Feature Article

Sample Registration System

The increasing acuteness of the dynamic population data set in India and the deficiencies in the statutory civil registration system have greatly intensified the need for quick and reliable estimates of birth and death rates on a current and continuous basis. The population census, though, provides decadal growth rates; it is not able to provide a measure of the change in vital rates from year to year. To measure short-term changes in the growth of population and to evaluate the impact of the family planning programs, there is need for resorting to alternate sources of data. Various methods based on the application of sampling techniques have been tried and tested in many developing countries. Such methods include single and multi-round retrospective surveys and the dual record system. In the absence of dependable vital rates from civil registration, the Office of the Registrar General, India, initiated a scheme of sample registration of births and deaths in India known as 'Sample registration of Births and Deaths in India: rural' in 1964-65 on a pilot basis. The scheme became operational on full scale from 1969-70 and was popularly known as 'Sample Registration System (SRS)'. The scheme envisages a large-scale demographic sample survey based on a dual record system.

The main objective of SRS is to provide reliable annual estimates of birth and death rates at the state and national levels for rural and urban areas separately. It also provides various other measures of fertility and mortality.

The field investigation under Sample Registration System consists of continuous enumeration of births and deaths in a sample of villages/urban blocks by a resident part-time enumerator and an independent six monthly retrospective survey by a full-time supervisor. The data obtained through these two sources are matched. The unmatched and partially matched events are re-verified in the field to get an unduplicated count of correct events. The advantage of this procedure, in addition to elimination of errors of duplication, is that it leads to a quantitative assessment of the sources of distortion in the two sets of records making it a self-evaluating technique.

Basic structure of the Survey

The main components of SRS are:

- Base-line survey of the sample units to obtain usual resident population of the same sample areas;

- Continuous (longitudinal) enumeration of vital events pertaining to usual resident population in the sample units by the part-time enumerator;

- An independent half-yearly survey for recording births and deaths which occurred during the half-year under reference and up-dating the House-list and Household schedule by the Supervisor;

- Matching of events recorded during continuous enumeration and those listed in course of half- yearly survey;

- Field verification of unmatched and partially matched events.

Baseline Survey:

The base-line survey is carried out prior to the start of continuous enumeration. This involves preparation of a notional map of the area to be surveyed, house numbering and house listing and filling-in of a household schedule. Wherever a sound system of house numbering exists the same is adopted. Otherwise, the house numbering is done by the enumerator/supervisor with the help of chalk and tar, etc. at a conspicuous place near the entrance of the house. The supervisor prepares a notional map with the help of the enumerator showing important landmarks and location of the houses covered by the sample unit. He then prepares a list of houses/households covered by the sample in the House List (Form 1) and fills-in the Household Schedule (Form 2) wherein he records the residential status and demographic particulars of each individual residing in the household viz. name, sex, age, marital status and relation to head of household, etc. The inmates of public institutions like hotels, inns, schools and hospitals are excluded, but households living permanently within the compound of such institutions are covered. A list of pregnant women (Form 3) is also prepared at the time of the base line survey.

Continuous enumeration :

The enumerator maintains a Birth Record (Form 4) and a Death Record (Form 5) in respect of his area. The enumerator is expected to record all births and deaths occurring within the sample unit, as well as those of the usual residents occurring outside the sample unit. The events to visitors occurring within the sample unit are also listed, but these are not taken into account while calculating rates. Thus the events to be enumerated by the enumerator are those pertaining to: (i) Usual residents inside the sample unit; (ii) Usual residents outside the sample unit; (iii) In-migrants present; (iv) In-migrants absent; (v) Visitors inside the sample unit.

For ensuring complete netting, the enumerator uses different means to get information of the occurrence of vital events in the sample unit. He takes the help of the village priest, barber, village headman, midwife and such other functionaries and contacts these informants at frequent intervals and collects information about the occurrence of births and deaths. On being informed about the occurrence of an event, he visits the concerned household and records the prescribed particulars. He also keeps in touch with other socially important persons and visits local or nearby hospitals, nursing homes, cremation or burial grounds, at frequent intervals to keep himself informed about the occurrence of events. He is required to maintain a list of pregnant women (Form 3) which helps him in netting of all the births. Despite all these efforts, the enumerator may fail to have information about some of the events. Therefore, he is required to visit all the households once in each quarter (in rural areas) and once a month (in urban areas) so as to ensure that all the events have been recorded.

Half-yearly Survey:

Half-yearly survey is carried out independently in each sample unit by a full-time supervisor. The supervisor belonging to the statistical cadre of the Census Directorates (either a Computor or Statistical Assistant or any suitable official) visits households in the sample unit and records the particulars of births and deaths in Forms 9 & 10 respectively pertaining to usual residents and to visitors (only those occurring within the sample unit) which had occurred during the half-yearly period (January-June or July-December) under reference. Simultaneously, he updates the 'house-list', the 'household schedule' and 'list of pregnant women' by making suitable entries. In carrying out this survey he does not have access to the birth and death records of the enumerator which are withdrawn from the field before the supervisor is deputed for the half yearly survey. An overlapping reference period of one year is also adopted in the survey in order to net the events which might have been missed in the previous half-yearly survey.

Matching:

On completion of the half-yearly survey, the Forms 9 & 10 filled-in by the supervisors are compared with the Forms 4 & 5 (filled-in by the enumerators). This is done either at the state or district headquarters or at regional centers. Each entry in the enumerator's and supervisor's record is matched item by item and events are classified as fully matched, partially matched and unmatched. The items generally considered for matching are location of the household i.e. name of the head of house-hold and house-number, name of the mother (for birth) and name of the deceased and cause of death (in case of death), residential status, sex and month of occurrence.

Field verification of unmatched and partially matched events :

Every unmatched or partially matched event is verified by a visit to the concerned household. This is done either by a third person or jointly by the supervisor and the enumerator, depending upon the availability of staff.

Sample design:

The Sample design adopted for SRS is a uni-stage stratified simple random sample without replacement. In rural areas, each district within a state has been divided into two stratas viz. Strata 1 - Villages with population less than or equal to 1500 and Strata 2 - Villages with population more than 1500. In order to cover the village by one part-time enumerator, villages belonging to the second strata (having population of more than 1500) were segmented into two or more segments of equal size. A simple random sample of villages and segments has been selected, from each of the two strata, without replacement in each State/Union Territory.

In urban areas stratification has been done on the basis of size class of the towns/cities. The towns/cities were grouped into five classes, viz.:- (a) towns with population below 20,000 (b) towns with population of 20,000 and more but less than 50,000 (c) towns with population of 50,000 and more but less than 100,000 (d) towns

with population of 100,000 and more but less than 500,000, (e) cities with population of 500,000 and more but less than 1,000,000 and (f) each city with population 1,000,000 or more, treated as a separate stratum. The sampling unit in urban area is a census enumeration block. A simple random sample of these enumeration blocks has been selected without replacement from each of the size classes of towns/cities in each State/Union Territory. There are 6,671 sample units covering about 6.2 million populations in 1999 for rural and urban areas combined. Statement 1 shows the number of sample units and population covered in 1999, separately for rural and urban areas of all the states and union territories where SRS is being implemented.

New Initiatives:

To enhance the utility of SRS data, keeping in view the needs of users, the following two initiatives have been taken during the year:-

- *Collection of additional data in SRS*: Special schedules have been canvassed during July-December, 2001 to collect additional data on 'Proof of age, registration of births and determining the residential status of the mother during pre and postnatal period'. The report analyzing the additional data will be brought out separately.

- *Integration of Survey of Causes of Deaths (Rural) in SRS*: The Survey of Causes of Deaths (Rural) has been merged with Sample Registration System from 1st January, 1999 to give more impetus covering both rural and urban areas. The technique of causes of deaths reported will remain the same as "post death verbal autopsy". The analysis of data on causes of deaths as collected in SRS will be presented in separate volume of SRS Annual Report : Causes of Death - 1999.

List of SRS publications brought out by ORGI.

- SRS Bulletin (Published twice in a year)
- Sample Registration System, Statistical Report (Annual Publication).
- SRS Based Abridged Life-Tables (Published once in two years)
- Survey of Causes of Death (Rural) (Annual Publication).
- Compendium of India's Fertility and Mortality Indicators, 1971-1997.

Statement 1

**Number of sample units and population covered
India, States and Union Territories, 1999**

India/States/	No. of sample units			Population covered (in '000)		
Union territories	Total	Rural	Urban	Total	Rural	Urban
1	2	3	4	5	6	7
India	**6671**	**4436**	**2235**	**6182**	**4821**	**1361**
Bigger states						
1.Andhra Pradesh	310	210	100	306	240	66
2.Assam	275	200	75	238	195	43
3.Bihar	500	400	100	428	393	34
4.Gujarat	300	200	100	274	222	51
5.Haryana	180	110	70	209	159	50
6.Karnataka	375	260	115	353	281	72
7.Kerala	250	150	100	302	240	62
8.Madhya Pradesh	400	300	100	292	243	49
9. Maharashtra	375	200	175	337	232	105
10.Orissa	405	300	105	300	239	61
11.Punjab	200	120	80	175	127	48
12.Rajasthan	350	250	100	325	277	48
13.Tamil Nadu	375	200	175	350	234	116
14.Uttar Pradesh	650	450	200	633	531	102
15.West Bengal	475	300	175	465	357	108
Smaller States						
1.Arunachal Pradesh	56	50	6	45	38	7
2.Chhatisgarh	101	84	17	90	80	10
3.Goa	70	40	30	62	44	17
4.Jharkhand	139	92	47	119	94	25
5.Himachal Pradesh	190	140	50	100	72	28
6.Jammu & Kashmir	166	100	66	136	96	40
7.Manipur	150	100	50	132	97	35
8.Meghalaya	120	100	20	60	51	10
9.Mizoram	32	16	16	22	12	11
10.Nagaland	35	25	10	N.A	N.A	5
11.Sikkim	60	50	10	57	49	9
12.Tripura	75	60	15	87	78	9
13.Uttaranchal	35	22	13	30	24	6
Union Territories						
1.Andaman & Nicobar Islands	45	30	15	31	22	9
2.Chandigarh	30	5	25	27	7	20
3.Dadra & Nagar Haveli	25	20	5	26	23	4
4.Daman & Diu	17	15	2	20	19	1
5.Delhi	130	10	120	98	16	83
6.Lakshadweep	10	5	5	13	8	4
7.Pondicherry	40	20	20	36	22	13

N.A : Not available due to non-receipt of returns

The latest data published on fertility and mortality from Sample Registration System are of the year 1999. The following statement 2 gives 'Estimated Birth rate, Death rate, Natural growth rate and Infant mortality rate, 1999'

Table 1

Provisional estimates of Birth rate, Death rate, Natural growth rate and Infant mortality rate, 2000

India/States/ Union Territories	Birth rate			Death rate			Natural growth rate			Infant mortality rate		
	Total	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban
1	2	3	4	5	6	7	8	9	10	11	12	13
India *	**25.8**	**27.5**	**20.7**	**8.5**	**9.3**	**6.3**	**17.3**	**18.3**	**14.4**	**68**	**74**	**43**
Bigger States												
1. Andhra Pradesh	21.3	21.7	20.1	8.2	9.0	5.8	13.1	12.7	14.3	65	74	36
2. Assam	26.9	27.9	18.6	9.6	10.0	6.1	17.4	17.9	12.6	75	78	35
3. Bihar	31.9	32.8	25.6	8.8	9.1	7.1	23.1	23.7	18.5	62	63	53
4. Gujarat	25.2	26.8	21.9	7.5	8.3	5.8	17.7	18.4	16.1	62	69	45
5. Haryana	26.9	27.9	23.0	7.5	7.9	6.2	19.4	20.1	16.7	67	69	57
6. Karnataka	22.0	23.3	19.1	7.8	8.6	5.7	14.2	14.6	13.3	57	68	24
7. Kerala	17.9	18.0	17.5	6.4	6.5	6.2	11.5	11.6	11.4	14	14	14
8. Madhya Pradesh	31.2	33.2	23.5	10.2	11.0	7.5	21.0	22.2	16.1	88	94	54
9. Maharashtra	20.9	21.2	20.3	7.5	8.6	5.7	13.4	12.7	14.6	48	57	33
10. Orissa	24.3	24.8	20.1	10.5	11.0	7.0	13.7	13.8	13.1	96	99	66
11. Punjab	21.5	22.6	18.5	7.3	7.8	5.8	14.2	14.8	12.6	52	56	38
12. Rajasthan	31.2	32.6	25.0	8.4	8.8	6.5	22.8	23.7	18.5	79	83	58
13. Tamil Nadu	19.2	19.9	18.0	7.9	8.6	6.4	11.3	11.2	11.5	51	57	38
14. Uttar Pradesh	32.8	34.0	27.2	10.3	10.8	8.0	22.5	23.2	19.1	83	87	65
15. West Bengal	20.6	23.0	14.0	7.0	7.1	6.7	13.6	15.8	7.3	51	54	37
Smaller States												
1. Arunachal Pradesh	22.3	23.1	13.9	6.0	6.3	2.5	16.3	16.8	11.4	44	45	11
2. Chhatisgarh	26.7	29.2	22.8	9.6	11.2	7.1	17.1	18.0	15.7	79	95	49
3. Goa	14.3	14.3	14.2	7.4	7.9	6.7	6.8	6.4	7.5	23	24	21
4. Jharkhand	26.5	28.8	19.4	9.0	9.8	6.5	17.6	19.0	13.0	70	74	48
5. Himachal Pradesh	22.1	22.5	16.9	7.2	7.3	5.5	14.9	15.2	11.4	60	62	37
6. Jammu & Kashmir	19.6	20.3	16.5	6.2	6.3	5.9	13.4	14.1	10.6	50	51	45
7. Manipur	18.3	19.1	16.2	5.6	5.4	6.0	12.7	13.6	10.2	23	23	25
8. Meghalaya	28.5	31.0	15.3	9.2	10.1	4.6	19.3	20.9	10.7	58	61	32
9. Mizoram	16.9	18.8	14.5	5.2	6.3	3.7	11.7	12.6	10.7	21	24	15
10. Nagaland	N.A.	N.A.	12.2	N.A.	N.A.	3.0	N.A.	N.A.	9.2	N.A	N.A	23
11. Sikkim	21.8	22.1	14.8	5.7	5.7	4.0	16.2	16.4	10.7	49	49	36
12. Tripura	16.5	17.0	14.0	5.4	5.3	5.6	11.1	11.6	8.4	41	42	32
13. Uttaranchal	20.2	24.6	17.1	6.9	10.3	4.5	13.3	14.3	12.6	50	73	26
Union territories												
1. Andman & Nicobar Islands	19.1	19.0	19.3	5.1	5.7	3.4	14.0	13.3	15.9	23	27	10
2. Chandigarh	17.5	18.9	17.3	3.9	3.8	3.9	13.6	15.1	13.4	28	38	26
3. Dadra & Nagar Haveli	34.9	35.9	24.0	7.8	8.2	3.5	27.0	27.7	20.4	58	62	14
4. Daman & Diu	23.7	21.8	25.4	6.6	7.1	6.2	17.1	14.7	19.2	48	38	57
5. Delhi	20.3	21.4	20.1	5.1	5.0	5.1	15.1	16.4	15.0	32	32	32
6. Lakshadweep	26.1	27.6	24.6	6.0	7.1	4.9	20.1	20.5	19.7	27	25	29
7. Pondicherry	17.8	18.4	17.4	6.5	7.2	6.0	11.3	11.2	11.3	23	33	15

Source: Sample Registration System Bulletin. Volume 32, Issue 2, October 2001

Note: *: Excludes Nagaland (Rural) due to part-receipt of returns.

N. A.: Not available due to part-receipt of returns.

Infant mortality rates for Smaller States and Union Territories are for the period 1998-2000