

A Comparative Study on Percentage of Women (Age 15–49) Attending at Least One Antenatal Care by Skilled Health Personnel in SAARC Countries (2015-2030)

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ABSTRACT

Background: Antenatal care (ANC) plays an important role in reducing maternal morbidity and mortality. The South Asian Association for Regional Cooperation (SAARC) is an economic and political organization of eight countries in South Asia. There is an unacceptably high burden of neonatal mortality and stillbirths in the SAARC region.

Purpose: The purpose of this study is to estimate the percentage of at least one ANC visit from 2015 to 2030 from previously available data and to compare the progress among SAARC nations.

Methodology: This is a secondary analysis study. Data indicating percentages of women attending at least one ANC by skilled health personnel in SAARC countries Maternal and newborn health coverage dataset-May 2021 by United Nations International Children's Emergency Fund (UNICEF) was used. Regression Coefficient was used first to check the strength of the relationship for prediction at a 5 % significance level. Then, the percentages of ANC visits were predicted. To compare the percentages among countries, non-Parametric correlation Kendall's tau was used.

Findings: Results indicate that SAARC countries are struggling to reach at least one ANC visit. Comparison among these countries has shown no significant trend and it is concluded that there is no significant difference among SAARC countries' women ANC visits from 2015 to 2030 at a 5% significance level for all years.

Practical implications: The estimations of this research would help to develop innovative strategies for uplifting maternal health among SAARC countries to reach Sustainable development goals (SDGs).

Keywords: Antenatal care, Maternal care, SAARC countries, UNICEF, Sustainable development goals, Skilled health personnel

1. INTRODUCTION

1.1. Antenatal Care (ANC)

The ultimate safety of children and mothers is one of the sustainable development goals for the government. The World Health Organization outlined a detailed plan to eradicate every avoidable infant death (WHO, 2015a) and an actionable strategy to reduce preventable mother deaths (WHO, 2015b). This makes ANC a prerequisite for the possibility of healthy infants and mothers. Antenatal care (ANC) is the care received during pregnancy to make sure that the mother and the baby are fine (NHS, 2017). It is a means to identify high-risk pregnancies and educate women so that they might experience a healthier delivery and outcome (McNellan et al., 2019). The new guidelines by WHO for Antenatal care services contain flexible recommendations for different countries according to their specific needs on health system interventions to improve the application and quality of antenatal care. An expectant mother should start her ANC visits within the first trimester and there should be at least eight visits (WHO, 2016). The early start of ANC visits can help detect any genetic or congenital or neural tube defects in the babies, STD (sexually transmitted disease), anemia, etc. in mothers. These ANC visits can also determine whether mothers have diseases like diabetes and hepatitis A and B as well. Through ANC visits, an intervention is possible for the healthcare of the mothers that can modify bad lifestyle risks like obesity, drug and alcohol abuse, malnutrition and smoking (Committee, 2015). One of the

key factors of maternal morbidity is the phenomenon labelled as an obstetric transition. They denote some earlier medical conditions of the expecting mothers, that may result in maternal morbidity and deaths (Souza et al., 2014). An investigation revealed that approximated worldwide ANC visits increased from 40.9% (1990) to 58.6% (2013). The maximum coverage in the developing world reached 48.1% as compared to 84.8% in the developed world, 24.0% in low-income countries, and 81.9% in high-income countries (Moller, Petzold, Chou, & Say, 2017). Jane Kuhnt and Sebastian Vollmer evaluated data from 69 low-income and middle-income countries and deduced that ANC consultations were directly proportional to improved birth outcomes and longer-term reductions in child mortality and undernourishment (Kuhnt & Vollmer, 2017).

1.2 SAARC Countries and Antenatal care

SAARC (South Asian Association for Regional Cooperation) is an economic and political organization of eight countries in South Asia. It was established in 1985 when the Heads of State of Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka formally adopted the charter. Afghanistan joined as the 8th member of SAARC in 2007 (Mfasia, 2021). There is an unacceptably high and irregular burden of neonatal mortality and stillbirths in the region which together account for 39% of global neonatal deaths and 41% of global stillbirths. Five of the eight SAARC countries have reduced their neonatal mortality rate by more than 50% since 1990, while India (43%), Afghanistan (29%) and Pakistan (25%) have made slower progress and will not reach their Millennium Development Goals(MDG)- 4 targets. (Coulter, 2015; Das et al., 2015). Research on Maternal care and newborn care in Bangladesh, Nepal and Pakistan identified substantial opportunities for programs to report gaps in knowledge and care seeking by mothers, families and newborn caregivers. In each country, routine care during the antenatal period and especially in the postnatal period was frequently perceived to be of little importance (Syed, Khadka, Khan, & Wall, 2008).

WHO recommendations on counselling on healthy eating and physical activity during pregnancy, balanced energy and protein dietary supplementation during pregnancy, addressing nutrition education to increase energy and protein intake during pregnancy guidelines exist in all SAARC countries except Pakistan, and guidance on daily iron and folic acid supplementation during pregnancy exists in all countries. Guidelines for Vitamin A supplements are recommended for Nepal only (UNICEF, 2019). A study on Mass media exposure and maternal healthcare utilization in India, Bangladesh, Nepal and Pakistan shows that exposure to mass media is positively associated with utilizing maternal healthcare services at antenatal, delivery, and postpartum stages of pregnancy in South Asia. Importantly, mass media has the potential to reach low-educated mothers and encourage them to utilize maternal healthcare services; therefore, exposure to mass media can help reduce maternal mortality in developing countries (Fatema & Lariscy, 2020).

Pakistan is 5th on the list of SAARC countries with 86% of women opting for ANC services once during pregnancy. Among other SAARC countries, Afghanistan has 65%, which is the lowest, Bangladesh 75%, Bhutan 98%, India 79%, Maldives 99%, Sri Lanka 99%, and Nepal 89% (UNICEF, 2021). For 5 visits of ANC, Sri Lanka has 93%, Maldives 85%, Nepal 69%, India 51%, Pakistan 37% and Afghanistan 18%. A study on the prevalence of unintended pregnancy and its associated factors from six South Asian countries, including Bangladesh (2014), Pakistan (2017–2018), Nepal (2016), Afghanistan (2015), Maldives (2016–2017) and India (2015–2016) revealed that an average of 9.1% pregnancies was unintended (ranging from 11.9% in India to 28.4% in Bangladesh) (Sarder, Islam, Talukder, & Ahammed, 2021).

2. OBJECTIVE

The main objective of this study is to compare the progression of one Antenatal care visit from 2015 to 2030 among SAARC countries.

3. HYPOTHESIS

H₀: There is no significant difference among SAARC countries from 2015 to 2030.

H_a: There is a significant difference among SAARC countries from 2015 to 2030.

4. METHODOLOGY

4.1. Data Source

In this study, the percentage of women (aged 15–49) who attended at least one ANC by skilled health personnel during pregnancy was extracted from UNICEF metadata. UNICEF (2021) for all SAARC countries. This data set is an open-access data set available for all on the UNICEF website. The data was last updated in August 2021. However, Since 2015, no frequent demographic health surveys have been conducted.

4.2. Data Indicators

The indicator refers to women who had a live birth in a recent time, generally two years for MICS and five years for DHS. For ANC 1, data indicators identified by UNICEF were: Indicator description: Antenatal care 1+ visit - Percentage of women (aged 15-19 and 15-49) who attended at least one ANC by skilled health personnel during pregnancy.

Numerator: Number of women aged 15-49 years with a live birth in the last 5 years who attended at least one ANC by skilled health personnel (typically a doctor, nurse or midwife) during their last pregnancy that led to a live birth.

Denominator: Total number of women aged 15-49 years with a live birth in the last 5 years.

Population used for aggregation: Number of total births among women aged 15-49

For each country, some years are missing in available data. In this study, from 2015 to 2030, data is estimated to compare the percentage distribution of women availing themselves of professional services at least once during their Pregnancy annually among SAARC countries. Data were analyzed using Microsoft Excel Professional Plus 2016 and statistical package for social sciences (SPSS) version 25. Values are predicted through Regression equation:

$$Y = b_1 * X - b_0$$

Where Y= Predicted percentage of at least 1+ ANC visits.

X= Years

b₁= Co-efficient of regression

b₀= y-intercept

After finding out the prediction for each country from 2015 to 2030, the extent to which SAARC countries have attained Sustainable development Goals (SDGs) was compared through a Non-Parametric Correlation (Kendall's tau) test with each year.

5. RESULTS

Predictor variables for at least one ANC visit of SAARC countries are mentioned in [Table 1](#):

Table 1. Percentage of Women (Aged 15–49) who Attended ANC by skilled health personnel at least once during pregnancy (UNICEF).

Country	Year	Data source	%	r ²	p-value
Afghanistan	2003	MICS 2003	16	0.83	0.002
	2008	Other NS 2008	36		
	2010	AMS 2010	60		
	2011	MICS 2010-2011	48		
	2012	Other NS 2012	51		
	2014	Other NS 2014	63		
	2015	DHS 2015	59		
	2018	Afghanistan health survey 2018	65		
Bangladesh	1994	DHS 1993-1994	26	0.00	
	1997	DHS 1996-1997	26		
	2000	DHS 1999-2000	33		
	2000	MICS 2000	40		
	2001	Other NS 2001	40		
	2004	DHS 2004	49		
	2006	MICS 2006	48		
	2007	DHS 2007	52		
	2010	Other NS 2010	53		
	2011	DHS 2011	55		
	2013	MICS 2012-2013	59		
	2014	DHS 2014	64		
	2018	DHS 2017-2018	82		
	2019	MICS 2019	75	0.95	
Country	Year	Data source	%	r²	P-value
Bhutan	2000	Other NS 2000	51		0.023

Country	Year	Data source	%	r ²	p-value
	2007	Other NS 2007	88		
	2010	MICS 2010	97		
	2012	NHS 2012	98	0.95	
India	1993	DHS 1992-1993	62		0.018
	1999	DHS 1998-1999	65		
	2000	MICS 2000	62		
	2006	NFHS 2005-2006	74		
	2016	NFHS 2015-2016	79	0.88	
Pakistan	1991	DHS 1990-1991	26	0.87	0.01
	1997	Other NS 1996-1997	26		
	1999	Other NS 1998-1999	25		
	2001	Other NS 2001	43		
	2005	PSLM 2004-2005	36		
	2007	DHS 2006-2007	61		
	2013	DHS 2012-2013	73		
	2018	DHS 2017-2018	86		
Sri Lanka	1993	DHS 1993	80	0.65	0.096
	2000	DHS 2000	95		
	2007	DHS 2006-2007	99		
	2014	Other NS 2014	96		
	2016	DHS-Style 2016	99		
Maldives	2001	MICS 2001	81	0.56	0.239
	2004	MoH 2004	95		
	2009	DHS 2009	99		
	2017	DHS 2016-2017	99		
Nepal	1991	Other NS 1991	15	0.96	0.00
	1996	DHS 1996	24		
	2000	Other NS 2000	27		
	2001	DHS 2001	28		
	2006	DHS 2006	44		
	2011	DHS 2011	58		
	2014	MICS 2014	68		
	2016	DHS 2016	84		
	2019	MICS 2019	89		

Note: $\alpha = 0.05$

Table 1 above shows the data source by UNICEF with its regression Coefficient and P-value, showing the strength of the relationship at a 5% significance value of the percentage of ANC visits of each country. Percentages of ANC +1 visits with years of Afghanistan, Bangladesh, Bhutan, India, Pakistan and Nepal have a positive linear relationship, that is, as the years are increasing ANC visits are also increasing, and significant enough to predict ANC visits where Sri-lanka (2016), Maldives (2017) and Bhutan (2012) have already reached 100% Antenatal goals.

Table 2. Estimated Percentage of Women (AGED 15–49) who attended ANC by skilled health personnel at least once during pregnancy (2015-2030)

Years	Country ANC +1 visits in percentages										
	Afghanistan	Bangladesh	Bhutan	India	Nepal	Pakistan	Maldives	Sri-Lanka	Mean	tb	P-value
2015	59	67.22	100	78.84	73.33	75.1	100	99.5	78.9986	0.473	0.105
2016	64.9	69.3	100	79	84	77.6	100	99.5	82.1286	0.488	0.129
2017	68.2	71.4	100	80.5	78.9	80.2	100	99.5	82.7143	0.293	0.362
2018	65	73.5	100	81.4	81.6	82.7	100	99.5	83.4571	0.488	0.129
2019	74.75	75	100	82.24	89	85.21	100	99.5	86.6357	0.551	0.091
2020	78.03	77.63	100	83.1	87.2	87.7	100	99.5	87.6614	0.39	0.224
2021	81.3	79.7	100	83.9	89.94	90.26	100	99.5	89.2571	0.39	0.224
2022	84.6	81.8	100	84.8	92.7	92.8	100	99.5	91.0143	0.293	0.362
2023	87.89	83.88	100	85.63	95.5	95.3	100	99.5	92.6157	0.39	0.224
2024	91.18	85.96	100	86.48	98.24	97.82	100	99.5	94.2143	0.39	0.224
2025	94.47	88.04	100	87.33	100	100	100	99.5	95.6243	0.507	0.132
2026	97.8	90.1	100	88.2	100	100	100	99.5	96.6143	0.507	0.132
2027	100	92.2	100	89	100	100	100	99.5	97.0286	0.507	0.132
2028	100	94.3	100	89.9	100	100	100	99.5	97.7429	0.329	0.342
2029	100	96.4	100	90.7	100	100	100	99.5	98.1571	0.329	0.342
2030	100	98.45	100	91.58	100	100	100	99.5	98.5757	0.329	0.342
R ²	0.9548	0.998	N/A	0.999	0.841	0.915	N/A	N/A			
p-value	0.00	0.00	N/A	0.00	0.00	0.001	N/A	N/A			

Note: $\alpha=0.05$

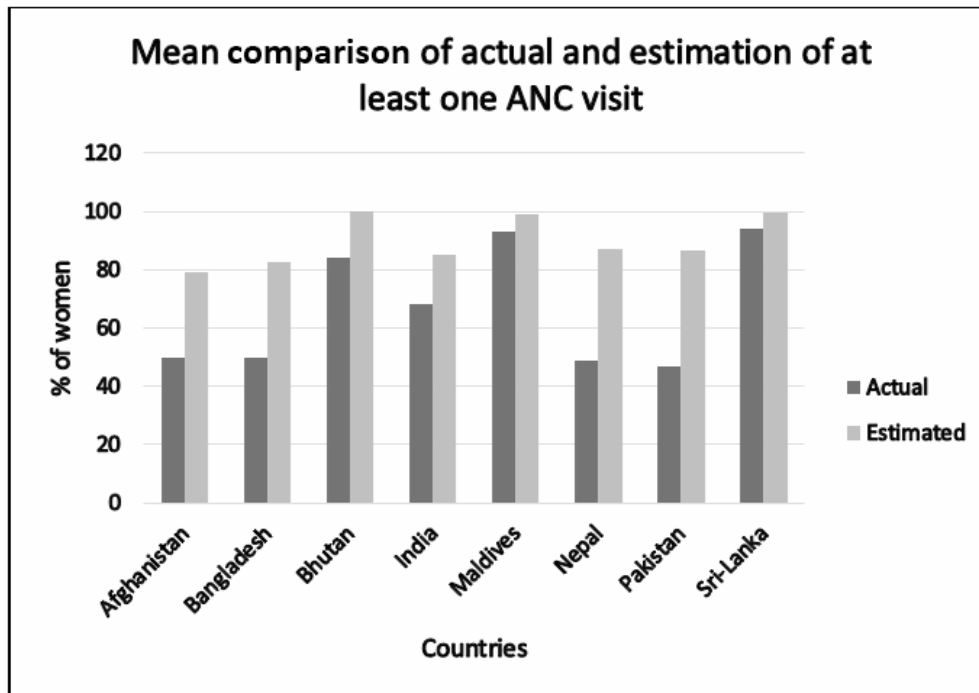


Figure 1. Mean comparison of actual and predicted at least one ANC visit.

(UNICEF, 2021).

6. FINDINGS

6.1. Individual Trends of Countries From 2015 to 2030

The overall results indicate that Bhutan, Maldives and Sri Lanka have already achieved ANC+1, but Bangladesh and India have not been able to reach 100% ANC +1 visits. Conditions for ANC +1 visits in Afghanistan and Pakistan have also shown a non-satisfactory trend. Figure 1 suggests that on average, Afghanistan, Bangladesh, Nepal, & Pakistan are expected to increase their ANC visit percentage up to 40% compared to previous Demographic and Health Surveys.

6.2. Comparison Among Countries

Table 2 suggests that as the years are increasing, ANC visits percentages are also increasing. With reference to similar data on ANC visits from years 2015 to 2030, the result shows that data for years 2015, 2016, 2018, 2019, 2025, 2026 & 2027 visits among countries have shown strong relationships among each other. In the years 2017, 2020-2024 and 2028-2030 relationship among countries weakens in terms of percentages of ANC +1 visits and disparities are observed and there is no statistical difference with reference to these percentages.

The hypothesis for the study is rejected and there is no significant difference among the countries studied

7. DISCUSSIONS

Health care is influenced by education, labor and social affairs, information and culture, transport and rural development in improving the mean percentage of women attending skilled Antenatal care.

Among all SAARC nations, Bhutan in 2012, Sri Lanka, and Maldives in 2017 have already reached at least one ANC visit up to 98% & 99% respectively.

The approach taken in this estimation is based on previous factors considered in demographic health surveys of each country conducted before COVID-19, and no latest surveys in any of the SAARC countries have been conducted. An analysis of the Afghanistan demographic and health survey 2015 showed that not only the socio-demographic factors but also the cultural factors were associated with ANC visits (Azimi et al., 2019). The United Nations 2030 goals for sustainable development include the reduction of global maternal mortality. This study reveals that if the current demographic characteristics continue in Afghanistan, it will reach the 2030 goal of at least one ANC visit to 100% in 2027. However, according to a study, the Taliban's return imperils maternal health, suggesting that Afghanistan's latest figure of 638 per 100,000 is now more likely to

grow than to shrink due to the new regime (Qaderi, Ahmadi, & Lucero-Prisno III, 2021) it is assumed that Antenatal care visits will also be affected.

DHS 2017-2018 of Bangladesh reveals Seeking antenatal care from a medically trained provider has increased noticeably over the last decade, from about 50% in 2007 to more than 80% in 2017. 76% reported receiving ANC from a qualified doctor (NIPORT, 2019). Analysis of national data from MICS 2019 reveals around one-third of Bangladeshi married women received antenatal care and skilled birth attendant reproductive health services (Ahmed, Khan, & Yunus, 2021). It is anticipated in this study that Bangladesh 98% of Pregnant women will be attending Antenatal care at least once by 2030 to reach SDGs. In this era of Millennium development goals, Bhutan's progress is remarkable. Nearly all Pregnant women get Antenatal care in Bhutan (WHO, 2018). Late ANC booking appeared to be associated with educational, geographic, socio-cultural and administrative characteristics in Bhutan (Dorji et al., 2019).

Full ANC utilization in India was inadequate and inequitable (Kumar et al., 2019). In India, Antenatal care (ANC) visits by pregnant women in their first trimester increased in most states and Union territories (UT), Goa, Himachal Pradesh, Jammu and Kashmir, Sikkim and Tripura were the only states that showed a decline in the number of mothers going for checkups in the first trimester in 2019-20 compared to National Family and Health Survey (2015-16) (Akhil, Gunnal, & Guha, 2021). However, this study reveals that 91% will reach at least one ANC visit by 2030. According to the data obtained from the Nepal Demography Health Survey (2016) on antenatal care, 70% of the Nepalese women had at least four antenatal care visits, and only 21% of these women received good-quality antenatal care (Adhikari, Chalise, Bista, Pandey, & Upadhyaya, 2020). The estimation of this study suggests that Nepal is expected to reach 100% at least one ANC in the year 2025. In Maldives as of 2009, 99.2% of women sought ANC from a skilled provider; 85.1 percent of women received the recommended four or more ANC visits (El-Sahraty, Ohno, Sarker, Secci, & Nagpoal, 2014). The Pakistan Demographic Health Survey (PDHS) 2017-18 evaluated women who gave birth in the last five years and concluded that 86% of mothers had at least one ANC visit while 51% of women availed themselves of four or more ANC services (NIPS, 2018). The survey of Pakistan revealed that in Urban areas 84% of births were with help of a skilled servicer and 81% of babies were delivered in a health care facility. While in a rural setting, only 63% of births were handled by capable wet nurse and only 59% were delivered in a clinic-like facility (NIPS, 2018). Pakistan is expected to reach the Goal of 100% ANC one visit by 2025. Demographic Health Survey Sri Lanka reveals that there is a 19% increase in women who attend at least one Antenatal care by professional during their Pregnancy from 1993 to 2017. And 93% of women received more than 4 times ANC according to DHS 2007. Sri Lanka and Maldives have already reached the goal of 99% in 2017.

8. CONCLUSIONS

It is concluded that most SAARC countries are struggling to achieve 100% one Antenatal care visit. This is an alarming situation for southeast countries as the new guidelines for ANC visits by WHO are more than 8 visits for Women during their Pregnancy.

Sustainable development goals for maternal health cannot be achieved till 2030 and the Pandemic situation has alarmingly affected the Health sector, Strains and disparities are expected according to the latest studies due to the Pandemic (Kotlar, Gerson, Petrillo, Langer, & Tiemeier, 2021; Ogunkola et al., 2021).

9. RECOMMENDATIONS

This study is useful if new DHS are conducted and estimations can be compared with newly conducted surveys keeping in view the effect of the Pandemic.

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CONFLICT OF INTEREST

The authors declare that they have no competing interests.

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