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## Policy Simulation Analysis Health

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## SUMMARY

Antenatal (ANC), also referred to as prenatal care, i.e., care of pregnant mothers, is a key component of the health of a pregnant woman and the primary means of identifying and treating complications before birth, as also informing women about their health behavior. Antenatal care varies between countries and in different settings within each country.

In some countries, ANC includes about seven to 11 visits; however, there is some controversy over the number of visits necessary to provide adequate care. Limited data are available with regard to optimal frequency, timing and content of visits. This should be determined according to the needs and risk status of the woman and her fetus.

Our earlier papers indicated an unequal distribution of antenatal services in rural and urban areas. The information obtained is that women in rural areas make fewer ANC visits and receive fewer services than urban women. The percentage of women who make four or more ANC visits is much lower in rural areas (53 percent) than in urban areas (82 percent). Complications during deliveries was higher in rural areas than in urban areas. Besides, urban women made their first ANC visit earlier than rural women. More than half the urban women (51 percent) made their first ANC visit in the first four months of pregnancy, as compared with 43 percent of rural women.

Taken in the context of the wider healthcare sector, however, variations in the number of visits between urban and rural women was not perceived as a primary issue in child and maternal healthcare programs; there are more important issues before policymakers since the mid-1990s to the 20<sup>th</sup> century. For instance, the increase of the number, quality and free ANC visits countywide was more important at that stage. In recent years, there have been significant improvements. However, the variation of visits between urban and rural women has largely remained, albeit with a marginal rise.

The difference in ANC visits between urban and rural areas suggests that special attention must be given to the ANC program in rural areas by focusing on its content. The government's reform of 2008 in the field of obstetrical–gynecological (O/Gyn) medical care was aimed at providing qualified and accessible medical services to pregnant women. According to the certification mechanisms that have been implemented, all pregnant women were receiving delivery certificates, ensuring that medical services were provided free of charge across the entire country. With that goal achieved, however, the above figures illustrate that there is more to be done to improve both targeting and service utilization.

Many questions have been posed about the health benefits of ANC, especially in relation to costs. Given the limited resources for healthcare and the wide range of services provided as part of antenatal care, such questions must be dealt with. Care should be appropriate, cost-effective, and based on the needs of the specific pregnant woman.

Current policy must be adjusted to try and increase ANC visits by pregnant women in rural areas to a figure closer to that in urban areas. Hence, the policy question is: what is the

most cost-effective, affordable and applicable policy intervention to increase the benefit incidence of pregnant women receiving antenatal services in rural areas?

In earlier reports, the AST team presented three policy adjustment options to address improvements in program targeting. All options were designed for pregnant women in rural areas, selected as beneficiaries with the highest risk of inadequate antenatal service. All policy options have the same general objective of increasing access to ANC by pregnant women in rural areas.

Based on calculations, the third option was the most cost-effective, which illustrates the benefits of providing visits to doctors rather than the option of transport compensation. The comparison of average and marginal cost-effective ratios also proves that the third option is the best as it provides better (lower) marginal cost per effect. In order to ensure the effectiveness of the government's policy in the field, it is suggested that a pilot intervention be made in any one region in Armenia. The results of this project will give positive preconditions for expanding the intervention.

## INTERNATIONAL EXPERIENCE AND LITERATURE REVIEW

Recognizing the large burden of maternal and neonatal ill health on the development capacity of individuals, communities and societies, world leaders reaffirmed their commitment to invest in mothers and children by adopting specific goals and targets to reduce maternal and childhood–infant mortality as part of the Millennium Declaration.<sup>1</sup>

Antenatal care includes regular monitoring of the pregnant woman and her baby throughout pregnancy through routine regular examinations and a number of simple tests.<sup>2</sup> This can be done by a general physician (GP), midwife or obstetrician (or by a combination of these professionals). Tests could include routine tests, tests for special circumstances, or physical tests such as blood pressure measurement and ultrasound examinations if needed.

Antenatal care is important because it helps to maintain the mother's health during pregnancy, informs the parents about pregnancy, labor and child care and, in particular, provides a means of detecting problems at an early stage of pregnancy when they are more easily treatable.

Before the 20<sup>th</sup> century, women had no supervision during pregnancy and were seen by a doctor or midwife for the first time when they went into labor. The outcome was often disastrous with high rates of complications, often resulting in the death of the mother and/or baby.

Routine antenatal care has dramatically changed this situation for the better. However, it must be remembered that pregnancy and childbirth are natural events that often proceed without problems in the majority of cases. The role of ANC and the tests that go with it are simply to monitor the pregnancy and to identify those few patients who may develop problems so that appropriate treatment can be instituted.

Antenatal care is a complex of interventions that a pregnant woman receives from organized healthcare services. The interventions may be provided in approximately 12 to 16 antenatal care visits during the entire period of pregnancy. The purpose of antenatal care is to prevent or identify and treat conditions that may threaten the health of the fetus, newborn and the mother, and to help a woman approach pregnancy and birth as positive experiences. To a large extent, ANC can contribute significantly.

Many questions have been posed about the health benefits of antenatal care, especially in relation to its costs. Given the limited resources available to the sector and the wide range of services provided as part of antenatal care, such questions are important. Care should be appropriate, cost-effective, and based on the needs of the specific pregnant woman.

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<sup>1</sup> Dr. Tomris Türmen, Executive Director, Family and Community Health (FCH) Pregnancy, Childbirth, Postpartum and Newborn Care: A Guide for Essential Practice, World Health Organization, Geneva, 2006.

<sup>2</sup> <http://www.axapphealthcare.co.uk/personal/medical-health-centres/fact-sheet/antenatal-care-and-pregnancy>

Studies have clearly demonstrated that antenatal care prevents health problems for both mother and child. Yet, until fairly recently, little was known about which elements of antenatal care were particularly valuable. Studies show that many antenatal interventions may be unnecessary or have not shown to be beneficial. Nevertheless, components of ANC and timing continue to be introduced without scientific evaluation.<sup>3</sup>

In general terms, antenatal care is relatively expensive. In a multi-country, randomized trial carried out by the World Health Organization (WHO) in 1996, the average cost was about US\$ 3,000 per pregnant woman. The main cost of antenatal care was the interventions that were required for suspected problems found during the process of care. Therefore, antenatal care needs to be scrutinized and planned carefully. The WHO has developed and evaluated a simplified model of care and has demonstrated in a large study that it provides the benefits of more complicated models while tending to save money.

Policy considerations:

1. Antenatal care is one of the most important services in the healthcare system. Every pregnant woman should have full access to it.
2. Excessive, unnecessary and unproven interventions are often used on women with normal pregnancies. A simplified model of care, as developed by the WHO, based on evidence of benefit, seems quite appropriate.
3. Many antenatal interventions have never been evaluated, and there is a great need for more research.

The primary goals of such care interventions are to:

1. Detect early factors that may heighten the perinatal risk of both individual pregnancies and members of vulnerable groups.
2. Intervene to improve outcomes.
3. Educate all who provide or receive care.
4. Help make pregnancy and birth a positive life experience.

Antenatal care includes planning for pregnancy and continues into the early neonatal and postpartum period. Health services generally consider that this begins with a pregnant woman's first visit to receive antenatal care and continues until the birth of the baby. The ANC model in Western Europe, North America and many other countries includes 12 to 16 visits to healthcare services by the pregnant woman, as well as healthcare visits to her home. The first visit ordinarily focuses on taking a detailed social, family, medical and obstetric history, carrying out a complete physical examination, and making a risk assessment, which requires a broad range of laboratory tests. Subsequent visits include simpler examinations, though some examinations are still conducted at every visit. Later in pregnancy, examinations focus on the status of the developing fetus and the preparation for a safe delivery.

An increasing number of complex examinations and interventions become part of modern antenatal care. Besides these examinations and the treatment of any adverse conditions

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<sup>3</sup>"What is the Efficacy/Effectiveness of Antenatal Care and the Financial and Organizational Implications?"  
*Health Evidence Network*, World Health Organization/Europe, December, 2003.  
([http://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0007/74662/E82996.pdf](http://www.euro.who.int/__data/assets/pdf_file/0007/74662/E82996.pdf))

detected, the pregnant woman may also receive health education and psychological and social support from the health services. As a result, an average pregnant woman in many countries receives 150 or more specific tests/examinations/interventions during pregnancy. This broad range of options makes evaluation of antenatal care a challenge.

It is generally assumed that antenatal care succeeds in meeting its goals. Thus, the main focus in assessing the effectiveness and cost-effectiveness of antenatal care is on the individual examinations and interventions, and on the indications for their use.

Maternal mortality is unacceptably high. About 1,000 women die from pregnancy- or childbirth-related complications around the world every day. In 2008, 358, 000 women died during and following pregnancy and childbirth. Almost all these deaths occurred in developing countries, and most could have been prevented. Key facts to support these statements are:<sup>4</sup>

- Every day, approximately 1,000 women die from preventable causes related to pregnancy and childbirth.
- 99 percent of all maternal deaths occur in developing countries.
- Maternal mortality is higher in rural areas and among poorer and less educated communities.
- Adolescents face a higher risk of complications and death as a result of pregnancy than older women.
- Skilled care before, during and after childbirth can save the lives of women and newborns.
- Between 1990 and 2008, maternal mortality worldwide dropped by one-third.

Improving maternal health is one of the eight Millennium Development Goals (MDGs) adopted by the international community in 2000. Under MDG5, countries are committed to reducing maternal mortality by three-quarters between 1990 and 2015. Since 1990, maternal deaths worldwide have dropped by 34 percent. In sub-Saharan Africa, a number of countries have halved their levels of maternal mortality since 1990. In other regions, including Asia and North Africa, even greater headway has been made. However, between 1990 and 2008, the global maternal mortality ratio (i.e., the number of maternal deaths per 100,000 live births) declined by only 2.3 percent per year. This is far from the annual decline of 5.5 percent required to achieve MDG5.

The maternal mortality ratio in developing countries is 290 per 100, 000 births, versus 14 per 100, 000 in developed countries. There are large disparities between countries, with some countries having extremely high maternal mortality ratios of 1,000 or more per 100, 000 live births. There are also large disparities within countries, between people with high and low incomes, and between people living in rural and urban areas.

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<sup>4</sup>Maternal Mortality, Fact Sheet No. 348. WHO, November, 2010.  
(<http://www.who.int/mediacentre/factsheets/fs348/en/index.html>)

Most maternal deaths are avoidable as the healthcare solutions to prevent or manage complications are well known. All women need access to antenatal care during pregnancy, skilled care during childbirth, and care and support in the weeks after childbirth. It is particularly important that all births are attended by skilled health professionals, as timely management and treatment can make the difference between life and death.

Where should antenatal appointments take place?<sup>5</sup> A meta-analysis of three randomized controlled trials (RCTs) examined whether a policy of home visits for antenatal care reduced the amount of antenatal care provided by nine hospital maternity units in France; 1,410 women with pregnancy complications were assessed. In the control group, women received the usual care provided by the maternity units, with visits to the out-patient clinics as necessary. In the intervention group, the women received one or two home visits a week by a midwife, in addition to the usual care. No difference in the rate of hospital admissions was found, but the average number of visits to the out-patient clinic was significantly lower in the two trials in which it was measured. Maternity care must be readily and easily accessible to all women. There must be sensitivity to the needs of the local population, and program interventions must be based primarily in the community.

An observational study explored the relationship between the number of antenatal visits made by 17,765 British women and adverse perinatal outcomes. No consistent relationship between admission to the neonatal unit or perinatal mortality and number of antenatal visits was found. A significant positive relationship between number of antenatal visits and caesarean sections was seen, and low birth weight (less than 2,500 g) was positively associated with number of visits for nulliparous, but not for parous, women. It is possible that the key issue is not more or less antenatal care, but the implementation of procedures that have been shown to be effective, and which may increase women's satisfaction with care received. The frequency of appointments can then be planned accordingly.

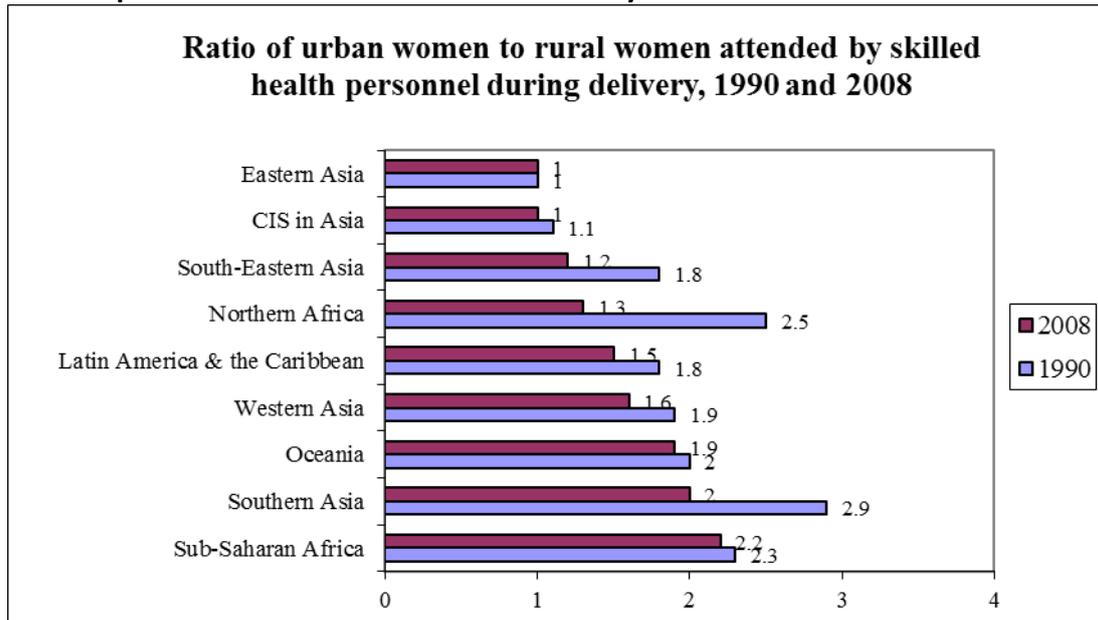
As mentioned, maternal healthcare is a priority in the policies of countries the world over, and disparities in ANC services between women in urban and rural areas are at the core of many analytical papers. Maternal healthcare is a target point in MDG5. To achieve this, a decrease in the gap between antenatal services among urban and rural areas is required. Studying the MDG 2010 report, we observed that in the period of study, the gap between urban and rural areas is narrowing.<sup>6</sup>

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<sup>5</sup> "Antenatal Care, Routine Care for the Healthy Pregnant Woman". National Collaborating Centre for Women's and Children's Health, Commissioned by the National Institute for Health and Clinical Excellence (NICE), March 2008, Funded to produce guidelines for the NHS by NICE

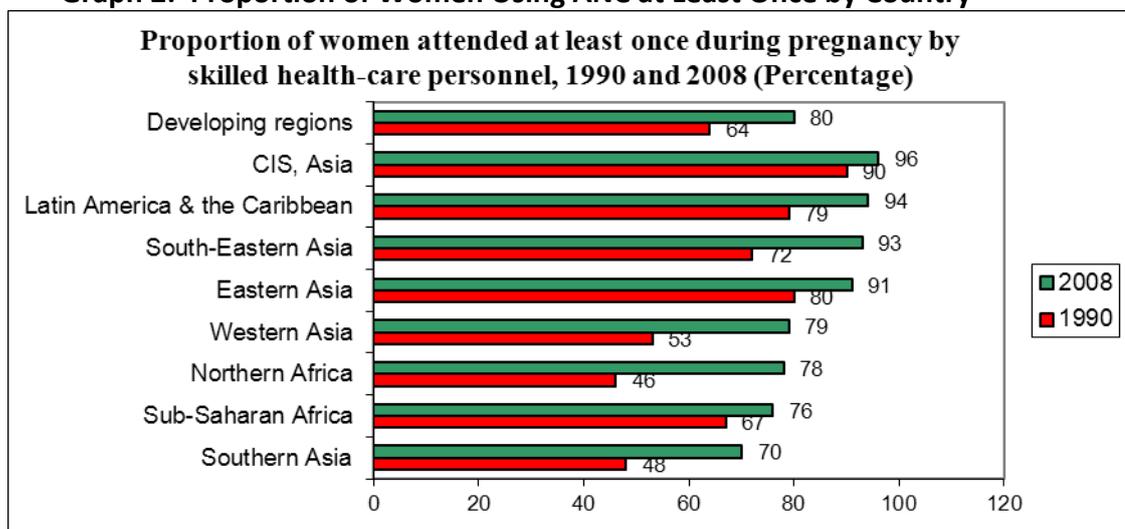
<sup>6</sup> The Millennium Development Goals Report, 2010. United Nations.

**Graph 1: Ratio of Women’s Attendance by Skilled Personnel in the World**



More rural women are receiving skilled assistance during delivery, reducing long-standing disparities between urban and rural areas. In South Asia, for example, urban women were three times more likely than their rural counterparts to receive professional care at childbirth in 1990; by 2008, they were only twice as likely to receive such care, indicating some improvement. Still, inequalities persist, especially in regions where attendance by skilled personnel is lowest and maternal mortality highest—notably in sub-Saharan Africa, South Asia and Oceania. Serious disparities in coverage are also found between the wealthiest and the poorest households. The widest gaps are in South Asia and sub-Saharan Africa, where the wealthiest women are five times more likely, and rural women three times more likely to be attended by trained healthcare workers at delivery. In the developing regions as a whole, women in the richest households are three times as likely as women in the poorest households to receive professional care during childbirth.

**Graph 2: Proportion of Women Using ANC at Least Once by Country**



In all regions, progress is being made in providing pregnant women with antenatal care. Remarkable gains were recorded in Northern Africa, where the share of women who saw a skilled health worker at least once during pregnancy increased by 70 percent. South Asia and Western Asia reported increases of almost 50 per cent.

Conclusions<sup>7</sup> for that case are as follows:

- The study reveals a large disparity between rural and urban areas in the use of antenatal care. Rural women go in for antenatal services later, make fewer visits, and use much fewer services than urban women.
- They make greater use of ANC in the private sector and at the primary level of the public health sector than women in urban areas.
- Despite the inadequate use of essential ANC services, women in both areas undergo more ultrasound examinations than necessary.

Interestingly, some of these findings echo the problems in Armenia, indicating that the problems of disparity of access to ANC services are not country-specific but are of a larger nature. A specific case for Kenya is presented in Annexure 5 of this paper.<sup>8</sup>

#### **POLICY ISSUE AND POLICY QUESTION**

As a post-Soviet legacy, Armenia inherited a healthcare system largely focused on hospital level care with outdated facilities, medical equipment and supplies; health providers with poor clinical skills; patients flocking to specialists for primary healthcare; and substantial inequities between urban and rural infrastructure and resources. In the mid-1990s, Armenia began major health sector reforms to develop a balanced partnership between primary healthcare and in-patient services to prevent disease and promote a healthy lifestyle. In spite of this, provision of healthcare is still not systematic and overarching. As a result, infant, child and maternal mortality rates are higher in rural than in urban areas.<sup>9</sup>

Many infant, child and maternal deaths can be avoided where emergency obstetric and newborn services are not available by providing a system of early identification of danger signs and viable referrals.

Armenian healthcare is divided into three levels of service delivery: primary, secondary (regional, district) and tertiary (national). The service delivery chain for the urban population is different from that in rural areas. In general, city dwellers receive primary healthcare (PHC) at polyclinics; on the other hand, the first point of contact for rural dwellers varies from health posts or rural medical ambulatory services to a regional/district level polyclinic. Health posts are located in rural areas, run by community nurses, and supervised by providers from nearby medical ambulatories or polyclinics. Located in rural and often isolated villages, health posts rarely fulfill crucial triage functions, and do not go beyond basic medical assistance and preventative activities.

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<sup>7</sup> See "Urban–Rural Disparities in Antenatal Care Utilization: A Study of Two Cohorts of Pregnant Women in Vietnam". *BMC Health Service Research*, 2011.

<sup>8</sup> AST will continue looking for more evidence on this matter across other countries.

<sup>9</sup> "Armenia Maternal and Child Health Referral System Study", USAID Project, NOVA, 2009.

The NGO Armavir Development Centre's 2009 working report ("Evaluation of Implementation of State Certificates System") illustrates that pre-delivery visits in rural areas are around 40 percent less than in urban areas.

The "Armenia Demographic and Health Survey" (ADHS) 2005 emphasizes the following: There is a lack of in-country targeted assessment and correlation of the impact of low utilization of antenatal services. However, the number of complications at delivery in rural areas is higher than in urban areas. The percentage (53 percent) of women who make four or more ANC visits in rural areas is less than the percentage (82 percent) in urban areas.

Therefore, the current policy must be adjusted to increase the level of visits to doctors by pregnant women in rural areas, such that it closes the gap in comparison to urban areas.

Reproductive and maternal healthcare in Armenia is implemented through an extensive system of ambulatory polyclinics and hospitals. The network of ambulatory healthcare is organized around geographical regions and is offered through women's consultation polyclinics and rural health facilities.

Obstetric care is offered at hospital obstetric–gynecological departments, regional delivery hospitals located in urban areas, and at republican centers for specialized (tertiary) care.

The health care that a mother-to-be receives during pregnancy and at the time of delivery is important for the survival and well-being of both the mother and the child. Antenatal care is described according to the type of provider, number of ANC visits, stage of pregnancy at the time of the visits, number of visits, as well as the services and information provided during antenatal care.

According to ADHS 2005, 93 percent of women who had a live birth in the five years preceding the survey received antenatal care at least once from a doctor (90 percent), or a nurse or trained midwife (3 percent). In urban areas, 94 percent of women received care from doctors, and 2 percent from nurses or trained midwives. In rural areas, 83 percent of women received antenatal care from a doctor, and 6 percent from a nurse or a midwife.

In almost all regions, at least nine out of 10 mothers received antenatal care from a trained professional.

However, only 78 percent women received antenatal care from a health professional (doctor, nurse or midwife) in Shirak region and 74 percent in Gegharkunik region.

In the five years since the 2000 ADHS survey, a significant increase has taken place in the coverage of ANC by a doctor from 84 to 90 percent, while care by a nurse or a midwife decreased from 9 to 3 percent.

Based on ADHS 2005, 71 percent of women who had a live birth in the five years preceding the survey made four or more antenatal care visits for their most recent birth. There is a significant variation between urban and rural areas.

In general, urban women appear to make their first ANC visit earlier than rural women. More than half the urban women (51 percent) make their first antenatal visit in the first four months of pregnancy, as compared to 43 percent of rural women. In the content of antenatal care, signs of complications at pregnancy are identified in 50.7 percent cases in urban areas and only 38.2 percent rural areas.

The ADHS 2010 shows that almost all women in Armenia (99 percent) received antenatal care.<sup>10</sup> This is an increase from 92 percent, recorded in the 2000 ADHS (NSS et al., 2001), and also from 93 percent, recorded in the 2005 ADHS (NSS et al., 2006). Practically all women who made use of ANC facilities saw a doctor (99 percent), and most of them (93 percent) saw a gynecologist. The role of nurse, midwife, or feldsher (paramedic) in providing ANC is gradually diminishing; it was 9 percent in 2000, 3 percent in 2005, and less than 1 percent in 2010.

There are small variations in provider use across sub-groups of women. The most notable differences are by region. In Lori, 76 percent of women saw a gynecologist, 5 percent went to see a family doctor, and 13 percent saw an internist. In Shirak, 86 percent of women saw a gynecologist, and 12 percent of pregnant women received ANC from a family doctor. In all other regions, more than 90 percent of women saw a gynecologist.

The prevention of complications during pregnancy and delivery and the successful outcome of the pregnancy for both mother and child are associated with the quality of antenatal care, the number of visits, and the timing of the first visit. The Ministry of Health has adopted the WHO's guidelines of at least four to six antenatal care visits for a normal pregnancy, and the first visit by 12 weeks of gestation.

Progress in access to quality ANC over time is evident in the increase in the proportion of women who made four or more antenatal care visits for their most recent birth. Annexure 1 shows that 93 percent of women who had a live birth in the five years before the survey made four or more ANC visits during pregnancy for the most recent birth. This is much higher than recorded in the 2005 ADHS (71 percent) and in the 2000 ADHS (65 percent). Less than 1 percent of women reported that they did not make an ANC visit, compared with 6 percent in the 2005 ADHS and 7 percent in the 2000 ADHS. Although there is some urban–rural differential in the percentage of women who made four or more ANC visits in 2010 (96 and 89 percent, respectively), the gap is much smaller than that reported in the 2005 ADHS (82 and 53 percent, respectively) and in the 2000 ADHS (82 and 45 percent, respectively).

Overall, 80 percent of women make their first ANC visit in the first trimester. Urban women are slightly less likely than rural women to have their first examination (79 percent compared with 82 percent) in the first trimester. There is a small difference between urban and rural women in the median number of months of pregnancy at the time of the first visit (3.3 and 3.4 months, respectively).

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<sup>10</sup> "Armenia Demographic and Health Survey 2010", National Statistical Service Yerevan, Armenia, Ministry of Health, Yerevan, ICF International Calverton, Maryland USA, April 2012.

**Table 1: Early Childhood Mortality Rates**

Neonatal, post-neonatal, infant and child mortality rates for the 10-year period preceding the survey, by background characteristics (urban–rural residence), Armenia 2000, 2005, 2010

Background Characteristics	ADHS 2000		ADHS 2005		ADHS 2010	
	Urban	Rural	Urban	Rural	Urban	Rural
Neonatal mortality	23.1	29.5	18	19	9	10
Post-neonatal Mortality	12.8	23.3	7	12	7	12
Infant Mortality	35.9	52.7	25	31	16	22
Child Mortality	1.4	6.8	2	11	2	4

Illustration and comparison of early childhood mortality rates over the last three ADHS's shows that there is a gap in the outcome indicators for urban–rural residence which could be the result of unequal distribution of ANC services in quality and accessibility. At the same time, there is a decline in mortality indicators that could indirectly be assumed to be the result of the increased number of ANC visits.<sup>11</sup>

Reproductive and maternal healthcare in Armenia is implemented through an extensive system of feldsher/obstetrician (paramedic) posts (FAPs), ambulatory polyclinics and hospitals. The network of ambulatory healthcare is organized around geographical regions and is offered through women's consultation clinics and rural health facilities. Obstetric care is provided at hospital obstetric gynecological departments, regional delivery hospitals located in urban areas, and republican centers for specialized (tertiary) care. Under the state's Basic Benefits Package (BBP), a set of limited reproductive health services is free of charge for all people, and broader services are free for certain vulnerable groups.

Hygienic conditions during delivery and supervision of delivery by trained medical staff reduce the risk of infections and ensure that complications during delivery are effectively handled. The 2010 ADHS collected information on the place of delivery for all children born in the five years preceding the survey, and on the type of medical staff assisting during delivery.

Almost all births (99 percent) took place in a health facility. The proportion of births in a health facility increased from 91 percent in 2000 to 97 percent in 2005, and to 99 percent in 2010. At the same time, deliveries at home declined from 9 percent in 2000 to 2 percent in 2005, and to less than 1 percent in 2010. There are small variations in location of delivery across sub-groups of women. The most notable differences are in the type of health facility

<sup>11</sup> We cannot insist on a confirmed negative relationship between the mortality and complication levels with the number of ANC visits as we do not have specific survey data on this. An assumption that the increased number of ANC visits in recent years has influenced the decrease in mortality rates is more than valid, and AST will try and address this issue in its next round of surveys.

across regions. The highest percentage of deliveries in the private sector are found in Aragatsotn (23 percent) and Armavir (14 percent).

Assistance at delivery by a health professional is universal in Armenia. A doctor attended 97 percent of live births during the five years preceding the survey. The role of nurse or trained midwife has declined in the past 10 years, from 14 percent in 2000 to 4 percent in 2005, and to 2 percent in 2010. There are no significant variations across groups of women. Being assisted at delivery by a feldsher is more common among older women and women with basic education (4 percent each). Relative to other regions, the role of nurses and midwives in assisting deliveries is prominent in Aragatsotn (13 percent) and Lori (8 percent).

This background information shows the positive trends in the sector, but also explains why this paper concentrates on the distribution gaps in antenatal care between urban and rural areas rather than child delivery and other aspects.

#### Existing Human Manpower Resources

Historically, Armenia has always had large medical manpower resources, being one of the most saturated republics in the territory of the former Soviet Union in terms of the number of physicians and nurses. Presently Armenia has 12,698 physicians (391 per 10,000 population) and 18,181 nurses/junior level medical personnel which constitutes 560 per 10,000 population.<sup>12</sup>

Although the total number of physicians is not high when compared with international standards, there are likely to be far more physicians with narrower specializations in Armenia. The number of nurses is relatively low in comparison to other countries and to the number of physicians and the distribution of nurses and physicians among the marzes (regional administrations) is unbalanced.

While the number of obstetrician–gynecologists (Ob/Gyn) is fairly adequate to cover the service needs of the population (despite the notable urban–rural disparities), there is today an obvious shortage in child/neonatal care specialist–physicians. This notable decrease in the number of specialists—pediatricians and neonatologists—has affected the performance of the neonatal/child healthcare system. As a consequence, there is a great need for physicians and neonatologists in some areas, especially in neonatal intensive care units (ICUs). The situation was also exacerbated by the fact that the pediatric department at Yerevan State Medical University was merged with the general practice department in 2005.

While evidence of excess medical workforce is present in almost all medical disciplines, these estimates however vary across professions and across geographic distribution with a rather sharp urban–rural disparity. Ex., According to Armenia’s NSS (2009), the number of practicing Ob/Gyn in Armenia in 2009 was 930, with 50 per 10,000 population, whereas the overall number of pediatricians was 1,030, comprising an estimate of 174 per 10,000 population (Armenia MOH/ NHIAC, 2009 Annual Report).

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<sup>12</sup> “A Conceptual Framework for the Activities Directed Towards the Improvement of Mother/Child/Reproductive Health Care”, USAID-funded HS-STAR Project prepared by Gohar V. Panajyan, June 2011.

With a more than sufficient number of Ob/Gyn, Armenia still has a rather poor distribution of these specialists across the country. Both urban out-patient care and hospital level maternal and child health (MCH) care facilities have a considerably high saturation of Ob/Gyn and other narrow specialists; on the other hand, however, there are some regions lacking adequate specialists in MCH care, especially in-patient care, suggesting a need for revising the existing health workforce planning schemes, beginning these efforts from the admission plans of the medical training institutions.

Out of 930 Ob/Gyn in Armenia, 631 are involved in clinical services delivery across the country, as are 188 neonatologists.

The number of nurses per 100, 000 population is low as compared to developed European countries and the Commonwealth of Independent States (CIS).

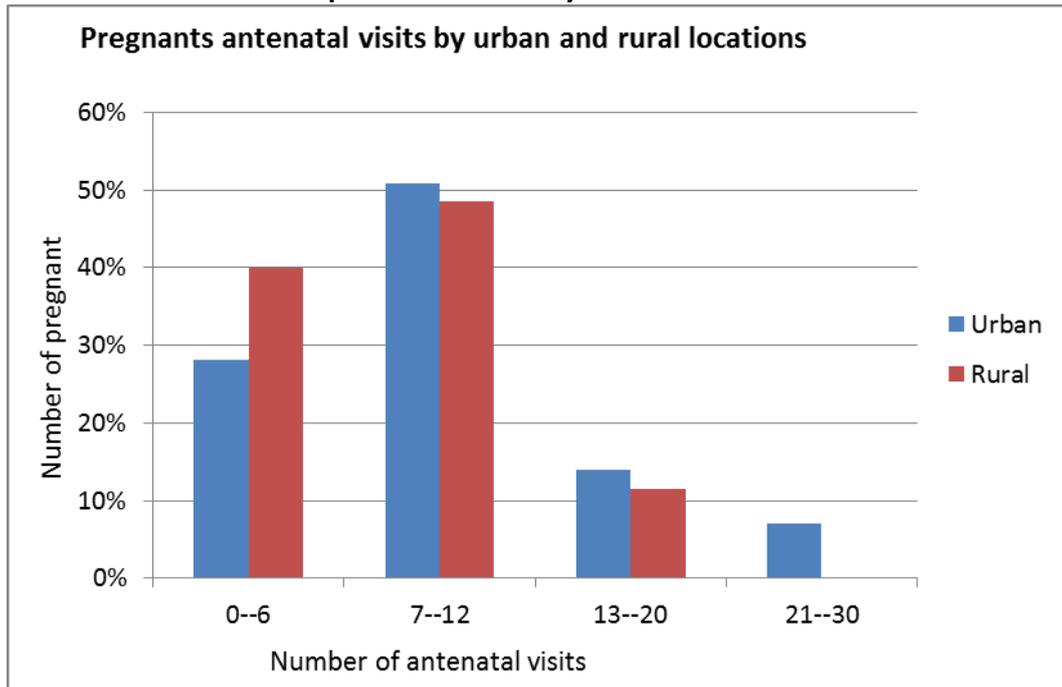
As of 1 January 2005, the number of Ob/Gyn beds comprised 2,473, of which 1,366 (55 percent) were obstetrical beds. The number of obstetrical and gynecological beds per 1,000 fertile women correspondingly comprised 14.9 and 4.0 beds per 1,000 fertile women, respectively.

Despite the rigorous efforts of the country in establishing and reinforcing the Family Medicine Institute of Armenia since 1996, mainly through training and re-training of family physicians, this institute is, in practice, more active in rural areas where the family physician is the only non-specialist practicing doctor. The situation is rather different in urban polyclinics where the family physicians are mostly specialists, and in the majority of cases, is unable to provide the full scope of services which the government had put in force for them. Overall, the number of actively practicing family physicians in the country is still well below the estimated targets.

#### AST survey

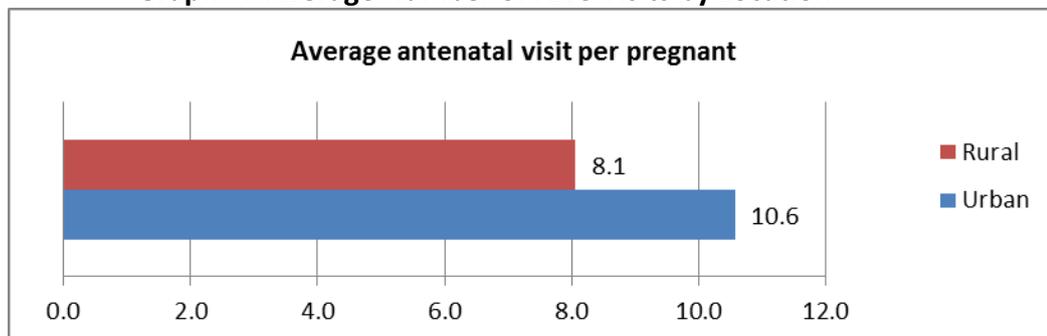
In June 2011, AST conducted a study of several aspects of cost-effectiveness in the fields of education, health and water on a sample of 1,600 households. Taking into account a special interest in antenatal care, an additional targeted study was conducted in different communities covering 200 pregnant women who had delivered during the past 12 months of the survey. The AST 2011 survey has shown that antenatal visits have increased, but the gap between rural and urban indicators still prevails. Antenatal visits in rural areas are 8.1, and 10.6 in urban areas. More detailed information on the findings of the survey are presented in Graph 3.

**Graph 3: ANC Visits by Location**



The Graph 3 shows that ANC visits below six is especially high amongst beneficiaries from rural areas. In the segment, seven to 12 visits, women from urban areas start to visit more frequently and this trend continues from that point. We observed no single beneficiary from rural areas who used ANC services more than 20 times per pregnancy, while there are 7 percent such cases for women in urban areas.

**Graph 4: Average Number of ANC Visits by Location**

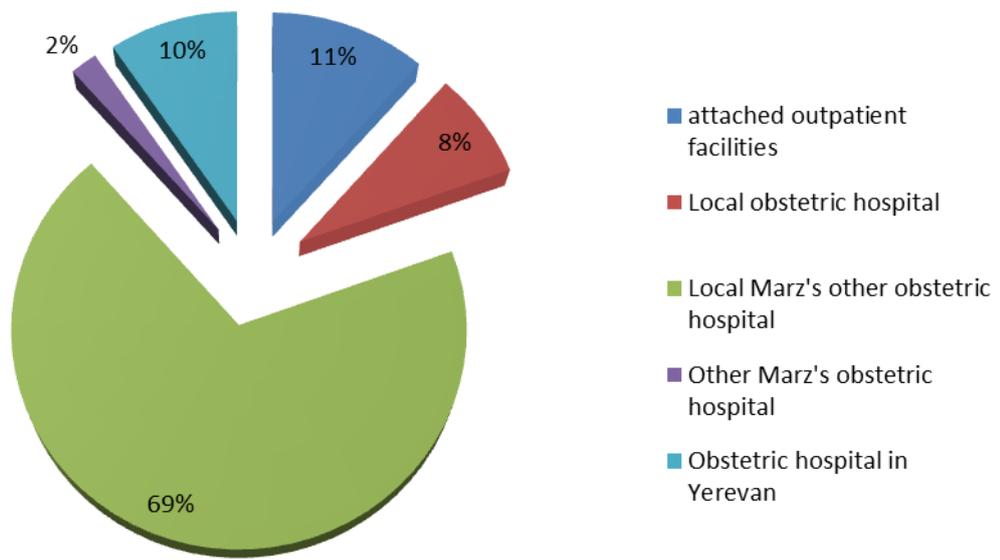


We observed the same picture in average numbers (see the Graph 4) which factually proves the earlier understanding of variance in ANC attendance by urban vs. rural women. Further, although the number of visits has increased in recent years, the difference between urban and rural beneficiaries remains.

Our recent survey addressed the issue of location with respect to ANC provision. As Graph 5 shows, the vast majority (69 percent) of beneficiaries had to travel to marz centers (regional centers) which are some distance from their residence.

**Graph 5: Location of ANC Visits**

**Where antenatal services took place?**



## DISCUSSION OF POLICY ALTERNATIVES AND SIMULATION OF SOLUTIONS

In this paper we have tried to identify several options that would help decision-makers deal with the issue of variance. As discussed in the earlier section on international experience, the number of visits may not be the primary factor in variance outcomes. There might also be the factor of quality of services provided to pregnant women. In our paper, however, we try to tackle the existing variance in quantity of services. It should be noted that as the primary purpose of this study is to decrease the gap in service utilization by pregnant women in rural vs. urban areas, the qualitative issues have not been targeted. The quality of ANC services is another issue that should be taken into consideration for future studies. However, ANC services provide to pregnant women regular check-ups that allow them to treat and prevent potential health problems throughout the course of pregnancy, while at the same time promoting healthy lifestyles that benefit both mother and child. Full coverage of ANC services can ensure referrals to specialized and more qualitative medical services that will prevent possible complications and provide adequate medical aid.

Thus, the AST team presented three policy adjustment options to address proper targeting of the program. All policy adjustment options are designed for pregnant women in rural areas as they are at highest risk from inadequate and proper antenatal services. The surveys conducted among pregnant women in rural areas show that pregnant women, that is, all beneficiaries of the ANC service program, make at least one ANC visit. The increase in the number of ANC visits in rural areas is the main purpose. Thus, all new policy options have the same objective of increasing access of pregnant women from rural areas to antenatal services. Therefore, this paper does not aim to discuss a change in the treatment of women in urban areas. In addition, as the only financing source for the ANC program is the state budget, the project also pursues to increase the governments' expenditure effectiveness.

Taking into account that the main purpose is the increase in the number of ANC visits in rural areas, the recommendations will be based on quantitative aspects of the current government policies in this area. More detailed options are described below, while further calculations of each option are presented in Annex 3.

The starting point for the options was the database of 16,000 pregnant women in rural areas. According to government assignment (certification mechanisms), all pregnant women across the entire country receive free delivery medical services. The aim of this mechanism is to provide qualified and accessible medical services to pregnant women. In recent years, some positive changes have been registered regarding increase of ANC visits. According to the AST survey of 2011, antenatal visits have increased up to 10 visits in urban areas and up to eight visits in rural areas on average. Despite the increase in the number of visits, there is still a gap between rural and urban indicators, and the purpose is to decrease this gap. Based on that, 10 visits is the baseline to be achieved per beneficiary in rural areas; the number of visits under the state budget funding is eight visits (simulative indicator). As a result, additional visits to be covered is 32 thousands visits.

Current policy must be directed to increasing the number of visits pregnant women make to doctors in rural areas to get closer to the level in urban areas and provide equal accessibility to medical services. The budget for medical services for pregnant women in rural areas is

258.4 thousand AMD, which means 16.2 thousands AMD per beneficiary, or 2 thousands AMD per visit. The presented calculations are updated based on the AST 2011 survey results.

#### Option 1: Status Quo Adjustments

In this option, no change is made in policy, and the government continues the implementation of existing programs on obstetrical–gynecological ambulatory–polyclinic services. The budget planned for pregnant women in rural areas and the number of visits assigned by the government is fully covered. However, even within the current framework, some savings can be made as the government purchases services for all pregnant women in the country while many of them in fact do not receive the services in the scale envisaged (number of visits). In any case, the government can introduce a more directly linked system that records the actual number of visits and compensates hospitals only for actual visits (as opposed to the current system of total registered number of pregnant women in that specific region covered by a particular hospital). The government pays doctors only for the actual visits, not for the number of registered pregnant women.

#### Option 2: Compensation for Transport

In this option, transport costs are subsidized so that women are able to travel long distances to the regional medical centers for out-patient services. This option addresses those beneficiaries who face financial difficulties in getting to medical centers regularly.

The direct cost of transportation and the number of visits from communities to regional centers is calculated. Only variable costs for reimbursement of transportation costs are considered. The transport reimbursement amount provided to pregnant women is 1,000 AMD per visit. As each beneficiary should make on average 10 ANC visits, the number of total visits to be achieved is 160 thousands visits, the total cost of this is 160 thousands AMD and the net cost of interventions is also 160 thousands AMD because of lack of savings. As the additional visits to be covered are 32 thousand, the cost-effective ratio for this option is 5,000.

#### Option 3: Home Visits

This option envisages a system of regular visits by medical specialists to rural locations. It addresses beneficiaries who face not only financial problems (which may not be the primary reason for low attendance), but also considers quality of infrastructure and the convenience of getting to medical centers. Costs include compensating pregnant women for transportation fees to health specialists in order to provide wider coverage and accessibility of medical services. For this option we have calculated the average number of pregnant women in an average rural community (based on National Statistics Service data). In this option, transport reimbursement is given to health specialists, which is 1,000 AMD for each visit. The number of total visits that should be made by specialists is 160,000. Meanwhile, each doctor can cover at least 10 beneficiaries per visit. Besides, as costs per visit for pregnant women is 2,000 AMD, the cost of each home visit (services fee per visit) will be 20.2 thousands AMD. As a result, the total cost of interventions is 339 million AMD; in addition, the planned budget is 258 million AMD. Therefore, the net cost of intervention for this option is 80.6 thousands AMD. Taking into account that additional visits to be covered is 32,000, the cost-effectiveness ratio for this option is 2.52 thousand.

Effectiveness is measured and estimated based on the number of pregnant women in rural areas and any additional visits they make, receiving the full scale of antenatal services within the 2<sup>nd</sup> and 3<sup>rd</sup> policy options.

**Table 2: Cost-effectiveness Measures by Policy Options, Beneficiaries**

Policy options	Coverage/ Beneficiaries	Total Cost of Intervention, in '000 AMD	Savings in' 000 AMD	Net Cost of Intervention in '000 AMD	C/E Ratio in '000 AMD
Option 1: Status Quo Adjustments	16,000	-	-	-	-
Option 2: Compensation for Transport	16,000 <sup>13</sup>	160,000	-	160,000	10.00
Option 3: Visits at Home	16,000	339,027	258,422	80,605	5.04

Table 2 presents the options with number of beneficiaries (pregnant women) being the “effect” measure. However, it is more beneficial from a presentation perspective to transform this effect measure into the “number of visits” as the policy issue in Armenia is not the number of beneficiaries being covered by the program, but the volume of the budget for services that are utilized by the beneficiaries (i.e., number of visits). In other words, the primary purpose of this policy proposal is to decrease the gap between service utilization by pregnant women in rural vs. urban areas.

Therefore, these options have been transformed and presented in Table 3, such that “effect measure” is the additional number of visits. First, the calculation is made for the number of visits and then the number of additional visits is subtracted from the estimate of the current average number of visits in rural areas (compared with the number of visits in urban areas).

The purpose is to increase the number of visits up to 160 thousand visits, thus covering an additional 32 thousand visits in the case of Options 2 and 3 in comparison to Option 1.

Effectiveness Measurement for Total Number of Visits

**Table 3: Cost-effectiveness Measures by Policy Options, Number of Visits**

Policy Options	Coverage/ Visits	Net Cost of Intervention in '000 AMD	Total Cost of Program for Rural in '000 AMD	Marginal C/E Ratio in '000 AMD	Program C/E Ratio in '000 AMD
Option 1: Status Quo Adjustments	128,000	-	-	-	

<sup>13</sup> The actual level of participation is difficult to predict (most likely it will be below the 100 percent level). Different scenarios in participation ratio can be applied here (10, 25, 50, 75 and 100 percent). However, we did not present those results in the table as the function is linear and the cost-effectiveness ratio is the same for all the models—it is only the scale of financing that moves linearly with the participation ratio. This is explained by the fact that this option, in fact, carries no fixed costs and variable costs are constant per user.

Policy Options	Coverage/ Visits	Net Cost of Intervention in '000 AMD	Total Cost of Program for Rural in '000 AMD	Marginal C/E Ratio in '000 AMD	Program C/E Ratio in '000 AMD
Option 2: Compensation for Transport	160,000	160,000	418,422	5.00	2.62
Option 3: Visits at Home	160,000	80,605	339,027	2.52	2.12

As observed, Option 3 presents the lowest cost-effectiveness measure (although the first policy option has no effect, it is not considered as a change in the current policy).

Table 4 summarizes the data above and presents average and marginal cost-effective measures by policy options. Option 3 has the lowest cost-effectiveness ratio and is worthwhile from a finance perspective.

**Table 4: Average and Marginal C/E Ratios by Policy Options**

Policy Options	Average			Marginal		
	Coverage / Visits	Total Cost of Program for Rural in '000 AMD	C/E Ratio of Program in '000 AMD	Change in Coverage	Net Cost of Interventi on in '000 AMD	C/E Ratio of Option in '000 AMD
Option 1: Status Quo Adjustments	128,000	-	-	-	-	-
Option 2: Compensation for Transport	160,000	418,422	<b>2.62</b>	32,000	160,000	<b>5.00</b>
Option 3: Visits at Home	160,000	339,027	<b>2.12</b>	32,000	80,605	<b>2.52</b>

The conclusion based on financial aspects echo the recommendation of adopting Option 3 from a policy implementation perspective. Option 2 has a significant disadvantage in that it has a higher risk level, and lower participation of pregnant women. This caveat is based on an assumption that the financial issues may not be the most significant impediment for pregnant women in rural areas to visit regional healthcare centers. The reasons may vary from infrastructure to culture.

#### Discussion of Implementation Aspects of Policy Options

Interestingly, the comparison of average and marginal cost-effective ratios (of the total program costs and total number of beneficiaries vs. marginal costs and marginal increase of beneficiaries) also proves that Option 3 is the best as it provides better (lower) marginal cost per effect.

Another method for selecting the most optimal policy option can employ a piloting of two or even all three<sup>14</sup> options, so each option might be piloted in a separate community or even region, and then information gathered can be analyzed before a full-scale implementation of any of the three options.

In this paper we have not discussed the creation and development of antenatal medical care facilities in rural communities which, if intended, is a long-term alternative. We believe that improved and accessible antenatal healthcare infrastructure in rural areas is a fundamental policy approach that needs comparably huge financial contributions (in terms of capital investment and qualified professional personnel) from the state budget. Current trends regarding state budget allocation for the health sector are not optimistic in this regard.

It is also important to stress that the implementation of the adjusted policy intervention to address the disparity of ANC benefit incidence between the urban and rural areas does not require a specific time-consuming preparatory stage. In fact, the results of the adjusted policy may show an impact within one fiscal year or so.

In our recent survey among primary beneficiaries we also addressed the preferred policy choice by the users.

Graph 6 shows that although the highest share of answers went to policy Option 2 (37 percent), the combined answers (physicians' regular visits to homes and mobile visits to communities), the share of answers posed for policy Option 3 is in fact higher (45 percent).

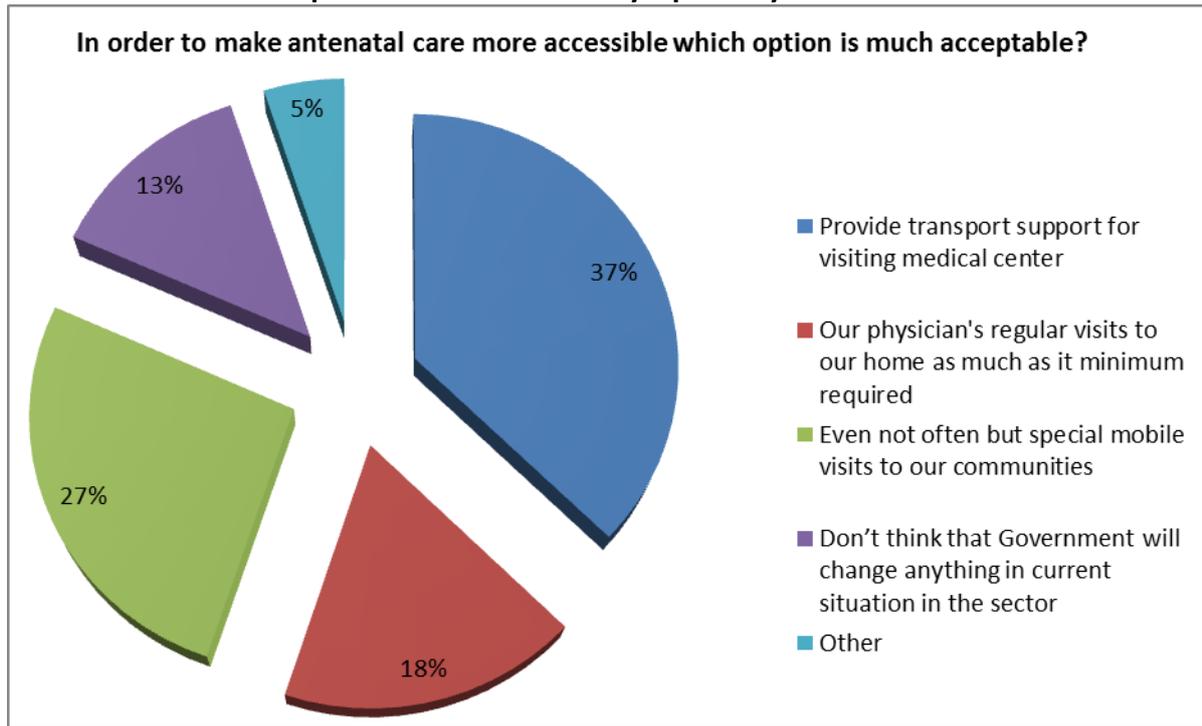
The question regarding Option 1 was not posed due to its nature and absence of relevance to beneficiaries' opinion on this.

Graph 5 in the previous section supported the idea that most of the beneficiaries had to travel to regional centers and this might naturally have presented an additional burden and inconvenience (not financial) to pregnant women. This also supports the idea that in-house visits by specialists is more favorable even apart from purely financial and cost-effectiveness reasons.

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<sup>14</sup> Piloting of the "status quo" option may also show some unplanned, non-financial positive results so that hospitals can become more active in offering their services to pregnant women (including making phone calls, reminders, etc.)

**Graph 6 Preference of Policy Option by Beneficiaries**



In general, we believe that all this data must be presented, analyzed and assessed by relevant policy decision-makers in tackling the issue of unequal benefit incidence amongst beneficiaries from urban and rural areas.

## **POLICY IMPLEMENTATION**

### **Policy Decision**

Based on the arguments presented in earlier sections, the AST team recommends that appropriate decision-makers from the Armenian government consider and design a policy intervention package aimed at reducing the gap between the benefit incidence of ANC services in rural and urban areas. As stated, the vast majority of pregnant women have to visit distant healthcare facilities even for general check-ups, leave aside complicated cases. The AST recommends that the policy package be based on Option 3. However, the government may choose to try and test the efficiency and effectiveness of other option in some pilot areas as a basis for further policy improvements.

It will be better if the Ministry of Health designs policy changes to fit into the MTEF/Budget allocation for the 2012 cycle. If this opportunity is lost, the option to allocate resources in the 2013 detailed budgeting is still valid.

The Ministry, however, will still need to consider a wider set of implications when implementing the recommended option, i.e., issues related to staffing. Even if the number of qualified personnel in regional centers are adequate to cover the existing number of visiting pregnant women at this stage, this does not automatically mean that the same number of personnel will suffice while implementing Option 3. The Ministry may analyze the possibility of outsourcing some of the rural visits to capital city personnel or find other optimal options for mapping staff resources with required visits.

The recommended policy alternative needs to be drafted by the Ministry of Health and by the Ministry of Finance in an MTEF paper and in annual budget law. After the decision on the implementation of a policy alternative is taken, the state order agreement should be adopted between the Ministry of Health and service providers.

We have outlined the tentative timetable of activities to be conducted by the Ministry of Health in the “Next Steps” section of this chapter.

### **Improvements in Legislation**

Our health expert has reviewed relevant legislation in order to identify the need for improvements in this area. Two main legal acts pertain to ensuring a pregnant woman’s right to receive medical services in the country: “Medical aid and services for the population” and “People’s reproductive health care”. More detailed provisions on policy implementation of a technical nature are in sub-legislative norms and are defined by the government and ministerial decrees.

In sum, we did not identify any major legislative impediment to enforce the recommended approach and all the necessary adjustments can be done by the government’s internal normative acts.

More specifically, practical organization of medical care is regulated by the Health Ministry's decree "on Standards of Medical Services". Thus the team recommends amendments in Order of the Minister of Health "on Standards of Organization of Obstetrical-gynecological Medical Services within State Guaranteed Free of Charge Medical Care Framework."

### **Improvements in Data Collection and Monitoring**

The most important gap faced by the AST team is the absence of data on factual antenatal visits. Also, there is no observation system that can estimate the correlation between services provided and status of beneficiaries' health.

Based on these challenges, the AST team recommends developing and implementing an antenatal care utilization registration and reporting system as well as regular monitoring mechanisms. It is also important to monitor complications during pregnancy and compare corresponding indicators for rural and urban areas. The important policy target is improvement of accountability in the health sector.

Therefore, AST recommends that the Ministry of Health should issue a special order to healthcare institutions and relevant staff to regularly report on actual visits by pregnant women. This will enable the Ministry to further analyze different aspects of efficiency and effectiveness of ANC service provision in the country. This recommendation, in fact, is relevant to all institutions (and not only in regions). Specific data to be collected may include:

- The date of first visit for ANC.
- Stage of pregnancy (period in months) at the first visit.
- Residence (marz, city/village).
- Age.
- Education level.
- Number of existing children.
- Responsible doctor.
- Nature of antenatal complications (if any).<sup>15</sup>
- Child delivery date
- Nature of perinatal, postnatal and neonatal complications (if any).

It will then be possible to aggregate and analyze this data for relevant correlations by different factors on assessing the causal relationship between those factors and outcomes. The list of data fields presented here must not be considered as final; the Ministry should consider further enhancement of this list with other factors that may be of interest to analysts.

It will also be beneficial if the Ministry allocates some financial resources for regular surveys (perhaps annual surveys) in order to check some of the data that cannot be collected by doctors. That will also help the Ministry to double check the reliability of data provided by

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<sup>15</sup> Although currently no grouping by complications has been done, the Ministry may consider this as a possible enhancement to the suggested approach. As we were informed, such grouping had taken place in the country before the collapse of the USSR.

the ministerial administrative system. The tentative cost for such an annual survey will not exceed US\$ 10,000 (if outsourced to a private research organization). The Ministry may also consider using the National Statistics Service systems by requesting additional relevant fields in the annual National Households Survey.<sup>16</sup> In any case, the AST team is ready to share the relevant methodology materials used in their 2011 survey, or cooperate in designing such mechanisms for future surveys.

## **Risk Management**

Although there were no major risks associated with the contents of the recommended policy changes, there were two significant risks present:

- **Budgeting:** the government may not find the required resources to implement the recommended solutions. However, the overall cost of the policy changes recommended is a small portion of the overall budget of the “Services of Obstetrical-gynecological Medical Assistance” program that is implemented in Armenia. It forms only 4.2 percent of the program, 0.5 percent of the total healthcare budget, and only 0.03 percent of the total budget of the country. Given the fact that the government has declared maternal healthcare services as a priority, we believe that allocation of 8.6 billion AMD annually is affordable and financially sustainable to start from the 2013 budget.
- **Personnel:** there is a high risk of deficit of adequate personnel (gynecologists, midwives, etc.) to operate policy Option 3 at the national level. This risk has not been analyzed by the AST team, but it is an area of analysis for the Ministry in identifying solutions to the problem. Possible solutions may be found in discussing this issue with relevant universities and colleges, other departments of the Ministry and hospital administrations in putting in place mandatory allocation mechanisms for those young professionals interested in promoting their career in this field.

For purposes of risk management, and in case the recommendations are not adopted for the 2013 budget, we suggest that the Ministry of Health formulate a solid policy paper and submit it to the government in further MTEF/Budget cycles, while at the same time working on managing personnel related risks in order that this risk factor is fully controlled by the time funding becomes available.

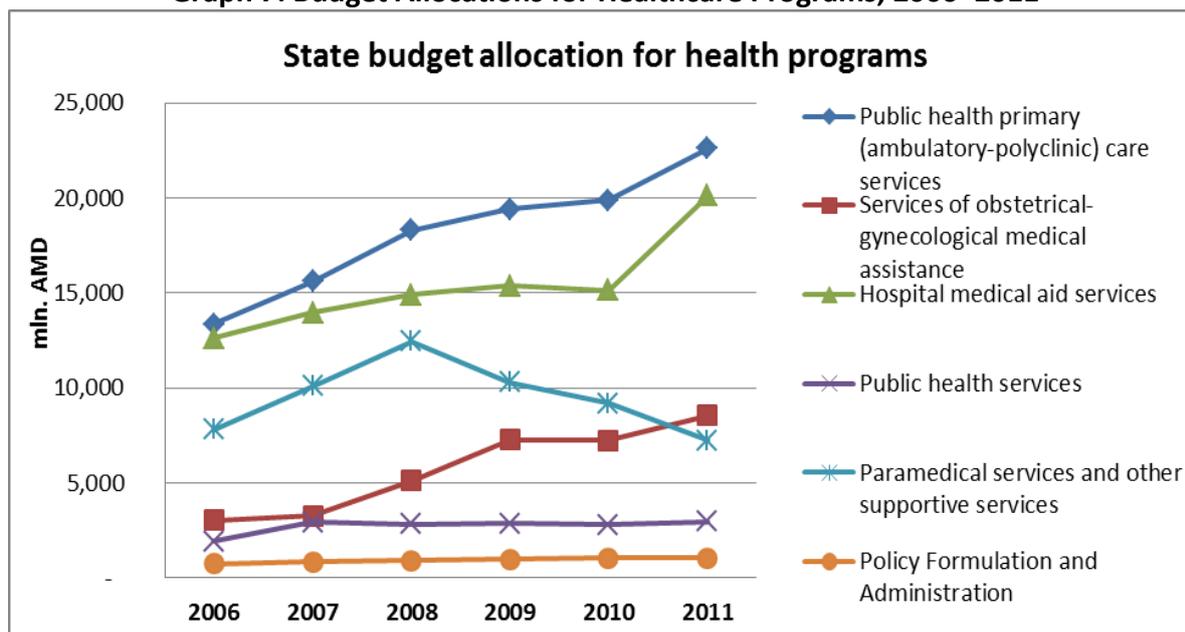
## **Financial Framework**

Chart 7 shows the state budget allocation for obstetrical–gynecological medical care services during the period of study. It demonstrates a higher growth rate among other healthcare programs. This financial trend is a positive precondition for further improvement of antenatal care in the country, with the focus on development of highly qualified medical personnel and accessible antenatal services.

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<sup>16</sup> This option may cost the government significantly less to operate, but may contain some bureaucratic and timing issues.

**Graph 7: Budget Allocations for Healthcare Programs, 2006–2011**



As Graph 7 shows, the Armenian government has paid significant attention to, as also provided funding for, the “Services of Obstetrical-Gynecological Medical Assistance” program in recent years. The numbers have more than doubled (2.8 times) over the period 2006 to 2011, while the overall health expenditure has increased only 1.6 times. The share of this program in total healthcare programs has reached 14 percent in 2011, while it was only 8 percent in 2006.

Our indicative assessment of implementation of the policy Option 3 will additionally be around 4.2 percent<sup>17</sup> of the total cost of the “Services of Obstetrical-Gynecological Medical Assistance” program, only 0.5 percent<sup>18</sup> of the total healthcare budget, and 0.034 percent of the total state budget for 2012.

Thus, we see that the financial aspects of implementation of the policy recommendations will not have a dramatic impact on the healthcare budget.

### Next Steps

Table 5 presents a recommended set of activities to be performed by the Ministry of Health in promoting policy changes suggested in this paper. If there is an in-principle agreement on introducing the recommended approach, the policy can be funded and commenced in 2013.

<sup>17</sup> Source: AST calculations based on 2012 State Budget, [www.mfe.am](http://www.mfe.am)

<sup>18</sup> Ibid.

**Table 5: Timetable of Activities in Promoting the Policy Recommendation**

Steps	Feb -12	Mar -12	Apr -12	May -12	Jun -12	Jul -12	Aug -12	Sep -12	Oct -12	Dec -12
Step 1. Internal ministry discussion of the PS paper presented by AST for decision-making										
Step 2. Discussion with Ministry of Finance and with the professionals, community and civil society										
Step 3. Presentation of the policy document to the government										
Step 4. Discussion by government, presentation to the Cabinet session and approval										
Step 5. Reflection of the government approved policy proposal in the draft budget bid 2013 (by MoH)										
Step 6. Development and introduction of mechanisms and a system of accountability and monitoring										
Step 7. Public outreach events, public hearings, press conferences of relevant representatives										

## IMPACT ANALYSIS

The recommended policy option presented will help pregnant women in rural areas to make more ANC visits which, in turn, must contribute to an improvement of service outcomes in this sector. Unfortunately, there is currently no solid, quantified assessment of the impact of quantity of visits on outcome indicators such as antenatal, postnatal complications and/or mortality. As we have already mentioned, one of the recommendations is to start collecting relevant data so that there is some prospect of undertaking better grounded and evidence-based adjustments in future policymaking processes.

However, with our limited data, there is still significant evidence that the infant mortality ratio (after improvements in data collection methodology) is higher in rural areas, where AST also observed few ANC visits. According to official data for 2009 and 2010, the infant mortality ratio in rural areas was 11.7 (vs. 9.6 for urban areas) and 11.8 (vs. 11.3 for urban areas).<sup>19</sup>

In assessing the benefit incidence gap for ANC services amongst pregnant women in rural areas, we approached this from two perspectives:

1. We observed that with the average number of ANC visits in rural areas being 8.1, the women from the poorest quintile make only seven visits, while women from the richest quintile make 15. In other words, women from the poorest quintile deliver 46 percent of total births, but only 40 percent of total ANC visits. So, there is a gap in terms of access to ANC services associated with the income/expenditure size of the household.<sup>20</sup> This is calculated based on the grouping by quintiles of all respondents from 1,600 households with data analyzed for rural women only. If, however, we double check this finding by assessing the same hypothesis for only rural women, and then group them by expenditure quintiles (a new grouping for filtered data), we still get a similar pattern, i.e., 29 percent of total births in rural areas are delivered by women from the poorest quintile, but only 23 percent<sup>21</sup> of ANC visits are made by these same women. The main factor, as we see it, in explaining this is financial (as it naturally falls from the grouping by expenditure quintiles).
2. As mentioned already, regardless of expenditure quintile, women in rural areas make noticeably fewer ANC visits than those from urban areas (8.1 vs. 10.6). The reasons for this pattern may be financial, but also others such as geographical location (distance from the medical centers), infrastructure problems (bad roads), time, etc.

A combination of both sets of factors (financial and others) from our current survey reveal that rural women have less access to ANC services than urban women. Therefore, a reflection of these two gaps is that the policy change must be aimed at having an impact on improving them both.

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<sup>19</sup> The Demographic Handbook of Armenia 2011, p. 81, National Statistics Service.

<sup>20</sup> Calculations on determination of quintiles was done on household per capita basis.

<sup>21</sup> Although the general pattern is identical, the difference in numbers by using a different methodology is explained by the fact that there are more poor people in the 1<sup>st</sup> quintile country-wide and thus a stronger imbalance in distribution of both number of births (46 vs. 29 percent).

We believe that implementation of the recommended policy will improve the output indicators of the quantity of ANC services for pregnant women in rural areas regardless of their income level. Provision of services at home will diminish both the geographic and income factors. Thus, the ideal indicator of the success of the recommended policy change is that we have significant improvements in both dimensions, i.e.:

1. Indicator 1: smoother distribution of average number of ANC services amongst the quintiles (i.e., the share of total ANC services in all quintiles is adequate to the share of total births in those quintiles). That means if, for example, 25 percent of total births are delivered by women from the poorest quintile, then around 25 percent of total ANC services must be delivered to these women.
2. Indicator 2: the existing gap in average number of ANC services between the rural and urban areas must be close to zero.

There is, however, a significant factor that can influence these indicators, and which is related to complications deriving from pregnancy. Naturally, beneficiaries with more complications may need more ANC visits. This factor may have some disturbing impact on the two indicators set as policy goals. Nevertheless, if the Ministry of Health enforces the recommendation of collecting more comprehensive data on actual level of services and associated data on complications and other information, that system will allow an adjustment in the analysis with this factor included, and we can still get a clear picture of the impact of the recommended approach.

## ANNEXURES

### Annexure 1: Number of Antenatal Care Visits and Timing of First Visit

The percentage distribution of women in the age group 15 to 49 who had a live birth in the five years preceding the survey, by number of ANC visits for the most recent live birth and by the timing of the first visit, and among women with ANC, median months pregnant at first visit, according to residence (2010).

<b>Number and Timing of ANC Visits</b>	<b>Urban</b>	<b>Rural</b>	<b>Total</b>
<b>Number of ANC Visits</b>			
None	1.6	0.0	0.9
1	0.0	0.5	0.2
2-3	1.4	7.6	3.9
4+	95.6	88.8	92.8
Don't Know/Missing	1.4	3.0	2.1
Total	100.0	100.0	100.0
<b>Number of Months Pregnant at Time of First ANC Visit</b>			
No Antenatal Care	1.6	0.0	0.9
<4	78.5	81.5	79.7
4-5	18.0	17.7	17.9
6-7	1.8	0.5	1.3
Don't Know/Missing	0.2	0.2	0.2
Total	100.0	100.0	100.0
Number of Women	680	471	1,151
Median Months Pregnant at First Visit (for those with ANC)	3.3	3.4	3.3
Number of Women with ANC	669	471	1,140

## Annexure 2: Level of Satisfaction with the Government Services

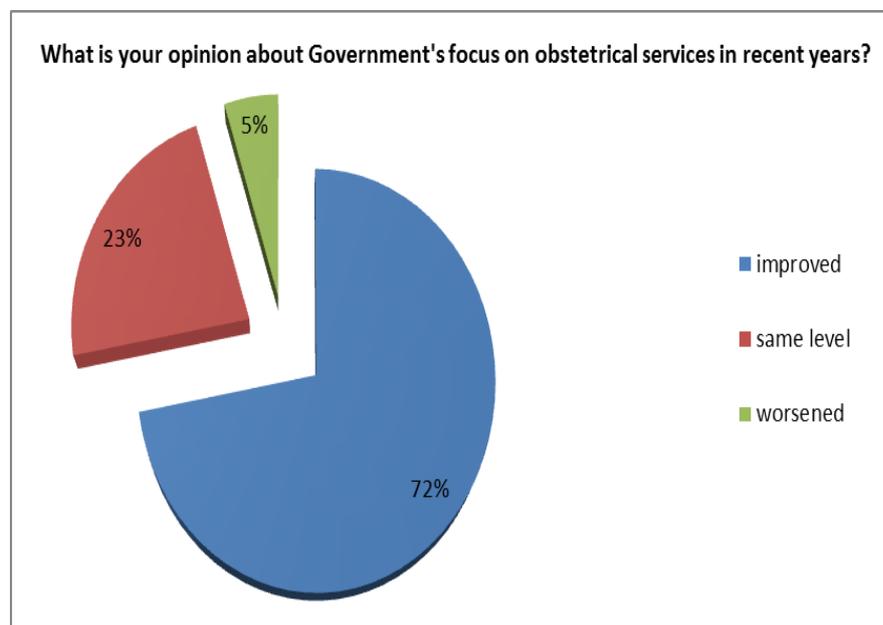
The government of Armenia makes efforts in developing obstetrical-gynecological medical care for the population. In 2008, the government initiated reforms in the field of Ob/Gyn medical care and increased state budget allocation for this program. The aim of these reforms is to provide qualified and accessible medical services to pregnant women. Since that year, certification mechanisms have been implemented. All pregnant women were receiving delivery certificates that ensured free delivery medical services across the country.

According to the 2009–2011 MTEF, the more relevant objectives for mothers' health care programs are the following:

- To increase accessibility to obstetrical services, decreasing maternal mortality at least by 20 percent.
- To improve quality of pregnant women's prenatal services, increasing pregnancy identification indicator by 30 percent.

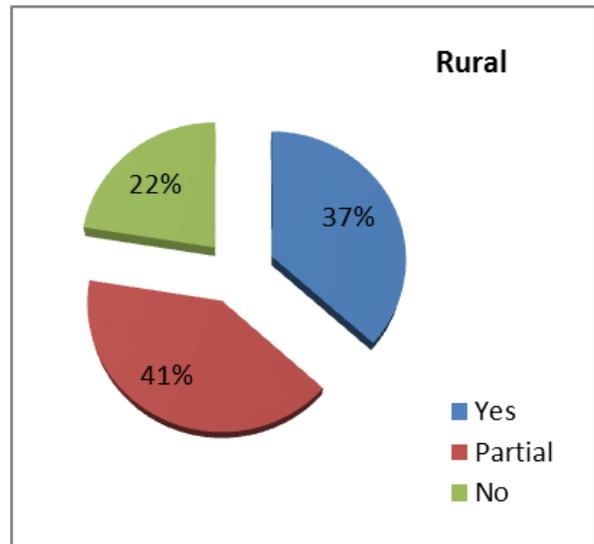
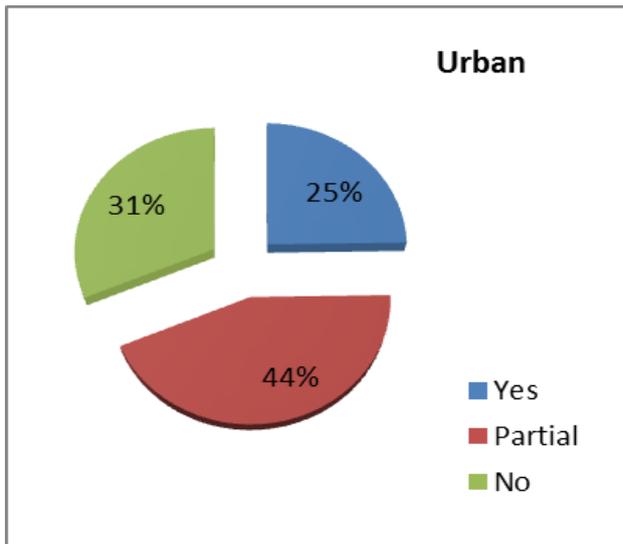
In our recent survey we addressed some aspects of the beneficiaries' satisfaction with the level of government services and recent changes already put in place.

As the tables below show, the population has generally responded positively to the government's recent initiatives.

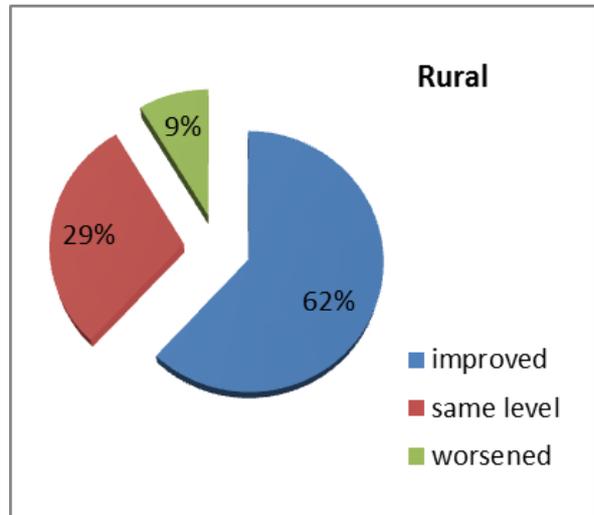
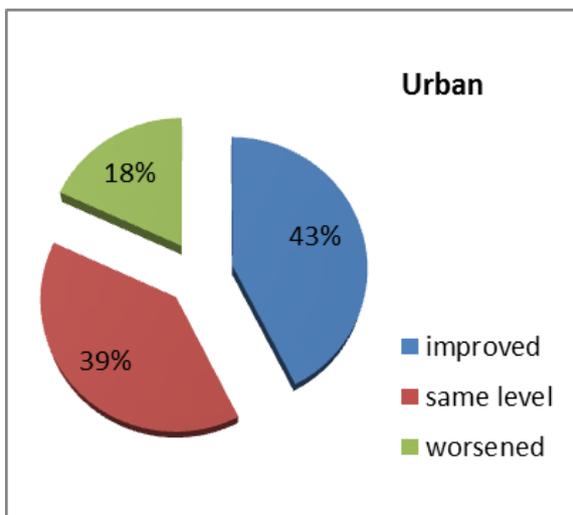


Interestingly, beneficiaries in rural areas are somewhat more positive towards the government's recent reforms.

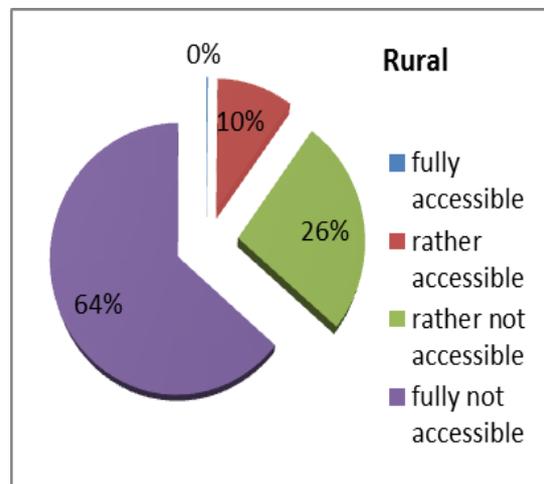
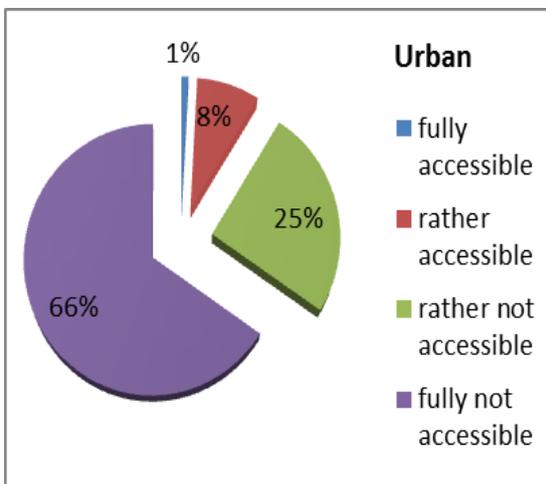
**Do you think that Government is acting in order to solve people's health issues?**



**Do you think that in recent years health care services are improved?**



**In sense of financial matter how accessible the medical services in Armenia are?**



### Annexure 3: Detailed Calculation of Policy Options

Base of calculations for policy options are the following indicators

- Average number of beneficiaries covered per visit (Option 3) - 10
- Number of visits assigned by the government as required - 8
- Average number of visits per beneficiary used as basis - 10
- Cost of each visit: transport reimbursement (Options 2,3) - 1000AMD
- Cost of each visit: services fee (Option 3) - 20189 AMD

Policy options	Coverage/ Beneficiaries	Coverage / Visits	Change in Coverage	Cost per Beneficiary in '000 AMD	Total Cost of Intervention in '000 AMD	Savings in '000 AMD	Net Cost of Intervention in '000 AMD	Total Cost of Program for Rural in '000 AMD	C/E Ratio of Option in '000 AMD	C/E Ratio of Program in '000 AMD
Option 1: Status Quo Adjustments	16,000	128,000	-	16	-	-	-	- 258,422		2.02
Option 2: Compensation for Transport	16,000	160,000	32,000	16	160,000	-	160,000	418,422	5.00	2.62
Option 3: Visits at Home	16,000	160,000	,32000	16	339,027	258,422	80,605	339,027	2.52	2.12

### Option 1: Status Quo Adjustments

Number of beneficiaries (pregnant women in rural areas)	16,000
Number of visits assigned by government as required	8
Coverage/ Visits	128,000
Change in coverage (additional number of visits)	-
Cost per beneficiary (covered by state budget), in '000 AMD	16
Cost per visit (covered by state budget), in '000 AMD	2
Total cost of intervention, in '000 AMD	-
Savings, in '000 AMD	-
Net cost of intervention, in '000 AMD	-
Total cost of program for rural, in '000 AMD	258,422
C/E ratio of option, in '000 AMD	-
C/E ratio of program, in '000 AMD	2.02

### Option 2: Compensation for Transport

Number of beneficiaries (pregnant women in rural areas)	16,000
Average number of visits per beneficiary used as basis	10
Coverage/ Visits	160,000
Change in coverage (additional number of visits)	32,000
Cost per beneficiary (covered by state budget), in '000 AMD	16
Cost of each visit: transport reimbursement, in '000 AMD	1
Total cost of intervention, in '000 AMD	160,000
Savings, in '000 AMD	-
Net cost of intervention, in '000 AMD	160,000
Total cost of program for rural, in '000 AMD	418,422
C/E ratio of option, in '000 AMD	5.00
C/E ratio of program, in '000 AMD	2.62

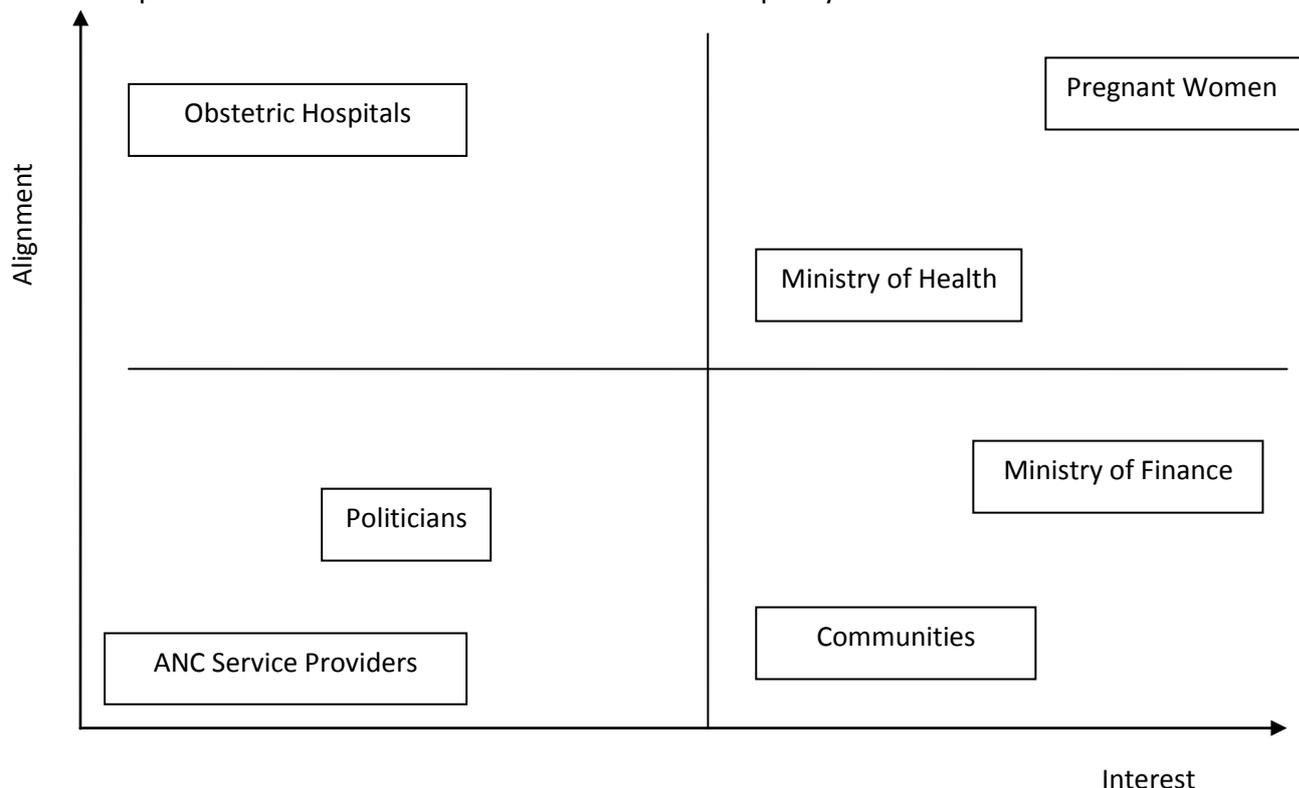
### Option 3: Visits at Home

Number of beneficiaries (pregnant women in rural areas)	16,000
Average number of visits per beneficiary used as basis	10
Coverage/ Visits	160,000
Change in coverage (additional number of visits)	32,000
Cost per beneficiary (covered by state budget), in '000 AMD	16
Cost per visit (covered by state budget), in '000 AMD	2
Cost of each visit: transport reimbursement, in '000 AMD	1
Cost of each visit at home: services fee, in '000 AMD	20
Average number of beneficiaries covered per visit	10
Number of villages	866
Average number of beneficiaries covered per village	18
Number of visits required	16,000
Cost per beneficiary (covered by government), in '000 AMD	16
Total cost of intervention, in '000 AMD	339,027
Savings, in '000 AMD	258,422
Net cost of intervention, in '000 AMD	80,605

Total cost of program for rural, in '000 AMD	339,027
C/E ratio of option, in '000 AMD	2.52
C/E ratio of program, in '000 AMD	2.12

#### Annexure 4: Stakeholder Mapping for Proposed Policy Option

This graph illustrates the occupation of the main stakeholders of the proposed policy initiative in terms of their interest and alignment. The mapping shows the lobbying among influential parties concerned in the context of the policy initiative's enforcement.



It is obvious as a primary observation and a preliminary analysis of a stakeholders' approach to the policy initiative that the most interested parties are consumers (pregnant women) and policymakers in the Ministry of Health. As a rule, politicians avoid making major changes in sensitive sectors (like the social sector in general and healthcare in particular) so as not to rock their career. The illustrative analysis indicates the nature of lobbying for policy enforcement among the most important players in the sector.

#### Annexure 5: Association between Maternal Characteristics and not Visiting an ANC, Asembo/Gem, Western Kenya, December 2002.

A survey conducted in a rural area of Western Kenya<sup>22</sup> (Asembo and Gem) shows that nine out of 10 women reported at least one ANC visit during their last pregnancy; however, two-

<sup>22</sup> "Use of Antenatal Services and Delivery Care among Women in rural Western Kenya: A Community Based Survey". (<http://www.reproductive-health-journal.com/content/3/1/2/>)

thirds of these women began using ANC services in the third trimester, and only half of these women made the recommended number of four visits.

Incomplete and inadequate services at the ANC center were some of the complaints mentioned by 29 percent of women. These women were more likely to begin with ANC in the third trimester (28 percent versus 20 percent among women who did not complain about the quality of ANC services, OR 1.5, 95% CI 1.0–2.3, P = 0.05), and had a lower median number of ANC visits (three), although this was not statistically significant (Mann–Whitney U test, P = 0.1).

A total of 64 women (10 percent) never attended an ANC center during their most recent pregnancy. The most frequently mentioned reasons for not doing so were because they did not see the need to (36 percent), cost of transport or the cost of ANC itself (27 percent), a perception that the care was not adequate (22 percent), and distance to the ANC center (14 percent). Of the 64 who did not attend, 27 percent sought alternative care during pregnancy from sources such as traditional birth attendants, religious functionaries or herbalists.

Factors associated with not attending an ANC are summarized in the table below. Adolescents (women < 18 years) and older women (> 34 years) were the least likely to attend. In a multivariate model, only < 8 years of education (adjusted odds ratio [AOR] 3.0, 95% CI 1.5–6.0) and medium/low SES (AOR 2.8, 95% CI 1.5–5.3) remained associated with never attending an ANC.

Factors associated with infrequent visits (< 3 times) among women who visited the ANC were similar to factors associated with not visiting at all, with the addition that being a single woman (single, separated, or divorced: AOR 2.5, 95% CI 1.3–5.0) was associated with making <3 visits to the ANC.

Association between maternal characteristics and not visiting an ANC, Asembo/Gem, Western Kenya, December 2002 is illustrated below

<b>Association Between Maternal Characteristics and Not Visiting an ANC, Asembo/Gem, Western Kenya, December 2002</b>				
	n (%*) who visited an ANC (N = 571)	N (%*) who did not visit an ANC (N = 64)	Factors associated with not visiting an ANC, univariate analysis OR (95% CI)	Factors associated with not visiting an ANC, multivariable analysis AOR (95% CI)
Age				
< 18 years	34 (6.0)	6 (9.4)	1.72 (0.67–4.43)	1.55 (0.36–6.72)
18–19 years	79 (13.8)	1 (1.6)	<b>0.12</b> (0.02–0.92)	0.16 (0.02–1.27)
20–29 years	282 (49.4)	29 (45.3)	Reference	Reference

30–34 years	99 (17.3)	9 (14.1)	0.88 (0.40–1.93)	0.53 (0.21–1.32)
> 34 years	77 (13.5)	19 (29.7)	<b>2.40</b> (1.28–4.51)	1.16 (0.51–2.67)
Parity				
Para 1	103 (18.0)	8 (12.5)	1.20 (0.49–2.91)	1.25 (0.33–4.80)
Para 2–4	231 (40.5)	15 (23.4)	Reference	Reference
Para ≥ 5	237 (41.5)	41 (64.1)	<b>2.66</b> (1.44–4.95)	1.95 (0.85–4.49)
Marital status				
Single/widow	79 (13.9)	9 (14.1)	1.02 (0.48–2.14)	
Married	491 (86.1)	55 (85.9)	Reference	
Socioeconomic status				
Low/medium	303 (54.5)	49 (76.6)	<b>2.73</b> (1.49–4.98)	<b>2.82</b> (1.49–5.34)
High	253 (45.5)	15 (23.4)	Reference	Reference
Education level				
< 8 years	291 (52.6)	51 (81.0)	<b>3.83</b> (2.00–7.33)	<b>3.02</b> (1.51–6.04)
≥ 8 years	262 (47.4)	12 (19.0)	Reference	Reference
Residence				
Asembo	293 (51.3)	26 (40.6)	0.65 (0.38–1.10)	
Gem	278 (48.7)	38 (59.4)	Reference	
Distance to ANC				
Walking < 1 hr	298 (52.2)	27 (42.2)	Reference	Reference
Walking 1 hr	128 (22.94)	16 (25.0)	1.38 (0.72–2.65)	1.13 (0.57–2.23)
Walking > 1 hr	107 (18.7)	20 (31.3)	<b>2.06</b> (1.11–3.83)	1.55 (0.80–3.03)
Used bus or bike	38 (6.7)	1 (1.6)	0.29 (0.04–2.20)	0.40 (0.05–3.12)
Previous child-death				
≥ 3 times	38 (6.7)	9 (14.1)	<b>2.79</b> (1.23–6.31)	1.40 (0.52–3.74)
1 or 2 times	180 (31.5)	25 (39.1)	1.63 (0.93–2.86)	1.14 (0.59–2.17)
None	353 (61.8)	30 (46.9)	Reference	Reference
Previous stillbirth				

Yes	65 (11.4)	8 (12.5)	1.11 (0.51–2.44)	
No	506 (88.6)	56 (87.5)	Reference	
<p>Abbreviations: OR, odds ratio; AOR, adjusted odds ratio; CI, confidence interval; hr:hour.  Significant (adjusted) odds ratios printed in bold.  *Column percentages</p>				
<p>van Eijk et al., Reproductive Health, 2006, 3:2 doi:10.1186/1742-4755-3-2</p>				

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