

## International Visitor Arrivals Sampling Errors

Each visitor arrival card is classified by the country of last permanent residence (CLPR). Sampling of cards is done within each country.

The sampling fraction varies by month, tending to be higher in winter and lower in summer. For example, in January 1998, the sampling fraction was 1 in 15. This means that every 15th card which had a CLPR of Australia was sampled, as was every 15th card which had a CLPR of Hong Kong etc.

Tables A and B give the typical range of sample errors (absolute and percentage) for a selection of different country sizes. The lower error range will correspond to a month where the percentage of visitors sampled is high (the winter months); the higher error range will correspond to a month where the percentage of visitors sampled is low (the summer months).

**Table A: Absolute Sampling Errors for Subgroups of Visitor Arrivals**

Total Population (Country size)	Cell size of interest (eg. subgroup within Country)														
	100	500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	5,000	10,000	15,000	20,000	25,000	30,000
	Sampling Interval (19)														
500	74														
1,000	79	131													
1,500	80	152	152												
2,000	81	161	186	161											
2,500	81	166	204	204	166										
3,000	82	170	215	228	215	170									
3,500	82	172	222	243	243	222	172								
4,000	82	174	228	255	263	255	228	174							
5,000	82	176	235	269	288	294	288	269	235						
10,000	83	181	249	297	333	360	381	397	407	416					
15,000	83	183	254	306	346	380	407	431	450	480	480				
20,000	83	184	256	310	353	389	420	447	470	509	588	509			
25,000	83	184	258	312	357	394	427	456	482	526	644	644	526		
30,000	83	184	259	314	359	398	432	462	490	537	679	720	679	537	
40,000	83	185	260	316	362	403	438	470	499	550	720	805	832	805	720
50,000	83	185	260	317	364	405	442	474	504	558	744	852	911	930	911
100,000	83	185	262	320	368	411	449	483	515	573	789	939	1052	1139	1205
	Cell size of interest (eg. subgroup within Country)														
Total Population (Country size)	100	500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	5,000	10,000	15,000	20,000	25,000	30,000
	Sampling Interval (29)														
500	93														
1,000	98	164													
1,500	100	189	189												
2,000	101	201	232	201											
2,500	102	207	254	254	207										
3,000	102	212	268	284	268	212									
3,500	102	215	277	304	304	277	215								
4,000	102	217	284	318	328	318	284	217							
5,000	103	220	293	336	359	367	359	336	293						
10,000	103	226	311	370	415	449	475	495	508	519					
15,000	103	228	317	381	432	473	508	537	562	599	599				
20,000	103	229	320	386	440	485	524	557	587	635	733	635			
25,000	104	230	321	389	445	492	533	569	601	656	803	803	656		
30,000	104	230	322	392	448	496	539	577	611	669	847	898	847	669	
40,000	104	230	324	394	452	502	546	586	622	686	898	1004	1037	1004	898
50,000	104	231	325	396	454	505	551	592	629	696	928	1063	1136	1160	1136
100,000	104	231	326	399	459	512	559	603	643	715	984	1171	1312	1420	1503

**Table B: Relative Sampling Errors for Subgroups of Visitor Arrivals (%)**

Total Population (Country size)	Cell size of interest (eg. subgroup within Country)														
	100	500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	5,000	10,000	15,000	20,000	25,000	30,000
	Sampling Interval (19)														
500	74														
1,000	79	26													
1,500	80	30	15												
2,000	81	32	19	11											
2,500	81	33	20	14	8										
3,000	82	34	21	15	11	7									
3,500	82	34	22	16	12	9	6								
4,000	82	35	23	17	13	10	8	5							
5,000	82	35	24	18	14	12	10	8	6						
10,000	83	36	25	20	17	14	13	11	10	8					
15,000	83	37	25	20	17	15	14	12	11	10	5				
20,000	83	37	26	21	18	16	14	13	12	10	6	3			
25,000	83	37	26	21	18	16	14	13	12	11	6	4	3		
30,000	83	37	26	21	18	16	14	13	12	11	7	5	3	2	
40,000	83	37	26	21	18	16	15	13	12	11	7	5	4	3	2
50,000	83	37	26	21	18	16	15	14	13	11	7	6	5	4	3
100,000	83	37	26	21	18	16	15	14	13	11	8	6	5	5	4
	Sampling Interval (29)														
500	93														
1,000	98	33													
1,500	100	38	19												
2,000	101	40	23	13											
2,500	102	41	25	17	10										
3,000	102	42	27	19	13	8									
3,500	102	43	28	20	15	11	7								
4,000	102	43	28	21	16	13	9	6							
5,000	103	44	29	22	18	15	12	10	7						
10,000	103	45	31	25	21	18	16	14	13	10					
15,000	103	46	32	25	22	19	17	15	14	12	6				
20,000	103	46	32	26	22	19	17	16	15	13	7	4			
25,000	104	46	32	26	22	20	18	16	15	13	8	5	3		
30,000	104	46	32	26	22	20	18	16	15	13	8	6	4	3	
40,000	104	46	32	26	23	20	18	17	16	14	9	7	5	4	3
50,000	104	46	32	26	23	20	18	17	16	14	9	7	6	5	4
100,000	104	46	33	27	23	20	19	17	16	14	10	8	7	6	5

For example, suppose there were 20,000 visitors who arrived in New Zealand from the United States in a particular month of whom 5,000 were for the purpose of visiting friend or relatives (VFR). The range for the true number of VFR visitors could be as large as 4,365 (5,000-635) to 5,635 (5,000+635). This is calculated at the 95% confidence level.

The error component of 635 is obtained from Table A, under the sampling interval of 29, at the intersection of 20,000 as total population and 5,000 as cell size of interest. From Table B it can be seen that the magnitude of the relative error is about 13%.

### Sampling Errors for NZ Resident Arrivals, NZ Resident Departures and Visitor Departures

Tables C and D give ranges of typical sampling errors for different sized cells of interest for New Zealand resident departures. Throughout the year the errors vary according to the sampling fraction and the monthly total. These tables give the range of errors from the smallest sample fraction (1:13 in June) to the largest sample fraction (1:19 in December).

**Table C: Absolute Sampling Errors for Subgroups of NZ Resident Departures**

Total NZ Resident Departures	Cell size of interest (eg. subgroup within total NZ resident departures.)																			
	100	500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	5,000	10,000	15,000	20,000	25,000	30,000	50,000	70,000	80,000	90,000	100,000
	Sampling Interval (23)																			
90,000	92	205	289	353	407	453	495	533	568	632	867	1028	1147	1235	1300	1370	1147	867		
100,000	92	205	289	353	407	454	496	534	570	634	872	1038	1163	1259	1332	1454	1332	1163	872	
110,000	92	205	289	354	407	454	497	535	571	635	877	1046	1176	1278	1358	1518	1467	1358	1176	877
120,000	92	205	290	354	408	455	497	536	572	636	880	1053	1187	1293	1379	1570	1570	1501	1379	1187
130,000	92	205	290	354	408	455	498	537	572	637	883	1059	1196	1306	1397	1613	1652	1613	1530	1397
140,000	92	205	290	354	408	456	498	537	573	638	886	1064	1204	1317	1411	1648	1720	1702	1648	1554
150,000	92	205	290	354	408	456	498	537	574	639	888	1068	1210	1327	1424	1678	1776	1776	1744	1678
160,000	92	205	290	354	409	456	499	538	574	640	890	1072	1216	1335	1435	1704	1824	1839	1824	1780
170,000	92	205	290	354	409	456	499	538	575	640	892	1075	1221	1342	1445	1727	1865	1892	1892	1865
180,000	92	205	290	355	409	456	499	539	575	641	893	1078	1226	1349	1454	1747	1901	1938	1950	1938
190,000	92	205	290	355	409	457	500	539	575	641	895	1081	1230	1355	1461	1765	1933	1978	2001	2001
200,000	92	205	290	355	409	457	500	539	576	642	896	1083	1233	1360	1468	1780	1961	2014	2045	2056
210,000	92	205	290	355	409	457	500	539	576	642	897	1085	1237	1364	1474	1794	1986	2046	2085	2104
	Cell size of interest (eg. subgroup within total NZ resident departures.)																			
Total NZ Resident Departures	100	500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	5,000	10,000	15,000	20,000	25,000	30,000	50,000	70,000	80,000	90,000	100,000
	Sampling Interval (33)																			
90,000	111	247	349	426	490	547	597	643	685	762	1045	1240	1383	1490	1568	1653	1383	1045		
100,000	111	247	349	426	491	547	598	644	687	764	1052	1252	1402	1518	1607	1753	1607	1402	1052	
110,000	111	247	349	426	491	548	599	645	688	766	1057	1262	1418	1541	1638	1831	1769	1638	1418	1057
120,000	111	247	349	427	492	549	600	646	689	767	1062	1270	1431	1560	1663	1894	1894	1811	1663	1431
130,000	111	247	349	427	492	549	600	647	690	769	1065	1277	1442	1576	1684	1945	1993	1945	1845	1684
140,000	111	247	349	427	492	549	601	648	691	770	1068	1283	1452	1589	1702	1988	2074	2053	1988	1874
150,000	111	248	349	427	493	550	601	648	692	771	1071	1288	1460	1600	1718	2024	2142	2142	2104	2024
160,000	111	248	350	427	493	550	602	649	692	772	1074	1293	1467	1610	1731	2056	2200	2217	2200	2147
170,000	111	248	350	428	493	550	602	649	693	772	1076	1297	1473	1619	1743	2083	2250	2282	2282	2250
180,000	111	248	350	428	493	551	602	650	693	773	1078	1300	1478	1627	1753	2107	2293	2337	2352	2337
190,000	111	248	350	428	493	551	602	650	694	774	1079	1303	1483	1634	1762	2128	2331	2386	2413	2413
200,000	111	248	350	428	493	551	603	650	694	774	1081	1306	1488	1640	1771	2147	2365	2429	2467	2499
210,000	111	248	350	428	493	551	603	650	695	775	1082	1309	1491	1645	1778	2164	2395	2467	2514	2538

**Table D: Relative Sampling Errors for Subgroups of NZ Resident Departures (%)**

Total NZ Resident Departures	Cell size of interest (eg. subgroup within total NZ resident departures.)																			
	100	500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	5,000	10,000	15,000	20,000	25,000	30,000	50,000	70,000	80,000	90,000	100,000
	Sampling Interval (23)																			
90,000	92	41	29	24	20	18	17	15	14	13	9	7	6	5	4	3	2	1		
100,000	92	41	29	24	20	18	17	15	14	13	9	7	6	5	4	3	2	1	1	
110,000	92	41	29	24	20	18	17	15	14	13	9	7	6	5	5	3	2	2	1	1
120,000	92	41	29	24	20	18	17	15	14	13	9	7	6	5	5	3	2	2	2	1
130,000	92	41	29	24	20	18	17	15	14	13	9	7	6	5	5	3	2	2	2	1
140,000	92	41	29	24	20	18	17	15	14	13	9	7	6	5	5	3	2	2	2	2
150,000	92	41	29	24	20	18	17	15	14	13	9	7	6	5	5	3	3	2	2	2
160,000	92	41	29	24	20	18	17	15	14	13	9	7	6	5	5	3	3	2	2	2
170,000	92	41	29	24	20	18	17	15	14	13	9	7	6	5	5	3	3	2	2	2
180,000	92	41	29	24	20	18	17	15	14	13	9	7	6	5	5	3	3	2	2	2
190,000	92	41	29	24	20	18	17	15	14	13	9	7	6	5	5	4	3	2	2	2
200,000	92	41	29	24	20	18	17	15	14	13	9	7	6	5	5	4	3	3	2	2
210,000	92	41	29	24	20	18	17	15	14	13	9	7	6	5	5	4	3	3	2	2
	Cell size of interest (eg. subgroup within total NZ resident departures.)																			
Total NZ Resident Departures	100	500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	5,000	10,000	15,000	20,000	25,000	30,000	50,000	70,000	80,000	90,000	100,000
	Sampling Interval (33)																			
90,000	111	49	35	28	25	22	20	18	17	15	10	8	7	6	5	3	2	1		
100,000	111	49	35	28	25	22	20	18	17	15	11	8	7	6	5	4	2	2	1	
110,000	111	49	35	28	25	22	20	18	17	15	11	8	7	6	5	4	3	2	2	1
120,000	111	49	35	28	25	22	20	18	17	15	11	8	7	6	6	4	3	2	2	1
130,000	111	49	35	28	25	22	20	18	17	15	11	9	7	6	6	4	3	2	2	2
140,000	111	49	35	28	25	22	20	19	17	15	11	9	7	6	6	4	3	3	2	2
150,000	111	50	35	28	25	22	20	19	17	15	11	9	7	6	6	4	3	3	2	2
160,000	111	50	35	28	25	22	20	19	17	15	11	9	7	6	6	4	3	3	2	2
170,000	111	50	35	29	25	22	20	19	17	15	11	9	7	6	6	4	3	3	3	2
180,000	111	50	35	29	25	22	20	19	17	15	11	9	7	7	6	4	3	3	3	2
190,000	111	50	35	29	25	22	20	19	17	15	11	9	7	7	6	4	3	3	3	2
200,000	111	50	35	29	25	22	20	19	17	15	11	9	7	7	6	4	3	3	3	2
210,000	111	50	35	29	25	22	20	19	17	15	11	9	7	7	6	4	3	3	3	3

For example, suppose 100,000 New Zealand residents left for a short-term overseas trip in a particular month, of whom 5,000 intended to visit Fiji. In that case, the range for the true number of New Zealand residents who visited Fiji, at the 95% confidence interval, could be as large as 4,236 (5000-764) to 5,764 (5000+764). The absolute error of 764 is obtained from Table C (under sampling interval of 33). From Table D it can be seen that the magnitude of the relative error is about 15%.