ADVANCED
SOCIAL
TECHNOLOGIES

BENEFIT INCIDENCE ANALYSIS

STRENGTHENING INSTITUTIONS TO IMPROVE PUBLIC EXPENDITURE ACCOUNTABILITY

PROJECT

ADVANCED SOCIAL TECHNOLOGIES

NON-GOVERNMENTAL ORGANIZATION

Armenia

December 2012

Contents

ABSTRACT

This report tries to reveal the distribution of the public services in education, health and water sectors to the population broken down by expenditure quintiles. The primary objective is to inform decision makers on effectiveness of current policy interventions from the perspective of state budget programs' benefit incidence amongst the poverty quintiles of the whole population of Armenia. The report contains similar information to the BIA report produced in 2009 and 2010, however, some additional dynamic analysis of the benefit incidence is presented in this updated report.

METHODOLOGY

This report is produced based on previously exercised methodology and is heavily related to the earlier program budgeting and benefit incidence reports produced by the Advanced Social Technologies[1]. The background information on programs, their structures and classification techniques is presented in the Program Budgeting Analysis report that was conducted by AST in parallel to this report.

In order to get the level of utilization of state budget funded programs and services by different poverty quintiles AST has conducted a survey that allowed the organization to assess the effectiveness of the state budget programs in selected sectors from the perspective of the final beneficiary. Unlike some other types of effectiveness analysis such as the cost effectiveness, the benefit incidence analysis requires field activities and collection of information from the final beneficiaries. Also, although the access to state budget information in Armenia is quite transparent, we struggle with some selected types of data that are primarily require surveys. The country still lacks state budget funded activities that would generate feedback datasets on service utilization of government programs. Thus, AST had to obtain a primary data to use in this benefit incidence analysis.

The survey has been conducted in October-November 2012 and covered the assessment on the use of services during 2012. The methodology and the questionnaire used was identical to the previously used ones (with some specific adjustments/additions to reflect additional requirements on assessing some hypothesis, e.g. the level, costs and effectiveness of using private tutors vs. state schools in getting access to the universities). Therefore, this **stability in the methodology allowed us to enhance this very report by introducing dynamic picture and comparison of benefit incidence patterns for 4 different periods (2008, 2009, 2010 and 2012).** Thus, this report will mostly concentrate on presentation of the above dynamics and reflections on possible causes of noticeable shifts in the patterns.

A specific questionnaire was prepared to support the process. 1600 households have participated in the survey from different parts (urban and rural) of Armenia. The quintiles had been identified using simple break points of 320 households[2] in each quintile. The quintiles by expenditure levels had been identified as follows:

Quintile	*Monthly expenditures, HH p.c.*
Quintile 1	Below 34543 AMD
Quintile 2	34543 - 56916 AMD

[1] See PBA and BIA reports 2009, 2010, Advanced Social Technologies, www.ast.am
[2] 1600 divided by 5 quintiles

Quintile 3	56916 - 61583 AMD
Quintile 4	61583 - 95202 AMD
Quintile 5	Above 95202 AMD

The process of benefit incidence identification has gone through the following stages:

- Obtain feedback on the level of usage of each service for identified programs (survey results[3])
- Allocate the results by each quintile
- Calculate the share of each benefit incidence in the total expenditure by programs and quintiles
- Compare the recent survey results with previous dynamics and provide explanations and assumptions on causality of significant changes

In identifying the programs for BIA, we have followed the PBA report programs structure. However, for the purpose of BIA we have excluded internal services (or assisting/supporting services) that are not directly attributable to those external services that the households receive from the government, e.g. "Policy formulation and administration" programs that the households cannot provide a solid feedback on the level of consumption of such service. Similarly, the "Paramedical services and other supportive services" program data also had been excluded from the most tables due to their insignificant response rate as a service directly used by the population. Although the survey questionnaire has captured service distribution for both public and private service providers, this report presents information on such benefit incidence for those services that are publicly funded (fully or partially) as the report aims at characterizing the pro-poorness of government expenditures (from the perspective of effectiveness of public expenditures) rather than general pattern of societal behavior.

[3] Survey conducted in October-November 2012

RESULTS AND DISCUSSION

Education

As in earlier versions of the Benefit Incidence Analysis the most important education programs in the country are General Education (primary school, middle school and high school), Professional (Vocational) Education and Higher Education. This structure of the benefit distribution amongst the population follows the main components of the program classification of the program budgeting analysis (PBA[4]).

The results of the survey conducted in 2012 are presented in the table below.

Table 1. Benefit incidence in education sector, 2012

	Q1	Q2	Q3	Q4	Q5
General Education	27%	25%	19%	15%	13%
Initial Professional and Middle Professional Vocational Education	20%	16%	14%	25%	25%
Higher Education	5%	15%	23%	23%	33%

As in previous years, we observe significant pro-poor distribution of the general education, which was and is explained by demographic pattern of poor families having more children in their households, thus contributing more to the overall picture of benefit distribution in the county.

The outlook of the distribution of benefit incidence for professional vocational education services is closer to a U-shape with more service utilization at the edges.

And finally, the higher education, as in previous years, shows a very high pro-rich pattern, which has several reasons such as higher likelihood of getting access to state paid education schemes by rich households due to capability to employ private tutorship prior to entry exams, as well as worldwide similar behavior of richer families to invest more in education for future benefits.

In sum, we observe quite a logical (though not greeted pattern of benefit incidence by quintiles and types of education). In order to assess the overall benefit incidence of public funds directed to education sector we need to weight the service utilization distribution with the government expenditure by subsectors, i.e. assess the portion of government expenditures (in terms of distribution of finances) by quintiles for the whole education sector.

Table 2. State budget allocations by education subsectors

In thousands AMD	2012 Budget
General Education	87,588,132
Initial Professional and Middle Professional Vocational Education	5,260,893
Higher Education	8,173,122

[4] See PBA reports 2009, 2010 and 2012, Advanced Social Technologies, www.ast.am

The table below provides this assessment using the state budget amounts allocated to the education sector in 2012 (see Table 2) and service utilization (see Table 1) .

Table 3. Total education expenditures benefit incidence

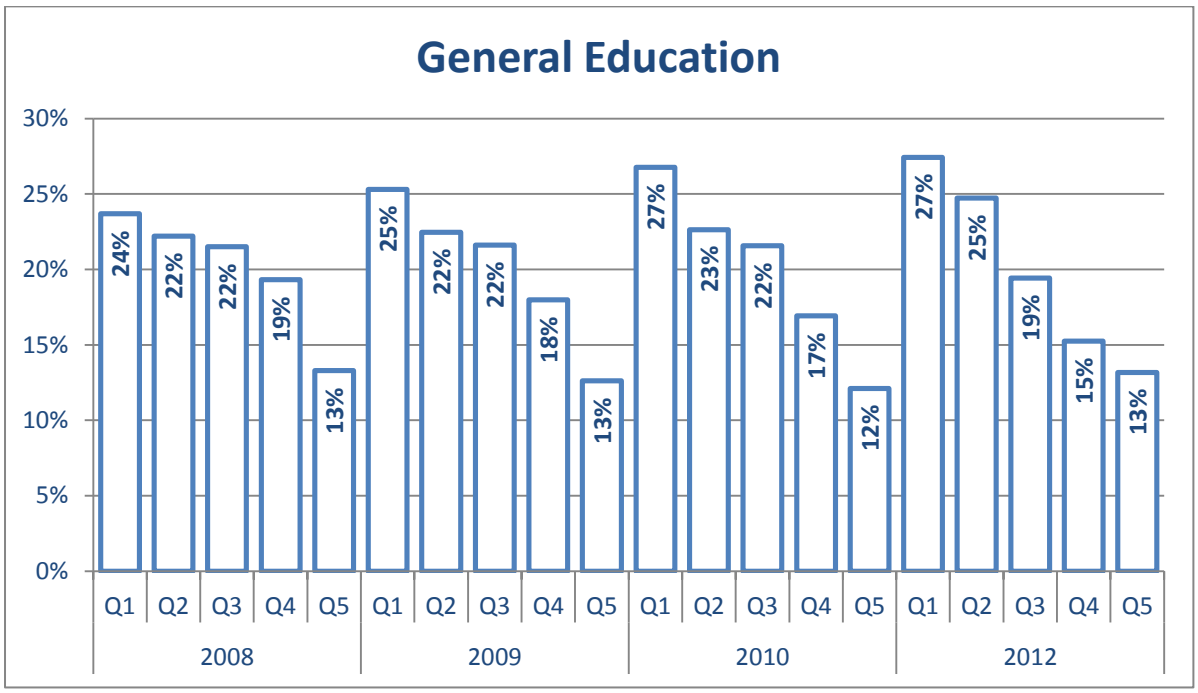
	Q1	Q2	Q3	Q4	Q5
2012 budget allocations, *in thousand AMD*	25,520,015	23,748,994	19,625,547	16,560,404	15,567,187
Total education expenditures benefit incidence	25%	24%	19%	16%	15%

So, we now observe a slight move towards more even distribution but still closer to the one illustrated for the general education as the weight of the latter is around 85% amongst the total amounts allocated to the above three subsectors.

Therefore, as a summary conclusion we can state the budget allocations in Armenia for the education sector have an obvious pro-poor shape.

In the graphs below we will present the dynamic picture of benefit incidence (service utilization) in last 4 years (as per AST conducted surveys within the framework of GDN project on Strengthening Institutions to Improve Public Expenditure Accountability).

Graph 1. Benefit incidence for general education in 2008-2012 period by poverty quintiles



As we observe, the benefit incidence for general education is very stable in its behavior with a slight move towards more pro-poor distribution. However, as the general education in Armenia is not accompanied with a need for significant investments (contributions) from households the primary

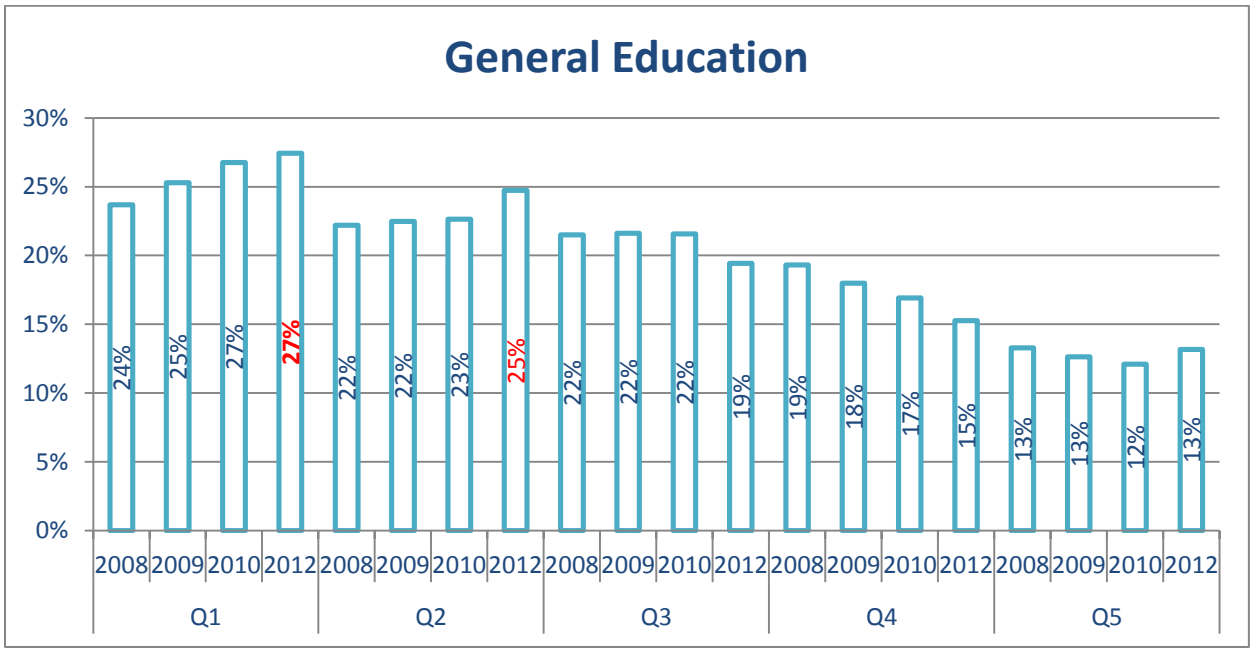
assumption/explanation here is the demographics. The table below (see Table 4) indicates the average household size by quintiles.

Table 4. Average household size by quintile, 2012

	Q1	Q2	Q3	Q4	Q5
Average HH size	5.15	4.63	4.19	3.83	3.56

The same data can also be presented in a dynamics by individual quintiles so we observe the changes in the distribution (see Graph 2).

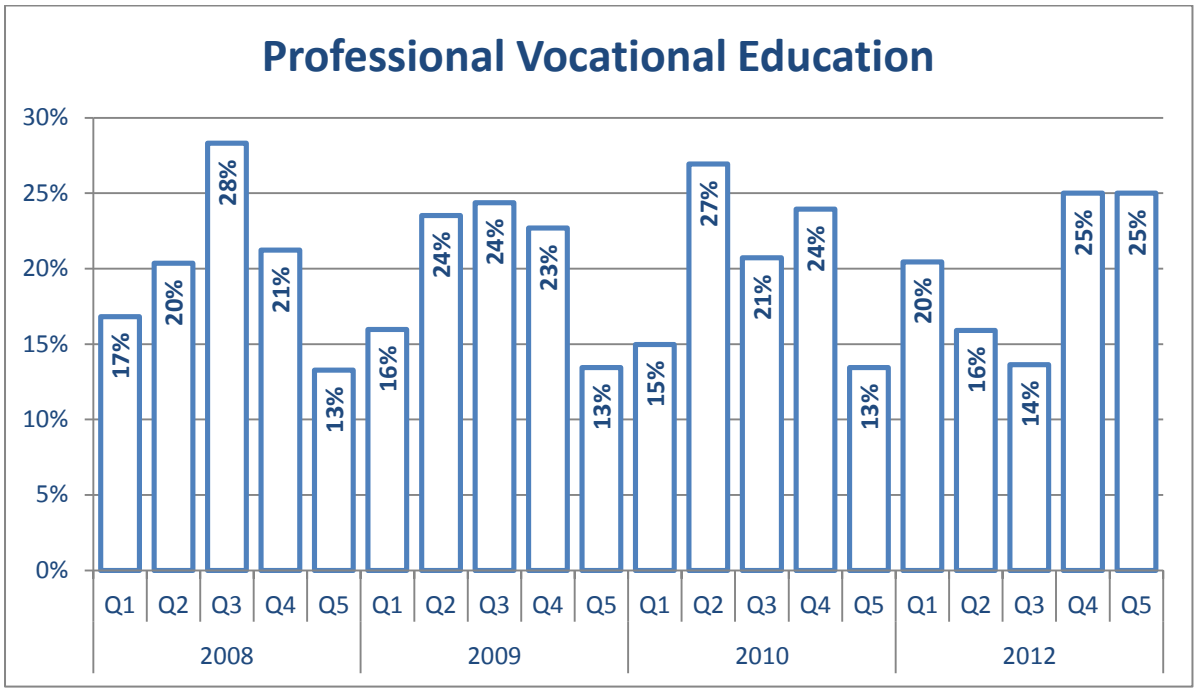
Graph 2. Benefit incidence for general education by poverty quintiles, 2008-2012



In the graph above we see that the first quintile has improved its positions but the gain was not solely at the expense of the last quintile but the two richest quintiles together, while the 2nd and the 3rd quintiles show more or less stable behavior.

The dynamics of the Initial Professional and Middle Professional Vocational Education services in the same period has shown a less stable behavior though such volatility is observed mostly in the results of the last survey. According to the initial communication with the MoE experts such behavior in the last period (covering 2011-2012) can be explained (with no proper analysis done yet officially) by two main factors: increase by 50% in number of state budget funded positions in middle professional education schools and specific promotion campaigns introduced by the MoE to make the middle professional education more attractive. These two factors might impact the decision making of all quintiles including the richer ones to use the middle professional education institutions as a "springboard" for higher education systems.

Graph 3. Benefit incidence of the professional vocational education in 2008-2012 period by quintiles

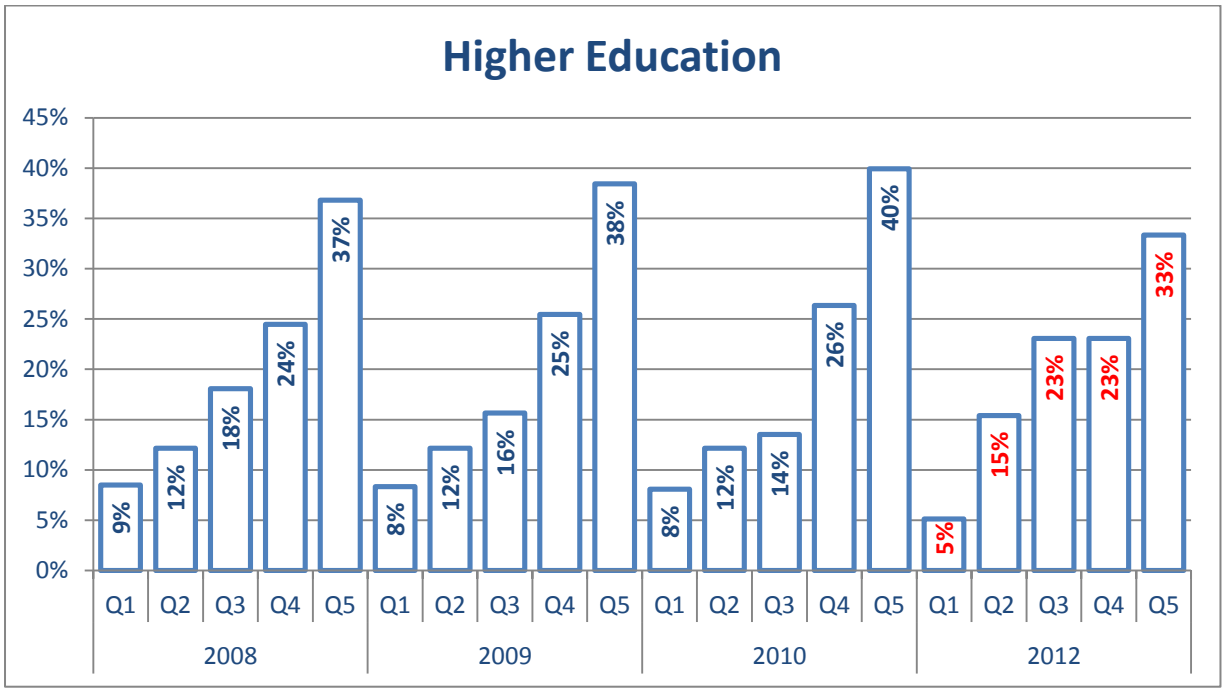


The distribution of the higher education services is one that as most interesting for our organization to follow as some of the recent outputs[5] tried to analyze the factors that can be effectively used to improve the uneven and "discriminating" distribution of the high education services funded by the state.

As we see in the table below the pattern has somewhat improved in last years (see Graph 4) for poor and average quintiles (Q2, Q3 and Q4) at the expense of the richest one (Q5), with, however, a shocking decline for the extreme poor quintile (see Graph 5).

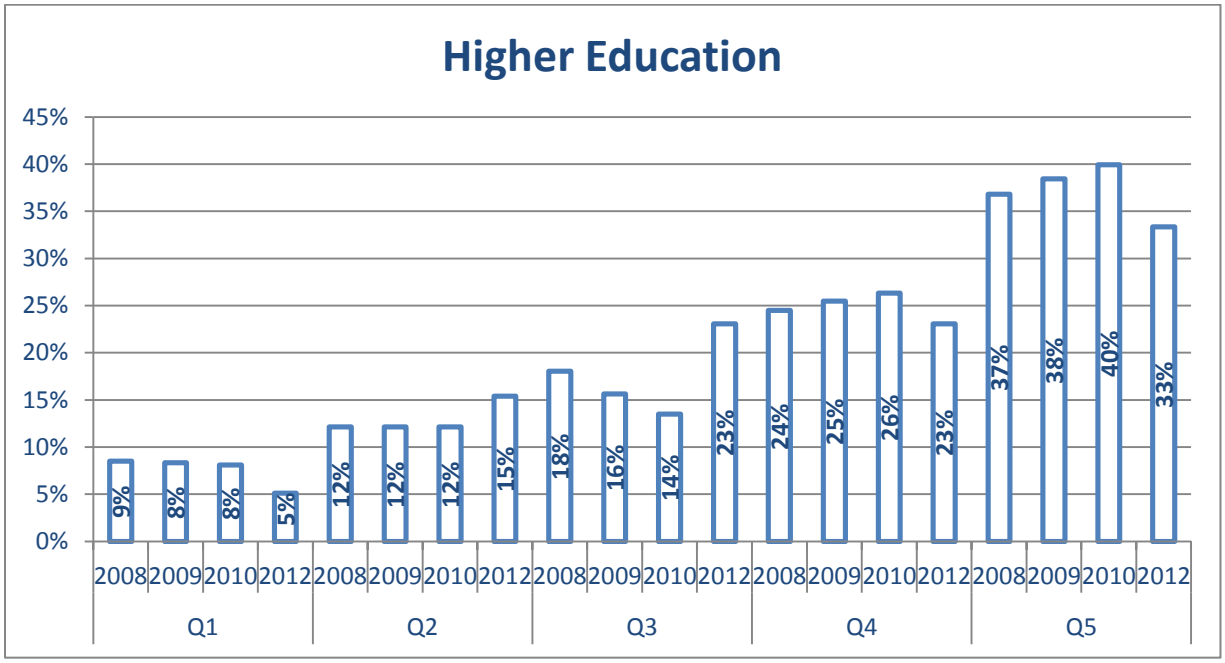
[5] see Cost Effectiveness Analysis and Policy Simulation Report (draft as of February 2013), AST, www.ast.am

Graph 4. Benefit incidence for state funded higher education services in the 2008-2012 period by quintiles



The graph below illustrates that severe decline down to 5%. It also shows that richest quintile's portion has also declined from 37% down to 33%.

Graph 5. Benefit incidence for higher education by quintiles, 2008-2012



This proves that the recent policy initiatives to decrease the dependency of access to higher education (e.g. introduction of annual revision of the lists of beneficiaries of state budget funding based on annual performance vs. previously used reliance on solely entrance exams when students from the richest quintiles had competitive advantage) had some positive impact on the overall pattern of the benefit incidence. However, the reduction of the first quintile may indicate that the government policies were effective for average quintiles (who get access to higher education and

then rely on government assistance schemes) but not the poorest ones (who do not even attempt to get access to universities). This conclusion is made from the pattern of distribution of participation in state budget funded high education schemes and reasons for not participating to those by quintiles revealed from the 2012 survey results (see Figure 1 vs. Figure 2).

Figure 2. Participation in state budget funded high education schemes

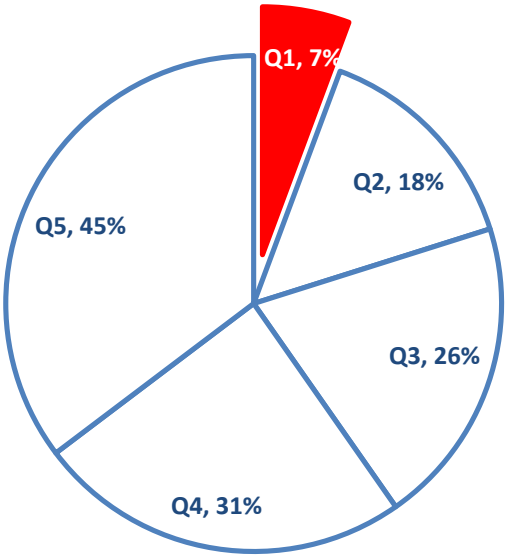
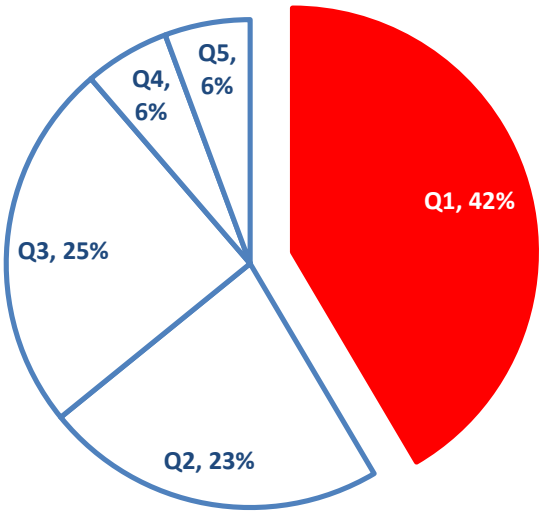


Figure 1. Distribution of non-participants due to the financial reasons



Health

In this report we tried to cover as many aspects of benefit incidence as possible. In particular, we tried to estimate and analyze the variations of benefit incidence by quintiles not only within the requirements of the BIA report, but also by additional aspects, such as dynamics and urban vs. rural distributions, etc.

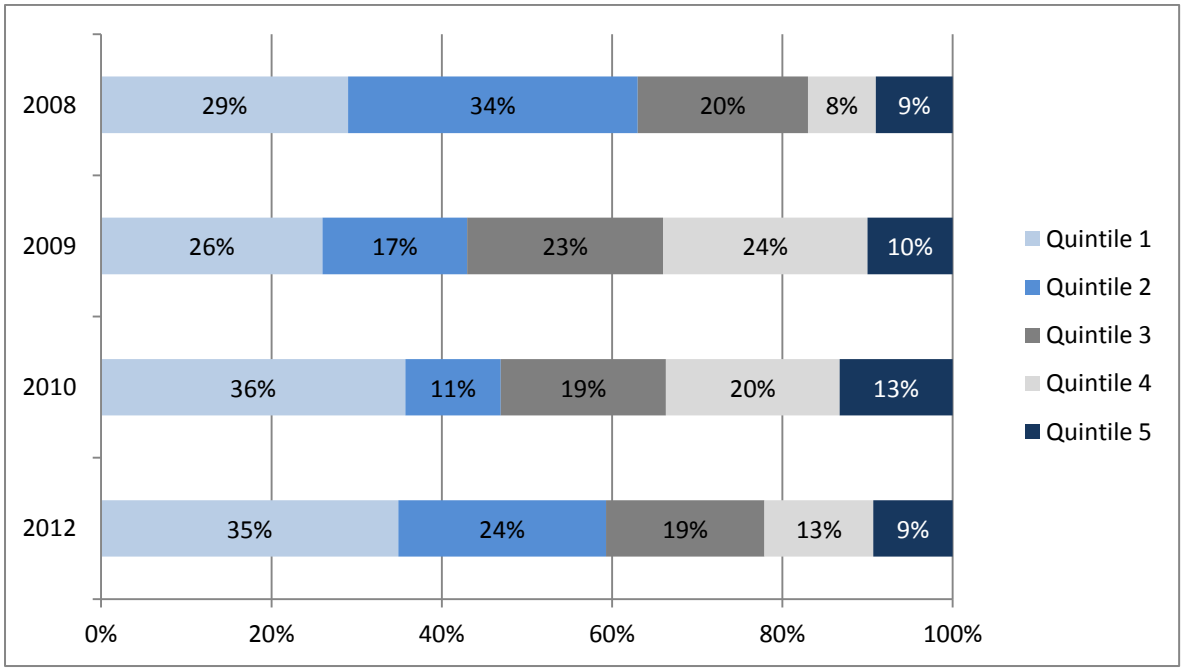
One of the most critical aspects in the health sector is the child birth support program and this is reflected in AST preceding papers[6] as well as the draft policy simulation paper. From this perspective the analysis of antenatal and child delivery services by quintiles becomes crucial and the survey conducted by AST has reflected these specific aspects more attentively among the overall healthcare services. Below is the basic breakdown of life births by quintiles and years.

Table 5. Household survey results for child births, in %

quintiles	2012	2010	2009	2008
1	35%	36%	26%	29%
2	24%	11%	17%	34%
3	19%	19%	23%	20%
4	13%	20%	24%	8%
5	9%	13%	10%	9%

Interestingly, this indirectly proves the unintentional pro-poor benefit incidence in education sector mentioned above (see Graph 2. Benefit incidence for general education by poverty quintiles, 2008-2012) as poorer quintiles not only already have bigger share of use of services to children but also supply the same trends for near future. However, as the further details show there might be some improvement in balancing the child births within quintiles.

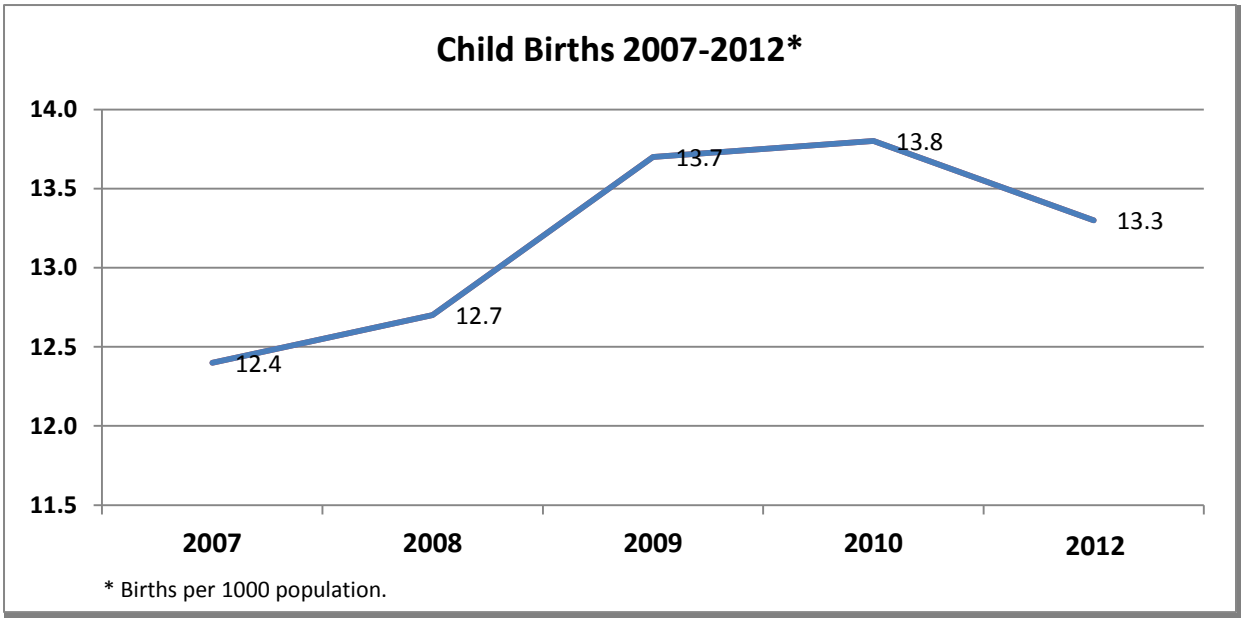
Graph 6. Benefit incidence for child births in 2008-2012 period



[6] See Benefit Incidence Analysis and Cost Effectiveness Analysis, www.ast.am

During 2008-2010 number of births increases, while in 2012 this trend changes and moves down. The official data on child births is available at the National Statistics Service (http://www.armstat.am/file/doc/99471433.pdf).

Graph 7. Child births in 2007-2012 period



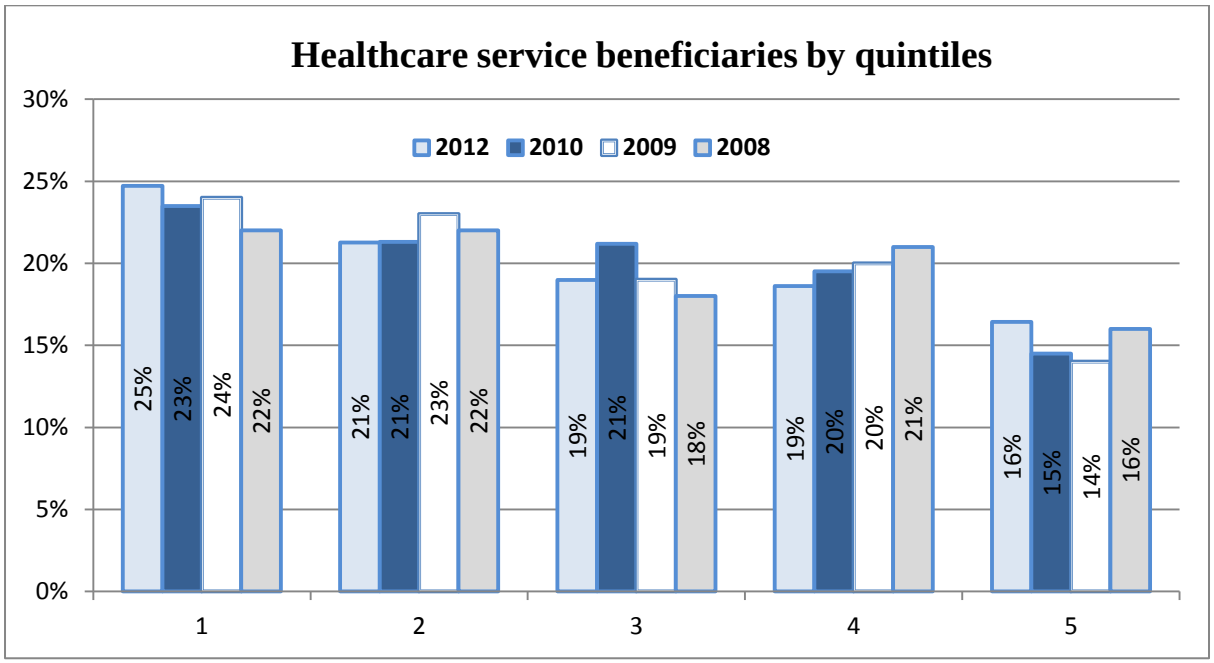
However, from this report perspective, the dynamics within the quintiles is more eye-catching. As we had already specified in our earlier reports (see www.ast.am), the increase in child birth rates had "coincided" with the government policy change and introduction of higher monetary allowances to the families at the birth of the 3rd and following children. So, the financial support program had its positive impact on the demographic picture. The 2012 drop is, however, related to the economic crisis and demography gap issues (the impact of a significant drop in child births in early 90s, thus reflecting on number of parents at the relevant age).

In any case, in spite of decline in the number of births in 2011 the share of 1st quintile increases past several years, while the number of births in 2nd quintile has decreased since 2008. Above the 2nd quintile there is some noticeable increase of the child births in 2009, but in 2011 those levels were mostly equalized to the level of 2008, except the 3rd quintile where the level of birth in 2011 was above the level in 2008. Meanwhile, just in 2011 we observe logical dynamic of birth distribution trend within the quintiles where the statement of the unintentional pro-poor benefit incidence is purely stressed (1q-35%, 2q-24%, 3q-19%, 4q-13%, 5q-9%).

As mentioned above, the decline of number of births in 2011 and 2012 shows that sole financial policy at current levels is not a sustainable solution to the demographic issues. Increase in child births in 2008-2010 is driven by generally positive trends in economy and more specifically by increased policy prioritization of this subsector. According to the Ministry of Health maternity related services became significantly more accessible to all layers of the population. Naturally, if financial aspects were important factor for family planning, we would see the opposite trend as the lower quintiles would have been most affected by such policy, whereas we see that middle level has responded the best.

The graph below (see **Error! Reference source not found.**) reflects the distribution of services by quintiles for all healthcare programs. As we see, for the whole period the first and second quintiles receive noticeably more than other quintiles, which means the state funded healthcare services are poor-oriented. As we had indicated in earlier BIA reports too, one of the most reliable assumptions on the reasons for this are the set of specific pro-poor interventions (e.g. full healthcare coverage for the most vulnerable social groups, including the ones eligible for the Family Benefit Program[7]) and preference of richer families to use private and paid healthcare services.

Graph 8. Healthcare services beneficiaries in 2008-2012 by quintiles



Having said the above, the second side of the coin suggests that there is also a much higher rates of sickness amongst the most vulnerable groups (lowest quintiles). This opinion is brought forward by sector experts. Therefore, having received the above prove of effectiveness and high targeting rates of pro-poor policies, the government must also reflect on the above opinion by introducing more targeted policy initiatives to respond on the issue.

Table 6. Share of beneficiaries of free or partially free healthcare services from the government by quintiles

	2012	2010	2009	2008
1	25%	23%	24%	22%
2	21%	21%	23%	22%
3	19%	21%	19%	18%
4	19%	20%	20%	21%
5	16%	15%	14%	16%

The table above indicates there is little variation noticed from 2008 through 2012 in terms of the shares of beneficiaries of free and partially free services by quintiles.

The tables below present the breakdown of the service utilization by the beneficiaries' quintiles and by types of services/programs in 2012, 2010, 2009 and 2008.

[7] Family Benefit Program is the state allowance system for around 100,000 poor and extreme poor families

Table 7. Benefit incidence by types of services/programs in 2012

Quintiles	Public health primary care services	Services of obstetrical-gynecological medical assistance	Hospital medical aid services	Public health services
1	17%	34%	18%	65%
2	20%	21%	27%	4%
3	23%	18%	25%	4%
4	21%	16%	18%	0%
5	19%	11%	12%	26%

Table 8. Benefit incidence by types of services/programs in 2010

Quintiles	Public health primary care services	Services of obstetrical-gynecological medical assistance	Hospital medical aid services	Public health services
1	20%	15%	25%	19%
2	24%	29%	23%	16%
3	25%	13%	16%	50%
4	19%	7%	20%	6%
5	12%	35%	16%	9%

Table 9. Benefit incidence by types of services/programs in 2009

Quintiles	Public health primary care services	Services of obstetrical-gynecological medical assistance	Hospital medical aid services	Public health services
1	23%	24%	28%	13%
2	23%	31%	14%	33%
3	19%	12%	19%	17%
4	21%	24%	25%	21%
5	14%	10%	14%	17%

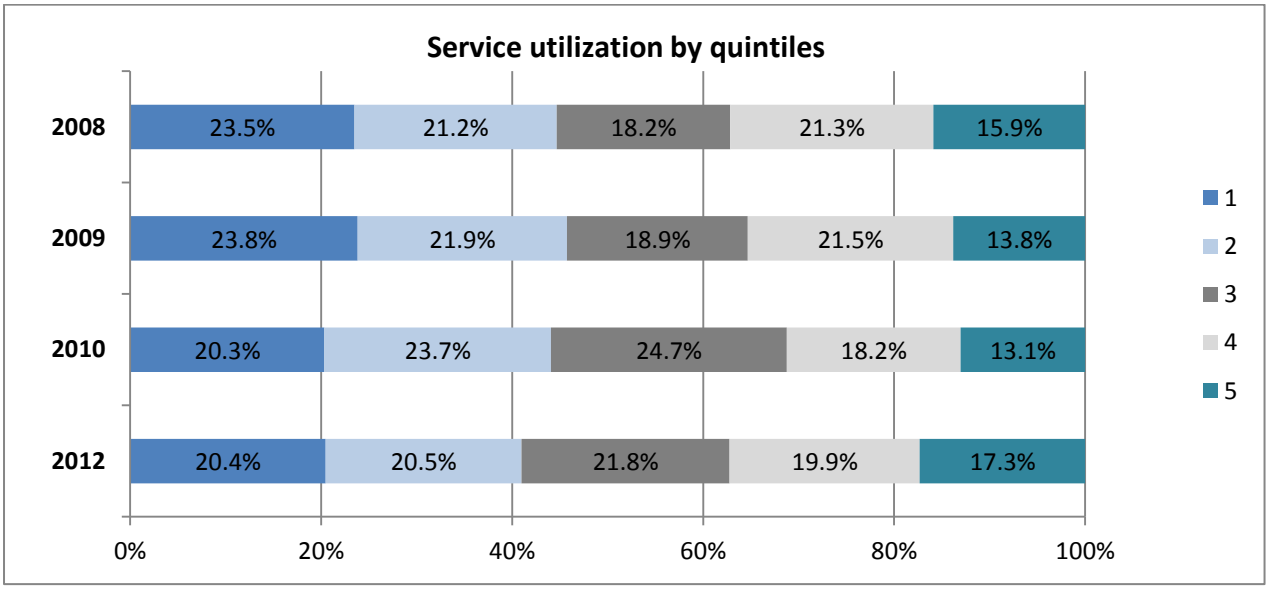
Table 10. Benefit incidence by types of services/programs in 2008

Quintiles	Public health primary care services	Services of obstetrical-gynecological medical assistance	Hospital medical aid services	Public health services
1	25%	19%	20%	0%
2	21%	43%	12%	33%
3	18%	5%	26%	13%
4	19%	29%	27%	38%
5	16%	5%	16%	17%

Benefit incidence for all surveyed years by healthcare services show that for preventive and curative medical care (i.e. primary care, obstetrical-gynecological care and hospital care) low quintiles take relatively high share.

The graph below introduces total application cases for all healthcare service utilization by quintiles and years. It is obvious that the healthcare system' service utilization is directed to the poorest quintiles of the population which by experts interpretation is connected to the health risks of vulnerable groups of population. The Government's policy in this sense should be focused on reduction of health risks in those groups of population.

Graph 9. Total healthcare services utilization in 2008-2012 by quintiles



The survey has also provided information on another dimension of the healthcare services shares in the country. In particular, the biggest share of service utilization is recorded in the areas the government has announced as priority, i.e. the primary healthcare services, hospital and child birth/pregnancy related services. Within this distribution, the highest rates of services provided to the population are for the primary healthcare – this exactly matches with the top priority of the government in the healthcare of health prevention and treatment at the initial stages.

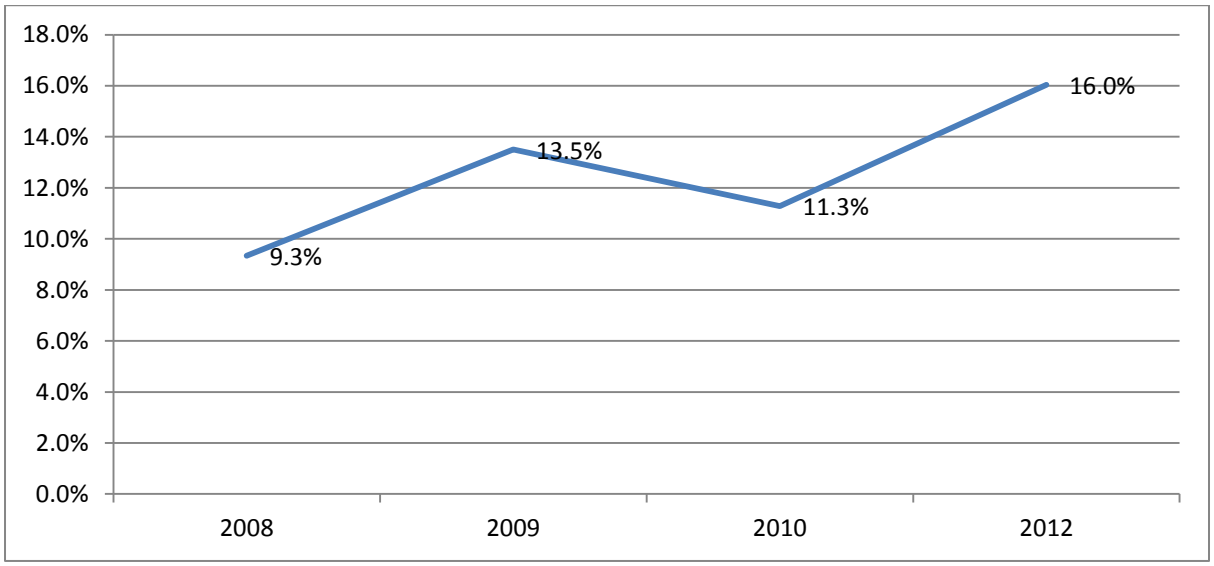
Table 11. Service utilization cases by healthcare programs in 2008-2012

Programs	Share of programs in total service utilization			
	2012	2010	2009	2008
Public health primary care services	77.5%	84.3%	77.6%	79.0%
Services of obstetrical-gynecological medical assistance	16.7%	2.8%	4.6%	3.3%
Hospital medical aid services	5.3%	9.2%	15.0%	14.0%
Public health services	0.5%	1.3%	2.6%	3.7%
Paramedical services and other supportive services	0.0%	2.3%	0.2%	0.0%

The indicators of share of programs in total service utilization demonstrate distribution of service application cases among healthcare programs. The most important point is that the share of primary healthcare service utilization is dominating among other programs which demonstrates government's policy focus on preventive healthcare system. Having observed the trend of service utilization we can assume that healthcare services are becoming more

accessible during the years that is one of Government's policy efforts in the sector. It also could indicate an increase in overall wellbeing of the population in the country.

Graph 10. Share of free or partially free healthcare services beneficiaries by years



One more dimension to the analysis is to review the distribution of service utilization by urban vs. rural. This is to assess the accessibility level of healthcare in the two above categories as this is also a government policy agenda item.

The distribution of birth services and free or partially free services by urban and rural is presented in the table below. It indicates that the majority of service recipients is urban and the general distribution of the population is also so. The general observation is that for both births and healthcare service from the government, the distribution of it by rural and urban communities reflects the country picture. Meanwhile, there is an interesting turnaround in 2012 when number of births in rural areas exceeds urban indicator demonstrating 53% in rural vs. 47% in urban areas.

Thus, although the expert community suggests that there is a service migration towards urban areas, the survey did not prove that, at least for the overall healthcare services level.

Table 12. Share of service utilization by urban vs. rural distribution

Urban/Rural	Share of survey responders				Share of life births				Share of beneficiaries of free or partially free healthcare services			
	2012	2010	2009	2008	2012	2010	2009	2008	2012	2010	2009	2008
Urban	59%	61%	62%	62%	47%	61%	64%	56%	62%	65%	60%	63%
Rural	41%	39%	38%	38%	53%	39%	36%	44%	38%	35%	40%	37%

The table below demonstrates increase of number of service beneficiaries in both urban and rural areas at the same time emphasizing more increase of beneficiaries in urban locations. This indicators show that Government should continue its policy on equal development of healthcare services and capacities in entire country.

Table 13. Share of service beneficiaries among survey responders by urban vs. rural distribution

Urban/Rural	Share of life births				Share of beneficiaries of free or partially free healthcare services			
	2012	2010	2009	2008	2012	2010	2009	2008
Urban	1.0%	1.4%	1.1%	1.2%	16.8%	12.2%	13.1%	9.4%
Rural	1.7%	1.4%	1.0%	1.6%	14.9%	9.9%	14.2%	9.3%

Table 14. Distribution of services by programs and quintiles in 2008-2012

	Public health primary care services	Services of obstetrical-gynecological medical assistance	Hospital medical aid services	Public health services
2012				
Urban	67%	58%	59%	91%
Rural	33%	42%	41%	9%
2010				
Urban	55%	57%	63%	69%
Rural	45%	43%	38%	31%
2009				
Urban	60%	74%	51%	71%
Rural	40%	26%	49%	29%
2008				
Urban	61%	86%	51%	54%
Rural	39%	14%	49%	46%

It is quite interesting that in contrast to the services that are paid or partially paid by the government, the households' own expenditures on healthcare services are significantly higher in the 4th and 5th quintiles (in average, around 70% of expenses of the 40% of the population). This finding partially questions the expertise assumption above on poorest segments having significantly higher level of healthcare problems. At least, the households' own expenditures tables indicate that there is also a high portion of financial responses to healthcare issues at the two highest quintiles too. It may turn out that the two highest quintiles basically prefer paid services due to potentially higher quality of such services.

For some healthcare services, however, the free access to those is available solely to the poorest quintile representatives (due to specific pro-poor policy which provided an additional set of services to beneficiaries of the Family Benefit Program – the primary and most expensive poverty reduction oriented government program in the state budget), so this also could be a factor in such a high pro-poor distribution of healthcare services in Armenia. Figures supporting this approach are the ones that the majority of households' own expenditures are paid for hospital services (although number of beneficiaries is significantly higher in primary healthcare services).

In any case, although the general pattern of healthcare benefit incidence is pro-poor oriented, however, the sector is quite complicated and government must proactively respond to the challenges on social aspects of healthcare services.

The table below also presents the allocation of the budget expenditures by quintiles.

Table 15. Budget allocations by quintiles and years

Quintiles	Budget allocation (%)				
	2008	2009	2010	2011	2012
1	21%	24%	21%	21%	23%
2	22%	22%	24%	24%	22%
3	19%	18%	21%	21%	22%
4	24%	23%	16%	17%	18%
5	15%	14%	17%	17%	16%

Budget allocation by quintiles is calculated based on shares of benefit incidence by types of services/programs for researched years. Calculated indicators demonstrate pro-poor orientation of the state budget and the Government policy on poverty reduction in the country. At the same time Government should make more focus on equal development of healthcare system in rural and urban areas and increase service accessibility for vulnerable groups of population with increasing budget allocations for those people's healthcare needs and improving policy intervention mix.

Water

The average drinking water consumption at households was AMD 1695 in 2008 per month or 1.08% of total HH expenditures. In 2012, it reached AMD 2336 per month or 0.9% of monthly expenditures. Meanwhile, the average expenditure for irrigation in 2008 was is 866AMD or 0.5%.

Table 16. Share of water sector beneficiaries in total population, by programs and expenditure quintiles, 2008

	1	2	3	4	5
Drinking Water Supply	86.9	90.3	90.9	93.8	95.3
Sewerage	74.4	70.9	74.4	74.1	78.4
Irrigation	22.2	27.8	26.6	24.4	24.4

Table 17. Benefit incidence of programs, by quintiles, 2008

	1	2	3	4	5
Drinking Water Supply	19	19.8	19.9	20.5	20.8
Sewerage	20	19	20	19.9	21.1
Irrigation	17.7	22.1	21.2	19.5	19.5

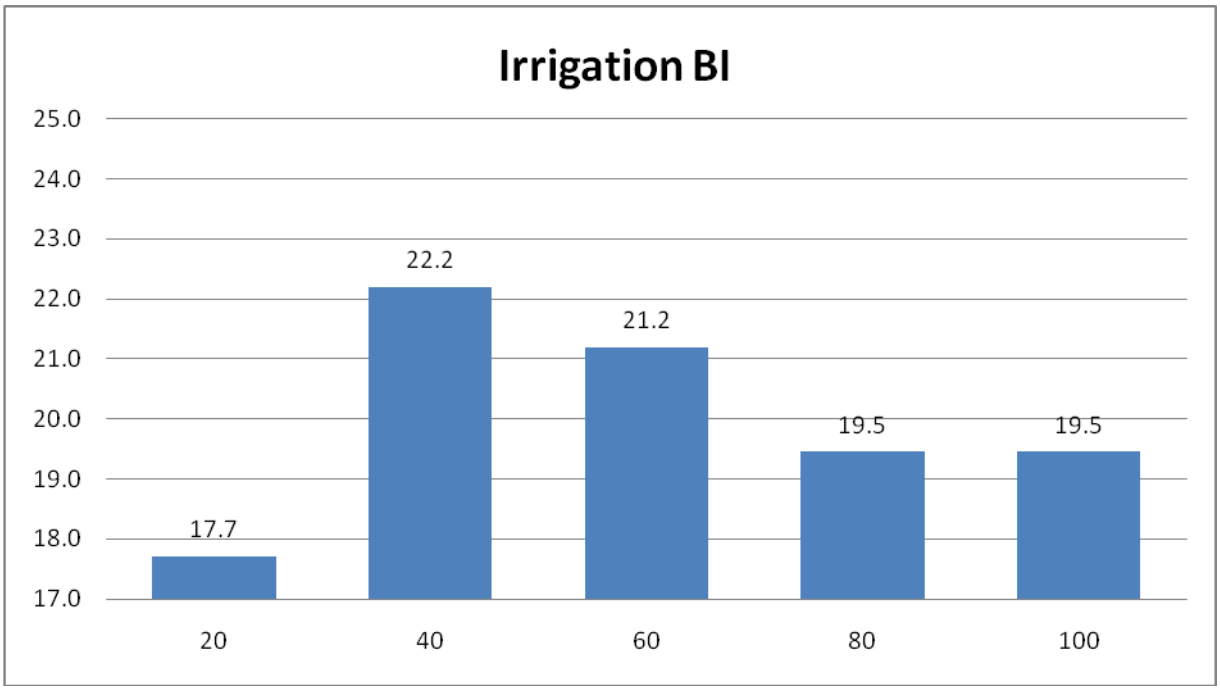
According to the budgeting information, the government has invested in the drinking water supply and irrigation systems the most. However, the share of the population using the irrigation system is quite small (the smallest amongst the water sector programs) and is only 25%. Meanwhile, the survey results indicate that this program's most beneficiaries are in the 2nd and 3rd quintiles, which is both positive and explainable.

The lowest portion of investments was made in the sewerage (water sanitation) systems, although 74.4% of households indicated they are users of sewerage system.

The biggest share in terms of using the services is in the drinking water supply program – 91.4% in 2008, which went slightly down to 89.8% by 2012.

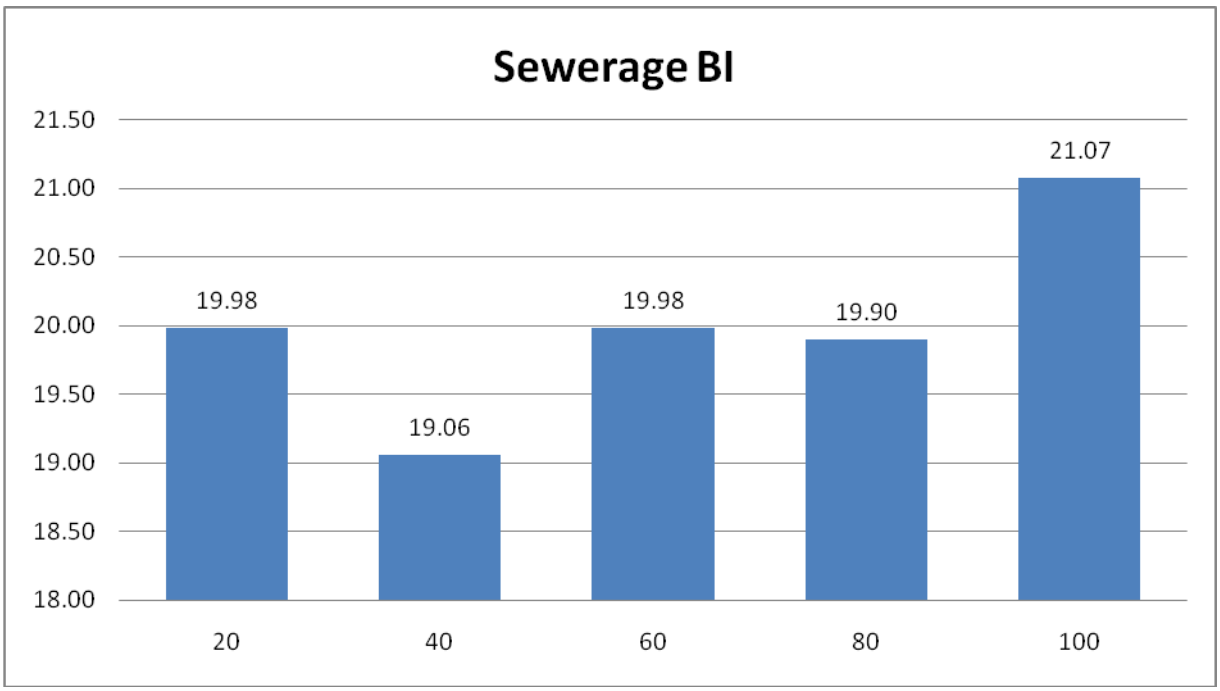
The patterns of benefit incidence are quite different by programs. The rapid increase and then the smooth downwards move by quintiles is logical as that is the segment of the population that mostly is engaged in the agriculture (lower middle and middle quintiles).

Graph 11. Benefit incidence in irrigation program



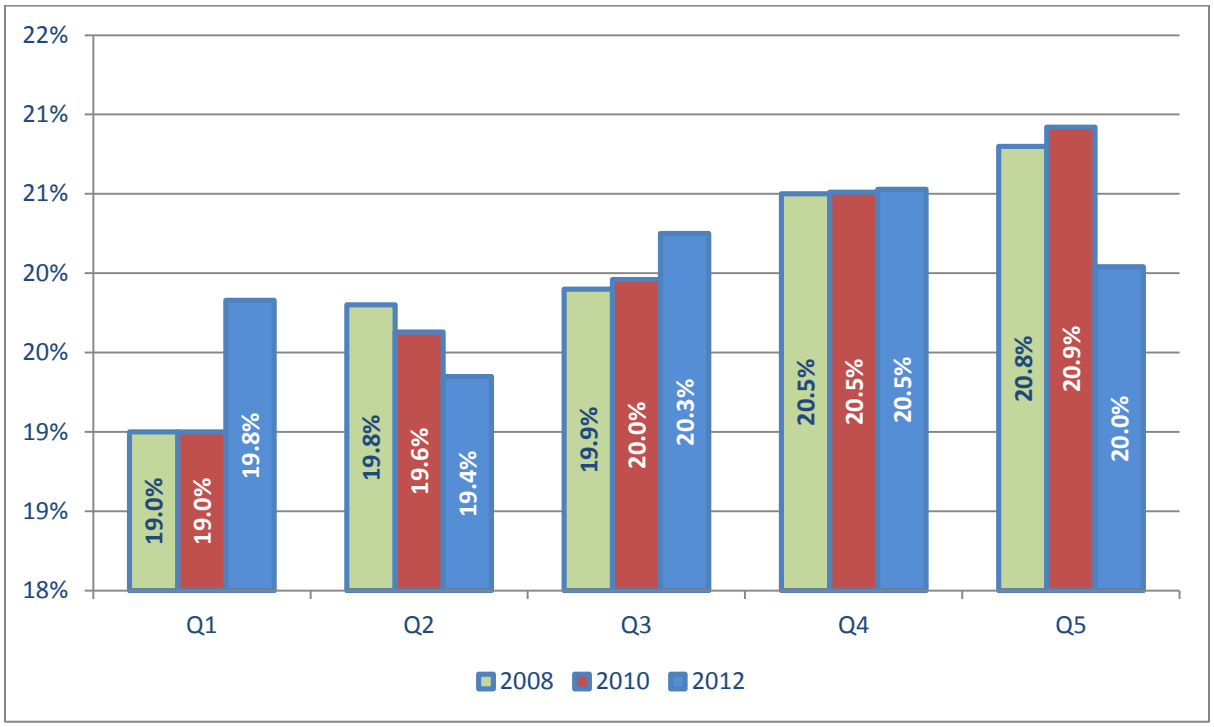
The pattern of the benefit incidence in the sewerage program is hardly explainable at this stage of the analysis. In fact, this program is comparatively low priority, so it will be difficult to invest resources in substantiating of the reason for such behavior of the benefit incidence in Armenia and then recommending changes in existing policies.

Graph 12. Benefit incidence in sewerage program



The most interesting pattern is registered for the Drinking water supply program. And the most important finding is not the pattern of the benefit incidence (in fact it was expected by our team) but the follow-up conclusions or suggestions.

Graph 13. Dynamics of access to water services in 2008-2012 by quintiles



One can see that no major shifts took place during 2008-2012 in terms of access to drinking water supply: overall shares of households in each quintiles remained almost unchanged. 0.8 percentage points were swapped between Q1 and Q5. Increase in the first quintile can be explained by large public investment projects implemented in the water supply sector which facilitated connection to the system by the poorest households which were not previously connected to the drinking water supply system. On the other hand, decrease in the connections' in Q5 cannot be explained by the survey findings. One assumption can be that rich households, when buying/building new houses, they prefer to have their own source of water supply instead of connecting to the system.

The idea of having subsidy in all the above subsectors is justified by the need of the government to compensate private operating companies the deficit in revenues due to the lower than market prices/fees for the services provided. And the rationale for the government to fix lower prices is (as a primary consideration) to support the poorest households in getting the normal volume of specific services that are important for wellbeing. The secondary consideration could be to motivate or force the private companies to employ standard pricing policy for the whole country regardless of specific regional variations and investment needs. And what we see in the benefit incidence analysis is that the government, de facto, does not employ the first rationale for using subsidies, i.e. assisting the poorest families. The pattern above indicates that the richer quintiles of the population in fact get more out of the subsidization scheme than the poorest ones. Thus, the whole idea of having subsidized water supply program has turned the other way around by which the collected taxes from all segments of the population is distributed to all of them back, but with more distributed to the richer segments.

Developments in 2009-2012 period

The table below illustrates the change in the unit subsidy from 2008 through 2011 surveys.

Table 18. Unit subsidy dynamics in 2008-2012

Water	2008		2009		2012	
	Unit Subsidy *(thousands AMD)*	**Unit Subsidy** in USD[8]	**Unit Subsidy** *(thousands AMD)*	**Unit Subsidy** in USD	**Unit Subsidy** *(thousands AMD)*	**Unit Subsidy** in USD
Drinking Water Supply	2.73	9	4.34	11.9	5.48	13.7
Sewerage	0.23	1	0.79	2.2	2.22	5.5
Irrigation	4.26	14	4.75	13.1	5.44	13.6

Distribution of monetary benefits in the quintiles can be derived based on the incidence levels (as estimated through the survey) and the actual benefits paid by the Government in each sub-sector. Below, two tables summarize these calculations for 2008, 2009 and 2012.

Table 19 Distribution of Benefits of Water Expenditures (AMD), by Expenditure Quintile and Program (4W), 2008

	1	2	3	4	5
Drinking Water Supply	1,419,127.2	1,465,236.1	1,490,852.1	1,531,837.7	1,562,576.9
Sewerage	34,901.7	33,288.6	34,901.7	34,901.7	36,808.1
Irrigation	1,695,806.8	2,125,729.7	2,006,306.7	1,839,114.5	1,862,999.1
Total	3,149,835.8	3,624,254.4	3,532,060.5	3,405,853.9	3,462,384.1
Distribution of Total Benefits, %	18.3%	21.1%	20.6%	19.8%	20.2%

Table 20. Distribution of Benefits of Water Expenditures (AMD), by Expenditure Quintile and Program (4W), 2009

	1	2	3	4	5
Drinking Water Supply	2,257,550.6	2,330,900.7	2,371,650.7	2,436,850.7	2,485,750.7
Sewerage	120,580.2	115,007.2	120,580.2	120,580.2	127,166.5
Irrigation	1,889,150.5	2,368,090.0	2,235,051.3	2,048,797.0	2,075,404.8
Total	4,267,281.3	4,813,997.9	4,727,282.2	4,606,227.9	4,688,322.0
Distribution of Total Benefits, %	18.5%	20.8%	20.5%	19.9%	20.3%

Table 21. Distribution of Benefits of Water Expenditures (AMD), by Expenditure Quintile and Program (4W), 2011

	1	2	3	4	5
Drinking Water Supply	3,027,666.4	2,953,302.6	3,091,406.7	3,133,900.3	3,059,536.6
Sewerage	342,959.3	325,811.3	342,959.3	341,244.5	361,822.1
Irrigation	2,223,824.7	2,776,639.9	2,663,564.1	2,449,976.4	2,449,976.4

[8] Exchange rates used: for 2008 USD1= AMD 303.33, 2009 USD1= AMD 364.7 and 2012 - USD1= AMD 400.

Total	5,594,450.4	6,055,753.9	6,097,930.1	5,925,121.2	5,871,335.0
Distribution of Total Benefits, %	18.94%	20.50%	20.64%	20.05%	19.87%

Table 22 Distribution of benefits in 2008-2012

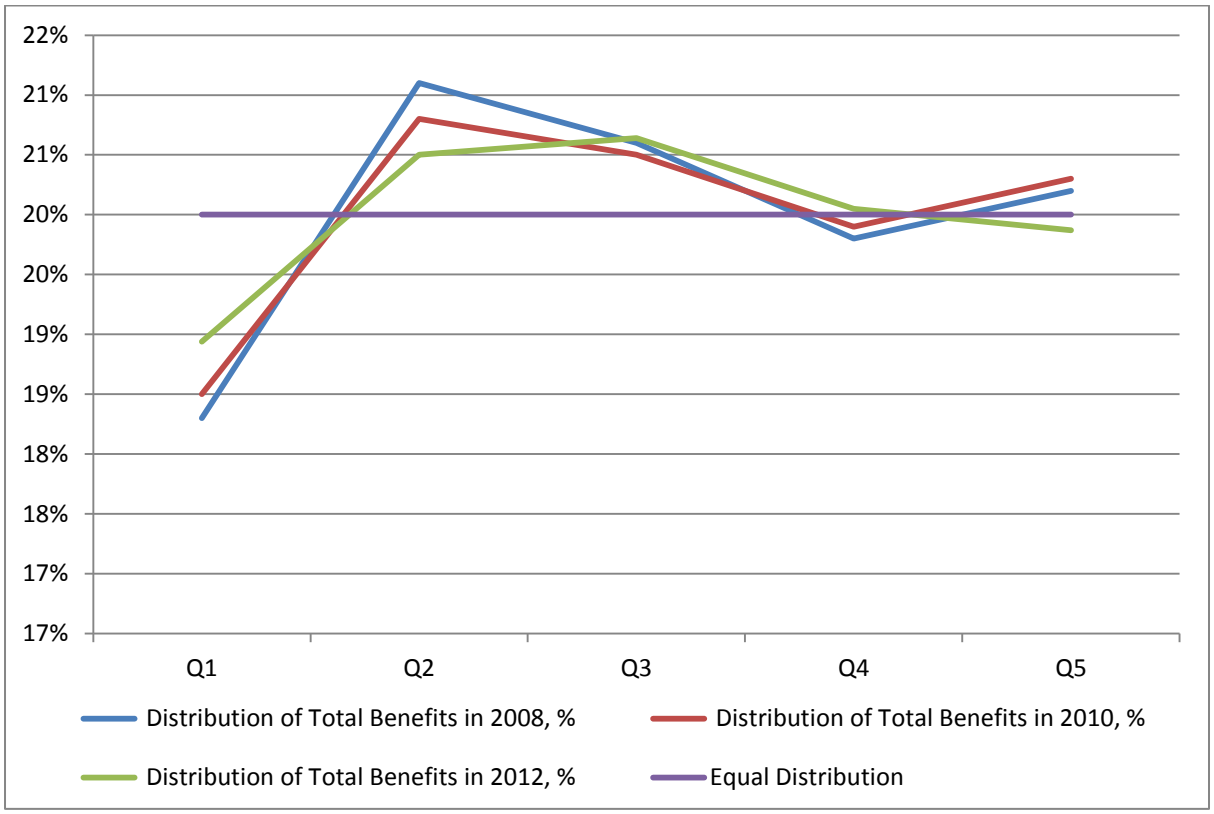
	1	2	3	4	5
2008	18.3%	21.1%	20.6%	19.8%	20.2%
2009	18.5%	20.8%	20.5%	19.9%	20.3%
2012	18.94%	20.50%	20.64%	20.05%	19.87%

As it is indicated earlier, water sector benefits overall are relatively evenly distributed across income quintiles, the major exception or deviation is seen in irrigation. This, of course, implies that increase in the amount of benefits to this sector will increase the inequality of distribution and vice versa. Nevertheless, overall the share of benefits (in terms of physical access to services[9]) falling to each quintile in water sector is close to 20%.

In terms of analyses of 2008, 2009 and 2012 data, one could see a slight trend towards having a more pro-poor distribution of benefits. Namely, the share of benefits flown to the lowest quintile has increased from 18.3% in 2008 to 18.5% in 2009 and 18.94% - in 2012.Although the changes and shifts are not significant enough to represent a qualitative change, however, it is worth noting that the "improvement" took place at the expense of 2nd and 5th quintiles. Interestingly, the share of the 4th quintile also increased slightly, while the share of the highest – 5th quintile decreased by about 0.3 percentage points. The explanation that can be derived immediately is that the richest households tend to rely on their own water sources instead of connecting to centralized systems. Unfortunately, this conclusion cannot be checked or verified at this stage. The Graph below depicts the distribution patterns for 2008, 2009 and 2012.

[9] The pattern of the benefit incidence in terms of actual use of services is analyzed in below sections of the paper and, in fact, are the core of the policy issue in the water sector

Graph 14. Benefit incidence of water sector budget programs in 2008-2012



As a conclusion, one can note a slight "improvement" towards pro-poor policy at the expense of 2nd and 5th quintiles. In parallel, total subsidies to the water sector increased from AMD 7.5 bln to AMD 29.5 bln. Benefits to the sewerage sub-sector still remain very low: AMD 1.7 bln, while those to drinking water supply and irrigation – AMD 15.2 bln and AMD 12.6 bln respectively.

This almost equal distribution, however, reflects only the access to the water supply system, but does not reflect the variations in benefit incidence in terms of "usage" of the system or, rather, the actual consumption of water by HHs across the quintiles. To estimate that, own AST survey data in last several years were used: first, per capita payments were calculated for all respondent HHs, then, per capita consumption was estimated based on per capita payments10. Based on per capita consumption estimates, the benefit incidence picture changes as presented in the Table below:

Table 23. The dynamics of the benefit incidence (service use), 2008-2012

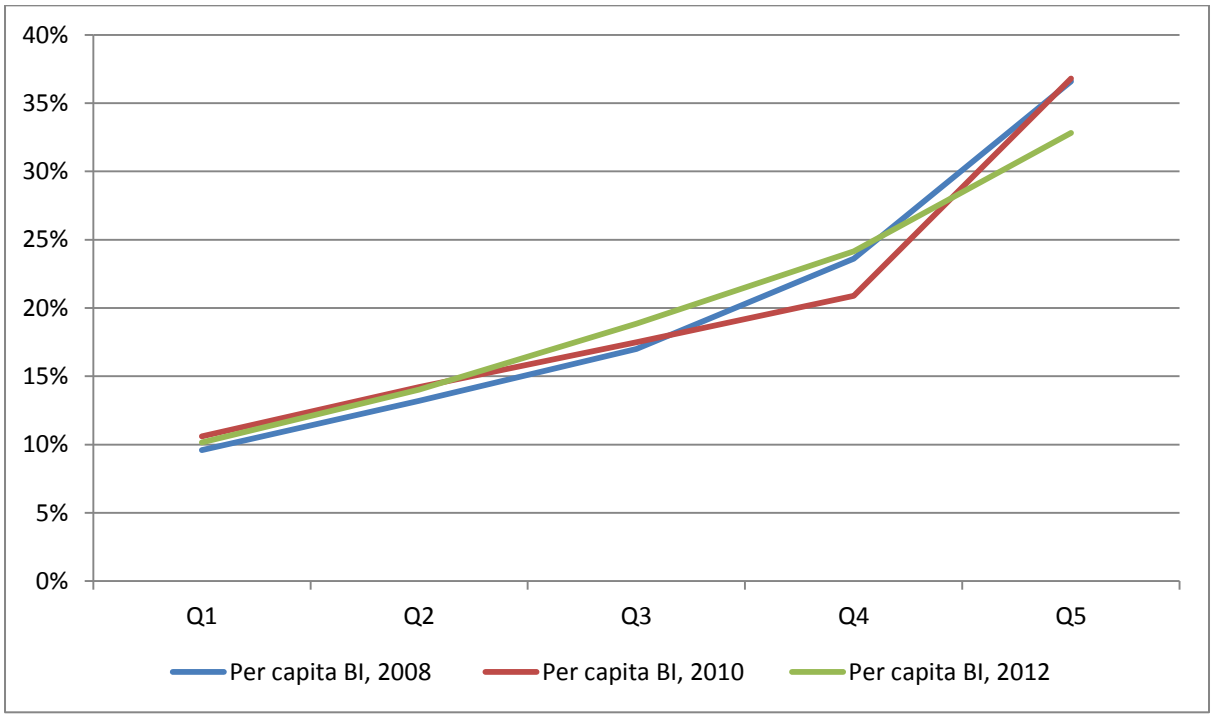
	1	*2*	*3*	*4*	*5*
Benefit Incidence depending on the consumption volumes per capita, 2008	9.6%	13.2%	17.0%	23.6%	36.6%
Benefit Incidence depending on the	10.6%	14.2%	17.5%	20.9%	36.8%

[10] Water supply tariffs are set in April-June every year, therefore, for simplicity reasons the average tariff for all 5 WSCs was used to estimate the per capita consumption. Since tariffs for all 5 companies do not vary drastically and fall into a relatively narrow range of AMD 172-202 per CM, the resulting error would not affect the analyses of benefit incidence significantly.

consumption volumes per capita, 2010					
Benefit Incidence depending on the consumption volumes per capita, 2012	10.16%	14.01%	18.86%	24.15%	32.82%

One can see that, despite a relatively proportional distribution of access to the system in all 5 quintiles, poorest HHs benefit much less from the government's expenditure programs in the water supply sector then their 20%-share.

Graph 15. Benefit Incidence based on per capita water consumption, 2008-2012



The overall picture has not changed drastically during 2008-2012. However, there is a slight improvement in that distribution between 2008 and 2012 in terms of decreased benefit incidence in the highest quintile by about 4 percentage points. In the lowest two quintiles, insignificant decreases are recorded in 2012 as compared to 2010 followed by 1 percentage points' increase in 2010 in each quintile. Meanwhile, slight improvement since 2008 is apparent in 2012 (0.5 percentage point in the lowest quintile and 0.8 percentage point – in the second quintile). Benefit incidence in the third quintile has steadily grown during 2008 through 2012, while in quintile 4 – it has increased by 0.5 percentage points (after about 3 percentage points' drop during 2008-2010). Overall, the distribution of benefit incidence in terms of per capita water consumption is very unequal: Quintile 5 consumes more than 3 times more water than Quintile 1, thus benefits from the government subsidies 3 times more than the poorest households. The variance between Quintile 4 and Quintile 1 has a coefficient of almost 2.5 times. On the other hand, decreased benefit incidence in Quintile 5 is "eaten" by increased benefit incidences in Quintile 3 and 4.