

**Urban Inequalities in antenatal care and facility birth for 33 countries:
Evolution over time**

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Abstract

With the urban population increasing in both number and percentage, urban health inequalities have been rising up the research agenda. A crucial aspect of health, both for the MDGs and the post-2015 agenda, is maternal health. This paper looks at inequalities in the percentage receiving sufficient antenatal care and children born within a facility and assesses how these have changed over time. Countries which have been most successful in reducing inequalities while increasing the proportion of mothers with these services are, and countries which have not succeeded in this way also assessed. Using 99 Demographic and Health Surveys from 33 countries, new measures of wealth were constructed using Principal Components Analysis, applying only to urban residents, based on the assets that the household owns. Various inequality measures were used including concentration indices. Results indicate that countries were diverse in the evolution of inequality with some successfully reducing it and others showing an increase over time. Policies to improve maternal health should tackle inequalities, while still increasing the overall level of service use in the whole urban population.

Introduction

The theme of World Health Day 2010 was focused around the theme of urbanisation and health, and led into a year-long focus on the issue (World Health Organisation 2010). The increasing emphasis on the health in urban areas highlights the specific and novel hurdles that are faced by those who reside in this environment. Over the past fifteen years there has been a focus on maternal health, mainly inspired by the Millennium Development Goals, with large improvements in indicators including maternal mortality, antenatal care coverage (ANC) and skilled attendance at birth (United Nations 2009). A great proportion of women than ever are giving birth in a facility and receiving a sufficient level of antenatal care. Yet there are still many women who do not receive the care that they need.

It was always widely thought that mothers in urban areas invariably had better maternal health than those in rural locations. However recent research has indicated that the urban advantage is not as ubiquitous as originally conceived, with poorer women in urban areas sometimes having worse maternal health than their rural counterparts (Matthews et al. 2010). This links closely with increasing international attention on inequalities in health, inspired by the Millennium Development Goals. Many studies have explored inequalities in health over whole countries, highlighting the large differences between rich and poor, measured in a variety of ways and using a wide number of outcomes (e.g. Countdown 2008 Equity Analysis Group 2008; Barros et al. 2012; Victora et al. 2012). Most of these papers show great disparities between rich and poor, but the detail of inequalities within urban and within rural areas, which are of great interest in themselves, is somewhat lost in these complete country analyses.

The aim of this paper is to focus only on urban areas and to examine equity in maternal health over time in a wide range of lower and middle income settings. This will highlight how equity in urban areas has changed and evolved over time and can be related to specific policies that have increased or decreased inequalities. These can be used to inform policy decisions in order to attempt to ensure equitable improvements in maternal health as urbanisation continues at pace.

The UN estimated in 2008 that the world's urban population surpassed the rural (Department of Economic and Social Affairs Population Division 2008). In lower income countries it is expected that there will be more people living in urban areas than in rural

areas by 2020 (Department of Economic and Social Affairs Population Division 2008). Coupled with a growing population this inevitably means that the numbers of urban births will increase. Many urban residents can access health care, but it is important to acknowledge the heterogeneity of the characteristics of those in urban areas. Differentials in wealth, knowledge and location all have a large influence on maternal health. High levels of urbanisation are associated with much exclusion from care for many mothers, with high levels of child and maternal mortality and morbidity amongst the poor as the health service provision has not kept pace with population growth. Montgomery (2009) has acknowledged the need to treat urban areas separately from the rest of the country, stating that 'disaggregation is essential if policies are to be properly formed and health programs targeted to those most in need' (p.2).

Inequality is a key aspect of the post-2015 development agenda (United Nations 2013). The current Millennium Development Goals, although successful in focusing resources on specific targets and goals have been criticised for a lack of focus on equity (e.g. Vandemoortele 2011). The taking of population averages to monitor progress to these goals mean that it is possible that inequality can increase, even while targets are met (Gwatkin 2002). Inequality in urban areas is of increasing concern, with differentials between rich and poor, and especially to those who live in slum areas, widening in many countries (Magadi, Zulu and Brockerhoff 2003; Say and Raine 2007).

Although more studies are showing the magnitude of intra-urban differentials there has been little focus on how inequalities in maternal care have developed and evolved over time. In part this has been due to a lack of available data. However, the Demographic and Health Survey (DHS) program now have a number of countries with 3 or more surveys over at least a 10 year period that can be analysed to assess if inequalities are increasing or decreasing. In some countries these surveys stretch back to the early 1990s and cover a period of almost 20 years – a period that includes large changes in the urban population in terms of numbers and composition.

This paper aims to highlight trends in inequality over time in facility births and antenatal care for 33 lower income countries from around the globe that have this time series of data. It will then group countries into typologies based on their current inequality profiles and the observed changes in inequalities over time.

Data

The datasets chosen include all countries that have had three or more standard DHS surveys conducted since 1990 (until January 2013). This cut-off date was chosen due to surveys before this date not having enough information about assets to be able to fully calculate the measure of wealth used in the analysis. For countries with more than three surveys over this period three were chosen – the most recent, the oldest and a survey close to the middle of the period. In total 99 surveys were analysed from 33 countries. A full list of these are shown in Table 1.

---Table 1 about here---

Most DHS record detailed information about births that have occurred to each surveyed woman aged 15-49 in the five years prior to the survey date. However some surveys use different reference periods, such as in the last three years. Restricting all surveys to births in the three years prior to the survey was considered, but small urban sample sizes in some surveys resulted in the full sample being used in all countries. Hence the results for different countries are not comparable for the time period that they refer to before the survey date.

The detailed information collected about the birth includes the location that the birth occurred and the antenatal care received during pregnancy. The place of birth was recoded into a binary response of home birth or facility birth. The number of visits for antenatal care was recoded, again into binary, into those who had 4 or more antenatal care visits (sufficient care) and those who did not. Only urban dwellers were included in the study. Survey design weights, to correct for the differential chances of an individual being selected into the survey, were used at all stages of the analysis.

Inequalities in the DHS

Measuring wealth in the DHS has been the subject of much debate, as no income or expenditure is recorded. The common method to obtain a measure of wealth is through the construction of an asset index (see Filmer and Pritchett (1998) and Rutstein and Johnson (2004) for more information). This uses the ownership of a list of assets (such as TVs, radios, cars), services provided to the house (water source, electricity, toilet facility) and the construction material used in the household for the wall, floor and roof. Using these assets

through the calculation of a Principal Component Analysis (PCA) the asset index is formed at the household level. This is usually ranked and divided into quintiles. Most DHS datasets now include the wealth index automatically. Yet this index is formed at the country level and ignores the fact that assets do not represent an invariant amount of wealth over the whole country. For instance a bicycle may indicate wealth in a rural area, but could be seen as a more rudimentary asset in an urban area.

The fact that the wealth quintiles are calculated at the country level can lead to some misinterpretation of inequalities. This is due to the relative proportions of urban and rural dwellers within each of the quintiles. An example of this can be seen in Ethiopia in 2011. Urban dwellers only form 12.9% of the population according to the DHS, but represent 71.7% of those in the richest quintile. Overall 84.2% of those from urban areas are classified as being in the richest quintile of the country, compared to 4.9% of those from rural areas. As a result the richest wealth quintile represents the very richest rural dwellers, but most of the urban dwellers, while the poorest wealth quintile only contains those from urban areas who are the very poorest. The implication of this is that inequalities calculated by wealth for urban areas using countrywide asset indices may be either larger or smaller than if there were 20% of the urban population within each quintile. The inequality results estimated will therefore be misleading.

In order to overcome the issues with the different weights for assets in urban and rural locations as well as the misleading inequality measures the asset index can be calculated in a different manner. Rutstein (2008a) explains this, with the PCA and associated rankings conducted only for those in urban areas. This allows the weighting of the assets to be specific to urban dwellers and 20% of the urban household population being placed in each quintile. Hence any inequality measures will be based on comparing the same proportions of the population against each other. These new urban only wealth measures were calculated for each of the surveys used in this analysis.

Measuring Inequalities

There are a number of ways that inequalities can be measured. The two most common are the least sophisticated – simply taking the difference in the percentages between rich and poor or calculating the ratio between rich and poor. Although these methods are simple to interpret, a criticism is that they do not take account of the full range of the wealth

spectrum. The percentage of those in the middle wealth groups who receive health care is also of great interest. In order to take account of the full range of wealth the concentration index was calculated in addition to the difference and ratio, using the continuous wealth measure of the first factor score from the PCA.

The concentration index is The CI is defined as twice the overall area between the concentration curve and the line of equity, where the concentration curve shows the cumulative distribution of a health outcome against individuals ranked from poorest to richest (in this case based on the asset index). The CI ranges from -1 to +1, with an index of zero representing complete equality. Unlike ratio estimates of inequality the CI takes into account SBA coverage for the whole range of wealth and not only in the richest and poorest quintiles. A positive CI indicates that the rich are more likely to obtain care than the poor, while a negative CI indicates the opposite (see O'Donnell et al (2008) for more information).

Results

Births in a Facility

There is great heterogeneity between countries with regard to the percentage of babies delivered in a hospital in urban areas. The country with the lowest percentage is Bangladesh, where only 20.4% of births were in a facility in 1993, increasing to 30.6% in 2007. At the other end of the spectrum there are the Dominican Republic and Armenia, where almost 100% of births were in a facility. Figure 1 shows the results for each of the three time points for each country and indicates that in most countries the percentage with a facility birth has increased over time. Exceptions are Haiti, Niger, Kenya, Madagascar, Uganda, Tanzania and Zimbabwe. However in all countries except Haiti and Zimbabwe the reductions are within the margin of error. The actual percentages are also shown in Appendix 1.

---Figure 1 about here---

The percentage of infants in urban areas delivered in a facility varied widely by wealth quintile, as expected. Figure 2 shows the percentage of facility births for the highest and lowest quintiles for each survey analysed. It is clear from this that there are large differences in many countries between the richest and poorest living in urban areas. Indeed, to take an extreme, in Cambodia in 2005 almost 98% of the richest quintile delivered in a hospital, compared with 8% of the poorest, a difference of almost 90%. This shows severe inequality.

Other surveys that show a difference between rich and poor of over 70% are Cambodia in 2000, Nepal in 1996, Bangladesh in 2007 and Ethiopia in 2005. It is noticeable that these countries are those with a lower level of overall service (i.e. to the left of Figure 2). Those countries with a higher level of overall service, such as Jordan, Dominican Republic and Armenia, do not have much inequality between rich and poor.

---Figure 2 about here---

It is interesting to note that in all surveys bar Bangladesh (1993) and Madagascar (1992 and 2003) the richest quintile had over 60% facility births, even when the overall percentage was well below this amount. Nepal is a good example – in 1996 the overall percentage with a facility birth was 43.3%, but almost 90% of infants in the richest quintile were delivered in a facility. A further aspect is that there have been recently large increases in the percentage with a facility birth in the poorest quintile. This has happened in a number of countries, including Nepal, Rwanda, Egypt, Cambodia and Bolivia.

Figure 2 only shows the percentage of facility births in the top and bottom urban quintiles. However the percentages within the other quintiles are also of interest, to see the distribution across groups. Figure 3 shows this for the latest survey for each country highlighting the inequalities between quintiles. From this it is possible to see in which countries the rich have only benefited from improvements in care, and in which the poor have been left behind. For example, in Bangladesh there is a large gap between the richest and the second richest quintile, with smaller gaps between the remaining quintiles. In comparison Benin indicates that all quintiles except for the poorest have an above average percentage delivered in a facility, with the poorest lagging greatly. Rwanda has a similar overall level of facility births than Benin, but the profile of the quintiles is very different.

---Figure 3 about here---

Finally the Concentration Index was calculated for all surveys in all countries. This is shown in Table 2 and in Figure 4. The results are as expected in many respects – the countries with lower levels of facility births show the greatest inequality, while countries which have almost universal coverage of births within a facility have the lowest inequality. This is partly due to the properties of the concentration index for a binary variable, where the maximum value it

can take decreases as the overall proportion of the outcome variable increases. Hence the decrease in inequality that the fall in the CI indicates may simply be an artefact of this.

---Table 2 and Figure 4 about here---

Yet it is illuminating to study the differences within countries and for countries with a similar level of facility births. Two countries are clearly highlighted in Figure 4. Firstly Bangladesh has a much higher inequality than in other countries, mainly due to the low proportion of facility births in the country. The second country is Cambodia, which in the first two rounds of the survey had extremely high inequality (in 2000 and 2005). By 2010, in the third survey round, this had fallen to a lower inequality level. A number of countries, from Cameroon to Bolivia have got a similar level of facility births in the latest survey (between 82% and 88%) so the CI can be compared. There is some variation, with Benin having the highest inequality and Zimbabwe the least. Similarly other countries have a similar level of facility births but different inequality levels – such as Madagascar and Nigeria which have low and high inequality respectively.

Sufficient Antenatal Care

Antenatal care tests a different aspect of the health system in urban areas. Facility births can be the first contact an individual has with the health system throughout the pregnancy and the facility itself may be of variable quality. Antenatal care, and especially four or more visits, indicates a more consistent interaction with the health system and, potentially, a better organised and higher standard of care.

Figure 5 and Appendix 1 show the overall results for the percentage of urban women who received sufficient ANC in the three survey rounds for each country. From this it is simple to observe that, in comparison to facility births, the percentage with sufficient ANC is a lot lower. The order of the countries is different to that seen before, with Niger having the lowest percentage in the most recent round, and Egypt the highest, at about 80%. There is clearly a lot of variation between surveys, with many countries showing a large fall in the percentage over time. Indeed in 13 of the 33 countries the most recent survey round indicated the lowest percentage of sufficient ANC. This may be due to an actual fall in urban areas or the definition of what constitutes an ANC visit changing over time, or being interpreted differently.

---Figure 5 about here---

The differences between the richest and poorest quintiles again show that there are large differences between the extremes of the wealth spectrum (Figure 6). However the differences are not as large as seen for the facility births for countries with a lower level of sufficient ANC, yet the inequalities are larger for those with a higher level. Countries that indicate large decreases in inequality include Cambodia, Armenia and Egypt.

---Figure 6 about here---

Again the individual quintiles for the latest survey are of interest and are shown in Figure 7. As before there is a clear gradation of women receiving sufficient antenatal care from the poorest to the richest. The only country that does not follow this trend is Rwanda, where the poorest are more likely to receive sufficient ANC than the two richer quintiles directly above them. Again there are major differences in the spread of results over the quintiles. Both Rwanda and Bangladesh have a similar overall percentage of women obtaining ANC, but Bangladesh has major differences between each quintile. In Rwanda, on the other hand, only the top decile has a much increased percentage. At the other end of the spectrum, both Peru and Egypt have about 80% of women receiving sufficient antenatal care. However in Egypt the poor are not benefitting from this as much as the rest of the population, while in Peru the results are more equitable.

---Figure 7 about here---

The final graph (Figure 8) shows the changes in the Concentration Indices over time, also displayed in Table 3. In comparison to Figure 4 there is less of a pattern shown as coverage increases. Indeed, Rwanda has less inequality than Turkey in the latest rounds of the survey, even though it has a much lower percentage of women receiving antenatal care. Egypt shows a high level of inequality for a country with the highest level of women with sufficient antenatal care. Again it is clear that two countries, Nepal and Cambodia, have reduced the inequality seen in urban areas considerably over the period of the analysis, in a similar manner to that seen for facility births.

---Table 3 and Figure 8 about here---

Discussion

Facility births, in the vast majority of situations, are preferable to home births (Pagel et al. 2009). Although the proportion of women who given birth at home in many countries analysed here is quite low, increasing this percentage further in urban areas will further reduce maternal mortality (Ronsmans and Graham 2006). This study highlights, for a wide selection of countries over time, inequalities within specific contexts. The barriers to care in urban areas can be quite specific and usually revolve around the ability to pay for care. By using context-specific socioeconomic measures the true inequalities within urban areas can be clearly observed. Many previous studies have investigated maternal health inequalities (Limwattananon, Tangcharoensathien and Sirilak 2011; Barros et al. 2012; Victora et al. 2012), although mainly on a countrywide basis, while this analysis highlights the plight of the urban poor more effectively.

Antenatal care is a crucial part of the continuum of care for mothers. Regular and effective checks throughout pregnancy are able to highlight issues that may need closer attention as well as prepare the mother for the birth. The WHO has advised that each woman should have four visits during pregnancy. In urban areas the facilities to do this level of care are often missing, with few qualified personnel available to give the care that is needed, while the care that is on offer is usually at too high a price for the majority of poorer women to obtain.

The results highlight interesting trends, both for facility births and for sufficient ANC. Cambodia, Nepal and Rwanda have had large increases in the percentage of children born in facilities alongside falling inequality, especially in the most recent survey, while the same is seen for Cambodia and Nepal for sufficient ANC. These are the countries with the largest percentage falls in their maternal mortality ratio (MMR) between 1995 and 2010 out of the countries in this analysis (World Health Organisation et al. 2012). The only country with an estimated increase in maternal mortality over this period was Zimbabwe which has inequality in a context of falling percentages of facility birth and women receiving the care that they need. The urban area is highlighting issues within the wider country and could be seen as a microcosm of the problems with regard to maternal health across the whole country.

Exclusion from having a facility birth either due to cost, distance or a lack of available beds increases the chances of death during and immediately after the birth. Identifying which women are failing to get the care that they need is vital to improve maternal health and this study helps to highlight those countries and areas which have the greatest inequalities and should be targeted to improve access for those who need it most. In certain countries the poor are still left behind and have not had relative increases over time. For instance, in India there has been little convergence between rich and poor, with the ratios between rich and poor in both urban areas larger in 2004-5 than in 1992-3. Other countries, such as Haiti indicate declining inequality, although it remains at a very high level (both absolute and relative).

An interesting observation is the difference between countries with varying levels of facility birth. Those with low percentages (e.g. Ethiopia, Bangladesh and Niger) have increasing differences between rich and poor in urban areas. For those in the middle of the distribution (e.g. Ghana, Cameroon, Bolivia) the urban inequalities are not increasing and in some cases are actually decreasing. It could be hypothesised that as the percentage of a service increase from a low level inequalities are first seen in urban areas while rural areas do not have a large change at all. As facility birth increases in prevalence the inequalities are seen more in rural areas as those in urban areas have improved access. This relates to the inverse equity hypothesis, where those who need care most are usually the last to receive it (Victora et al. 2000). In urban areas there is still inequality, but it soon becomes the very poorest only who don't have care.

The results presented estimates of inequality based on asset quintiles. The development of these are based on a standard methodology (Rutstein and Johnson 2004; Rutstein 2008b). The assets included in the index differ between countries due to availability, and hence the quintiles studied are likely to differ from those used in other studies due to the inclusion of different assets. Furthermore the assets included in each country differ over time, so comparability over time is difficult. However, the measures used give the percentage of children born in a facility or with sufficient ANC for the poorest and richest relative to the rest of those in the population. The asset index is a relative measure of wealth and should be treated as such. A further limitation is in the designation of an urban area. This is supplied in the DHS dataset but there is no standard definition of what constitutes an urban - and these may differ between surveys. Thus two countries may have very different definitions of

urban/rural. Related to this some of the children classified as being in urban areas may have been born in rural villages where the mother went back to the family home to give birth, or the family has moved to the urban centre since the birth.

The analysis presented here omits two important factors that may further link the inequalities to maternal health. The first is that all facilities were grouped together rather than split by the type of provider, such as public, private and other. This was conducted due to space and for clarity, although it is acknowledged that some facility births are no safer than a home birth. This leads to the second factor, of quality. No assessment of quality was undertaken, although it is highly likely that the poorest in both urban and rural areas will obtain the poorest quality care (Say and Raine 2007; Fotso, Ezeh and Oronje 2008). Antenatal care may vary widely with regard to what has been obtained by the pregnant mother – in some cases it may be a cursory examination, in others it may be detailed.

Conclusions

These results have clear policy implications. There is no 'one-size-fits-all' solution to increasing the numbers of deliveries in a facility, increasing the proportion of women getting sufficient ANC nor to reducing inequalities. Each country must implement policies which address the situation that they face, with most needing to target different policies in different contexts. In urban areas it is usually the poorest who are being left behind – specific policies are needed to target this group, possibly through specific exemptions from payment or improving infrastructure in the poorest areas of cities. Countries which have managed to improve care greatly of women in urban areas, such as Cambodia and Nepal, should be studied to examine what they have implemented which have reduced inequalities to the extent that they have. Other countries, such as Nigeria and Zimbabwe, have not performed well. It is possible to have rapid increases in facility births and antenatal care which affect all women, irrespective of wealth.

Finally, the wealth quintiles calculated just for urban areas in this study highlight the inequalities within these areas much more effectively than the standard wealth quintiles calculated over the whole country. More area level wealth measures are required in order to study wealth at a smaller area. This study shows that it can be done to illuminate specific inequalities within areas. Further work should be completed to highlight inequalities at a

range of levels to ensure that women at most need in whatever context received the care that they need and deserve.

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Table 1: List of countries and survey years included in analysis

Country	Year	Country	Year
Armenia	2000, 2005, 2010	Madagascar	1992, 2003-04, 2008-09
Bangladesh	1993-94, 1999-00, 2007	Malawi	1992, 2000, 2010
Benin	1996, 2001, 2006	Mali	1995-96, 2001, 2006
Bolivia	1994, 2003, 2008	Namibia	1992, 2000, 2006-07
Burkina Faso	1993, 2003, 2011	Nepal	1996, 2001, 2011
Cambodia	2000, 2005, 2010	Niger	1992, 1998, 2006
Cameroon	1991, 1998, 2004	Nigeria	1999, 2004, 2008
Colombia	1990, 2000, 2010	Peru	1991-92, 2000, 2007-08
Dominican Republic	1991, 2002, 2007	Philippines	1993, 2003, 2008
Egypt	1992, 2000, 2008	Rwanda	1992, 2000, 2010-11
Ethiopia	2000, 2005, 2011	Senegal	1992-93, 2005, 2010-11
Ghana	1993, 2003, 2008	Tanzania	1991-92, 1999, 2010
Haiti	1994-95, 2000, 2005-06	Turkey	1993, 1998, 2003
India*	1992-93, 1998-99, 2005-06	Uganda	1995-96, 2000-01, 2006
Indonesia	1991, 1997, 2007	Zambia	1992, 2001-02, 2007
Jordan	1997, 2002, 2007	Zimbabwe	1994, 2005-06, 2010-11
Kenya	1993, 2003, 2008-09		

* In India the survey conducted was the National Family Health Survey, a DHS equivalent

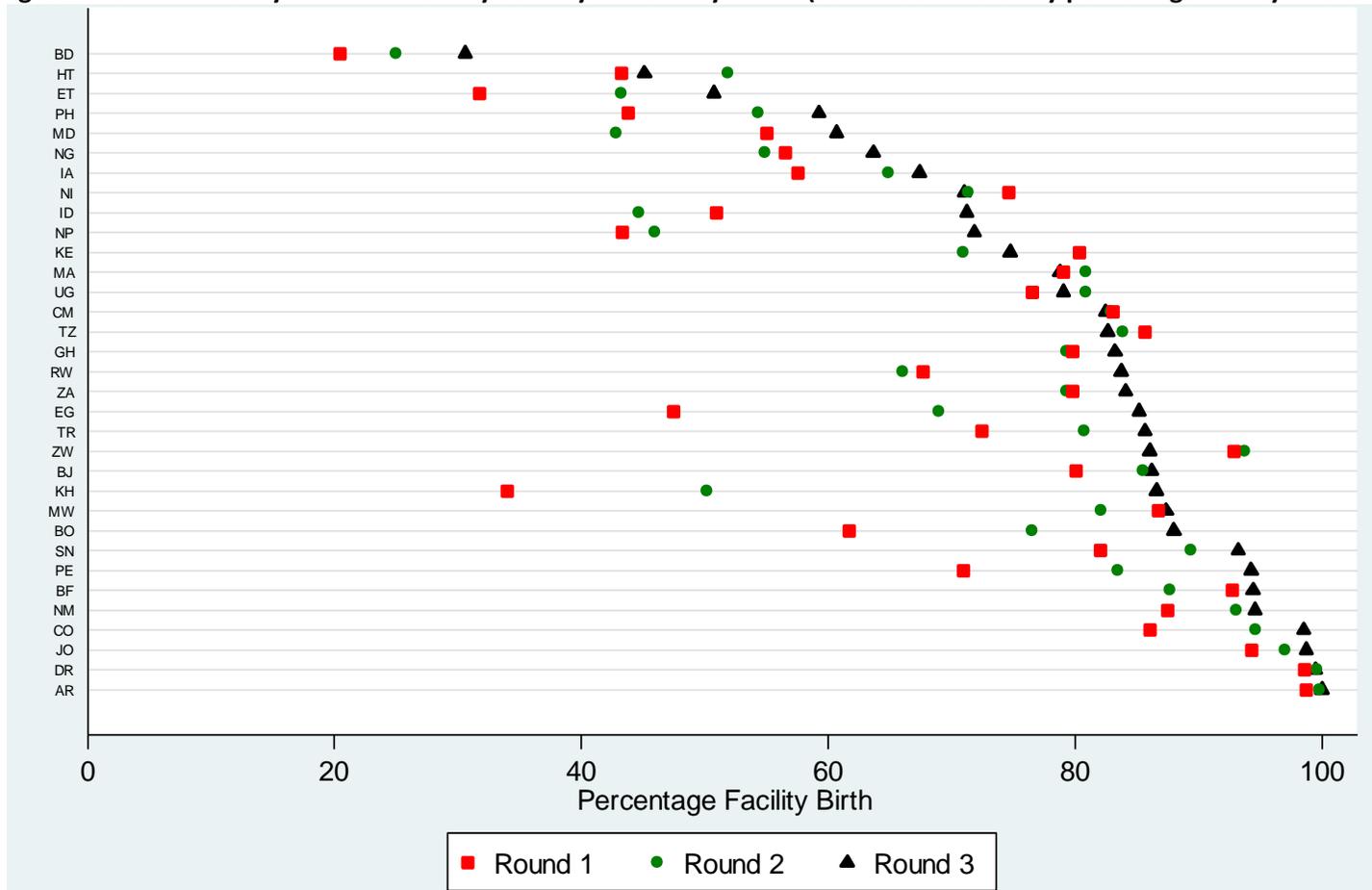
Table 2: Concentration Indices for Facility Births by survey round

	<i>Round 1</i>	<i>Round 2</i>	<i>Round 3</i>
Bangladesh	0.521	0.456	0.425
Ethiopia	0.246	0.359	0.260
Haiti	0.256	0.169	0.239
Philippines	0.289	0.200	0.209
Madagascar	0.044	0.134	0.129
Nigeria	0.192	0.268	0.225
India	0.186	0.144	0.168
Indonesia	0.235	0.118	0.141
Nepal	0.323	0.291	0.136
Niger	0.083	0.107	0.130
Kenya	0.073	0.135	0.120
Uganda	0.097	0.097	0.109
Mali	0.103	0.082	0.088
Cameroon	0.087	0.041	0.075
Ghana	0.082	0.092	0.063
Rwanda	0.146	0.170	0.080
Zambia	0.088	0.103	0.071
Egypt	0.219	0.134	0.069
Turkey	0.130	0.097	0.082
Tanzania	0.033	0.055	0.090
Benin	0.143	0.105	0.105
Cambodia	0.474	0.393	0.084
Malawi	0.045	0.072	0.055
Bolivia	0.216	0.129	0.058
Senegal	0.056	0.039	0.027
Zimbabwe	0.024	0.019	0.045
Peru	0.137	0.086	0.031
Burkina Faso	0.021	0.059	0.028
Namibia	0.053	0.026	0.024
Colombia	0.075	0.029	0.008
Jordan	0.016	0.010	0.005
Dominican Republic	0.004	0.002	0.003
Armenia	0.008	-0.001	0.000

Table 3: Concentration Indices for Sufficient Antenatal Care by survey round

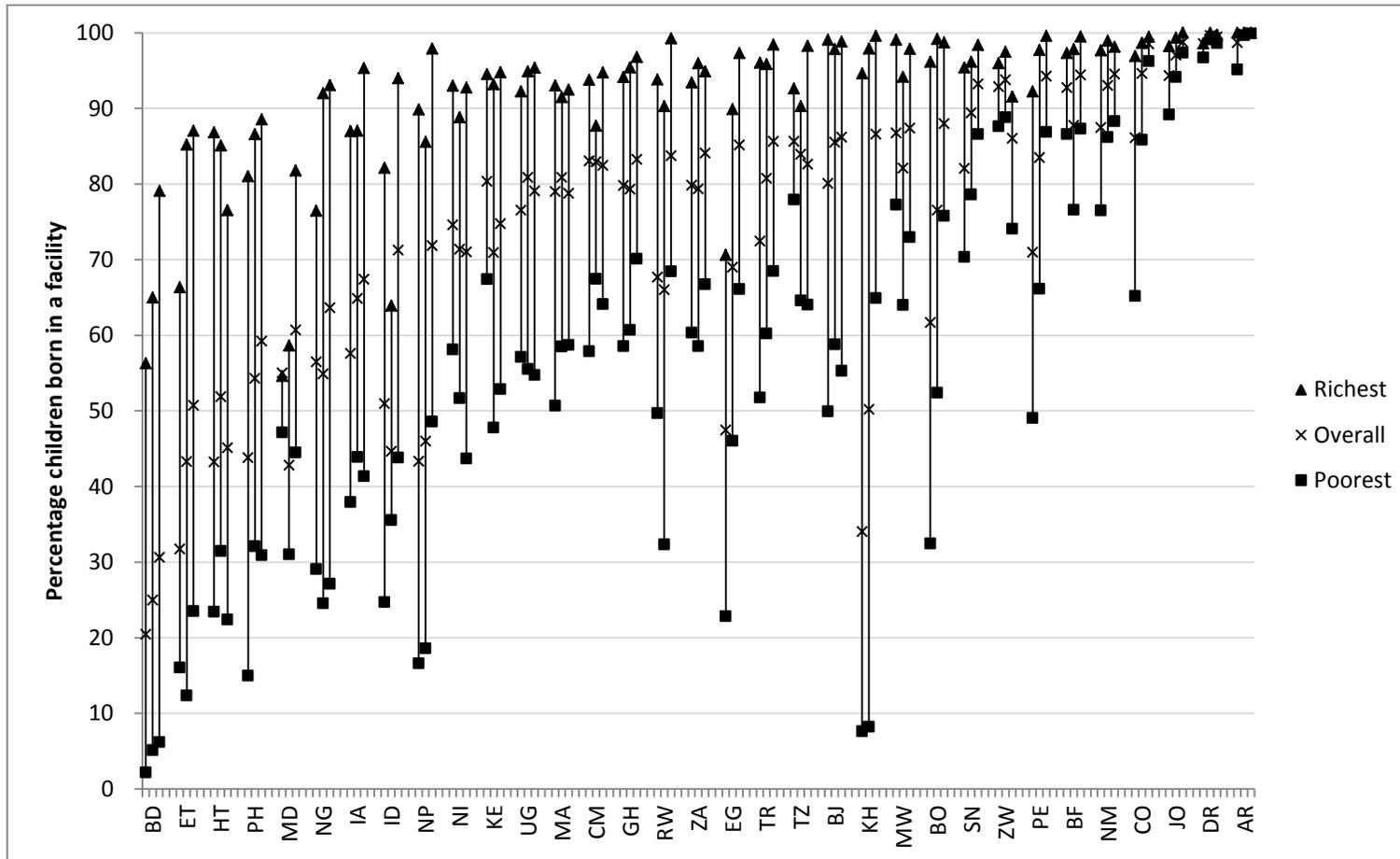
	<i>Round 1</i>	<i>Round 2</i>	<i>Round 3</i>
Niger	0.124	0.147	0.225
Rwanda	0.114	0.224	0.119
Bangladesh	0.475	0.435	0.380
Burkina Faso	0.097	0.230	0.149
Ethiopia	0.239	0.260	0.270
Malawi	0.032	0.041	0.105
Mali	0.181	0.165	0.182
Tanzania	0.051	0.022	0.176
Uganda	0.061	0.112	0.152
Zambia	0.024	0.070	0.082
Senegal	0.190	0.135	0.090
India	0.238	0.196	0.228
Nigeria	0.083	0.177	0.146
Kenya	0.031	0.123	0.115
Benin	0.162	0.164	0.192
Cameroon	0.151	0.092	0.108
Haiti	0.157	0.130	0.135
Zimbabwe	0.045	0.065	0.057
Madagascar	0.130	0.212	0.140
Turkey	0.272	0.257	0.223
Nepal	0.398	0.270	0.172
Philippines	0.147	0.122	0.121
Jordan	0.017	0.042	0.035
Bolivia	0.230	0.167	0.085
Namibia	0.040	0.062	0.036
Cambodia	0.535	0.358	0.091
Ghana	0.053	0.047	0.030
Dominican Republic	0.026	0.065	0.049
Armenia	0.048	-0.076	0.017
Indonesia	0.102	0.041	0.047
Columbia	0.083	0.083	0.058
Peru	0.160	0.103	0.044
Egypt	0.255	0.186	0.077

Figure 1: Percentage of births in a facility in urban areas by country and survey round (countries ordered by percentage facility births in round 3)



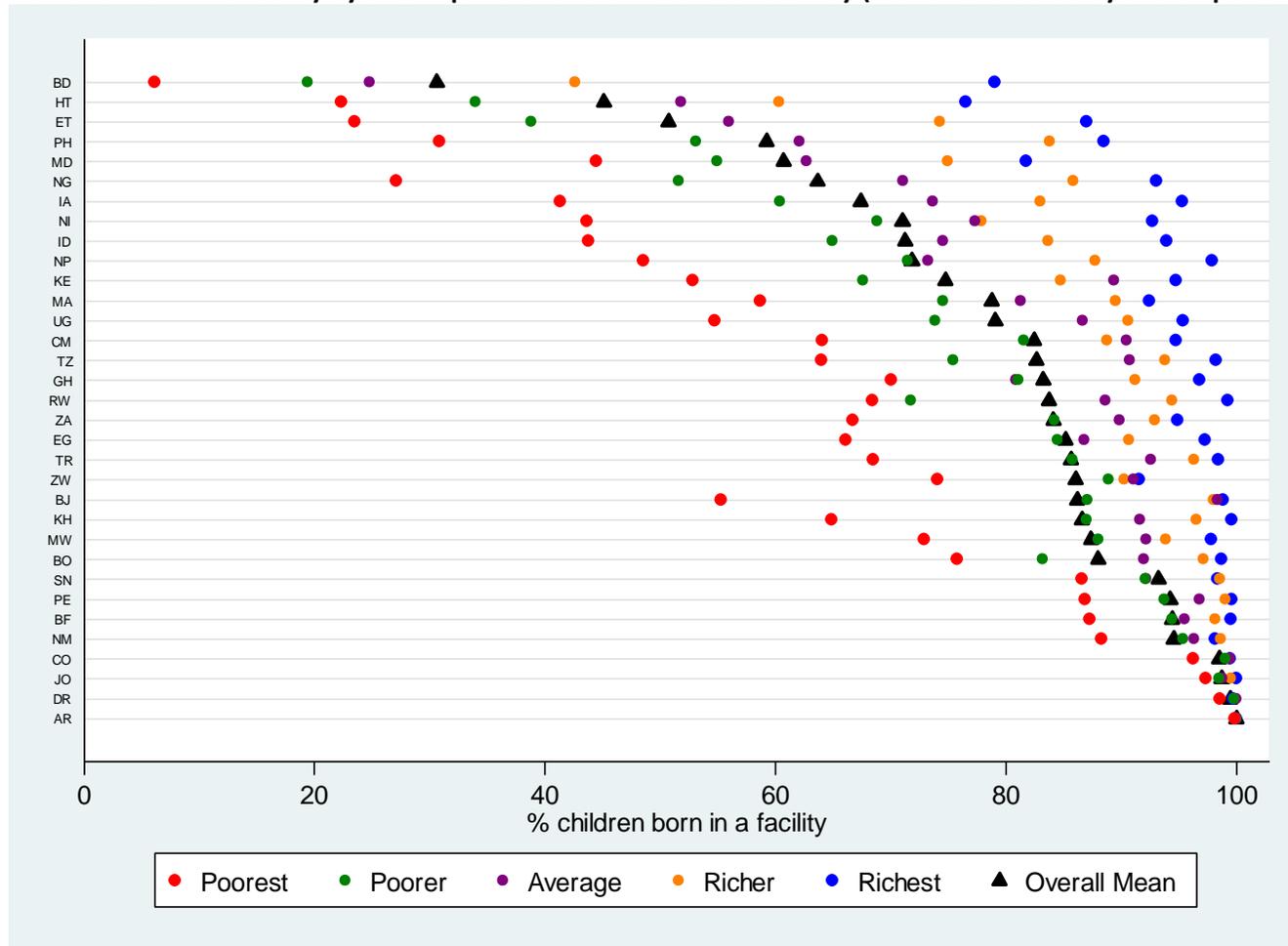
BD (Bangladesh); ET (Ethiopia); HT (Haiti); PH (Philippines); MD (Madagascar); NG (Nigeria); IA (India); ID (Indonesia); NP (Nepal); NI (Niger); KE (Kenya); UG (Uganda); MA (Mali); CM (Cameroon); GH (Ghana); RW (Rwanda); ZA (Zambia); EG (Egypt); TR (Turkey); TZ (Tanzania); BJ (Benin); KH (Cambodia); MW (Malawi); BO (Bolivia); SN (Senegal); ZW (Zimbabwe); PE (Peru); BF (Burkina Faso); NM (Namibia); CO (Colombia); JO (Jordan); DR (Dominican Republic); AM (Armenia)

Figure 2: Percentage of children born in a facility in the poorest and richest quintiles in urban areas (countries ordered by highest facility birth percentage)



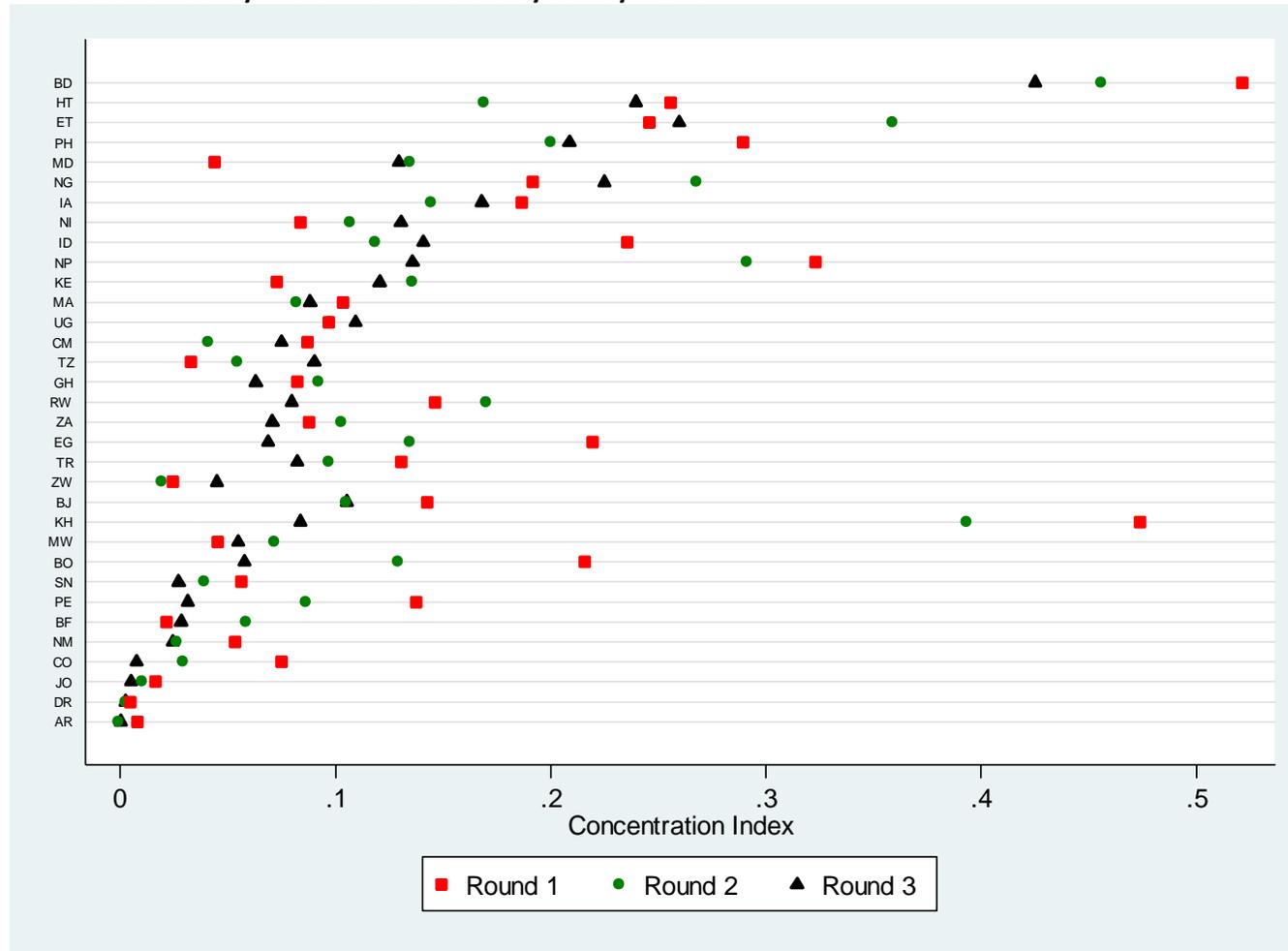
BD (Bangladesh); ET (Ethiopia); HT (Haiti); PH (Philippines); MD (Madagascar); NG (Nigeria); IA (India); ID (Indonesia); NP (Nepal); NI (Niger); KE (Kenya); UG (Uganda); MA (Mali); CM (Cameroon); GH (Ghana); RW (Rwanda); ZA (Zambia); EG (Egypt); TR (Turkey); TZ (Tanzania); BJ (Benin); KH (Cambodia); MW (Malawi); BO (Bolivia); SN (Senegal); ZW (Zimbabwe); PE (Peru); BF (Burkina Faso); NM (Namibia); CO (Colombia); JO (Jordan); DR (Dominican Republic); AM (Armenia)

Figure 3: Percentage of children born in a facility by urban quintile for the most recent survey (countries ordered by overall percentage)



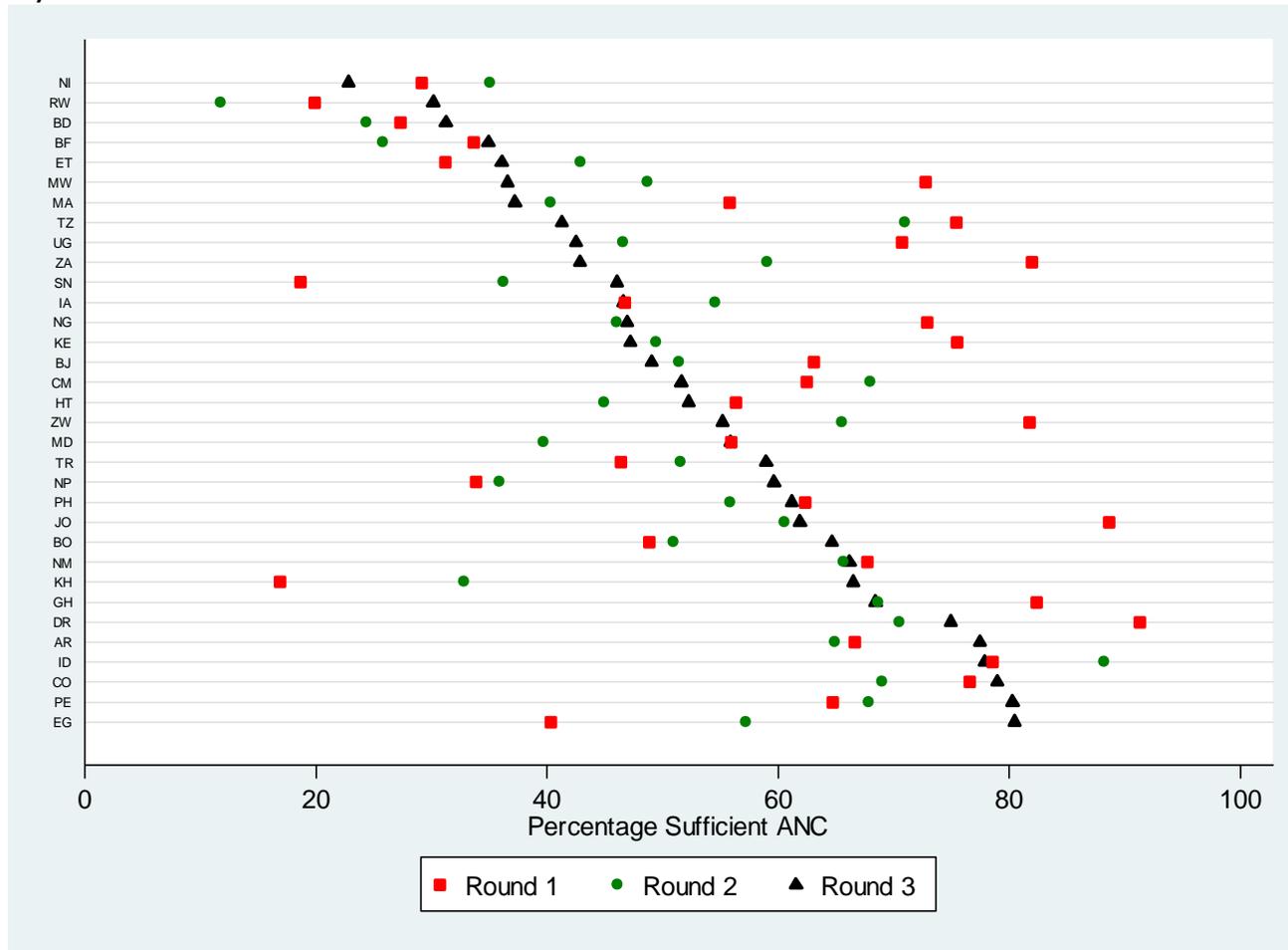
BD (Bangladesh); ET (Ethiopia); HT (Haiti); PH (Philippines); MD (Madagascar); NG (Nigeria); IA (India); ID (Indonesia); NP (Nepal); NI (Niger); KE (Kenya); UG (Uganda); MA (Mali); CM (Cameroon); GH (Ghana); RW (Rwanda); ZA (Zambia); EG (Egypt); TR (Turkey); TZ (Tanzania); BJ (Benin); KH (Cambodia); MW (Malawi); BO (Bolivia); SN (Senegal); ZW (Zimbabwe); PE (Peru); BF (Burkina Faso); NM (Namibia); CO (Colombia); JO (Jordan); DR (Dominican Republic); AM (Armenia)

Figure 4: Concentration Indices for Facility Births in Urban areas by Survey Round



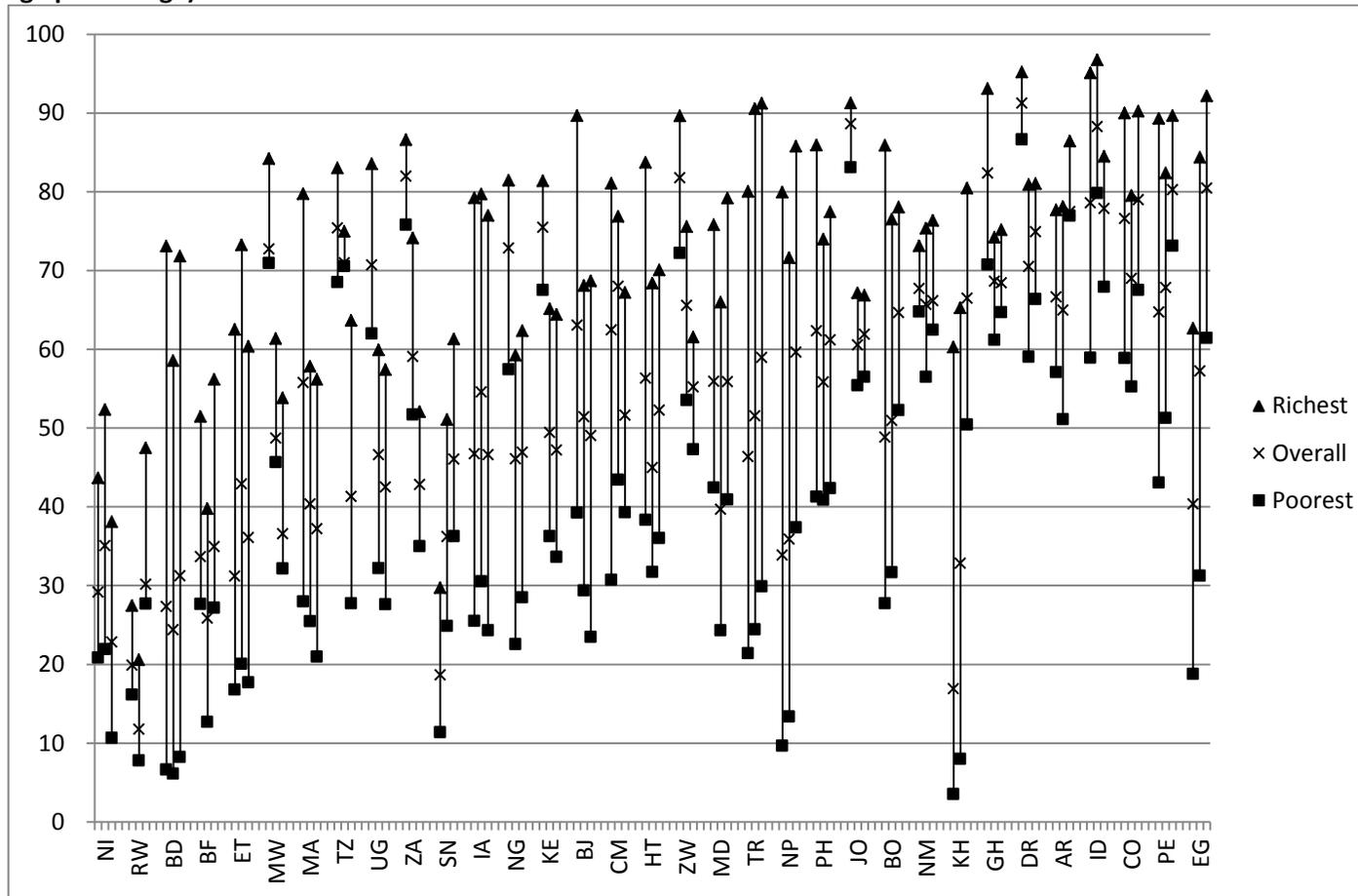
BD (Bangladesh); ET (Ethiopia); HT (Haiti); PH (Philippines); MD (Madagascar); NG (Nigeria); IA (India); ID (Indonesia); NP (Nepal); NI (Niger); KE (Kenya); UG (Uganda); MA (Mali); CM (Cameroon); GH (Ghana); RW (Rwanda); ZA (Zambia); EG (Egypt); TR (Turkey); TZ (Tanzania); BJ (Benin); KH (Cambodia); MW (Malawi); BO (Bolivia); SN (Senegal); ZW (Zimbabwe); PE (Peru); BF (Burkina Faso); NM (Namibia); CO (Colombia); JO (Jordan); DR (Dominican Republic); AM (Armenia)

Figure 5: Percentage of women with sufficient antenatal care in urban areas by country and survey round (countries ordered by percentage with sufficient ANC in round 3)



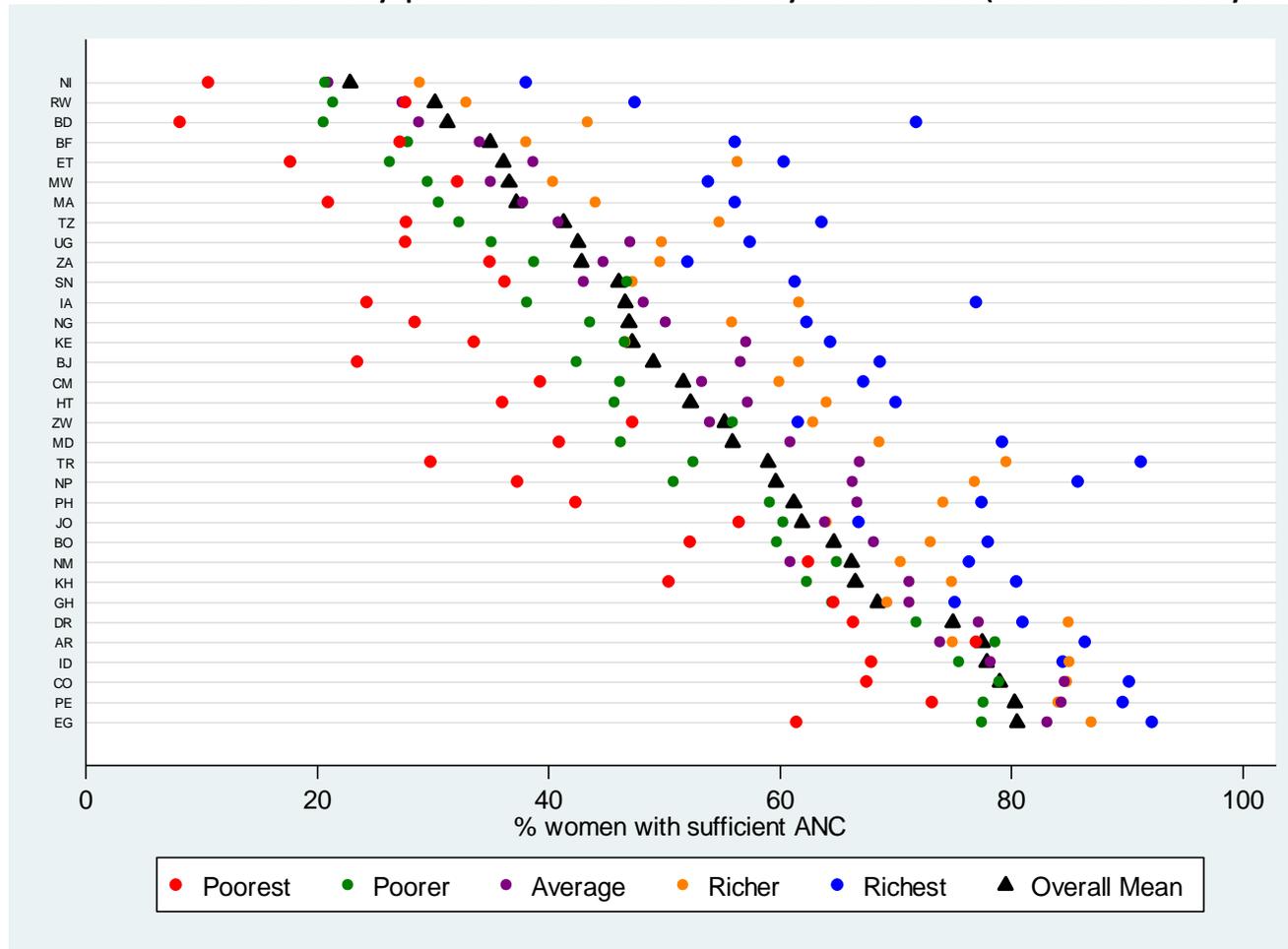
NI (Niger); RW (Rwanda); BD (Bangladesh); BF (Burkina Faso); ET (Ethiopia); MW (Malawi); MA (Mali); TZ (Tanzania); UG (Uganda); ZA (Zambia); SN (Senegal); IA (India); NG (Nigeria); KE (Kenya); BJ (Benin); CM (Cameroon); HT (Haiti); ZW (Zimbabwe); MD (Madagascar); TR (Turkey); NP (Nepal); PH (Philippines); JO (Jordan); BO (Bolivia); NM (Namibia); KH (Cambodia); GH (Ghana); DR (Dominican Republic); AM (Armenia); ; ID (Indonesia); CO (Colombia); PE (Peru); EG (Egypt)

Figure 6: Percentage of mothers with sufficient antenatal care visits (4 or more) in the poorest and richest quintiles in urban areas (countries ordered by highest ANC coverage percentage)



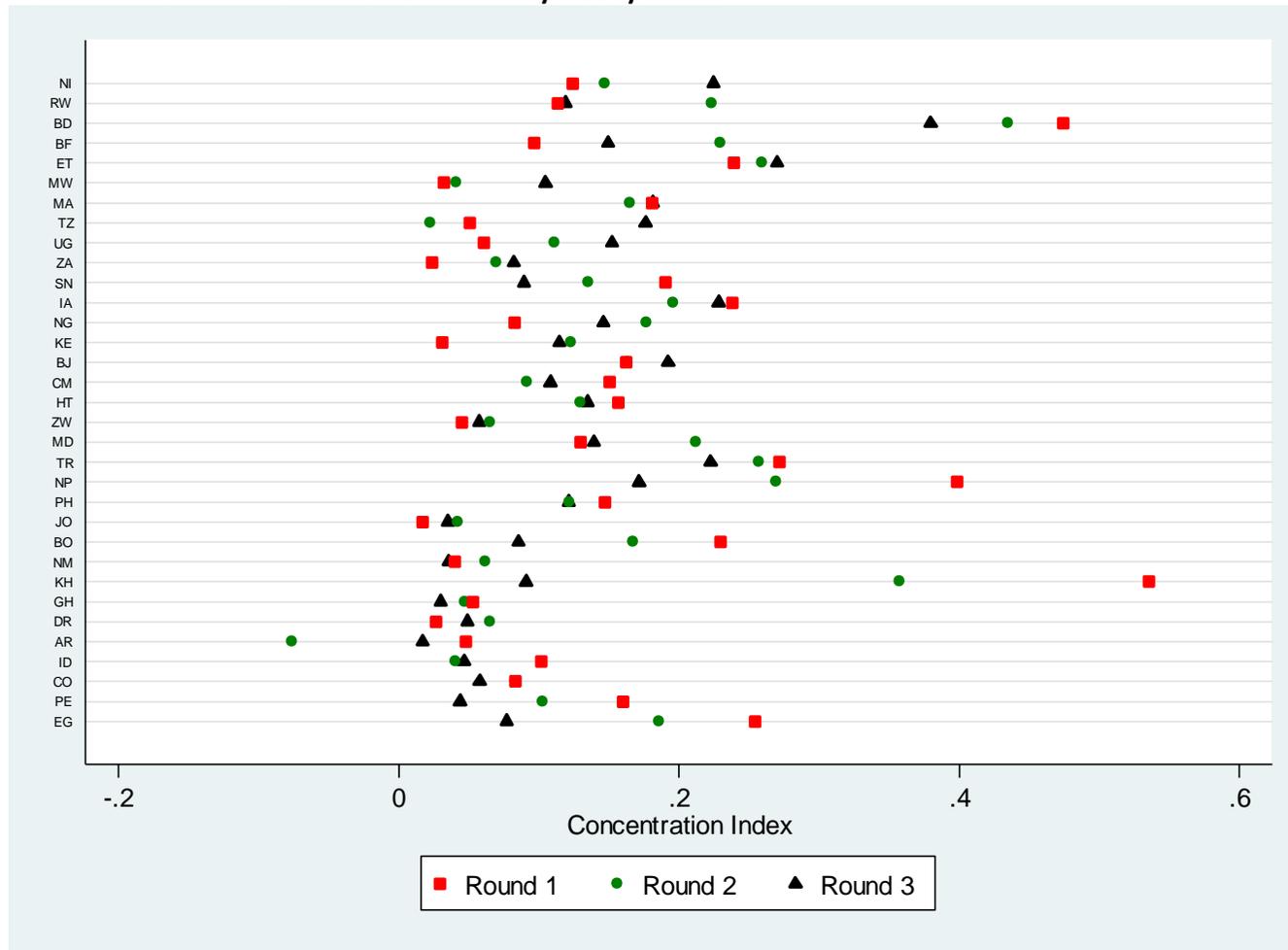
NI (Niger); RW (Rwanda); BD (Bangladesh); BF (Burkina Faso); ET (Ethiopia); MW (Malawi); MA (Mali); TZ (Tanzania); UG (Uganda); ZA (Zambia); SN (Senegal); IA (India); NG (Nigeria); KE (Kenya); BJ (Benin); CM (Cameroon); HT (Haiti); ZW (Zimbabwe); MD (Madagascar); TR (Turkey); NP (Nepal); PH (Philippines); JO (Jordan); BO (Bolivia); NM (Namibia); KH (Cambodia); GH (Ghana); DR (Dominican Republic); AM (Armenia); ; ID (Indonesia); CO (Colombia); PE (Peru); EG (Egypt)

Figure 7: Percentage of women with sufficient ANC by quintile in the most recent survey in urban areas (countries ordered by overall percentage)



NI (Niger); RW (Rwanda); BD (Bangladesh); BF (Burkina Faso); ET (Ethiopia); MW (Malawi); MA (Mali); TZ (Tanzania); UG (Uganda); ZA (Zambia); SN (Senegal); IA (India); NG (Nigeria); KE (Kenya); BJ (Benin); CM (Cameroon); HT (Haiti); ZW (Zimbabwe); MD (Madagascar); TR (Turkey); NP (Nepal); PH (Philippines); JO (Jordan); BO (Bolivia); NM (Namibia); KH (Cambodia); GH (Ghana); DR (Dominican Republic); AM (Armenia); ; ID (Indonesia); CO (Colombia); PE (Peru); EG (Egypt)

Figure 8: Concentration Indices for Sufficient ANC in Urban areas by Survey Round



NI (Niger); RW (Rwanda); BD (Bangladesh); BF (Burkina Faso); ET (Ethiopia); MW (Malawi); MA (Mali); TZ (Tanzania); UG (Uganda); ZA (Zambia); SN (Senegal); IA (India); NG (Nigeria); KE (Kenya); BJ (Benin); CM (Cameroon); HT (Haiti); ZW (Zimbabwe); MD (Madagascar); TR (Turkey); NP (Nepal); PH (Philippines); JO (Jordan); BO (Bolivia); NM (Namibia); KH (Cambodia); GH (Ghana); DR (Dominican Republic); AM (Armenia); ; ID (Indonesia); CO (Colombia); PE (Peru); EG (Egypt)

Appendix 1

	Year	Facility Birth			Sufficient Antenatal Care		
		Overall	Poorest	Richest	Overall	Poorest	Richest
Armenia	2000	98.7	95.1	100.0	66.6	57.1	77.7
	2005	99.8	99.7	100.0	64.9	51.1	78.1
	2010	100.0	99.9	100.0	77.5	76.9	86.4
Bangladesh	1993	20.4	2.2	56.3	27.3	6.6	73.1
	1999	25.0	5.1	65.0	24.4	6.1	58.5
	2007	30.6	6.2	79.1	31.2	8.2	71.8
Benin	1996	80.1	49.9	99.0	63.0	39.2	89.6
	2001	85.5	58.8	97.8	51.4	29.3	68.1
	2006	86.2	55.3	98.8	49.0	23.5	68.6
Bolivia	1994	61.7	32.5	96.1	48.8	27.7	85.9
	2003	76.5	52.4	99.2	50.9	31.7	76.5
	2008	88.0	75.8	98.7	64.6	52.2	78.0
Burkina Faso	1993	92.8	86.6	97.3	33.7	27.6	51.5
	2003	87.7	76.6	97.8	25.8	12.7	39.8
	2011	94.4	87.3	99.5	34.9	27.2	56.2
Cambodia	2000	34.0	7.6	94.6	16.9	3.5	60.3
	2005	50.2	8.2	97.9	32.8	8.0	65.2
	2010	86.6	64.9	99.6	66.5	50.4	80.5
Cameroon	1991	83.0	57.8	93.8	62.4	30.7	81.0
	1998	82.9	67.4	87.7	68.0	43.4	76.9
	2004	82.4	64.1	94.7	51.6	39.3	67.2
Columbia	1990	86.1	65.2	96.9	76.6	58.9	90.0
	2000	94.6	85.8	98.7	69.0	55.2	79.5
	2010	98.5	96.2	99.4	79.0	67.5	90.2
Dominican Republic	1991	98.5	96.7	98.6	91.2	86.6	95.2
	2002	99.6	99.1	100.0	70.5	59.0	80.9
	2007	99.4	98.6	99.7	74.9	66.4	81.0
Egypt	1992	47.5	22.8	70.6	40.3	18.8	62.7
	2000	69.0	46.0	89.9	57.2	31.2	84.3
	2008	85.1	66.1	97.3	80.5	61.4	92.2
Ethiopia	2000	31.7	16.0	66.3	31.2	16.8	62.5
	2005	43.3	12.3	85.2	42.9	20.1	73.3
	2011	50.7	23.5	87.0	36.1	17.7	60.4
Ghana	1993	79.8	58.5	94.1	82.3	70.7	93.1
	2003	79.3	60.7	95.4	68.6	61.2	74.2
	2008	83.2	70.1	96.8	68.4	64.7	75.1
Haiti	1994	43.2	23.4	86.8	56.3	38.3	83.7
	2000	51.9	31.4	85.0	45.0	31.7	68.4
	2005	45.1	22.4	76.5	52.2	36.0	70.0
India	1992	57.6	37.9	87.0	46.7	25.5	79.2
	1998	64.9	43.9	87.0	54.5	30.5	79.7
	2005	67.4	41.3	95.3	46.6	24.3	77.0
Indonesia	1991	50.9	24.7	82.1	78.6	58.9	95.0
	1997	44.6	35.5	63.9	88.2	79.8	96.7
	2007	71.2	43.8	94.0	77.8	67.9	84.5
Jordan	1997	94.3	89.2	98.2	88.6	83.1	91.2
	2002	97.0	94.1	99.3	60.5	55.4	67.1
	2007	98.7	97.3	100.0	61.9	56.5	66.8
Kenya	1993	80.3	67.4	94.5	75.5	67.5	81.4
	2003	70.9	47.8	93.2	49.4	36.2	65.1
	2008	74.7	52.8	94.8	47.2	33.6	64.4

	Year	Facility Birth			Sufficient Antenatal Care		
		Overall	Poorest	Richest	Overall	Poorest	Richest
Madagascar	1992	55.0	47.1	54.6	55.9	42.4	75.8
	2003	42.8	31.0	58.6	39.7	24.3	65.9
	2008	60.7	44.5	81.8	55.9	40.9	79.2
Malawi	1992	86.7	77.2	99.1	72.7	70.9	84.2
	2000	82.1	64.0	94.1	48.7	45.6	61.3
	2010	87.4	72.9	97.9	36.6	32.1	53.8
Mali	1995	79.0	50.6	93.0	55.8	28.0	79.7
	2001	80.9	58.5	91.5	40.3	25.5	57.8
	2006	78.7	58.7	92.5	37.2	20.9	56.2
Namibia	1992	87.5	76.5	97.6	67.7	64.8	73.1
	2000	93.0	86.2	98.9	65.7	56.5	75.4
	2006	94.5	88.3	98.1	66.2	62.4	76.4
Nepal	1996	43.3	16.6	89.8	33.9	9.6	79.9
	2001	46.0	18.6	85.5	35.9	13.4	71.6
	2011	71.8	48.5	97.9	59.6	37.4	85.7
Niger	1992	74.6	58.1	93.0	29.1	20.9	43.7
	1998	71.4	51.7	88.8	35.1	21.9	52.3
	2006	71.0	43.7	92.7	22.8	10.6	38.1
Nigeria	1999	56.5	29.0	76.5	72.9	57.4	81.5
	2004	54.9	24.5	92.0	46.1	22.6	59.2
	2008	63.6	27.1	93.1	46.9	28.5	62.3
Peru	1991	71.0	49.0	92.2	64.7	43.1	89.3
	2000	83.5	66.1	97.7	67.8	51.3	82.4
	2007	94.3	86.9	99.6	80.3	73.1	89.7
Philippines	1993	43.8	15.0	81.0	62.3	41.2	85.9
	2003	54.3	32.1	86.6	55.8	40.9	74.0
	2008	59.2	30.9	88.5	61.2	42.3	77.4
Rwanda	1992	67.7	49.7	93.8	19.9	16.1	27.4
	2000	66.0	32.3	90.3	11.8	7.8	20.5
	2010	83.7	68.4	99.3	30.1	27.7	47.5
Senegal	1992	82.0	70.3	95.4	18.6	11.4	29.7
	2005	89.4	78.6	96.2	36.2	24.8	51.0
	2010	93.2	86.6	98.4	46.1	36.3	61.3
Tanzania	1991	85.6	77.9	92.6	75.4	68.5	83.0
	1999	83.9	64.6	90.3	71.0	70.6	75.0
	2010	82.6	64.0	98.2	41.3	27.7	63.6
Turkey	1993	72.4	51.8	96.0	46.4	21.4	80.0
	1998	80.7	60.2	95.8	51.5	24.4	90.5
	2003	85.6	68.5	98.4	58.9	29.9	91.2
Uganda	1995	76.5	57.1	92.2	70.7	62.0	83.5
	2000	80.9	55.5	94.9	46.6	32.2	59.9
	2006	79.1	54.7	95.3	42.5	27.6	57.4
Zambia	1992	79.8	60.3	93.4	82.0	75.8	86.6
	2001	79.3	58.5	95.9	59.1	51.7	74.1
	2007	84.1	66.7	94.9	42.8	35.0	52.1
Zimbabwe	1994	92.8	87.6	96.0	81.7	72.2	89.6
	2005	93.8	88.8	97.4	65.5	53.5	75.6
	2010	86.0	74.1	91.5	55.2	47.3	61.5