shows the age distribution of the sample. The age distribution in the sample is shows a normal distribution i.e. high frequency in middle and low on extreme points.

**Table 3. Descriptive Statistics of Index of Multiple Deprivation**

N	500
Mean	28.5
Median	27.0
Std. Deviation	17.1
Minimum	1.79
Maximum	96.33
Percentiles	
25	18.32
50	27.0
75	33.34

Table 3 Shows that the index of multiple deprivation has range from 1.79 to 96.33 with a mean of 28.5 and median of 27.0. The 25<sup>th</sup>, 50<sup>th</sup> and 75<sup>th</sup> percentile are 18.32, 27.0 and 33.34 shows that more people lie in range of from 2 to 40 of index of multiple deprivation. This is also shown by the graph1 below.

**Graph 1. Histogram of Index of Multiple Deprivation**

**Table 4. The Statistics of Element of Index of Multideprivation**

	Perceived Deprivation	Educational deprivation	Employment deprivation	Health deprivation	Housing deprivation
N	500	500	500	500	500
Mean	2.12	0.08	1.09	3.31	2.86
Median	2.00	0.00	1.00	4.00	2.66
Mode	2	0.00	1.00	4.00	2.00
Std. Deviation	1.000	0.18	0.29	0.97	1.41

The four elements of Index of Multiple deprivation and their descriptive is shown in the table 4. The sample explains that we are more health wise deprived and 2<sup>nd</sup> highest deprivation is **housing**.

### 1. Conclusion

A common observation is that even during periods of rapid growth as in the 1980s, social indicators, particularly health and education, witnessed only a small improvement because state funds could not be invested in human capital, however urgently this was required (Hussain 2003). The Social Action Program of the 1990s did not bring about the desired change in social indicators; the low level of human capital greatly contributed to the rising trends in poverty in the 1990s. Arif (2003) finds that the total consumption of households that fell into poverty between FY1999 and FY2001 declined by 50%, of which more than half was attributable to a reduction in food consumption.

Pakistan's overall economic performance for the period 1961–1990 was respectable, but the 1990s were characterized by macroeconomic instability. The average growth rate during the 1960s was 6.8% per annum, dropping lower than 5% in the 1970s and then climbing to 6.5% in the 1980s. The country's growth performance deteriorated during the 1990s: real GDP growth slowed down to an average of 4.9% in the first half of the decade, and declined further to an average of 4% in the second half (Table

5). The performance of the large-scale manufacturing sector contributed largely to this deceleration: it grew at an average annual rate of 8.2% in the 1980s, slowed down to an average of 4.7% in the first half of the 1990s, and then fell even further to 2.4% in the second half (GoP 2001).

**Table 5: Pakistan’s Economic Growth Performance Period**

	GDP Growth Rate (%)	Agriculture (%)	Total Manufacturing (%)	Large-Scale Manufacturing (%)	Services (%)
FY1980–1989	6.1	4.1	8.2	8.2	6.6
FY1991–1995	4.9	4.2	4.8	4.7	5.1
FY1996–2000	4.0	4.8	3.2	2.4	4.0
FY2000	3.9	6.1	1.4	(0.2)	4.8
FY2001	2.6	(2.5)	7.1	7.8	4.4
FY2002	3.1	0.1	4.5	3.5	4.8
FY2003	5.1	4.1	6.9	7.2	5.3
FY2004	6.4	2.6	13.4	17.1	5.2

Source: Pakistan Economic Survey

Finally, the evidence on employment and poverty reinforces the argument that unemployment and poverty cannot be left to the market to resolve. Rising trends in poverty can only be arrested if enough productive and remunerative jobs are created and this will only be possible only if investment levels increase. The level of investment in Pakistan has stagnated at low levels, while public development expenditure has fallen, displaced by government commitments to reduce the fiscal deficit. This sharp decline in development expenditures is a serious matter because it plays a complementary role in poverty reduction. Falling development expenditure reduces private investment and leads to slower economic growth while increasing unemployment and undermining the maintenance of services and capital stock. The reduction in debt servicing has already created fiscal space, although more fiscal space is likely to be required. To increase production, employment, and income,

attention needs to be paid to those sectors that can create more jobs at a lower capital cost.

### **1. Discussion**

The new threshold has various attractive characteristics to analyze poverty. Because of the connection with the minimal needs of a household, there is a clear interpretation of the poverty threshold. One poverty line variant represents the basic needs of a household and the other variant also incorporates the minimal costs to participate in society. The indexation regime is quite easy to calculate, in contrast to an expert budget method. The quasi-relative trait of the new threshold is theoretically desirable and empirically demonstrated. Besides this, the two variants of the new poverty line seem to fit with the public opinion of poverty in the Netherlands. This concept can make the poverty clearer in terms of goals and evaluation of policies and gives a clearer view on the composition and the characteristics of poor households.

Contrary to what might be expected, we have found that more deprived areas tend to be better served by health services see table 4. This suggests that general practices are generally located nearer to those people who need them most, e.g. socio-economically deprived communities. The relationship seen may also reflect the tendency for deprivation to concentrate in city centres – where services are also often concentrated.

The indexation mechanism of the poverty line has a clear relation with the level of prosperity of a society. If the standard of living in a society increases, average expenses on basic items as housing, clothing and food also increase and consequently the poverty line. The key issue here is the pace at which the poverty line increases. It is at a faster rate than inflation indexed poverty line, but slower than a median income index poverty line. This characteristic is desirable as it has been shown that public perception of minimal needs increases at a lower pace than average income.

Economic growth in the past has not automatically trickled down to benefit the poor. Pakistan's growth performance over the last 3 years indicates that the stage is probably set for high growth, which can be made pro-poor by creating additional jobs for the poor as well as enhancing their education and skill levels. In addition to explicit actions to ensure that this occurs, efforts should be made to ensure that growth does not inadvertently increase inequality. More resources need to be diverted to the education and health sectors for the benefit of the poor, and the quality of public sector education, particularly in rural areas, also needs to be improved.

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