

2.2 Sample Surveys

Sample surveys are other important sources of population or demographic statistics. At federal level Federal Bureau of Statistics and at provincial level Provincial Bureaus of Statistics are responsible for conducting sample surveys. Some other agencies like NIPS, PIDE etc. also conduct some special type of surveys from time to time.

2.2.1 Historical background

The World Fertility Survey (WFS) program deserves a special mention that was started in 1972. WFS has been described as the largest single social science research project ever attempted (People 1978:30). Its purpose was to assist a large number of interested countries, particularly the developing countries, in carrying out nationally representative, internationally comparable, and scientifically designed and conducted surveys of human fertility behavior. The WFS did not provide the means to evaluate national family planning programs so a new series of surveys, the Contraceptive Prevalence Survey (CPS), was begun in the late 1970s (Morris et al. 1981).

NIPS → National institute of population studies

PIDE → Pakistan institute of Development economics

The Demographic and Health Surveys (DHS) program, initiated in 1984, was designed to update and expand the data from the WFS and CPS. The objectives of the DHS included the provision of adequate data for policy makers, planners, and researchers (Fisher and Way 1988:15). The DHS has led to substantial expansion of the international health and population database. During the first phase, DHS-I, 34 surveys were carried out in 29 developing countries. The second and third phases, DHS-II and DHS-III, will include over 40 surveys (Moore and Croft 19990: 216; Haub 1993:2)

2.2.2 Types of Sample

A sample could be a probability sample or it could be a non-probability sample. Probability sample allows its self evaluation in term of standard error as an in built mechanism. The magnitude of standard error will go on decreasing with increase in sample size. For non-probability sample it is not possible to estimate the magnitude of standard error irrespective of choice and size of sample. The magnitude of sampling error depends upon the type of sample and its size. The size in turn is directly proportional to the number of administrative levels for which data are to be released. If data are to be released at national level only, then relatively a small sample is sufficed. However if data are desirable at district level then perhaps quite a large sample is required for attaining the same degree of precision. On the other hand the magnitude of non-sampling error is inversely proportional to the size of the sample.

Probability samples include simple random sample (with or without replacement), cluster sample, stratified sample, multi-stage sample, multi-phase sample, interpenetrating sample and sequential sample. Sample selection could be random or it could be systematic. Sample results can be blown up by applying simply the raising factors, or by using ratio method or regression method. Allocation of sample to various levels could be based on equal probability or it could be based on probability proportionate to size.

Simple random sample is a sample for which each item is selected randomly. It is simple to select and simple to blow up the estimates but not as efficient as other samples are. Selection of sample after dividing the population into groups having heterogeneity between various items within the groups is known as clusters sample and these groups are known as clusters. This sample is a bit difficult in selection but more efficient than simple random sample. Selection of sample after dividing the population into groups having homogeneity between various items within the groups is known as stratified sample and these groups are called as strata. This sample is a bit difficult in selection but more efficient than simple random sample. It could be even more efficient than cluster sampling if items within groups are homogeneous and between groups heterogeneous other-wise less efficient. If any sample is selected in stages then it is known as multi-stage sample. It is a complicated and very difficult sampling technique but very efficient, efficient than cluster sampling and efficient than stratified sampling. If any sample is selected in phases then it is known as multi-phases sample. It is also complicated and very difficult sampling technique but very efficient. When two or more sub-sample are drawn from the same universe by the same sampling plan so that each sub-sample covers the universe and provides estimators of the parameters on application of the same estimating procedures, the sample is known as interpenetrating. This method permits to examine the factors causing variation, e.g. interviewers, field work, data collection methods and data processing procedures; compute the sampling error from the first stage units if these consist of one level of interpenetration; provide control in data collection and processing; supply advanced estimates on the basis of one or more sub-samples and to provide estimates based on one or more sub-samples when the total sample can not be

covered due to some emergency. Sequential sampling is a process of selecting a sample in sequence for bringing a balance between two types of errors that is type I error and type II error. This method is usually applied in quality control methods.

Systematic selection procedure allows more spreading of sample over the universe as compared to simple random selection therefore it is more representative and hence more efficient selection technique and its field coverage is also easy. Among the three estimation methods simple estimation method is very easy to apply but less efficient and biased. Ratio estimation method is a bit difficult and biased but more efficient than simple method. Regression estimation method is more complicated in computation but unbiased and far efficient than simple method and ratio method of estimation.

Non probability samples include purposive sampling, quota sampling, snow ball sampling methods etc. Purposive sample are drawn with certain purpose in mind. Quota sample is based on pre fixed quota of items to be included in the sample. Snow ball technique depends upon selection of first item possessing some desired characteristics and second item is selected on the basis of information received from first item. Similarly selection of third item depends upon information received from the second item and so on. Thus all selected items have almost similar characteristics. Such samples are very easy to select but it not possible to measure magnitude of sampling error and hence nothing can said about their reliability.

2.2.3 Reliability of Sampling

The reliability of sampling technique depends upon the size of the sample, the choice of sampling method, inputs, degree of desired precision and levels of release of data. It is reiterated that with increase in sample size the reliability as measured in term of standard error will go on increasing but magnitude of non sampling errors is likely to increase. The more sophisticated designs are more efficient than simple samples. Well qualified, experienced and trained staff can delivered better results than untrained and less qualified staff that is little exposed to sampling methods. Better facilities and field use equipments are the additional advantages which can also enhance the reliability. The reliability, as already said, depends upon the size of the sample and size of the sample in turn is determined on the basis of degree of precision one wants through the sample. For capturing information with same reliability relative size of sample at national level would be very small as compare to any sub-national level simply because of law of large number which says that with increasing number of items in a universe relatively a small sample is needed with same level of precision. Thus, if one has to release sample estimates at grass-roots-level a relatively large sample is required.

2.2.4. Advantages and Disadvantages

Since sample is a small part of the whole universe, therefore, it reduces the over all cost of collection and release of data.

Again being a fraction of whole lot it requires far less time in completing the entire work.

It carries sampling errors besides non-sampling errors.

Sampling enquiry always demand well qualified, experienced and trained field staff and latter on competent data processing people for raising the sample information.

2.2.5 Suggestions

For sensitive and difficult questions or queries demanding detailed probing or for cost and time consideration sampling methods should always be preferred over census or complete count.

Summary of Sample Surveys in Pakistan

NAME OF THE SURVEY	YEARS	FINANCING AND COLLABORATING AGENCIES	BASIC OBJECTIVES AND AREAS OF COVERAGE
2004-2008 2017-2018 Pakistan Demographic Survey (PDS-2001)	Sixties 1984 2001	Federal Bureau of Statistics (FBS) with collaboration of other agencies	Statistics of births and deaths, population increase and characteristics of population, impact of family planning and other socio-economic developments
The National Health Survey of Pakistan (NHSP)	1996	Collaborative project of Pakistan Medical Research Council (PMRC), FBS of Pakistan and NCHADS of Health Services of USA	General health profile, mortality profile, health priority issues and to assess the utilization of public and private health sector
Pakistan Integrated household survey (PIHS)	1991 1995-96 1998-99	Federal Bureau of Statistics (FBS) with collaboration of other agencies	Family size, fertility rates, utilization of health services and other social issues
2004-5 2005-6 2007-8 2010-11 2011-12 Household Integrated Economic Survey (HIES)	1990-91 1993-94 1996-97 1998-99	The operational activities of Household Integrated Economic Survey were carried on jointly with PIHS and HIES by FBS	Households size and economic indicators
2013-14 2015-16 2000 2006 2009-10 2012 2016 2018 Multiple Indicator Cluster Survey of Pakistan (MICS)	1995	Ministry of Health Government of Pakistan with collaboration of UNICEF & Gallup Pakistan	To evaluate the mid-decade goals, Water and sanitation, Education, Nutrition, ARI, Diarrhoeas, diseases and immunization coverage

SCOPE AND LIMITATIONS OF SURVEY DATA

As implemented by government agencies empowered to compel response, sample surveys can be biased by non-response. Among those who do respond, however, data quality is easier to control in surveys than in censuses. Higher data quality is not automatic, indeed survey data quality

extremely variable, and it is vital to always check and evaluate quality control procedures before analyzing a survey data-set. Whereas censuses frequently rely on self-enumeration, surveys more often than not use face to face or telephone interviews. If the interviewers are trained the quality and reliability of the data can be maintained in both surveys and censuses data. It is common for surveys to be used to check the accuracy of census and even vital registration data.

As the quality control trained interviewers are the prerequisite and the sample survey has capacity to define target groups and topic more narrowly, it allows much more detailed data to be gathered than do the censuses. As one can observe from the nature of findings HEIS is mainly targeting the household size and the economic issues in detail where as the MICS is objectively targeting the health issues especially related to the children in more detail and depth.

An increasingly important variant of the sample survey in demography over recent years has been the micro approach. It is generally applied in small geographic areas (often village) over an extended period of time, combining the formalities of localized census-undertaking and demographic surveying in detailed semi-structured or unstructured anthropological or sociological investigation so called "qualitative research".