Appendix: Sampling Variability

Estimates based on sample data may differ from the figures that would have been obtained had all, rather than specified samples, of the records been used. These differences are termed sampling variability. The standard error is a measure of the sampling variability. About 68 percent of all possible probability samples selected with the same specifications will give estimates within one standard error of the figure obtained from a compilation of all records. Similarly, approximately 90 percent will give estimates within 1.645 standard errors, about 95 percent will give estimates within two standard errors, and about 99 percent will give estimates within two and one-half standard errors. The standard error of an estimate depends on the design elements such as the method of sampling, sample size, and the estimation process.

Because of the large number of data cells tabulated from the sample files, it is not practical to calculate the standard error for every possible cell. However, standard errors for a large number of cells were estimated. These estimates were used to fit regression curves to provide estimates of approximate standard errors associated with tabulated counts and proportions.

The tables showing the sampling variability provide a general order of magnitude for similar estimates from the various sample files. Table A-1 presents approximate standard errors for the estimated number of people from the 1 percent and the 10 percent files. The reliability of an estimated percentage depends on both the size of the percentage and on the size of the total on which the percentage is based. Data in Table A-2 provide approximate standard errors of the estimated percentage of people in the 1 percent and 10 percent files. The standard errors are expressed in percentage points, and the bases shown are in terms of inflated data.

Table A-1. Approximate standard errors of estimated number of people

Size of estimate (inflated	Standard error					
1 percent file						
500	250					
1,000	300					
2,500	500					
5,000	800					
7,500	900					
10,000	1,100					
25,000	1,700					
50,000	2,400					
75,000	3,000					
100,000	3,400					
250,000	5,400					
500,000	7,800					
750,000	9,600					
1,000,000	11,100					
5,000,000	25,800					
10,000,000	36,900					
25,000,000	57,700					
50,000,000	76,100					
75,000,000	82,900					
10 percent file						
100	30					
500	70					
1,000	100					
5,000	225					
10,000	300					
50,000	700					
100,000	1,000					
500,000	2,200					
1,000,000	3,200					
2,000,000	4,300					
3,000,000	5,300					
5,000,000	6,500					
10,000,000	8,500					
20,000,000	9,300					

Table A-2. Approximate standard errors of estimated percentage of people

Size of base			10 or	25 or		
(inflated)	2 or 98	5 or 95	90	75	50	
1 percent file						
1,000	4.7	7.3	10.1	14.5	16.8	
10,000	1.5	2.3	3.2	4.6	5.3	
50,000	0.7	1.0	1.4	2.1	2.4	
100,000	0.5	0.7	1.0	1.5	1.7	
500,000	0.2	0.3	0.4	0.7	8.0	
1,000,000	0.1	0.2	0.3	0.5	0.5	
5,000,000	0.1	0.1	0.1	0.2	0.2	
10,000,000	(L)	0.1	0.1	0.2	0.2	
50,000,000	(L)	(L)	(L)	0.1	0.1	
100,000,000	(L)	(L)	(L)	(L)	(L)	
10 percent file						
500	1.9	3.0	4.1	5.9	6.8	
1,000	1.3	2.1	2.9	4.1	4.8	
2,500	8.0	1.3	1.8	2.6	3.0	
10,000	0.4	0.6	0.9	1.3	1.5	
50,000	0.2	0.3	0.4	0.6	0.7	
100,000	0.1	0.2	0.3	0.4	0.5	
500,000	(L)	0.1	0.1	0.2	0.2	
1,000,000	(L)	0.1	0.1	0.1	0.2	
5,000,000	(L)	(L)	(L)	(L)	0.1	
10,000,000	(L)	(L)	(L)	(L)	(L)	
50,000,000	(L)	(L)	(L)	(L)	(L)	

NOTE: (L) = less than 0.05 percent.