

### CHAPTER 3 COVERAGE ERROR

This chapter deals with the results of the Post Enumeration Survey (PES) on Population, mainly on the coverage error. The *net omission rates* per thousand enumerated persons, based on dual estimation, are presented in this chapter at national and zonal levels by sex and residence. Detailed results for coverage error are presented in Tables 3.1-3.5. The standard errors of the omission rates have also been presented as Percent Relative Standard Errors (PRSE).

**3.2** The *net omission rates* have been calculated as the ratio of the number of omitted persons net of duplication to the number of persons enumerated in the census. Net omission rates at national and zonal levels are given below in Statement A.

**STATEMENT A**  
**NET OMISSION RATES (PER THOUSAND PERSONS) BY SEX AND RESIDENCE, INDIA AND ZONES BASED ON DUAL ESTIMATION**

India/Zones	TOTAL			RURAL			URBAN		
	Persons	Male	Female	Persons	Male	Female	Persons	Male	Female
1	2	3	4	5	6	7	8	9	10
<b>India</b>	<b>23.3</b>	<b>23.5</b>	<b>23.1</b>	<b>16.8</b>	<b>16.2</b>	<b>17.5</b>	<b>39.8</b>	<b>41.5</b>	<b>37.9</b>
Southern	33.7	33.6	33.7	25.3	24.5	26.1	49.8	51.0	48.5
Eastern	19.8	19.8	19.7	12.7	11.8	13.7	49.0	51.8	45.8
North eastern	7.6	7.5	7.7	8.5	8.3	8.7	2.8	3.6	2.0
Northern	48.6	50.7	46.3	34.2	34.2	34.2	76.1	80.9	70.3
Western	11.2	11.0	11.5	7.5	6.8	8.3	16.6	16.9	16.3
Central	12.9	12.6	13.2	11.7	11.2	12.1	17.1	17.3	17.0

**3.3** At the national level, the net omission is about 23 persons for every thousand persons enumerated in census. The northern zone has reported net omission rates (49 per thousand persons) followed by southern zone (34 per thousand persons). North eastern zone has net omission rate (8 per thousand persons). The net omission rates per thousand persons for the eastern, western and central zones are 20, 11 and 13 persons respectively. Except in case of north eastern zone, the net omission rates at national and zonal levels for the rural areas are less compared to the net omission rates for the urban areas. At the national level, the net omission for rural areas is 17 per thousand persons against the net omission rate of 40 in the urban areas. The omission, in case of both rural and urban areas, is higher in the northern zone. There is no significant variation in the net omission rates by sex at the national as well as the zonal levels. However, in urban areas males seems to have omitted more than the females.

**3.4** The Statement B gives the rates of gross omission, duplication and net omission per thousand persons at national and zonal levels. The level of duplication seems to be negligible as only one out of thousand persons is wrongly enumerated. The duplication rate at zonal levels varies 0 to 3 per thousand persons.

**STATEMENT B**  
**RATES OF GROSS OMISSION, DUPLICATION AND NET OMISSION**

India/Zones	Rates per thousand persons		
	Gross omission	Duplication	Net omission
1	2	3	4
<b>India</b>	<b>24.4</b>	<b>1.1</b>	<b>23.3</b>
Southern	34.1	0.4	33.7
Eastern	20.1	0.3	19.8
North Eastern	7.6	0.0	7.6
Northern	49.7	1.1	48.6
Western	11.3	0.0	11.2
Central	15.9	3.0	12.9

**3.5** Comparable estimates of net omission rates for 1981 to 2001 are given below in the Statement C. The estimates are on the higher side in the year 2001 compared to 1981 and 1991. There could be several factors including the manner in which PES was conducted that resulted in a higher omission rate. It would not be appropriate to conclude that omission in 2001 Census was higher on the basis of these results alone.

**STATEMENT C**  
**NET OMISSION RATES (PER THOUSAND PERSONS) BY SEX AND RESIDENCE-1981\*, 1991 AND 2001**

Sex	Total			Rural			Urban		
	1981	1991	2001	1981	1991	2001	1981	1991	2001
1	2	3	4	5	6	7	8	9	10
Persons	18.0	17.6	23.3	15.0	16.8	16.8	27.6	19.8	39.8
Males	17.1	17.3	23.5	13.8	16.0	16.2	27.7	21.1	41.5
Females	18.8	17.9	23.1	16.3	17.7	17.5	27.5	18.3	37.9

\* Net omission rates are not based on dual estimation

**3.6** The Type I, Type II and total errors by sex and residence at national level are higher in urban areas than those in rural areas. Type I error in case of males and females are almost the same in total and rural areas. It is lower in case of females in urban areas compared to the males. There is no considerable variation in case of the Type II errors by residence, which have been arrived as the difference of Total and Type I errors, by sex and residence.

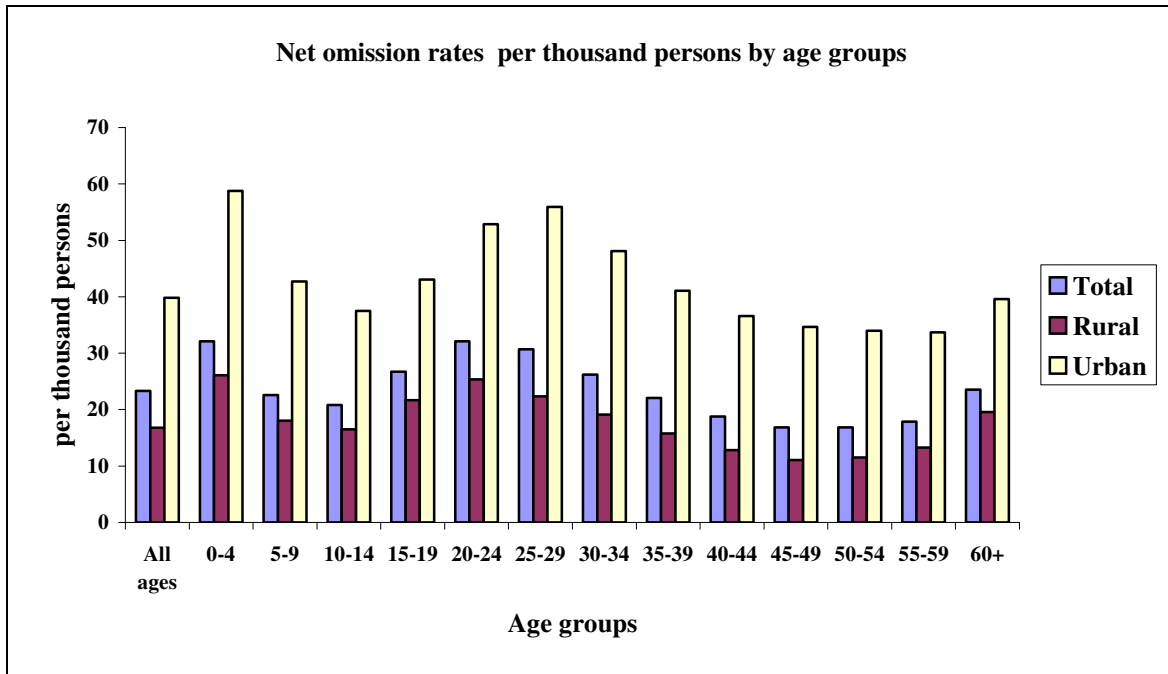
**3.7** The net omission rates at national level by age groups and sex are given in the following Statement D.

**STATEMENT D**  
**NET OMISSION RATES (PER THOUSAND PERSONS) BY AGE, SEX AND RESIDENCE - INDIA**

Age groups	Total			Rural			Urban		
	Persons	Male	Female	Persons	Male	Female	Persons	Male	Female
1	2	3	4	5	6	7	8	9	10
All ages	23.3	23.5	23.1	16.8	16.2	17.5	39.8	41.5	37.9
0-4	32.1	31.5	32.7	26.1	25.3	27.0	58.8	59.1	58.4
5-9	22.6	21.8	23.5	18.0	17.1	19.0	42.7	42.2	43.4
10-14	20.8	20.4	21.3	16.5	15.9	17.2	37.5	38.1	36.8
15-19	26.7	25.2	28.4	21.7	19.6	24.2	43.1	44.0	42.0
20-24	32.1	31.6	32.7	25.4	23.9	26.8	52.8	54.6	50.9
25-29	30.7	33.0	28.3	22.4	23.9	20.9	56.0	60.8	51.2
30-34	26.2	29.3	23.1	19.1	21.2	17.0	48.1	53.3	42.5
35-39	22.1	25.8	18.1	15.8	18.6	12.8	41.1	47.5	34.3
40-44	18.8	20.3	16.9	12.8	14.4	11.1	36.6	37.7	35.2
45-49	16.9	17.9	15.7	11.1	11.3	10.8	34.6	37.4	31.3
50-54	16.9	15.9	18.0	11.5	10.2	13.0	34.0	33.3	34.8
55-59	17.9	16.5	19.2	13.3	10.7	15.7	33.7	34.8	32.4
60+	23.6	19.5	27.7	19.6	15.4	23.9	39.6	36.5	42.7

**3.8** An omission rate, 32 per thousand persons, is observed in the age groups 0-4 and 20-24. Similarly omission rate, 17 per thousand persons, is observed in 45-49 and 50-54 age groups. Variation in the omission rates by sex is more significant in the age groups 15-19, 25-29, 35-39, 40-44, and 60+. Omission rates are significantly low in case of females compared to those for males except in the age groups 25-29, 50-54, 55-59, and 60+. Rural urban scenario is not different from those omission rates or total areas. The omission rates are higher in the age group 0-4 in case of rural and urban areas. It is observed from the above statement that the omission rates for females in rural areas are higher in the earlier and later stages of age groups compared to those for the males in the same age groups. This is not exactly same for the urban areas.

**3.9** The patterns by age are suggestive only as the estimates have larger PRSEs, some of the variation may not be significant. A graphical presentation for the zone wise omission rates for persons per thousand persons by age groups is given below.



**3.10** The Statement E given below provides the net omission rates by literacy, sex and residence at national level. More illiterate males and females are omitted more significantly in urban areas compared to the literates. Urban females seem to have low omission rates for both literate and illiterates compared to males though the difference does not appear statistically significant. Literacy of the respondent may have some impact on the results, which could not be studied in this survey.

**STATEMENT E**  
**NET OMISSION RATES FOR THOSE AGED 7 YEARS AND ABOVE (PER THOUSAND PERSONS) BY LITERATES, ILLITERATES, SEX AND RESIDENCE - INDIA**

Literate/Illiterate	Persons	Male	Female
1	2	3	4
<b>Literate</b>			
Total	24.8	24.5	25.1
Rural	18.1	17.7	18.7
Urban	41.0	42.6	38.9
<b>Illiterate</b>			
Total	24.8	25.1	24.5
Rural	20.2	19.9	20.4
Urban	52.9	56.6	50.0
<b>Total</b>			
Total	24.8	24.7	24.8
Rural	19.1	18.6	19.7
Urban	44.5	46.0	42.8

**3.11** Net omission rates by marital status and sex are given in the Statement F. Omission rates are higher for 'widowed' and 'divorced or separated' categories. The number of persons is very less and it may not have any impact on the census results. Omission rates are slightly higher in these categories is very less case of females except in case of divorced or separated males. Similar trend was observed in 1991 also. This brings out the need to sensitize the enumerators to ensure that all such persons in the households are enumerated.

**STATEMENT F**  
**NET OMISSION RATES (PER THOUSAND PERSONS) BY MARITAL STATUS AND SEX - INDIA**

Marital status	Total		
	Persons	Male	Female
1	2	3	4
Total	23.3	23.5	23.1
Never married	25.7	26.1	25.1
Currently married	22.8	22.5	23.0
Widowed	32.5	30.7	33.1
Divorced or separated	47.7	59.3	42.0

**3.12** Statement G gives the omission rates by relationship, sex and residence.

**STATEMENT G**  
**NET OMISSION RATES (PER THOUSAND PERSONS) BY RELATIONSHIP TO THE HEAD OF THE FAMILY BY RESIDENCE - INDIA**

Relationship	Total	Rural	Urban
1	2	3	4
<b>Total</b>	23.3	16.8	39.8
Head	19.5	12.0	43.7
Spouse	18.4	12.4	38.0
Father	52.4	46.6	77.1
Mother	38.6	34.5	54.5
Sons	22.7	18.0	39.4
Daughters	24.0	18.2	44.0
Other relatives	39.8	34.8	60.3
Unrelated	217.0	222.3	213.0

**3.13** Head of the household is omitted more in urban areas compared to the rural areas. There is no significant variation in the omission rates of spouse and the head of the family in total and rural areas. This holds true in case of sons and daughters of the head of the family. Compared to the father, the mother of the head is less omitted. Distant relatives and unrelated persons are omitted more often than near relatives a pattern seen in PEC of 1981 and 1991. The enumerators' and respondents' perception about head and those who are to be enumerated could have been contributed to the pattern of omission rates.

**3.14** The Statement H below gives the distribution of persons enumerated in PES by sex and location.

**STATEMENT H**  
**DISTRIBUTION OF PERSONS ENUMERATED IN PES BY RESIDENTIAL STATUS.**

<b>Residential Status</b>	<b>Total</b>	<b>Rural</b>	<b>Urban</b>
<b>1</b>	<b>2</b>	<b>5</b>	<b>8</b>
Present through out	967.0	972.2	949.0
Absent through out	27.8	22.5	46.0
Partly present	5.2	5.3	5.0
Total	1000.0	1000.0	1000.0

**3.15** In a massive operation like census proper understanding and application of the concepts and definition are very important. The census instructions lay down clear-cut criteria for identifying those who are to be enumerated. Broadly three categories of usual residents are identified in census. The same procedure is followed in identifying the persons in PES also.

**3.16** The distribution of persons enumerated in census by enumeration status, sex and location is given below in the Statement I. The proportion of persons enumerated elsewhere and duplicated taken together amounts to about four per 1000 only. Duplication seems to be almost negligible in urban areas.

**STATEMENT I**  
**DISTRIBUTION OF PERSONS ENUMERATED IN CENSUS BY THE ENUMERATION STATUS**

<b>Enumeration status</b>	<b>Total</b>			<b>Rural</b>			<b>Urban</b>		
	<b>Persons</b>	<b>Male</b>	<b>Female</b>	<b>Persons</b>	<b>Male</b>	<b>Female</b>	<b>Persons</b>	<b>Male</b>	<b>Female</b>
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>
Enumerated correctly	995.8	996.1	995.5	995.6	996.0	995.3	996.1	996.3	996.0
Enumerated elsewhere	3.1	2.9	3.3	3.0	2.7	3.2	3.6	3.4	3.7
Duplicated	1.1	1.0	1.2	1.4	1.3	1.5	0.3	0.3	0.3
Total enumerated	1000.0	1000.0	1000.0	1000.0	1000.0	1000.0	1000.0	1000.0	1000.0

### **Implication of the results**

**3.17** The results of PES discussed so far do not indicate any significant problems in using the census data. This is illustrated by analyzing the age data. A comparative percentage distribution of population by age groups, sex and residence with the actual canvassed population and the estimated population with adjustment for omission are given in the Statement J. It is to be noted that there do not exist any significant difference in the percentage share among the age groups by sex or by residence.

**STATEMENT J**  
**AGE DISTRIBUTION OF POPULATION WITH AND WITHOUT ADJUSTMENT FOR OMISSION**

Age groups	Total						Rural						Urban						
	Unadjusted			Adjusted			Unadjusted			Adjusted			Unadjusted			Adjusted			
	P	M	F	P	M	F	P	M	F	P	M	F	P	M	F	P	M	F	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
All ages	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
0-4	10.7	10.7	10.7	10.8	10.8	10.8	11.5	11.5	11.4	11.5	11.6	11.5	8.9	8.8	8.9	9.0	8.9	9.1	
5-9	12.5	12.5	12.4	12.4	12.5	12.4	13.3	13.4	13.1	13.2	13.4	13.1	10.4	10.4	10.5	10.4	10.3	10.5	
10-14	12.1	12.3	11.9	12.1	12.3	11.9	12.4	12.7	12.1	12.4	12.7	12.1	11.3	11.3	11.4	11.3	11.2	11.3	
15-19	9.7	10.1	9.3	9.8	10.1	9.4	9.4	9.9	9.0	9.5	9.9	9.0	10.5	10.8	10.3	10.5	10.7	10.3	
20-24	8.7	8.7	8.8	8.8	8.8	8.8	8.3	8.2	8.4	8.3	8.2	8.4	9.9	10.1	9.7	10.0	10.2	9.8	
25-29	8.1	7.8	8.4	8.2	7.9	8.5	7.8	7.4	8.1	7.8	7.5	8.1	9.0	8.8	9.3	9.1	8.9	9.3	
30-34	7.2	7.0	7.4	7.2	7.1	7.4	7.0	6.7	7.2	7.0	6.7	7.2	7.8	7.8	7.9	7.9	7.8	7.9	
35-39	6.9	6.8	7.0	6.8	6.8	6.9	6.6	6.5	6.7	6.6	6.5	6.6	7.6	7.4	7.7	7.5	7.4	7.6	
40-44	5.4	5.6	5.2	5.4	5.6	5.2	5.2	5.4	5.0	5.2	5.3	5.0	6.0	6.3	5.7	6.0	6.2	5.6	
45-49	4.6	4.7	4.5	4.6	4.6	4.5	4.4	4.5	4.4	4.4	4.4	4.4	5.1	5.2	4.9	5.0	5.2	4.8	
50-54	3.6	3.7	3.4	3.5	3.7	3.3	3.5	3.6	3.3	3.4	3.6	3.3	3.8	4.0	3.5	3.7	4.0	3.5	
55-59	2.7	2.6	2.8	2.7	2.5	2.8	2.7	2.5	2.9	2.7	2.5	2.9	2.7	2.7	2.7	2.7	2.6	2.7	
60+	7.7	7.4	8.1	7.7	7.3	8.1	8.0	7.7	8.3	8.0	7.7	8.3	7.0	6.6	7.5	7.0	6.5	7.5	

**3.18** The statement K gives the omission rates for some of the selected countries. These are not strictly comparable due to the various methods adopted in census enumeration but give an idea of the omission rates.

**STATEMENT K**  
**OMISSION RATES -SELECTED COUNTRIES**

S. No.	Country	Year	Omission Rate (Percent)
1	2	3	4
1	India	1981	1.8
		1991	1.7
		2001	2.3
2	China	2000	1.8
3	U.K	2001	2.2
4	New Zealand	2001	2.2
5	Cambodia	1998	1.8
6	Bangladesh	1991	4.6

Source: -

1. Website of each country
2. Report on Post Enumeration Check 1991, Census of India, 1991