

## APPENDIX D: ESTIMATES OF SAMPLING ERRORS

---

The sample of respondents selected in the Multiple Indicator Cluster Survey (MICS) Punjab, 2014 is only one of the samples that could have been selected from the same population, using the same design and size. Each of these samples would yield results that differ somewhat from the results of the actual sample selected. Sampling errors are a measure of the variability between the estimates from all possible samples. The extent of variability is not known exactly, but can be estimated statistically from the survey data.

The following sampling error measures are presented in this appendix for each of the selected indicators:

- *Standard error (se)*: Standard error is the square root of the variance of the estimate. For survey indicators that are means, proportions or ratios, the Taylor series linearization method is used for the estimation of standard errors. For more complex statistics, such as fertility and mortality rates, the Jackknife repeated replication method is used for standard error estimation.
- *Coefficient of variation (se/r)* is the ratio of the standard error to the value ( $r$ ) of the indicator, and is a measure of the relative sampling error.
- *Design effect (deff)* is the ratio of the actual variance of an indicator, under the sampling method used in the survey, to the variance calculated under the assumption of simple random sampling based on the same sample size. The *square root of the design effect (deft)* is used to show the efficiency of the sample design in relation to the precision. A *deft* value of 1.0 indicates that the sample design of the survey is as efficient as a simple random sample for a particular indicator, while a *deft* value above 1.0 indicates an increase in the standard error due to the use of a more complex sample design.
- *Confidence limits* are calculated to show the interval within which the true value for the population can be reasonably assumed to fall, with a specified level of confidence. For any given statistic calculated from the survey, the value of that statistic will fall within a range of plus or minus two times the standard error ( $r + 2.se$  or  $r - 2.se$ ) of the statistic in 95 percent of all possible samples of identical size and design.

For the calculation of sampling errors from MICS data, programs developed in CSPro Version 5.0, SPSS Version 21 Complex Samples module and CMRJack<sup>72</sup> have been used.

The results are shown in the tables that follow. In addition to the sampling error measures described above, the tables also include weighted and unweighted counts of denominators for each indicator. Given the use of normalized weights, by comparing the weighted and unweighted counts it is possible to determine whether a particular domain has been under-sampled or over-sampled compared to the average sampling rate. If the weighted count is smaller than the unweighted count, this means that the particular domain had been over-sampled. As explained later in the footnote of Table SE.1, there is an exception in the case of indicators 4.1 and 4.3, for which the unweighted count represents the number of sample households, and the weighted counts reflect the total population.

---

<sup>72</sup> CMRJack is a software developed by FAFO, an independent and multidisciplinary research foundation. CMRJack produces mortality estimates and standard errors for surveys with complete birth histories or summary birth histories. See [http://www.fafo.no/ais/child\\_mortality/index.html](http://www.fafo.no/ais/child_mortality/index.html)

Sampling errors are calculated for indicators of primary interest, for the provincial level, for urban and rural areas, and for all 9 divisions. Three of the selected indicators are based on households members, 10 are based on women, and 3 are based on children under 5. Table SE.1 shows the list of indicators for which sampling errors are calculated, including the base population (denominator) for each indicator. Tables SE.2 to SE.12 show the calculated sampling errors for selected domains.

<b>Table SE.1: Indicators selected for sampling error calculations</b>	
List of indicators selected for sampling error calculations, and base populations (denominators) for each indicator, MICS Punjab, 2014.	
<b>MICS5 Indicator</b>	<b>Base Population</b>
<b>Household members</b>	
4.1 Use of improved drinking water sources	All household members <sup>a</sup>
4.3 Use of improved sanitation	All household members <sup>a</sup>
7.4 Primary school net attendance ratio (adjusted)	Children of primary school age
<b>Women</b>	
- Total fertility rate	Women years of exposure to childbirth during ages 15-49 years
5.1 Adolescent birth rate	Women years of exposure to childbirth during ages 15-19 years
5.3 Contraceptive prevalence rate	Women age 15-49 years who are currently married
5.4 Unmet need	Women age 15-49 years who are currently married
5.5a Antenatal care coverage (1+ times, skilled provider)	Women age 15-49 years with a live birth in the last 2 years
5.5b Antenatal care coverage (4+ times, any provider)	Women age 15-49 years with a live birth in the last 2 years
5.7 Skilled attendant at delivery	Women age 15-49 years with a live birth in the last 2 years
7.1 Literacy rate (young women)	Women age 15-24 years
9.1 Knowledge about HIV prevention (young women)	Women age 15-24 years
<b>Under-5s</b>	
2.1a Underweight prevalence (moderate and severe)	Children under age 5 years
2.1b Underweight prevalence (severe)	Children under age 5 years
3.22 Anti-malarial treatment of children under age 5	Children under age 5 years with fever in the last 2 weeks
<sup>a</sup> To calculate the weighted results of MICS Indicators 4.1 and 4.3, the household weight is multiplied by the number of household members in each household. Therefore the unweighted base population presented in the SE tables reflect the unweighted number of households, whereas the weighted numbers reflect the household population.	

Table SE.2: Sampling errors: Total sample											
Standard errors, coefficients of variation, design effects ( <i>deff</i> ), square root of design effects ( <i>deft</i> ), and confidence intervals for selected indicators, MICS Punjab, 2014.											
	MICS Indicator	MDG Indicator	Value ( <i>r</i> )	Standard error ( <i>se</i> )	Coefficient of variation ( <i>se/r</i> )	Design effect ( <i>deff</i> )	Square root of design effect ( <i>deft</i> )	Weighted count	Unweighted count	Confidence limits	
										Lower bound <i>r</i> - 2 <i>se</i>	Upper bound <i>r</i> + 2 <i>se</i>
<b>Household members</b>											
Use of improved drinking water sources	4.1	7.8	0.94	0.0024	0.0025	4.2	2.0	246,396	38,405	0.939	0.949
Use of improved sanitation	4.3	7.9	0.66	0.0045	0.0068	3.5	1.9	246,396	38,405	0.653	0.671
Primary school net attendance ratio (adjusted)	7.4	2.1	0.58	0.0045	0.0078	2.6	1.6	31,647	31,694	0.569	0.587
<b>Women</b>											
Total fertility rate	-	-	0.03	0.0005	0.0151	-	-	-	-	0.034	0.036
Adolescent birth rate	5.1	5.4	0.34	0.0192	0.0570	-	-	-	-	0.299	0.376
Contraceptive prevalence	5.3	5.3	0.24	0.0024	0.0099	1.7	1.3	53,668	53,668	0.234	0.243
Unmet need	5.4	5.6	0.17	0.0025	0.0145	1.5	1.2	33,047	32,854	0.170	0.180
Antenatal care coverage (1+ times, skilled provider)	5.5a	5.5	0.16	0.0019	0.0118	1.4	1.2	53,668	53,668	0.155	0.162
Antenatal care coverage (4+ times, any provider)	5.5b	5.5	0.10	0.0015	0.0155	1.4	1.2	53,668	53,668	0.093	0.099
Skilled attendant at delivery	5.7	5.2	0.13	0.0018	0.0139	1.5	1.2	53,668	53,668	0.125	0.132
Literacy rate (young women)	7.1	2.3	0.50	0.0055	0.0109	2.6	1.6	21,119	21,241	0.493	0.515
Knowledge about HIV prevention (young women)	9.1	6.3	0.01	0.0007	0.0894	1.4	1.2	21,119	21,241	0.007	0.009
<b>Under-5s</b>											
Underweight prevalence (moderate and severe)	2.1a	1.8	0.34	0.0041	0.0120	2.0	1.4	26,490	26,555	0.329	0.345
Underweight prevalence (severe)	2.1b	1.8	0.11	0.0026	0.0227	1.7	1.3	26,490	26,555	0.108	0.118
Anti-malarial treatment of children under age 5	3.22	6.8	0.01	0.0018	0.1408	1.5	1.2	5,714	5,751	0.009	0.016

**Table SE.3: Sampling errors: Urban**Standard errors, coefficients of variation, design effects (*deff*), square root of design effects (*deft*), and confidence intervals for selected indicators, MICS Punjab, 2014.

					Coefficient of variation (se/r)	Design effect (deff)	Square root of design effect (deft)	Weighted count	Unweighted count	Confidence limits	
	MICS Indicator	MDG Indicator	Value (r)	Standard error (se)						Lower bound r - 2se	Upper bound r + 2se
Household members											
Use of improved drinking water sources	4.1	7.8	0.89	0.0053	0.0060	4.1	2.0	81,222	14,164	0.880	0.901
Use of improved sanitation	4.3	7.9	0.84	0.0055	0.0065	3.2	1.8	81,222	14,164	0.830	0.852
Primary school net attendance ratio (adjusted)	7.4	2.1	0.68	0.0076	0.0113	2.8	1.7	9,359	10,580	0.661	0.691
Women											
Total fertility rate	-	-	0.03	0.0008	0.0274	-	-	-	-	0.028	0.032
Adolescent birth rate	5.1	5.4	0.27	0.0343	0.1283	-	-	-	-	0.199	0.336
Contraceptive prevalence	5.3	5.3	0.27	0.0044	0.0162	2.0	1.4	18,625	20,084	0.262	0.280
Unmet need	5.4	5.6	0.16	0.0045	0.0292	1.9	1.4	11,188	11,873	0.147	0.165
Antenatal care coverage (1+ times, skilled provider)	5.5a	5.5	0.16	0.0032	0.0202	1.5	1.2	18,625	20,084	0.151	0.164
Antenatal care coverage (4+ times, any provider)	5.5b	5.5	0.12	0.0028	0.0237	1.5	1.2	18,625	20,084	0.114	0.125
Skilled attendant at delivery	5.7	5.2	0.14	0.0033	0.0236	1.8	1.4	18,625	20,084	0.135	0.148
Literacy rate (young women)	7.1	2.3	0.52	0.0106	0.0206	3.6	1.9	7,233	7,958	0.494	0.537
Knowledge about HIV prevention (young women)	9.1	6.3	0.01	0.0016	0.1336	1.7	1.3	7,233	7,958	0.009	0.015
Under-5s											
Underweight prevalence (moderate and severe)	2.1a	1.8	0.28	0.0077	0.0277	2.6	1.6	8,147	8,926	0.262	0.292
Underweight prevalence (severe)	2.1b	1.8	0.08	0.0041	0.0530	2.1	1.4	8,147	8,926	0.069	0.086
Anti-malarial treatment of children under age 5	3.22	6.8	0.02	0.0042	0.2702	2.2	1.5	1,757	1,891	0.007	0.024

**Table SE.4: Sampling errors: Rural**Standard errors, coefficients of variation, design effects (*deff*), square root of design effects (*deft*), and confidence intervals for selected indicators, MICS Punjab, 2014.

	MICS Indicator	MDG Indicator	Value ( <i>r</i> )	Standard error ( <i>se</i> )	Coefficient of variation ( <i>se/r</i> )	Design effect ( <i>deff</i> )	Square root of design effect ( <i>deft</i> )	Weighted count	Unweighted count	Confidence limits	
										Lower bound <i>r</i> - 2 <i>se</i>	Upper bound <i>r</i> + 2 <i>se</i>
Household members											
Use of improved drinking water sources	4.1	7.8	0.97	0.0024	0.0025	4.9	2.2	165,174	24,241	0.966	0.975
Use of improved sanitation	4.3	7.9	0.57	0.0060	0.0105	3.6	1.9	165,174	24,241	0.562	0.586
Primary school net attendance ratio (adjusted)	7.4	2.1	0.54	0.0055	0.0102	2.5	1.6	22,287	21,114	0.526	0.548
Women											
Total fertility rate	-	-	0.04	0.0007	0.0178	-	-	-	-	0.036	0.039
Adolescent birth rate	5.1	5.4	0.37	0.0231	0.0622	-	-	-	-	0.326	0.418
Contraceptive prevalence	5.3	5.3	0.22	0.0027	0.0123	1.4	1.2	35,043	33,584	0.216	0.226
Unmet need	5.4	5.6	0.18	0.0030	0.0165	1.3	1.1	21,859	20,981	0.179	0.191
Antenatal care coverage (1+ times, skilled provider)	5.5a	5.5	0.16	0.0023	0.0145	1.3	1.2	35,043	33,584	0.154	0.163
Antenatal care coverage (4+ times, any provider)	5.5b	5.5	0.08	0.0017	0.0207	1.3	1.1	35,043	33,584	0.080	0.087
Skilled attendant at delivery	5.7	5.2	0.12	0.0021	0.0172	1.4	1.2	35,043	33,584	0.117	0.126
Literacy rate (young women)	7.1	2.3	0.50	0.0063	0.0126	2.1	1.4	13,886	13,283	0.486	0.511
Knowledge about HIV prevention (young women)	9.1	6.3	0.01	0.0007	0.1150	1.0	1.0	13,886	13,283	0.005	0.007
Under-5s											
Underweight prevalence (moderate and severe)	2.1a	1.8	0.36	0.0047	0.0131	1.7	1.3	18,343	17,629	0.354	0.373
Underweight prevalence (severe)	2.1b	1.8	0.13	0.0032	0.0248	1.6	1.3	18,343	17,629	0.122	0.135
Anti-malarial treatment of children under age 5	3.22	6.8	0.01	0.0018	0.1559	1.1	1.0	3,957	3,860	0.008	0.015

**Table SE.5: Sampling errors: Bahawalpur division**Standard errors, coefficients of variation, design effects (*deff*), square root of design effects (*deft*), and confidence intervals for selected indicators, MICS Punjab, 2014.

	MICS Indicator	MDG Indicator	Value ( <i>r</i> )	Standard error ( <i>se</i> )	Coefficient of variation ( <i>se/r</i> )	Design effect ( <i>deff</i> )	Square root of design effect ( <i>deft</i> )	Weighted count	Unweighted count	Confidence limits	
										Lower bound <i>r</i> - 2 <i>se</i>	Upper bound <i>r</i> + 2 <i>se</i>
Household members											
Use of improved drinking water sources	4.1	7.8	0.95	0.0072	0.0075	4.1	2.0	25,956	3,690	0.937	0.965
Use of improved sanitation	4.3	7.9	0.54	0.0154	0.0285	3.5	1.9	25,956	3,690	0.509	0.571
Primary school net attendance ratio (adjusted)	7.4	2.1	0.44	0.0157	0.0357	3.3	1.8	3,682	3,288	0.409	0.472
Women											
Total fertility rate	-	-	0.04	0.0017	0.0499	-	-	-	-	0.032	0.039
Adolescent birth rate	5.1	5.4	0.29	0.0509	0.1738	-	-	-	-	0.191	0.395
Contraceptive prevalence	5.3	5.3	0.18	0.0070	0.0388	1.6	1.3	5,369	4,847	0.167	0.195
Unmet need	5.4	5.6	0.19	0.0080	0.0412	1.2	1.1	3,358	3,009	0.178	0.210
Antenatal care coverage (1+ times, skilled provider)	5.5a	5.5	0.12	0.0054	0.0445	1.3	1.1	5,369	4,847	0.110	0.131
Antenatal care coverage (4+ times, any provider)	5.5b	5.5	0.05	0.0034	0.0627	1.1	1.0	5,369	4,847	0.048	0.061
Skilled attendant at delivery	5.7	5.2	0.08	0.0050	0.0591	1.6	1.2	5,369	4,847	0.074	0.094
Literacy rate (young women)	7.1	2.3	0.38	0.0176	0.0466	2.5	1.6	2,102	1,899	0.342	0.413
Knowledge about HIV prevention (young women)	9.1	6.3	0.01	0.0019	0.3243	1.2	1.1	2,102	1,899	0.002	0.010
Under-5s											
Underweight prevalence (moderate and severe)	2.1a	1.8	0.43	0.0134	0.0316	1.9	1.4	2,940	2,590	0.399	0.452
Underweight prevalence (severe)	2.1b	1.8	0.17	0.0099	0.0596	1.8	1.4	2,940	2,590	0.146	0.186
Anti-malarial treatment of children under age 5	3.22	6.8	0.02	0.0078	0.4065	1.3	1.1	455	392	0.004	0.035

**Table SE.6: Sampling errors: DG Khan division**

Standard errors, coefficients of variation, design effects (*deff*), square root of design effects (*deft*), and confidence intervals for selected indicators, MICS Punjab, 2014.

	MICS Indicator	MDG Indicator	Value ( <i>r</i> )	Standard error ( <i>se</i> )	Coefficient of variation ( <i>se/r</i> )	Design effect ( <i>deff</i> )	Square root of design effect ( <i>deft</i> )	Weighted count	Unweighted count	Confidence limits	
										Lower bound <i>r</i> - 2 <i>se</i>	Upper bound <i>r</i> + 2 <i>se</i>
Household members											
Use of improved drinking water sources	4.1	7.8	0.96	0.0063	0.0065	4.3	2.1	23,418	4,051	0.949	0.974
Use of improved sanitation	4.3	7.9	0.45	0.0180	0.0400	5.3	2.3	23,418	4,051	0.414	0.485
Primary school net attendance ratio (adjusted)	7.4	2.1	0.37	0.0150	0.0408	4.3	2.1	3,877	4,409	0.337	0.397
Women											
Total fertility rate	-	-	0.05	0.0021	0.0445	-	-	-	-	0.043	0.052
Adolescent birth rate	5.1	5.4	0.52	0.0744	0.1434	-	-	-	-	0.370	0.668
Contraceptive prevalence	5.3	5.3	0.18	0.0059	0.0334	1.3	1.1	4,563	5,446	0.164	0.188
Unmet need	5.4	5.6	0.25	0.0089	0.0352	1.6	1.2	3,175	3,726	0.235	0.271
Antenatal care coverage (1+ times, skilled provider)	5.5a	5.5	0.16	0.0066	0.0403	1.7	1.3	4,563	5,446	0.151	0.178
Antenatal care coverage (4+ times, any provider)	5.5b	5.5	0.06	0.0044	0.0676	1.7	1.3	4,563	5,446	0.056	0.073
Skilled attendant at delivery	5.7	5.2	0.10	0.0047	0.0448	1.3	1.1	4,563	5,446	0.095	0.114
Literacy rate (young women)	7.1	2.3	0.39	0.0202	0.0524	3.5	1.9	1,682	2,026	0.346	0.426
Knowledge about HIV prevention (young women)	9.1	6.3	0.00	0.0011	0.7431	1.7	1.3	1,682	2,026	0.000	0.004
Under-5s											
Underweight prevalence (moderate and severe)	2.1a	1.8	0.44	0.0112	0.0255	1.8	1.3	3,012	3,546	0.417	0.462
Underweight prevalence (severe)	2.1b	1.8	0.17	0.0086	0.0498	1.8	1.4	3,012	3,546	0.156	0.190
Anti-malarial treatment of children under age 5	3.22	6.8	0.02	0.0047	0.3024	1.2	1.1	757	864	0.006	0.025

**Table SE.7: Sampling errors: Faisalabad division**

Standard errors, coefficients of variation, design effects (*deff*), square root of design effects (*deft*), and confidence intervals for selected indicators, MICS Punjab, 2014.

	MICS Indicator	MDG Indicator	Value ( <i>r</i> )	Standard error ( <i>se</i> )	Coefficient of variation ( <i>se/r</i> )	Design effect ( <i>deff</i> )	Square root of design effect ( <i>deft</i> )	Weighted count	Unweighted count	Confidence limits	
										Lower bound <i>r</i> - 2 <i>se</i>	Upper bound <i>r</i> + 2 <i>se</i>
Household members											
Use of improved drinking water sources	4.1	7.8	0.82	0.0114	0.0138	4.2	2.0	30,970	4,647	0.801	0.846
Use of improved sanitation	4.3	7.9	0.70	0.0131	0.0188	3.8	1.9	30,970	4,647	0.671	0.723
Primary school net attendance ratio (adjusted)	7.4	2.1	0.63	0.0118	0.0188	2.1	1.5	3,640	3,553	0.603	0.650
Women											
Total fertility rate	-	-	0.03	0.0015	0.0439	-	-	-	-	0.031	0.037
Adolescent birth rate	5.1	5.4	0.32	0.0518	0.1637	-	-	-	-	0.213	0.420
Contraceptive prevalence	5.3	5.3	0.21	0.0056	0.0265	1.3	1.1	6,796	6,724	0.202	0.224
Unmet need	5.4	5.6	0.18	0.0075	0.0422	1.5	1.2	4,029	3,997	0.162	0.192
Antenatal care coverage (1+ times, skilled provider)	5.5a	5.5	0.16	0.0053	0.0340	1.4	1.2	6,796	6,724	0.146	0.167
Antenatal care coverage (4+ times, any provider)	5.5b	5.5	0.10	0.0041	0.0390	1.2	1.1	6,796	6,724	0.096	0.112
Skilled attendant at delivery	5.7	5.2	0.13	0.0054	0.0410	1.7	1.3	6,796	6,724	0.121	0.143
Literacy rate (young women)	7.1	2.3	0.52	0.0140	0.0268	2.1	1.5	2,732	2,689	0.494	0.550
Knowledge about HIV prevention (young women)	9.1	6.3	0.01	0.0019	0.2135	1.1	1.0	2,732	2,689	0.005	0.012
Under-5s											
Underweight prevalence (moderate and severe)	2.1a	1.8	0.34	0.0095	0.0281	1.2	1.1	3,210	3,016	0.319	0.357
Underweight prevalence (severe)	2.1b	1.8	0.11	0.0066	0.0610	1.4	1.2	3,210	3,016	0.094	0.121
Anti-malarial treatment of children under age 5	3.22	6.8	0.01	0.0031	0.4021	0.7	0.9	643	599	0.001	0.014



**Table SE.8: Sampling errors: Gujranwala division**

Standard errors, coefficients of variation, design effects (*deff*), square root of design effects (*deft*), and confidence intervals for selected indicators, MICS Punjab, 2014.

	MICS Indicator	MDG Indicator	Value ( <i>r</i> )	Standard error ( <i>se</i> )	Coefficient of variation ( <i>se/r</i> )	Design effect ( <i>deff</i> )	Square root of design effect ( <i>deft</i> )	Weighted count	Unweighted count	Confidence limits	
										Lower bound <i>r</i> - 2 <i>se</i>	Upper bound <i>r</i> + 2 <i>se</i>
Household members											
Use of improved drinking water sources	4.1	7.8	0.95	0.0051	0.0053	3.4	1.8	36,313	6,254	0.939	0.960
Use of improved sanitation	4.3	7.9	0.81	0.0070	0.0087	2.0	1.4	36,313	6,254	0.792	0.820
Primary school net attendance ratio (adjusted)	7.4	2.1	0.71	0.0078	0.0110	1.5	1.2	4,452	4,955	0.693	0.724
Women											
Total fertility rate	-	-	0.03	0.0011	0.0326	-	-	-	-	0.030	0.035
Adolescent birth rate	5.1	5.4	0.26	0.0380	0.1478	-	-	-	-	0.181	0.333
Contraceptive prevalence	5.3	5.3	0.28	0.0053	0.0191	1.3	1.1	8,328	9,232	0.266	0.287
Unmet need	5.4	5.6	0.15	0.0057	0.0386	1.4	1.2	4,901	5,443	0.138	0.161
Antenatal care coverage (1+ times, skilled provider)	5.5a	5.5	0.17	0.0045	0.0272	1.4	1.2	8,328	9,232	0.158	0.176
Antenatal care coverage (4+ times, any provider)	5.5b	5.5	0.11	0.0039	0.0363	1.5	1.2	8,328	9,232	0.100	0.115
Skilled attendant at delivery	5.7	5.2	0.14	0.0044	0.0312	1.5	1.2	8,328	9,232	0.134	0.151
Literacy rate (young women)	7.1	2.3	0.59	0.0104	0.0177	1.7	1.3	3,446	3,816	0.570	0.612
Knowledge about HIV prevention (young women)	9.1	6.3	0.01	0.0018	0.1607	1.1	1.1	3,446	3,816	0.008	0.015
Under-5s											
Underweight prevalence (moderate and severe)	2.1a	1.8	0.24	0.0083	0.0339	1.6	1.3	4,006	4,393	0.228	0.261
Underweight prevalence (severe)	2.1b	1.8	0.07	0.0046	0.0669	1.4	1.2	4,006	4,393	0.059	0.078
Anti-malarial treatment of children under age 5	3.22	6.8	0.01	0.0041	0.2832	1.3	1.1	972	1,089	0.006	0.023

**Table SE.9: Sampling errors: Lahore division**Standard errors, coefficients of variation, design effects (*deff*), square root of design effects (*deft*), and confidence intervals for selected indicators, MICS Punjab, 2014.

	MICS Indicator	MDG Indicator	Value ( <i>r</i> )	Standard error ( <i>se</i> )	Coefficient of variation ( <i>se/r</i> )	Design effect ( <i>deff</i> )	Square root of design effect ( <i>deft</i> )	Weighted count	Unweighted count	Confidence limits	
										Lower bound <i>r</i> - 2 <i>se</i>	Upper bound <i>r</i> + 2 <i>se</i>
Household members											
Use of improved drinking water sources	4.1	7.8	0.98	0.0031	0.0032	2.0	1.4	43,847	4,874	0.969	0.982
Use of improved sanitation	4.3	7.9	0.82	0.0087	0.0107	2.5	1.6	43,847	4,874	0.800	0.835
Primary school net attendance ratio (adjusted)	7.4	2.1	0.64	0.0112	0.0175	2.2	1.5	5,304	3,969	0.618	0.662
Women											
Total fertility rate	-	-	0.03	0.0015	0.0432	-	-	-	-	0.032	0.038
Adolescent birth rate	5.1	5.4	0.31	0.0560	0.1815	-	-	-	-	0.196	0.420
Contraceptive prevalence	5.3	5.3	0.28	0.0072	0.0253	1.7	1.3	9,685	6,630	0.270	0.298
Unmet need	5.4	5.6	0.16	0.0071	0.0434	1.5	1.2	6,024	4,106	0.150	0.178
Antenatal care coverage (1+ times, skilled provider)	5.5a	5.5	0.16	0.0047	0.0290	1.1	1.0	9,685	6,630	0.153	0.172
Antenatal care coverage (4+ times, any provider)	5.5b	5.5	0.12	0.0044	0.0368	1.2	1.1	9,685	6,630	0.112	0.129
Skilled attendant at delivery	5.7	5.2	0.14	0.0050	0.0349	1.4	1.2	9,685	6,630	0.134	0.154
Literacy rate (young women)	7.1	2.3	0.55	0.0172	0.0312	3.3	1.8	3,883	2,724	0.518	0.587
Knowledge about HIV prevention (young women)	9.1	6.3	0.01	0.0023	0.2777	1.7	1.3	3,883	2,724	0.004	0.013
Under-5s											
Underweight prevalence (moderate and severe)	2.1a	1.8	0.31	0.0134	0.0429	2.8	1.7	4,452	3,306	0.285	0.339
Underweight prevalence (severe)	2.1b	1.8	0.10	0.0074	0.0773	2.1	1.4	4,452	3,306	0.081	0.111
Anti-malarial treatment of children under age 5	3.22	6.8	0.01	0.0064	0.4484	2.3	1.5	1,036	777	0.001	0.027

**Table SE.10: Sampling errors: Multan division**Standard errors, coefficients of variation, design effects (*deff*), square root of design effects (*deft*), and confidence intervals for selected indicators, MICS Punjab, 2014.

										Confidence limits	
	MICS Indicator	MDG Indicator	Value ( <i>r</i> )	Standard error ( <i>se</i> )	Coefficient of variation ( <i>se/r</i> )	Design effect ( <i>deff</i> )	Square root of design effect ( <i>deft</i> )	Weighted count	Unweighted count	Lower bound <i>r</i> - 2 <i>se</i>	Upper bound <i>r</i> + 2 <i>se</i>
Household members											
Use of improved drinking water sources	4.1	7.8	0.98	0.0031	0.0031	2.4	1.5	27,788	4,526	0.976	0.988
Use of improved sanitation	4.3	7.9	0.42	0.0145	0.0345	3.9	2.0	27,788	4,526	0.390	0.448
Primary school net attendance ratio (adjusted)	7.4	2.1	0.54	0.0128	0.0239	2.5	1.6	3,884	3,756	0.512	0.563
Women											
Total fertility rate	-	-	0.03	0.0014	0.0411	-	-	-	-	0.031	0.037
Adolescent birth rate	5.1	5.4	0.38	0.0612	0.1619	-	-	-	-	0.256	0.500
Contraceptive prevalence	5.3	5.3	0.24	0.0062	0.0254	1.2	1.1	5,887	5,953	0.232	0.257
Unmet need	5.4	5.6	0.16	0.0064	0.0397	1.1	1.1	3,653	3,622	0.150	0.175
Antenatal care coverage (1+ times, skilled provider)	5.5a	5.5	0.16	0.0063	0.0388	1.7	1.3	5,887	5,953	0.149	0.174
Antenatal care coverage (4+ times, any provider)	5.5b	5.5	0.09	0.0040	0.0452	1.2	1.1	5,887	5,953	0.081	0.097
Skilled attendant at delivery	5.7	5.2	0.12	0.0046	0.0389	1.2	1.1	5,887	5,953	0.110	0.129
Literacy rate (young women)	7.1	2.3	0.49	0.0145	0.0294	2.0	1.4	2,307	2,380	0.466	0.524
Knowledge about HIV prevention (young women)	9.1	6.3	0.01	0.0015	0.2647	0.9	1.0	2,307	2,380	0.003	0.008
Under-5s											
Underweight prevalence (moderate and severe)	2.1a	1.8	0.37	0.0111	0.0302	1.5	1.2	2,884	2,804	0.346	0.391
Underweight prevalence (severe)	2.1b	1.8	0.13	0.0065	0.0514	1.1	1.0	2,884	2,804	0.113	0.139
Anti-malarial treatment of children under age 5	3.22	6.8	0.01	0.0046	0.3336	0.8	0.9	541	515	0.005	0.023

**Table SE.11: Sampling errors: Rawalpindi division**

Standard errors, coefficients of variation, design effects (*deff*), square root of design effects (*deft*), and confidence intervals for selected indicators, MICS Punjab, 2014.

										Confidence limits	
	MICS Indicator	MDG Indicator	Value ( <i>r</i> )	Standard error ( <i>se</i> )	Coefficient of variation ( <i>se/r</i> )	Design effect ( <i>deff</i> )	Square root of design effect ( <i>deft</i> )	Weighted count	Unweighted count	Lower bound <i>r</i> - 2 <i>se</i>	Upper bound <i>r</i> + 2 <i>se</i>
Household members											
Use of improved drinking water sources	4.1	7.8	0.95	0.0104	0.0110	7.9	2.8	21,767	3,756	0.925	0.966
Use of improved sanitation	4.3	7.9	0.82	0.0110	0.0134	3.1	1.8	21,767	3,756	0.799	0.843
Primary school net attendance ratio (adjusted)	7.4	2.1	0.75	0.0107	0.0142	1.5	1.2	2,298	2,403	0.732	0.775
Women											
Total fertility rate	-	-	0.03	0.0013	0.0449	-	-	-	-	0.027	0.032
Adolescent birth rate	5.1	5.4	0.23	0.0488	0.2165	-	-	-	-	0.128	0.323
Contraceptive prevalence	5.3	5.3	0.27	0.0085	0.0317	1.9	1.4	5,086	5,169	0.251	0.284
Unmet need	5.4	5.6	0.15	0.0080	0.0550	1.6	1.3	3,067	3,117	0.129	0.161
Antenatal care coverage (1+ times, skilled provider)	5.5a	5.5	0.15	0.0057	0.0369	1.3	1.1	5,086	5,169	0.143	0.165
Antenatal care coverage (4+ times, any provider)	5.5b	5.5	0.12	0.0054	0.0438	1.4	1.2	5,086	5,169	0.112	0.134
Skilled attendant at delivery	5.7	5.2	0.14	0.0058	0.0417	1.5	1.2	5,086	5,169	0.128	0.152
Literacy rate (young women)	7.1	2.3	0.54	0.0166	0.0306	2.1	1.5	1,885	1,918	0.510	0.576
Knowledge about HIV prevention (young women)	9.1	6.3	0.02	0.0035	0.2169	1.5	1.2	1,885	1,918	0.009	0.023
Under-5s											
Underweight prevalence (moderate and severe)	2.1a	1.8	0.21	0.0105	0.0492	1.4	1.2	2,079	2,189	0.193	0.235
Underweight prevalence (severe)	2.1b	1.8	0.06	0.0058	0.1056	1.4	1.2	2,079	2,189	0.044	0.067
Anti-malarial treatment of children under age 5	3.22	6.8	0.01	0.0049	0.3660	0.7	0.8	350	366	0.004	0.023

**Table SE.12: Sampling errors: Sahiwal division**

Standard errors, coefficients of variation, design effects (*deff*), square root of design effects (*deft*), and confidence intervals for selected indicators, MICS Punjab, 2014.

	MICS Indicator	MDG Indicator	Value ( <i>r</i> )	Standard error ( <i>se</i> )	Coefficient of variation ( <i>se/r</i> )	Design effect ( <i>deff</i> )	Square root of design effect ( <i>deft</i> )	Weighted count	Unweighted count	Confidence limits	
										Lower bound <i>r</i> - 2 <i>se</i>	Upper bound <i>r</i> + 2 <i>se</i>
Household members											
Use of improved drinking water sources	4.1	7.8	0.97	0.0066	0.0068	4.6	2.2	17,255	3,054	0.957	0.983
Use of improved sanitation	4.3	7.9	0.62	0.0177	0.0287	4.1	2.0	17,255	3,054	0.583	0.653
Primary school net attendance ratio (adjusted)	7.4	2.1	0.54	0.0139	0.0256	2.0	1.4	2,272	2,554	0.515	0.571
Women											
Total fertility rate	-	-	0.04	0.0018	0.0477	-	-	-	-	0.034	0.041
Adolescent birth rate	5.1	5.4	0.37	0.0721	0.1976	-	-	-	-	0.221	0.509
Contraceptive prevalence	5.3	5.3	0.23	0.0072	0.0312	1.3	1.1	3,685	4,347	0.217	0.246
Unmet need	5.4	5.6	0.17	0.0085	0.0490	1.3	1.2	2,265	2,645	0.157	0.191
Antenatal care coverage (1+ times, skilled provider)	5.5a	5.5	0.18	0.0063	0.0343	1.2	1.1	3,685	4,347	0.171	0.197
Antenatal care coverage (4+ times, any provider)	5.5b	5.5	0.09	0.0048	0.0513	1.2	1.1	3,685	4,347	0.084	0.103
Skilled attendant at delivery	5.7	5.2	0.15	0.0072	0.0493	1.8	1.3	3,685	4,347	0.132	0.161
Literacy rate (young women)	7.1	2.3	0.47	0.0168	0.0361	1.9	1.4	1,441	1,702	0.431	0.499
Knowledge about HIV prevention (young women)	9.1	6.3	0.00	0.0014	0.3327	0.8	0.9	1,441	1,702	0.001	0.007
Under-5s											
Underweight prevalence (moderate and severe)	2.1a	1.8	0.36	0.0109	0.0302	1.2	1.1	1,980	2,283	0.338	0.381
Underweight prevalence (severe)	2.1b	1.8	0.12	0.0074	0.0606	1.2	1.1	1,980	2,283	0.107	0.136
Anti-malarial treatment of children under age 5	3.22	6.8	0.00	0.0017	1.0088	0.9	1.0	495	559	0.000	0.005

**Table SE.13: Sampling errors: Sargodha Division**

Standard errors, coefficients of variation, design effects (*deff*), square root of design effects (*deft*), and confidence intervals for selected indicators, MICS Punjab, 2014.

	MICS Indicator	MDG Indicator	Value ( <i>r</i> )	Standard error ( <i>se</i> )	Coefficient of variation ( <i>se/r</i> )	Design effect ( <i>deff</i> )	Square root of design effect ( <i>deft</i> )	Weighted count	Unweighted count	Confidence limits	
										Lower bound <i>r</i> - 2 <i>se</i>	Upper bound <i>r</i> + 2 <i>se</i>
Household members											
Use of improved drinking water sources	4.1	7.8	0.95	0.0090	0.0095	5.6	2.4	19,082	3,553	0.927	0.963
Use of improved sanitation	4.3	7.9	0.61	0.0180	0.0293	4.9	2.2	19,082	3,553	0.578	0.650
Primary school net attendance ratio (adjusted)	7.4	2.1	0.61	0.0145	0.0239	2.5	1.6	2,238	2,807	0.578	0.636
Women											
Total fertility rate	-	-	0.03	0.0016	0.0514	-	-	-	-	0.028	0.034
Adolescent birth rate	5.1	5.4	0.51	0.0690	0.1363	-	-	-	-	0.368	0.644
Contraceptive prevalence	5.3	5.3	0.20	0.0084	0.0418	2.3	1.5	4,270	5,320	0.184	0.218
Unmet need	5.4	5.6	0.18	0.0086	0.0479	1.6	1.3	2,574	3,189	0.162	0.197
Antenatal care coverage (1+ times, skilled provider)	5.5a	5.5	0.16	0.0058	0.0371	1.3	1.2	4,270	5,320	0.144	0.167
Antenatal care coverage (4+ times, any provider)	5.5b	5.5	0.07	0.0041	0.0560	1.3	1.1	4,270	5,320	0.065	0.081
Skilled attendant at delivery	5.7	5.2	0.12	0.0052	0.0421	1.3	1.2	4,270	5,320	0.113	0.134
Literacy rate (young women)	7.1	2.3	0.47	0.0163	0.0351	2.2	1.5	1,642	2,087	0.433	0.498
Knowledge about HIV prevention (young women)	9.1	6.3	0.01	0.0015	0.2209	0.7	0.8	1,642	2,087	0.004	0.010
Under-5s											
Underweight prevalence (moderate and severe)	2.1a	1.8	0.35	0.0133	0.0382	1.9	1.4	1,927	2,428	0.322	0.375
Underweight prevalence (severe)	2.1b	1.8	0.11	0.0092	0.0819	2.1	1.4	1,927	2,428	0.094	0.131
Anti-malarial treatment of children under age 5	3.22	6.8	0.01	0.0040	0.4050	1.0	1.0	465	590	0.002	0.018