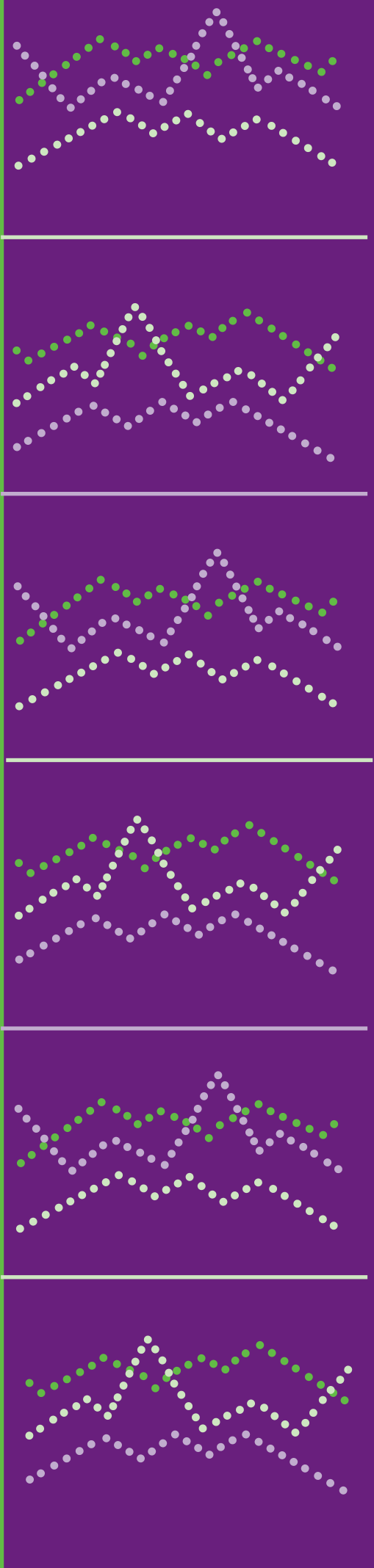
Antenatal Care in Developing Countries

Promises, achievements and missed opportunities

An analysis of trends, levels and differentials, 1990-2001



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Why does antenatal care matter?

The provision of special care for women during pregnancy through the public health services was a relatively late development in modern obstetrics. Not until the late 1930s did the United Kingdom of Great Britain and Northern Ireland authorities decide that all women should be offered regular check-ups during pregnancy as an integral part of maternity care, some 30 years after the introduction of formalized labour and delivery care. This development was stimulated by the realization that whereas maternal mortality due to puerperal sepsis, haemorrhage and obstructed labour had declined substantially during the early years of the 20th century, this was not the case for deaths associated with eclampsia. If these eclampsia-related deaths were to be averted, it was supposed, interventions would be needed earlier during the pregnancy, to measure blood pressure, identify women at risk of eclamptic convulsions, and take measures to reduce blood pressure whenever possible.

During the second half of the 20th century, international awareness grew of the dimensions of the tragedy of maternal mortality; national governments collaborated with technical assistance and donor agencies to ensure that pregnant women in developing countries also had access to maternity care. However, providing access for all pregnant women to care during the short period of labour and delivery is logistically and operationally a much more complex endeavour than making services available during the much longer – and less unpredictable – antenatal period. As a result, many programmes focused attention on providing antenatal care rather than delivery care. Unfortunately, antenatal care interventions alone do not address the main causes of maternal deaths that result from complications arising during labour, delivery and the immediate postpartum period.

Today we have better evidence about what works and what does not work to reduce maternal mortality, and the role that antenatal care can play.[1] Many elements of antenatal care, such as routine monitoring of height and weight gain, have not been shown to have any impact in reducing the risk of serious complications and maternal deaths.[2] The risk approach, adopted as a way of identifying which women are most likely to develop serious complications, has been shown to have only limited effectiveness: most women who go on to develop life-threatening complications had no apparent risk factors; conversely, those identified as being at risk generally end up with uneventful deliveries.[3] Other antenatal interventions, such as detection and treatment of anaemia and management of sexually transmitted infections (STIs), offer improvements in health without necessarily any equivalent reduction in the risk of maternal death. It has therefore become clear that antenatal care interventions, in and of themselves, cannot be expected to have significant impact on maternal *mortality.* There is now broad agreement that the focus of antenatal care interventions should be on improving maternal *health,* this being both an end in itself and necessary for improving the health and survival of infants.

With this improved understanding has come a refocusing of maternal health programmes towards ensuring that women have access to care during the critical period around labour and delivery – which is when most deaths occur – coupled with referral for the management of obstetric emergencies. Thus, safe motherhood programmes tend to

prioritize the need for skilled care during delivery, including emergency obstetric care, rather than ensuring that all women receive antenatal care.[1]

Nonetheless, there are potential benefits to be had from some of the elements of antenatal care, and these benefits may be most significant in developing countries where morbidity and mortality levels among reproductive-age women are high. The antenatal period clearly presents opportunities for reaching pregnant women with a number of interventions that may be vital to their health and well-being and that of their infants. For example, if the antenatal period is used to inform women and families about danger signs and symptoms and about the risks of labour and delivery, it may provide the route for ensuring that pregnant women do, in practice, deliver with the assistance of a skilled health care provider. The antenatal period provides an opportunity to supply information on birth spacing, which is recognized as an important factor in improving infant survival. Better understanding of foetal growth and development and its relationship to the mother's health has resulted in increased attention to the potential of antenatal care as an intervention to improve both maternal and newborn health. Tetanus immunization during pregnancy can be life-saving for both mother and infant. The prevention and treatment of malaria among pregnant women, management of anaemia during pregnancy and treatment of STIs can significantly improve foetal outcomes and improve maternal health. Adverse outcomes such as low birthweight can be reduced through a combination of interventions to improve women's nutritional status and prevent infections (malaria, STIs) during pregnancy. More recently, the potential of the antenatal period as an entry point for HIV prevention and care, in particular for the prevention of HIV transmission from mother to child, has led to renewed interest in access to and use of antenatal care services.[4,5,6]

In recognition of the potential of care during the antenatal period to improve a range of health outcomes for women and children, the World Summit for Children in 1990 adopted antenatal care as a specific goal, namely "Access by all pregnant women to prenatal care, trained attendants during childbirth and referral facilities for high-risk pregnancies and obstetric emergencies". Similar aims have been voiced in other major international conferences, including the International Conference on Population and Development in 1994, the Fourth World Conference on Women in 1995, their five-year follow-up evaluations of progress, and the United Nations General Assembly Special Session on Children in 2002.[7]

What should antenatal care consist of?

Most antenatal care programmes in developing countries were established along the lines of those used in developed countries, with little adjustment for local conditions. In recent years, the underlying premise of much that is carried out under the heading of antenatal care has been called into question. It has emerged that few of the components of standard antenatal care regimens have been subjected to rigorous scientific evaluation to determine their effectiveness.[8,9]

In 2001, WHO published the conclusions of a randomized controlled trial of a new model of antenatal care and also carried out a systematic review of other randomized trials that looked at the effectiveness of different models of antenatal care.[10] This work has led to a growing consensus around key elements of antenatal care that are likely to improve maternal and/or perinatal health outcomes, though it is important to note that these outcomes tend to be either maternal and perinatal health or perinatal survival, not maternal survival.[11]

The new WHO model of antenatal care separates pregnant women into two groups: those likely to need only routine antenatal care (some 75% of the total population of pregnant women), and those with specific health conditions or risk factors that necessitate special care (25% of pregnant women). For the first group, a standard programme of four antenatal visits is recommended (with additional visits should conditions emerge which require special care). The WHO guidelines are also specific as regards the timing and content of antenatal care visits according to gestational age. The guidelines stipulate that "only examinations and tests that serve an immediate purpose and that have been proven to be beneficial should be performed".[11] These examinations include measurement of blood pressure, testing of urine for bacteriuria and proteinuria, and blood tests to detect syphilis and severe anaemia. Routine weight and height measurement at each visit is considered optional. But evidence-based programming on the optimal number, timing and content of antenatal visits is not yet routine in most settings. This is a topic to which we will return later in this paper.

How is use of antenatal care measured?

Efforts to monitor progress in coverage of antenatal care have generally focused on quantifiable issues such as the number and timing of visits and the characteristics of users and non-users of antenatal care. The World Summit for Children goal calls for "access" to antenatal care, but access is a multidimensional concept that is very difficult to monitor. Most commentators recognize at least five different components of access, including physical availability of services, distance and/or time to a facility, economic and other costs associated with use of services, cultural and social factors that may impede access, and quality of services offered. Even if it were possible to reach consensus around the precise scope, meaning and importance of each of these elements, their measurement would still remain problematic, particularly for drawing valid comparisons between countries or regions. And access in itself says nothing about actual use of services. In practice, indicators of use are easier to define, measure and interpret than indicators for access; data on use of antenatal care are widely available from household surveys.

Indicators on use of antenatal care services provide no information on the content or quality of the services. Despite the broad consensus on what the content and quality should be, it is generally recognized that the antenatal care services currently provided in many parts of the world fail to meet the standards recommended by WHO. Some information on the content of care is now available from recent Demographic and Health Surveys (DHS) which included questions about antenatal interventions such as height and weight

checking, blood pressure testing, and blood and urine testing. For the most part, however, the available data do not report on specific interventions or the quality of care. The analysis that follows should therefore be treated with a certain degree of caution.

In most developing countries, information on the use of antenatal care services is obtained from household surveys. Such surveys have been conducted over the past decade by many organizations, including the Demographic and Health Surveys (DHS) supported by the United States Agency for International Development, the Multiple Indicator Cluster Surveys (MICS) supported by UNICEF, and the PAPCHILD surveys. These pose a similar series of questions to women who have had a live birth in a specified period (ranging from one to five years), asking whether and from whom the woman received antenatal care, the number of visits and, more recently, the content of the visits.

In the DHS surveys conducted in the first half of the 1990s, women respondents of reproductive age (15-49 years)[a] were asked to provide information about pregnancies resulting in live births that occurred during the five years prior to the interview date. In most of the subsequent surveys, the reference period was reduced to the three years prior to the interview. In the most recent surveys (those conducted from 1999 on), information is collected only about the *last* birth in the last five years. The MICS surveys use methodology and questions similar to those of the DHS surveys, but the information is collected only for live births occurring within the previous year.

Regardless of the reference period, women are first asked whether they saw anyone for antenatal care during the pregnancy. Those who respond 'yes' are asked to list all of the people they saw. In the analysis below, for women listing more than one person seen, only the most qualified person is counted. The woman is then asked how many months pregnant she was at the time of the first visit and how many visits she had in total during the pregnancy.

While every effort is made to ensure that the data reported are accurate, it is clear that much depends on the ability of the respondent to identify correctly the type of health care provider she saw, whether a qualified doctor, midwife, nurse or other country-specific category of provider. Broadly speaking, the term 'skilled attendant' embraces qualified doctors, midwives, nurses and providers with equivalent levels of skills. Traditional birth attendants and other practitioners who are not part of the formal health care system are not defined as skilled providers.[12]

[a] For some DHS surveys, unmarried women were excluded and only ever-married women were interviewed. These surveys were Bangladesh 1994 and 1997, Egypt 1992 and 1995, India 1993, Indonesia 1994 and 1997, Jordan 1990, Nepal 1996, Pakistan 1991, and Turkey 1993 and 1998. Furthermore, the age span for the Bangladesh surveys was 10-49 years and 13-49 years for the India 1993 survey.

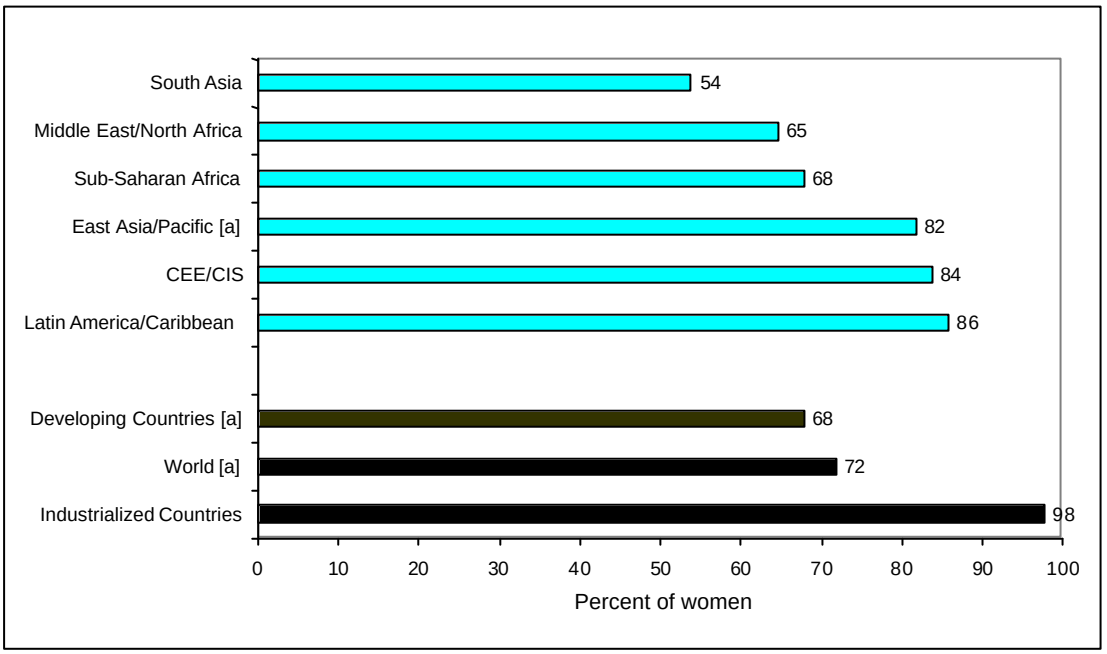
What do we know about current use of antenatal care?

Most women have some antenatal care

Data for the late 1990s and for 2000-2001 show that just over 70% of women worldwide have at least one antenatal visit with a skilled provider during pregnancy (Figure 1). In the industrialized countries coverage is extremely high, with 98% of women having at least one visit. In the developing world, antenatal care use is around 68% (data are not available for China), but this indicates considerable success for programmes aimed at making antenatal care available. The region of the world with the lowest levels of use is South Asia, where only 54% of pregnant women have at least one antenatal care visit. In sub-Saharan Africa, generally the region with the lowest levels of health care use, fully 68% of women report at least one antenatal visit. The levels in the remaining regions of the world range from 82% to 86%.

Figure 1. Antenatal care by region

In developing countries, two out of three women receive some antenatal care, but in South Asia the rate is barely half



[a] Excluding China

* Central and Eastern Europe/Commonwealth of Independent States and Baltic States

Source: UNICEF/WHO 2002. Data from Demographic and Health Surveys (DHS), Multiple Indicator Cluster Surveys (MICS) and other national surveys, late 1990s to 2001. 104 countries. Averages weighted by number of births.

The data show that efforts to extend the reach of antenatal care have been largely successful. Only in a few countries do levels of antenatal care use fall below 50% of pregnant women. While these figures do not tell us anything about the quality of care on offer, it is clear that women are able and willing to present for antenatal care, thus providing opportunities to give them information and services that can help improve their health and that of their infants. Table 1 shows the most recent data available on antenatal care use listed by country.

Table 1. Antenatal care in developing countries, late 1990s to 2001 (women aged 15-49 reporting 1+ antenatal visits with a skilled attendant – doctor, nurse or midwife)

Sub-Saharan Africa		Middle East/North Africa		South Asia		East Asia/Pacific		Latin America/Caribbean	
Cape Verde	99	Bahrain	97	Sri Lanka	98	Brunei Darussalam	100	Cuba	100
Botswana	97	United Arab Emirates	97	Maldives	81	Mongolia	97	Dominica	100
Zambia	96	Occupied Palestinian Territory	96	India	60	Indonesia	89	Saint Kitts and Nevis	100
Gabon	94	Oman	96	**Regional average** [a]	**54**	Kiribati	88	Saint Lucia	100
South Africa	94	Kuwait	95	Bangladesh	33	Philippines	86	Jamaica	99
Zimbabwe	93	Qatar	94	Nepal	28	Thailand	86	Dominican Republic	98
Rwanda	92	Saudi Arabia	90	Pakistan	28	**Regional average**	**82**	Grenada	98
Uganda	92	Lebanon	87	Afghanistan	-	Papua New Guinea	78	Trinidad and Tobago	98
Malawi	91	Libya	81	Bhutan	-	Myanmar	76	Belize	96
Namibia	91	Tunisia	79			Viet Nam	68	Argentina	95
Côte d'Ivoire	88	Iraq	78			Cambodia	38	Chile	95
Ghana	88	Iran	77			Lao People's Dem. Rep	29	Uruguay	94
Lesotho	88	Sudan	75			China	-	Saint Vincent and Grenadines	92
Liberia	84	Algeria	58			Cook Islands	-	Colombia	91
Togo	82	Egypt	53			East Timor	-	Suriname	91
Benin	81	Syria	51			Fiji	-	Venezuela	90
Burundi	79	**Regional average**				Korea, Dem. People's Rep.	-	Barbados	89
Senegal	77	Morocco	42			Korea, Republic	-	Paraguay	89
Kenya	76	Yemen	34			Malaysia	-	Brazil	86
Cameroon	75	Cyprus	-			Marshall Islands	-	Mexico	86
Comoros	74	Djibouti	-			Micronesia, (Fed. States)	-	**Regional average**	**86**
Madagascar	73	Jordan	-			Nauru	-	Honduras	84
Guinea	71					Niue	-	Peru	84
Mozambique	71					Palau	-	Antigua and Barbuda	82

Sub-Saharan Africa		Middle East/North Africa	South Asia	East Asia/Pacific		Latin America/Caribbean	
Sierra Leone	68			Samoa	-	Nicaragua	82
Regional average	**68**			Singapore	-	Haiti	79
Central African Republic	67			Solomon Islands	-	El Salvador	76
Mauritania	64			Tonga	-	Panama	72
Nigeria	64			Tuvalu	-	Costa Rica	70
Guinea-Bissau	62			Vanuatu	-	Bolivia	69
Burkina Faso	61					Ecuador	69
Eritrea	49					Guatemala	60
Tanzania, United Republic	49					Bahamas	-
Mali	47					Guyana	-
Chad	42						
Niger	41						
Equatorial Guinea	37						
Somalia	32						
Ethiopia	27						
Angola	-						
Congo	-						
Congo, Dem. Rep. of	-						
Gambia	-						
Mauritius	-						
Sao Tome/Principe	-						
Seychelles	-						
Swaziland	-						

[a] Excluding China

Source: UNICEF/WHO/ 2002. Data from Demographic and Health Surveys (DHS), Multiple Indicator Cluster Surveys (MICS) and other national surveys, late 1990s to 2001. 104 countries. Averages weighted by number of births.

What do we know about recent trends in antenatal care?

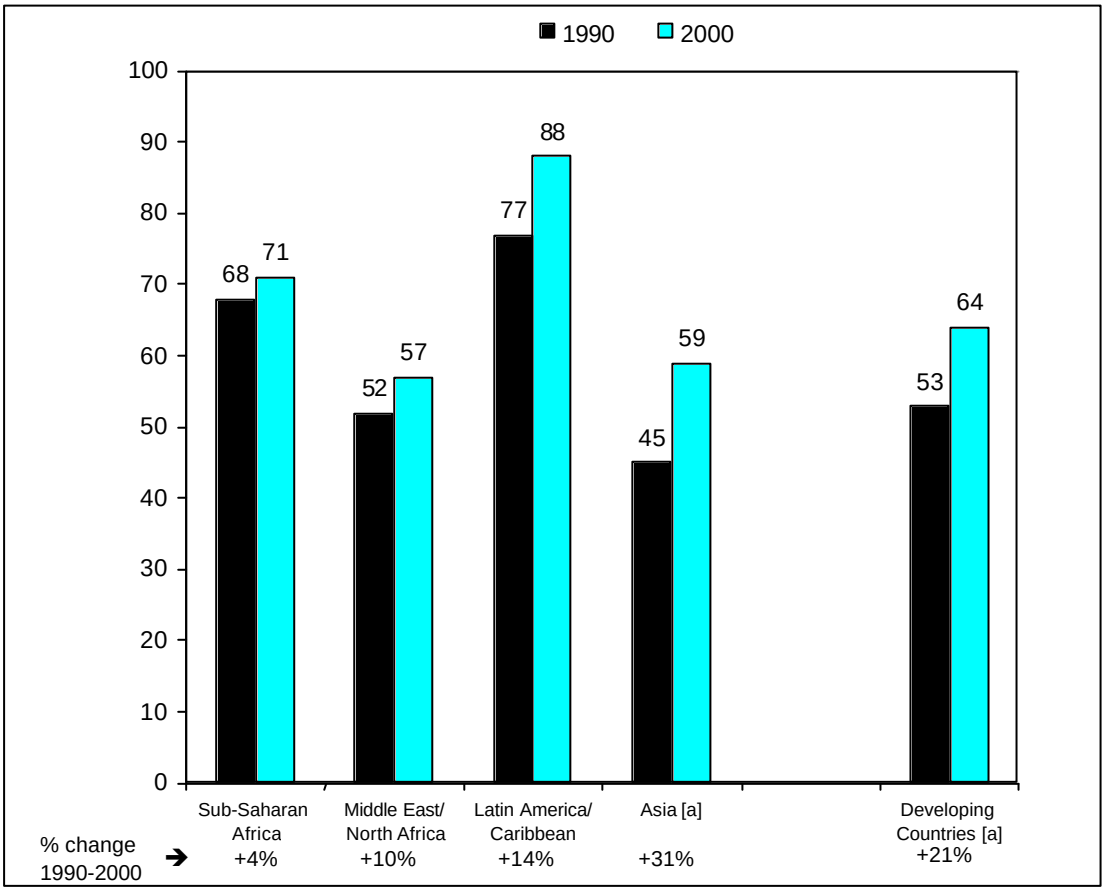
Use of antenatal care in developing countries rose steadily during 1990-2001 but the smallest increases were in sub-Saharan Africa

Information on trends in antenatal care use over the past decade is limited to countries where more than one household survey has been carried out. At the end of 2001, a total of 49 countries had trend data.[b]

The figures show a striking improvement in use of antenatal care of around one fifth in the developing world over the decade 1990 to 2000 (Figure 2). Progress was greatest in Asia, where antenatal care increased by nearly one third over the period, although this region started from the lowest base. By contrast, in sub-Saharan Africa the increase was only some 4%. In the Middle East and North Africa and in Latin America and the Caribbean, the increases were 10% and 14% respectively.

Figure 2. Trends in antenatal care, 1990-2001

Use of antenatal care in developing countries rose by a fifth; smallest increase in sub-Saharan Africa, largest in Asia



[a] Excluding China

Source: AbouZahr and Wardlaw, 2002. Data from household surveys in 49 countries with two or more surveys during the period.

[b] These 49 countries account for 70% of births in the developing world excluding China. They represent 46% of births in the Middle East and North Africa, 60% of births in sub-Saharan Africa and in Latin America and the Caribbean, and 85% of births in Asia and the Pacific (excluding China).

How many visits and when?

The trend data on antenatal care use specify only one or more antenatal visits. More detailed information on the number and timing of antenatal visits, and on the sociodemographic characteristics of the women using antenatal care, is available from DHS surveys in a slightly different subset of 45 countries.[c] [d]

In most of these 45 countries, the relevant DHS survey was conducted in the second half of the 1990s. Unfortunately, for a few countries the relevant survey dates back earlier: they include India 1993, Jordan 1990, Morocco 1992, Pakistan 1991, and Yemen 1991.

Most women using antenatal care report four or more visits

WHO recommends that antenatal care for the majority of normal pregnancies should consist of four visits during pregnancy, and has outlined the key elements of the visits and their timing. We looked at the evidence on women who report at least four visits and compared the data on these women with the data on women reporting only one visit or none at all. But we were limited by the nature of the data available. Since the surveys do not specify the type of provider seen at each visit, but sum up all the providers seen throughout the pregnancy, we were able to assess only the total number of visits and whether a medically trained provider was seen on at least one visit.

Bearing in mind these limitations, the most striking finding is that in the developing world as a whole, the majority of women presenting for any antenatal care have at least four visits (Figure 3). In 33 of the 45 countries, at least 50% of women reported four or more visits (Table 2).[e] There are, of course, some notable exceptions; countries with relatively high percentages of women who received only one antenatal care visit include Bangladesh, Ethiopia, Morocco, Nepal and Yemen. The South Asian countries are distinguished by their overall low level of use.[f] In Nepal, for example, 38% of women reported at least one visit but only 9% reported four or more visits, with most women having two or three antenatal visits.

[c] This subset of 45 DHS surveys – the primary grouping used for detailed analysis throughout this paper – differs slightly from the grouping of countries where two or more surveys made it possible to assess the general trend over time.

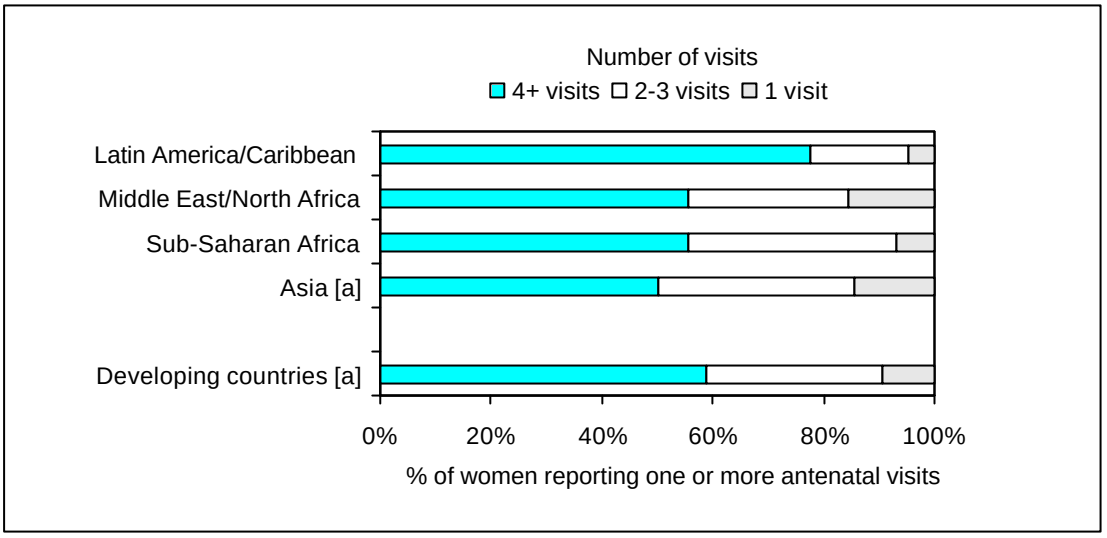
[d] This subset of 45 countries accounts for 62% of births in the developing world (74% if China is excluded). The 45 countries represent 45% of births in the Middle East and North Africa, 54% in Latin America and the Caribbean, 61% in Asia and the Pacific, and 76% of births in sub-Saharan Africa.

[e] Note that a few DHS surveys reported relatively high levels of don't know/missing values for the number of visits. They include Mozambique 1997 (11% don't know/missing), Nigeria 1999 (12%), and Zimbabwe 1999 (14%).

[f] A DHS-type survey was conducted in India in 1998-1999 but the data file on number of visits was not available for this analysis. The published results suggest that antenatal care use has remained stable since the 1992-93 NFHS survey in India.

Figure 3. Number of visits for antenatal care: summary

In all developing regions, most women using antenatal care report four or more visits



[a] Excluding China

Source: AbouZahr and Wardlaw, 2002. DHS surveys in 45 developing countries.

A surprising finding is the frequency of four or more antenatal visits in sub-Saharan Africa, with at least 70% of women reporting four or more visits in Ghana, Nigeria, Tanzania and Zambia (Table 2). In Rwanda and Senegal, on the other hand, 75% and 72% of women report only two or three visits.

It would be reasonable to assume that settings showing the highest overall levels for at least one antenatal visit would also show the highest levels for at least four visits. In practice, this is not necessarily the case, particularly in Africa.

In Latin America and the Caribbean, most women report at least four antenatal visits, with levels particularly high in Brazil, Colombia, the Dominican Republic and Guatemala (Table 2). Indeed, in this region the median number of antenatal visits is 6 and substantial proportions of pregnant women report 10 or more antenatal visits (Figure 4). While this situation is most striking in Latin America and the Caribbean, sizeable proportions of pregnant women in the other developing regions also report 9 or more visits. Whereas this may be necessary in complicated pregnancies, it raises the question whether limited resources are being used efficiently and effectively for the antenatal care of women with normal pregnancies. Moreover, where women have to travel long distances and wait long hours for antenatal care, there are substantial financial and opportunity costs to the women in such frequent attendance.

Table 2 Number of antenatal visits and timing of first visit (women reporting 1+ visits)

	Number of antenatal visits					Months pregnant at first visit						% women with at least 1 visit [a]	*Total number of women*
	1	2-3	4+	Don't know/ Missing	Total	0-3	4-5	6-7	8+	Don't know/ Missing	Total		
Benin 1996	5	28	66	1	100	29	39	27	4	1	100	80	*2,362*
Burkina 1999	8	52	37	3	100	33	35	25	3	4	100	61	*3,773*
Cameroon 1998	4	28	66	2	100	40	41	18	1	0	100	79	*1,945*
Central African Rep. 1994	6	38	53	3	100	32	44	20	3	1	100	67	*1,898*
Chad 1997	10	47	42	1	100	44	35	17	3	1	100	32	*2,396*
Comoros 1996	6	30	61	4	100	41	38	18	2	1	100	85	*968*
Cote d'Ivoire 1994	16	49	34	1	100	26	36	32	6	1	100	83	*3,320*
Ethiopia 2000 [b]	22	38	39	2	100	23	36	29	11	1	100	27	*2,133*
Ghana 1998	6	23	70	2	100	44	40	14	2	1	100	87	*2,794*
Guinea 1999	5	28	64	4	100	46	32	20	2	1	100	71	*4,127*
Kenya 1998	4	30	65	2	100	14	43	38	4	0	100	92	*3,186*
Madagascar 1997	5	45	49	1	100	20	42	32	4	2	100	77	*2,989*
Malawi 1992	2	28	68	2	100	10	44	42	4	1	100	90	*2,989*
Mali 1996	10	30	54	6	100	38	29	24	7	3	100	47	*2,822*
Mozambique 1997	5	32	52	11	100	24	48	22	4	2	100	71	*3,005*
Namibia 1992	7	21	64	8	100	31	40	23	4	2	100	87	*3,362*
Niger 1998	12	59	29	1	100	34	42	20	4	1	100	39	*1,968*
Nigeria 1999	2	13	72	12	100	24	50	23	3	1	100	64	*2,257*
Rwanda 1992	12	75	13	0	100	3	20	64	12	0	100	94	*5,346*
Senegal 1997	7	72	20	2	100	54	29	12	2	3	100	82	*5,774*
Tanzania 1999 [c]	3	24	73	1	100	11	53	33	3	0	100	92	*2,019*
Togo 1998	5	37	56	2	100	20	41	35	4	1	100	82	*3,262*
Uganda 1995	7	40	51	2	100	15	38	41	7	0	100	91	*5,496*
Zambia 1996	2	22	74	2	100	12	51	34	2	0	100	96	*6,841*
Zimbabwe 1999	1	16	68	14	100	28	43	25	3	1	100	93	*2,579*
Sub-Saharan Africa	**7**	**36**	**54**	**4**	**100**	**28**	**40**	**28**	**4**	**1**	**100**	**75**	

	Number of antenatal visits					Months pregnant at first visit						% women with at least 1 visit [a]	*Total number of women*
	1	2-3	4+	Don't know/ Missing	Total	0-3	4-5	6-7	8+	Don't know/ Missing	Total		
Egypt 1995	5	22	70	2	100	77	15	6	2	0	100	39	*4,482*
Jordan 1990	4	12	84	0	100	70	22	6	2	1	100	80	*6,630*
Morocco 1992	29	47	24	0	100	63	17	13	7	0	100	32	*1,674*
Turkey 1998	11	26	62	2	100	68	17	11	3	1	100	68	*2,335*
Yemen 1991	27	34	33	5	100	45	22	18	13	2	100	26	*1,924*
Middle East/North Africa	**15**	**28**	**55**	**2**	**100**	**65**	**19**	**11**	**6**	**1**	**100**	**49**	
Bangladesh 1997	31	47	21	1	100	43	29	20	7	0	100	26	*1,643*
India 1993 [d]	6	37	56	0	100	38	32	25	5	0	100	62	*30,878*
Nepal 1996	24	52	23	1	100	31	29	30	8	1	100	38	*1,647*
Pakistan 1991	15	30	53	2	100	51	19	21	9	2	100	25	*1,654*
Indonesia 1997	3	19	77	1	100	68	22	8	2	0	100	89	*14,490*
Philippines 1998	5	26	69	0	100	54	32	12	2	0	100	86	*6,483*
Asia	**14**	**35**	**50**	**1**	**100**	**48**	**27**	**19**	**5**	**1**	**100**	**54**	
Bolivia 1998	8	21	70	1	100	64	21	11	4	1	100	65	*4,487*
Brazil 1996	1	8	89	2	100	77	17	5	1	0	100	86	*4,094*
Colombia 2000	3	9	88	0	100	75	18	6	1	0	100	91	*3,221*
Dominican Rep.1996	2	9	89	1	100	80	16	4	1	0	100	98	*4,304*
Guatemala 1999	3	12	83	1	100	66	23	10	1	0	100	60	*2,709*
Haiti 1994	10	37	52	1	100	57	26	14	2	1	100	68	*2,451*
Nicaragua 1998	5	19	75	1	100	72	17	8	2	1	100	81	*6,511*
Paraguay 1990	4	21	74	1	100	64	20	13	2	0	100	84	*3,336*
Peru 1996	6	22	72	1	100	64	19	13	4	0	100	67	*10,518*
Latin America/Caribbean	**5**	**18**	**77**	**1**	**100**	**69**	**20**	**9**	**2**	**0**	**100**	**78**	
TOTAL	**8**	**31**	**58**	**3**	**100**	**43**	**32**	**21**	**4**	**1**	**100**	**70**	

[a] Some of these figures may vary slightly from those in table 1 because the sources differ

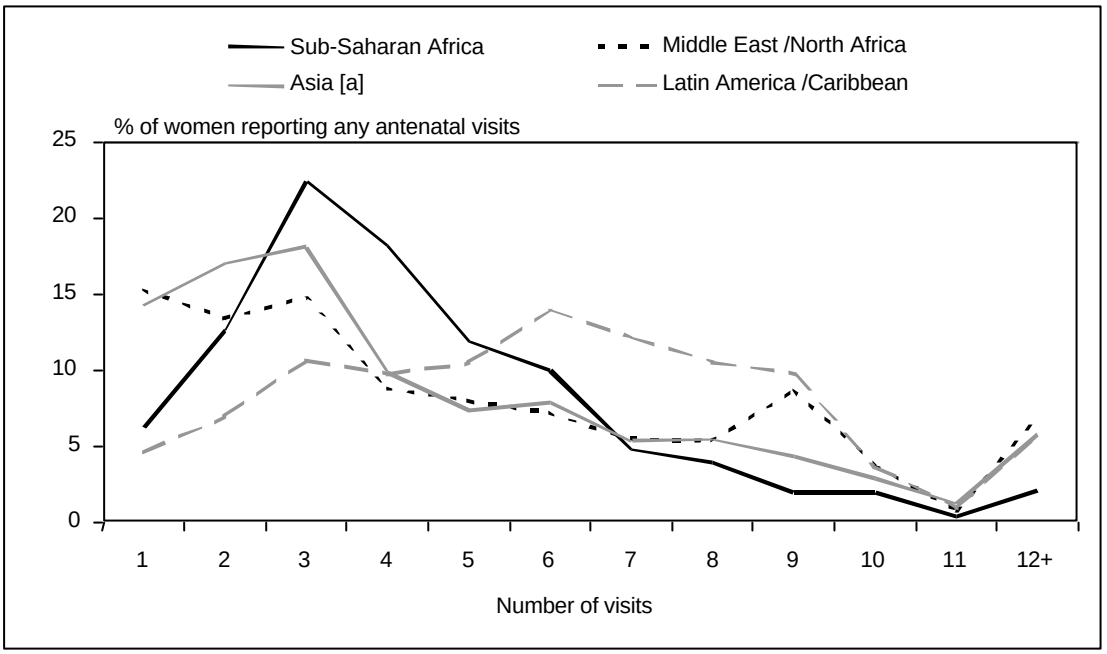
[b] For Ethiopia 2000, Tanzania 1999, Zimbabwe 1999, Colombia 2000 includes LAST birth in the last 5 years only

[c] In this analysis, skilled attendant includes auxiliary midwives who were excluded from the skilled attendant category in Table 1.

[d] India, includes visits from home health workers, births in last 4 years

Figure 4. Number of visits for antenatal care: detail

Substantial proportions of women report six or more antenatal visits



[a] Excluding China

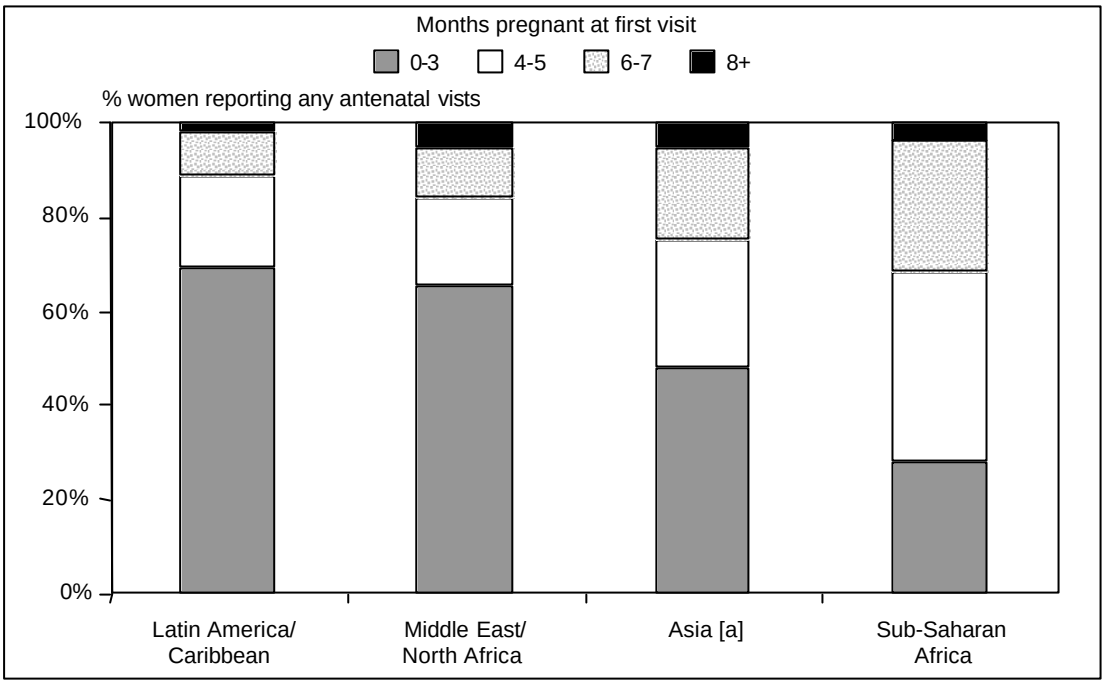
Source: AbouZahr and Wardlaw, 2002. DHS surveys in 45 developing countries.

Except in sub-Saharan Africa, most women come for antenatal care early in pregnancy

A key objective of maternal health care programmes has been to ensure that women present for antenatal care early in pregnancy in order to allow enough time for essential diagnosis and treatment regimens such as treatment of STIs and management of anaemia. Overall, this objective is being met: in Latin America and the Caribbean and in the Middle East and North Africa, two thirds of women present for antenatal care visit in the first trimester, while the figure for Asia is nearly half. The exception is sub-Saharan Africa, where women presenting for antenatal care are most likely to wait until the second trimester and a relatively substantial proportion present only in the third trimester (Figure 5). Although women in sub-Saharan Africa make their first antenatal visit rather late in pregnancy, they nonetheless tend to report more than one visit.

Figure 5. Timing of first antenatal visit

Except in sub-Saharan Africa, most women present for antenatal care in their first trimester



[a] Excluding China

Source: AbouZahr and Wardlaw, 2002. DHS surveys in 45 developing countries.

Differentials in use of antenatal care

An analysis of differentials in use of antenatal care is inevitably constrained by the interrelationships between the different variables examined. Clearly, urban or rural residence, age, number of births, level of education and household wealth all interact, so it is not possible to assess the individual contribution of each element to overall use of antenatal care. A multivariate analysis would be needed to better understand the impact of each variable, and that has not been possible for this paper. Nevertheless, the available data offer some intriguing insights.

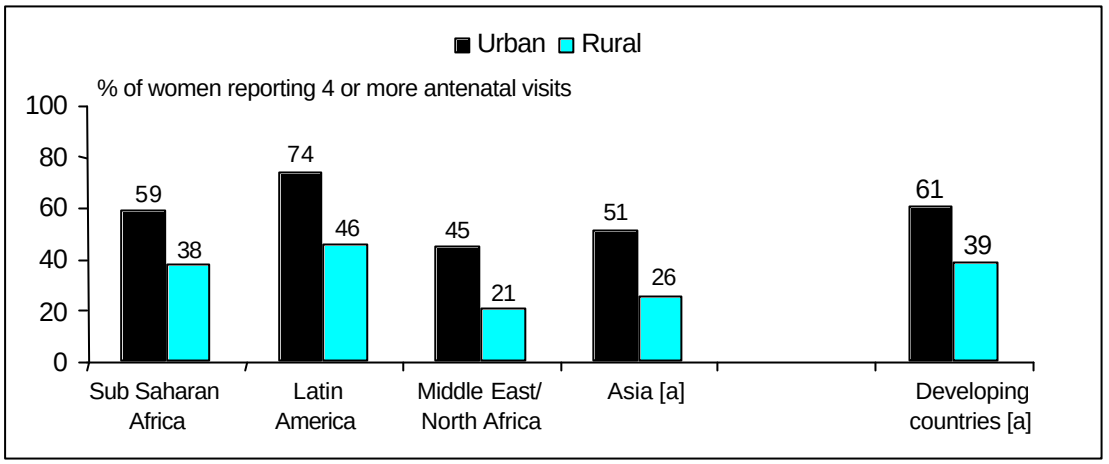
Urban women are twice as likely as rural women to report having four or more antenatal visits

Not surprisingly, there are marked urban/rural differentials in use of antenatal care, the differences being most pronounced for four or more antenatal visits. Women living in urban areas are generally twice as likely as those living in rural areas to report four or more antenatal care visits (Figure 6). Overall, some 86% of women in urban areas report at least one antenatal visit and 61% report four or more visits. By contrast, the figures for women in rural areas are only 65% and 39% respectively.

As a general rule, urban/rural differences are greatest when overall use of antenatal care is low. For example, in Bangladesh, Ethiopia, Morocco, Pakistan and Yemen, the urban rate for four or more visits is at least sixfold the rural rate (Table 3). Zimbabwe is notable for rural levels roughly the same as the urban levels.

Figure 6. Antenatal care and urban/rural residence

Urban women are twice as likely as rural women to report at least four antenatal visits



[a] Excluding China

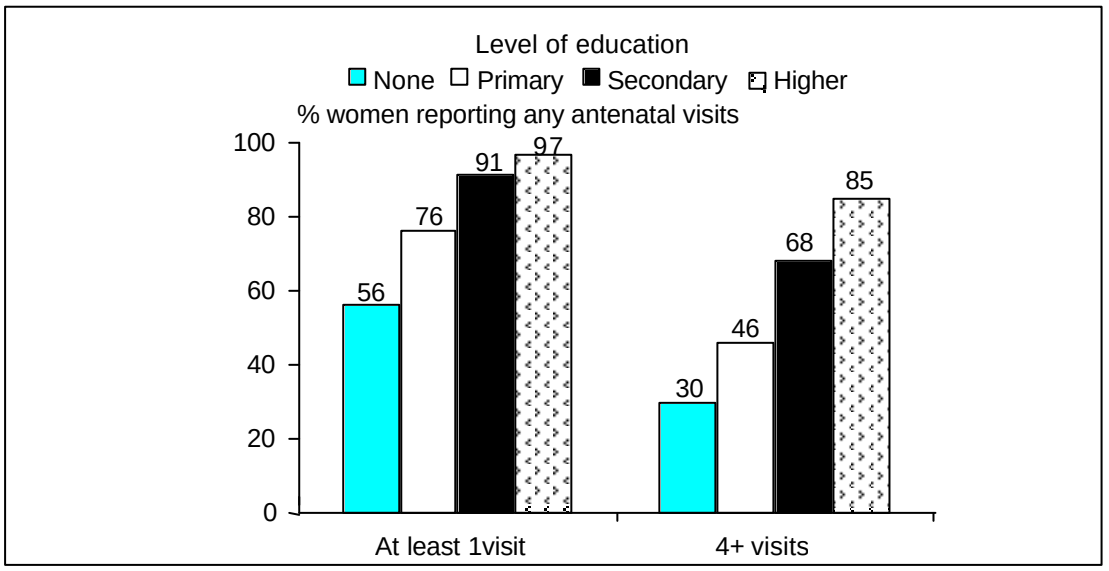
Source: AbouZahr and Wardlaw, 2002. DHS surveys in 45 developing countries.

Educated women are more likely to have four or more visits but education has least effect in sub-Saharan Africa

The data confirm that in developing countries as a whole, educated women are more likely to receive antenatal care and the likelihood of their using antenatal care is associated with their level of education (Figure 7). Educated women are also more likely to report four or more visits. In most countries, the greatest proportionate difference occurs between women with no education and those with primary education.

Figure 7. Antenatal care and education

In developing countries, educated women are more likely to have antenatal care and four or more antenatal visits



Source: AbouZahr and Wardlaw, 2002. DHS surveys in 45 developing countries.

Table 3. Sociodemographic characteristics for antenatal care (women reporting 4+ visits)

	Type of residence		Level of education				Mother's age at birth			Parity				Women with 4+ visits as % of all women
	Urban	Rural	None	Primary	Secondary	Higher	< 20	20-34	35+	1	2-3	4-5	6+	
Benin 1996	63	50	49	70	86	[a]	54	56	46	62	56	56	45	54
Burkina Faso 1999	34	22	21	34	49	[a]	25	23	20	26	25	21	20	23
Cameroon 1998	68	48	28	62	73	[a]	53	55	46	61	54	52	46	54
Central African Rep. 1994	53	25	25	42	60	[a]	39	36	33	39	36	36	34	36
Chad 1997	35	7	9	25	58	[a]	15	13	12	15	14	12	13	13
Comoros 1996	64	50	44	64	73	[a]	58	54	46	65	56	47	47	53
Côte d'Ivoire 1994	41	22	22	35	58	[a]	29	30	23	34	32	25	22	29
Ethiopia 2000	44	6	6	21	49	[a]	10	11	8	14	11	12	6	10
Ghana 1998 [b]	81	57	47	60	78	[a]	60	65	55	69	63	63	53	62
Guinea 1999	72	39	44	66	77	87	51	47	42	56	50	45	40	47
Kenya 1998	70	59	58	57	72	96	52	64	53	60	65	61	56	61
Madagascar 1997	50	35	29	34	57	88	35	38	42	39	38	38	37	38
Malawi 1992	73	62	60	64	81	[a]	65	63	59	66	64	65	59	63
Mali 1996	55	17	22	43	80	[a]	28	27	22	33	30	25	21	26
Mozambique 1997	71	33	27	48	76	[a]	40	41	39	45	39	38	42	41
Namibia 1992	69	56	41	59	73	75	49	63	60	59	61	61	61	60
Niger 1998	35	7	9	23	42	[a]	9	13	11	12	12	14	10	11
Nigeria 1999	74	44	28	68	83	90	37	57	49	56	57	49	46	52
Rwanda 1992	20	12	11	12	21	[a]	10	12	12	14	12	11	12	12
Senegal 1997	23	13	14	21	34	61	16	17	14	20	19	14	13	16
Tanzania 1999 [b]	86	64	57	72	87	[a]	69	71	62	72	70	71	61	69
Togo 1998	66	42	40	53	79	[a]	46	49	40	53	53	45	39	47
Uganda 1995	71	45	39	48	73	74	47	49	43	51	50	48	43	48
Zambia 1996	82	67	62	72	82	87	67	75	71	70	73	76	72	73
Zimbabwe 1999 [b]	75	73	70	69	78	98	69	76	69	75	75	78	65	74
Sub-Saharan Africa	**59**	**38**	**34**	**49**	**67**	**84**	**41**	**44**	**39**	**47**	**45**	**42**	**38**	**43**

	Type of residence		Level of education				Mother's age at birth			Parity				Women with 4+ visits as % of all women
	Urban	Rural	None	Primary	Secondary	Higher	< 20	20-34	35+	1	2-3	4-5	6+	
Egypt 1995	50	15	12	23	49	82	19	30	26	41	32	19	13	28
Jordan 1990	73	55	50	62	74	84	72	69	60	83	70	66	60	68
Morocco 1992	18	3	4	15	32	60	6	9	6	15	10	5	3	8
Turkey 1998	52	27	14	41	74	92	37	45	29	56	45	24	9	43
Yemen 1991	32	5	7	30	73	63	10	10	6	12	10	9	8	9
Middle East/N. Africa	**45**	**21**	**17**	**34**	**60**	**76**	**29**	**32**	**25**	**41**	**33**	**25**	**19**	**31**
Bangladesh 1997	28	3	2	4	18	57	5	6	3	10	5	3	1	6
India 1993 [c]	49	31	24	44	60	82	34	36	21	43	37	27	19	35
Indonesia 1997	88	63	44	64	85	99	64	72	60	77	73	61	47	70
Nepal 1996	35	7	5	14	35	72	13	9	3	17	10	5	2	9
Pakistan 1991	35	5	7	20	49	86	10	16	8	18	17	13	8	14
Philippines 1998	74	47	10	39	64	84	50	62	52	71	65	52	37	59
Asia [d]	**51**	**26**	**15**	**31**	**52**	**80**	**29**	**33**	**25**	**39**	**35**	**27**	**19**	**32**
Bolivia 1998	62	25	17	32	68	91	47	48	37	60	53	38	28	46
Brazil 1996	86	55	39	68	90	99	73	81	70	86	82	65	47	78
Colombia 2000	86	68	55	70	88	96	75	83	75	86	83	68	53	81
Dominican Rep.1996	92	83	72	85	95	99	81	91	84	89	90	86	78	88
Guatemala 1999	66	40	33	50	88	91	44	53	42	60	57	42	37	50
Haiti 1994	56	25	19	44	74	[a]	37	38	25	49	39	32	20	35
Nicaragua 1998	73	51	40	61	80	91	59	65	53	69	67	62	46	63
Paraguay 1990	82	46	23	54	90	98	57	66	54	74	72	57	41	63
Peru 1996	66	23	18	30	64	86	43	51	42	62	53	40	24	49
Latin America/Caribbean	**74**	**46**	**35**	**55**	**82**	**94**	**57**	**64**	**54**	**71**	**66**	**54**	**41**	**61**
Total	**59**	**36**	**30**	**46**	**67**	**85**	**42**	**45**	**38**	**50**	**46**	**41**	**34**	**44**

[a] Excluding China

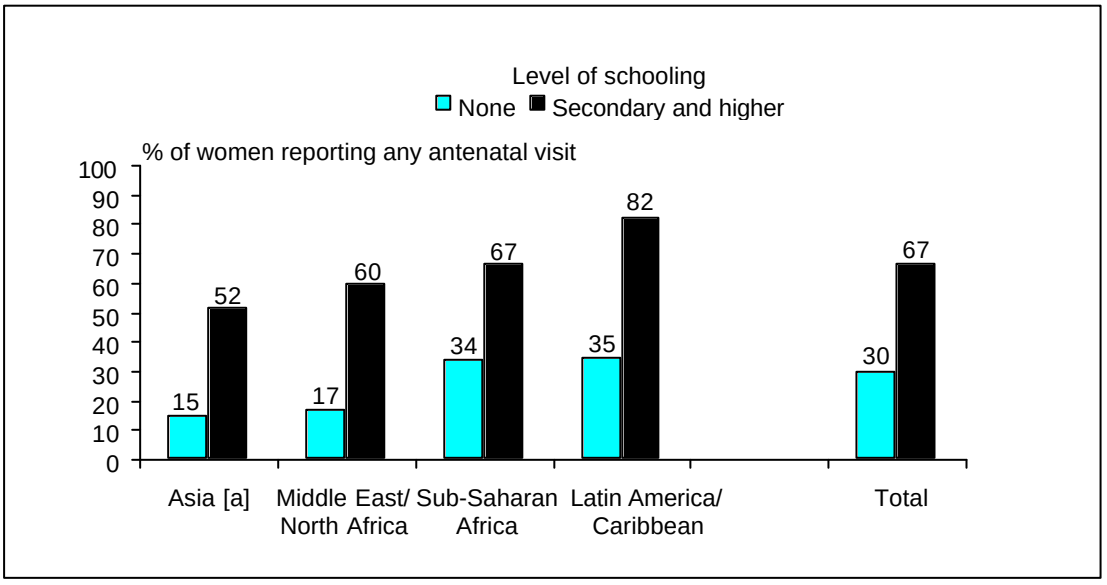
Source: UNICEF/WHO/ 2002. Data from Demographic and Health Surveys (DHS), Multiple Indicator Cluster Surveys (MICS) and other national surveys, late 1990s to 2001. 104 countries. Averages weighted by number of births.

Despite this overall consistency in the relationship between education and antenatal care, there are large differences in coverage levels among women at the same level of education. Women with similar levels of education can have vastly different levels of antenatal care use. These differences are greatest among women with no education and smallest among women with secondary or higher education. For example, the percentages of women with no education reporting four or more antenatal care visits range from 2% in Bangladesh to 72% in the Dominican Republic (Table 3). The range among women with secondary education is smaller but still substantial: aside from Bangladesh and Rwanda, which show very low use levels even among women with secondary education, the levels for four or more visits vary from 32% and 34% in Morocco and Senegal to 90% in Brazil and Paraguay and 95% in the Dominican Republic. Overall, the data indicate that there are ways to overcome the disadvantage of low educational levels; lack of education does not necessarily have to be a strong determinant of use of antenatal care, given appropriate programme interventions to encourage women to make use of available antenatal services.

A significant finding of the regional analysis is that education appears to have less effect on use of antenatal care in sub-Saharan Africa than in other regions, particularly in the Middle East and North Africa and in Asia (Figure 8). But in all the developing regions, women with secondary schooling are at least twice as likely to present for antenatal care as women with no schooling.

Figure 8. Antenatal care and education: regional variations

Women with secondary education are twice as likely to have antenatal care as women with no education; education has least effect in sub-Saharan Africa



[a] Excluding China

Source: AbouZahr and Wardlaw, 2002. DHS surveys in 45 developing countries.

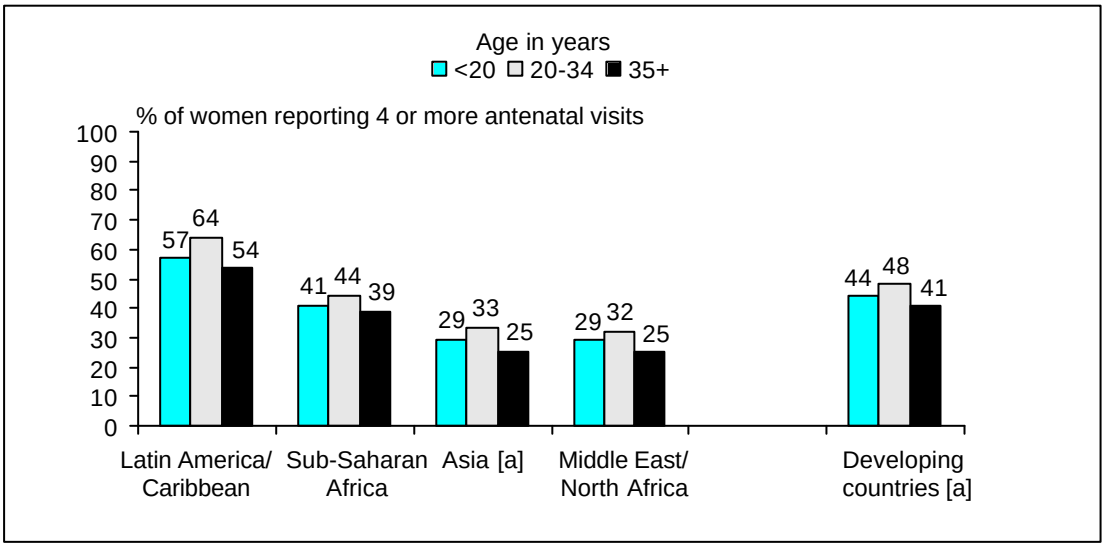
Differentials across age and parity groups are small

It is generally assumed that use of antenatal care must be lowest in the youngest and oldest age groups, because many of the younger pregnant women will be unmarried and unable or unwilling to use maternal health services, and many of the older pregnant women will have ingrained cultural biases against formal health care. In fact, our findings show that differentials across age groups are not very marked, with all age groups showing similar rates for four or more antenatal visits (Figure 9). This is an important finding, especially in the context of HIV/AIDS; use of antenatal care by younger women is a key entry point for HIV testing and efforts to prevent mother-to-child transmission of HIV/AIDS. The differences between age groups are even less marked when the comparison is women reporting one or more antenatal visits.

Although age and parity (number of births per woman) are closely correlated, higher parity appears to have more of an effect on antenatal care use than age by itself in all developing regions except sub-Saharan Africa (Figure 10). In the vast majority of countries, women expecting their first child are the most likely to present for antenatal care. In many countries, however, the differentials across parity are not large. For example, in Malawi, the percentage of mothers reporting four or more antenatal visits declines from 66% for first births to 59% for sixth or higher-order births (Table 3). In a few countries, such as Egypt, India and Turkey, the drop-off with increasing parity is steep. For instance, antenatal care use in Egypt decreases from 41% for first births to 13% for sixth or higher-order births.

Figure 9. Antenatal care by age group

Older women report slightly lower levels of antenatal care than women under 35

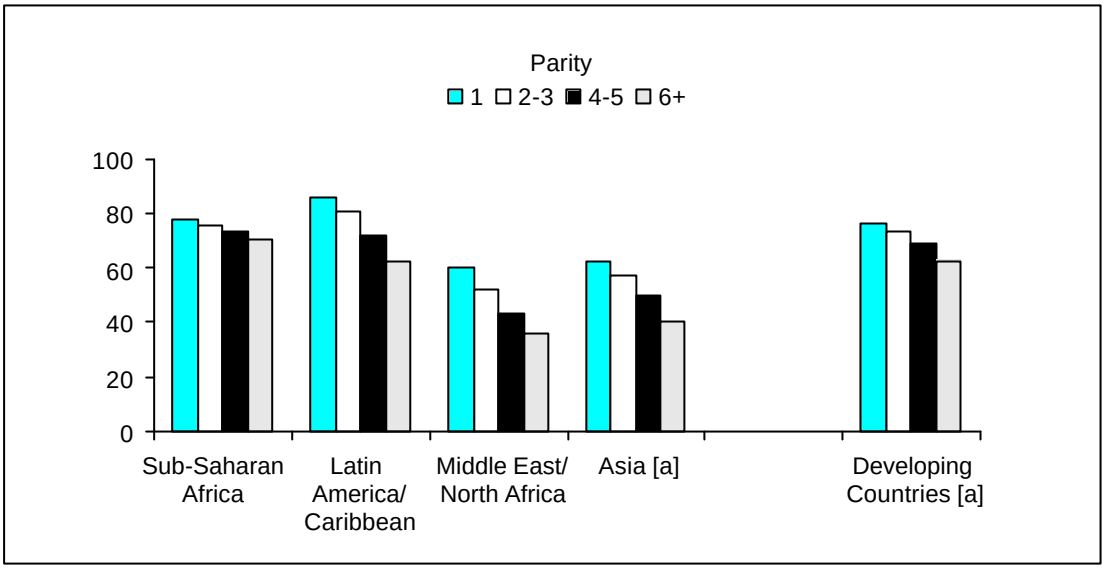


[a] Excluding China

Source: AbouZahr and Wardlaw, 2002. DHS surveys in 45 developing countries.

Figure 10. Antenatal care by parity

Higher-parity women have lower levels of antenatal care in all regions except sub-Saharan Africa, where differences are small



[a] Excluding China

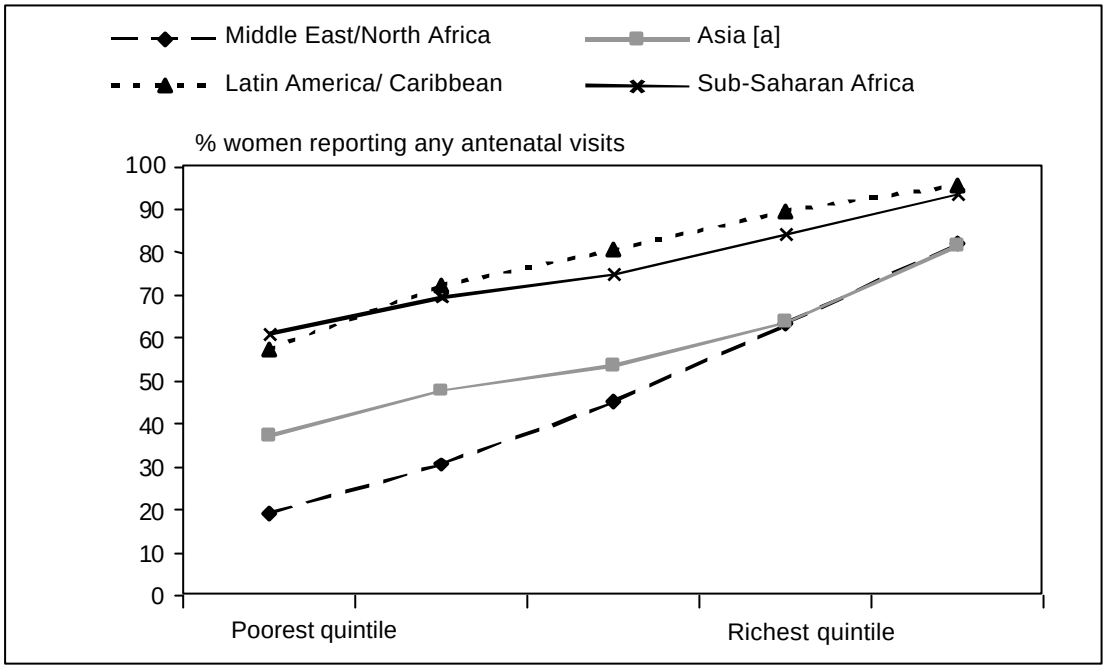
Source: AbouZahr and Wardlaw, 2002. DHS surveys in 45 developing countries.

Antenatal care is heavily influenced by wealth

The World Bank has produced an analysis of antenatal care use based on wealth quintiles, in which households are categorized by their wealth into five groups each representing 20% of the total population. An analysis of these data shows that use of antenatal care is heavily influenced in the expected direction by wealth in all regions (Figure 11). Women living in households that fall within the poorest population quintile use antenatal services much less frequently than do those in the richest 20%. The data also show that whereas some degree of wealth differential exists everywhere, the gap between the richest 20% and the poorest 20% for use of antenatal care varies enormously (Figure 12). Particularly steep gradients are observed in Bangladesh, Chad, Egypt, India, Mali, Morocco, Niger and Pakistan (Table 4). On the other hand, in the Dominican Republic, Ghana, Kenya, Malawi, Namibia, Uganda, Zambia and Zimbabwe, there is far less variation in use of antenatal care between the poorest and richest population quintiles (Table 4).

Figure 11. Antenatal care and household wealth

In all developing regions, the poorest 20% of the population are less likely to use antenatal care than the richest 20%

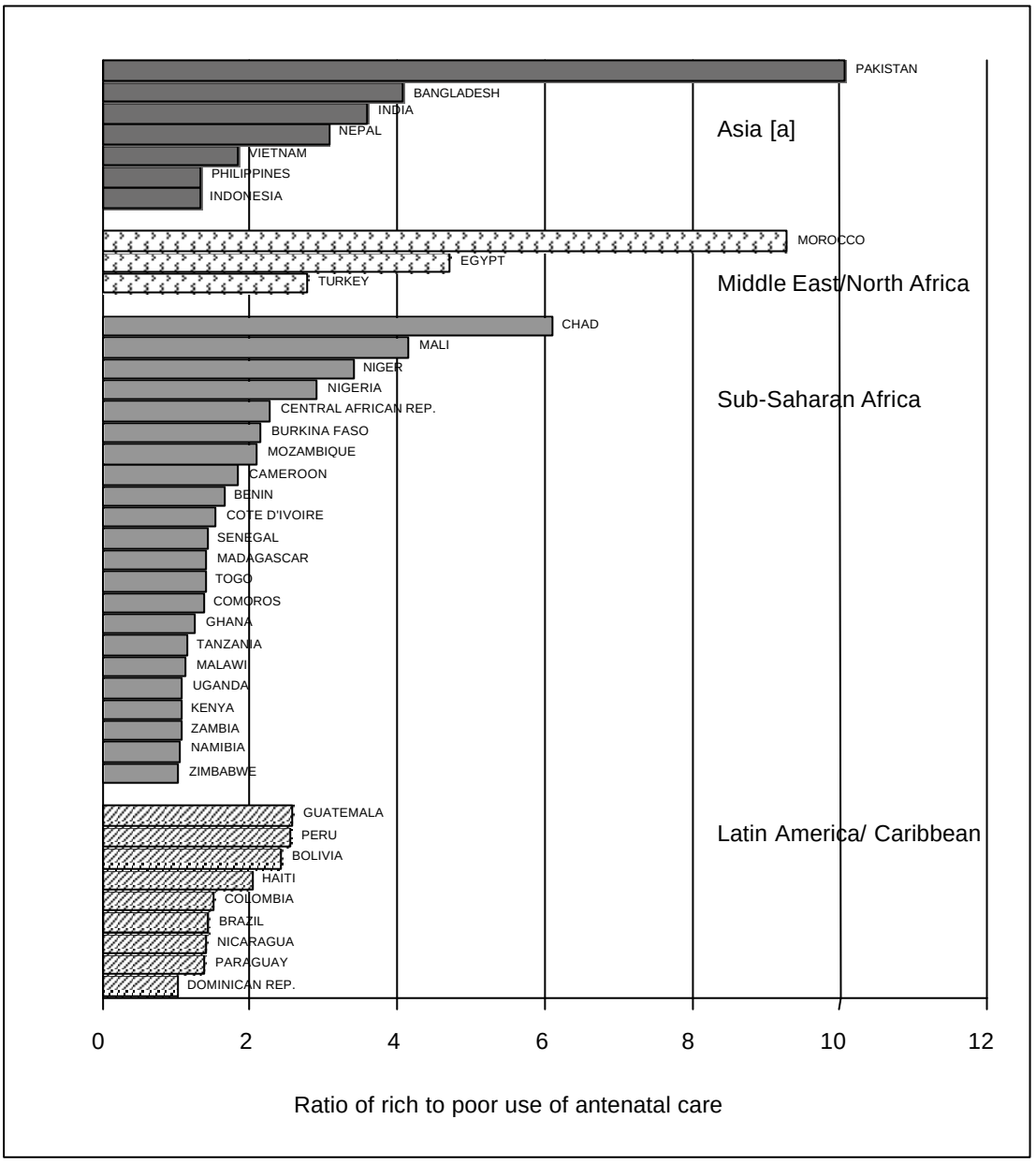


[a] Excluding China

Source: AbouZahr and Wardlaw, 2002. Based on World Bank analysis of DHS surveys in 41 developing countries.

Figure 12. Antenatal care by household wealth: regional comparisons

The gap between richest and poorest varies widely in all developing regions except in Latin America/Caribbean



[a] Excluding China

Source: AbouZahr and Wardlaw, 2002. Based on World Bank analysis of DHS surveys in 41 developing countries.

Table 4 Antenatal care and household wealth: richest compared with poorest (women reporting 1+ visits)

Indicator	Poorest	Second	Middle	Fourth	Richest	Ratio
Benin	59	73	88	94	99	**1.7**
Burkina Faso	43	47	49	68	93	**2.2**
Cameroon	53	69	79	91	99	**1.9**
Central African Rep.	40	54	67	84	92	**2.3**
Chad	12	18	24	40	70	**6.1**
Comoros	68	83	86	96	95	**1.4**
Cote D'ivoire	63	81	85	96	98	**1.6**
Ghana	76	79	84	95	97	**1.3**
Kenya	88	90	93	95	96	**1.1**
Madagascar	67	72	75	86	96	**1.4**
Malawi	84	86	90	95	97	**1.2**
Mali	20	35	44	57	85	**4.2**
Mozambique	47	69	64	90	98	**2.1**
Namibia	83	88	89	86	90	**1.1**
Niger	25	27	28	45	84	**3.4**
Nigeria	31	43	65	74	91	**2.9**
Senegal	67	72	87	95	96	**1.4**
Tanzania [a]	82	90	88	93	96	**1.2**
Togo	68	78	87	89	97	**1.4**
Uganda	87	90	92	93	96	**1.1**
Zambia	91	95	95	98	100	**1.1**
Zimbabwe	91	93	91	95	96	**1.1**
Sub-Saharan Africa	**61**	**70**	**75**	**84**	**94**	**1.5**
Egypt	17	23	38	52	80	**4.7**
Morocco	8	17	31	55	74	**9.3**
Turkey	33	52	67	84	92	**2.8**
Middle East/N. Africa	**19**	**31**	**45**	**63**	**82**	**4.3**
Bangladesh	14	16	22	32	59	**4.1**
India	25	34	46	65	89	**3.6**
Indonesia	74	89	93	97	99	**1.3**
Nepal	22	35	36	44	67	**3.1**
Pakistan	7	9	11	32	70	**10.1**
Philippines	72	83	93	95	98	**1.4**
Vietnam	50	70	74	83	92	**1.9**
Asia [b]	**37**	**48**	**54**	**64**	**82**	**2.2**
Bolivia	39	58	70	89	95	2.5
Brazil	68	88	93	97	98	**1.5**
Colombia	62	81	90	95	96	**1.5**
Dominican Rep.	96	98	99	99	100	**1.0**
Guatemala	35	41	49	72	90	**2.6**
Haiti	44	60	72	84	91	**2.1**
Nicaragua	67	81	87	89	96	**1.4**
Paraguay	70	80	86	95	99	**1.4**
Peru	37	65	79	88	96	**2.6**
Latin America/ Caribbean	**57**	**72**	**81**	**90**	**96**	**1.7**

[a] In this analysis, skilled attendant includes auxiliary midwives who were excluded from the skilled attendant category in Table 1

[b] Excluding China

Source: Adapted from data produced by The World Bank

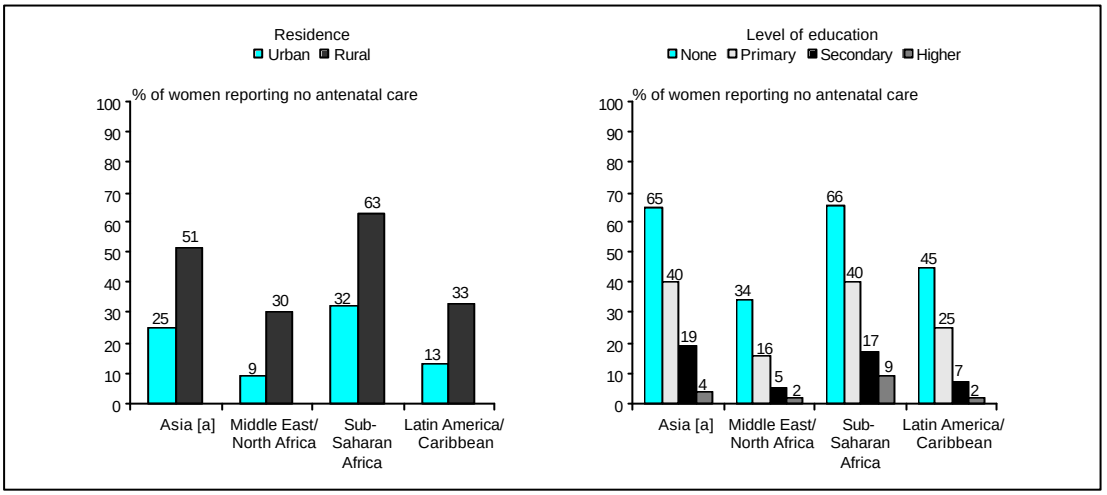
Who gets no antenatal care?

Rural and uneducated women are least likely to report antenatal care use

Women reporting no antenatal care are most likely to be living in rural areas and to have only primary education or no education at all (Figure 13). Among all the developing countries with data, one third of women in rural areas and two thirds of women with primary or no schooling report no antenatal care. Except in Latin America and the Caribbean, neither age nor parity are important factors in non-use of antenatal care.

Figure 13. Who gets no antenatal care?

Rural women and less educated women are less likely to have antenatal care



[a] Excluding China

Source: AbouZahr and Wardlaw, 2002. DHS surveys in 45 developing countries.

Content of antenatal care

Some of the more recent DHS surveys in 14 countries have asked questions about common elements of antenatal care. Women were asked whether specific data were collected, including taking of weight and height, measurement of blood pressure, and taking blood or urine samples. They were also asked whether they received information about danger signs for pregnancy complications and what to do if these arose. We have reviewed the limited results available from these responses.[g]

While responses to these questions are available for only 14 countries in total, they provide some interesting pointers to what actually happens during antenatal care visits. Comparison with WHO recommendations for the content of antenatal care makes for interesting reading. Among the countries with data on the content of care, the most common elements are measurement of weight and blood pressure, and the least common elements are blood and urine tests along with information on danger signs (Table 5).

[g] The women were also asked whether they received tetanus toxoid injections and iron or folate supplements. We have not analysed the responses to these questions in this paper.

Countries differ significantly on content of care. For example, only 6% of women in Rwanda were informed about danger signs compared with 83% in Colombia. The only developing countries where more than half of women received such information were Colombia, Malawi and Peru. On the other hand, at least half of all women in all the countries had their weight or blood pressure taken. Urine and blood samples were taken from only 4% and 8% of women in Rwanda. Under half of women had a blood or urine sample taken in Cambodia, Egypt, Ethiopia, Malawi, Mauritania, Nepal and Uganda. Although this represents only a small sample of countries, it indicates that more effort needs to be put into blood and urine testing to identify conditions such as pre-eclampsia, severe anaemia and STIs.

Table 5 Specific antenatal interventions received, 1999-2001 (% among women reporting 1+ visits)

	Informed about danger signs of pregnancy	Weight measured	Height measured	Blood pressure taken	Urine sample taken	Blood sample taken	Number
Cambodia 2000	40	-	-	61	17	15	2543
Colombia 2000	83	98	-	99	91	92	3224
Egypt 2000	18	60	32	58	46	47	9688
Ethiopia 2000	27	67	43	69	21	25	2179
India 1998/99	36	56	27	63	56	59	21173
Gabon 2000	35	93	81	92	90	88	2766
Haiti 2000	34	88	55	89	57	58	3443
Malawi 2000	71	-	-	83	23	43	7675
Mauritania 2000/2001	14	86	81	86	57	56	2242
Nepal 2001	48	47	14	60	29	28	2330
Peru 2000	75	97		97	68	65	8045
Rwanda 2000	6	93	39	65	4	8	4755
Uganda 2000/01	19	71	34	56	11	15	4206
Zimbabwe 1999	42	-	-	89	80	75	2770

Notes:
For all countries except India and Egypt, data refer to the last birth in the 5 years preceding the survey.

For India, data refer to the two most recent births in the 3 years preceding the survey.

For Egypt, data refer to all births in the last 5 years.

Source: DHS final reports

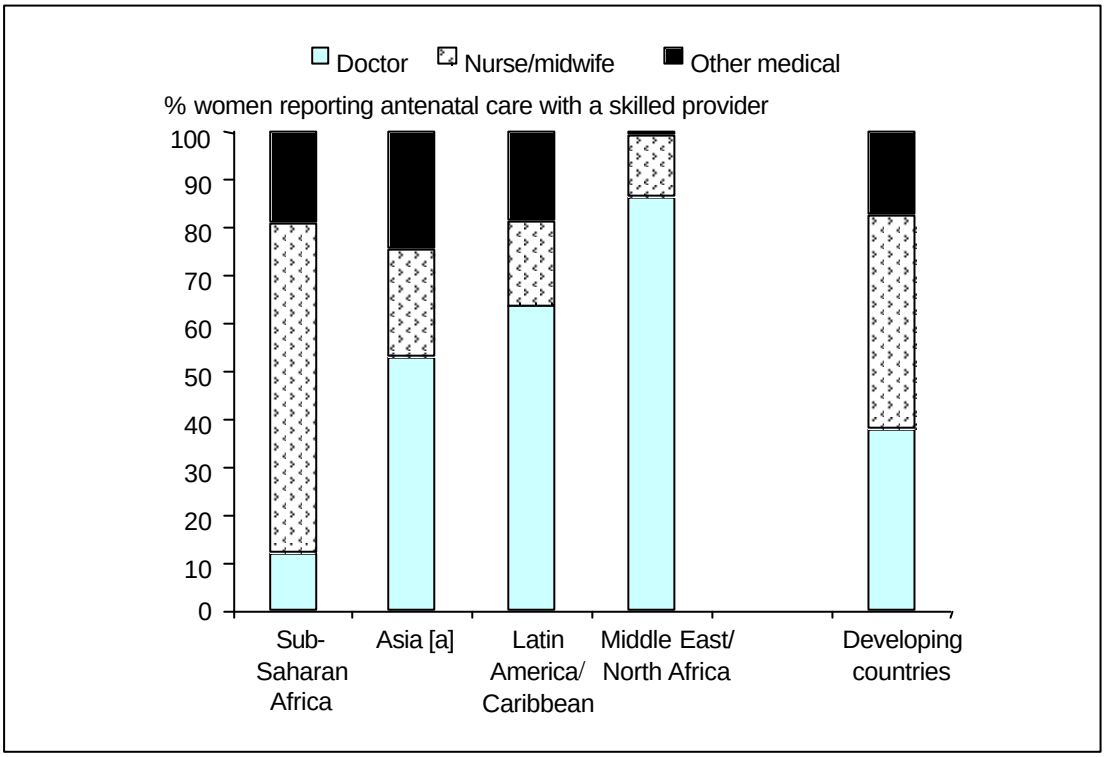
Who provides antenatal care?

The majority of the antenatal interventions known to be effective can be delivered by a midwife or nurse or, indeed, lower-level health care workers such as auxiliary nurse/midwives, primary health care workers and community health workers, provided they have the necessary training, equipment and supplies and are appropriately supervised. However, for complicated cases, it is important to be able to draw upon more specialized skills such as those of a doctor or even an obstetrician/gynaecologist. Because the DHS questionnaires elicit information about the highest level of health care provider seen for

antenatal care (see section 3), it is possible to assess the extent to which women have access to a qualified doctor. The data are available for 43 developing countries. There are some technical issues to be resolved regarding the precise classification of the various providers in the different national surveys, and definitions for the category 'Other medical' are not always comparable from country to country. But the 'Doctor' category is relatively standard across countries, so it is possible to conclude that of the women who received antenatal care from a skilled provider, the percentage who received care from a doctor varies from the vast majority of women in the Middle East and North Africa, to around two thirds of women in Latin America and the Caribbean, to a little more than half of women in Asia. However, only 12% of women in sub-Saharan Africa reported seeing a doctor at any time during antenatal care (Figure 14).

Figure 14. Antenatal care by type of provider

In all regions except sub-Saharan Africa, doctors are the most commonly used skilled attendants



[a] Excluding China

Source: AbouZahr and Wardlaw, 2002. DHS surveys in 43 developing countries.

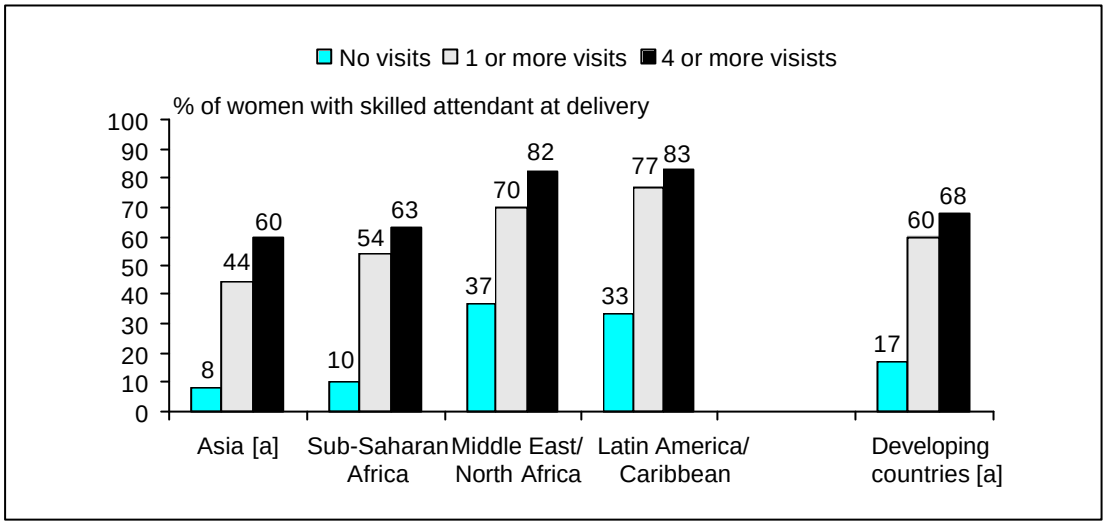
How does antenatal care relate to care at delivery?

Overall, there appears to be a consistent link between use of antenatal care and delivery assisted by a medically trained health care provider – doctor, nurse or midwife (Figure 15). Women reporting four or more antenatal visits are far more likely to have given birth with medical assistance than women reporting fewer visits (Table 6). This is particularly the case in countries where the overall level of antenatal care use is low. Across all developing

countries, skilled medical assistance at delivery is six times more common for women who had at least one antenatal care visit than for women who had none, and three times more common for women who had four or more visits than for women who had fewer visits (Table 6).

Figure 15. Number of antenatal care visits and skilled attendant at delivery

Women who deliver with a skilled attendant are more likely to have had antenatal care

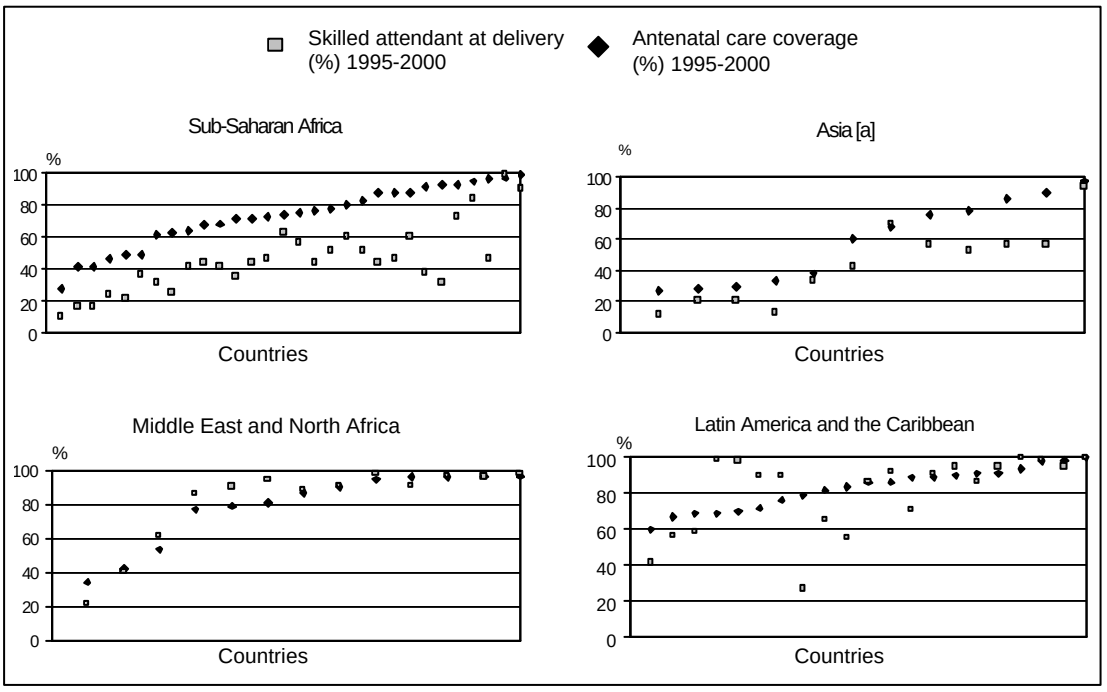


[a] Excluding China

Source: AbouZahr and Wardlaw, 2002. DHS surveys in 45 developing countries.

Figure 16. Antenatal care and skilled attendant at delivery: country patterns

The link between antenatal care and skilled attendant is closest in the Middle East and North Africa



[a] Excluding China

Source: AbouZahr and Wardlaw, 2002. DHS data in 45 developing countries.

Table 6 Number of antenatal care visits and skilled attendant at delivery (women delivering with skilled attendant)

	Mother had medical assistance at delivery					
	<4 visits	**4+ visits**	**Ratio**	**No visits**	**1 visit**	**Ratio**
Benin 1996	40.2	84.6	2.1	11.1	77.0	6.9
Burkina 1999	23.1	55.7	2.4	4.7	47.8	10.2
Cameroon 1998	36.6	77.1	2.1	9.0	71.3	7.9
Central African Republic 1994	30.8	72.2	2.3	6.7	65.3	9.7
Chad 1997	9.1	52.3	5.7	3.4	39.7	11.7
Comoros 1996	32.4	69.0	2.1	15.1	58.6	3.9
Côte d'Ivoire 1994	35.4	71.1	2.0	5.3	53.6	10.1
Ethiopia 2000	2.8	33.8	12.1	1.5	18.6	12.4
Ghana 1998	17.3	59.7	3.5	8.8	48.8	5.5
Guinea 1999	16.7	54.3	3.3	2.8	47.4	16.9
Kenya 1998	34.3	50.2	1.5	20.4	46.0	2.3
Madagascar 1997	34.6	68.7	2.0	8.0	59.1	7.4
Malawi 1992	42.5	62.4	1.5	6.7	60.2	9.0
Mali 1996	23.7	77.4	3.3	12.8	67.7	5.3
Mozambique 1997	24.9	65.9	2.6	3.0	58.6	19.5
Namibia 1992	54.2	77.3	1.4	32.6	73.5	2.3
Niger 1998	13.1	52.1	4.0	3.1	40.0	12.9
Nigeria 1999	13.0	66.8	5.1	4.1	62.3	15.2
Rwanda 1992	24.1	37.7	1.6	6.8	26.9	4.0
Senegal 1997	42.8	66.3	1.5	8.2	55.1	6.7
Tanzania 1999	25.7	56.7	2.2	10.8	49.5	4.6
Togo 1998	35.1	68.3	1.9	10.4	59.4	5.7
Uganda 1995	24.5	51.9	2.1	8.6	40.3	4.7
Zambia 1996	27.8	53.1	1.9	4.7	48.1	10.2
Zimbabwe 1999	57.4	78.6	1.4	28.9	76.6	2.7
Sub-Saharan Africa	**28.9**	**62.5**	**2.9**	**9.5**	**54.1**	**8.3**
Egypt 1995	33.4	78.6	2.4	30.4	70.9	2.3
Jordan 1990	77.4	92.0	1.2	72.7	90.8	1.2
Morocco 1992	26.5	82.9	3.1	16.2	61.7	3.8
Yemen 1991	32.1	72.3	2.3	28.3	56.9	2.0
Middle East/North Africa	**42.4**	**81.5**	**2.2**	**36.9**	**70.1**	**2.4**
Bangladesh 1997	5.5	53.0	9.6	3.0	22.2	7.4
India 1993	21.5	58.3	2.7	9.9	49.5	5.0
Indonesia 1997	24.2	60.0	2.5	8.2	54.0	6.6
Nepal 1996	6.0	49.3	8.2	3.1	20.6	6.6
Pakistan 1991	11.1	67.2	6.1	6.8	54.4	8.0
Philippines 1998	33.9	72.3	2.1	16.9	63.0	3.7
Asia [b]	**17.0**	**60.0**	**5.2**	**8.0**	**44.0**	**6.2**
Bolivia 1998	31.6	85.7	2.7	18.2	77.3	4.2
Brazil 1996	69.2	94.1	1.4	61.1	93.0	1.5
Colombia 2000	63.4	94.8	1.5	50.8	92.5	1.8
Dominican Republic 1996	83.2	96.9	1.2	54.2	96.0	1.8
Guatemala 1999	19.0	61.6	3.2	14.7	57.9	3.9
Haiti 1994	36.1	64.1	1.8	26.0	55.7	2.1
Nicaragua 1998	45.3	77.4	1.7	31.0	72.8	2.3
Paraguay 1990	36.5	83.7	2.3	17.4	75.3	4.3
Peru 1996	30.6	83.8	2.7	21.5	73.3	3.4
Latin America/Caribbean	**46.1**	**82.5**	**2.1**	**32.8**	**77.1**	**2.8**
Developing countries [a]	**31.7**	**67.6**	**3.0**	**16.8**	**58.3**	**6.3**

[a] In this analysis, skilled attendant includes auxiliary midwives who were excluded from the skilled attendant category in Table 1
[b] Excluding China

The relationship between four or more antenatal care visits and delivering in a medical facility – hospital, health centre or clinic – is even more pronounced (DHS data not supplied in this paper). Women reporting at least four antenatal care visits were on average 3.3 times more likely to deliver in a medical facility than other women. The difference between the two groups of women is especially large in Bangladesh and Ethiopia, both countries with low overall levels of antenatal care use.

At the aggregate level, there is a strong positive correlation between at least one antenatal care visit and skilled attendant at delivery (r^2 + 0.6). But there are important regional variations in the patterns connecting skilled antenatal care and skilled delivery care (Figure 16). In the Middle East and North Africa, antenatal care and delivery care move consistently together. Neither in Asia nor in Latin America and the Caribbean does there appear to be a consistent pattern in the two variables. In sub-Saharan Africa, by contrast, the levels for antenatal care use are consistently higher than the levels for skilled attendant at delivery. This would appear to indicate that antenatal care is less effective in sub-Saharan Africa in getting women to use skilled attendance at delivery. There are many possible reasons for this, including the fact that women in sub-Saharan Africa are far less likely to have been in contact with a doctor during antenatal care (see section 10). It is also possible that maternal health programmes in this region have tended to focus on antenatal care to the detriment of delivery care or care for the management of obstetric complications. Interestingly, this is the region with the highest levels of maternal mortality.

Antenatal care has the potential to serve as a strategy for increasing use of a skilled health care provider at delivery. These skilled attendants – doctors, nurses, midwives – are the providers of obstetric care for complications, though clearly they need the necessary back-up, equipment and supplies if they are to function effectively.

Missed opportunities: malaria, HIV/AIDS, nutrition and TB

Our analysis shows overall that women are using antenatal care; in general, they attend early and get more than one visit, usually four if not more. This has important programme implications beyond those related to obstetric care alone. For four programme areas in particular, namely malaria, TB, nutrition, and HIV/AIDS and other STIs, the antenatal period represents an important opportunity yet it currently appears to be underexploited. Antenatal care can be privileged entry point for counselling to prevent mother-to-child transmission of HIV. For malaria programmes it is important for women expecting their first child to present for antenatal care early in the pregnancy, to be offered preventive treatment and advice on the use of bednets. These opportunities need to be seized if antenatal care is to avoid being a period of missed opportunities.

Conclusions

Among safe motherhood advocates, antenatal care has been downplayed in recent years as an intervention for reducing maternal mortality. This has arisen in large part as a result of improved understanding of the causal pathways that lead to maternal deaths, notably absence of effective management for obstetric complications. Few life-threatening complications can be prevented antenatally, most requiring interventions at the time of delivery and the immediate postpartum period. Most safe motherhood programmes therefore currently stress ensuring access to emergency obstetric care and ensuring that all women benefit from the care of a skilled health care professional during delivery.

In these circumstances, it is not surprising that little attention has been paid to patterns and trends in antenatal care use. Yet there is ample evidence that care during the antenatal period represents an opportunity to deliver interventions that will improve maternal health, perinatal health and, more than likely, perinatal survival. Moreover, the HIV/AIDS epidemic has directed more attention to the antenatal period as an entry point for HIV prevention and care initiatives. We therefore conducted an analysis of antenatal care use patterns and trends, using data drawn from household surveys carried out in developing countries during the 1990s and 2000-2001. While our analysis was inevitably constrained by the limitations of descriptive statistics, some interesting findings have emerged that have important policy and programme implications.

We concluded from our examination of recent DHS data that antenatal care is very much a success story. On average, in developing countries, some two thirds of pregnant women report at least one antenatal visit. The countries falling below this average are mainly in Asia and sub-Saharan Africa, with a few in the Middle East and North Africa and only one in Latin America and the Caribbean. On the other hand, very high levels of antenatal care use are also found in both Asia and sub-Saharan Africa as well as in most countries of the Middle East and Latin America.

Recent trends in use of antenatal care in developing countries during the 1990s show striking improvements, increasing by some 20% overall. In sub-Saharan Africa, by contrast, antenatal care use has changed hardly at all over the decade although levels are relatively high compared with Asia. The greatest improvements were in Asia, largely as a result of rapid changes in a few large countries such as Indonesia. However, significant increases also took place in Latin America and the Caribbean, although this region already had relatively high levels for antenatal care.

Despite this progress, disparities in access between urban and rural areas remain significant, especially in Bangladesh, Chad, Egypt, Ethiopia, Mali, Morocco, Niger, Pakistan and Yemen. While physical remoteness and inaccessibility surely play a part in these disparities, they are unlikely to provide the whole story.

Part of the explanation may lie in the impact of education on use of antenatal care. In developing countries as a whole, women with secondary or higher education are more likely to have antenatal care than women with no education, and the disparities are even more

marked for four or more visits. Overall, women with secondary education are twice as likely to have antenatal care than women with no education. But in some countries the disparity is much larger, particularly in Asia and in the Middle East and North Africa. In Bangladesh and Yemen, for example, women with secondary education are 11 times more likely to report at least four antenatal visits than women with no education, and in Ethiopia, Morocco and Nepal they are 8 times more likely. However, the link between education and use of antenatal care seems much less powerful in most countries of sub-Saharan Africa.

Age does not appear to be a significant determinant of use of antenatal care; although older women do have slightly lower levels of antenatal care use than women under 35, the differences are not marked. Parity has a somewhat greater effect; higher-parity women generally have lower levels of antenatal care use in all regions. The exception is sub-Saharan Africa, where the differences across parity groups are small.

By contrast, wealth distribution appears to be a major determinant of use of antenatal care. In all regions, the poorest fifth of the population is less likely to have antenatal care than the richest fifth. However, within regions, there are important disparities between countries, with wealth disparities generally widest in Asia, in some countries of Northern Africa as compared with Southern and Eastern Africa, and in Latin America.

An encouraging finding from a programming perspective is that women who present for one antenatal care visit are likely to receive additional visits and, except in sub-Saharan Africa, most women present for their first visit in the first trimester. Moreover, antenatal care does appear to serve as a way of increasing use of skilled attendance at delivery, though this relationship is weakest in sub-Saharan Africa, where levels of maternal mortality are highest. Skilled attendants can help ensure provision of basic and comprehensive emergency obstetric care if they have the necessary back-up, equipment and supplies to function effectively.

The antenatal period offers opportunities for delivering health information and services that can significantly enhance the health of women and their infants, but its potential remains insufficiently exploited. Whereas women themselves appear to have embraced the concept of care during pregnancy with enthusiasm when such services are available, the care they are offered often falls short of the ideal by a long way, in terms of content and probably also quality. Antenatal visits offer entry points for a range of other programmes – such as nutrition, malaria, HIV/AIDS and TB – as well as for obstetric care. Greater efforts are needed to improve the content and quality of services offered. In addition, increased attention is needed to ensure that particular groups of women, specifically those living in rural areas, the poor and the less educated, obtain better access to antenatal services.

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[12] The term 'skilled attendant' refers exclusively to people with midwifery skills (for example midwives, doctors and nurses) who have been trained to proficiency in the skills necessary to manage normal deliveries and diagnose, manage or refer obstetric complications. Source: *Reduction of maternal mortality: a joint WHO/UNFPA/ UNICEF/World Bank statement*, op. cit.