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EAST AND SOUTH ASIAN WORKSHOP ON STRATEGIES FOR ACCELERATING THE IMPROVEMENT OF CIVIL REGISTRATION AND VITAL STATISTICS SYSTEMS
BEIJING, 29 NOVEMBER - 3 DECEMBER, 1993

STATISTICAL DIVISION
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STATE STATISTICAL
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1. Introduction

Bangladesh Bureau of Statistics has been implementing Birth-Death Sample Registration System (BDSRS) since 1980. Earlier the title was Bangladesh Demographic Survey and Vital Registration system (BDSVRS) has been conducting survey throughout the country taking 210 PSU's of which 150 in rural areas and 60 in urban areas since 1880. Each PSU consists of around 250 households. A total of 57663 households consisting of 315823 population (0.30% of total population) with a sex- ratio of 106 were covered in 1990. On an average an enumeration area consisted of 275 households and 1504 population. Cantonments, institutions like hotels, barracks, messes, jails, etc., were excluded from the perview of the survey. Dejure definition of population was followed.

2. Survey design

Cluster sampling is generally used for dual record operations. Cluster sampling simplifies field work. In view of workload and payment of remuneration to local registrars, cluster sampling is more advantageous than simple random sampling. Considering these, stratified cluster random sampling of equal size has been adopted for Birth and Death Sample Registration System with households as the ultimate sampling unit. Details about survey design can be seen in Annexure-1.

3. Method of data collection

The project activities involves the collection of vital events (births, deaths, marriages, in and out-migration) through two Independent Systems namely recording of vital events by the local registrars (System-1) and collection of events by the headquarters staff using last three months as reference period (System-2). the

local registrars used to collect particulars of events as and when they occur on a continuous basis and send them to the headquarters in the first week of the next month. The headquarters staff collected particulars of the events occurring during the preceding three months in the same sample area independently on a quarterly basis.

4. Training of supervisors, enumerators and local registrars

For the collection of quality data, an intensive training for a period of 3 days was imparted to the supervisors and headquarters based enumerators by the senior trained and experienced officers at the headquarters at least once in a year. Besides, they had to undergo vigorous training about field problems and solution thereof, technique of collection of quality data through probing the items of information before each and every field visit. During training, items in each row and column of the schedules are clearly explained and the technique of how to fill the schedules properly were taught through mock survey. Supervisor in each visit by checking the works of local registrars evaluate their work and impart them training accordingly.

5. Supervision and quality control

Timely collection of good quality data and their quick processing was the joint responsibility of the field workers and a team of officers headed by senior officers, all of whom received intensive training on data collection technique. Both collection of data from the primary sampling units and processing of the same at headquarters were subjected to careful and intensive supervision. Special measures where adopted to ensure the operational independence of the two systems including rotation of system-2's interviewers among others and close supervision and quality control.

On completion of each quarterly round of survey by the headquarters based enumerators, events of births and deaths reported by them were matched with those reported by local registrars following the selected pre-determined criteria such as household number, mother's name, mother's relationship with head of household, baby's name, date of birth, sex of baby, age of mother, place of birth name of the deceased, age of the deceased, date of death and sex of the deceased etc. provided in tables. The events are ultimately classified into matched, partially matched, nonmatched and out of scope events. Partially matched and non-matched, events were subjected to further verification, through field visits, for ascertaining the real status of the events. this important task was done by the trained and experienced senior officers of BDSRS through door to door visit in the sample area. this also helped catch the events missed by both the systems. The process of matching greatly reduces the possibility of erroneous inclusion of out of scope events or exclusion of bonafied events.

Household population and occurrences of events such as births, deaths, marriage, in and out migration collection through different schedules by both the systems, had to undergo systematic and rigorous cross-sectional consistency checks.

6. Matching procedures

Matching Variables	Tolerance Limit
For Birth	
1. Household Number	a. Exact agreement
2. Mother's Name	a. Exact spelling b. Two names sound alike
3. Baby's name/Father's name	a. As item no.(2) above
4. Date of birth	a. Exact agreement b. + 1 day c. + 7 days d. + 14 days e. + 31 days
5. Age of mother	a. Exact agreement b. + 1 year c. + 2 years d. + 5 years
6. Mother's relationship with head of household	a. Exact agreement
7. Place of birth	a. Exact agreement
8. Sex of baby	a. Exact agreement
For Death	
1. Household number	a. Exact agreement
2. Name of deceased	a. As item (2) for birth
3. Date of death	a. As item (4) for birth
4. Age of deceased	a. Exact agreement b. + 1 week c. + 2 weeks d. + 52 weeks e. + 1 year f. + 2 years g. + 5 years
5. Sex of deceased	a. Exact agreement
6. Relationship to head of household	a. Exact agreement

7. Updating of the sample population and household

Updating of individuals' characteristics is done annually in January each year through the administration of OMR form of questionnaire used in the population census, 1991 and updating of persons in the sample area is made giving due consideration of the effect of the occurrences of births, deaths, marriages, in and out migration of both individual and household collected continuously through both the systems.

Similarly, updating of the household and the sketch map of the sample areas is made annually in January each year. The continuous monitoring of the change of household numbers during the year due to the formation of new household, decay of household and/or cluster of households due to river erosion, household migration, etc. is made continuously throughout the year independently by the two systems. The specially developed household listing schedule is used for the purpose of household & population updating. The updated household and population are used as denominator for the purpose of estimation of different measures. the continuously updating of household and population, thus facilitate removal of possible sampling discrepancy likely to associate with the continuous use of the sample areas.

8. ESTIMATION PROCEDURE & COMPILATION

8.1 Estimation Procedure

The following differnt estimates of the vital events are yielded from this system.

(1) System-1 : $N1=M+n1$ = Total events N1 caught independent by the system-1 (local registrars) where M are the events common to both the systems and n1 are the number of events report by sysmen-1 : only;

(2) System-2 : $N2=M+n2$ = Total events N2 caught independently by the system-2 (quarterly interviewers),where n2 are the number of events reported by system- 2 only;

(3) Dual Record: $N^{1} = M+n1+n2$ = Joint coverage of the two systems, i.e., dual record coverage;

(4) Chandrasekaran Deming adjusted Dual Record Estimate:

$$N_c = M+n1+n2+\frac{n_1 x n_2}{M}$$

= Where (n1xn2)/M are the estimated events assumed to be missed by both the systems.

(5) Total events:

$$N=M+n1+n2+n3+\frac{n_1 x n_2}{M}$$

= Where n3 are those events detected in the verification check;

8.2 Completion Rate

The estimates of completeness of events for 1986 by administrative division have been shown in Table-1. The completeness of the events for either of these systems in rural areas varies from around 90 percent to around 95 percent. The common proportion varies from around 82 percent to around 88 percent. At the aggregate level, the common proportion is about 86 percent. The dual record coverage (M+n1+n2=85.74+6.76=99.45) of events in rural areas comes to about 99.5 percent. The extent of coverage in urban areas is a little lower, where common proportion ranges from 70 percent to 94 percent among divisions. The urban total coverages for system-1 and system-2 are 87.5 and 87.3 percent respectively. The dual record coverage is about 98.3 percent. About 7 & 12 percent of the events are missed due to non-sampling errors by either of these systems respectively in rural and urban areas. These errors are adjusted by estimation procedures stated above.

Table -1 : Estimates of number births and percentage distribution thereof for principles of dual estimation by division, 1989.

Division	Matched events M	Events Recorded only by System-1 N1	Events Recorded only by System-2 N2	Total events recorded by System-1 N1	Total events recorded by System-2 N2	Events missed by both $\frac{n1xn2}{M}$	Total events NC
Rural				Number:			
Chittagong	1762	158	151	1920	1913	14	2085
Dhaka	1823	143	139	1966	1962	9	2114
Khulna	1234	97	110	1331	1344	9	1450
Rajshahi	1751	131	114	1882	1865	9	2005
Total	6570	529	514	7099	7084	41	7654
Urban							
Chittagong	437	52	54	489	491	7	550
Dhaka	765	120	133	885	898	21	1039
Khulna	280	37	31	317	311	4	352
Rajshahi	247	27	24	274	261	2	290
Total	1729	236	232	1965	1961	34	2231
Rural				Percent:			
Chittagong	84.5	7.6	7.2	92.1	91.7	0.7	100.0
Dhaka	86.2	6.8	6.6	93.0	92.8	0.4	100.0
Khulna	85.1	6.7	7.6	91.8	92.7	0.6	100.0
Rajshahi	87.3	6.5	5.7	93.8	93.0	0.5	100.0
Total	85.8	6.9	6.7	92.7	92.5	0.6	100.0
Urban							
Chittagong	79.4	9.5	9.9	88.9	89.3	1.2	100.0
Dhaka	73.6	11.5	12.8	85.1	86.4	2.1	100.0
Khulna	89.6	10.5	8.7	90.1	88.3	1.2	100.0
Rajshahi	85.1	9.2	5.0	94.3	90.1	0.7	100.0
Total	87.4	10.6	10.5	88.0	87.9	1.5	100.0

Estimates of CBR and CDR for 1989 and 1990 derived by applying different approaches are presented in Table 2 and Table 3 respectively.

Table-2 : Estimates of crude birth rates per 1000 population by division for 1989 and 1990 by applying different approaches.

Division	1989				1990			
	System 1	System 2	Dual Record System	Chandra Sekaran Deming	System 1	System 2	Dual Record System	Chandra Sekaran Deming
				Rural				
Chittagong	32.6	33.1	36.0	36.3	31.9	31.7	34.4	34.6
Dhaka	31.4	31.4	34.0	34.2	31.3	31.3	33.7	33.7
Khulna	30.5	30.9	33.0	33.2	28.8	29.1	31.1	31.3
Rajshahi	33.2	33.1	36.3	36.6	33.7	33.4	35.8	36.0
Total	32.0	32.2	34.9	35.1	31.6	31.5	33.8	34.0
				Urban				
Chittagong	23.2	24.0	25.7	25.9	21.9	22.0	24.3	24.6
Dhaka	26.2	24.3	28.6	28.8	21.7	22.0	24.9	25.4
Khulna	23.9	24.3	26.3	26.5	20.2	19.8	22.2	22.4
Rajshahi	21.6	22.3	23.1	23.2	23.2	22.1	24.3	24.5
Total	24.3	23.9	26.5	26.8	21.2	21.6	24.2	24.6

Table-3: Estimates of crude death rates per 1000 population by division for 1989 and 1990 by Applying different Approaches.

Division	1989				1990			
	System 1	System 2	Dual Record System	Chandra Sekaran Deming	System 1	System 2	Dual Record System	Chandra Sekaran Deming
					Rural			
Chittagong	11.7	12.0	13.1	13.2	11.3	10.8	12.1	12.3
Dhaka	11.3	11.7	12.2	12.3	10.9	10.5	11.8	11.9
Khulna	9.8	9.7	10.3	10.3	9.4	10.0	10.3	10.3
Rajshahi	11.3	10.9	11.8	11.9	11.6	11.6	12.3	12.3
Total	11.1	11.2	12.0	12.0	10.9	10.8	11.7	11.8
					Urban			
Chittagong	7.9	8.0	8.7	8.8	8.6	8.6	9.0	9.1
Dhaka	6.0	5.3	6.5	6.6	5.9	6.2	7.0	7.1
Khulna	5.5	5.4	5.8	5.8	6.7	6.7	7.3	7.3
Rajshahi	8.0	7.9	8.7	9.0	6.5	6.8	7.2	7.2
Total	6.7	6.3	7.2	7.3	6.8	6.9	7.6	7.6

SVRS.KEY/

SELECTED INDICATORS
FROM
BIRTH AND DEATH SAMPLE REGISTRATION SYSTEM

A. POPULATION AND AGE-STRUCTURE

		National	Rural	Urban
1. Population 1992 (January) (in million)				
	Both Sex	111.7	95.1	16.6
	Male	57.4	48.3	9.1
	Female	54.3	46.8	7.5
2. Sex Ratio		105.8	103.3	123.0

3. Age Structure	Number (in million)	%	Number (in million)	%	Number (in million)	%
Both Sex: 0-14	47.8	43.7	41.9	44.7	6.0	37.7
15-49	50.7	46.3	42.3	45.2	8.4	53.2
50+	10.9	10.0	9.5	10.1	1.4	9.1
Total	109.5	100.0	93.7	100.0	15.8	100.0
Male : 0-14	24.3	43.2	21.2	44.5	3.1	35.5
15-49	26.0	44.6	21.2	44.6	4.8	55.0
50+	4.9	10.2	4.3	9.3	0.6	8.7
Total	56.3	100.0	47.6	100.0	8.7	100.0
Female: 0-14	23.6	44.3	20.7	44.9	2.9	40.4
15-49	24.7	45.5	21.1	45.8	3.6	50.9
50+	4.9	10.2	4.3	9.3	0.6	8.7
Total	53.2	100.0	46.1	100.0	7.1	100.0

4. Dependency Ratio,	1991	86	90	68
	1992	82	90	62
5. Density (SQ.Km.),	1991	745	-	-
	1992			

B. NUPTIALITY MEASURES

		National	Rural	Urban
6. Crude Marriage Rate	1987	11.6	12.2	6.9
	1988	11.3	12.1	6.6
	1989	11.2	11.6	8.3
	1990	11.1	11.6	7.9
	1991	11.0	11.2	7.4
	1992	10.7	11.0	7.2
7. Mean age at Marriage	1986	17.5	17.3	18.3
	1987	17.9	17.5	18.8
	1988	18.0	17.8	18.8
	1989	18.0	17.8	18.9
	1990	18.0	17.9	18.8
	1991	18.1	17.9	19.0
	1992	18.2	18.1	19.2

		National	Rural	Urban
8. Female Marital Status in percent, Never married, All ages :	1961	10.5	-	-
	1974	24.4	20.4	29.9
	1981	23.7	22.7	29.6
	1987	26.2	25.0	34.8
	1988	27.5	26.1	33.6
	1990	28.0	26.7	33.7
	1991	28.4	27.2	33.7
	1992	29.0	27.8	33.9
15-19 :	1961	8.3	-	-
	1974	24.5	22.2	44.6
	1981	31.3	28.7	45..1
	1987	47.0	43.5	67.4
	1988	48.1	44.6	66.6
	1990	48.9	45.0	67.0
	1991	50.0	45.3	67.3
	1992	50.4	45.3	67.7
29-24	1961	1.3	-	-
	1974	3.2	2.5	10.1
	1981	5.1	4.0	10.9
	1987	9.2	7.4	20.9
	1988	9.6	7.5	21.5
	1990	9.8	7.9	21.8
	1991	9.5	7.4	21.9
	1992	9.9	7.9	22.2
Currently married, all age :	1961	70.7	-	-
	1974	61.2	65.0	58.3
	1981	63.4	64.0	59.6
	1987	62.3	63.0	57.1
	1988	62.2	66.9	63.4
	1990	62.4	67.0	63.6
	1991	62.6	67.0	63.2
	1992	62.3	66.6	63.4
15-19 :	1961	89.4	-	-
	1974	71.8	73.9	53.2
	1981	65.4	67.8	52.7
	1987	50.4	53.7	31.3
	1988	49.4	52.5	31.6
	1990	48.0	52.0	61.0
	1991	47.6	51.8	60.6
	1992	47.2	51.4	60.2
20-24 :	1961	95.6	-	-
	1974	92.9	93.7	86.3
	1981	90.9	91.8	85.7
	1987	87.4	89.0	76.8
	1988	86.5	88.3	76.4
	1990	86.0	87.3	75.8
	1991	85.6	86.8	75.2
	1992	85.1	86.2	74.6

C. FERTILITY MEASURES

		National	Rural	Urban
9. Crude Birth Rate (CBR) per 1000 Population	1983	35.0	36.4	27.1
	1988	33.2	34.5	24.9
	1989	33.0	34.5	24.4
	1990	32.8	34.3	24.6
	1991	31.6	34.1	24.6
	1992	30.8	32.2	23.7
10. Number of births ('000')	1988	3477	3101	367
	1989	3531	3133	398
	1990	3559	3141	408
	1991	3561	3160	401
	1992	3575	3176	399
11. Birth per minute	1988	6.6	5.9	0.7
	1989	6.7	6.0	0.7
	1990	6.8	6.0	0.8
	1991	6.8	6.1	0.8
	1992	6.9	6.1	0.8
12. TFR per woman	1983	5.07	5.36	3.10
	1988	4.45	4.70	3.08
	1989	4.35	4.59	2.88
	1990	4.33	4.57	2.95
	1991	4.24	4.51	2.92
	1992	4.18	4.33	2.88
13. Net Reproduction Rate (NRR)	1988	1.74	1.80	1.22
	1989	1.73	1.79	1.20
	1990	1.71	1.76	1.20
	1991	1.70	1.74	1.19
	1992	1.68	1.72	1.18

D. MORTALITY MEASURES

14. Crude death Rate (CDR) per 1000 Population	1983	12.3	13.2	7.5
	1988	11.3	11.9	7.5
	1989	11.3	11.9	7.3
	1990	11.4	11.8	7.9
	1991	11.2	11.4	7.8
	1992	11.0	11.3	7.5
15. Number of Deaths (000)	1988	1179	1065	114
	1989	1206	1091	115
	1990	1230	1103	127
	1991	1239	1109	130
	1992	1242	1110	132

		National	Rural	Urban
16. Death per minute	1988	2.2	2.0	0.2
	1989	2.3	2.1	0.2
	1990	2.3	2.1	0.2
	1991	2.2	2.1	0.2
	1992	2.2	2.1	0.2
17. Infant Mortality Rate (IMR) per 1000, live births				
	1983			
	Both Sex	117	121	99
	Male	119	121	107
	Female	116	121	91
	1988			
	Both Sex	110	112	91
	Male	116	118	96
	Female	105	107	86
	1990			
	Both sex	94	97	71
	Male	98	101	73
	Female	91	93	68
	1991			
	Both Sex	92	94	69
	Male	95	98	72
	Female	90	95	65
	1992			
	Both sex	88	91	65
	Male	90	95	68
	Female	86	90	62
18. Neo-Natal Mortality,	1988			
	Both sex	73	75	58
	Male	79	81	64
	Female	67	68	58
	1990			
	Both Sex	67	69	48
	Male	71	73	51
	Female	62	64	48
	1991			
	Both sex	64	66	44
	Male	68	70	48
	Female	61	60	43
	1992			
	Both Sex	62	64	43
	Male	65	68	46
	Female	58	62	40

		National	Rural	Urban
19. Post Neo-Natal Mortality	1988			
	Both sex	37	38	33
	Male	36	37	32
	Female	38	39	33
	1990			
	Both Sex	28	28	23
	Male	27	28	22
	Female	29	29	24
	1991			
	Both sex	27	28	23
	Male	26	28	23
	Female	28	28	24
	1992			
	Both Sex	26	27	22
	Male	25	27	22
	Female	28	28	22
20. Child Death Rate (1-4 Years)	1988	13.5	14.1	8.7
	1989	13.7	14.3	8.6
	1990	14.2	15.0	8.3
	1991	13.6	14.4	8.2
	1992	13.2	14.0	8.0
21. Probability of dying by age 5 per 1000				
	1988			
	Both sex	169	173	127
	Male	172	176	135
	Female	165	171	118
	1990			
	Both Sex	151	158	100
	Male	154	160	103
	Female	149	155	96
	1991			
	Both sex	146	154	96
	Male	148	156	98
	Female	144	153	94
	1992			
	Both Sex	144	152	93
	Male	146	154	95
	Female	142	150	92

22. Maternal Mortaity Rate (MMR) per 1000	1988	5.72	5.98	5.31
	1989	5.08	5.78	4.60
	1990	4.78	5.02	4.25
	1991	4.72	4.84	4.02
	1992	4.68	4.80	3.98
23. Life Expectancy at Birth (Years)		National	Rural	Urban
	1988			
	Both Sex	56.4	56.1	60.0
	Male	56.4	56.5	60.5
	Female	56.0	55.6	59.5
	1990			
	Both sex	55.4	55.5	60.1
	Male	56.4	56.0	60.3
	Female	55.4	54.0	59.0
	1991			
	Both Sex	55.8	55.5	60.1
	Male	56.4	56.0	60.4
	Female	55.6	55.2	60.0
	1992			
	Both Sex	56.0	55.6	62.2
	Male	56.7	56.3	60.3
	Female	55.6	54.4	60.1
E. NATURAL GROWTH OF POPULATION				
24. Natural Growth Rate (NGR) Percent,	1983	2.27	2.32	1.96
	1988	2.19	2.28	1.75
	1989	2.16	2.24	1.71
	1990	2.15	2.23	1.67
	1991	2.06	2.18	1.60
	1992	1.98	2.08	1.58
25. Natural Growth per Minute (No.)	1988	4.4	3.9	0.5
	1989	4.4	3.9	0.5
	1990	4.5	3.9	0.6
	1991	4.5	4.0	0.7
	1992	4.6	4.0	0.7
F. HEADS OF HOUSEHOLDS				
26. Male Headed Household (percent)	1982	84.7	83.5	93.1
27. Female Headed Household (Percent)	1982	15.3	16.5	6.9

G. Religious Composition

28. Religious Composition (percent)

1988			
Muslim	86.5	86.4	87.0
Non-Muslim	13.5	13.6	13.0
Total	100.0	100.0	100.0
1991			
Muslim	86.6	86.5	87.0
Non-Muslim	30.4	13.5	13.0
Total	100.0	100.0	100.0
1992			
Muslim	86.6	86.5	87.0
Non-Muslim	13.4	13.5	13.0
Total	100.0	100.0	100.0

H. EDUCATION AND LITERACY	National	Rural	Urban
29. Literacy Rate of Population aged 5 + 1987			
Both Sex	27.8	24.1	51.2
Male	34.6	31.0	58.3
Female	20.3	16.7	43.6
1990			
Both Sex	36.0	30.2	52.0
Male	38.2	34.3	54.4
Female	23.0	22.3	46.0
1991			
Both Sex	36.2	30.4	52.4
Male	38.4	34.8	56.5
Female	23.0	22.5	46.2
1992			
Both sex	37.0	31.2	52.8
Male	38.9	35.0	56.7
Female	23.5	22.5	46.4

30. Adult Literacy Rate of Population aged 15 +

1987			
Both Sex	33.8	29.5	61.5
Male	44.0	39.6	71.6
Female	22.9	18.7	50.5
1990			
Both Sex	36.9	30.7	62.5
Male	45.5	39.3	70.0
Female	24.2	20.3	50.5
1991			
Both Sex	38.8	33.2	63.2
Male	46.2	39.9	70.6
Female	24.5	22.7	51.0
1992			
Both Sex	39.7	33.7	63.6
Male	46.8	40.2	71.0
Female	25.0	23.1	51.9

I. MIGRATION

31. Migration for Economic Reason, 1990

Direction	Migration per 1000 population	Number of Migrants
Rural to Rural	8.50	57965
Rural to Urban	4.46	74900
Urban to Rural	1.36	4949
Urban to Urban	29.83	78999
1991		
Rural to Rural	8.60	58342
Rural to Urban	5.62	76823
Urban to Rural	1.42	5245
Urban to Urban	28.02	77835