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LEVELS AND TRENDS IN THE USE OF MATERNAL HEALTH SERVICES IN DEVELOPING COUNTRIES

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MEASURE DHS assists countries worldwide in the collection and use of data to monitor and evaluate population, health, and nutrition programs. Additional information about the MEASURE DHS project can be obtained by contacting ICF Macro, 11785 Beltsville Drive, Suite 300, Calverton, MD 20705 (telephone: 301-572-0200; fax: 301-572-0999; e-mail: reports@measuredhs.com; internet: www.measuredhs.com).

The main objectives of the MEASURE DHS project are:

- to provide decisionmakers in survey countries with information useful for informed policy choices;
- to expand the international population and health database;
- to advance survey methodology; and
- to develop in participating countries the skills and resources necessary to conduct high-quality demographic and health surveys.

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Levels and Trends in the Use of Maternal Health Services in Developing Countries

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Preface

One of the most significant contributions of the MEASURE DHS program is the creation of an internationally comparable body of data on the demographic and health characteristics of populations in developing countries. The *DHS Comparative Reports* series examines these data across countries in a comparative framework. The *DHS Analytical Studies* series focuses on specific topics. The principal objectives of both series are to provide information for policy formulation at the international level and to examine individual country results in an international context.

Whereas *Comparative Reports* are primarily descriptive, *Analytical Studies* have a more analytical approach. The *Comparative Reports series* covers a variable number of countries, depending on the availability of data sets. Where possible, data from previous DHS surveys are used to evaluate trends over time. Each report provides detailed tables and graphs organized by region. Survey-related issues such as questionnaire comparability, survey procedures, data quality, and methodological approaches are addressed as needed.

The topics covered in *Comparative Reports* are selected by MEASURE DHS staff in conjunction with the U.S. Agency for International Development. Some reports are updates of previously published reports.

It is anticipated that the availability of comparable information for a large number of developing countries will enhance the understanding of important issues in the fields of international population and health by analysts and policymakers.

Ann Way
Project Director

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Executive Summary

Many countries have made very limited or no progress in achieving the Millennium Development Goals (MDGs) 4 and 5 of reducing under-five mortality and maternal mortality. This study aims to contribute to the understanding of use of key maternal health services in the past two decades in developing countries. Such services are potentially important determinants of maternal and child mortality, and many other health outcomes of mothers and children. We analyze the current levels, trends and correlations in use of antenatal care, skilled birth attendance and postnatal care, along with differentials in use of these services by women's demographic and socioeconomic characteristics.

The study uses Demographic and Health Survey (DHS) data from 1990 to 2009 in 38 countries in four regions: sub-Saharan Africa; North Africa/West Asia/Europe; South/Southeast Asia; and Latin America and the Caribbean. We use the woman as the unit of analysis and focus on the most recent live birth in the past five years, or three years in surveys that asked only about births in three years prior to the interview. Based on the most recent DHS survey of each country, we report the level of each service use, as well as differences in use by individual and household characteristics. We also examine data from consecutive surveys in these countries to establish trends in use of antenatal care and skilled birth attendance. For postnatal care, the analysis covers only the most recent surveys in 18 countries with information available for both institutional births and non-institutional births.

Our results indicate that the developing world as a whole has achieved great success in extending the reach of antenatal care. Over 80 percent of women in the majority of countries studied have at least one antenatal care visit during pregnancy, and in many countries the coverage reaches 90 percent. Despite progress in antenatal care coverage, many countries, particularly in sub-Saharan Africa and South/Southeast Asia, still have unsatisfactory levels of the recommended four or more antenatal care visits. Additionally, many women, particularly in sub-Saharan Africa, tend to wait to start antenatal care until the second or third trimester. Socioeconomic disparities in use of antenatal care are profound. Women are more likely to report four or more antenatal care visits if they reside in urban areas, have a higher education level or live in a richer household. The differentials are smaller in countries with overall high levels of antenatal care. The study shows that skilled health providers (doctor, nurse or midwife) are commonly reported as the sources of antenatal care in most of the countries studied. In all countries as a whole, women are more likely to get their blood pressure measured, but less likely to get urine and blood samples tested, particularly in South/Southeast Asia and sub-Saharan Africa. Countries in Latin America and the Caribbean perform better than those in other regions with regard to delivering a majority of the selected services. In sub-Saharan Africa, most countries have not taken advantage of antenatal care to offer women preventive medicines for malaria, despite the high prevalence of malaria.

With regard to delivery care, there is a growing trend toward deliveries occurring in health facilities, both private and public. While in many countries the public sector contributes a major share of births that take place in an institutional setting, in some countries, particularly in North Africa/West Asia/Europe and South/Southeast Asia, the private sector for delivery care is much more developed. Use of health facilities for delivery varies by women's socioeconomic status. There is a consistently positive association between use of health facilities for delivery and women's education and household wealth.

In most countries, skilled birth attendance for women at delivery follows a pattern very similar to their use of health facilities. These rates are considerably lower in sub-Saharan Africa and South Asia than in the other regions. Especially in sub-Saharan Africa, nurses and midwives rather than doctors are the main providers of skilled birth attendance.

Women who delivered in a health facility, compared to those who did not, are more likely to report postnatal checkups, to have the first checkup within two days after delivery and to receive postnatal

care from a doctor, nurse or midwife. Combining institutional births and non-institutional births, in 8 of the 18 countries with data, 64 to 92 percent of women reported having a postnatal checkup within 41 days after giving birth.

There is a strong positive correlation between number of antenatal visits, having skilled birth attendance, and receiving postnatal care.

These findings provide valuable information for identifying intervention priorities for maternal and infant survival strategies and for developing policies and programs that can help to achieve MDGs 4 and 5.

1 Introduction

Only five years are left to achieve the Millennium Development Goals (MDGs) 4 and 5 of reducing the under-five mortality rate by two-thirds and reducing the maternal mortality ratio by three-quarters. However, many countries have made very limited or no progress in achieving these goals. Maternal mortality ratios remain high in many developing countries. The most recent estimates show that 358,000 maternal deaths occurred worldwide in 2008, with 99 percent of maternal deaths occurring in developing countries as a whole, and 87 percent in sub-Saharan Africa and South Asia (WHO et al. 2010). There has been encouraging achievement in reducing the global under-five mortality rate, which dropped from 89 per 1,000 in 1990 to 60 per 1,000 in 2009. Still, in 2009, 8.1 million children died before their fifth birthday. Neonatal mortality remains high and contributes to 40 percent of total under-five mortality (You, Jones, and Wardlaw 2010).

The evidence shows that high maternal, neonatal and child mortality rates are associated with inadequate and poor-quality maternal health care, including antenatal care, skilled attendance at birth and postnatal care (Carroli, Rooney, and Villar 2001; Li et al. 1996; WHO 1999). With improved understanding of the need for women to prepare physically, mentally and even logistically for childbirth, antenatal care is recognized as a key maternal service in improving a wide range of health outcomes for women and children (McDonagh 1996; Carroli, Rooney, and Villar 2001; Chen et al. 2007). Antenatal care represents an opportunity to deliver interventions for improving maternal nutrition, providing health education, and encouraging skilled attendance at birth and use of facilities for emergency obstetric care (EMOC). All of these interventions could contribute to reducing maternal mortality and improving infant survival. With the spread of HIV in many countries of the world, antenatal care also serves as an important conduit for HIV testing and counseling and thus has potential for the prevention of HIV transmission from mother to child. The prevention and treatment of malaria among pregnant women can also significantly improve maternal health and fetal outcomes.

The World Health Organization (WHO) recommends a minimum of four antenatal care visits, based on reviewing the effectiveness of different models of service delivery (Villar et al. 2001). WHO guidelines also specify the content of antenatal care visits, which should include blood pressure measurement, urine testing for bacteriuria and proteinuria, and blood testing to detect syphilis and severe anemia (WHO 2001). Some other services, including giving tetanus immunization, providing iron and folate tablets and teaching women about danger signs of pregnancy complications, are also important to improve both maternal and newborn health.

Evidence suggests that skilled attendance at birth and access to emergency obstetric care are key factors in reducing the risk of maternal death, in both industrialized and developing countries (WHO, ICM, and FIGO 2004; Graham, Bell, and Bullough 2001; De Brouwere, Tonglet, and Van Lerberghe 1998). WHO has defined a skilled attendant as "a accredited health professional – such as a midwife, doctor or nurse – who has been educated and trained to proficiency in the skills needed to manage normal (uncomplicated) pregnancies, childbirth and the immediate postnatal period, and in the identification, management and referral of complications in women and newborns" (WHO 1999). Providing skilled attendants for delivery care, along with the equipment, drugs and supplies necessary for effective prevention and management of obstetric complications, has been advocated as the most important intervention in preventing maternal deaths (WHO 1999). For this reason, the proportion of deliveries assisted by a skilled health provider is an intermediate indicator to monitor progress toward achieving MDG 5.

Most studies on antenatal care and skilled birth attendance have been conducted in only one or a few countries, rather than more widely (Chen et al. 2007; Magoma et al. 2010; Mpembeni et al. 2007; Syed et al. 2008; Bhutta et al. 2011). However, one study of levels and trends of antenatal care conducted

in the early 2000s based on household survey data in 49 countries showed that around 68 percent of women in developing countries had at least one antenatal care visit and that the use of antenatal care had increased by 20 percent in the developing world over the 1990 to 2000 decade (AbouZahr and Wardlaw 2003). Another comparative study using DHS data in six countries examined trends in delivery care with a health professional and found that the proportion of deliveries with a health professional had increased between 1990 and 2000 in all six countries (Bell, Curtis, and Alayón 2003).

A global analysis of maternal mortality trends also presented information on trends in skilled birth attendance and caesarean section delivery, based on data from the WHO/UNICEF databases and the DHS (AbouZahr and Wardlaw 2001). This study found modest improvement in use of skilled birth attendants, with an average annual increase of 1.7 percent in 53 countries examined in the decade 1989 to 1999. The authors also found that caesarean delivery rates tended to be stable over the 1990s, with higher rates in countries of the Americas than in Africa and Asia.

Compared to antenatal care and skilled attendance at birth, postnatal care has been largely neglected in safe motherhood programs. Postnatal care, especially within the first 48 hours after birth, is critical to the management of postpartum hemorrhage, an important cause of maternal deaths in developing countries. In developing countries, more than 60 percent of maternal deaths occur in the six weeks post-delivery and 80 percent of postpartum deaths are caused by obstetric factors occurring in the first week postpartum (Li et al. 1996). Postnatal care is also key to neonatal survival, through the prevention of neonatal sepsis and asphyxia/hypothermia, as well by promoting healthy behaviors such as exclusive breastfeeding and care of babies with low birth weight. Research on postnatal care, however, is limited in developing countries. One study using data from 30 DHS surveys conducted between 1999 and 2004 found that seven of ten mothers delivering outside a health institution did not receive any postnatal care. However, this study was not able to find enough information on postnatal care among women delivering at a health facility; and the assumption that all women who delivered at a health facility would have received postnatal care may not be true in many cases (Fort, Kothari, and Noureddine 2006).

Examining the use of maternal health services in developing countries can inform programs about where to focus interventions that can reduce maternal and newborn mortality and improve their health outcomes. For this purpose, our study provides up-to-date information on levels and trends in use of antenatal care, skilled birth attendance and postnatal care for mothers over the past two decades in 38 developing countries.

2 Data and Analysis

2.1 Data

This comparative report analyzes levels and trends in use of maternal health services: antenatal care, skilled birth attendance and postnatal care for the mother. The study uses Demographic and Health Surveys (DHS) data from 1990 to 2009 in 38 countries in four regions: 21 countries in sub-Saharan Africa; 4 countries in North Africa/West Asia/Europe; 8 countries in South/Southeast Asia; and 5 countries in Latin America and the Caribbean. Each country included has at least two surveys and most have three or four completed during this period. For each country, we choose surveys in order to keep approximately five years' time difference between the two consecutive surveys, if surveys were conducted more frequently than every five years. To reflect a recent level of service use, we include only those countries in which the most recent survey was conducted after 2000. Table 1 lists the countries and surveys included in this analysis.

Table 1. DHS surveys included in the analysis

Region and country	Survey year				
Sub-Saharan Africa					
Benin	1996*	2001	2006		
Burkina Faso	1993	1998-99	2003		
Cameroon	1991	1998*	2004		
Chad	1996-97	2004			
Ethiopia	2000	2005			
Ghana	1993*	1998	2003	2008	
Guinea	1999	2005			
Kenya	1993	1998*	2003	2008	
Madagascar	1992	1997*	2003-04	2008-09	
Malawi	1992	2000	2004		
Mali	1995-96*	2001	2006		
Mozambique	1997*	2003			
Namibia	1992	2000	2006-07		
Niger	1992	1998*	2006		
Nigeria	1990	2003	2008		
Rwanda	1992	2000	2007		
Senegal	1992-93	1997	2005		
Tanzania	1991-92	1996	1999	2004-05	
Uganda	1995*	2000-01	2006		
Zambia	1992	1996	2001-02	2007	
Zimbabwe	1994*	1999	2005-06		
North Africa/West Asia/Europe					
Armenia	2000	2005			
Egypt	1992	1995	2000	2005	2008
Jordan	1990	1997	2002	2007	
Morocco	1992	2003-04			
South/Southeast Asia					
Bangladesh	1993-94*	1999-2000	2004	2007	
Cambodia	2000	2005			

(Cont'd)

Table 1. – cont'd

Region and country	Survey year				
India	1992-93*	1998-99*	2005-06		
Indonesia	1991	1997	2002-03	2007	
Nepal	1996*	2001	2007		
Pakistan	1990-91	2006-07			
Philippines	1993	1998	2003	2008	
Vietnam	1997*	2002*			
Latin America/Caribbean					
Bolivia	1994*	1998	2003	2008	
Colombia	1990	1995	2000	2005	
Dominican Republic	1991	1996	2002	2007	
Haiti	1994-95	2000	2005-06		
Peru	1991-92	1996	2000	2005	2008

Note: Data for Peru 2005 and 2008 are obtained from the Peru 2004-2008 continuous DHS.

*Information was collected only for live births in the three years preceding the survey, so analyses focus on the most recent birth in the past three years.

In DHS surveys, women age 15-49 were asked to provide information about pregnancies resulting in a live birth during the five years prior to the interview. In some surveys conducted during the 1990s, the reference period was three years prior to the interview. Since 1999, DHS resumed collecting antenatal and postnatal information for the last live birth in the past five years. Information on skilled birth attendance was collected for all live births in the past five years. Starting in 2005, DHS surveys have collected postnatal care information for both institutional and non-institutional births, whereas in previous surveys such information was collected only for non-institutional births. Therefore, we limit the analysis of postnatal care to surveys in which respondents were asked about postnatal care for all births (both institutional and non-institutional). As a result, only 18 of the 38 countries are included in our analysis of postnatal care.

We use the woman as the unit of analysis and focus on the most recent live birth in the past five years, or three years in surveys that asked about births only in three years prior to the interview. Table 2 presents characteristics of women who had a live birth in the five/three years preceding the most recent survey in each country.

Table 2. Percent distribution of women who had a live birth in the five years preceding the survey by selected characteristics, the most recent DHS survey, 1990-2009

	Age at the last birth			Birth order				Residence		Education				Wealth status (quintile)					Total number of women who had a live birth in the past 5 years
Country/Year	<20	20 -34	35 -49	1	2	3	4 or more	Urban	Rural	None	Pri-mary	Secon -dary	High -er	Low -est	Se-cond	Mid-dle	Four -th	High -est	
Sub-Saharan Africa																			
Benin 2006	11.0	73.6	15.4	17.6	17.9	16.1	15.4	35.6	64.4	73.1	18.5	7.9	0.5	21.0	19.8	20.7	20.7	17.8	10,521
Burkina Faso 2003	13.7	65.5	20.7	17.9	16.4	14.3	51.5	14.2	85.8	87.1	8.6	4.0	0.4	18.6	20.5	26.6	18.0	16.4	7,428
Cameroon 2004	21.2	65.5	13.3	22.9	18.3	14.5	44.3	46.2	53.8	28.0	41.7	29.0	1.3	23.8	19.6	20.4	19.2	17.0	5,303
Chad 2004	19.7	66.0	14.3	15.5	15.4	14.5	54.5	18.9	81.1	76.9	18.6	4.3	0.3	18.0	22.8	19.5	21.6	18.1	3,720
Ethiopia 2005	13.6	67.4	19.0	16.3	14.9	13.7	55.1	8.7	91.3	78.5	16.5	4.5	0.5	20.8	21.3	21.7	19.9	16.4	7,307
Ghana 2008	10.2	70.3	19.5	22.3	20.8	16.6	40.3	40.2	59.8	30.8	24.3	42.4	2.3	22.9	22.0	19.1	20.8	15.3	2,099
Guinea 2005	17.9	62.2	19.9	16.8	15.1	14.5	53.5	24.4	75.8	85.5	9.0	5.1	0.4	23.3	21.0	20.8	18.7	16.2	4,447
Kenya 2008	14.2	72.6	13.2	21.3	21.3	17.3	40.2	20.7	79.3	11.1	62.6	21.1	5.3	21.2	19.2	18.7	19.3	21.6	3,973
Madagascar 2008-09	19.6	62.7	17.7	21.4	19.2	15.7	43.7	12.4	87.6	23.2	54.6	20.9	1.2	23.4	21.4	20.1	18.5	16.6	8,662
Malawi 2004	17.8	68.5	13.7	20.9	20.3	16.3	42.6	14.3	85.7	24.9	63.0	11.8	0.3	19.0	21.7	22.1	19.7	17.5	7,271
Mali 2006	18.8	63.9	17.3	16.5	15.8	13.5	54.1	28.6	71.4	84.2	10.4	5.0	0.4	19.9	20.1	20.6	20.4	19.0	9,087
Mozambique 2003	20.4	64.4	15.2	20.3	17.9	15.6	46.3	31.2	68.8	44.3	51.1	4.5	0.2	25.5	19.0	20.5	17.2	17.9	7,179
Namibia 2006-07	15.1	69.3	15.6	31.4	25.7	16.6	26.4	43.9	56.1	9.5	27.9	57.3	5.3	20.2	18.2	21.9	22.0	17.6	3,898
Niger 2006	17.1	65.4	17.4	14.2	14.0	12.6	59.3	15.5	84.5	87.0	9.5	3.3	0.2	21.2	19.5	19.8	20.9	18.6	6,300
Nigeria 2008	13.4	68.1	18.5	17.3	16.6	15.3	50.8	30.2	69.8	45.5	22.8	25.8	6.0	23.1	22.2	19.0	18.2	17.5	17,635
Rwanda 2007	4.7	71.8	23.5	18.8	18.0	15.9	47.3	14.9	85.1	25.2	67.0	7.1	0.7	15.6	28.3	19.3	19.4	17.5	3,658
Senegal 2005	14.1	67.3	18.5	20.3	18.2	14.6	46.8	38.8	61.2	70.1	21.8	7.6	0.5	21.5	21.3	21.1	19.2	16.9	6,928
Tanzania 2004-05	15.7	69.5	14.8	20.4	20.2	16.1	43.3	22.1	77.9	25.4	69.4	4.0	1.3	21.2	20.6	20.2	19.5	18.5	5,772
Uganda 2006	15.4	68.1	16.5	16.3	14.1	13.5	56.2	13.3	86.7	21.6	62.7	12.9	2.8	21.3	21.6	19.6	19.1	18.4	5,035
Zambia 2007	15.5	68.6	15.9	18.7	17.2	15.5	48.6	32.6	67.4	13.0	61.0	22.9	3.1	22.3	20.9	20.2	20.6	16.0	4,136
Zimbabwe 2005-06	18.7	70.9	10.4	30.1	25.6	17.5	26.8	31.3	68.7	4.1	35.2	58.1	2.6	22.8	20.1	17.4	22.0	17.7	4,100
North Africa/West Asia/Europe																			
Armenia 2005	9.4	84.3	6.3	38.7	39.8	14.5	7.0	62.6	37.4	0.0	0.7	75.8	23.5	18.0	19.4	19.1	22.6	20.9	1,176
Egypt 2008	9.2	79.7	11.1	26.6	28.1	21.6	23.7	38.2	61.8	25.3	10.2	51.5	13.0	19.3	19.7	21.0	20.6	19.4	7,896
Jordan 2007	4.2	73.9	21.8	15.2	19.9	18.1	46.8	84.0	16.0	2.4	5.5	61.7	30.5	23.4	23.3	21.4	17.9	14.1	6,446
Morocco 2003-04	7.7	71.1	21.2	24.0	24.0	18.2	33.7	53.6	46.4	60.4	18.5	17.0	4.1	21.8	21.6	20.9	17.7	18.1	4,695

(Cont'd)

Table 2. – cont'd

Country/Year	Age at the last birth			Birth order				Residence		Education				Wealth status (quintile)					Total number of women who had a live birth in the past 5 years
	<20	20 -34	35 -49	1	2	3	4 or more	Urban	Rural	None	Pri-mary	Secon -dary	High -er	Low -est	Se-cond	Mid-dle	Four -th	High -est	
South/Southeast Asia																			
Bangladesh 2007	30.8	63.2	6.0	31.9	26.8	16.9	24.4	21.2	78.8	26.1	30.9	36.2	6.7	21.8	21.3	19.0	19.5	18.4	4,905
Cambodia 2005	9.2	70.2	20.6	24.4	23.4	17.1	35.1	14.1	85.9	23.1	59.4	17.0	0.6	25.2	22.5	18.4	17.1	16.8	5,865
India 2005-06	17.3	77.4	5.2	26.4	28.7	17.2	27.8	26.8	73.2	47.4	14.0	32.7	6.0	24.1	21.7	19.6	18.3	16.3	39,677
Indonesia 2007	9.9	75.1	15.0	34.6	28.7	18.1	18.6	42.0	58.0	3.3	41.2	47.7	7.9	21.4	19.9	20.0	19.5	19.1	14,043
Nepal 2006	17.7	73.1	9.2	26.9	27.6	16.4	29.2	13.2	86.8	58.0	18.3	21.1	2.7	23.5	21.1	20.0	18.5	16.9	4,066
Pakistan 2006-07	8.1	75.8	16.1	17.0	18.2	15.5	49.2	30.2	69.8	64.6	15.0	14.3	6.0	22.7	21.0	19.4	18.8	18.1	5,677
Philippines 2008	9.3	72.2	18.5	27.9	22.6	17.1	32.3	49.7	50.3	1.5	23.1	47.9	27.5	24.0	22.0	19.7	18.8	15.5	4,590
Vietnam 2002	8.1	84.1	7.8	40.6	36.0	13.4	10.0	18.1	81.9	7.3	25.9	61.1	5.7	24.3	22.0	18.4	16.0	19.3	1,215
Latin America/Caribbean																			
Bolivia 2008	15.0	67.4	17.5	26.6	23.3	16.1	34.0	57.7	42.3	5.7	50.1	31.1	13.2	22.7	19.8	22.5	19.9	15.1	6,472
Colombia 2005	20.0	67.4	12.6	35.8	28.6	17.6	18.0	71.6	28.4	3.2	31.0	51.5	14.4	21.4	24.1	22.3	18.2	14.1	11,083
Dominican Republic 2007	21.2	70.5	8.3	32.7	26.0	21.4	19.9	68.5	31.5	3.7	38.6	39.2	18.4	22.7	22.9	20.7	18.4	15.2	8,203
Haiti 2005-06	14.6	65.4	20.0	27.5	18.6	13.1	40.8	37.0	63.0	31.6	42.1	24.5	1.8	22.4	19.3	20.3	21.4	16.6	4,074
Peru 2008	13.8	68.4	17.7	33.9	24.9	17.4	23.8	63.8	36.2	4.3	31.4	41.3	23.0	10.4	23.9	24.8	18.6	22.4	4,920

Reflecting the WHO definition, we define antenatal care as pregnancy-related health care checkups, which could occur either in a health facility or at home, and also use the WHO definition of a skilled health provider, which includes a doctor, midwife or nurse. Therefore, skilled birth attendance is defined as delivery assistance provided by a doctor, nurse or midwife (or in certain countries their professional equivalent, e.g., a nurse-midwife). It should be noted that in some countries other health personnel (e.g. auxiliary nurse or midwife) could be trained and equipped to provide maternal health care, although in the analysis we do not treat these providers as skilled health providers, for the purpose of consistency and comparability. We also use the WHO definition of postnatal care, which encompasses checkups by a health professional or others within 41 days or six weeks of childbirth.

Indicators of care are derived based on the following questions in the DHS woman's questionnaire.

Antenatal care:

- When you were pregnant with (NAME OF CHILD), did you see anyone for antenatal care for this pregnancy? IF YES: Whom did you see? Anyone else?
- How many months pregnant were you when you first received antenatal care?
- How many times did you receive antenatal care during this pregnancy?
- As part of your antenatal care during this pregnancy, were any of the following done at least once?
    - Was your blood pressure measured?
    - Did you give a urine sample?
    - Did you give a blood sample?
- During (any of) your antenatal care visit(s), were you told about the signs of pregnancy complications?
- During this pregnancy, were you given an injection in the arm to prevent the baby from getting tetanus, that is, convulsions after birth? If YES, how many times did you get this tetanus injection during this pregnancy?
- During this pregnancy, were you given or did you buy any iron tablets or iron syrup?
- During this pregnancy, did you take any drugs to keep you from getting malaria?
- How many times did you take (SP/Fansidar/Amalar/Maloxine) during this pregnancy?
- Did you get the (SP/Fansidar/Amalar/Maloxine) during any antenatal care visit?
- Were you offered a test for the AIDS virus as part of your antenatal care?
- I don't want to know the results, but were you tested for the AIDS virus as part of your antenatal care?

Delivery care:

- Who assisted with the delivery of (NAME OF CHILD)? Anyone else?
- Where did you give birth to (NAME OF CHILD)?
- Was (NAME OF CHILD) delivered by caesarean section?

Postnatal care:

- Before you were discharged after (NAME OF CHILD) was born, did any health care provider check on your health?
- How long after delivery did the first check take place?
- Who checked on your health at that time?

- After (NAME OF CHILD) was born, did a health professional or a traditional birth attendant check on your health?
- How long after delivery did the first checkup take place?
- Who checked on your health at that time?

Variables of women's characteristics, including age, birth order, urban/rural residence and level of education, are developed based on the relevant survey questions. Another characteristic, household wealth status, is a quintile index based on a number of indicators asked in the DHS related to household assets and housing characteristics (Rutstein and Johnson 2004).

2.2 Analysis

Based on the most recent DHS survey of each country, the analysis reports the level of use of each service, along with differentials by individual and household characteristics. We examine data from consecutive surveys to establish trends in use of antenatal care and skilled birth attendance. In the 18 countries included for postnatal care analysis, only the most recent survey has collected postnatal care information for the last live birth; thus it is not possible to determine trends in using postnatal care.

We analyze the data using Stata 10.0 Statistical Software. We apply sampling weights in all the analyses to enable us to generalize the results to the country's population. The sample weight variable is the pre-existing individual sampling weight in the DHS datasets.

3 Results

3.1 Antenatal Care

Having a sufficient number of antenatal care visits and receiving appropriate and timely care during the visits ensure that women prepare for the childbirth. This section presents the characteristics of antenatal care that women received for their most recent birth, including the number of antenatal care visits, timing of the first visit, content of care, provider of care and differentials in use. Trends are also presented in making four or more visits and using skilled health providers for antenatal care.

3.1.1 Current Use of Antenatal Care

Table 3 shows the number of antenatal care visits that women had for their most recent live birth in the five years preceding the most recent DHS survey in each country studied. Most countries show a fairly high level of antenatal care coverage. In 24 of the 38 countries, over 80 percent of women had at least one antenatal visit during their last pregnancy. In 18 countries, more than 90 percent had antenatal care.

Women in Latin America and the Caribbean have higher levels of antenatal care than women in other regions. About 86 percent of pregnant women in Haiti, and more than 90 percent in the other four countries in this region, reported at least one antenatal care visit. In the Dominican Republic and Peru, almost all pregnant women had at least one antenatal care visit.

In the North Africa/West Asia/Europe region, Jordan and Armenia show high rates of antenatal care coverage, at over 90 percent. But in Egypt and Morocco, coverage is lower, at 73 percent and 68 percent, respectively.

Large variations in use of antenatal care exist in sub-Saharan Africa. About half of the 21 sub-Saharan countries included in the analysis show over 90 percent coverage. However, levels in some countries are much lower. In Chad and Niger, for example, more than half of women did not receive any antenatal care. Ethiopia has the lowest level of antenatal care use among all countries included in this analysis, at only 28 percent. Antenatal care coverage in the other sub-Saharan African countries ranges from 55 percent to 87 percent, as of the most recent surveys.

In South/Southeast Asia, antenatal care coverage is over 95 percent in Indonesia and the Philippines, and 87 percent in Vietnam, while the rates are lower than 80 percent in the other four countries.

Having only one antenatal visit may not be enough to ensure that women prepare for and receive sufficient care for childbirth, and WHO recommends a minimum of four antenatal visits. Overall, most women who receive any antenatal care have at least four antenatal visits, but there is substantial variation among countries. In half the countries included in this analysis, more than 50 percent of all pregnant women surveyed reported four or more antenatal visits. Having four visits is most prevalent in Latin America and the Caribbean. With the exception of Haiti (54 percent), all other countries in the region have more than two-thirds of women reporting four or more antenatal care visits, and as many as 95 percent in the Dominican Republic.

In three of the four countries in the North Africa/West Asia/Europe region, at least two-thirds of women make four or more antenatal care visits. Levels are lower in the South/Southeast Asian region, except in Indonesia and the Philippines, where sizable proportions of women reported four or more antenatal visits. For example, only 21 percent of Bangladeshi women and 27 percent of Cambodian

women reported four or more visits. Although 87 percent of Vietnamese women reported having some antenatal care, only 30 percent had four or more visits.

In sub-Saharan Africa, the proportion of women making four or more antenatal care visits ranges from 12 percent in Ethiopia to 78 percent in Ghana. Some countries with high antenatal coverage also show a high level of four or more visits—Ghana, Zimbabwe and Namibia, for example. In a few other countries—for example, Chad, Ethiopia and Niger—only a minority of women had any antenatal care at all, and very few made as many as four antenatal care visits. Even where antenatal coverage is high, the percentage reporting as many as four visits may be low. In Rwanda, for example, 96 percent of women reported at least one antenatal care visit, but only 24 percent reported four or more visits.

Table 3. Percent distribution of women who had a live birth in the five years preceding the survey by number of antenatal care visits for the most recent birth, the most recent DHS survey, 1990-2009

	Number of visits						Percentage of women with at least one visit	Number of women who had a live birth in the past 5 years
Country/Year	None	1	2-3	4 or more	Missing/ Don't know	Total		
Sub-Saharan Africa								
Benin 2006	11.2	4.5	22.4	60.5	1.4	100.0	87.4	10,521
Burkina Faso 2003	26.2	9.5	45.3	17.6	1.4	100.0	72.4	7,428
Cameroon 2004	16.1	2.4	19.8	60.4	1.2	100.0	82.6	5,303
Chad 2004	56.3	3.8	20.9	17.8	1.2	100.0	42.5	3,720
Ethiopia 2005	71.5	4.6	11.3	12.2	0.4	100.0	28.1	7,307
Ghana 2008	3.5	2.8	13.3	78.2	2.3	100.0	94.3	2,099
Guinea 2005	16.5	5.5	24.2	48.8	5.0	100.0	78.5	4,447
Kenya 2008	7.3	4.3	39.2	47.1	2.0	100.0	90.6	3,973
Madagascar 2008-09	9.0	3.7	37.0	49.3	1.0	100.0	90.0	8,662
Malawi 2004	4.6	2.5	35.2	57.1	0.7	100.0	94.8	7,271
Mali 2006	28.7	6.3	27.6	35.4	2.1	100.0	69.3	9,087
Mozambique 2003	14.7	3.0	27.9	53.1	1.3	100.0	84.0	7,179
Namibia 2006-07	3.8	1.7	13.9	70.4	10.2	100.0	86.0	3,898
Niger 2006	52.9	5.5	26.6	14.9	0.2	100.0	47.0	6,300
Nigeria 2008	36.3	1.5	8.2	44.8	9.2	100.0	54.5	17,635
Rwanda 2007	2.7	5.9	66.0	23.9	1.5	100.0	95.8	3,658
Senegal 2005	6.6	3.8	47.5	39.8	2.3	100.0	91.1	6,928
Tanzania 2004-05	3.0	1.7	33.4	61.5	0.4	100.0	96.6	5,772
Uganda 2006	4.5	5.6	41.7	47.2	1.0	100.0	94.5	5,035
Zambia 2007	2.1	2.3	34.0	60.3	1.3	100.0	96.6	4,136
Zimbabwe 2005-06	5.0	2.0	20.7	71.1	1.2	100.0	93.8	4,100
North Africa/West Asia/Europe								
Armenia 2005	6.3	2.9	18.1	70.9	1.7	100.0	91.9	1,176
Egypt 2008	25.8	0.4	6.5	66.5	0.8	100.0	73.4	7,896
Jordan 2007	1.2	0.6	3.9	94.1	0.1	100.0	98.6	6,446
Morocco 2003-04	32.0	8.0	29.1	30.5	0.5	100.0	67.6	4,695

(Cont'd)

Table 3. – cont'd

Country/Year	Number of visits: None	1	2-3	4 or more	Missing/ Don't know	Total	Percentage of women with at least one visit	Number of women who had a live birth in the past 5 years
South/Southeast Asia								
Bangladesh 2007	39.6	15.8	23.9	20.6	0.1	100.0	60.3	4,905
Cambodia 2005	28.2	11.2	33.2	27.0	0.3	100.0	71.4	5,865
India 2005-06	22.8	6.0	33.5	37.0	0.8	100.0	76.5	39,677
Indonesia 2007	4.2	2.6	11.1	81.5	0.7	100.0	95.2	14,043
Nepal 2006	26.2	8.5	35.8	29.4	0.0	100.0	73.7	4,066
Pakistan 2006-07	34.7	13.2	22.2	28.4	1.4	100.0	63.8	5,677
Philippines 2008	3.8	3.0	15.0	77.8	0.4	100.0	95.8	4,590
Vietnam 2002	12.8	9.8	47.2	30.1	0.0	100.0	87.1	1,215
Latin America/Caribbean								
Bolivia 2008	9.6	3.3	14.7	72.1	0.4	100.0	90.1	6,472
Colombia 2005	6.4	1.4	7.7	83.0	1.5	100.0	92.1	11,083
Dominican Republic 2007	0.5	0.5	2.5	94.5	2.0	100.0	97.5	8,203
Haiti 2005-06	13.8	4.9	26.8	53.8	0.6	100.0	85.5	4,074
Peru 2008	2.5	1.0	4.5	92.0	0.1	100.0	97.5	4,920

3.1.2 Timing of the First Antenatal Care Visit

To allow for sufficient time to identify and treat problems such as anemia and infections, women are recommended to start antenatal care early in pregnancy. Table 4 shows the timing of the first antenatal visit among women who report any antenatal care visits.

In Latin America and the Caribbean and in North Africa/West Asia/Europe, among women who receive antenatal care, more than half receive care in the first trimester. In Jordan, nine in ten women start antenatal care in the first trimester. South/Southeast Asia has lower figures, however. In four countries—India, Indonesia, the Philippines and Vietnam—more than half of women reported that the first antenatal care visit took place in the first trimester. Indonesia has the highest percentage; 79 percent of women reported that the first antenatal care visit was in the first trimester of pregnancy. In the other four countries of the region, however, less than half of women with any antenatal care reported starting care in the first trimester.

Although in sub-Saharan Africa a majority of women receive antenatal care, most wait until the second or even the third trimester before making the first visit. The exception is Ghana, where 57 percent of women who reported antenatal care reported that their first visit occurred during the first trimester of pregnancy. In contrast, in Malawi, where 95 percent of women reported at least one antenatal care visit, less than 10 percent reported making the first visit in the first three months of pregnancy. In Senegal, the finding is even more striking. Although 91 percent of women make at least one antenatal care visit, 43 percent of them wait until the third trimester to start care. Even where a high proportion of women reported four or more antenatal care visits, as in Namibia and Zimbabwe, at about 70 percent, only 34 percent in Namibia and 29 percent in Zimbabwe reported making the first antenatal care visit in the first trimester.

Table 4. Percent distribution of women who had any antenatal care(ANC) for the most recent birth by timing of the first visit, the most recent DHS survey, 1990-2009

Country/Year	Timing of the first ANC visit among women receiving any ANC visit				Total	Number of women receiving ANC for their most recent birth
	<4 months	4-6 months	7 or more months	Missing/ Don't know		
Sub-Saharan Africa						
Benin 2006	47.0	43.7	8.6	0.8	100.0	9,286
Burkina Faso 2003	36.4	48.1	13.3	2.2	100.0	5,468
Cameroon 2004	41.4	52.3	5.5	0.8	100.0	4,436
Chad 2004	38.2	52.6	8.5	0.7	100.0	1,624
Ethiopia 2005	22.5	52.6	23.5	1.4	100.0	2,076
Ghana 2008	57.0	40.0	2.5	0.6	100.0	2,024
Guinea 2005	40.5	49.1	9.5	0.8	100.0	3,703
Kenya 2008	15.7	66.6	17.4	0.3	100.0	3,680
Madagascar 2008-09	30.1	62.5	6.2	1.2	100.0	7,869
Malawi 2004	8.1	75.6	16.0	0.3	100.0	6,930
Mali 2006	42.6	43.2	11.6	2.5	100.0	6,465
Mozambique 2003	20.9	70.2	8.0	0.9	100.0	6,098
Namibia 2006-07	33.9	55.7	8.4	2.1	100.0	3,734
Niger 2006	29.5	55.4	14.6	0.4	100.0	2,954
Nigeria 2008	25.4	60.8	10.8	2.8	100.0	11,158
Rwanda 2007	22.6	59.7	15.7	2.0	100.0	3,519
Senegal 2005	4.1	50.9	42.6	2.5	100.0	6,441
Tanzania 2004-05	14.5	73.5	11.8	0.1	100.0	5,593
Uganda 2006	17.4	65.2	17.2	0.2	100.0	4,809
Zambia 2007	19.6	72.3	7.7	0.4	100.0	4,044
Zimbabwe 2005-06	28.6	60.2	10.7	0.4	100.0	3,890
North Africa/West Asia/Europe						
Armenia 2005	51.4	43.6	3.5	1.3	100.0	1,097
Egypt 2008	82.3	15.5	1.9	0.1	100.0	5,861
Jordan 2007	90.3	8.7	0.9	0.0	100.0	6,366
Morocco 2003-04	74.9	19.1	5.9	0.1	100.0	3,185
South/Southeast Asia						
Bangladesh 2007	40.4	39.9	19.7	0.0	100.0	2,956
Cambodia 2005	32.2	48.5	18.8	0.7	100.0	4,213
India 2005-06	56.9	34.2	7.9	1.0	100.0	30,621
Indonesia 2007	78.6	18.2	2.8	0.5	100.0	13,457
Nepal 2006	37.5	53.4	8.9	0.1	100.0	3,000
Pakistan 2006-07	46.9	27.6	23.1	2.5	100.0	3,673
Philippines 2008	56.1	39.0	4.7	0.1	100.0	4,411
Vietnam 2002	65.0	26.8	8.0	0.1	100.0	1,059
Latin America/Caribbean						
Bolivia 2008	68.4	26.8	4.4	0.4	100.0	5,841
Colombia 2005	75.3	21.8	2.8	0.2	100.0	10,379
Dominican Republic 2007	82.3	15.7	1.3	0.8	100.0	8,120
Haiti 2005-06	59.5	33.8	6.1	0.5	100.0	3,512
Peru 2008	74.1	23.6	2.3	0.1	100.0	4,796

3.1.3 Trends in Four or More Antenatal Care Visits

This section presents trends in making four or more antenatal care visits for the most recent birth. For this analysis we divide the sub-Saharan African region into two groups—the Western and Central African countries and the Eastern and Southern African countries—to provide a clearer picture of these trends within sub-Saharan Africa.

Figure 1 shows the trends in Western and Central Africa in the proportion of women making at least four antenatal care visits. Eight of the 10 countries have experienced an increase in use of the recommended antenatal care, while two countries, Nigeria and Burkina Faso, show a slightly decreasing trend. Increases are large in Ghana and Senegal over the survey period (in Ghana, for example, the percentage of women making at least four antenatal visits increased from 60 percent in 1993 to 80 percent in 2008). In other countries, such as Niger and Chad, the increase is very small.

Figure 2 presents the trends in Eastern and Southern Africa. Five countries—Namibia, Mozambique, Madagascar, Rwanda and Ethiopia—show increasing trends in the number of women making at least four antenatal visits, with varying degrees of increase. In the remaining six countries a decreasing trend is observed, most notably in Kenya and Tanzania, where the figure has dropped by over 10 percentage points.

Figure 3 shows a steady increase in all countries in South/Southeast Asia. Indonesia and the Philippines are the two countries in the region where the level of antenatal care is very high and also where the increase is greatest. For example, In Indonesia the percentage of women with four or more antenatal care visits rose from 58 percent in 1991 to 82 percent in 2007.

Figure 4 shows that the four countries in North Africa/West Asia/Europe region have reached a fairly high proportion of women reporting four or more antenatal care visits. In little more than a decade, the level has more than doubled in Egypt, and there is an almost 60 percentage point increase in Morocco. For Jordan and Armenia, where the base level was higher, there is also a steady increase.

Figure 5 shows that in Latin America and the Caribbean the percentage of women with four or more antenatal care visits has increased steadily in all countries, irrespective of their varying levels of antenatal care use. In general, the Dominican Republic has the highest level, rising from 86 percent in the 1991 survey to 97 percent in 2007. Although Haiti shows the lowest level of antenatal care use, it has increased by over 20 percentage points over the survey period. Peru and Bolivia show the most encouraging trends. In Peru, the level was only 51 percent in 1991-92 but then increased considerably in the mid-1990s and reached 92 percent in 2008. In Bolivia, antenatal care use more than doubled from 1994 to 2008, reaching 72 percent.

Figure 1. Trends in percentage of women having at least four antenatal care visits for the most recent birth in Western and Central Africa, 1990-2009

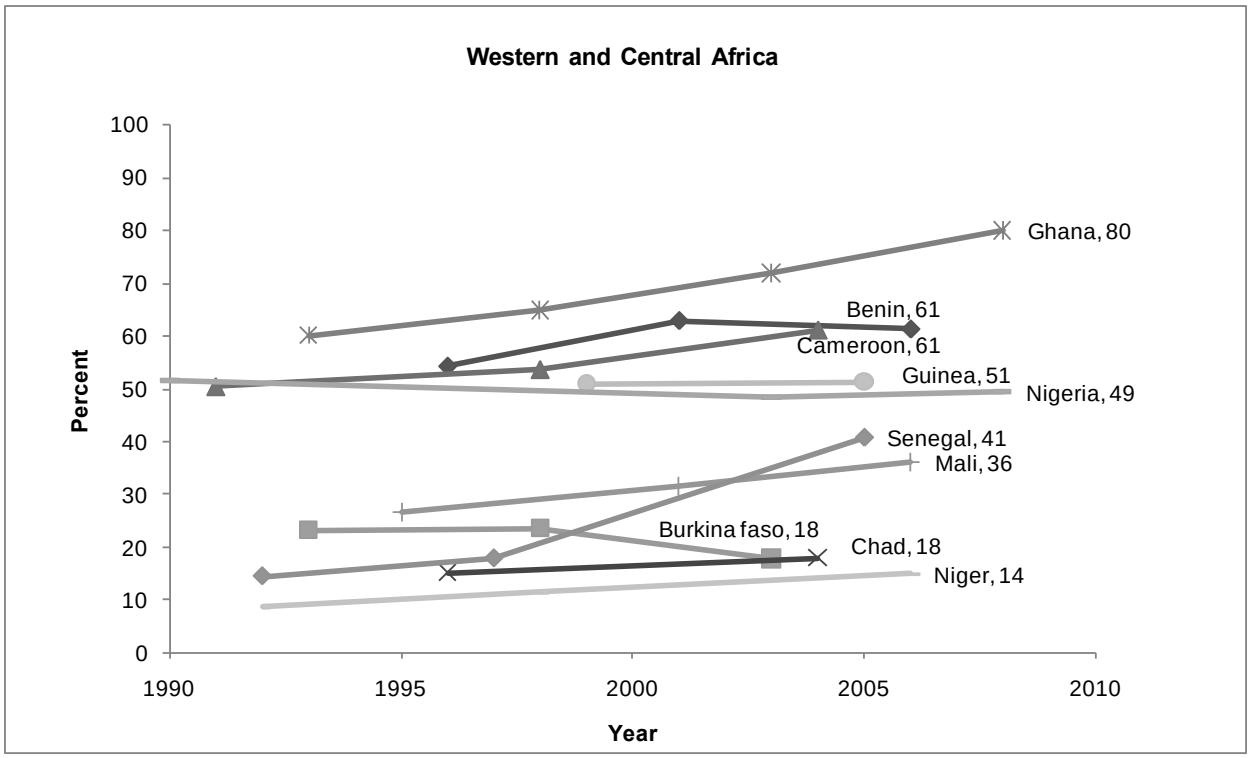


Figure 2. Trends in percentage of women having at least four antenatal care visits for the most recent birth in Eastern and Southern Africa, 1990-2009

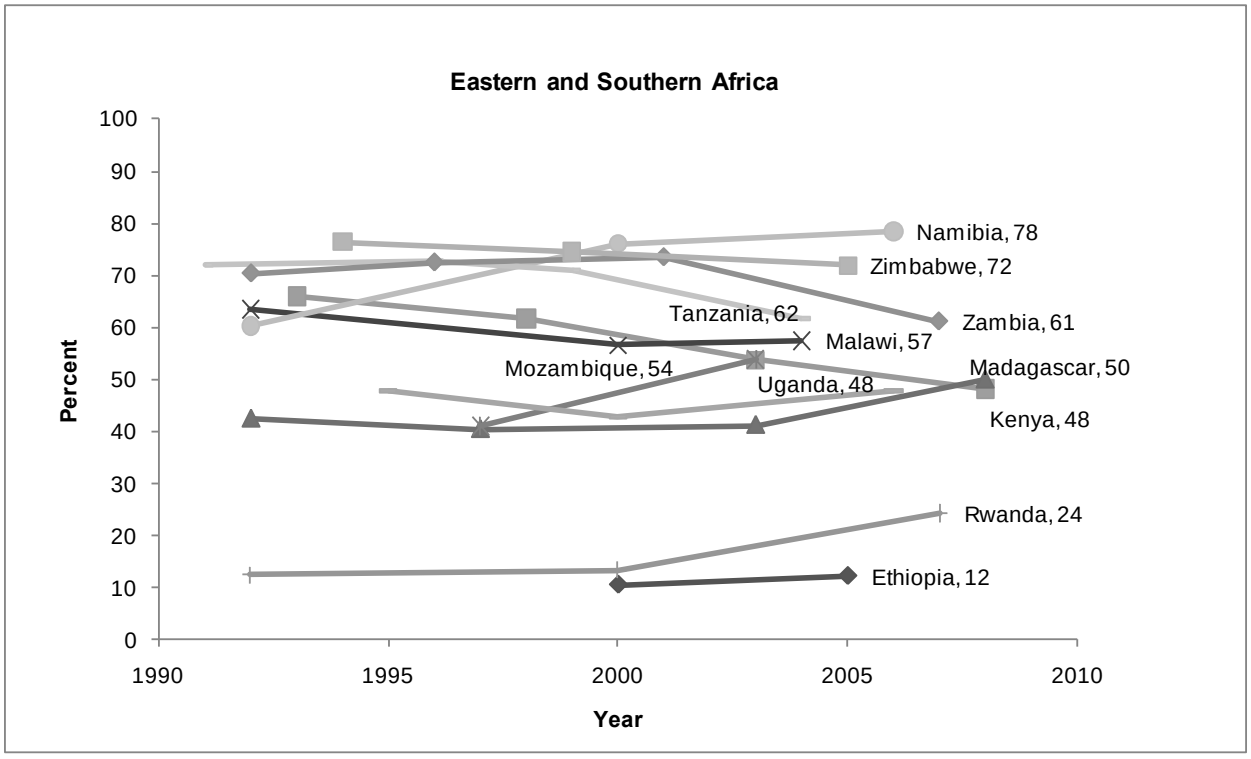


Figure 3. Trends in percentage of women having at least four antenatal care visits for the most recent birth in South/Southeast Asia, 1990-2009

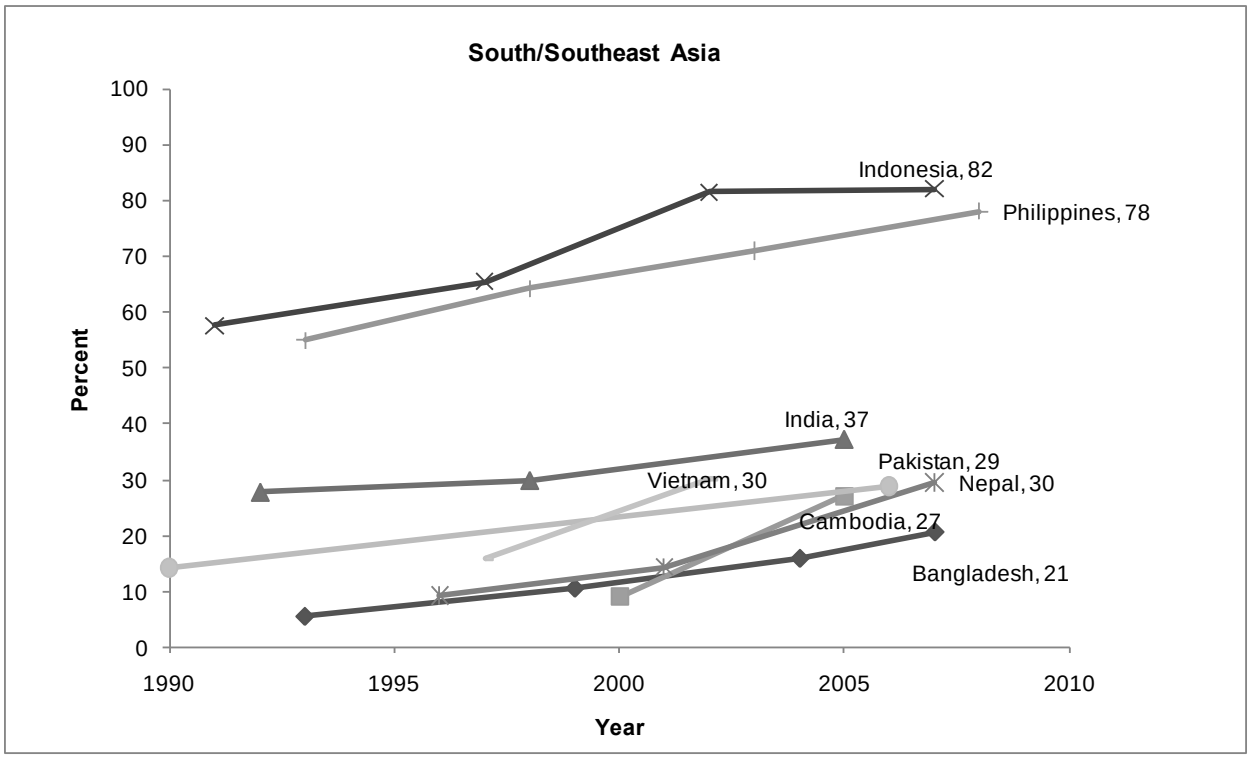


Figure 4. Trends in percentage of women having at least four antenatal care visits for the most recent birth in North Africa/West Asia/Europe, 1990-2009

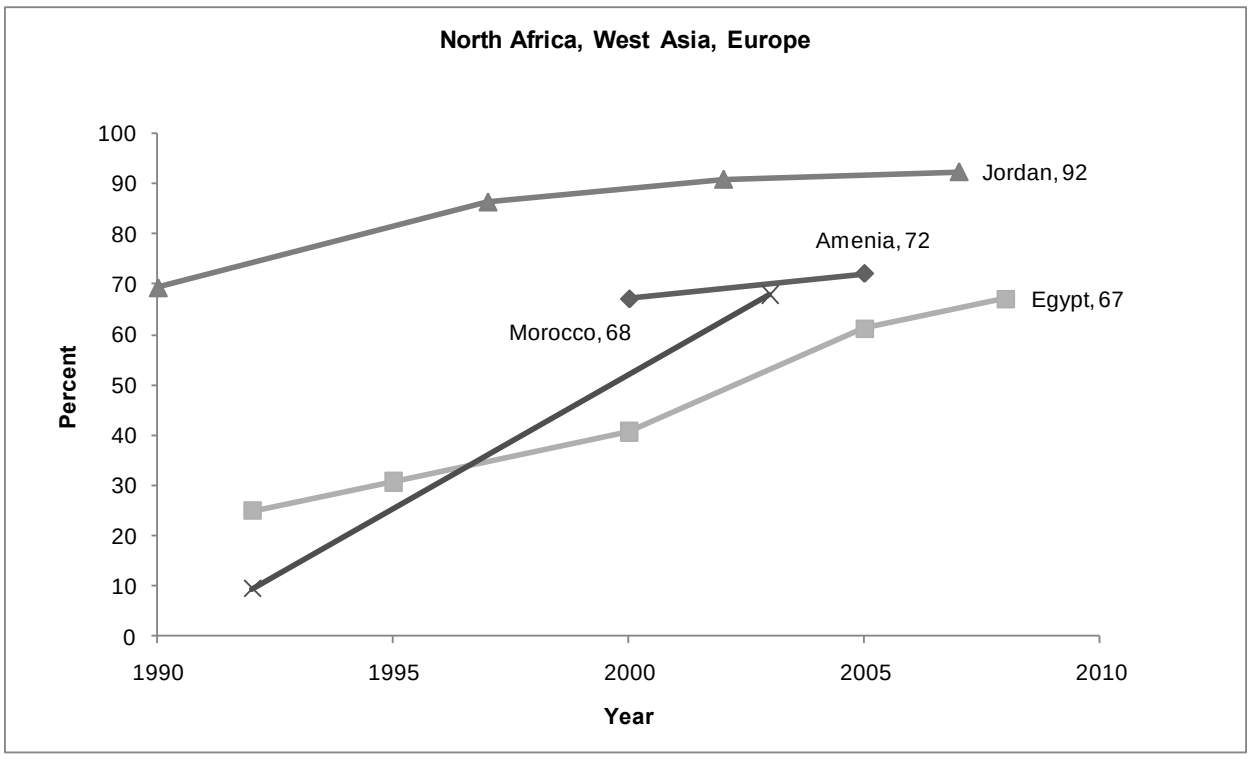
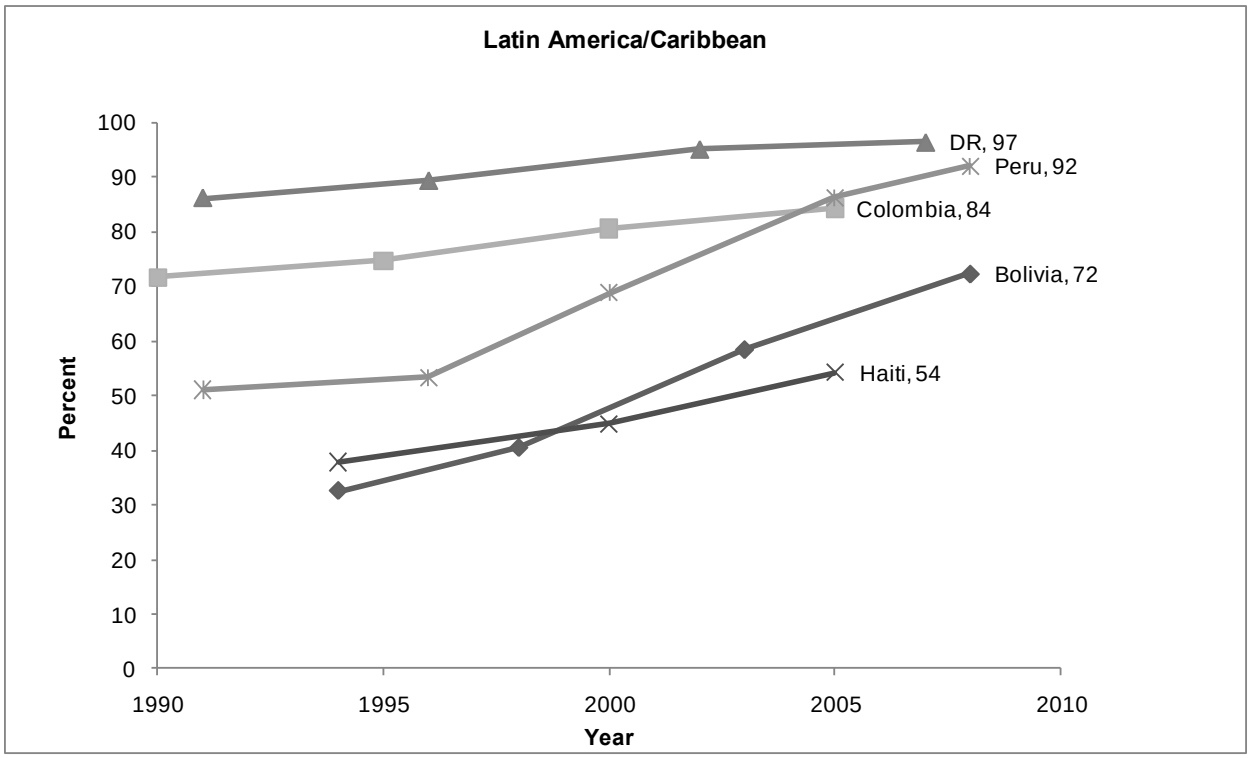


Figure 5. Trends in percentage of women having at least four antenatal care visits for the most recent birth in Latin America and the Caribbean, 1990-2009



3.1.4 Differentials in Four or More Antenatal Care Visits

Mother's age at birth

Table 5 shows percentage of women with four or more antenatal care visits for the most recent birth in the five years preceding the survey, by background characteristics—including mother's age at birth, birth order, urban/rural residence, women's education, and household wealth status.

By women's age, in Latin America and the Caribbean and in North Africa/West Asia/Europe the differences in making four or more antenatal care visits are not substantial. In sub-Saharan Africa and in South/Southeast Asia, however, variations in antenatal care by age are more apparent. In more than half of the countries mothers age 20-34 are most likely to report four or more visits. Also, in the majority of countries in these two regions, mothers under age 20 are more likely to report four or more antenatal care visits than mothers age 35-49. Exceptions include Niger and Vietnam, where use of antenatal care increases by age, and also Zambia, Rwanda, Kenya and Ghana, where mothers age 35-49 have higher antenatal care use compared to mothers under age 20.

Birth order

Overall, mothers are more likely to make four or more antenatal visits for the first birth than for later births. This pattern holds in almost all countries studied, except in a few sub-Saharan African countries, including Burkina Faso, Kenya, Madagascar, Mali, Namibia and Senegal, where a similar proportion of women report at least four antenatal visits across the first three births.

In almost all countries, women are least likely to have four or more antenatal visits for birth orders 4 or higher. The differentials are smaller in sub-Saharan Africa and in Latin America and the Caribbean than in South/Southeast Asia or in North Africa/West Asia/Europe. In the latter two regions, use of at least four antenatal care visits drops as parity increases, in all countries except Jordan, where the level remains relatively flat after the second birth.

Urban/rural residence

In all countries, women who live in urban areas are more likely to make four or more antenatal care visits than women in rural areas. Urban-rural differentials are relatively larger in South/Southeast Asia than other regions. In five Asian countries—Bangladesh, India, Nepal, Pakistan and Vietnam—urban women are at least twice as likely as rural women to report four or more antenatal care visits. The differentials are less marked in Latin America and the Caribbean. In the Dominican Republic, levels of use of four or more antenatal care visits are similar in urban and rural areas.

Countries with overall low use of antenatal care generally have large urban-rural differences. For example, in Burkina Faso, Chad, Ethiopia and Niger, where less than 20 percent of women report four or more visits, women living in urban areas are two to six times more likely to have the recommended number of visits than women in rural areas.

Women's education

In the surveyed countries as a whole, the likelihood of using antenatal care is associated with women's educational attainment. In virtually every country, the more schooling a woman has the more likely she is to report four or more antenatal care visits. In most countries, over 80 percent of women with education beyond the secondary level, but fewer than half of women with no education, report the recommended four antenatal care visits. Across countries, there are striking differences in antenatal care use among women with the same level of education. For example, in sub-Saharan Africa the proportion of women with no education reporting four or more antenatal care visits ranges from 8 percent in Ethiopia to 68 percent in Ghana, and in South/Southeast Asia from 5 percent in Vietnam to 44 percent in Indonesia. Such differences are less remarkable in Latin America and the Caribbean.

Household wealth

Use of antenatal care use is positively associated with level of household wealth. In all countries, use of four or more antenatal care visits is highest among women from the richest households. As with differentials by women's education, wealth-related disparities in use of antenatal care are greater in countries with little use of antenatal care overall than in those with a high level of use. For example, in South/Southeast Asia, where in most countries less than one-third of women report four or more antenatal care visits, the disparity in use by wealth status is substantial. In Bangladesh, India, Nepal and Pakistan, women in the richest wealth quintile are at least six times more likely than women in the poorest quintile to report four or more visits. In Latin America and the Caribbean, where the overall level of use is high, the differences between the rich and the poor are less sizable. In the Dominican Republic use of four or more antenatal care visits is at least 90 percent across all wealth quintiles.

In many sub-Saharan African countries, there is little difference in use of antenatal care among the bottom 60 percent of households by wealth status, while only in the top two wealth quintiles is there substantially higher use. This pattern is observed in Burkina Faso, Chad, Ethiopia, Kenya, Madagascar, Mali, Niger and Uganda.

Table 5. Percentage of women who received four or more antenatal care visits for the most recent live birth in the five years preceding the survey by selected characteristics, the most recent DHS survey, 1990-2009

	Age at the last birth			Birth order				Residence		Education				Wealth status (quintile)				
Country/Year	<20	20 -34	35 -49	1	2	3	4 or more	Urban	Rural	None	Pri-mary	Secon-dary	High -er	Low -est	Se-cond	Mid-dle	Four -th	High -est
Sub-Saharan Africa																		
Benin 2006	57.7	62.1	55.1	70.7	66.2	62.0	54.3	71.3	54.6	53.7	76.3	84.6	92.8	39.5	50.1	58.4	70.9	87.5
Burkina Faso 2003	18.3	18.1	15.6	20.2	21.0	18.2	15.5	33.4	15.0	15.3	28.8	39.4	*	11.9	12.1	16.4	18.7	31.8
Cameroon 2004	58.3	61.2	60.0	68.2	64.9	60.1	54.6	74.4	48.4	34.8	63.5	79.3	94.7	39.2	47.3	62.6	75.2	85.7
Chad 2004	19.7	18.1	13.5	22.3	19.0	18.9	15.8	43.7	11.7	13.2	27.1	54.9	*	2.2	11.7	11.9	20.6	43.7
Ethiopia 2005	13.1	13.3	7.6	19.0	18.9	13.5	8.0	54.5	8.1	7.9	16.9	61.1	79.2	4.0	6.1	8.5	8.7	39.3
Ghana 2008	70.8	79.5	77.3	82.6	81.1	78.7	73.9	88.1	71.5	68.4	72.0	87.6	*	62.9	73.2	77.6	89.1	93.8
Guinea 2005	52.9	49.7	42.3	55.0	52.4	50.8	45.3	65.7	43.4	45.8	66.5	64.1	*	36.6	39.3	47.1	58.4	69.8
Kenya 2008	39.6	49.2	43.9	50.3	50.0	53.9	41.0	59.9	43.8	34.6	42.4	59.6	80.5	36.0	38.8	41.1	55.3	63.4
Madagascar 2008-09	48.0	50.1	48.1	52.6	52.9	53.3	44.7	70.5	46.3	36.9	47.4	66.1	86.5	34.9	41.7	47.6	55.0	75.4
Malawi 2004	57.8	57.2	55.1	61.5	57.4	55.2	55.4	65.2	55.7	52.7	56.5	68.5	*	52.5	52.1	53.7	60.0	69.0
Mali 2006	33.5	36.4	33.6	37.7	38.8	37.5	33.2	54.8	27.6	31.2	51.3	68.7	(90.3)	22.9	27.3	28.4	36.0	63.8
Mozambique 2003	45.8	45.6	45.1	56.8	57.0	50.3	51.0	70.7	45.2	42.4	59.6	84.0	*	36.6	44.8	52.1	64.0	76.5
Namibia 2006-07	63.7	73.2	64.6	72.7	72.2	75.0	63.1	73.0	68.4	50.7	66.7	74.7	79.7	64.2	68.3	69.9	73.5	76.5
Niger 2006	13.5	14.9	16.2	17.9	14.9	15.6	14.0	35.3	11.1	12.3	24.2	53.1	*	8.6	10.3	9.4	13.1	34.6
Nigeria 2008	32.1	48.0	42.4	50.3	48.7	49.1	40.4	68.8	34.4	21.9	53.9	68.9	80.9	15.7	28.6	47.6	64.2	80.7
Rwanda 2007	18.0	24.8	22.3	30.0	24.3	22.0	22.0	26.5	23.5	20.3	23.4	38.5	(57.7)	22.3	19.9	23.2	25.9	30.4
Senegal 2005	37.2	41.9	34.3	45.0	44.3	46.5	33.8	50.6	33.0	35.6	45.2	60.8	*	28.4	30.5	37.9	47.3	60.2
Tanzania 2004-05	65.8	61.2	58.2	66.3	64.2	63.6	57.1	71.4	58.6	54.1	62.6	80.5	85.2	52.2	59.0	58.9	63.4	75.6
Uganda 2006	48.2	47.4	45.5	54.1	50.2	44.4	45.1	59.6	45.3	41.0	45.4	60.6	72.6	44.3	42.1	42.1	45.0	64.3
Zambia 2007	56.0	61.2	60.8	60.6	59.4	60.7	60.4	58.6	61.2	56.1	60.0	61.3	77.7	59.3	61.0	62.2	57.8	61.6
Zimbabwe 2005-06	69.2	72.4	65.1	74.7	70.9	72.1	66.5	75.7	68.9	59.6	65.7	74.4	87.9	64.9	68.4	72.3	71.5	80.3
North Africa/West Asia/Europe																		
Armenia 2005	63.9	72.1	64.9	79.2	69.8	64.0	45.8	81.6	53.0	na	93.2	66.9	83.1	47.2	59.6	78.0	78.8	86.9
Egypt 2008	67.0	67.2	61.1	79.5	68.6	63.7	52.1	80.5	57.9	45.7	59.2	72.5	89.2	41.7	55.9	64.5	80.5	89.4
Jordan 2007	96.4	94.4	92.7	98.5	94.3	94.9	92.3	94.8	90.7	75.9	85.0	94.5	96.3	90.0	93.8	95.4	94.9	98.4
Morocco 2003-04	30.7	30.4	30.8	42.8	33.1	31.6	19.2	44.0	14.9	19.6	34.5	53.4	78.2	10.6	19.6	27.9	40.8	60.4

(Cont'd)

Table 5. – cont'd

Country/Year	Age at the last birth			Birth order				Residence		Education				Wealth status (quintile)				
	<20	20 -34	35 -49	1	2	3	4 or more	Urban	Rural	None	Pri-mary	Secon-dary	High -er	Low -est	Se-cond	Mid-dle	Four -th	High -est
South/Southeast Asia																		
Bangladesh 2007	21.3	20.9	13.8	29.5	23.2	17.6	8.3	38.3	15.9	6.6	12.7	29.5	63.8	8.3	9.8	14.9	26.6	47.3
Cambodia 2005	28.4	29.4	18.3	39.4	31.1	26.6	15.8	43.2	24.4	15.6	24.6	49.1	(80.8)	15.1	19.0	22.5	30.6	56.8
India 2005-06	35.7	38.6	17.2	52.8	48.1	31.7	13.7	62.4	27.7	16.0	35.5	59.2	85.3	12.1	21.1	36.6	53.0	77.3
Indonesia 2007	77.2	83.3	75.4	87.2	84.0	81.0	67.7	89.9	75.5	44.1	73.3	88.7	96.8	61.1	78.3	83.4	90.6	96.4
Nepal 2006	36.8	30.3	8.2	47.0	34.1	23.5	12.1	51.9	26.0	16.1	35.6	53.5	87.2	10.5	20.1	27.6	38.0	60.3
Pakistan 2006-07	23.9	30.6	20.4	37.5	32.5	31.5	22.7	48.3	19.8	17.4	32.0	54.8	75.0	10.1	14.4	21.9	38.4	64.0
Philippines 2008	74.3	79.7	71.9	85.1	82.5	80.4	66.7	83.0	72.6	31.7	62.0	78.9	91.5	61.1	71.5	82.4	88.9	93.1
Vietnam 2002	25.9	30.2	33.3	38.7	28.1	19.8	16.4	56.5	24.3	4.8	18.6	33.6	77.6	13.8	19.9	25.6	33.8	63.7
Latin America/Caribbean																		
Bolivia 2008	70.0	74.5	64.5	79.3	78.3	73.8	61.3	81.3	59.5	49.0	63.5	81.4	92.7	50.3	66.9	76.0	83.2	90.9
Colombia 2005	79.6	84.6	80.4	88.0	86.0	83.4	68.3	86.9	73.3	55.2	73.9	87.0	94.6	67.0	81.3	87.5	89.9	94.5
Dominican Republic 2007	94.2	94.7	94.2	96.6	95.4	94.0	90.6	94.7	94.2	87.5	91.8	96.2	98.0	90.0	94.3	96.1	96.2	97.4
Haiti 2005-06	47.2	57.1	47.8	62.6	58.4	54.5	45.6	66.9	46.1	36.0	51.7	77.4	95.3	33.0	43.5	53.8	63.1	82.0
Peru 2008	88.7	93.3	89.2	93.8	94.2	93.3	86.0	94.3	87.8	84.5	87.3	92.8	98.1	84.7	87.0	92.1	96.1	97.0

Note: Figures in parentheses are based on 25-49 unweighted cases; an asterisk denotes a figure based on fewer than 25 unweighted cases that has been suppressed.

3.1.5 Providers of Antenatal Care

Table 6 shows the providers of antenatal care that women receive for the most recent live birth—whether a skilled provider or someone else, such as another health worker, traditional birth attendant or non-health person. Sources of antenatal care vary by region. In Latin America and the Caribbean and in North Africa/West Asia/Europe, 68 to 99 percent of women reported obtaining antenatal care from a skilled health provider, while other sources are rarely reported. Most women receive antenatal care from a doctor, except in Peru, Haiti and Morocco. Particularly in Jordan and the Dominican Republic, almost all women go to a doctor for antenatal care.

In South/Southeast Asia, the proportion of women using a skilled health provider for antenatal care ranges from 44 percent in Bangladesh and Nepal to 93 percent in Indonesia. While doctors are the single largest source of antenatal care in Bangladesh, India, Pakistan and Vietnam, a nurse/midwife is more often reported as the provider in the other countries in the region. Indonesia makes the highest use of nurses or midwives, at about 80 percent. Antenatal care from non-skilled health providers is uncommon in this region, except in Nepal, where about 30 percent of women reported receiving antenatal care from other health providers, such as auxiliary health workers, maternal and child health workers, and village health workers.

In sub-Saharan Africa, in seven countries over 90 percent of women obtain antenatal care from a doctor, nurse or midwife. The lowest use of skilled care is in Mali, at 37 percent, and Chad, at 39 percent. The general pattern in this region is that women heavily rely on nurses or midwives rather than doctors. For example, in Rwanda 92 percent of women reported a nurse/midwife and only 3 percent reported a doctor as their source of antenatal care. Kenya, Ghana, Madagascar and Nigeria have relatively higher use of doctors for antenatal care than other sub-Saharan African countries.

Table 6. Percent distribution of women who had a live birth in the five years preceding the survey by provider of antenatal care(ANC) for the most recent birth, the most recent DHS survey, 1990-2009

Country/Year	Doctor	Nurse or midwife	Other health person	Traditional birth attendant	Other (not health workers)	No one	Missing/ Don't know	Total	Percentage of women who received ANC from a skilled health provider	Total number of women who had a live birth in the past 5 years
Sub-Saharan Africa										
Benin 2006	4.4	79.7	3.9	0.1	0.1	11.2	0.5	100.0	84.1	10,521
Burkina Faso 2003	2.5	70.3	0.0	0.7	0.1	26.2	0.2	100.0	72.8	7,428
Cameroon 2004	16.2	63.8	3.4	0.2	0.1	16.1	0.3	100.0	80.0	5,303
Chad 2004	2.6	36.3	4.7	0.1	0.0	56.3	0.0	100.0	38.9	3,720
Ghana 2008	23.5	63.2	8.8	0.3	0.7	3.5	0.1	100.0	86.7	2,099
Guinea 2005	13.2	39.4	29.6	1.1	0.0	16.5	0.2	100.0	52.6	4,447
Kenya 2008	28.9	62.6	0.2	0.8	0.1	7.3	0.1	100.0	91.5	3,973
Madagascar 2008-09	26.5	59.8	0.0	4.5	0.1	9.0	0.2	100.0	86.3	8,662
Malawi 2004	9.8	82.3	1.0	2.0	0.2	4.6	0.1	100.0	92.1	7,271
Mali 2006	1.4	35.8	0.0	33.8	0.1	28.7	0.2	100.0	37.2	9,087
Mozambique 2003	2.3	82.2	0.0	0.2	0.2	14.7	0.4	100.0	84.5	7,179
Namibia 2006-07	16.1	78.6	0.0	1.0	0.2	3.8	0.4	100.0	94.7	3,898
Niger 2006	0.7	45.4	0.0	0.8	0.0	52.9	0.3	100.0	46.1	6,300
Nigeria 2008	22.9	30.0	4.9	3.1	2.4	36.3	0.4	100.0	52.9	17,635
Rwanda 2007	3.4	92.4	0.0	0.4	0.0	2.7	1.1	100.0	95.8	3,658
Senegal 2005	4.6	55.2	27.6	5.5	0.1	6.6	0.5	100.0	59.8	6,928
Tanzania 2004-05	2.1	74.2	18.0	0.1	2.5	3.0	0.1	100.0	76.3	5,772
Uganda 2006	9.0	84.0	1.2	1.3	0.2	4.5	0.0	100.0	93.0	5,035
Zambia 2007	1.8	88.4	3.6	2.7	1.3	2.1	0.1	100.0	90.2	4,136
Zimbabwe 2005-06	10.0	84.2	0.0	0.4	0.2	5.0	0.1	100.0	94.2	4,100
North Africa/West Asia/Europe										
Armenia 2005	89.8	3.2	0.2	0.0	0.0	6.3	0.4	100.0	93.0	1,176
Egypt 2008	73.9	0.3	0.0	0.0	0.0	25.8	0.0	100.0	74.2	7,896
Jordan 2007	96.1	2.7	0.0	0.0	0.0	1.2	0.0	100.0	98.8	6,446
Morocco 2003-04	40.2	27.6	0.0	0.1	0.0	32.0	0.2	100.0	67.8	4,695

(Cont'd)

Table 6. – cont'd

Country/Year	Doctor	Nurse or midwife	Other health person	Traditional birth attendant	Other (not health workers)	No one	Missing/ Don't know	Total	Percentage of women who received ANC from a skilled health provider	Total number of women who had a live birth in the past 5 years
South/Southeast Asia										
Bangladesh 2007	35.5	8.2	8.0	0.2	8.4	39.6	0.1	100.0	43.7	4,905
Cambodia 2005	6.3	63.0	0.0	2.5	0.0	28.2	0.0	100.0	69.3	5,865
India 2005-06	50.2	23.0	2.7	1.1	0.1	22.8	0.1	100.0	73.2	39,677
Indonesia 2007	14.0	79.3	0.0	2.2	0.3	4.2	0.0	100.0	93.3	14,043
Nepal 2006	21.2	22.5	29.7	0.1	0.2	26.2	0.0	100.0	43.7	4,066
Pakistan 2006-07	56.0	4.9	1.4	2.4	0.0	34.7	0.6	100.0	60.9	5,677
Philippines 2008	39.1	52.0	0.0	5.0	0.1	3.8	0.1	100.0	91.1	4,590
Vietnam 2002	46.8	23.4	16.6	0.3	0.1	12.8	0.0	100.0	70.2	1,215
Latin America/Caribbean										
Bolivia 2008	77.2	8.6	4.2	0.1	0.1	9.6	0.1	100.0	85.8	6,472
Colombia 2005	86.6	6.6	0.2	0.1	0.1	6.4	0.0	100.0	93.2	11,083
Dominican Republic 2007	98.7	0.1	0.0	0.0	0.1	0.5	0.5	100.0	98.8	8,203
Haiti 2005-06	48.6	27.8	9.1	0.5	0.2	13.8	0.0	100.0	76.4	4,074
Peru 2008	27.6	66.8	0.6	0.1	2.3	2.5	0.1	100.0	94.4	4,920

Note: If more than one source of antenatal care was mentioned, only the provider with the highest qualifications is considered in this table.
Ethiopia is excluded as doctors and nurses were not distinguished from other health professionals in the survey

3.1.6 Trends in Using Skilled Health Providers for Antenatal Care

Figure 6 shows trends in the proportion of women in Western and Central Africa who received antenatal care from a skilled health provider. Seven of the 10 countries have experienced an increase in the proportion of women receiving antenatal care from skilled providers. Ghana and Burkina Faso had the biggest increases in use of skilled providers. In the 2008 Ghana DHS, 87 percent of women reported using a skilled health provider compared to 61 percent in 1993–a 26 percentage point increase in 15 years (but with a small decline from 2003 to 2008). The increase is very small in Benin and Cameroon, where the baseline levels were already above 70 percent. Senegal, Guinea and Chad experienced a decreasing trend over the survey period. Guinea has the biggest drop, about 20 percentage points from 1999 to 2005.

Figure 7 shows that in Eastern and Southern Africa 7 of the 10 countries have maintained high proportions (above 80 percent) of women receiving antenatal care from skilled providers and in the most recent surveys have reached over 90 percent. Among the other three countries, Tanzania, Madagascar and Mozambique, in Madagascar the level of antenatal use from skilled providers remained around 80 percent until 2003-04, then rose to 87 percent in the most recent survey in 2008-09. In Tanzania use of skilled providers for antenatal care decreased during the 1990s but increased substantially after 1999, reaching 76 percent in 2004-05. And in Mozambique, use of skilled providers for antenatal care rose from 72 percent in 1997 to 85 percent in 2003.

Figure 8 shows that in every country analyzed in South/Southeast Asia there has been a steady increase in antenatal care from skilled health providers. Indonesia and the Philippines have the highest level of service from a skilled provider across the years, with a slight increase, reaching over 90 percent in the most recent survey year. The increase is most rapid in Vietnam and Cambodia, where the level increased by about 30 percentage points within five years.

Figure 9 shows an increase in the level of use of skilled health providers for antenatal care in all four countries in the North Africa/West Asia/Europe region. The increase is slight in Armenia and Jordan, where the level has been high over the survey years, but is substantial in Egypt and Morocco, where the levels rose from about 40 percent in the 1990s to about 70 percent in the most recent survey.

Figure 10 shows that in all five countries analyzed in Latin America and the Caribbean, the percentage of women receiving antenatal care from a skilled provider was already high in the 1990s and has continued to rise. Peru and Bolivia show the most encouraging improvement. In Peru, only 69 percent of women in 1991-92 reported visiting a skilled health provider for antenatal care, rising to 95 percent in 2008.

Figure 6. Trends in percentage of women receiving antenatal care from a skilled health provider for the most recent birth in Western and Central Africa, 1990-2009

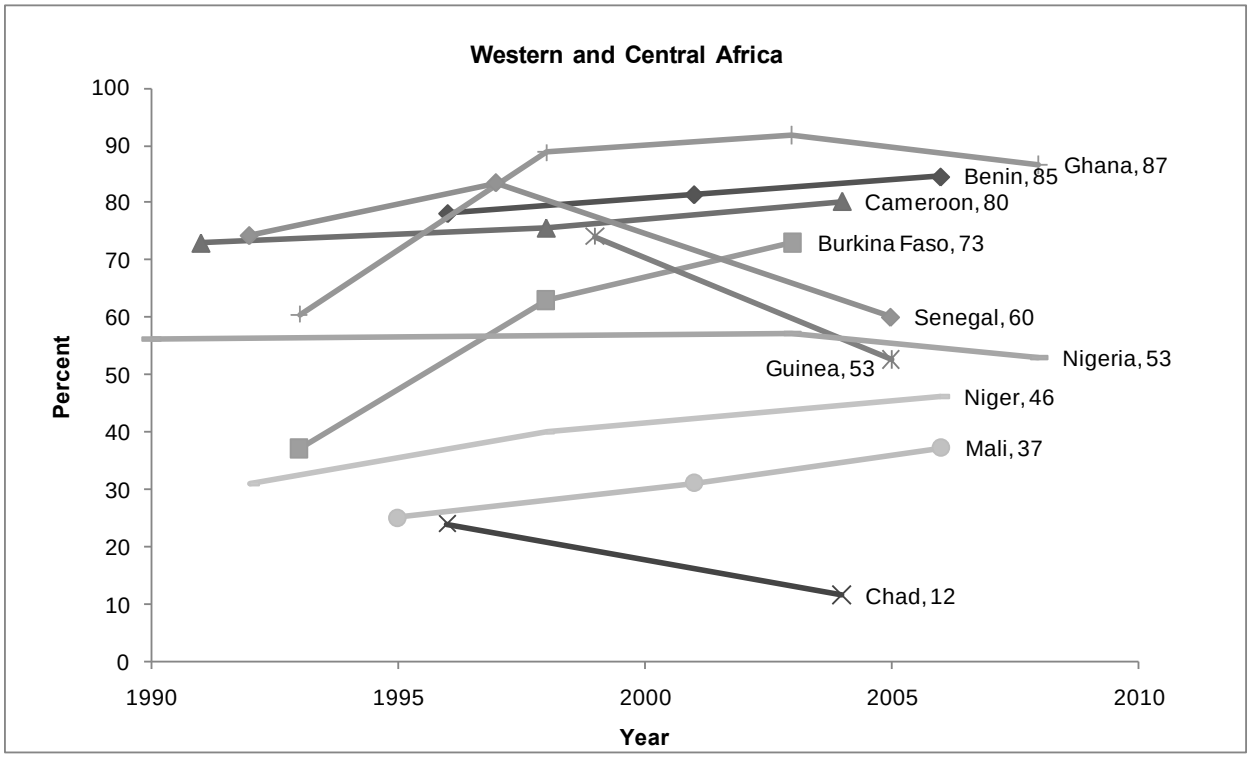
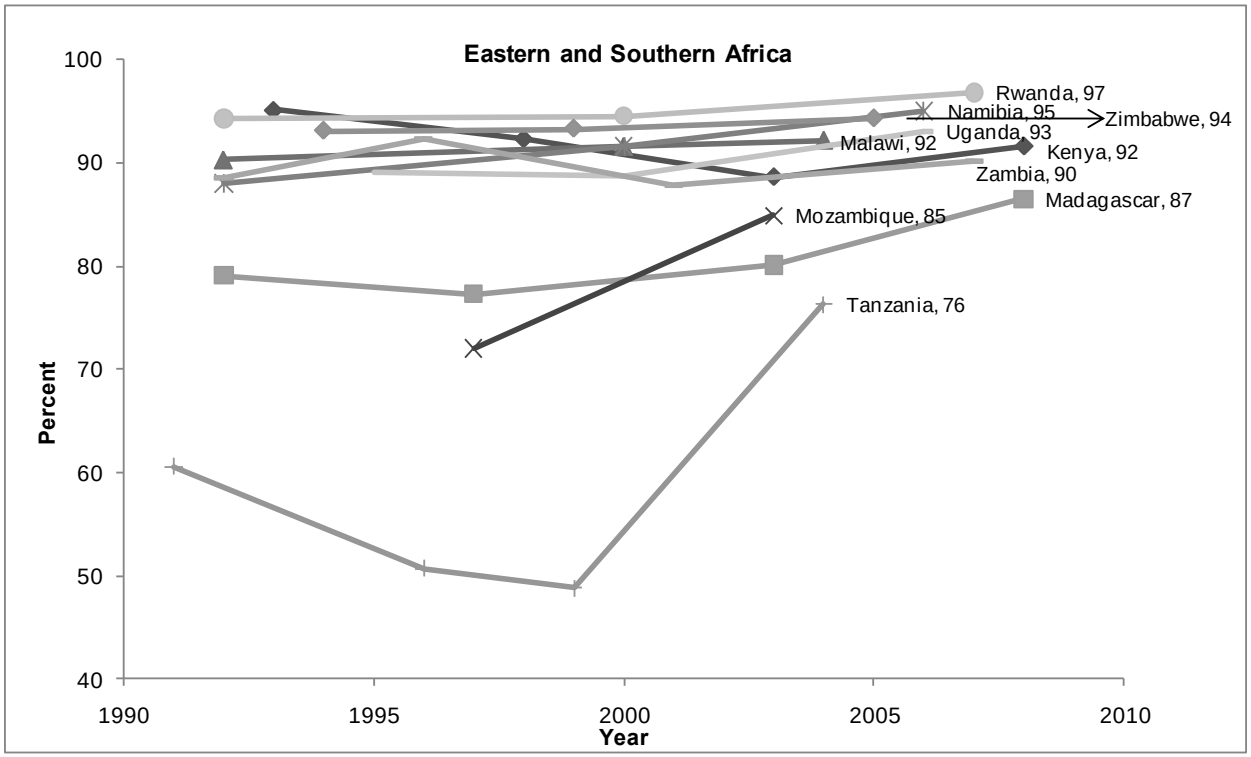


Figure 7. Trends in percentage of women receiving antenatal care from a skilled health provider for the most recent live birth in Eastern and Southern Africa, 1990-2009



Note: Ethiopia is excluded as doctors and nurses were not distinguished from other health professionals in the survey

Figure 8. Trends in percentage of women receiving antenatal care from a skilled health provider for the most recent live birth in South/Southeast Asia, 1990-2009

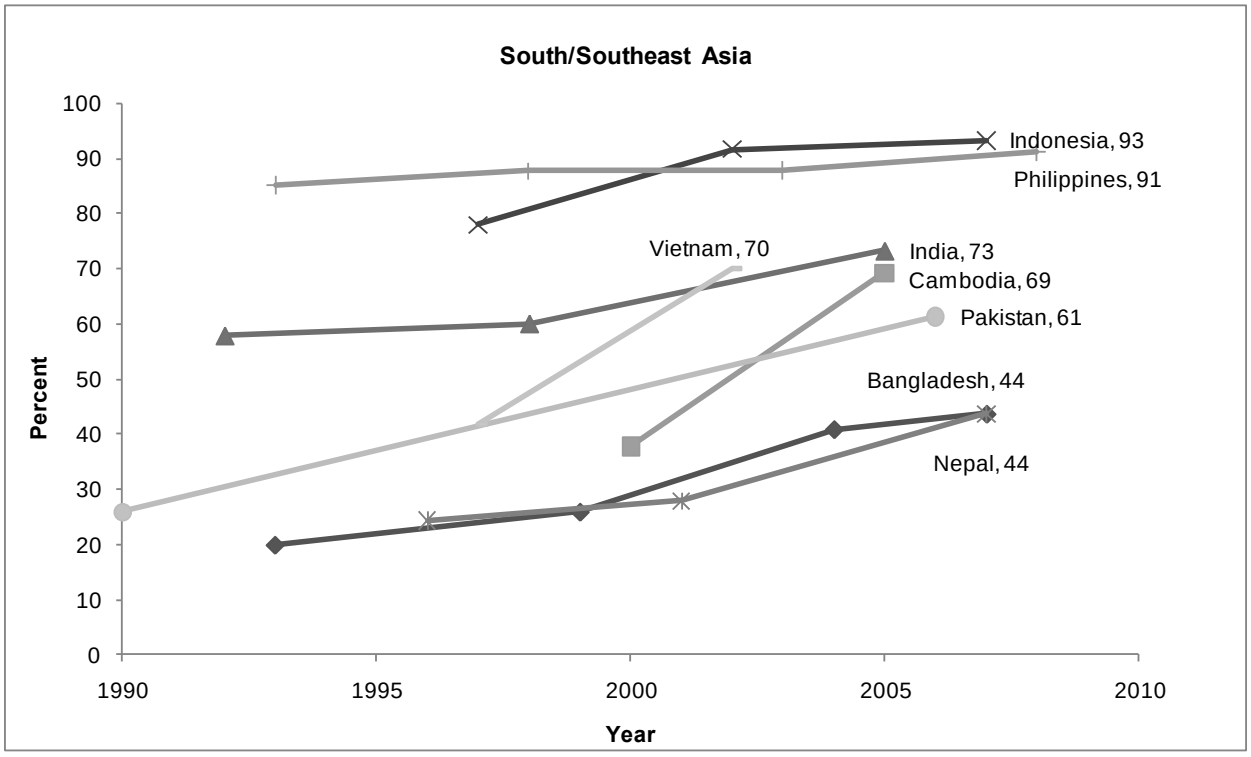


Figure 9. Trends in percentage of women receiving antenatal care from a skilled health provider for the most recent live birth in North Africa/West Asia/Europe, 1990-2009

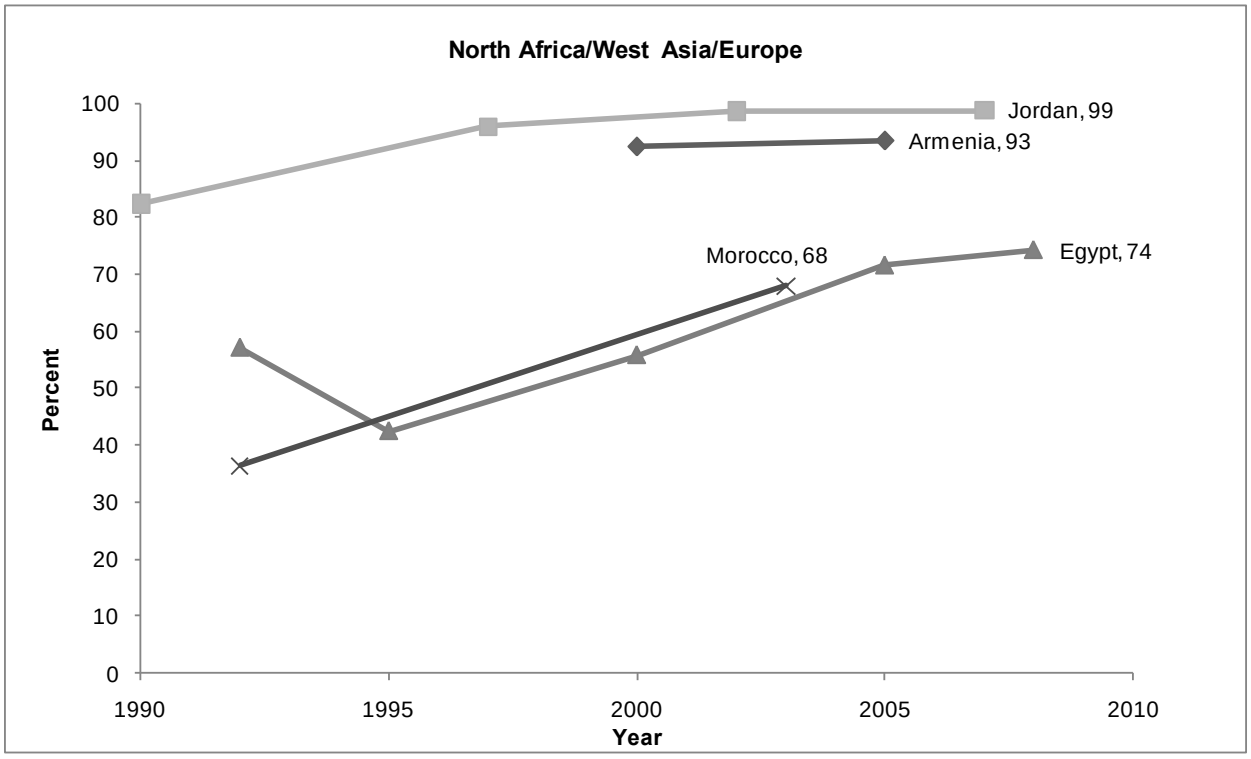
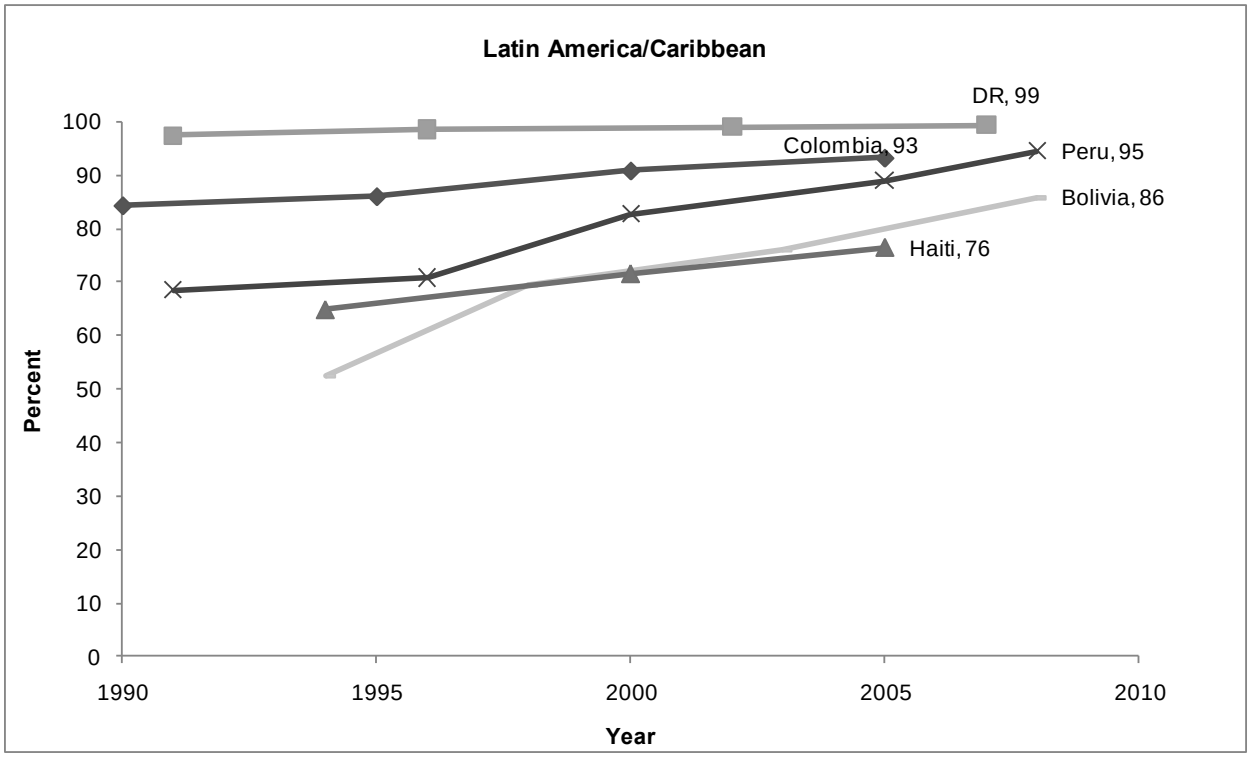


Figure 10. Trends in percentage of women receiving antenatal care from a skilled health provider for the most recent live birth in Latin America and the Caribbean, 1990-2009



3.1.7 Differentials in Use of Skilled Health Providers for Antenatal Care

Mother's age at birth

Table 7 shows the percentage of women who received antenatal care from a skilled health provider for the most recent birth in the five years preceding the survey, by women's background characteristics. Overall, there is no marked relationship between level of skilled care use and mother's age at birth. In general, all age groups show similar use of skilled providers, except in most South/Southeast Asian countries, where a decreased use is evident among women age 35-49.

Birth order

Mothers are most likely to receive antenatal care from a skilled provider for the first birth than for subsequent births. This pattern is observed in all but a few countries studied, including Kenya, Tanzania and Indonesia, where the difference in use across parity is negligible. In all countries in Latin America and the Caribbean, South/Southeast Asia and North Africa/West Asia/Europe, and in a majority of countries in sub-Saharan Africa, the proportion of women receiving skilled antenatal care decreases with each birth order. In the sub-Saharan African countries where this pattern is not consistent, there is a general decrease. Consistent decreased use of antenatal care with increase of parity is most pronounced in South/Southeast Asia and North Africa/West Asia/Europe, where the drop in antenatal care with increase in birth order is generally higher than 20 percentage points, whereas in most sub-Saharan African countries the decrease is very small.

Urban/rural residence

In all countries, women living in urban areas have higher levels of use of skilled health providers for antenatal care than women in rural areas, and in almost all countries, across regions, this difference is considerable. For the sub-Saharan African region and the North Africa/West Asia/ Europe region, the countries with the most striking urban-rural gap are in North Africa and West Africa, including Guinea, Mali, Niger and Senegal, where the level of skilled provider use is at least twice as high in urban areas as in rural areas, and sometimes three times as high, as in Mali. In all countries of South/Southeast Asia, there is a considerable gap as well, especially in Bangladesh and Nepal, where urban women are about twice as likely as rural women to receive antenatal care from a skilled provider. The difference, although still evident, is more moderate in Latin America and the Caribbean. In the Dominican Republic the level is almost the same for women in urban and rural areas.

Women's education

Table 7 also shows that in developing countries as a whole the likelihood of using a skilled provider is positively associated with women's level of educational attainment. In almost all countries with data, over 95 percent of women with education higher than the secondary level receive antenatal care from a skilled provider, while the percentage of women with no education receiving skilled care varies across countries, from 22 percent in Bangladesh to over 90 percent in the Dominican Republic, Zimbabwe and Rwanda. Since in almost all countries with available data nearly all women in the highest education group use skilled providers for antenatal care, the overall low level of skilled antenatal care use found in certain countries can be explained by the fact that less educated women, who receive very low levels of antenatal care, are a much greater share of all women needing antenatal care. As a result, there is also a greater gap by education status in countries with lower overall level of use. This observed barrier of education status is most pronounced in all countries in South/Southeast Asia and most countries in West Africa and North Africa.

Household wealth

As with women's education, use of antenatal care from a skilled health provider is positively associated with household wealth. In all countries across regions, the level of use of skilled antenatal care is highest among women in the richest households. As before, wealth-related differences are larger in countries with a low level of antenatal care than those with a high level. For example, in Guinea, Mali, Niger, Nigeria, Senegal, Bangladesh, Nepal and Pakistan, where no more than half of women report use of antenatal care from a skilled provider, the disparity between rich and poor is substantial. Also in the same countries, wealth status does not seem to have an impact on skilled antenatal care use until the fourth wealth quintile. The level of use remains low for women in the bottom 60 percent of households, starts to increase for women in the fourth wealth quintile, and is highest for the richest 20 percent. Similarly, countries with a higher overall level of skilled provider use have the least variance across wealth groups—namely Namibia, Nigeria, Zimbabwe, Uganda and most notably Jordan, Rwanda and the Dominican Republic, where the difference in use between the poorest and the richest is less than 4 percentage points.

Table 7. Percentage of women who received antenatal care from a skilled health provider for the most recent birth in the five years preceding the survey by selected characteristics, the most recent survey, 1990-2009

	Age at the last birth			Birth order				Residence		Education				Wealth status (quintile)				
Country/Year	<20	20 -34	35 -49	1	2	3	4 or more	Urban	Rural	None	Pri-mary	Secon -dary	High-er	Low-est	Se-cond	Mid-dle	Four -th	High -est
Sub-Saharan Africa																		
Benin 2006	81.0	85.2	81.3	89.2	86.9	85.9	80.6	90.9	80.4	79.8	94.6	98.4	98.1	68.4	78.6	85.0	93.0	97.5
Burkina Faso 2003	73.7	73.8	69.2	80.2	76.4	75.0	68.5	96.4	68.9	69.9	89.4	99.9	*	56.3	62.2	72.9	81.0	95.8
Cameroon 2004	80.4	80.3	77.9	87.3	83.1	80.9	74.7	91.5	70.1	55.1	85.8	94.9	100.0	60.6	71.4	85.9	92.2	96.2
Chad 2004	40.2	39.0	36.8	48.5	39.8	36.6	36.5	76.8	30.1	29.1	68.3	85.2	*	6.9	25.5	39.1	50.2	73.9
Ghana 2008	83.6	88.2	82.6	90.4	88.5	88.4	82.9	94.0	81.8	77.5	85.7	93.2	*	71.7	83.2	92.1	94.1	97.0
Guinea 2005	55.5	53.5	46.9	60.7	59.1	51.4	48.4	92.4	39.8	48.3	73.0	84.4	*	31.5	39.6	45.2	64.9	94.8
Kenya 2008	88.5	93.3	84.7	92.4	92.2	95.6	88.8	95.8	90.3	72.4	92.8	95.6	99.1	83.6	92.7	93.2	92.7	95.6
Madagascar 2008-09	82.8	87.4	86.3	88.6	87.3	88.1	84.1	94.7	85.1	71.2	88.8	95.8	100.0	72.9	82.8	89.2	94.5	97.2
Malawi 2004	92.5	92.4	90.7	93.8	93.5	92.1	90.8	97.6	91.3	86.3	93.5	97.3	*	88.7	89.8	91.1	94.9	97.2
Mali 2006	37.3	38.9	31.0	44.1	40.4	43.2	32.7	72.1	23.2	31.9	57.0	81.6	(93.7)	19.3	23.4	25.5	40.6	79.7
Mozambique 2003	87.2	84.0	83.6	89.9	86.6	82.5	82.2	97.1	78.9	75.0	91.5	98.7	*	67.0	82.5	86.1	96.9	98.3
Namibia 2006-07	79.5	80.3	75.9	62.7	62.7	61.1	58.8	96.1	93.4	79.0	94.4	97.1	97.2	90.3	93.2	95.7	97.0	96.6
Niger 2006	38.1	38.7	38.0	31.0	27.1	26.7	24.2	87.3	38.5	41.6	69.5	93.9	*	35.7	35.5	36.8	42.7	82.6
Nigeria 2008	38.2	56.3	50.8	32.9	31.5	31.7	26.7	78.8	41.6	27.6	62.0	79.9	93.6	20.3	35.8	56.8	75.2	89.8
Rwanda 2007	93.6	96.2	95.0	97.2	95.8	96.1	95.1	95.9	95.8	93.8	96.2	98.7	(100.0)	94.1	94.7	97.2	96.0	97.3
Senegal 2005	54.7	61.3	58.0	67.5	64.3	59.7	54.7	88.3	41.7	51.0	76.4	91.0	*	31.9	44.3	58.7	82.0	90.9
Tanzania 2004-05	73.6	77.1	75.2	76.6	78.7	78.7	74.1	83.2	74.3	67.1	79.4	77.6	86.2	66.0	75.2	80.2	78.0	83.2
Uganda 2006	93.9	93.1	91.2	96.0	93.1	92.9	92.0	97.1	92.3	89.5	93.3	95.7	98.5	92.5	91.4	92.0	92.9	96.3
Zambia 2007	90.7	90.2	89.5	92.7	91.6	90.1	88.7	98.2	86.3	82.5	89.5	95.0	99.2	85.1	83.7	88.5	97.6	98.2
Zimbabwe 2005-06	93.0	94.9	91.7	95.7	95.6	94.4	91.1	96.0	93.4	94.1	91.1	96.0	97.2	92.7	92.0	94.5	95.2	97.1
North Africa/West Asia/Europe																		
Armenia 2005	90.1	93.7	88.3	97.2	93.7	89.3	73.8	95.6	88.8	na	100.0	91.1	99.1	84.5	87.5	95.2	97.1	99.2
Egypt 2008	75.8	74.7	69.2	85.6	76.1	72.6	60.8	85.1	67.5	55.4	69.2	79.9	92.4	54.1	64.5	74.0	85.6	92.4
Jordan 2007	97.8	99.1	97.7	99.5	99.3	99.1	98.1	98.9	97.9	89.4	95.8	98.9	99.7	96.8	98.8	99.3	99.8	99.9
Morocco 2003-04	68.6	68.8	63.9	82.8	72.8	68.2	53.3	84.9	47.9	55.5	78.5	92.1	98.7	39.7	56.4	70.6	86.8	93.1

(Cont'd)

Table 7. – cont'd

Country/Year	Age at the last birth			Birth order				Residence		Education				Wealth status (quintile)				
	<20	20 -34	35 -49	1	2	3	4 or more	Urban	Rural	None	Pri-mary	Secon -dary	High-er	Low-est	Se-cond	Mid-dle	Four -th	High -est
South/Southeast Asia																		
Bangladesh 2007	45.7	44.1	29.3	58.1	45.1	37.9	27.3	67.1	37.4	21.6	36.0	58.0	87.8	22.4	27.7	37.4	56.8	79.8
Cambodia 2005	68.8	72.1	59.8	80.3	75.0	71.3	56.8	79.2	67.7	49.9	70.6	89.9	(100.0)	55.2	63.7	68.4	77.6	90.2
India 2005-06	76.5	74.1	50.1	85.5	82.7	71.1	53.1	89.0	67.4	56.8	78.4	90.3	98.1	52.0	64.5	76.4	87.7	96.2
Indonesia 2007	90.8	94.2	90.1	95.2	95.4	92.8	86.9	97.7	90.1	62.6	89.5	97.6	99.5	82.2	92.1	95.5	98.5	99.2
Nepal 2006	50.8	44.9	20.4	58.6	50.2	43.4	24.0	84.6	37.5	28.5	51.9	71.9	94.7	17.7	30.5	38.4	60.7	84.1
Pakistan 2006-07	59.0	63.7	48.9	73.4	67.3	65.4	52.8	78.1	53.5	50.1	70.1	85.4	96.1	36.9	48.3	61.4	73.7	91.9
Philippines 2008	90.9	91.8	88.7	95.2	93.1	93.6	84.8	94.2	88.1	44.0	80.6	94.2	97.1	77.1	91.4	95.9	97.6	98.3
Vietnam 2002	53.7	72.1	66.2	74.5	71.4	68.1	50.5	92.7	65.2	35.1	61.1	75.7	96.9	51.7	61.7	68.9	78.8	97.0
Latin America/Caribbean																		
Bolivia 2008	86.5	88.1	76.3	91.0	90.4	90.0	76.6	94.5	73.9	62.9	80.4	93.3	98.5	65.7	82.8	92.1	96.2	96.8
Colombia 2005	92.7	94.0	90.5	96.8	95.0	93.9	82.9	95.8	87.0	72.5	87.8	96.5	98.4	83.1	92.6	96.8	97.3	99.1
Dominican Republic 2007	99.0	98.8	98.9	99.5	99.1	98.3	98.2	99.0	98.5	94.6	98.8	99.2	99.4	97.8	99.2	99.1	99.4	99.1
Haiti 2005-06	77.9	78.1	69.7	84.8	80.1	77.3	68.7	85.7	70.9	60.8	78.1	91.8	99.4	57.6	71.3	80.1	83.7	93.6
Peru 2008	92.4	95.1	93.1	96.7	95.3	95.6	89.4	98.3	87.5	86.6	89.4	96.3	99.2	82.5	89.1	97.3	98.4	99.0

Note: Figures in parentheses are based on 25-49 unweighted cases; an asterisk denotes a figure based on fewer than 25 unweighted cases that has been suppressed.

Ethiopia is excluded as doctors and nurses were not distinguished from other health professionals in the survey.

3.1.8 Content of Antenatal Care

Table 8 presents information on the percentage of women who were informed of signs of pregnancy complications, had blood pressure measured and urine and blood samples taken, for their most recent live birth in the last five years. The content of antenatal care provides an indication of its quality. Pregnancy complications are primary sources of maternal and child morbidity and mortality, and therefore teaching women about signs associated with pregnancy complications and the appropriate action to take, as well as having measurements and tests to identify any potential complications, are important components of antenatal care.

In most sub-Saharan African countries, less than half of women who received antenatal care were informed of signs of pregnancy complications. This percentage is extremely low in some countries, as in Rwanda, where less than 10 percent of women were taught about danger signs during pregnancy. Ghana and Zambia perform better than other countries, with more than two-thirds of women receiving such services, followed by Nigeria (61 percent) and Namibia (58 percent). In this region, most women who receive antenatal care had their blood pressure measured. The practice of taking urine and blood samples is less common except in a few countries, including Cameroon, Ghana, Kenya, Namibia, Nigeria and Zimbabwe.

It is generally assumed that countries with higher levels of use of skilled health providers for antenatal care will also have higher percentages of women receiving essential services. However, this is not always the case. For example, in Uganda 93 percent of women reported using skilled health providers for antenatal care, but only 35 percent were informed of danger signs of pregnancy, 12 percent had their urine samples taken, and 28 percent had blood samples taken, while a little more than half were measured for blood pressure. A similar pattern is observed in Rwanda and Malawi. In these countries, the main source of antenatal care is a nurse or midwife, rather than a doctor.

Similarly, in the South/Southeast Asia region most women had their blood pressure measured during antenatal care visits, but less than half were informed of signs of pregnancy complications. Even fewer women had their urine or blood samples taken. Countries in the region perform differently with respect to the various components of care. For example, India has the highest percentage of women whose urine and blood samples were collected in antenatal care but the smallest percentage who were informed of signs of pregnancy complications. Cambodia demonstrates the opposite pattern.

Countries in North Africa/Central Asia/Europe and particularly in Latin America and the Caribbean generally have a high proportion of women reporting provision of the selected services. Nevertheless, in all countries of both regions relatively fewer women reported being informed about signs of pregnancy complications than reported the other three types of services (measurement of blood pressure and taking urine and blood samples).

Table 8. Among women receiving antenatal care (ANC) for the most recent birth in the five years preceding the survey, the percentage who reported specific antenatal services, the most recent survey, 1990-2009

Country/Year	Informed of signs of pregnancy complications	Blood pressure measured	Urine sample taken	Blood sample taken	Number of women receiving ANC for their most recent birth
Sub-Saharan Africa					
Benin 2006	39.0	98.7	91.6	39.6	9,286
Burkina Faso 2003	19.2	95.5	78.9	36.0	5,468
Cameroon 2004	38.4	93.9	83.8	82.3	4,436
Chad 2004	18.0	74.0	42.1	39.1	1,624
Ethiopia 2005	31.4	61.9	26.5	26.2	2,076
Ghana 2008	68.4	97.1	90.3	90.4	2,024
Guinea 2005	26.8	87.0	59.9	42.5	3,703
Kenya 2008	43.4	84.7	67.7	82.1	3,680
Madagascar 2008-09	48.7	80.6	29.5	30.6	7,869
Malawi 2004	70.3	77.9	20.7	35.9	6,930
Mali 2006	29.1	88.1	45.4	35.3	6,465
Mozambique 2003	51.8	72.8	37.7	50.4	6,098
Namibia 2006-07	58.2	97.3	93.7	97.4	3,734
Niger 2006	26.2	87.1	37.9	36.2	2,954
Nigeria 2008	61.3	85.1	74.5	73.6	11,158
Rwanda 2007	7.7	86.9	18.0	70.8	3,519
Senegal 2005	34.0	97.6	82.6	56.5	6,441
Tanzania 2004-05	47.3	66.0	41.9	54.2	5,593
Uganda 2006	35.3	52.5	12.4	28.1	4,809
Zambia 2007	73.3	80.4	23.0	59.0	4,044
Zimbabwe 2005-06	49.6	92.6	68.6	67.8	3,890
North Africa/West Asia/Europe					
Armenia 2005	46.2	98.5	98.4	98.5	1,097
Egypt 2008	39.8	93.2	76.8	78.7	5,861
Jordan 2007	49.9	98.3	94.1	94.6	6,366
Morocco 2003-04	39.1	90.9	54.0	52.3	3,185
South/Southeast Asia					
Bangladesh 2007	37.5	86.4	54.2	36.8	2,956
Cambodia 2005	60.3	80.6	23.8	18.1	4,213
India 2005-06	24.6	63.8	58.1	59.5	30,621
Indonesia 2007	38.8	91.9	40.1	29.2	13,457
Nepal 2006	57.3	78.5	31.6	27.9	3,000
Pakistan 2006-07	25.0	79.6	49.2	43.7	3,673
Philippines 2008	68.8	92.9	54.3	46.6	4,411
Vietnam 2002	na	na	na	na	
Latin America/Caribbean					
Bolivia 2008	66.6	97.2	72.1	69.8	5,841
Colombia 2005	63.6	99.3	92.2	93.0	10,379
Dominican Republic 2007	69.1	99.5	97.2	99.1	8,120
Haiti 2005-06	43.8	95.4	66.7	68.9	3,512
Peru 2008	85.0	99.4	84.3	83.3	4,796

Table 9 shows information about other components of antenatal care, including women's receipt of iron tablets/syrups and tetanus injections during pregnancy. While both services could be obtained outside of antenatal care, an antenatal visit serves as an important channel to distribute them to pregnant women. Administration of iron tablets/syrup is very important to meet women's increased iron needs during pregnancy, and it also affects the iron status of the children after birth. In Latin America and the Caribbean, the majority of women were given or bought iron supplements during pregnancy of their last birth. In South/Southeast Asia the figures also are higher than 50 percent, except in Pakistan (43 percent).

In the four countries in North Africa/West Asia/Europe, the percentage of women receiving iron supplementation during antenatal care is highest in Jordan, at 81 percent. It is lowest in Armenia, at 18 percent, and is 38 percent in Morocco and 42 percent in Egypt.

A large variation in iron supplementation is found among countries in sub-Saharan Africa. In Senegal, Zambia, Ghana, Benin and Namibia, at least 8 in 10 pregnant women reported receiving iron tablets or syrups. Among most other countries, the level ranges from 29 percent in Chad to 79 percent in Malawi. However, in Ethiopia only 10 percent of women reported receiving iron supplements during pregnancy.

Neonatal or maternal tetanus could occur in deliveries conducted at home or other places where the hygienic environment is poor. Tetanus toxoid injections are given to pregnant women primarily for the prevention of neonatal tetanus, a leading cause of infant mortality, but it also prevents tetanus in the women. If a woman did not previously receive injections, she should receive at least two doses during the pregnancy in order to be fully protected.

Table 9 also shows the percentage of women who reported one, two or more doses of tetanus toxoid injections during pregnancy for their most recent live birth. In most countries in Latin America and the Caribbean, South/Southeast Asia and 11 countries in sub-Saharan Africa, more than half of women reported receiving two or more injections during pregnancy. However, in North Africa/West Asia/Europe, much smaller percentages reported two or more doses of tetanus toxoid injections—38 percent in Egypt, 13 percent in Morocco and 6 percent in Jordan.

Table 9. Among women with a live birth in the five years preceding the survey, the percentage who received iron tablets or syrups and the percentage who received tetanus toxoid injections during the pregnancy of the most recent birth, the most recent survey, 1990-2009

Country/Year	Iron tablets or syrup	Tetanus toxoid injections		Number of women with a live birth the past 5 years
		One	Two or more	
Sub-Saharan Africa				
Benin 2006	86.1	19.3	56.3	10,521
Burkina Faso 2003	69.3	24.4	40.2	7,428
Cameroon 2004	73.3	19.1	53.3	5,303
Chad 2004	28.7	12.5	29.3	3,720
Ethiopia 2005	10.4	8.7	28.0	7,307
Ghana 2008	86.5	31.5	56.2	2,099
Guinea 2005	75.0	9.9	65.7	4,447
Kenya 2008	68.7	32.5	55.0	3,973
Madagascar 2008-09	41.1	15.0	47.4	8,662
Malawi 2004	79.4	18.4	66.2	7,271
Mali 2006	60.8	14.4	47.9	9,087
Mozambique 2003	60.2	18.5	57.2	7,179
Namibia 2006-07	79.8	21.0	32.9	3,898
Niger 2006	45.3	18.4	23.0	6,300
Nigeria 2008	54.3	9.1	45.3	17,635
Rwanda 2007	41.0	39.4	30.7	3,658
Senegal 2005	90.5	21.8	66.1	6,928
Tanzania 2004-05	38.9	23.8	55.9	5,772
Uganda 2006	63.1	25.9	50.8	5,035
Zambia 2007	90.4	49.2	30.3	4,136
Zimbabwe 2005-06	42.9	25.2	54.5	4,100
North Africa/West Asia/Europe				
Armenia 2005	17.9	na	na	1,176
Egypt 2008	41.5	42.1	37.7	7,896
Jordan 2007	80.5	25.3	6.2	6,446
Morocco 2003-04	38.3	15.1	12.6	4,695
South/Southeast Asia				
Bangladesh 2007	54.8	22.9	59.7	4,905
Cambodia 2005	62.8	21.4	54.2	5,865
India 2005-06	65.1	6.7	76.3	39,677
Indonesia 2007	77.3	21.8	49.7	14,043
Nepal 2006	59.3	10.2	63.2	4,066
Pakistan 2006-07	43.3	4.9	53.4	5,677
Philippines 2008	82.4	30.4	47.7	4,590
Vietnam 2002	na	14.2	71.3	1,215
Latin America/Caribbean				
Bolivia 2008	76.8	27.7	40.1	6,472
Colombia 2005	75.9	24.0	61.5	11,083
Dominican Republic 2007	92.8	9.0	84.1	8,203
Haiti 2005-06	64.7	13.8	60.2	4,074
Peru 2008	77.4	19.2	54.6	4,920

na=not available; information was not collected in the survey.

3.1.9 Use of Intermittent Preventive Treatment during Pregnancy for Malaria and HIV Testing During Antenatal Care

Due to the relatively high prevalence of HIV and malaria in sub-Saharan Africa, we examine use of intermittent preventive treatment (IPT) for malaria during pregnancy and HIV testing during antenatal care among women in this region. IPT during pregnancy is defined as preventive treatment for malaria with two or more doses of sulfadoxine/pyrimethamine (SP/Fansidar) given to pregnant women. In high malaria-endemic areas, it is recommended that pregnant women receive SP/Fansidar once in the second trimester of pregnancy and once in the third trimester, preferably during antenatal care visits.

As table 10 shows, in certain countries—Burkina Faso, Cameroon, Chad, Ethiopia and Niger—almost none of the pregnant women receive two doses of SP/Fansidar during pregnancy for their most recent birth in the two years prior to the survey. Zambia, Malawi and Ghana have the highest use of IPT, with 66 percent, 47 percent and 46 percent of women, respectively, receiving at least two doses of SP/Fansidar during the pregnancy. They are followed by Tanzania (22 percent), Rwanda (18 percent) and Uganda (18 percent). In most of countries, a majority of women who took at least two doses of SP/Fansidar received at least one dose during an antenatal care visit.

Antenatal care is also an important conduit for HIV screening. Table 10 indicates that in most of the sub-Saharan African countries studied a very small proportion of women were offered and accepted HIV testing during their antenatal care visits, except in Namibia and Kenya (73 percent each).

Table 10. Among women with a live birth in the two years preceding the survey, the percentage who received intermittent-preventive treatment (IPT) and the percentage who were offered and accepted an HIV test during an antenatal care (ANC) visit during the pregnancy of the most recent live birth, the most recent survey, 1990-2009

	Intermittent-preventive treatment (IPT)[1]		Were offered and accepted an HIV test during antenatal care[2]		
Country/Year	Took two or more doses of SP/Fansidar	Took two or more doses of SP/Fansidar, and received at least one during an ANC visit	Received results	Did not receive results	Number of women with a live birth in the 2 years prior to the survey[3]
Sub-Saharan Africa					
Benin 2006	3.0	0.1	15.8	2.3	6,380
Burkina Faso 2003	0.0	0.0	na	na	4,201
Cameroon 2004	0.0	0.0	8.9	1.1	3,173
Chad 2004	0.0	0.0	0.6	0.0	2,251
Ethiopia 2005	1.2	0.5	0.4	0.1	4,321
Ghana 2008	45.5	43.7	28.0	7.3	1,178
Guinea 2005	3.6	2.5	1.5	0.5	2,614
Kenya 2008	15.1	14.0	72.7	1.8	2,264
Madagascar 2008-09	6.7	6.4	6.2	1.2	4,807
Malawi 2004	46.5	42.9	3.7	0.6	4,604
Mali 2006	11.2	4.0	6.8	0.7	5,663
Namibia 2006-07	10.6	10.0	72.5	4.1	2,054
Niger 2006	0.5	0.4	1.9	0.2	3,918
Nigeria 2008	6.5	4.9	16.0	3.1	11,027
Rwanda 2007	17.7	17.3	na	na	2,267
Senegal 2005	13.2	11.9	6.2	0.8	4,391
Tanzania 2004-05	22.3	21.7	12.9	2.3	3,500
Uganda 2006	17.6	16.2	21.2	4.8	3,247
Zambia 2007	65.7	62.5	39.5	5.0	2,631
Zimbabwe 2005-06	6.8	6.3	27.5	7.2	2,144

[1]Intermittent Preventive Treatment during pregnancy is preventive treatment with two or more doses of SP/Fansidar.

[2]Only women who were offered the test are included here; women who were either required or asked for the test are excluded from the numerator of this measure.

[3]This includes women who did not receive antenatal care for their last birth in the past 2 years

na=not available.

3.2 Delivery Care

Delivery care through access to health facilities and skilled health personnel are two important interventions for safe motherhood. Historically, increasing women's access to health facilities with the capacity to provide emergency obstetric care has been responsible for large drops in maternal mortality (Post 1997; Wildman and Bouvier-Colle 2004; Maine 1991). This section provides information on the patterns for both indicators in the countries studied.

3.2.1 Place of Delivery

Table 11 presents the distribution of place of delivery for women whose most recent birth was in the five years preceding the survey. In half of the 38 countries analyzed, the majority of women delivered their last child in an institutional setting. In North Africa/West Asia/Europe and in Latin America and the Caribbean, women are more likely to give birth in a health facility than are women in sub-Saharan Africa or South/Southeast Asia. In Jordan and Armenia, over 95 percent of women had their most recent birth in a health facility, whether public or private. In the Latin American and Caribbean countries, except for Haiti (at 27 percent), over 70 percent of women delivered their most recent birth in an institutional setting, including 92 percent in Colombia and 98 percent in the Dominican Republic.

In contrast, the situation in sub-Saharan Africa is mixed. The use of institutional facilities is greatest in Namibia (82 percent), Benin (81 percent), and Zimbabwe (70 percent). In about half of the countries, most births take place in a health facility, but the percentage is around 50 percent in several countries, including Mozambique, Rwanda, Tanzania and Zambia. The region's countries with the lowest levels of births in health facilities are Ethiopia (6 percent), Chad (13 percent) and Niger (18 percent).

In South and Southeast Asia, very few women deliver in health facilities. As table 11 shows, women who did not deliver in public or private birth facilities primarily delivered at home. Other than Vietnam, in no country in this region were a majority of last births delivered in facilities. Instead, home births were predominant. Particularly low levels of institutional births are in Bangladesh (16 percent), Nepal (20 percent), and Cambodia (23 percent).

Overall, the public sector contributes a major share of births that take place in an institutional setting—particularly in Namibia, Armenia, Vietnam, Colombia, the Dominican Republic and Peru, where over 70 percent of women's births are in a public health facility. Other countries with widespread access to public sector childbirth facilities include Benin (66 percent), Jordan (63 percent), Senegal (60 percent) and Bolivia (60 percent). In a few countries, however, particularly in North Africa/West Asia/Europe and South Asia/Southeast Asia, private sector provision of delivery care plays a relatively important role. For example, in Egypt 46 percent of women, and in Jordan 36 percent, delivered their most recent birth in a private sector facility. The pattern is similar in Indonesia (38 percent) and Pakistan (26 percent), with India not far behind (23 percent). In sub-Saharan Africa, the highest use of private sector delivery care is in Malawi, at 27 percent.

Table 11 also presents information on the rates of caesarean section among all births.

A higher caesarean section percentage suggests the availability of obstetric care, which is offered primarily in institutional facilities. It is well recognized that very low and or very high levels of caesarean section are dangerous. WHO has proposed that in a country a rate of 5-15 percent of births undergoing a caesarean section is optimal, and a rate above 15 percent in a country is not recommended (WHO 2009).

Among the regions, caesarean section rates are lowest in sub-Saharan Africa, exceeding 5 percent only in Namibia (14 percent) and Ghana and Kenya (7 percent each). In contrast, the rates of caesarean

section deliveries in Egypt, Jordan and all countries in Latin America and Caribbean studied except Haiti are much higher than 15 percent. Particularly high rates are seen in Egypt and Colombia (29 percent each) and the Dominican Republic (44 percent).

Overall, the countries with the highest caesarean section rates, all above 20 percent (Egypt, Jordan, Bolivia, Colombia, the Dominican Republic and Peru), are also among the countries with the highest institutional birth rates (Benin, Namibia, Armenia, Egypt, Jordan, Vietnam, Bolivia, Colombia, the Dominican Republic and Peru). In some of these countries, the high rate of caesarean section deliveries is associated with a high percentage of births taking place in public health facilities. Data not presented here indicate that, particularly in Latin American and Caribbean countries with caesarean section rates above 20 percent (Bolivia, Colombia, the Dominican Republic and Peru), more than 60 percent of caesarean section deliveries occur in public facilities, and as many as 95 percent in Colombia and 79 percent in Peru. However, comparing caesarean sections in public and private facilities, the rate is much higher in private facilities than in public facilities in a number of countries, including Mozambique, Namibia, Armenia, Morocco, Bangladesh, Bolivia, the Dominican Republic and Peru (data not shown here).

Trend data on caesarean section deliveries (see Appendix A) indicate a mixed pattern in sub-Saharan Africa. While steady increases are evident in Namibia, Ghana and Benin, a majority of countries in the region display little change, and in some instances a small decline. Elsewhere, increases in caesarean section rates between the early 1990s and 2010 exceeded five percentage points in Egypt and Jordan in the North Africa/West Asia/Europe region, India, Indonesia and Pakistan in South/Southeast Asia, and Bolivia, Columbia, the Dominican Republic and Peru in Latin America and the Caribbean.

Table 11. Percent distribution of women who had a live birth in the five years preceding the survey by place of delivery for the most recent live birth, the most recent survey, 1990-2009

Country/Year	Institutional delivery		Home	Other places	Missing/ Don't know	Total	Percentage who delivered in a health facility	Percentage who received caesarean section	Total number of women with a live birth in the 5 years preceding the survey
	Public sector	Private sector							
Sub-Saharan Africa									
Benin 2006	65.9	14.6	19.3	0.2	0.1	100.0	80.5	4.0	10,521
Burkina Faso 2003	39.7	0.8	59.4	0.1	0.0	100.0	40.5	0.7	7,428
Cameroon 2004	42.9	18.9	37.4	0.6	0.2	100.0	61.8	2.3	5,303
Chad 2004	11.4	1.9	86.1	0.6	0.0	100.0	13.3	0.5	3,720
Ethiopia 2005	5.8	0.6	93.1	0.4	0.1	100.0	6.4	1.2	7,307
Ghana 2008	50.7	9.4	39.3	0.5	0.0	100.0	60.1	7.2	2,099
Guinea 2005	30.0	1.8	68.0	0.0	0.1	100.0	31.8	1.9	4,447
Kenya 2008	34.9	11.9	53.1	0.2	0.0	100.0	46.8	7.2	3,973
Madagascar 2008-09	34.4	3.2	61.7	0.7	0.0	100.0	37.6	1.7	8,662
Malawi 2004	42.4	27.3	29.0	1.2	0.0	100.0	69.7	3.3	7,272
Mali 2006	45.1	2.4	52.1	0.2	0.1	100.0	47.5	2.0	9,087
Mozambique 2003	49.9	0.3	48.2	1.6	0.1	100.0	50.2	2.4	7,179
Namibia 2006-07	77.2	5.1	17.3	0.2	0.2	100.0	82.3	13.6	3,898
Niger 2006	17.6	0.5	81.5	0.4	0.0	100.0	18.1	1.2	6,300
Nigeria 2008	21.3	15.2	61.2	2.3	0.0	100.0	36.5	2.1	17,635
Rwanda 2007	48.7	0.9	47.2	3.2	0.0	100.0	49.6	na	3,658
Senegal 2005	59.8	4.3	35.2	0.5	0.2	100.0	64.1	3.9	6,928
Tanzania 2004-05	40.5	9.7	49.6	0.1	0.0	100.0	50.2	4.0	5,772
Uganda 2006	32.0	13.3	54.5	0.1	0.0	100.0	45.3	3.6	5,035
Zambia 2007	45.6	4.9	49.0	0.4	0.1	100.0	50.5	3.5	4,136
Zimbabwe 2005-06	56.6	12.9	29.5	0.9	0.2	100.0	69.5	5.4	4,100
North Africa/West Asia/Europe									
Armenia 2005	96.7	0.7	2.0	0.3	0.3	100.0	97.4	9.8	1,176
Egypt 2007	26.8	45.6	27.6	0.1	0.0	100.0	72.4	29.2	7,896
Jordan 2007	62.6	36.3	1.1	0.0	0.0	100.0	98.9	20.0	6,446
Morocco 2003-04	55.1	8.5	36.0	0.3	0.1	100.0	63.6	5.8	4,695

(Cont'd)

Table 11. – cont'd

Country/Year	Institutional delivery		Home	Other places	Missing/ Don't know	Total	Percentage of women who delivered in a health facility	Percentage who received caesarean section	Total number of women with a live birth in the 5 years preceding the survey
	Public sector	Private sector							
South/Southeast Asia									
Bangladesh 2007	7.5	8.6	83.6	0.3	0.0	100.0	16.1	8.6	4,905
Cambodia 2005	18.1	5.1	76.7	0.1	0.0	100.0	23.2	2.2	5,865
India 2005-06	19.0	22.5	58.3	0.2	0.0	100.0	41.5	9.8	39,677
Indonesia 2007	9.9	37.5	51.6	0.7	0.3	100.0	47.4	7.3	14,043
Nepal 2006	14.4	5.1	79.2	1.3	0.0	100.0	19.5	3.3	4,066
Pakistan 2006-07	11.5	25.5	62.4	0.0	0.5	100.0	37.0	8.5	5,677
Philippines 2008	27.8	19.0	53.1	0.1	0.0	100.0	46.8	11.4	4,590
Vietnam 2002	75.8	3.6	20.3	0.2	0.1	100.0	79.4	10.2	1,215
Latin America/Caribbean									
Bolivia 2008	59.6	12.1	27.9	0.4	0.0	100.0	71.7	21.1	6,472
Colombia 2005	88.0	4.0	7.8	0.2	0.0	100.0	92.0	28.8	11,084
Dominican Republic 2007	76.0	21.9	1.0	0.6	0.4	100.0	97.9	44.4	8,203
Haiti 2005-06	15.9	11.5	72.0	0.5	0.1	100.0	27.4	3.5	4,074
Peru 2008	73.3	7.4	18.4	0.9	0.0	100.0	80.7	20.3	4,920

3.2.2 Trends in Births in Health Facilities

Figures 11-15 show trends in institutional births, including both public and private health facilities. Overall, in almost all countries the percentage of births taking place in health facilities has increased since the early 1990s. Among the West and Central African countries (Figure 11), the increases are most prominent in Benin, Ghana, Mali and Senegal, at 10-18 percentage points between the early/mid 1990s and the mid/late 2000s. But in Chad, Guinea, Niger and Nigeria, the percentage of births in institutional facilities has increased very little and remains quite low.

In East and Southern Africa (Figure 12), the most significant increase in institutional births is in Rwanda, at 24 percentage points between 2000 and 2007. Other countries with increases over 10 percentage points between the early 1990s and mid 2000s are Malawi, Namibia and Uganda. However, a few countries in this sub-region (Madagascar, Tanzania and Zambia) display a decrease in the percentage of institutional births over the survey period.

In South/Southeast Asia (Figure 13), all countries show steady increases in institutional deliveries in the past two decades. India, Indonesia and Pakistan, in particular, have had the highest levels of growth (24-31 percentage points). As Figures 14 and 15 indicate, there is a strong upward trend in institutional births in North Africa and West Asia and in Latin America and Caribbean, except for Haiti. In all of these countries with increases, a high percentage of births now take place in a health facility. In some of the countries, as in Jordan, the increase seems small, but only because the level of institutional births has been consistently high, approaching 100 percent.

Figure 11. Trends in percentage of women whose most recent live birth occurred in a health facility in Western and Central Africa, 1990-2009

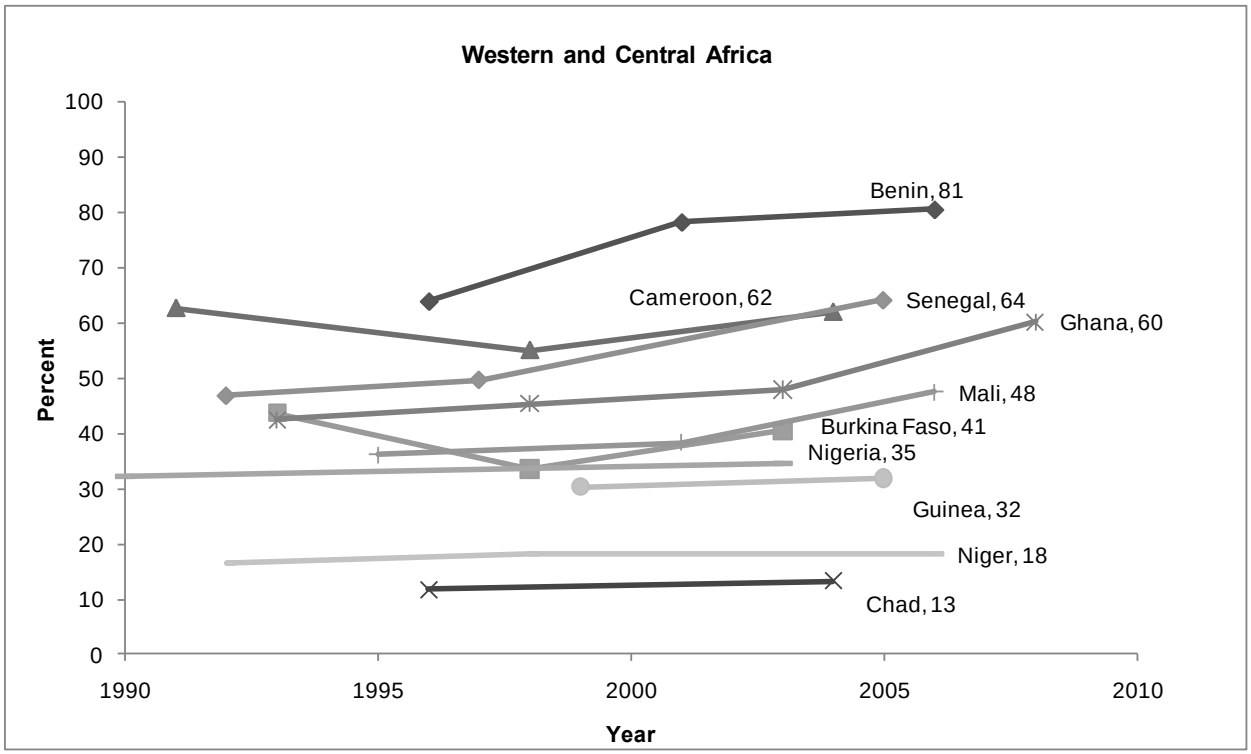


Figure 12. Trends in percentage of women whose most recent live birth occurred in a health facility in Eastern and Southern Africa, 1990-2009

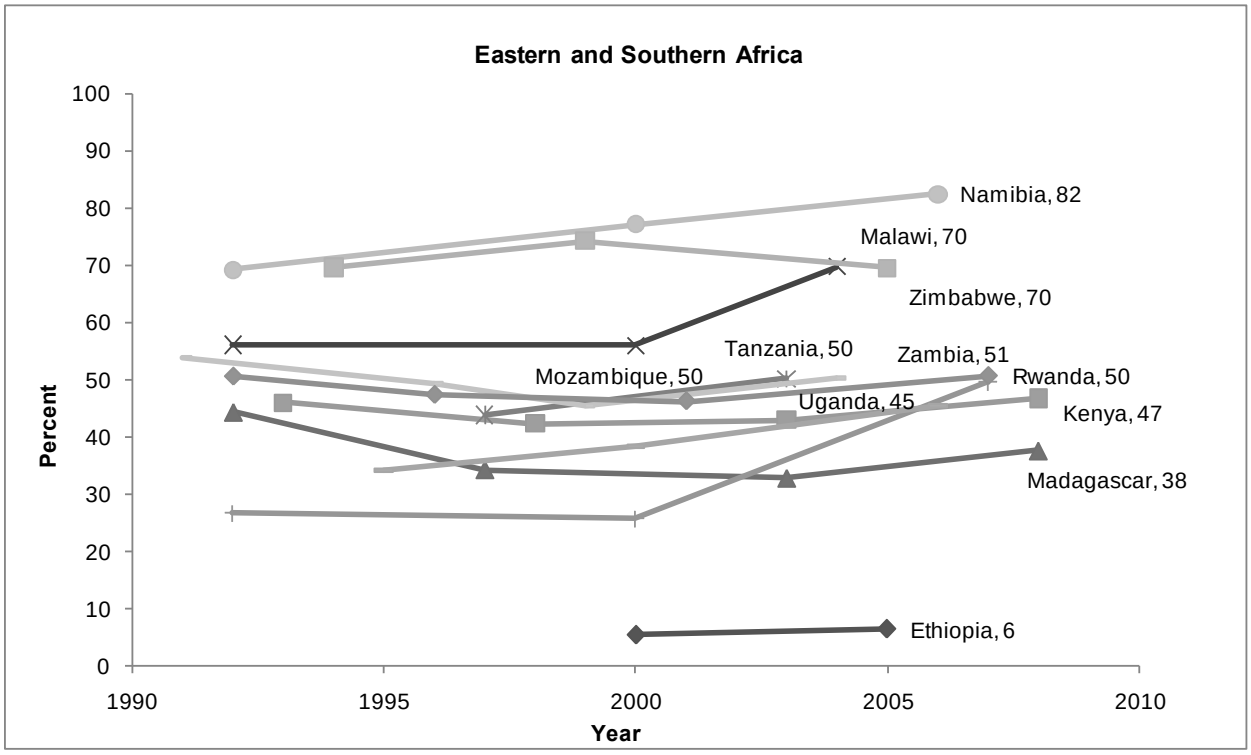


Figure 13. Trends in percentage of women whose most recent live birth occurred in a health facility in South/Southeast Asia, 1990-2009

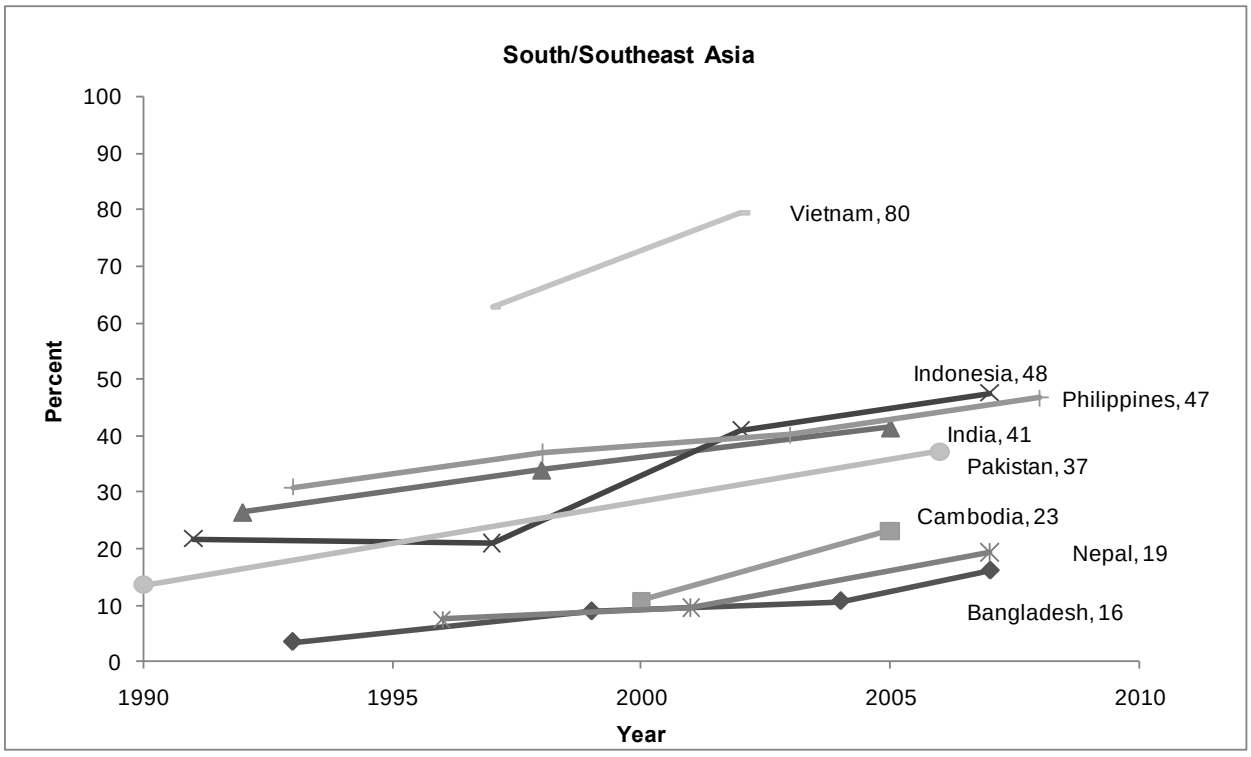


Figure 14. Trends in percentage of women whose most recent live birth occurred in a health facility in North Africa/West Asia/Europe, 1990-2009

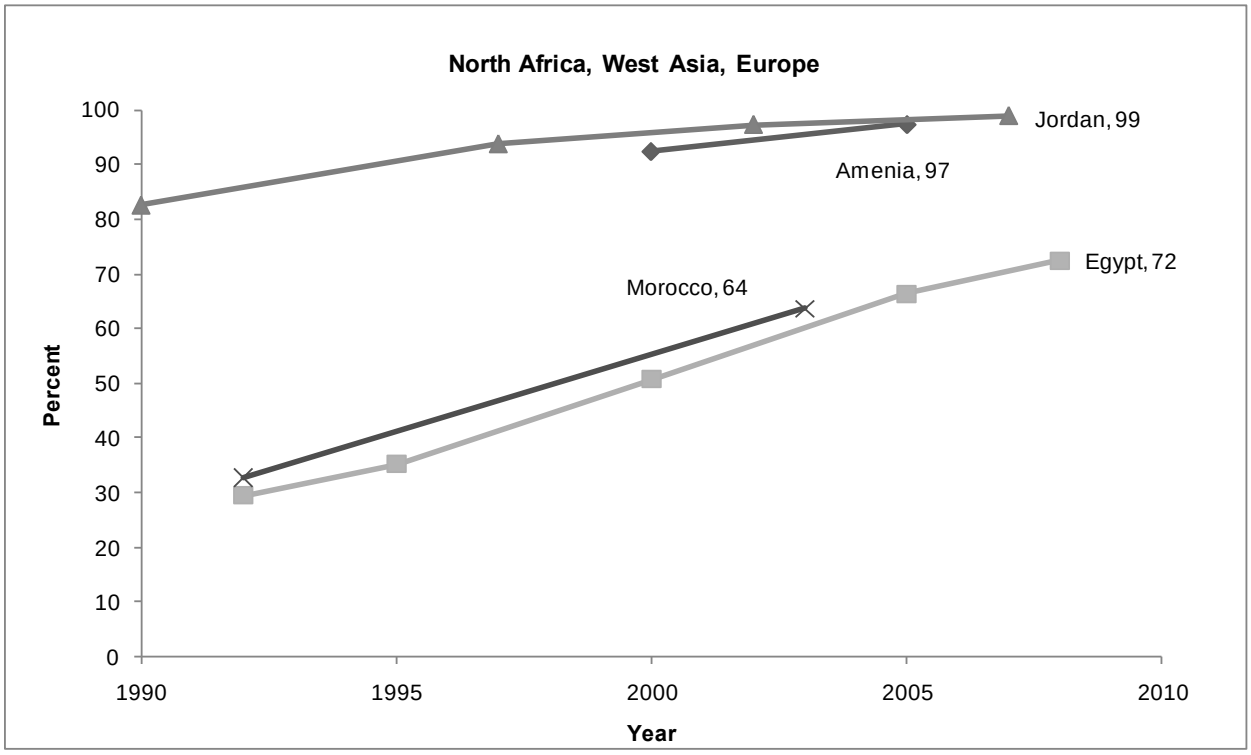
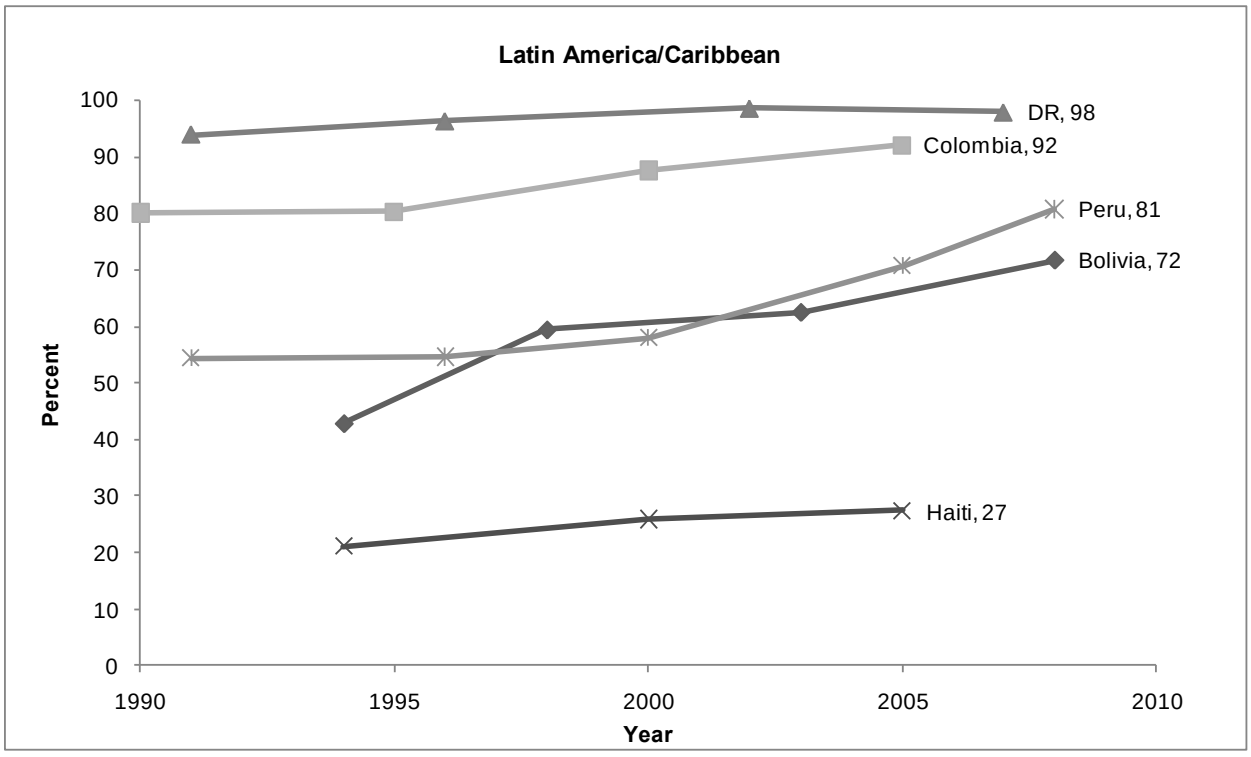


Figure 15. Trends in percentage of women whose most recent live birth occurred in a health facility in Latin America and the Caribbean, 1990-2009



3.2.3 Differentials in Births in Health Facilities

Mother's age at birth

Table 12 shows the characteristics of women whose last birth was at a health facility. In general, the younger the mother is, the more likely she is to use a health facility. That is, the age of the mother at last birth is inversely related to the use of a health facility for birth. This pattern is most prominent in sub-Saharan Africa, where in a majority of countries the percentage of women under age 20 who gave birth in an institutional setting is greater than the percentage among women age 35-49.

The relationship between mother's age and use of health facilities for delivery is somewhat non-linear in some sub-Saharan African countries (Benin, Cameroon, Ghana, Nigeria and Zimbabwe) and in South/Southeast Asia (all countries except Nepal and Vietnam), where a larger proportion of women age 20-34 had their last birth at a health facility compared to other age groups. In Indonesia, the Philippines and Vietnam, the proportion of women age 20-34 who delivered in a health facility is 10 percentage points higher than among women under age 20.

Birth order

As Table 12 shows, birth order has a strong inverse relationship with use of a health facility for delivery. Consistently across all four regions in this study, the proportion of births delivered in a health facility declines with birth order. A larger proportion of women with just one birth deliver at a health facility compared to women with four or more births. This difference is less prominent in sub-Saharan Africa than the other three regions, where most countries show a 20 percentage point difference between the two groups. Exceptions are Jordan and the Dominican Republic, where the percentage of institutional births is consistently high, over 97 percent irrespective of birth order.

Urban/rural residence

Overall, births in a health facility are more common in urban than rural areas. This difference is most apparent in sub-Saharan Africa and South/Southeast Asia, where in a majority of countries the proportion of health facility births in urban areas is double the proportion in rural areas. Countries where health facility use is significantly low in rural areas are Chad, Ethiopia and Niger, where less than 10 percent of women in rural areas delivered their most recent child in a health facility. Other countries with percentages between 10 and 20 percent are Bangladesh, Cambodia, Nepal and Haiti. In contrast, in Armenia, Jordan and the Dominican Republic, rates in rural areas, as in urban areas, are close to 100 percent. Benin and Vietnam also display a high rate of institutional births in rural areas (over 75 percent).

Women's education

In all countries examined, there is a strong positive association between mother's education and use of a health facility for delivery. In most countries, over 90 percent of women educated beyond the secondary level had their last birth at a health facility. Some exceptions are in sub-Saharan Africa and South/Southeast Asia, with the lowest percentages in Bangladesh and the Philippines. This pattern persists among women with secondary education. Among women with a primary education or no education, the proportion of women using a health facility for delivery is lowest in sub-Saharan Africa and South/Southeast Asia, although there is considerable variation across countries.

Household wealth

Overall, the relationship between household wealth status and health facility use for delivery is positive, as with mother's education. However, there is some variation between countries within regions. For example, in Chad and Ethiopia in sub-Saharan Africa, and Bangladesh in South Asia, countries where the use of institutional facilities for childbirth is low, less than half of women in the wealthiest quintile had their last birth in a health facility. This percentage is lowest in Ethiopia (28 percent). Among the poorest groups in these countries, the use of health facilities for delivery is minimal. Other countries with very low use of health facilities among the poorest groups but moderate to high use among women in the wealthiest quintile include Guinea, Niger and Nigeria. A similar pattern is evident in Haiti and several South/Southeast Asian countries, except Vietnam, where less inequity exists than elsewhere in the region. In Vietnam even among the poorest group, over 50 percent of women had their last birth in a health facility. In all four counties in the North Africa/West Asia/Europe region, the use of health facilities ranges between 80 and 100 percent for the two richest groups, and over 90 percent for the richest group alone, while only in Egypt and Morocco is it below 50 percent for the poorest group.

Table 12. Percentage of women whose most recent live birth in the five years preceding the survey occurred in a health facility by selected characteristics, the most recent survey, 1990-2009

	Age at birth			Birth order				Residence		Education				Wealth status (quintile)				
Country/Year	<20	20 -34	35 -49	1	2	3	4 or more	Urban	Rural	None	Pri-mary	Secon-dary	High -er	Low-est	Se-cond	Mid-dle	Four -th	High -est
Sub-Saharan Africa																		
Benin 2006	77.9	81.6	76.6	88.7	84.1	83.4	75.1	87.7	76.4	75.0	93.9	98.7	97.0	59.1	72.7	82.1	92.8	97.9
Burkina Faso 2003	44.4	41.0	36.1	53.2	43.0	42.0	34.8	88.8	32.5	34.8	70.9	94.6	*	19.1	26.8	34.0	46.1	86.2
Cameroon 2004	61.7	62.5	58.7	75.1	68.0	59.8	53.1	82.8	43.8	22.3	68.2	89.4	95.4	28.7	44.1	69.5	85.9	92.1
Chad 2004	16.4	12.6	12.2	22.0	13.3	11.9	11.2	47.1	5.4	8.5	22.6	54.6	*	1.4	5.6	7.0	10.8	44.7
Ethiopia 2005	8.0	6.8	3.8	16.0	9.8	5.7	2.8	45.8	2.6	2.6	10.0	50.9	80.6	0.7	1.3	1.9	4.5	28.4
Ghana 2008	56.5	62.3	54.6	71.7	66.5	61.4	50.0	83.4	44.6	37.6	56.7	76.5	*	23.6	51.6	64.9	81.4	92.2
Guinea 2005	36.7	31.9	27.3	43.3	32.3	32.4	28.0	64.4	21.5	27.1	52.3	71.0	*	12.0	17.7	26.9	46.0	68.7
Kenya 2008	52.9	47.3	37.1	66.3	53.0	49.4	32.0	75.8	39.2	17.2	40.8	69.6	89.4	18.9	32.3	45.2	55.1	80.9
Madagascar 2008-09	35.6	38.4	37.1	46.6	39.7	41.5	31.0	62.8	34.1	17.9	36.7	59.0	87.1	18.4	25.2	37.7	49.3	67.8
Malawi 2004	70.7	70.8	63.3	77.5	71.7	68.3	65.6	87.8	66.7	55.2	71.7	89.7	*	56.9	63.0	66.1	75.9	89.9
Mali 2006	51.6	47.5	42.9	58.1	49.1	49.3	43.3	79.8	34.5	41.6	73.4	90.0	(86.5)	31.6	34.2	35.4	53.4	84.8
Mozambique 2003	57.0	49.2	44.8	62.7	54.8	46.9	43.9	82.0	35.7	32.1	61.6	95.4	*	25.2	34.1	44.4	70.3	90.0
Namibia 2006-07	83.3	83.6	75.3	90.3	84.6	83.3	69.9	93.6	73.4	49.4	72.7	90.8	99.6	59.6	74.6	86.4	93.5	97.0
Niger 2006	18.4	17.9	18.9	27.8	20.7	19.4	15.0	71.6	8.4	13.2	40.0	81.0	*	4.4	7.0	9.1	13.5	60.5
Nigeria 2008	23.5	39.6	34.8	46.5	42.1	41.2	29.9	61.4	25.8	10.7	40.5	66.3	90.1	7.7	16.5	34.5	57.7	80.4
Rwanda 2007	65.5	52.7	37.0	74.8	54.7	48.4	38.0	68.1	46.4	35.1	51.4	80.1	(91.59)	40.4	44.6	47.3	48.9	69.2
Senegal 2005	64.3	65.3	59.8	79.4	68.2	61.8	56.6	88.6	48.6	54.7	83.0	94.6	*	30.5	44.8	71.0	89.3	94.1
Tanzania 2004-05	55.1	51.1	41.0	67.3	54.0	53.5	39.2	82.8	41.0	32.8	53.9	81.7	99.4	31.7	38.4	42.3	56.1	87.2
Uganda 2006	54.3	45.9	34.8	65.2	50.7	47.2	37.8	82.0	39.8	27.9	42.9	77.2	87.8	29.8	34.7	37.4	50.8	78.6
Zambia 2007	59.7	51.6	36.8	69.0	58.3	48.5	41.3	84.9	34.0	26.3	44.8	73.1	99.0	29.3	30.2	38.1	73.4	92.9
Zimbabwe 2005-06	69.1	71.2	58.1	79.7	73.7	67.8	55.0	93.4	58.6	36.0	52.2	80.9	99.1	46.0	55.8	71.2	84.3	95.0
North Africa/West Asia/Europe																		
Armenia 2005	98.9	97.6	95.2	100.0	98.4	95.9	82.8	99.7	93.9	na	100.0	96.8	100.0	88.4	98.7	100.0	99.6	100.0
Egypt 2007	73.0	72.1	73.6	83.4	74.7	70.9	58.6	86.0	64.0	52.6	65.5	78.4	92.5	46.2	61.3	74.4	84.6	94.6
Jordan 2007	98.4	98.9	98.7	99.6	99.3	98.3	98.7	98.9	98.5	95.1	96.7	98.8	99.7	97.5	98.6	99.5	99.4	99.9
Morocco 2003-04	69.7	63.2	62.7	83.3	68.1	62.7	46.9	83.9	40.2	49.6	76.3	91.5	98.2	29.6	49.6	70.3	83.9	93.7

(Cont'd)

Table 12. – cont'd

	Age at birth			Birth order				Residence		Education				Wealth status (quintile)				
Country/Year	<20	20 -34	35 -49	1	2	3	4 or more	Urban	Rural	None	Pri-mary	Secon-dary	High -er	Low-est	Se-cond	Mid-dle	Four -th	High -est
South/Southeast Asia																		
Bangladesh 2007	15.7	16.7	11.6	26.7	16.4	11.3	5.1	33.1	11.5	3.0	7.4	24.6	60.8	5.1	5.5	9.4	19.3	44.9
Cambodia 2005	23.7	24.4	18.8	33.9	26.3	22.0	14.2	53.6	18.2	10.7	20.5	47.2	(88.0)	7.1	11.1	15.2	27.0	68.0
India 2005-06	40.8	42.8	24.0	61.1	50.9	32.9	18.4	70.5	30.9	19.5	39.0	64.9	93.1	13.2	24.3	41.1	60.2	85.6
Indonesia 2007	37.9	48.7	47.6	56.0	48.9	43.5	33.3	71.0	30.4	15.7	29.9	58.7	84.4	14.1	32.4	48.6	62.7	83.6
Nepal 2006	24.1	19.3	11.6	36.5	20.4	11.3	7.3	51.6	14.6	8.5	19.5	41.7	79.9	5.0	9.3	11.7	23.3	57.1
Pakistan 2006-07	35.6	39.3	26.8	51.4	45.5	40.9	27.7	59.1	27.5	24.7	42.7	66.5	85.3	14.4	22.3	32.8	48.6	74.8
Philippines 2008	38.0	48.4	44.7	61.6	52.8	47.8	29.2	62.0	31.7	7.8	18.6	45.5	74.8	13.0	34.3	49.2	70.2	85.3
Vietnam 2002	67.0	80.2	83.8	86.7	80.8	71.0	56.0	99.1	75.1	38.8	69.8	86.4	100.0	50.5	78.3	86.6	93.4	98.7
Latin America/Caribbean																		
Bolivia 2008	75.5	74.1	59.3	84.7	80.7	74.3	54.0	89.1	48.0	37.3	58.5	87.7	99.0	32.9	62.6	81.5	92.9	99.0
Colombia 2005	92.6	92.1	90.3	97.0	94.0	92.8	78.2	97.5	78.1	71.0	83.8	96.2	99.3	73.0	94.0	97.6	99.1	99.2
Dominican Republic 2007	98.7	97.8	97.5	98.7	98.2	97.5	97.0	98.4	97.1	90.4	97.9	98.4	98.5	95.5	99.1	98.8	98.7	97.8
Haiti 2005-06	30.2	29.6	18.1	46.0	30.8	24.1	14.4	45.6	16.7	9.1	21.8	56.1	90.3	6.8	10.8	20.7	39.4	67.3
Peru 2008	82.5	81.4	76.5	90.3	84.0	79.6	64.4	93.7	57.8	49.1	61.3	89.2	97.9	41.7	64.3	85.7	96.6	97.5

Note: Figures in parentheses are based on 25-49 unweighted cases; an asterisk denotes a figure based on fewer than 25 unweighted cases that has been suppressed.

3.2.4 Attendance during Delivery

Table 13 presents information on skilled birth attendance for women's last birth in the five years preceding the survey. The proportion of births attended by skilled health personnel is one of the two key indicators of progress toward the reduction of maternal mortality, as part of Millennium Development Goal 5. In the DHS, women who had a live birth in the five years preceding the survey in a country were asked who assisted with the delivery.

Overall, the pattern of birth attendance for women at delivery is similar to their use of health facilities for births. Except for a few countries (Benin, Namibia, Zimbabwe and Vietnam), the use of skilled care for delivery is considerably lower in sub-Saharan Africa and South/Southeast Asia than in the other regions. In sub-Saharan Africa, only 8 of the 21 countries examined have skilled birth attendance rates higher than 50 percent. Within the region, the Southern African countries perform better, particularly Zimbabwe and Namibia, with rates of skilled birth attendance higher than 70 percent. In Western Africa, Cameroon (62 percent) and Benin (76 percent) had much higher percentages of skilled birth attendance than other countries in the sub-region. In all sub-Saharan countries, the predominant type of skilled provider is a nurse/midwife.

In the South/Southeast Asian region, the use of skilled attendants at birth is lower in South Asia than Southeast Asia. The lowest rates are in Bangladesh (19 percent) and Nepal (21 percent). The highest rates are in the Philippines (65 percent) and Vietnam (78 percent). Within South Asia, the highest rates are in India (49 percent) and Pakistan (42 percent). In all countries in the region except Indonesia and Cambodia, doctors constitute the major portion of skilled delivery assistance, although, especially in India, there are large disparities within country (data not shown).

Although skilled birth attendants typically provide delivery care in institutional facilities, this is not always the case. In Egypt, for example, 28 percent of women deliver at home (see Table 11), while about 28 percent of home births had a skilled attendant at birth (data not shown). In Indonesia as well, where home births account for 52 percent of deliveries, 28 percent of home births had a skilled attendant. Madagascar is another example, where 16 percent of the 62 percent of women who delivered at home had a skilled birth attendant.

Outside sub-Saharan Africa, in most countries doctors are the main providers of skilled birth assistance, and especially In North Africa/West Asia/Europe, except for Morocco, where nurses/midwives outnumber doctors as skilled providers of delivery assistance. The Latin American and the Caribbean countries follow the pattern of high levels of health facility use for deliveries, alongside very high levels of skilled birth attendance, except for Haiti. Doctors play a key role in deliveries in Bolivia, Colombia and the Dominican Republic, and to a smaller extent in Peru.

Among births delivered without skilled birth attendance, traditional birth attendants form the major group in most countries. Some exceptions are Chad, Ethiopia and Senegal in sub-Saharan Africa, and Nepal in South Asia, where relatives and other individuals are also important in providing birth assistance.

In several sub-Saharan African countries, over 10 percent of women reported not receiving any assistance for their last birth. The lack of assistance during delivery reaches nearly 20 percent in Niger and Nigeria, and 13 percent in Mali and Rwanda.

Table 13. Percent distribution of women who had a live birth in the five years preceding the survey by provider of assistance at birth for the most recent live birth, the most recent DHS survey, 1990-2009

	Person providing assistance during delivery									
Country/Year	Doctor	Nurse/ Midwife	Other health personnel	Traditional birth attendant	Relative/ Other	No one	Missing/ Don't know	Total	Percentage of women who had a skilled birth attendant	Total number of women with a live birth in the 5 years preceding the survey
Sub-Saharan Africa										
Benin 2006	6.0	70.2	3.9	4.8	10.8	4.0	0.2	100.0	76.2	10,521
Burkina Faso 2003	1.7	38.0	0.0	32.5	21.9	6.0	0.0	100.0	39.7	7,428
Cameroon 2004	9.0	52.9	2.7	11.0	19.0	5.3	0.1	100.0	61.9	5,303
Chad 2004	0.8	1.8	11.9	34.0	47.6	3.9	0.0	100.0	2.6	3,720
Ghana 2008	11.5	46.3	3.9	27.5	8.0	2.8	0.0	100.0	57.8	2,096
Guinea 2005	5.3	25.2	9.3	22.5	28.1	9.5	0.2	100.0	30.5	4,447
Kenya 2008	18.0	30.0	0.6	24.3	20.7	6.4	0.0	100.0	48.0	3,972
Madagascar 2008-09	15.7	31.5	0.0	46.1	5.9	0.8	0.0	100.0	47.2	8,651
Malawi 2004	6.3	50.5	1.0	25.1	14.4	2.6	0.1	100.0	56.8	7,272
Mali 2006	1.7	27.1	0.0	44.3	13.6	12.9	0.3	100.0	28.8	9,087
Mozambique 2003	3.5	46.7	0.0	10.7	36.0	3.0	0.2	100.0	50.2	7,179
Namibia 2006-07	19.5	63.2	0.0	5.8	10.7	0.7	0.1	100.0	82.7	3,898
Niger 2006	0.5	18.2	0.0	63.6	0.1	17.6	0.0	100.0	18.7	6,273
Nigeria 2008	9.9	26.2	4.8	21.4	18.7	19.1	0.0	100.0	36.1	17,537
Rwanda 2007	6.8	43.9	6.1	1.4	29.0	12.8	0.0	100.0	50.7	3,617
Senegal 2005	4.1	43.1	7.4	6.9	34.1	4.2	0.2	100.0	47.2	6,928
Tanzania 2004-05	4.6	40.9	4.0	18.1	29.1	3.1	0.2	100.0	45.5	5,772
Uganda 2006	5.4	39.8	0.7	21.8	23.2	9.1	0.0	100.0	45.2	5,035
Zambia 2007	3.9	44.1	1.1	22.6	23.3	4.9	0.0	100.0	48.0	4,136
Zimbabwe 2005-06	10.0	60.1	0.0	26.0	1.6	2.1	0.2	100.0	70.1	4,100
North Africa/West Asia/Europe										
Armenia 2005	94.3	4.1	0.7	0.0	0.4	0.0	0.5	100.0	98.4	1,176
Egypt 2007	75.4	4.5	0.0	18.9	0.7	0.5	0.0	100.0	79.9	7,891
Jordan 2007	74.4	24.8	0.0	0.0	0.5	0.3	0.0	100.0	99.2	6,446
Morocco 2003-04	16.9	48.6	0.0	19.3	14.0	1.0	0.2	100.0	65.5	4,695

(Cont'd)

Table 13. – cont'd

Country/Year	Person providing assistance during delivery: Doctor	Nurse/ Midwife	Other health personnel	Traditional birth attendant	Relative/ Other	No one	Missing/ Don't know	Total	Percentage of women who had a skilled birth attendant	Total number of women with a live birth in the 5 years preceding the survey
South/Southeast Asia										
Bangladesh 2007	14.0	4.9	0.7	72.1	6.2	2.2	0.0	100.0	18.9	4,902
Cambodia 2005	7.4	39.0	0.0	52.7	0.6	0.3	0.0	100.0	46.4	5,865
India 2005-06	38.1	10.5	1.2	34.5	15.2	0.5	0.1	100.0	48.6	39,677
Indonesia 2007	14.0	43.7	16.5	23.4	2.0	0.4	0.0	100.0	57.7	14,043
Nepal 2006	11.7	8.9	4.0	19.1	49.9	6.4	0.0	100.0	20.6	4,066
Pakistan 2006-07	35.8	5.9	0.0	49.3	7.7	0.8	0.6	100.0	41.7	5,677
Philippines 2008	37.5	27.9	0.0	33.5	1.0	0.2	0.0	100.0	65.4	4,587
Vietnam 2002	50.3	27.5	8.0	5.4	8.7	0.1	0.0	100.0	77.8	1,215
Latin America/Caribbean										
Bolivia 2008	69.9	3.8	1.3	3.6	20.5	0.9	0.0	100.0	73.7	6,469
Colombia 2005	89.5	2.7	0.4	4.5	2.6	0.3	0.0	100.0	92.2	11,084
Dominican Republic 2007	97.9	0.6	0.0	0.5	0.4	0.0	0.6	100.0	98.5	8,203
Haiti 2005-06	17.8	9.8	1.5	62.9	4.7	3.4	0.0	100.0	27.6	4,074
Peru 2008	50.8	32.3	0.5	8.2	7.8	0.4	0.0	100.0	83.0	4,920

Note: Ethiopia is excluded as doctors and nurses were not distinguished from other health professionals in the survey.

3.2.5 Trends in Use of Skilled Birth Attendants

Figures 16-20 show trends in skilled birth attendance for the countries studied, by region. In almost all countries in Western and Central Africa (Figure 16), use of skilled birth attendants increased over the survey period, although the increases are small. Ghana and Benin show the steepest increase in the region. Chad has the lowest rate and there appears to be a decline in the use of skilled birth attendants between the surveys in 1996-97 and 2004.

Among the Eastern and Southern African countries (Figure 17), in Uganda use of skilled birth attendants decreased from 34 percent in 1995 to 20 percent in 2000-01, but then rose sharply to 45 percent in 2006, mainly because of the large role played by nurses and midwives in recent years. Steep rises in skilled birth attendance occurred in Rwanda between 1992 and 2007, from 25 to 50 percent, and in Namibia, from 70 to 83 percent between 1992 and 2006-07. In Madagascar, however, use of skilled birth attendants has declined since 1992.

Improvements in skilled birth attendance were seen in all countries in South/Southeast Asia (Figure 18). Vietnam showed the steepest increase, from 57 percent in 1997 to 78 percent in 2002, followed by Cambodia, from 34 percent in 2000 to 46 percent in 2005. Elsewhere in the region, Pakistan had a steady increase in use of skilled birth attendants, from 17 percent in 1990-91 to 42 percent in 2006-07.

All four of the North African/West Asian/European countries saw an increase in use of skilled birth attendants (Figure 19). The two countries with the highest initial levels, Jordan and Armenia, showed a very small increase, while Morocco and Egypt, which had low levels in the early 1990s, increased substantially.

The countries studied in Latin America and the Caribbean (Figure 20) follow a pattern similar to North Africa/West Asia/Europe. Increases in the Dominican Republic and Colombia have been small, partly because the levels were already quite high, while Peru and Bolivia show larger increases. Haiti, which has a much lower rate of skilled birth attendance than the other four countries, also displays an increase, but at a much slower rate.

Figure 16. Trends in percentage of women whose most recent live birth was attended by a skilled health provider in Western and Central Africa, 1990-2009

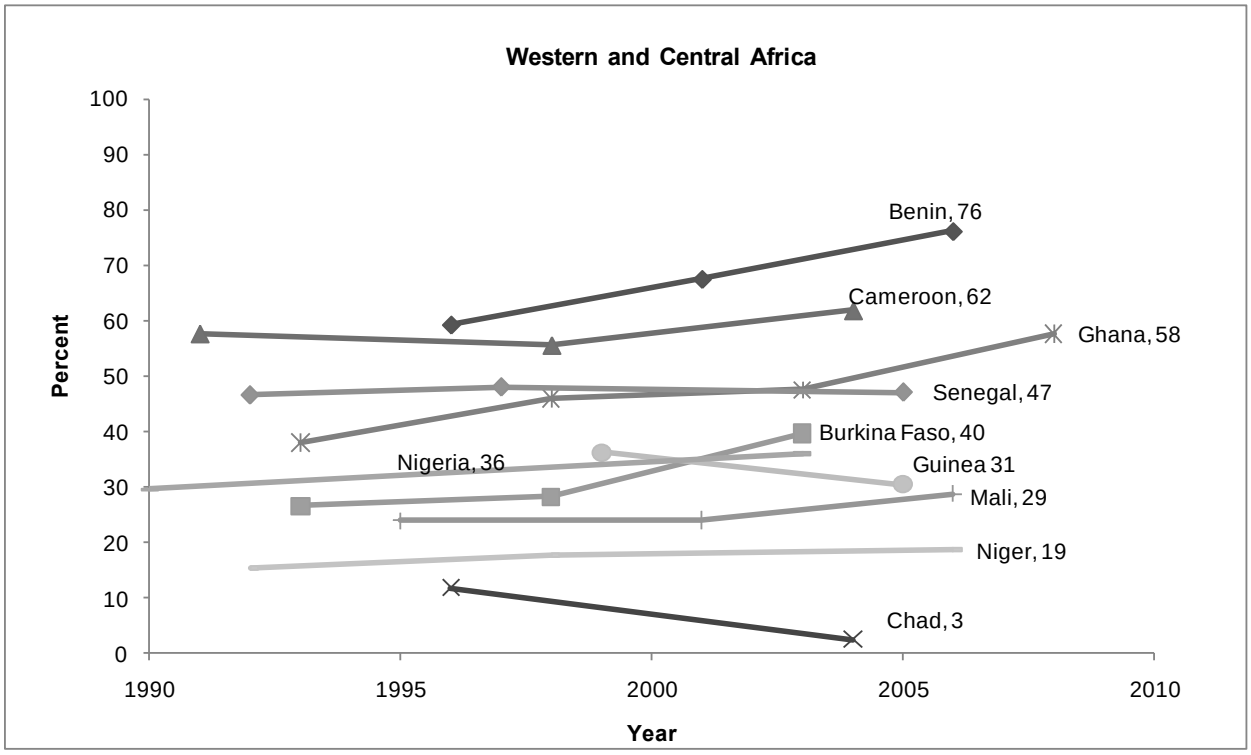
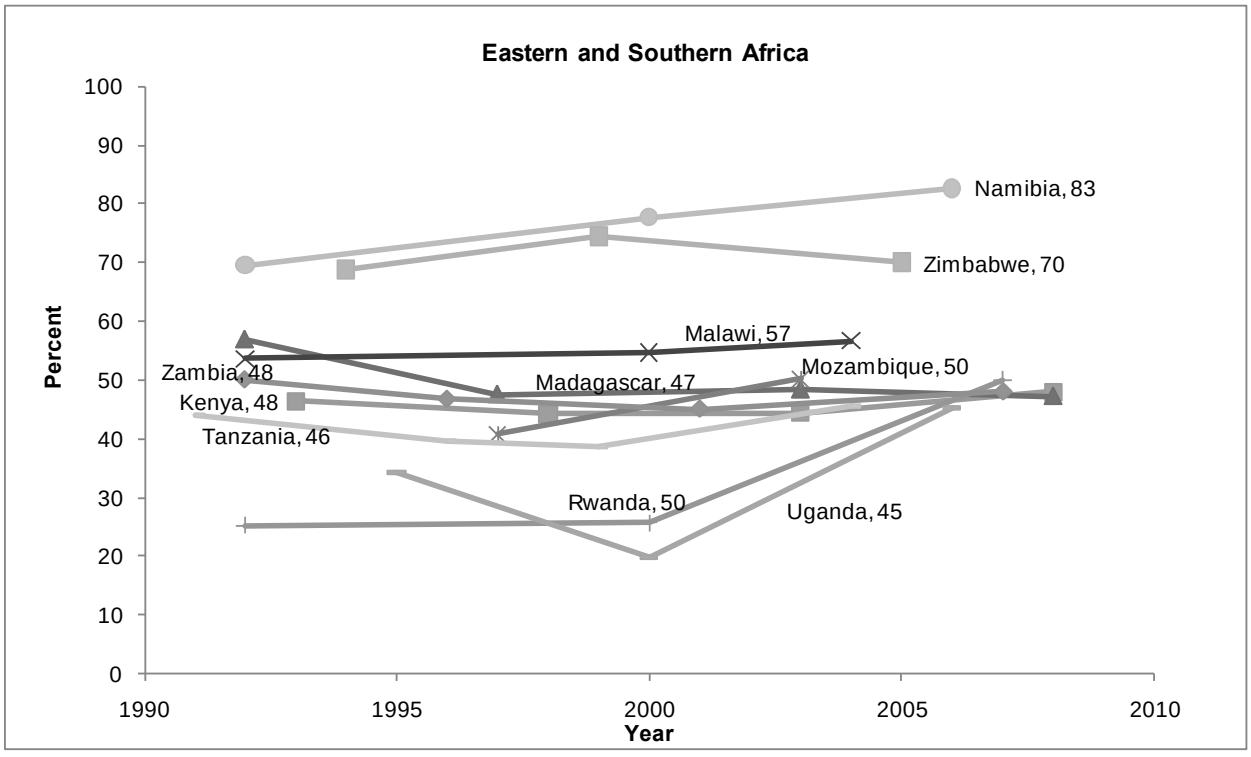


Figure 17. Trends in percentage of women whose most recent live birth was attended by a skilled health provider in Eastern and Southern Africa, 1990-2009



Note: Ethiopia is excluded as doctors and nurses were not distinguished from other health professionals in the survey

Figure 18. Trends in percentage of women whose most recent live birth was attended by a skilled health provider in South/Southeast Asia, 1990-2009

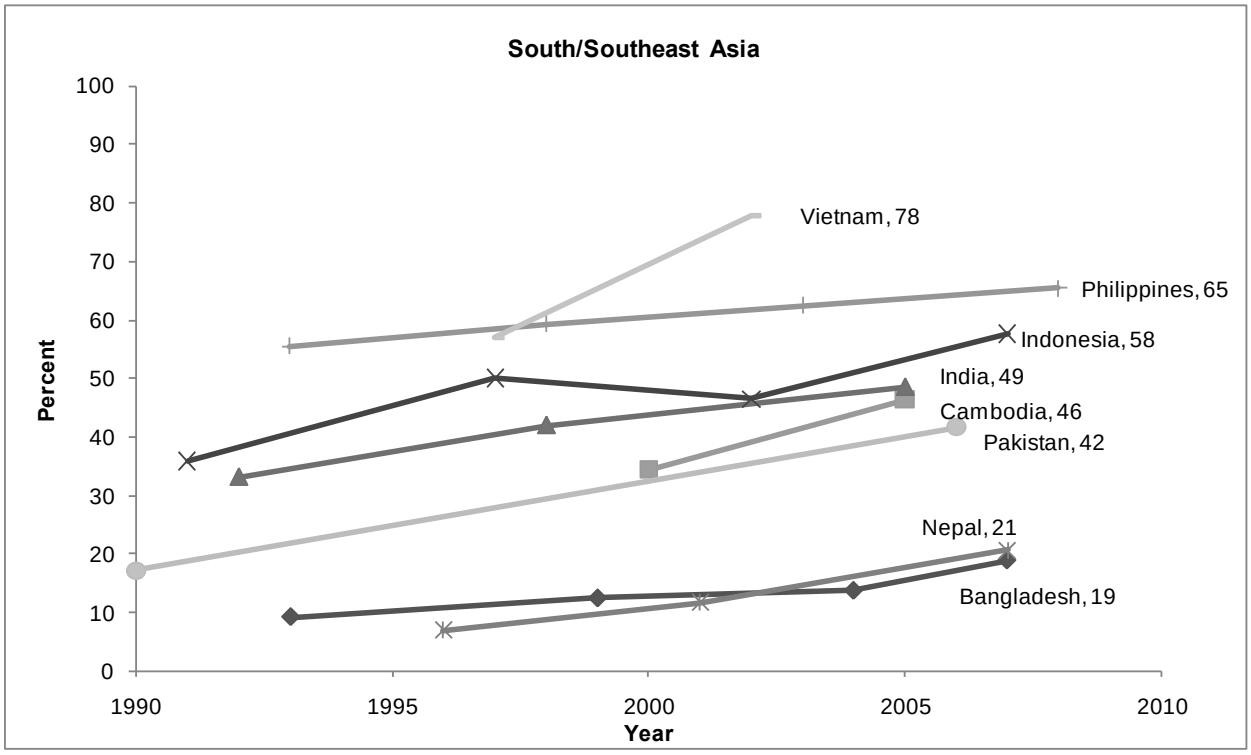


Figure 19. Trends in percentage of women whose most recent live birth was attended by a skilled health provider in North Africa/West Asia/Europe, 1990-2009

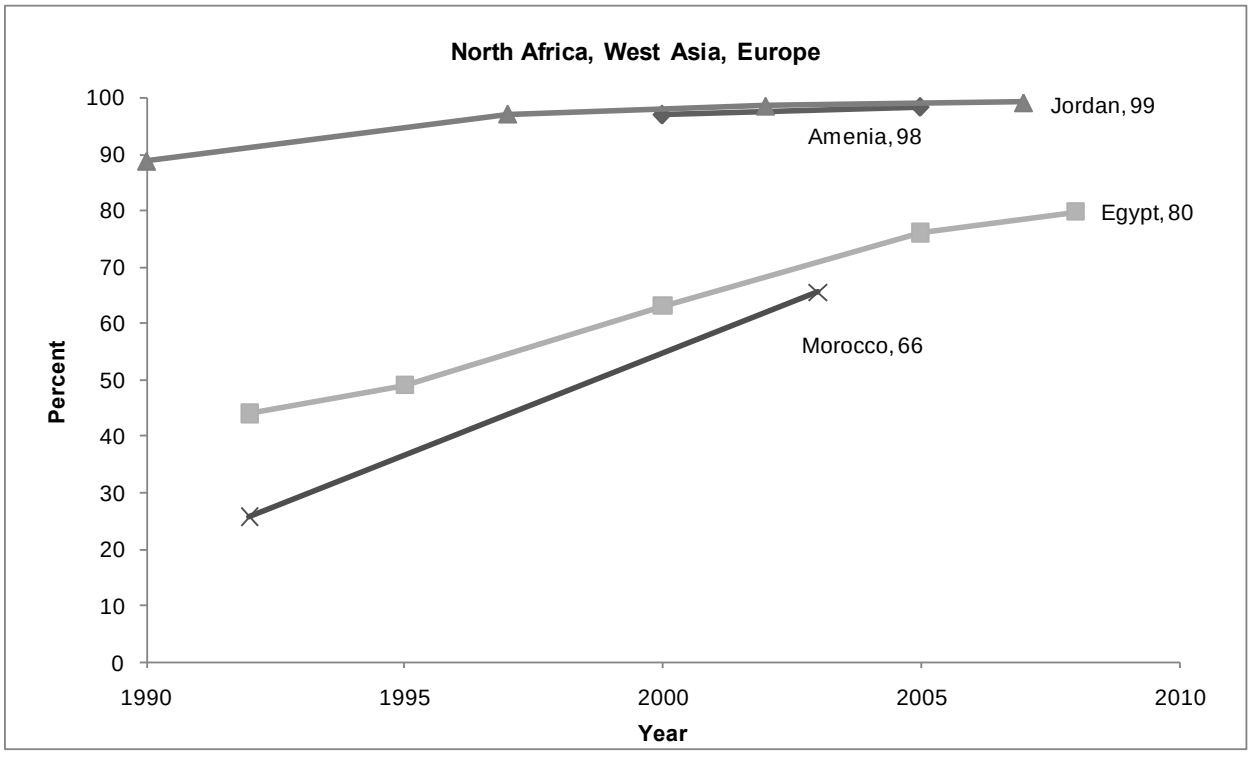
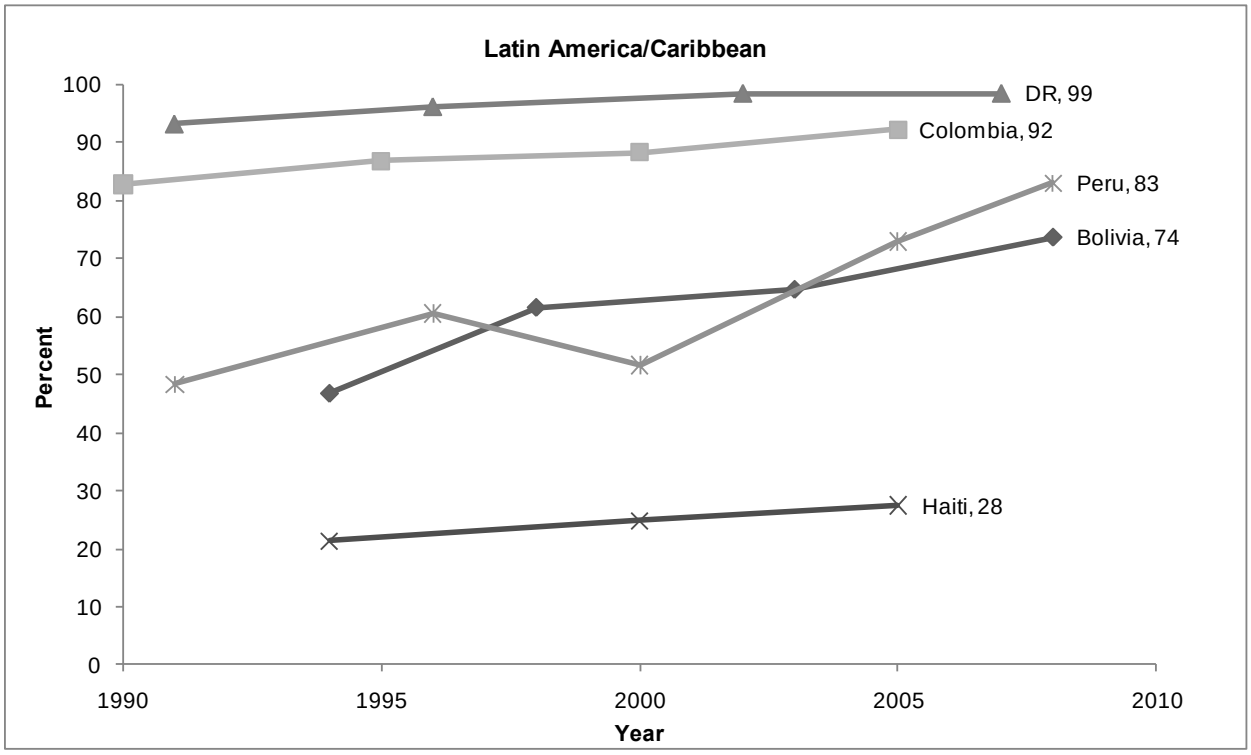


Figure 20. Trends in percentage of women whose most recent live birth was attended by a skilled health provider in Latin America and the Caribbean, 1990-2009



3.2.6 Differentials in Use of Skilled Birth Attendants

Mother's age at birth

Table 14 presents the characteristics of women whose last birth was attended by a skilled health provider. In a majority of countries, there is a negative relationship between mother's age at last birth and use of a skilled attendant. Typically, younger women are more likely to use skilled birth attendants. This inverse relationship is strongest between women age 20-34 and women age 35-49, at greater than 10 percentage points in several sub-Saharan African countries (Kenya, Rwanda, Uganda, Zambia and Zimbabwe), and in India (over 20 percentage points), Pakistan, Bolivia and Haiti.

In a substantial number of countries, however, a non-linear relationship is observed, although the differences are small. In these countries women age 20-34 are most likely to use skilled birth attendants. Among countries following this pattern, the difference in use of skilled birth attendants between women under age 20 and women age 20-34 is largest in Nigeria (16 percentage points), Indonesia (14 percentage points).

Birth order

In all countries, higher levels of use of skilled attendants are associated with lower birth order. In most sub-Saharan African countries, women with one child (birth order 1) are substantially more likely to use a skilled health provider for their last delivery than women with four or more children. In several sub-Saharan African countries with skilled birth attendance rates over 60 percent for women with one child,

the decline in skilled birth assistance between birth order 1 and birth orders 4 or more is 30-50 percentage points (Rwanda, Tanzania and Zambia).

This pattern is also evident in South/Southeast Asia. In India, for example, the rate of skilled attendance decreases from 68 percent for birth order 1 to 25 percent for birth orders 4 or more. The pattern is also evident in countries with low levels of skilled birth attendance, such as Bangladesh and Nepal in South/Southeast Asia and Haiti in the Caribbean.

In most countries of Latin America and the Caribbean and North Africa/West Asia/Europe, the use of skilled birth attendants is relatively widespread, and in these countries use of skilled birth attendants also decreases as birth order increases.

Urban/rural residence

Women in urban areas use skilled birth attendants to a much greater extent than women in rural areas. In over half of sub-Saharan African countries and in several countries in South/Southeast Asia, the use of skilled birth attendants among urban women is double that of rural women. Only in two countries—Chad and Bangladesh—do less than half of urban women use skilled birth attendants. In Namibia and Vietnam, use of skilled birth care is over 90 percent in urban areas and is almost 75 percent in rural areas. However, in many countries in these two regions, less than 25 percent of rural women receive skilled assistance. In North Africa/West Asia/Europe and Latin America and the Caribbean, differences between urban and rural areas in skilled attendance at delivery are minimal, except in Haiti and Morocco, where they are significant, for example, in Morocco at 86 percent of urban women compared with 42 percent of rural women.

Women's education

Mother's education is consistently positively related to the use of skilled birth attendants at delivery. Skilled birth attendance among the most educated women is high. Chad and Bangladesh are the few countries where less than 80 percent of women with the highest education level had a skilled birth attendant at last delivery. In a majority of countries, outside of South/Southeast Asia, this percentage is well over 90 percent. As mentioned, in many countries studied very few women have more than a secondary education.

Although the use of skilled birth attendants increases with education, there is large variation across countries among women at the same education level. For example, in Benin over 70 percent of women with no education had skilled attendance at their last birth, while this percentage rises among women who have primary and secondary levels of education. In most other countries in the region, skilled birth care among women with no education ranges between 20 and 40 percent. Other countries with high levels of skilled birth assistance among uneducated women or women with primary only education are Armenia, Jordan and the Dominican Republic.

Household wealth

A strong positive relationship is evident between household wealth status and use of skilled birth care at delivery. The greatest inequality in use of skilled birth care is in South Asia. Very low levels of care (below 10 percent) are observed among women in the poorest wealth quintile in Bangladesh and Nepal, with India and Pakistan performing only slightly better (18-19 percent). Such low levels of care among the poorest group are also observed in sub-Saharan Africa, in Burkina Faso, Chad, Guinea, Mali, Niger, Nigeria and Senegal. However, several countries in sub-Saharan Africa –Namibia, Benin, Zimbabwe, Malawi and Rwanda—and Vietnam in Southeast Asia are reasonably good performers even

among women in the poorest wealth quintile. In these countries, over 40 percent of women in the poorest group use skilled birth care.

The use of the skilled birth care is highest among the wealthiest group in almost all of the countries studied. In sub-Saharan Africa, over 90 percent of women in the highest wealth quintile in Benin, Cameroon, Ghana, Madagascar, Namibia, Zambia and Zimbabwe received skilled birth assistance for their last birth. Skilled birth attendance is high among the wealthiest group in some South/Southeast countries as well. In Cambodia, India, the Philippines and Vietnam, more than 90 percent of women in the wealthiest group reporting having a skilled birth attendant.

In North Africa/West Asia/Europe and Latin America and the Caribbean, over 95 percent of women in the highest wealth quintile had a skilled birth attendant at delivery, in all countries except Haiti. These high percentages prevail even among the poorest group in Armenia, Jordan and the Dominican Republic.

Table 14. Percentage of women who had a skilled birth attendant at birth for the most recent birth in the five years preceding the survey by selected characteristics, the most recent survey 1990-2009

	Age at birth			Birth order				Residence		Education				Wealth status (quintile)				
Country/Year	<20	20 -34	35 -49	1	2	3	4 or more	Urban	Rural	None	Pri-mary	Secon-dary	Higher	Low-est	Se-cond	Mid-dle	Four-th	High-est
Sub-Saharan Africa																		
Benin 2006	72.1	77.4	73.5	83.6	80.4	79.0	71.0	85.8	70.9	70.4	90.1	96.2	98.1	54.1	68.5	76.7	88.4	96.1
Burkina Faso 2003	44.0	40.3	34.9	52.5	43.1	41.2	33.7	89.1	31.5	34.0	69.9	93.6	*	18.0	25.8	32.9	45.8	85.8
Cameroon 2004	62.1	62.7	58.1	75.8	67.5	59.8	53.1	83.6	43.4	22.6	67.7	90.1	98.2	28.3	43.3	70.2	85.4	93.9
Chad 2004	4.2	2.3	2.2	5.7	3.2	2.4	1.7	10.0	0.9	1.6	4.0	14.5	*	0.0	0.7	2.0	2.0	9.1
Ghana 2008	52.7	60.0	51.9	68.6	63.8	57.7	48.4	82.2	41.1	35.2	52.2	74.7	*	21.7	44.8	63.5	79.4	93.0
Guinea 2005	34.8	31.5	23.5	42.7	35.7	29.3	25.5	80.1	14.7	25.2	54.7	70.9	*	8.3	13.5	19.8	41.6	85.4
Kenya 2008	54.0	48.6	38.3	67.5	53.6	50.3	33.6	75.8	40.7	22.0	41.4	70.3	91.9	21.4	33.5	45.4	56.7	81.3
Madagascar 2008-09	44.1	48.6	45.3	57.8	51.5	52.5	38.1	83.8	42.0	23.4	44.6	77.3	97.0	23.0	29.2	44.2	62.4	91.1
Malawi 2004	58.0	57.6	50.9	65.3	59.6	54.1	52.2	83.9	52.2	40.8	57.9	83.5	*	44.1	46.6	50.3	62.3	84.9
Mali 2006	30.5	30.1	22.5	38.2	32.0	32.6	24.2	69.2	12.7	22.7	52.6	78.9	(91.3)	8.9	13.4	16.2	32.0	76.4
Mozambique 2003	56.4	49.4	45.1	62.0	55.5	46.7	44.2	81.9	35.8	32.5	61.4	95.2	*	24.9	34.6	44.9	70.7	89.3
Namibia 2006-07	83.6	84.2	75.0	90.4	85.0	83.7	70.7	94.1	73.8	50.3	73.0	91.3	99.3	61.0	74.4	86.5	94.0	97.5
Niger 2006	18.7	18.4	19.7	28.5	20.7	19.4	15.7	72.6	8.8	13.7	40.6	82.0	*	4.6	7.9	9.1	13.8	61.6
Nigeria 2008	22.8	38.9	34.1	46.2	41.9	39.9	29.1	61.9	24.6	10.7	39.3	65.0	88.0	7.3	16.1	32.4	57.0	80.2
Rwanda 2007	64.4	53.1	38.1	75.4	55.1	48.8	38.6	68.8	46.9	35.4	52.0	80.5	(91.6)	41.0	44.9	47.9	49.5	70.0
Senegal 2005	45.8	48.3	44.1	61.6	51.4	46.7	39.4	82.1	25.0	35.9	69.0	85.4	*	14.4	22.4	45.1	77.4	88.3
Tanzania 2004-05	50.0	46.4	36.7	62.2	49.8	48.1	34.7	81.2	35.4	26.8	49.4	79.6	99.6	24.6	32.6	37.1	52.3	86.1
Uganda 2006	54.3	45.6	35.1	64.8	50.6	47.1	37.7	83.1	39.4	28.1	42.9	75.2	89.2	29.7	34.6	37.0	50.6	78.7
Zambia 2007	56.2	49.1	35.3	65.4	55.2	45.6	39.6	83.7	30.8	24.2	42.0	71.1	95.2	26.4	26.6	35.0	71.7	92.1
Zimbabwe 2005-06	69.8	71.7	59.3	80.2	74.2	68.3	55.9	93.9	59.2	36.0	52.7	81.7	99.1	46.4	56.5	71.5	85.3	95.6
North Africa/West Asia/Europe																		
Armenia 2005	100.0	98.3	97.2	99.5	99.2	98.5	87.5	99.6	96.4	na	97.9	99.9	98.4	92.9	99.2	100.0	99.2	100.0
Egypt 2007	79.3	79.8	80.5	89.2	81.7	78.8	68.1	90.7	73.2	61.3	75.6	85.7	96.1	56.7	70.4	83.7	90.7	96.9
Jordan 2007	97.7	99.3	99.2	99.3	99.5	99.0	99.1	99.3	98.7	95.4	97.1	99.3	99.6	98.4	99.0	99.2	100.0	100.0
Morocco 2003-04	71.6	65.1	64.7	84.9	69.9	65.4	48.7	86.0	41.8	51.5	77.9	93.7	99.4	30.7	51.6	73.0	85.9	95.5

(Cont'd)

Table 14. – cont'd

Country/Year	Age at birth			Birth order				Residence		Education				Wealth status (quintile)				
	<20	20 -34	35 -49	1	2	3	4 or more	Urban	Rural	None	Pri-mary	Secon-dary	Higher	Low-est	Se-cond	Mid-dle	Four-th	High-est
South/Southeast Asia																		
Bangladesh 2007	18.9	19.5	12.7	30.5	19.3	14.0	6.7	38.5	13.7	4.7	9.0	29.3	63.8	5.2	6.3	12.2	24.1	51.2
Cambodia 2005	47.8	47.8	41.0	57.0	52.2	46.9	35.0	74.0	41.9	24.0	44.9	80.8	(95.0)	21.6	30.6	42.4	64.3	91.0
India 2005-06	48.9	49.8	29.4	68.2	58.2	40.8	25.0	76.0	38.6	26.4	47.3	72.6	96.4	19.2	31.7	49.8	69.1	90.1
Indonesia 2007	45.8	59.3	57.7	63.3	59.3	56.9	45.6	80.1	41.5	22.6	39.7	69.8	93.0	25.4	44.4	58.3	74.5	89.9
Nepal 2006	25.1	20.5	12.3	38.0	21.6	12.8	7.9	54.3	15.5	8.9	21.0	44.1	84.5	5.7	10.3	12.1	24.5	59.8
Pakistan 2006-07	41.7	43.8	31.6	56.4	50.0	46.8	31.8	63.4	32.3	29.3	49.2	70.4	87.2	18.3	27.1	38.5	54.3	78.2
Philippines 2008	60.9	67.2	60.5	77.3	71.3	68.6	49.2	80.6	50.3	13.7	36.6	67.7	88.2	26.8	57.5	77.0	87.0	95.3
Vietnam 2002	66.1	78.5	82.4	84.4	78.0	71.4	58.8	97.5	73.4	39.1	68.9	84.1	100.0	51.6	72.6	84.3	91.6	99.1
Latin America/Caribbean																		
Bolivia 2008	77.9	75.7	62.3	86.5	82.1	76.7	56.4	89.3	52.3	39.9	61.6	88.9	98.4	38.2	66.8	81.8	93.0	98.2
Colombia 2005	93.3	92.0	91.1	97.3	94.2	92.4	78.5	97.5	78.9	71.2	84.3	96.2	99.2	74.1	94.2	97.3	98.9	99.4
Dominican Republic 2007	98.9	98.3	98.6	99.0	99.2	98.1	97.0	98.8	97.7	92.1	98.2	99.1	99.0	96.2	99.4	98.6	99.5	99.0
Haiti 2005-06	31.1	29.5	18.3	45.8	30.5	24.2	14.9	45.9	16.7	9.7	21.6	55.9	91.4	6.8	9.9	21.0	40.2	67.6
Peru 2008	84.6	83.7	79.3	92.1	85.1	84.2	67.2	95.2	61.6	52.6	64.9	91.5	98.4	45.8	68.2	88.1	97.3	98.7

Note: Figures in parentheses are based on 25-49 unweighted cases; an asterisk denotes a figure based on fewer than 25 unweighted cases that has been suppressed.

Ethiopia is excluded as doctors and nurses were not distinguished from other health professionals in the survey.

3.3 Postnatal Care

Postnatal care, especially within the first 48 hours after birth, is critical to the management of postpartum hemorrhage, an important cause of maternal deaths in developing countries. DHS surveys ask women whether they received a health checkup after the delivery of their most recent live birth, the timing of the checkup and the type of health provider performing the services. As might be expected, use of postnatal care, its timing and type of provider vary according to whether or not women delivered at a health facility. This section presents findings on the use of postnatal care by separating women who delivered in a health facility and women who delivered outside a health facility.

3.3.1 Current Use of Postnatal Care

The survey results (Table 15) show substantial differences in receiving postnatal care between women who delivered at a health facility and women who did not. Overall, at least two-thirds of women who delivered at a health facility reported postnatal checkups within 41 days after delivery. This is true in all countries except Uganda and Zimbabwe, where less than half of the women reported postnatal checkups. In contrast, women who delivered in non-institutional settings are much less likely to report receiving postnatal care within 41 days of delivery.

In South/Southeast Asia, in four countries (Bangladesh, India, Nepal and Pakistan), only 15-28 percent of women who did not give the birth at a health facility received postnatal care. Cambodia and the Philippines are exceptions, with a high proportion of women who did not give the birth at a health facility reporting postnatal care (up to 88 percent in the Philippines), although these figures do not provide information on the content and providers of services.

In sub-Saharan Africa, very low proportions of women who did not deliver at a health facility had a postnatal checkup, except in Ghana and Madagascar, where little over half of such women had a postnatal checkup during this period.

In three of the four Latin America and the Caribbean countries studied (Bolivia, the Dominican Republic and Peru), although more than half of women who did not deliver at a health facility reported postnatal checkups, women who delivered at a health facility were far more likely to report postnatal checkups, at 90 percent or more.

Combining women who delivered in a health facility and those who did not, in 8 of the 18 countries with data, 64-92 percent of women reported a postnatal checkup within 41 days after delivery. The level of postnatal service use is low in most of countries studied in South/Southeast Asia and sub-Saharan Africa.

Table 15. Among women with a live birth in the five years preceding the survey, the percentage who received postnatal checkups (PNC) for the most recent birth according to place of delivery, the most recent survey, 1990-2009

	Women who delivered in a health facility				Women who did NOT deliver in a health facility				All women			
Country/Year	No PNC	Received PNC within 41 days after delivery	Received PNC after 41 days/ Missing/ Don't know	Total number of women	No PNC	Received PNC within 41 days of delivery	Received PNC after 41 days/ Missing/ Don't know	Total number of women	No PNC	Received PNC within 41 days of delivery	Received PNC after 41 days/ Missing/ Don't know	Total number of women
Sub-Saharan Africa												
Ghana 2008	6.3	91.5	2.2	1,263	46.8	51.9	1.3	835	22.5	75.7	1.8	2,099
Kenya 2008	30.1	66.8	3.1	1,858	71.3	28.1	0.6	2,113	52.1	46.2	1.8	3,973
Madagascar 2008-09	9.4	85.8	4.8	3,256	47.4	50.7	1.8	5,394	33.2	63.9	2.9	8,662
Namibia 2006-07	14.1	79.2	6.7	3,207	56.0	42.1	1.9	684	21.6	72.5	5.9	3,898
Nigeria 2008	14.9	77.7	7.5	6,431	78.2	20.9	0.9	11,157	55.2	41.5	3.3	17,635
Uganda 2006	57.8	41.2	0.9	2,245	87.2	12.7	0.1	2,789	74.1	25.4	0.5	5,035
Zambia 2007	27.8	69.2	3.0	2,090	72.3	26.2	1.5	2,043	49.8	48.0	2.2	4,136
Zimbabwe 2005-06	34.7	46.7	18.7	2,849	67.6	25.1	7.3	1,244	44.8	40.0	15.2	4,100
South/Southeast Asia												
Bangladesh 2007	5.3	92.8	1.9	732	80.5	19.1	0.4	4,171	69.3	30.1	0.6	4,905
Cambodia 2005	9.0	89.4	1.6	1,358	36.5	62.9	0.6	4,507	30.1	69.1	0.9	5,865
India 2005-06	19.0	78.5	2.4	16,267	83.8	15.3	0.9	23,396	57.2	41.2	1.5	39,677
Nepal 2006	13.2	83.8	2.9	745	79.0	20.9	0.1	3,320	67.0	32.4	0.6	4,065
Pakistan 2006-07	31.7	65.6	2.7	2,101	71.5	28.3	0.2	3,548	56.9	42.0	1.1	5,677
Philippines 2008	5.8	93.3	1.0	2,145	11.4	88.0	0.6	2,442	8.8	90.4	0.8	4,590
Latin America/Caribbean												
Bolivia 2008	2.0	97.7	0.3	4,638	44.2	53.5	2.2	1,832	13.9	85.2	0.9	6,472
Dominican Republic 2007	8.3	89.5	2.3	8,036	34.2	63.1	2.7	132	9.1	88.7	2.3	8,203
Haiti 2005-06	22.1	75.3	2.6	991	78.0	21.5	0.5	3,080	64.4	34.6	1.0	4,074
Peru 2008	1.5	98.3	0.3	3,970	36.4	63.3	0.3	950	8.2	91.5	0.3	4,920

Note: The total number of women does not always equal the sum of the number of women who did and did not deliver in a health facility since information on place of delivery is missing for some births.

3.3.2 Timing of the First Postnatal Checkup

Tables 16a and 16b show the timing of the first postnatal checkup for women who received postnatal checkups within 41 days after delivery. The data show that the timing of the first postnatal checkup is very different between women who delivered at a health facility and women who delivered in other places. In all countries except Madagascar and Zimbabwe, over 90 percent of women who gave birth in a health facility received postnatal care within two days of delivery, and many of them (63-97 percent) reported having the first checkup within 24 hours after delivery.

Among women who delivered in a non-institutional setting, in most countries more than 70 percent reported receiving postnatal care within two days, except in Zambia (38 percent), Zimbabwe (42 percent), India (65 percent), Bolivia (52 percent) and Peru (65 percent). In many countries, although women who deliver at health facilities are more likely to report receiving postnatal care in the first 24 hours than those who delivered elsewhere, there is little difference between these two groups in reporting a postnatal checkup within one hour after delivery. This pattern is observed in Ghana, Kenya, Madagascar, Namibia, Uganda and all South/Southeast Asian countries except Bangladesh. While the current survey data cannot explain this finding, it is possible that some women who delivered at home may report checkups given by the birth attendants before they leave following the childbirth, which should be considered as intra-partum care, not postnatal care.

Table 16a. Percent distribution of women whose last live birth in the past five years occurred in a health facility and who received postnatal checkups (PNC) within 41 days after delivery, by timing of mother's first postnatal checkup, the most recent survey, 1990-2009

	Women who delivered in a health facility and received postnatal checkups within 41 days after delivery									
Country/Year	Within 1 hour	1-3 hours	4-23 hours	1-2 days	3-6 days	7-41 days	Total	Percentage who received PNC within 24 hrs after delivery	Percentage who received PNC within 2 days after delivery	Total number of women
Sub-Saharan Africa										
Ghana 2008	24.3	42.6	16.8	11.9	1.2	3.2	100.0	83.7	95.6	1,156
Kenya 2008	14.5	47.4	18.7	15.2	1.3	2.9	100.0	80.6	95.8	1,241
Madagascar 2008-09	13.5	17.1	11.4	28.1	11.5	18.4	100.0	42.0	70.1	2,793
Namibia 2006-07	8.1	39.7	15.7	27.5	2.5	6.6	100.0	63.5	91.0	2,539
Nigeria 2008	12.7	57.4	14.2	12.0	1.9	1.9	100.0	84.3	96.3	4,994
Uganda 2006	9.5	33.1	30.7	19.9	4.7	2.2	100.0	73.3	93.2	926
Zambia 2007	21.2	43.5	25.5	6.3	0.8	2.7	100.0	90.2	96.5	1,447
Zimbabwe 2005-06	19.4	18.6	25.2	20.2	2.9	13.7	100.0	63.2	83.4	1,330
South/Southeast Asia										
Bangladesh 2007	58.1	27.1	11.0	2.4	0.4	1.0	100.0	96.2	98.6	679
Cambodia 2005	4.3	53.0	19.0	21.8	1.2	0.8	100.0	76.3	98.1	1,378
India 2005-06	12.7	61.0	13.5	10.5	1.1	1.2	100.0	87.2	97.7	12,777
Nepal 2006	17.7	48.6	27.3	5.3	0.6	0.5	100.0	93.6	98.9	625
Pakistan 2006-07	22.2	45.8	18.0	9.4	2.1	2.4	100.0	86.0	95.4	1,378
Philippines 2008	8.5	43.0	23.0	17.6	2.6	5.2	100.0	74.5	92.1	2,001
Latin America/Caribbean										
Bolivia 2008	12.0	47.9	26.7	11.9	0.5	0.9	100.0	86.6	98.5	4,533
Dominican Republic 2007	7.1	48.4	19.1	18.3	2.6	4.6	100.0	74.6	92.9	7,190
Haiti 2005-06	10.5	47.9	17.8	21.1	2.4	0.3	100.0	76.2	97.3	747
Peru 2008	17.4	59.4	20.5	2.0	0.2	0.6	100.0	97.3	99.3	3,901

Table 16b. Percent distribution of women whose last live birth in the past five years occurred outside a health facility and who received postnatal checkups (PNC) within 41 days after delivery, by time of mother's first postnatal checkup, the most recent survey, 1990-2009

	Women who did not deliver in a health facility and received postnatal checkups within 41 days after delivery									
Country/Year	Within 1 hour	1-3 hours	4-23 hours	1-2 days	3-6 days	7-41 days	Total	Percentage who received PNC within 24 hrs after delivery	Percentage who received PNC within 2 days after delivery	Total number of women
Sub-Saharan Africa										
Ghana 2008	20.4	26.5	8.1	21.3	9.7	14.0	100.0	55.0	76.3	433
Kenya 2008	15.1	41.5	10.5	14.5	2.7	15.7	100.0	67.1	81.6	594
Madagascar 2008-09	14.0	15.7	8.7	36.6	12.4	12.6	100.0	38.4	75.0	2,736
Namibia 2006-07	8.7	33.4	7.5	29.4	8.1	12.9	100.0	49.6	79.0	288
Nigeria 2008	20.5	43.9	5.5	13.9	4.8	11.3	100.0	69.9	83.8	2,329
Uganda 2006	10.8	37.0	18.6	17.4	7.5	8.7	100.0	66.4	83.8	354
Zambia 2007	5.4	12.1	6.5	14.1	10.4	51.5	100.0	24.0	38.1	536
Zimbabwe 2005-06	6.3	7.4	6.9	21.7	18.3	39.4	100.0	20.6	42.3	313
South/Southeast Asia										
Bangladesh 2007	31.3	24.6	13.0	13.3	6.3	11.5	100.0	68.9	82.2	795
Cambodia 2005	5.9	36.1	14.0	34.2	8.6	1.3	100.1	56.0	90.2	1,004
India 2005-06	12.0	27.5	5.9	19.1	10.2	25.3	100.0	45.4	64.5	3,585
Nepal 2006	21.5	34.2	18.3	20.9	3.8	1.3	100.0	74.0	94.9	693
Pakistan 2006-07	28.7	28.1	9.3	25.8	4.5	3.5	100.0	66.1	91.9	1,004
Philippines 2008	10.3	28.7	10.4	29.0	11.5	10.1	100.0	49.4	78.4	2,150
Latin America/Caribbean										
Bolivia 2008	9.1	16.7	6.0	20.4	12.6	35.1	100.0	31.8	52.2	981
Dominican Republic 2007	12.6	28.2	10.4	20.5	10.1	18.3	100.0	51.2	71.7	84
Haiti 2005-06	4.3	23.5	6.8	37.4	17.2	10.8	100.0	34.6	72.0	661
Peru 2008	11.4	26.2	13.4	14.2	6.2	28.5	100.0	51.0	65.2	601

3.3.3 Provider of the First Postnatal Checkup

Tables 17a and 17b present information on the provider of the mother's first postnatal checkup, among women who received a postnatal checkup within 41 days after delivery. Almost all women who delivered at health facilities (Table 17a) received the first checkup from a doctor, nurse or midwife. In the majority of sub-Saharan African countries, women are more likely to report a nurse or midwife than a doctor. In the other two regions, however, in countries with data doctors are the main providers of postnatal care, except in Cambodia and Peru, where fewer women reported doctors than nurses or midwives.

In contrast, among women who delivered at home or places other than a health facility (Table 17b), in only a few countries do more than half receive postnatal care from a skilled health provider. These countries include Namibia, Zambia, Zimbabwe, India, Bolivia, the Dominican Republic and Peru. In Zimbabwe, among women who received postnatal care, 94 percent received a checkup from a skilled health provider. In other countries, the majority of women received postnatal care from non-skilled health providers (e.g. traditional birth attendants).

Combining institutional and non-institutional births, the overall use of skilled health providers for postnatal care is high (data not shown). In countries both in sub-Saharan Africa and Latin America and the Caribbean, more than two-thirds of women reported postnatal checkups from a skilled health provider. In South/Southeast Asia, this level is slightly lower except in India, at 91 percent, which is probably due to the much higher level of use of skilled health providers in India than elsewhere in this region, even among women who did not deliver at health facilities.

Table 17a. Percent distribution of women whose last live birth in the past five years occurred in a health facility and who received postnatal checkups (PNC) within 41 days after delivery, by type of provider at the first checkup, the most recent survey, 1990-2009

	Women who delivered in a health facility and received postnatal checkups within 41 days after delivery								
Country/Year	Doctor	Nurse/ Midwife	Other health personnel	Traditional birth attendant	Other	Missing/ Don't know	Total	Percentage who received PNC from a skilled health provider	Total number of women
Sub-Saharan Africa									
Ghana 2008	34.4	59.0	5.8	0.4	0.3	0.1	100.0	93.4	1,156
Kenya 2008	50.9	48.6	0.1	0.4	0.0	0.0	100.0	99.5	1,241
Madagascar 2008-09	39.4	60.0	0.1	0.4	0.0	0.1	100.0	99.4	2,793
Namibia 2006-07	47.9	51.7	0.0	0.0	0.0	0.3	100.0	99.6	2,539
Nigeria 2008	48.4	43.2	8.0	0.4	0.1	0.0	100.0	91.6	4,994
Uganda 2006	27.0	70.6	1.5	0.9	0.0	0.0	100.0	97.6	926
Zambia 2007	12.9	82.0	3.4	1.1	0.6	0.0	100.0	94.9	1,447
Zimbabwe 2005-06	26.0	73.9	0.0	0.0	0.0	0.1	100.0	99.9	1,330
South/Southeast Asia									
Bangladesh 2007	89.6	9.3	0.8	0.0	0.2	0.0	100.0	98.9	679
Cambodia 2005	29.7	69.8	0.0	0.5	0.0	0.0	100.0	99.5	1,378
India 2005-06	84.1	15.5	0.2	0.1	0.0	0.0	100.0	99.6	12,777
Nepal 2006	51.2	47.3	1.1	0.5	0.0	0.0	100.0	98.5	625
Pakistan 2006-07	86.4	10.5	0.5	2.5	0.0	0.0	100.0	96.9	1,378
Philippines 2008	75.6	23.6	0.0	0.8	0.0	0.0	100.0	99.2	2,001
Latin America/Caribbean									
Bolivia 2008	84.5	14.4	0.7	0.0	0.4	0.0	100.0	98.9	4,533
Dominican Republic 2007	87.7	11.8	0.0	0.0	0.2	0.2	100.0	99.5	7,190
Haiti 2005-06	58.5	39.3	2.1	0.0	0.0	0.0	100.0	97.8	747
Peru 2008	47.3	51.3	0.1	0.0	1.2	0.0	100.0	98.6	3,901

Table 17b. Percent distribution of women whose last live birth in the past five years occurred outside a health facility and who received postnatal checkups within 41 days after delivery, by type of provider at the first checkup, the most recent survey, 1990-2009

	Women who did not deliver in a health facility and received postnatal checkups within 41 days after delivery								
Country/year	Doctor	Nurse/ Midwife	Other health personnel	Traditional birth attendant	Other	Missing/ Don't know	Total	Percentage who received PNC from a skilled health provider	Total number of women
Sub-Saharan Africa									
Ghana 2008	2.3	23.6	7.8	55.0	11.3	0.0	100.0	25.9	433
Kenya 2008	13.6	17.6	1.7	66.1	1.0	0.0	100.0	31.2	594
Madagascar 2008-09	12.7	20.9	42.9	22.7	0.6	0.1	100.0	33.6	2,736
Namibia 2006-07	9.3	51.8	0.0	35.2	3.0	0.6	100.0	61.1	288
Nigeria 2008	7.3	27.2	10.8	53.8	0.5	0.4	100.0	34.5	2,329
Uganda 2006	4.7	26.7	1.0	65.8	1.2	0.6	100.0	31.4	354
Zambia 2007	0.6	60.7	8.3	29.3	1.1	0.0	100.0	61.3	536
Zimbabwe 2005-06	6.0	87.9	0.0	5.0	0.9	0.1	100.0	93.9	313
South/Southeast Asia									
Bangladesh 2007	0.1	29.7	13.9	2.7	4.2	49.4	100.0	29.8	795
Cambodia 2005	1.8	39.0	0.0	58.7	0.5	0.0	100.0	40.8	1,004
India 2005-06	27.0	31.6	6.9	34.2	0.3	0.0	100.0	58.6	3,585
Nepal 2006	5.6	11.3	17.4	64.1	1.6	0.0	100.0	16.9	693
Pakistan 2006-07	8.1	4.9	1.2	83.9	1.9	0.1	100.0	13.0	1,004
Philippines 2008	1.4	33.3	0.7	64.1	0.5	0.0	100.0	34.7	2,150
Latin America/Caribbean									
Bolivia 2008	50.0	27.4	21.2	0.0	1.4	0.0	100.0	77.4	981
Dominican Republic 2007	73.6	6.7	0.0	19.1	0.6	0.0	100.0	80.3	84
Haiti 2005-06	14.0	19.8	47.4	17.9	0.1	0.9	100.0	33.8	661
Peru 2008	17.9	68.2	2.4	5.5	5.7	0.2	100.0	86.1	601

3.3.4 Differentials in Use of Postnatal Care

Mother's age at birth

Tables 18a and 18b show percentages of women who received postnatal care for the most recent birth, by women's characteristics. In most countries in sub-Saharan Africa, the percentage of women who delivered at a health facility (Table 18a) and who reported postnatal care tends to increase as mother's age at birth increases; mothers under age 20 are least likely to report postnatal care. In South/Southeast Asia, Bangladesh and the Philippines show increasing use of postnatal care among mothers who are older at birth, while in the other four countries in the region use is greatest among women age 20-34. In the Latin America and the Caribbean region, differentials associated with age are not apparent, with women reporting similar levels of postnatal care across all age groups.

In contrast, the pattern of receiving postnatal care associated with mother's age at birth is unclear among women who did not deliver in health facilities (Table 18b). In 12 countries, however, women age 20-34 reported the highest levels of use of postnatal care.

Birth order

Receipt of postnatal care does not appear to be associated with birth order for institutional births, although a slightly lower level is seen for birth orders 4 or higher. For non-institutional births, higher births orders are generally less likely to receive postnatal care. In Nigeria, Bangladesh, Cambodia, Nepal and Haiti, a consistent pattern is observed—that is, as birth order increases, the proportion of women receiving postnatal checkups decreases.

Urban/rural residence

In most countries, for both institutional and non-institutional births, women in urban areas are more likely to report postnatal care than women in rural areas. The Philippines is an exception, where the opposite relationship is observed. In six countries, including Ghana, Bangladesh, Nepal, Bolivia, the Dominican Republic and Peru, among women who delivered at a health facility, women in rural areas reported about the same level of postnatal care as women in urban areas.

Women's education

In general, regardless of whether the delivery was in an institution or not, women with more education are more likely to report postnatal care, although in some countries the association starts from the secondary or higher levels of education. For non-institutional births, due to small number of cases, data for women with higher than secondary level education are suppressed in several countries.

Household wealth

Among women whose last birth was delivered at a health facility, a consistent association between wealth and postnatal care is observed in most countries—that is, women from richer households are more likely to report postnatal care. In contrast, among women who did not deliver at a health facility, the association between postnatal care and household wealth is consistent only in a few countries—Namibia, Nigeria, Zimbabwe and India, where a pattern of increasing use of postnatal care with wealth is observed. In the Philippines, Bolivia and Peru, the level of postnatal care is similar across wealth groups.

Table 18a. Percentage of women whose last live birth in the past five years occurred in a health facility and who received postnatal checkups within 41 days after delivery by selected characteristics, the most recent survey, 1990-2009

	Age at birth			Birth order				Residence		Education				Wealth status (quintile)				
Country/Year	<20	20-34	35-49	1	2	3	4 or more	Urban	Rural	None	Pri-mary	Secon-dary	Higher	Low-est	Se-cond	Mid-dle	Four-th	High-est
Sub-Saharan Africa																		
Ghana 2008	85.9	92.3	91.4	92.8	91.1	92.0	90.6	91.8	91.2	89.8	86.8	93.9	(95.2)	90.8	88.4	91.4	90.5	95.7
Kenya 2008	62.3	66.8	73.9	66.9	68.4	68.3	64.2	75.4	62.5	60.4	64.5	69.1	74.8	60.8	58.9	61.1	65.0	74.8
Madagascar 2008-09	84.8	86.4	84.6	85.6	87.1	85.1	85.5	89.5	84.8	82.9	85.0	87.3	93.8	79.3	86.3	84.5	86.1	88.6
Namibia 2006-07	77.4	79.2	81.0	78.0	80.6	83.5	76.0	81.9	76.5	72.4	73.6	81.3	86.1	71.0	73.1	79.3	82.7	85.3
Nigeria 2008	73.0	78.2	77.7	78.1	81.9	77.3	75.7	82.4	72.7	77.4	74.7	76.6	86.5	65.1	72.2	72.1	75.7	84.7
Uganda 2006	40.5	40.7	45.5	43.6	45.4	39.8	39.1	45.9	39.7	39.3	36.7	47.6	68.9	39.6	36.6	36.8	37.1	49.2
Zambia 2007	64.7	70.1	71.4	67.8	71.1	70.0	69.0	73.0	64.8	63.2	67.0	69.8	93.0	61.6	68.2	65.0	67.2	77.3
Zimbabwe 2005-06	43.3	46.5	55.6	44.5	45.9	47.9	50.1	57.1	39.1	20.8	13.8	28.7	26.0	33.4	39.7	42.3	47.3	62.1
South/Southeast Asia																		
Bangladesh 2007	91.5	93.2	(94.5)	93.2	92.7	93.0	90.4	92.9	92.7	(92.6)	86.2	93.2	95.9	(85.0)	(93.7)	87.0	92.3	95.2
Cambodia 2005	84.9	90.4	87.7	89.7	92.0	90.9	84.7	91.8	88.3	83.9	86.8	94.9	*	81.8	87.3	89.4	88.5	91.5
India 2005-06	73.8	79.9	70.3	79.1	82.2	76.2	68.7	82.6	75.2	68.8	74.1	81.1	89.6	65.1	71.6	75.0	78.9	86.1
Nepal 2006	82.1	85.5	(69.1)	83.0	88.7	78.2	79.5	83.4	84.1	81.8	76.4	86.1	92.6	(85.7)	79.0	86.8	76.9	86.9
Pakistan 2006-07	64.1	67.0	57.0	66.1	68.7	68.9	61.9	70.7	60.8	59.8	64.3	71.2	74.9	57.0	57.8	57.3	67.6	72.9
Philippines 2008	91.1	93.2	94.3	92.9	92.0	95.9	93.2	91.7	96.3	*	93.4	91.9	94.7	94.7	93.4	91.5	92.7	94.8
Latin America/Caribbean																		
Bolivia 2008	97.2	97.8	98.1	97.7	97.4	97.6	98.2	97.7	97.8	95.6	97.5	97.8	98.4	97.5	97.5	97.0	97.3	99.4
Dominican Republic 2007	87.5	89.9	90.8	89.9	90.5	89.6	87.3	89.7	89.0	84.8	86.9	90.3	93.8	85.6	89.0	88.3	94.8	91.0
Haiti 2005-06	75.6	74.4	79.7	75.2	75.5	78.2	73.9	77.3	71.9	63.8	72.6	77.9	87.4	(67.3)	66.5	71.8	74.9	79.4
Peru 2008	98.3	98.7	96.6	98.5	98.5	98.4	97.4	98.4	97.9	98.5	97.0	98.6	98.7	96.8	97.6	98.8	97.5	99.2

Note: Figures in parentheses are based on 25-49 unweighted cases; an asterisk denotes a figure based on fewer than 25 unweighted cases that has been suppressed.

Table 18b. Percentage of women whose last live birth in the past five years occurred outside a health facility and who received postnatal checkups within 41 days after delivery by selected characteristics, the most recent survey, 1990-2009

	Age at birth			Birth order				Residence		Education				Wealth status (quintile)				
Country/Year	<20	20-34	35-49	1	2	3	4 or more	Urban	Rural	None	Pri-mary	Secon-dary	Higher	Low-est	Se-cond	Mid-dle	Four -th	High -est
Sub-Saharan Africa																		
Ghana 2008	51.4	53.3	47.9	55.5	55.9	50.3	49.8	60.9	50.0	45.4	53.2	63.0	*	47.8	45.4	60.0	66.8	*
Kenya 2008	26.3	29.5	23.2	29.4	29.4	27.3	27.5	36.3	27.2	26.6	27.5	30.8	*	29.4	23.8	28.4	30.0	31.7
Madagascar 2008-09	49.9	51.2	49.9	52.8	54.5	49.7	48.8	64.1	49.7	41.4	52.9	62.6	*	42.9	48.2	52.4	60.5	65.2
Namibia 2006-07	30.1	46.6	36.6	38.9	47.1	46.5	39.3	53.7	40.0	27.7	43.9	53.0	*	30.0	44.2	56.3	70.8	*
Nigeria 2008	18.7	22.0	18.8	26.3	22.7	21.7	18.8	31.5	18.5	13.3	27.9	42.9	58.3	12.5	15.6	25.0	36.5	51.7
Uganda 2006	11.1	12.6	14.0	14.7	10.4	12.2	12.9	24.0	12.2	12.6	12.4	14.0	*	15.1	10.2	9.6	14.3	18.5
Zambia 2007	22.5	26.7	27.0	24.1	29.3	27.6	25.5	39.2	24.8	23.7	26.6	28.3	*	25.8	26.1	22.5	31.8	(49.4)
Zimbabwe 2005-06	20.1	25.2	31.3	21.0	21.5	27.2	28.3	32.9	24.6	35.0	23.0	26.0	*	20.4	24.7	31.5	31.5	(35.3)
South/Southeast Asia																		
Bangladesh 2007	19.2	19.6	13.1	24.6	19.8	17.9	13.4	23.9	18.0	11.5	16.6	25.5	47.5	11.5	16.1	18.9	26.5	28.3
Cambodia 2005	61.2	63.4	62.0	65.2	63.2	62.9	61.6	64.4	62.8	57.9	62.2	77.9	*	57.0	59.2	65.5	70.3	77.4
India 2005-06	14.7	15.8	11.1	18.0	19.2	16.3	11.2	20.9	14.4	11.9	17.3	24.2	37.1	11.9	12.9	18.9	20.4	28.2
Nepal 2006	23.4	21.3	13.4	23.1	21.9	20.3	18.9	22.9	20.7	20.1	15.8	26.4	(80.4)	9.2	20.0	27.3	26.8	30.9
Pakistan 2006-07	24.0	30.3	22.5	28.8	28.5	30.3	27.6	33.9	26.9	25.7	35.2	39.3	46.1	26.7	23.0	30.8	34.0	35.0
Philippines 2008	87.4	88.1	87.9	87.9	88.9	88.4	87.5	87.5	88.3	79.3	86.4	88.7	91.6	87.5	86.9	88.3	92.0	88.0
Latin America/Caribbean																		
Bolivia 2008	49.9	54.8	52.3	52.9	58.8	55.1	51.8	44.5	56.2	53.1	52.9	57.1	*	54.7	57.0	47.8	46.2	*
Dominican Republic 2007	(61.0)	61.7	(75.1)	79.4	(59.9)	(45.6)	(67.6)	69.9	56.8	54.7	61.4	(66.9)	*	58.6	*	*	*	*
Haiti 2005-06	23.3	21.6	20.0	29.5	22.7	19.3	17.9	26.0	19.7	14.2	22.3	36.0	*	15.2	19.5	21.3	28.6	32.6
Peru 2008	54.7	65.2	62.5	66.9	61.7	72.0	59.0	73.5	60.6	59.5	58.0	78.2	(77.6)	55.4	65.3	66.8	(78.4)	(78.9)

Note: Figures in parentheses are based on 25-49 unweighted cases; an asterisk denotes a figure based on fewer than 25 unweighted cases that has been suppressed.

3.4 Relationships between Uses of Maternal Health Services

With regard to maternal health care, it is also important to explore associations between care received by women during pregnancy, delivery and post-delivery. In this section, we analyze bivariate associations between these maternal health care indicators to show their relationships and the patterns across countries.

3.4.1 Association between Using Antenatal Care and Skilled Birth Attendance

Table 19 presents the percentage of women who received skilled birth attendance for their last birth based on the number of antenatal care visits they reported. Overall, there is a strong positive association between the number of antenatal visits and the use of skilled birth assistance. In 11 of the 20 sub-Saharan African countries studied (with Ethiopia excluded), over 60 percent of women who had four or more antenatal care visits also had skilled assistance at their last birth. Benin, Cameroon, Namibia and Zimbabwe, in particular, display this pattern. Benin is a good example of a maternal health program in West Africa where nurses and midwives play an important role. In Benin, 80 percent of women reported receiving antenatal care from a nurse or midwife, and 70 percent reported nurses/midwives attending their last birth. Almost 90 percent of women in Benin who had four or more antenatal care visits also reported skilled birth assistance.

Countries in Latin America and the Caribbean (except Haiti), as well as countries in the North Africa/West Asia/Europe region, show the results of strong maternal health care programs. Among countries in these two regions, over 80 percent of women in Armenia, Jordan and the Dominican Republic reported skilled assistance at delivery, despite receiving no antenatal care.

Other than India (81 percent), Cambodia (70 percent), Pakistan (73 percent), the Philippines (73 percent) and Vietnam (91 percent), continuity in maternal health care in other South/Southeast Asian countries (Bangladesh, Indonesia and Nepal) has not been as successful, at least based on data for women who reported four or more antenatal care visits. Other than Indonesia and the Philippines, where over 75 percent of women received four or more antenatal care visits, the other countries in South/Southeast Asia performed relatively poorly.

Table19. Among women receiving different number of antenatal care visits for the most recent live birth in the five years preceding the survey, the percentage who had a skilled attendant at birth, the most recent survey, 1990-2009

	Number of antenatal care visits		
Country/Year	**No visits**	**1-3**	**4 or more**
Sub-Saharan Africa			
Benin 2006	11.4	73.6	89.3
Burkina Faso 2003	3.1	49.1	63.4
Cameroon 2004	10.5	56.2	78.0
Chad 2004	0.4	4.0	7.8
Ghana 2008	10.0	29.5	65.8
Guinea 2005	2.5	22.5	42.7
Kenya 2008	11.6	39.3	61.7
Madagascar 2008-09	5.8	39.0	61.4
Malawi 2004	23.6	50.3	63.8
Mali 2006	5.1	26.6	48.7
Mozambique 2003	4.7	45.5	65.2
Namibia 2006-07	39.8	70.9	87.7
Niger 2006	3.0	31.0	47.9
Nigeria 2008	3.7	28.8	59.5
Rwanda 2007	9.3	47.3	65.3
Senegal 2005	6.3	42.8	59.3
Tanzania 2004-05	19.2	38.1	51.2
Uganda 2006	15.7	36.4	56.3
Zambia 2007	4.0	45.2	51.0
Zimbabwe 2005-06	28.9	62.0	75.5
North Africa/West Asia/Europe			
Armenia 2005	84.9	99.4	99.7
Egypt 2007	58.9	72.5	88.7
Jordan 2007	89.7	97.7	99.4
Morocco 2003-04	37.4	71.8	87.2
South/Southeast Asia			
Bangladesh 2007	4.2	17.6	49.7
Cambodia 2005	23.0	47.1	69.6
India 2005-06	15.1	37.6	80.9
Indonesia 2007	5.5	6.3	24.4
Nepal 2006	4.1	15.5	42.9
Pakistan 2006-07	15.6	42.6	73.0
Philippines 2008	34.6	41.6	72.5
Vietnam 2002	50.0	77.0	91.2
Latin America/Caribbean			
Bolivia 2008	24.5	55.5	84.7
Colombia 2005	56.6	83.6	95.8
Dominican Republic 2007	80.8	96.6	99.0
Haiti 2005-06	4.4	15.0	40.5
Peru 2008	36.7	60.8	85.6

Note: Ethiopia is excluded as doctors and nurses were not distinguished from other health professionals in the survey.

3.4.2 Association between Using Antenatal Care and Postnatal Care

Table 20 presents the association between receiving antenatal care and receiving postnatal care. In all countries studied except Uganda, Zimbabwe and Haiti, a majority of women who reported four or more antenatal care visits also received postnatal care. In Ghana, Madagascar, Namibia, Cambodia, the Philippines and all Latin American and Caribbean countries except Haiti, this association also holds true among women who received 1-3 antenatal care visits for their last birth. In fact, in countries where postnatal care levels are extremely high, as in the Philippines, even women who received no antenatal care received postnatal care. In the Philippines, however, the percentage of women who did not receive antenatal care for their last birth is very small (see Table 3). A similar pattern is found in Cambodia, the Dominican Republic and Peru, where more than 50 percent of women with no antenatal care received postnatal care. Although in the Dominican Republic and Peru the percentage of women not receiving any antenatal care is very small, as Table 3 indicates, the same is not true of Cambodia.

Table 20. Among women receiving different number of antenatal care visits for the most recent live birth in the five years preceding the survey, the percentage who had a postnatal checkup within 41 days after delivery, the most recent survey, 1990-2009

	Number of antenatal care visits		
Country/Year	**No visits**	**1-3**	**4 or more**
Sub-Saharan Africa			
Ghana 2008	41.6	57.8	81.1
Kenya 2008	24.8	38.7	56.6
Madagascar 2008-09	31.0	60.4	72.8
Namibia 2006-07	46.4	70.2	76.0
Nigeria 2008	13.8	40.3	63.3
Uganda 2006	8.5	19.7	32.7
Zambia 2007	10.5	44.7	51.2
Zimbabwe 2005-06	15.0	35.2	43.4
South/Southeast Asia			
Bangladesh 2007	12.7	31.5	60.6
Cambodia 2005	56.3	69.7	81.4
India 2005-06	10.5	30.0	72.3
Nepal 2006	18.0	29.1	50.2
Pakistan 2006-07	23.9	41.8	64.6
Philippines 2008	80.3	87.7	91.6
Latin America/Caribbean			
Bolivia 2008	45.4	76.7	92.6
Dominican Republic 2007	56.5	82.4	89.5
Haiti 2005-06	12.2	24.4	46.2
Peru 2008	55.8	77.7	93.3

3.4.3 Association between Using Skilled Birth Attendance and Postnatal Care

Table 21 shows the association between having a skilled attendant at last birth and receiving postnatal care. Overall, in a majority of countries there is a strong association between having skilled birth attendance and receiving postnatal care. Only in Uganda and Zimbabwe do less than 50 percent of women who had a skilled birth attendant also receive postnatal care. In several countries (Cambodia, the Philippines, the Dominican Republic and Peru), over 60 percent of women who had someone other than a skilled birth attendant help with the birth nonetheless receive postnatal care.

Table 21. Among women receiving birth assistance from different providers for the most recent live birth in the five years preceding the survey, the percentage who had postnatal checkups within 41 days after delivery, the most recent survey, 1990-2009

	Person providing assistance during delivery		
Country/Year	**Doctor/Nurse/Midwife**	**Others**	**No one**
Sub-Saharan Africa			
Ghana 2008	91.6	55.7	33.7
Kenya 2008	66.1	29.8	14.5
Madagascar 2008-09	82.4	47.8	17.4
Namibia 2006-07	79.0	42.4	15.8
Nigeria 2008	77.5	27.1	8.6
Uganda 2006	41.0	13.5	8.1
Zambia 2007	69.8	27.9	25.8
Zimbabwe 2005-06	46.6	22.8	49.0
South/Southeast Asia			
Bangladesh 2007	89.4	16.3	11.8
Cambodia 2005	93.2	66.9	57.4
India 2005-06	71.1	13.1	11.1
Nepal 2006	82.6	20.8	3.3
Pakistan 2006-07	61.8	28.2	14.0
Philippines 2008	92.1	87.6	35.1
Latin America/Caribbean			
Bolivia 2008	97.6	50.6	52.2
Dominican Republic 2007	89.2	64.8	38.2
Haiti 2005-06	75.7	19.1	16.8
Peru 2008	98.3	76.5	48.3

4 Summary and Discussion

Analyzing data from nationally representative household surveys in 38 countries between 1990 and 2009, our study contributes to an understanding of the use of essential maternal health services in the past two decades and has important policy and program implications in improving health outcomes for mothers and children, particularly in developing countries.

Antenatal care

The developing world as a whole has achieved great success in extending the reach of antenatal care. Over 80 percent of women in the majority of countries studied have at least one antenatal care visit during pregnancy, and the coverage reaches 90 percent in many countries.

Despite progress in extending antenatal care coverage, many countries, particularly in sub-Saharan Africa and South/Southeast Asia, still have unsatisfactory levels of the WHO-recommended four or more antenatal care visits. However, it is encouraging that the data on trends in having at least four antenatal care visits show improvements since 1990 in most countries. This trend could be the result of program efforts based on better understanding of antenatal care in improving health outcomes for women and children. Steady increases are found in Latin America and the Caribbean, North Africa/West Asia/Europe and South/Southeast Asia, while the former two regions already had relatively high levels of use in the 1990s. Sub-Saharan Africa presents a mixed picture, with increases more evident in Western and Central Africa than elsewhere in the region.

WHO recommends that pregnant women start antenatal care in the first trimester to have enough time for diagnosis and treatment of problems and diseases. The majority of women surveyed in Latin America and the Caribbean and in North Africa/West Asia/Europe have the first antenatal care visit in their first trimester of pregnancy. In contrast, women in sub-Saharan Africa tend to start antenatal care only in the second trimester, and even as late as the third trimester.

Socioeconomic disparities in use of antenatal care are profound. In developing countries as a whole, women are more likely to report four or more antenatal care visits if they reside in urban rather than rural areas, have a higher education level or live in a richer household. These differentials are smaller in countries with overall high levels of antenatal care.

Antenatal care provided by a skilled health provider—that is, a doctor, nurse or midwife—can be effective in identifying problems and pregnancy complications, given that such providers have been educated and trained to be proficient in the skills of diagnosing, managing and referring complicated pregnancies. Use of skilled health providers for antenatal care has been increasing in most of countries studied, although the degree of increase varies by country. The most recent surveys show that skilled health providers are commonly reported as the providers of antenatal care in most countries, except for a few in Western and Central Africa.

Doctors are the main providers of antenatal care, particularly in Latin America and the Caribbean and North Africa/West Asia/Europe. In contrast, in sub-Saharan Africa women rely primarily on nurses or midwives for antenatal care. Traditional birth attendants and other health personnel other than a doctor, nurse or midwife are rarely reported as providers of antenatal care, except in a very few countries.

The likelihood of a woman receiving antenatal care from a skilled health provider appears to be highly associated with residence in an urban rather than rural area, having a higher education level and belonging to a richer household. Furthermore, the socioeconomic gap in antenatal care is considerably larger in countries where overall use of skilled health providers is low.

Essential examinations and tests, such as measuring blood pressure and testing urine and blood samples for certain diseases, should be performed during antenatal care visits. Overall, and particularly in South/Southeast Asia and sub-Saharan Africa, women are more likely to have their blood pressure measured than to have urine and blood samples tested. Countries in Latin America and the Caribbean perform better than those in other regions with regard to delivering a majority of the selected services, but more efforts in teaching women about signs of pregnancy complications are needed.

Results also show that receiving antenatal care from a skilled health provider does not in itself ensure the delivery of essential services. For example, in Uganda, although over 90 percent of women receive antenatal care from a skilled health provider, most women do not get their blood and urine samples tested. However, in many countries in Latin America and the Caribbean, North Africa/West Asia/Europe, and some sub-Saharan countries, where a high proportion of women report a doctor as their source of antenatal care, a high proportion of women also receive the essential services.

This finding may reflect the quality of care provided by different health providers, although we are unable to directly examine the quality of service provided to women, due to lack of data. Another reason could be related to availability of testing supplies in the facility. In facilities where testing supplies are not available, women may not get blood or urine samples drawn and tested regardless of which providers they see.

The receipt of iron supplements during pregnancy is common in Latin America and the Caribbean and in South/Southeast Asia, but is generally less common in sub-Saharan Africa. The high proportion of pregnant women who are given or who purchase iron supplements in some sub-Saharan countries, including Senegal and Ghana, may reflect program efforts to address high levels of anemia among women and children (Seck and Jackson 2010; MacDonald et al. 2007).

Antenatal care visits also represent an important opportunity to address other key health issues such as malaria and HIV/AIDS. Study results in sub-Saharan Africa show that many countries with high malaria prevalence have not taken advantage of antenatal care to offer women preventive medicines for malaria. For example, in Cameroon and Chad none of the pregnant women took two or more doses of SP/Fansidar during the pregnancy, despite the high prevalence of malaria. In Zambia and Malawi, however, a high proportion of women receive IPT during pregnancy, which reflects the extensive program efforts to address the problem of malaria infections in these two countries. Similarly, despite the extremely high prevalence of HIV in many sub-Saharan countries, including Malawi, Zambia and Zimbabwe, women are rarely offered and accept HIV testing during antenatal care visits.

Delivery care

Delivery care—including giving birth in health facilities and receiving skilled attendance at birth—has a strong positive influence on the health of mothers and their children. Globally, there is a growing trend for women to give birth in health facilities, both private and public. A strong upward trend is clearly evident in North Africa/West Asia/Europe and in Latin America and the Caribbean, except Haiti. Countries in these regions show a high percentage of births in health facilities, rather than at home or elsewhere. In half of the 38 countries analyzed, the majority of women delivered their last child in an institutional setting. Despite this progress, the situation in sub-Saharan Africa is mixed, with levels of institutional births over 70 percent in Benin, Namibia and Zimbabwe, but below 20 percent in Ethiopia, Chad and Niger. The South/Southeast Asia region also lags behind in the percentage of women who deliver in health facilities.

In all but a handful of countries, the public sector contributes the major share of births that take place in an institutional setting. In Namibia, Vietnam and Peru, for example, over 60 percent of women's

births take place in a public health facility. However, in some countries, particularly in North Africa/West Asia/Europe and South/Southeast Asia, the private sector for delivery care is much more developed. Other studies also see an increasing trend of privatization of delivery (Pomeroy, Koblinsky, and Alva 2010).

Countries where the private sector plays a large role in deliveries include Egypt (46 percent) and Jordan (36 percent), and Indonesia, Pakistan and Malawi (each over 25 percent). In contrast, the percentage of home births continues to remain high in all South/Southeast Asian countries except Vietnam, with Bangladesh, Cambodia and Nepal having the highest levels. Recently, however, in Bangladesh, India and Indonesia much of the recent increase in facilities for births has been in the private sector (Pomeroy, Koblinsky, and Alva 2010).

In some countries studied, a high rate of caesarean section deliveries is associated with a high percentage of births in public health facilities. Particularly in the Latin America countries studied (Bolivia, Colombia, the Dominican Republic and Peru), which have caesarean section rates above 20 percent, more than 60 percent of caesarean section deliveries occur in public facilities. The highest rates in the region are in Colombia (95 percent) and Peru (79 percent). Vietnam is another example where, with a caesarean section rate of 10 percent, almost all caesarean section deliveries are in public health facilities (98 percent).

Use of health facilities for delivery varies by women's socioeconomic status. A negative relationship between maternal age and institutional births is most prominent in sub-Saharan Africa. Moreover, in all four regions, the proportion of births delivered in a health facility declines with birth order, although the decline is smaller in sub-Saharan Africa than elsewhere. Both findings might indicate that the increase in use of health facilities for delivery is a recent trend. Furthermore, as expected, births in health facilities are more common than home births in urban areas than rural areas. This difference is most apparent in sub-Saharan Africa and South/Southeast Asia, where in a majority of countries studied the proportion of births in health facilities in urban areas is double the proportion in rural areas. The higher levels in urban areas are also associated with such factors as women's education and wealth, as well as a higher density of facilities in urban areas, resulting in easier access.

Overall, skilled birth attendance and use of health facilities for births follow similar patterns, with rates considerably lower in sub-Saharan Africa and South Asia compared to the other regions. Nurses/midwives are the great majority of skilled birth attendants in sub-Saharan Africa, while doctors dominate in other regions. In a few countries, including Chad, Guinea and Indonesia, other health personnel also play a role in delivery. Among births delivered without skilled birth attendants, traditional birth attendants are the primary care providers in most countries.

Overall, the majority of countries show an increase in rates of skilled birth attendance in recent years, although the increase is small in most countries. This includes countries where skilled birth attendance for delivery has been the norm, as in Armenia, Jordan, the Dominican Republic and Colombia, and many sub-Saharan African countries, where skilled assistance is not widely available. In other sub-Saharan countries, including Benin, Ghana, Namibia, Rwanda and Uganda, increases in skilled attendance have been substantial in the past decade.

With regard to demographic and socioeconomic differences in use of delivery care, in most countries there is a negative relationship between the mother's age at last birth and the use of skilled attendants. But in many countries there is a non-linear relationship, although weak. Birth order is also negatively related to skilled birth attendance, and substantially higher levels of skilled attendance are seen with lower birth orders in many countries, including those with low levels of skilled birth attendance—Bangladesh, Nepal, Indonesia and Haiti. The majority of women in urban areas use skilled birth

attendants for delivery. Furthermore, in a majority of countries in sub-Saharan Africa and South/Southeast Asia, the use of skilled birth attendants among urban women is double that among rural women. Although there are differences in the level of use of skilled birth care, mother's levels of education and household wealth are consistently and positively related to the use of skilled birth attendants at delivery in all countries.

Postnatal care

Postnatal care, especially within the first few days following delivery, is critical to reducing maternal mortality and improving newborn survival. Although there is consensus on this point, no globally accepted guidelines exist that address the provision and standardize the content of postnatal care to mothers. WHO and Save the Children are two organizations working to define aspects of care and to develop evidence-based guidelines for postnatal care (WHO 2010).

As expected, women who deliver in a health facility are more likely than women who deliver at home or other places to report postnatal checkups, have the first checkup within two days after delivery and receive postnatal care from a skilled health provider.

Among all women regardless of place of delivery, whether in a health facility or elsewhere, in 8 of the 18 countries with data, more than half of the women have a postnatal checkup within 41 days after delivery. In sub-Saharan Africa and Latin American and the Caribbean, more than two-thirds of women who receive postnatal care have a postnatal checkup from a skilled health provider (doctor, nurse or midwife). In South/Southeast Asia the proportion is lower.

Relationships between uses of maternal health services

Given the association between lack of appropriate care at all stages (pregnancy, birth and post-delivery) and poor maternal and newborn health outcomes, a concept of "continuum of care" for maternal and newborn health has been developed, focusing on the continuity of care for every woman and child (AbouZahr and Wardlaw 2003; Kerber et al. 2007; Tinker et al. 2005; de Graft-Johnson, Kerber, and Tinker 2006). Overall, our study shows that there is a strong positive correlation between the number of antenatal visits and the use of skilled birth attendants. Women who receive antenatal care are more likely to use skilled birth attendants for delivery.

However, in some countries there is no clear pattern in relation to maternal mortality. For instance, although maternal mortality ratios continue to remain high in Benin (410 per 100,000 live births) and Cameroon (600 per 100,000 live births), according to recent WHO estimates (WHO et al. 2010), both countries have high levels of antenatal care and skilled birth attendance. The percentage of four or more antenatal care visits as well as skilled birth attendance is greater than 60 percent in both countries, and over three-fourths of women with four or more antenatal care visits also receive skilled birth assistance. Nevertheless, it is important to note that in these countries the major providers of such care are nurses and midwives, whose roles in caesarean sections and other life-saving procedures are more limited. Most countries in Latin America and the Caribbean, as well as North Africa/West Asia/Europe, display a similar pattern. Interestingly, in a few countries (Armenia, Jordan and the Dominican Republic) women report having skilled birth attendance at delivery despite receiving no antenatal care.

In almost all countries, a majority of women who have four or more antenatal care visits also receive postnatal care. A strong association between having a skilled attendant at birth and receiving postnatal care is also observed. However, in several countries a significant percentage of women who

receive no antenatal care or use a non-skilled birth attendant or other person at delivery also receive postnatal care.

Limitations of the study

There are several limitations in this study that should be acknowledged. First is recall bias. Information collected in the DHS for maternal health services such as antenatal care, skilled birth attendance and postnatal checkups are based on women's recall of events, which can be affected by the period of recall as well as the women's situation at the time of the event. We focus on the last birth in the five years prior to the survey and expect that women are more likely to misreport or misclassify events the earlier the birth occurred. A woman in a critical situation, for example, shortly after delivery or a caesarean section, may be prone to misinterpret or not realize whether a contact with a health provider after birth was "postnatal care" or some other type of care. A woman may also not correctly identify the category or skill level of the care provider. This may occur because of poor recall, nonstandard provider uniform (or no uniform), or lack of knowledge of the types of provider offering these services. Similarly, women may not know whether the facility they visit is public or private, although this may be less likely to be a problem than knowing the provider type. DHS makes every effort to construct survey questions adequately to provide reliable information, but because women's answers to these questions are self-reported, the resulting data are open to the potential for self-reporting bias.

While the DHS provides information on the use of antenatal care, including timing, number of visits and components of antenatal care, there is limited information on the specific contents of services offered in skilled birth attendance and postnatal care. Although the surveys give information on caesarean section delivery, only in a few surveys are there details about obstetric care and complications. As a result, the surveys do not provide data on the quality of care received by women.

The third limitation is related to the design of DHS surveys. In most DHS surveys, women age 15-49 are asked to provide information about pregnancies resulting in live births during the five years prior to the interview. In some surveys conducted in 1990s, the reference period was reduced to three years prior to the interview. Since 1999, surveys have resumed collecting antenatal and postnatal information for the reference period of five years, but only for the last birth in the reference period. Information on skilled birth attendance continues to be collected for all live births in the past five years. Thus, in our trend analysis, data from a number of surveys (noted in Table 1) conducted during the 1990s were only based on the last birth in the three-year reference period. However, we do not expect substantial differences resulting from using reference periods of three years versus five years, based on a recent study that examined such differences using DHS data (Bell, Curtis, and Alayón 2003).

References

AbouZahr, C., and T. Wardlaw. 2001. Maternal mortality at the end of a decade: signs of progress? *Bullution of the World Health Organization* 79 (6):561-8.

AbouZahr, C., and T. Wardlaw. 2003. Antenatal care in developing countries: promises, achievements and missed opportunities. Geneva: World Health Organization.

Bell, J., S. Curtis, and S. Alayón. 2003. Trends in delivery care in six countries. In *DHS analytical studies N0.7*. Calverton, Maryland USA: ICF Macro and International Research Partnership for Skilled Attendance for Everyone (SAFE).

Bhutta, Z. A., S. Soofi, S. Cousens, S. Mohammad, Z. A. Memon, I. Ali, A. Feroze, F. Raza, A. Khan, S. Wall, and J. Martines. 2011. Improvement of perinatal and newborn care in rural Pakistan through community-based strategies: a cluster-randomised effectiveness trial. *Lancet* 377(9763): 403-412.

Carroli, G., C. Rooney, and J. Villar. 2001. How effective is antenatal care in preventing maternal mortality and serious morbidity? An overview of the evidence. *Paediatr Perinat Epidemiol* 15 Suppl 1:1-42.

Chen, X. K., S. W. Wen, Q. Yang, and M. C. Walker. 2007. Adequacy of prenatal care and neonatal mortality in infants born to mothers with and without antenatal high-risk conditions. *Aust N Z J Obstet Gynaecol* 47 (2):122-7.

De Brouwere, V., R. Tonglet, and W. Van Lerberghe. 1998. Strategies for reducing maternal mortality in developing countries: what can we learn from the history of the industrialized West? *Trop Med Int Health* 3 (10):771-82.

de Graft-Johnson, J, K Kerber, and A Tinker. 2006. The maternal, newborn and child health continuum of care. In *Opportunities for Africa's newborns*, edited by Lawn J and Kerber K. Cape Town, South Africa: Partnership for Maternal, Newborn and Child Health.

Fort, A., M. Kothari, and A. Noureddine. 2006. Postpartum Care: Levels and Determinants in Developing Countries. Calverton, Maryland USA: ICF Macro.

Graham, W.J., J.S. Bell, and C.H.W. Bullough. 2001. Can skilled attendance at delivery reduce maternal mortality in developing countries? In *Studies in health service organisation and policy*, edited by V. D. Brouwere, V. Lerberghe and B. I. P. Antwerp. Antwerp, Belgium: TIG Press.

Kerber, K. J., J. E. de Graft-Johnson, Z. A. Bhutta, P. Okong, A. Starrs, and J. E. Lawn. 2007. Continuum of care for maternal, newborn, and child health: from slogan to service delivery. *Lancet* 370 (9595):1358-69.

Li, X. F., J. A. Fortney, M. Kotelchuck, and L. H. Glover. 1996. The postpartum period: the key to maternal mortality. *Int J Gynaecol Obstet* 54 (1):1-10.

MacDonald, C;, B; Main, R; Namarika, M; Neequaye, and K Siekmans. 2007. Effectiveness of a large-scale multiple-sector program to reduce anemia in Ghanaian and Malawian women. In *Micronutrient Forum*. Istanbul, Turkey.

Magoma, M., J. Requejo, O. M. Campbell, S. Cousens, and V. Filippi. 2010. High ANC coverage and low skilled attendance in a rural Tanzanian district: a case for implementing a birth plan intervention. *BMC Pregnancy Childbirth* 10:13.

Maine, D. 1991. Safe motherhood programs: options and issues. New York: Center for Population and Family Health, Columbia University.

McDonagh, M. 1996. Is antenatal care effective in reducing maternal morbidity and mortality? *Health Policy Plan* 11 (1):1-15.

Mpembeni, R. N., J. Z. Killewo, M. T. Leshabari, S. N. Massawe, A. Jahn, D. Mushi, and H. Mwakipa. 2007. Use pattern of maternal health services and determinants of skilled care during delivery in Southern Tanzania: implications for achievement of MDG-5 targets. *BMC Pregnancy Childbirth* 7:29.

Pomeroy, A., M. Koblinsky, and S. Alva. 2010. Private delivery care in developing countries: Trends and determinants. In *DHS working paper series*. Calverton, Maryland USA: ICF Macro.

Post, M. 1997. Preventing Maternal Mortality through Emergency Obstetric Care. In *SARA Issues Paper*. Washington DC: Academy for Educational Development.

Rutstein, S.O., and K. Johnson. 2004. The DHS Wealth Index. In *DHS Comparative Reports No. 6.* Calverton, Maryland USA: ICF Macro.

Seck, B. C., and R. T. Jackson. 2010. Multiple contributors to iron deficiency and anemia in Senegal. *Int J Food Sci Nutr* 61 (2):204-16.

Syed, U., N. Khadka, A. Khan, and S. Wall. 2008. Care-seeking practices in South Asia: using formative research to design program interventions to save newborn lives. *J Perinatol* 28 Suppl 2:S9-13.

Tinker, A., P. ten Hoope-Bender, S. Azfar, F. Bustreo, and R. Bell. 2005. A continuum of care to save newborn lives. *Lancet* 365 (9462):822-5.

Villar, J., H. Ba'aqeel, G. Piaggio, P. Lumbiganon, J. Miguel Belizan, U. Farnot, Y. Al-Mazrou, G. Carroli, A. Pinol, A. Donner, A. Langer, G. Nigenda, M. Mugford, J. Fox-Rushby, G. Hutton, P. Bergsjo, L. Bakketeig, H. Berendes, and J. Garcia. 2001. WHO antenatal care randomised trial for the evaluation of a new model of routine antenatal care. *Lancet* 357 (9268):1551-64.

WHO. 1999. Reduction of maternal mortality: A joint WHO/UNFPA/UNICEF/World Bank statement. Geneva: World Health Organization.

———. 2001. Antenatal care randomized trial: manual for the implementation of the new model. In *WHO/RHR/01.30*. Geneva: World Health Organization.

———. 2009. Monitoring emergency obstetric care: a handbook. Geneva: World Health Organization.

———. 2010. WHO technical consultation on postpartum and postnatal care. Geneva: Department of Making Pregnancy Safer, WHO.

WHO, ICM, and FIGO. 2004. Making pregnancy safer: the critical role of the skilled attendant. A joint statement by WHO, ICM and FIGO. Geneva: World Health Organization.

WHO, UNICEF, UNFPA, and World Bank. 2010. Trends in maternal mortality: 1990-2008. Estimates developed by WHO, UNICEF, UNFPA and the World Bank. . Geneva: WHO.

Wildman, K., and M. H. Bouvier-Colle. 2004. Maternal mortality as an indicator of obstetric care in Europe. *BJOG* 111 (2):164-9.

You, D., G. Jones, and T. Wardlaw. 2010. Levels and trends in child mortality. New York: the United Nations Children's Fund.

Appendix A: Percentage of women who had a caesarean section for the most recent live birth in the five years preceding the survey, 1990-2009

Country	Survey year	Percentage with a caesarean section
Sub-Saharan Africa		
Western and Central Africa		
Benin	1996*	2.3
	2001	3.9
	2006	4.0
Burkina Faso	1993	1.6
	1998-99	1.1
	2003	0.7
Cameroon	1991	2.8
	1998*	2.7
	2004	2.3
Chad	1996-97	0.5
	2004	0.5
Ghana	1993*	4.8
	1998	4.0
	2003	4.4
	2008	7.2
Guinea	1999	2.2
	2005	1.9
Mali	1995-96*	0.9
	2001	1.1
	2006	2.0
Niger	1992	1.0
	1998*	0.6
	2006	1.2
Nigeria	1990	2.5
	2003	1.9
	2008	2.1
Senegal	1992/93	2.5
	1997	na
	2005	3.9
Eastern and Southern Africa		
Ethiopia	2000	0.7
	2005	1.2
Kenya	1993	6.0
	1998*	7.0
	2003	4.9
	2008	7.2
Madagascar	1992	1.1
	1997*	0.7
	2003-04	1.0
	2008-09	1.7
Malawi	1992	3.9
	2000	3.0
	2004	3.3
Mozambique	1997*	2.3
	2003	2.4
Namibia	1992	7.2
	2000	na
	2006-07	13.6
Rwanda	1992	1.7
	2000	2.2
	2007	na

(Cont'd)

Appendix A. – cont'd

Country	Survey year	Percentage with a caesarean section
Tanzania	1991-92	2.9
	1996	2.3
	1999	3.7
	2004-05	4.0
Uganda	1995*	2.7
	2000-01	3.1
	2006	3.6
Zambia	1992	3.0
	1996	2.1
	2001-02	2.4
	2007	3.5
Zimbabwe	1994*	6.0
	1999	7.5
	2005-06	5.4
North Africa/West Asia/Europe		
Armenia	2000	7.3
	2005	9.8
Egypt	1992	5.6
	1995	7.6
	2000	11.3
	2005	21.5
	2008	29.2
Jordan	1990	7.0
	1997	12.2
	2002	17.3
	2007	20.0
Morocco	1992	2.7
	2003-04	5.8
South/Southeast Asia		
Bangladesh	1993-94*	na
	1999-2000	2.9
	2004	4.0
	2007	8.6
Cambodia	2000	1.0
	2005	2.2
India	1992-93*	2.8
	1998-99*	7.3
	2005-06	9.8
Indonesia	1991	1.6
	1997	4.6
	2002-03	4.1
	2007	7.3
Nepal	1996*	0.8
	2001	1.1
	2007	3.3
Pakistan	1990-91	2.7
	2006-07	8.5
Philippines	1993	7.0
	1998	6.7
	2003	8.6
	2008	11.4
Vietnam	1997*	3.6
	2002*	10.2

(Cont'd)

Appendix A. – cont'd

Country	Survey year	Percentage with a caesarean section
Latin America/Caribbean		
Bolivia	1994*	11.1
	1998	16.5
	2003	17.2
	2008	21.1
Colombia	1990	16.8
	1995	18.8
	2000	25.8
	2005	28.8
Dominican Republic	1991	24.4
	1996	28.3
	2002	34.3
	2007	44.4
Haiti	1994-95	2.0
	2000	2.0
	2005-06	3.5
Peru	1991-92	11.1
	1996	10.3
	2000	14.0
	2005	16.4
	2008	20.3

*Information was collected only for live births in the three years preceding the survey, so analyses focus on the most recent birth in the past three years.
na=not available

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