Shape Consulting Limited carried out a Health Impact Assessment in June 2012. The impact assessment has been superseded by the ESIA. The baseline from the 2012 Health Impact Assessment is presented here as an Appendix to this ESIA.

7 Baseline Health Status

7.1 General Socio-Economic Context

Armenia is a landlocked, mountainous country in Central Asia.

It became independent from the Soviet Union in 1990. In the years during the transition the economy and development were severely affected causing widespread poverty, and the gross domestic product of the county was halved [25]. Today, Armenia is a rapidly developing country, ranking 76th (out of 187 countries) in the (2011) global Human Development Index (HDI) with a classification as a 'high human development' country [26]. Between 1995 and 2010, Armenia's HDI improved by 22% [27].

The country is classified as moderately wealthy, with a gross domestic product (GDP) of 3,090US$ per capita per year in 2010 [28]. In comparison, Norway, ranking first place in the HDI, has a GDP of US$52,012 per capita per year.

Armenia ranks 123 (out of 178) in the Transparency International Corruption Index [29].

Inflation in Armenia has been declining in the past years and predictions by the International Monetary Fund (IMF) for 2011 set it at 6% with an economical growth of 6% [31].

When Armenia was still part of the Soviet Union, poverty was practically non-existent. However, poverty levels are currently high with a third of the population living below the poverty line of 2US$ a day in 2009 [32], but there has been an stable improvement from 1999 when 54.8% of the population lived below the poverty line [28].

Remittances from abroad to Armenia are an important source of income for the country and a driver for economic growth and poverty reduction. According to an Asian Development Bank (ADB) study, 26% of households in Armenia received remittances from abroad in 2006 [33].

Armenia has a very high literacy rate with 100% of the adult population functionally literate. 4% of public expenditure is designated for the education sector [28]. These indicators are consistent with most European standards.

Armenia has a small population (3.1 million) and low population annual growth (0.1%). Fertility rate is also low (1.7 children per woman) [31]. Most of the population in Armenia lives in an urban setting (64%) and enjoys a relatively long life expectancy (74 years) [31].

7.2   General Health Profile of the Country

After the collapse of Soviet Union, the Armenian health system was also impacted by the economic crisis, which resulted in a general deterioration of health care and shortage of basic medical and public health supplies. The country started to overcome the challenges between 1998 and 2003 when structural, financial reforms were approved, and this changed the health system from being centrally administered to a network of state controlled but economically independent enterprises [35].

However, these new administrative divisions still present challenges to the quality of health care in the country for a number of reasons:

- Mismanagement of health budget with shortage in drugs procured for chronic diseases: for instance public spending on pharmaceuticals is very low- less than 2US$ per person per year [35].
- Poor health outreach and coverage at rural level. It is noteworthy that a state supported programme addresses the health care needs of the most vulnerable portions of the population, where the government covers over 50% of costs for medication, consultations and surgery.
- Poor access to health services for poor people: drug prices are high and are often unaffordable to the majority of population. In addition, the introduction of value added tax for medications led to further price increases and exacerbated the access to affordable health care and medications [36]. This has been the subject of intense debate in the country as health care in Armenia is free for vulnerable groups. This was subject to specific conditions and the Basic Benefits Package comprised of a publicly funded package of services specifying a list of services that are free of charge for selected vulnerable groups. However, shortages of medication have meant that households are forced to procure the medications privately placing a significant burden on the family budget or limiting access to health care. The list of vulnerable groups has not been met with a commensurate increase in budget, which has compounded this.

In fact, the health system is largely privately financed. According to WHO in 2011, private funding constituted about 50% of total health expenditures in Armenia, with 84% of that coming directly out of the consumer's pocket [37] [38].

Hospitals are generally large with a big bed capacity that was part of the Soviet model of health care, which included long hospital stays based on rigid protocols. However, bed occupancy rates are extremely low (30% in urban areas and 10-15% in rural areas). Visits by doctors have also fallen by up to 200%, which is mainly linked to the prevailing poverty in country [35, 37].

The number of physicians per capita in Armenia is double that of other Western countries. However, the distribution of the healthcare staff reveals an uneven urban versus rural mix. The number of physician's per capita population is also in decline because of migration of skilled staff to more attractive countries. This and the reduction of beds per capita is shown in Figure 7 [38]

Indices	1990	1995	2000	2001	2002
Number of physicians per 10.000 people	41	33.3	32.3	30.3	35.8
Number of beds per 10.000 people	86	76.2	54.7	42.5	43.5

Figure 1: Number of physicians and bed in Armenia [12], 2004

The disability-adjusted life year (DALY) is a measure of overall disease burden. It is designed to quantify the impact of premature death and disability on a population by combining them into a single, comparable measure [40]. The DALY is an important indicator and it is a health gap measure that extends the concept of potential years of life lost (YLL) due to premature death to include equivalent years of 'healthy' life lost by virtue of (being in a state of) poor health or disability. DALYs for Armenia are shown in Figure 8 [40].
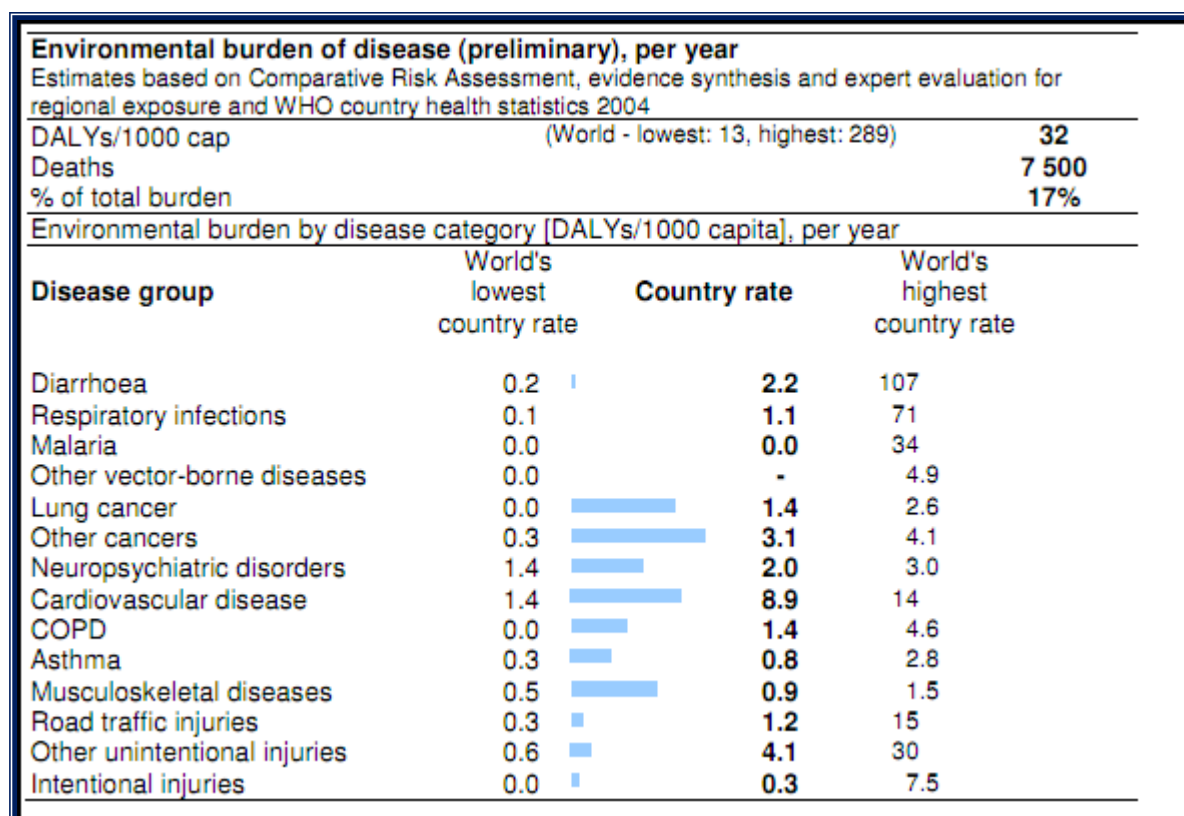
Environmental burden of disease (preliminary), per year
Estimates based on Comparative Risk Assessment, evidence synthesis and expert evaluation for regional exposure and WHO country health statistics 2004

DALYs/1000 cap	(World - lowest: 13, highest: 289)		32
Deaths			7 500
% of total burden			17%

Environmental burden by disease category [DALYs/1000 capita], per year

Disease group	World's lowest country rate	Country rate	World's highest country rate
Diarrhoea	0.2	2.2	107
Respiratory infections	0.1	1.1	71
Malaria	0.0	0.0	34
Other vector-borne diseases	0.0	-	4.9
Lung cancer	0.0	1.4	2.6
Other cancers	0.3	3.1	4.1
Neuropsychiatric disorders	1.4	2.0	3.0
Cardiovascular disease	1.4	8.9	14
COPD	0.0	1.4	4.6
Asthma	0.3	0.8	2.8
Musculoskeletal diseases	0.5	0.9	1.5
Road traffic injuries	0.3	1.2	15
Other unintentional injuries	0.6	4.1	30
Intentional injuries	0.0	0.3	7.5

Figure 2: Estimated DALYs ('000) by cause, estimates for 2004, WHO

Cardiovascular diseases and cancer are the largest contributors to DALYs in Armenia: cardiovascular diseases account for 8.9% of deaths, lung cancer for 1.4% and other forms of cancer account for 3.1% of deaths [40].

The mortality indicators (2002) from the WHO described in Figure 9, provide a similar picture where ischemic heart and cerebrovascular diseases make up 49% of the total deaths [41].

Top ten causes of death, all ages Armenia, 2002			
	Deaths		Years of Life Lost
Causes	(000)	(%)	(%)
All causes	26	100	100
Ischaemic heart disease	8	33	23
Cerebrovascular disease	4	16	11
Diabetes mellitus	1	6	5
Trachea, bronchus, lung cancers	0	4	4
Chronic obstructive pulmonary disease	0	3	2
Inflammatory heart diseases	0	2	2
Hypertensive heart disease	0	2	1
Breast cancer	0	2	3
Stomach cancer	0	2	2
Cirrhosis of the liver	0	2	2

Figure 3: Estimated total death ('000) by cause in Armenia, WHO, 2002

Armenia has made progress in achieving the Millennium Development Goals [75]:

- Under 5 mortality has decreased from 55 deaths per 1,000 live births in 1990 to 22 in 2009.
- Infant mortality has dropped from 48 per 1,000 births in 1990 to 20 per 1,000 births in 2009.
- Life expectancy was estimated at 74 years in men and women.

7.3   General Health Profile of the Project Regions

The Project will develop in Vayots Dzor (capital Yeghegnadoz) and Syunik (capital Kapan) Marzes. Four types of facilities are available; a state-owned referral hospital in Vayk, one general hospital in Jermuk, one health centre in Gorayk (formerly a hospital) and two health posts in Saravan and Gndevaz. There is one other general hospital in Sisian which was not visited during the field trip. Figure 10 show type and location of health facilities in the Project area.

In the social assessment, scoping study discussions with the local residents and health centre staff revealed that the main health problems in the area included [1]:

- high blood pressure and associated cardio-vascular disease complications;
- diabetes;
- cancers;
- osteoporosis; and
- seasonal health issues such as influenza in winter and diarrhoea in summer.
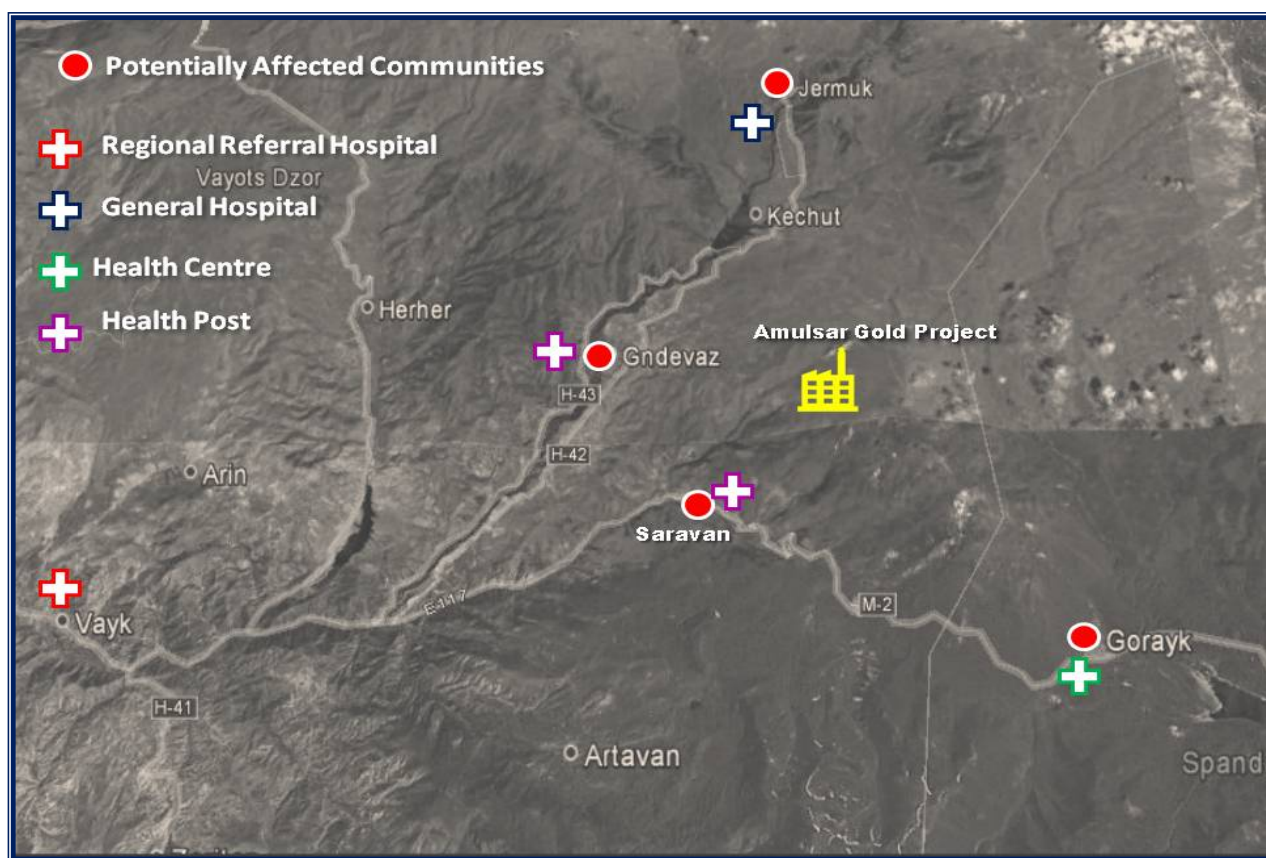
Figure 4: Map of the Project area and location of health facilities

Table 8 describes the health facilities in the area and their different characteristics. The study area is well resourced in terms of available health centres and hospitals and there is a functioning referral and ambulance system in place. Unfortunately, most of the health facilities and especially the health centres and posts suffer from major structural issues (such as wall damage due to humidity (Figure 11)) and often lack basic services such as functional heating systems, proper sanitation and running water. The social scoping study also reported on the availability and functionality of the local health facilities (table 2.11) with the following important findings:

- there are no pharmacies in the villages. The community are expected to pay a quarterly advance fee to the health posts in the area to support the stocking of medicines. OXFAM support this drug fund to ensure that the supply chain actually functions. However, in-spite of this there is a general reluctance from the community to visit the local health facilities.

Figure 5: Damage by humidity, Gorayk Health Centre

The health posts have a limited supply of drugs (Figure 12) and the drug payment system discourages the general population and especially the vulnerable proportion of the population to access care at these facilities due to the costs, limited availability of free drugs and poor basic services. Table 8 further describes the characteristics of the health facilities in the area.

Figure 6: Limited drug supply at Saravan Health Post

Table 1: Health facilities characteristics

Location	Type of Facility	Catchment Area	Services/Facilities	In-patients Capacity	Staff	Challenges
Vayk	State-owned Regional Referral Hospital	Saravan, Gndevaz	Ambulance service, Surgery, Outpatients, Inpatients capacity, Maternity, Orthopaedics, Emergency Care, Laboratory.	180 beds	40 medical staff	-limited financial resources -lack of high tech diagnostic equipment -referral hospital for a big population (40,000 people)
Jermuk	State-owned General Hospital	Jermuk, Kechut	Ambulance service, Surgery, Outpatients, Inpatients capacity, Maternity, Orthopaedics, Emergency care, Laboratory	25 beds	24 medical staff	-lack of trained staff -top-down approach in health policy implementation decided by the MoH
Gorayk	Health Centre	3 villages	Basic health care, first aid, health education, monitoring of pregnancies and chronic diseases, family planning, vaccinations, home visits	0 beds	11 medical staff (2 nurses permanently at the health centre)	-structural issues (humidity) and lack of heating and hot water -lack of even basic diagnostic medical equipment -no inpatient capacity
Saravan	Health Post	1 village	Basic health care, first aid, health education, monitoring of pregnancies and chronic diseases, family planning, vaccinations, home visits	0 beds	1 nurse	-irregular supply of drugs -lack of heating and running water -no sanitation facilities -limited supplies provided by the state
Gndevaz	Health Post	1 village	Basic health care, first aid, health education, monitoring of pregnancies and chronic diseases, family planning, vaccinations, home visits	0 beds	1 nurse	-structural issue (floor) -no sanitation facilities, no heating -limited supplies provided by the state

7.4 Environmental Health Areas

The following section will describe the baseline health status in relation to the proposed site development project with reference to the EHA framework. This is based on the national, regional and local baseline health data that was identified in the desktop review, during the field mission and through data provided by Geoteam in consultation with different stakeholders.

7.4.1 EHA #1 – Communicable Diseases linked to Overcrowding and Poor Environmental/Socio-economic Conditions

Communicable diseases (e.g. acute respiratory infections, pneumonia, tuberculosis, meningitis, plague, leprosy, etc.) rely on fluid exchange, contaminated substances, or close contact to travel from an infected carrier to a healthy individual. Therefore, they are directly linked to housing design, overcrowding and housing inflation.

According to the 2005 Armenia Demographic Health Survey (ADHS) [42], the average household composition in the rural areas was four members with the size of the household limited to two sleeping areas in 41.6% of rural families. In the rural areas, 67% of households are made out of wooden planks and 41% use natural gas for heating and cooking [42].

This local situation is described in more detail in the social baseline [141].

Housing and heating in the study area:
Houses in the study area are made out of stone bricks and roofing is provided with corrugated iron sheets, concrete asbestos sheets, or asbestos sheeting. Houses are usually quite large and usually include stables for animals (Figure 13). Houses generally have piped water and only a few houses have connections to water borne sewerage systems with most relying on outhouses as their sanitary facility.

The main source of energy for cooking was through a centralized gas supply with the exception of Saravan were wood was mainly used. However, Saravan may have a connection to the main gas line by 2013. The fuel for heating was either wood or dried manure but this varied between communities [141]. Most of the households had access to electricity that was used for lighting. In Jermuk, the majority (48%) use gas or electricity (21%) for heating [142]. The small community of Kechut mirrored the finding of the other more rural areas.

The social baseline further reported that on average 5-7 people lived per household across the PAC 1-3, with one sub-family living with another family unit in more than 50% of households. While it did not appear that people lived in overcrowded conditions due to the size of the houses it is important to recognise that many households did not have the financial means to live separately [141].

In Jermuk, the proportion of households that had more than five family members was 38%, which was lower than the rural villages. As with the other communities, 68% of households in Jermuk had more than one sub family unit per household. It was reported that people do not get married because of the lack of proper living space [142].

Figure 7: Typical house in the project area

7.4.1.1 Tuberculosis

It has been estimated that in 2009 TB affected 9.4 million people (Figure 14) which is equivalent to 137 cases per 100,000 population. While the majority of countries with a high incidence were located in Sub-Saharan Africa, the Central Asian and Commonwealth of Independent States (CIS) region is the second most important area [43].
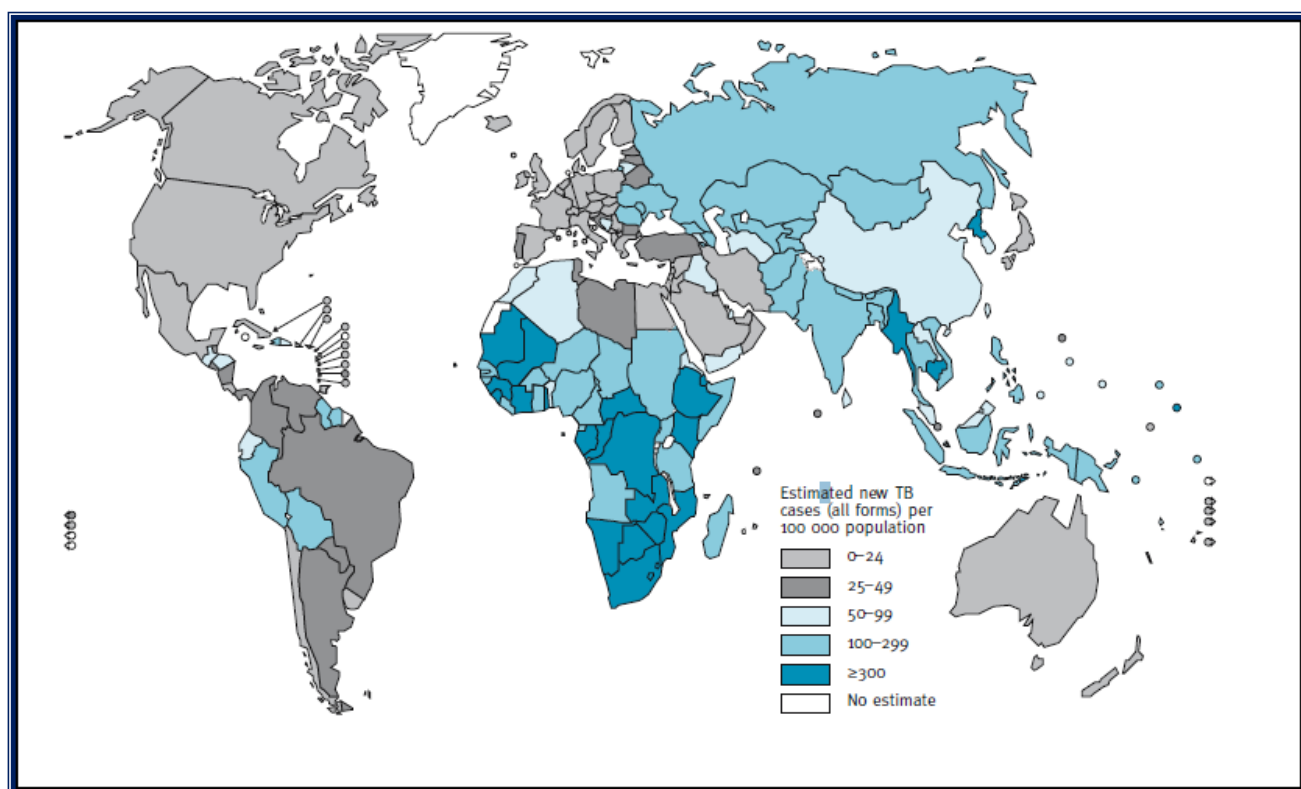
Figure 8: Estimated world TB incidence, WHO, 2009

TB can be cured using a 6 month long course of medication. This long course of medication that may have signficant side effects is prone to poor compliance or defaulting of treatment. This can lead to multidrug-resistant TB (MDR-TB) or extensively multi-drug resistant TB (XDR-TB) which are more difficult and extremely costly to treat [44, 45]. Cure rates are also poor with these conditions [46, 47].

National level

- Armenia is not classified as a high burden TB country as per the WHO classifications. The estimate of the burden of disease from TB from 1990-2010 was reported by the WHO with the following findings [43]:
  - The prevalence rate from TB has increased from 56/100,000 population in 1990 to 114/100,000 population in 2010.
  - The incidence rate from TB has increased from 33/100,000 population in 1990 to 73/100,000 population in 2010. This has been static since 2000.
- Treatment success rates had increased from 55% in 1995 to 73% in 2009. This is still below the ideal WHO rate of at least 80% treatment success rates to control epidemics [43]. However, treatment success in retreatment cases was only 63%.
- The case detection rates at present are estimated at 62%, which is down from 74% and 69% in 2008 and 2009 respectively. This ideally needs to be above 85% to slow disease progression and is likely to play a role in the high incidence of MDR-TB as described below.
- The association of TB with HIV infection is now well recognised in Armenia with 70% of TB patients knowing their HIV status in 2009. This increased from 12% in 1995 [43].
- In 2009, the country notified 2,006 new cases of TB. While TB cases are decreasing, MDR-TB cases show an increasing trend from 2007 to 2009 as Figure 15 shows [43, 48].
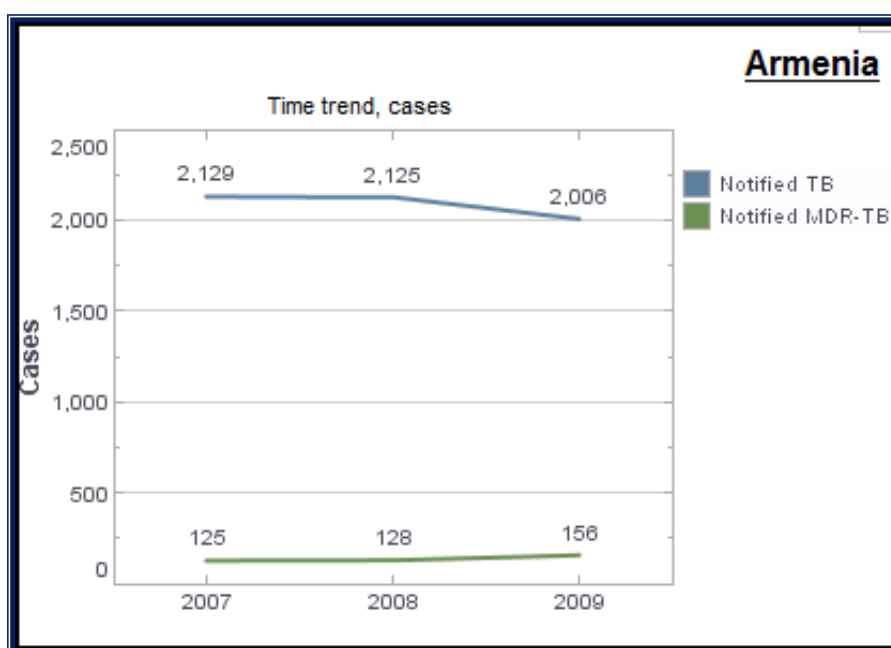

Figure 9: Trends in TB new cases 2007-2009, WHO, 2009

- Armenia is listed by WHO as one of 27 countries with a highest MDR-TB and XDR-TB in the world [49]. In 2008, 9.4% of new TB cases showed signs of MDR-TB and it was estimated that 43% of cases were retreatment, as conventional first line drugs had not cured them. The proportion of XDR-TB among MDR-TB was estimated at 4% at the same period [50].

- Only 53% of MDR-TB patients succeeded in being cured [24]. This low rate is due to lack of second line drugs, inexperienced medical staff and poor therapy compliance [51].

- Treatment is costing to the Armenian government about 10,000US$ to 15,000US$ per patient but only 200US$ per person is allocated in the budget for treatment [52].

Regional level

- The Vayk hospital had no cases of TB in 2011. Suspected cases are usually referred to Abovyan, a specialized TB centre, North of Yerevan, where proper diagnostics and treatment is available.

Study area

- While the health posts and centres in the area have not notified or referred any suspected cases of TB in the past few years, Jermuk hospital has referred about 20 cases in the period from 2010 to 2011. All the cases were residents from the study area but had recently returned from serving in the army or from temporary work assignments in Russia. The head doctor in Jermuk reported that he believed these were all imported cases as TB was not common in the area.

- Suspected cases of TB are referred to the specialised Abovyan hospital. Jermuk hospital supports as a DOTS dispensing centre as well as supporting adherence to treatment on an outpatient basis. Abovyan hospital is responsible for final sputum testing to confirm treatment success.

- TB is included in the 1997 Basic Benefits Package (BBP), which means that drugs and diagnostics are provided for free to all patients even if they do not belong to any special vulnerable groups.

- Out of the 20 cases identified in Jermuk hospitals, five had TB/HIV co-infection, nine had MDR-TB and two suffered from XDR-TB.

- TB vaccination is part of the expanded programme of immunisation (EPI). Vaccination coverage (with BCG at birth)) was estimated to be over 95% in the area.

- In the FGDs, it emerged that TB was a well-known disease but not considered a problem by the communities. However, consistent knowledge on the manners of TB transmission and the importance to treat early appeared limited.

7.4.1.2 Acute Respiratory Infections

Pneumonia kills ~3 million children per year in the developing world and affects adults of all ages. The most serious cases are bacterial *(e.g. *Streptococcus pneumonia, Haemophilus influenza, Staphylococcus aureus*). In 2000–2003, acute respiratory-tract infections (ARIs) were responsible for 20% of deaths among children under 5 years of age and ranked fourth among the top ten causes of death, in all ages [53].

National level

- According to 2005 ADHS, 8.5% of children under five in the rural areas showed signs of ARIs in the two weeks preceding the survey. Only 46% of this population sought medical care when their children were diagnosed with pneumonia and only 9% received appropriate antibiotics [42].
- In the 2010 ADHS, 5% of children showed signs of ARIs in the two weeks preceding the survey and 56.7% sought care from a proper health facility/ provider.
- In 2008, 17% of deaths of children under five were caused by pneumonia [53].

Regional level

- No specific statistics were available for ARIs and pneumonia at the Vayk hospital.

Study area

- Respiratory conditions are recorded in the routine health management information system (RHMIS) at the local health centres. Between June and November 2011 ARIs accounted for 14.9% of cases at Gorayk health centre they account for of the diagnoses, 4.6% of patients at Gndevaz and only 3% of patients in Saravan.
- The health posts and centres of the area did not consider ARIs a serious health issue. Pneumonia is very rare and respiratory related infections include flu and seasonal influenza. Health staff believed that the cold season and poor heating led to more frequent infections during winter. Furthermore, some patients tend to neglect respiratory infections due to lack of financial means to buy additional drugs to complete drug courses that are initiated free at the health posts or centres. The health centres rarely provide the full course due to stock challenges.

7.4.1.3   Measles

Measles is a highly contagious, serious disease caused by a paramyxovirus. Unvaccinated children, living in overcrowded or squalid conditions, and those visiting or admitted to health facilities are at increased risk of measles [31]. Most deaths from measles occur in low-income countries with weak infrastructure where coverage of the measles vaccine coverage is low (Figure 16) [54].
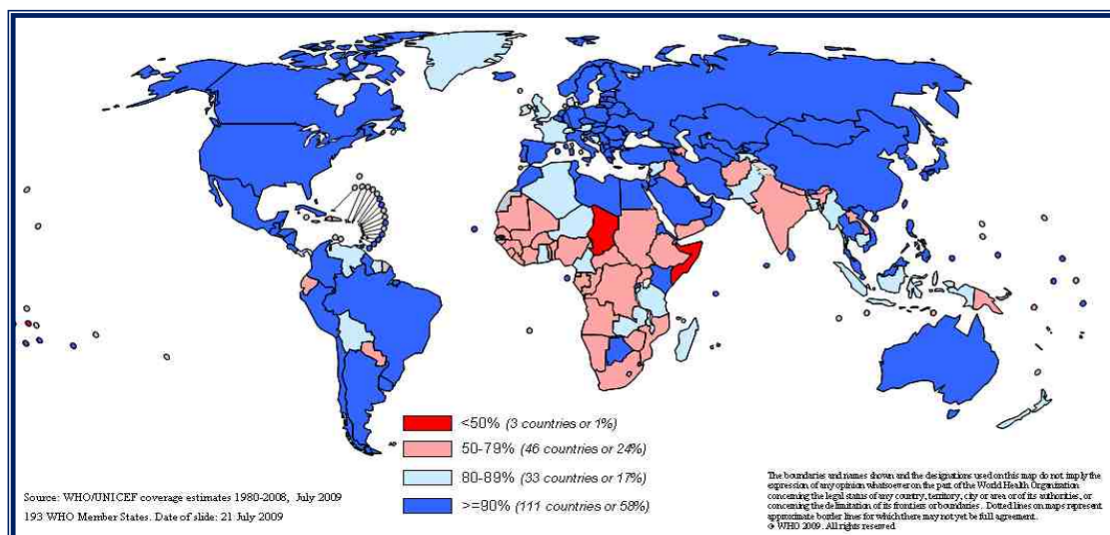

Figure 10: Measles immunization coverage 1998-2008, WHO, 2009

National level

*   In Armenia, measles vaccination is dispensed in the form of a MMR vaccination at 12 months of age to protect against measles, mumps, and rubella. According to WHO, in 2010, 94% of children under 1 year were immunized against measles, and is thus considered a high immunization country [55].
*   No measles cases were reported in Armenia since 2008 [56].

Regional level

*   The Vayk hospital has reported no cases of measles in the past years, which according to the health staff is due to high vaccination coverage in the region.

Study area

*   At the Gorayk health centre, the Jermuk hospital, and the health posts in Gndevaz and Saravan no cases of measles have been reported in the last years.

7.4.1.4   Meningitis

Meningitis is an infection of the thin lining around the brain and spinal cord.   The transmission is through direct contact with respiratory droplets. Infections are most commonly caused by *Haemophilus influenzae type b* (Hib), *Streptococus pneumoniae* and *Neisseria meningitides.*

National level

- According to WHO, Armenia reported only five case of Hib meningitis in 2010 [57]. The vaccination is part of the national EPI.

Regional level

- The Vayk hospital reported no cases of meningitis in the past years, which is, according to the health staff, due to high vaccination coverage in the region.

Study area

- At the Gorayk health centre, the Jermuk hospital and the health posts in Gndevaz and Saravan no cases of meningitis were reported in the last years.

7.4.2 EHA #2 – Vector-related Disease

7.4.2.1   Malaria

Until the 1950s, malaria was endemic in Armenia. A large-scale eradication campaign resulted in Armenia gaining malaria-free status in 1963. Thereafter the first cases of autochthonous (malaria transmission in the community that have not travelled to malaria endemic areas) began to reappear in 1994. Case numbers peaked at 1,156 in 1998. *Anopheles maculipennis* was the main malaria vector in the country and *P. Vivax* the most common parasite [58].

Control measures were again instituted and in October 2011, the WHO Director-General granted Armenia malaria-free status [59]. However, the risk for re-introduction is higher in the summer months with potential focal areas of transmission on the western border with Turkey and other areas far from the study area [60]. The elevation and the climate in the study area make it unlikely that malaria will be reintroduced into the area.

7.4.2.2   Tick-borne Encephalitis

These viral tick borne diseases are unlikely to occur commonly in Armenia. There general distribution is from the Baltics to the Crimea with the bulk of the cases from Western Europe and western and eastern Siberia [60, 61]. These diseases occur in forested areas below 1,500 meters elevation so the study area is unlikely to experience any risk.

7.4.2.3   Borreliosis/Lyme Disease

Borrelia is a genus of bacteria of the spirochete class. It is a zoonotic, vector-borne disease transmitted primarily by ticks and some by lice, depending on the species. Of the 37 known species of *Borrelia*, 12 of these species are known to cause Lyme disease or borreliosis and are transmitted by ticks.

These tick borne diseases are generally limited to rural forested areas and people who are exposed to outdoor activities (hiking) in rural wooded areas are at risk [61]. The incidence of tick borne diseases may be influenced by climatic or environmental changes- for example reduced agricultural activity and reduced use of pesticides resulted in an increase in tick borne diseases in the former Soviet Union [62].

There was no data on these conditions locally and they are not anticipated to be of significant importance related to the Project.

7.4.3 EHA #3 – Soil-, Water- and Waste-related Diseases

The prevalence of soil-, water- and waste-related diseases is highly dependent on sanitation facilities and access to safe drinking water, factors which often show strong variations on continental and regional levels.

In the 2005 ADHS, it was reported that 92.9% of the rural population uses improved drinking water sources. In the rural areas, 47.2% had access to improved sanitation facilities in the form of ventilated improved pit (VIP) latrines. 17.3% had access to a flush toilet connected to water based sewage system. Only 17% of the population used unimproved facilities (pit latrines without slabs) [42].

In the FGD with women in the study area, it was reported that VIP latrines were most commonly used, which mirrors the national studies. Some did report having facilities in the house with septic tanks or French drains reported to be the most common forms.

A number of key findings were reported from the social baseline studies commissioned by the Project including [121]:

- All communities in the study area have good access to piped water with the proportions described in the report. However, the quality of potable water in Gorayk and Saravan does not meet the required drinking water quality standards. 87.5% of the respondents in Gorayk mentioned that drinking water as a major problem with 55% of the respondents reporting that they were not satisfied with the drinking water quality.

- The sewerage system in all the villages is either non-existent or is in a poor condition. The lack of a sewerage system was cited as a major challenge in 40% of interviewed households in Saravan.

- Collection and removal of domestic waste/garbage was only provided in 16.3% of the PACs. This was worse in winter as access to the villages declined. The exception is Gorayk as this is organised by the Project.

- There is a lot of damp in the buildings due to poor construction and high levels of water and humidity in the communities.Elevated radon levels exist in a significant proportion of houses within Gorayk. A survey of radon levels has been coordinated by the Amulsar project to understand this pre-existing condition and present the results to government authorities to seek support for the village.

- Air pollution was not mentioned as a challenge.

In Jermuk, the following was reported in terms of environmental hygiene [122]:

- 78% of the population reported that there are no environmental issues. Of those that did report issues 23.5% reported street pollution and 15% the presence of rodents.

- 99% of the community had access to a permanent drinking water supply as well as domestic waste/garbage removal services. However, only 55% were satisfied with the quality.

- All of the households in Kechut had a permanent water and power supply as well as services for domestic waste/garbage removal. Most of this community was satisfied with their drinking water supply (77%).

7.4.3.1   Diarrhoeal Diseases

Diarrhoea is usually a symptom of gastrointestinal infection, which can be caused by a variety of bacterial, viral and parasitic organisms.

National level

- Diarrhoeal diseases represent 2.2% of the DALYs [39].

- According to 2005 ADHS, 19.5 % of children under 5 in the rural areas showed signs of diarrhoea and 1.1% had diarrhoea with blood in the two weeks preceding the survey [42].

- In the 2010 ADHS, 9% of children had signs of diarrhoea in the two weeks preceding the survey. Only 42% were taken to a health facility [117].

Regional level

- According to the 2005 ADHS, in Vayots Dzor, 12.4% of children under 5 had diarrhoea and 1.3% had diarrhoea with blood in the 2 weeks preceding the survey.

- According to the 2005 ADHS, in Syunik, 15.3% of children under 5 had diarrhoea and 1.9% had diarrhoea with blood in the 2 weeks preceding the survey.

Study area

- In the KII diarrhoeal diseases were not considered to be a major challenge in the area with cases occurring in the spring and summer months more commonly than in winter.

- Health data on diarrhoeal diseases from the RHMIS is only available for Saravan. Between June and November 2011, 4.5% of patients were diagnosed with some form of intestinal problems, which was assumed to be diarrhoea, or gastro-intestinal upset.

Cholera

Cholera is caused by the bacteria *Vibrio cholerae* and is the main cause of dehydrating diarrhoea in adults.

National level

- The last epidemic was recorded in Armenia in 1988 [63].

7.4.3.2   Soil Transmitted Helminthiasis

Soil Transmitted Helminthiasis (STH) or intestinal worm infection is the commonest parasitic infection worldwide often affecting deprived communities. Infection with STHs is strongly associated with unsafe sanitation and lack of hygiene.

The common helminths are roundworm *(Ascaris lumbricoides)*, whipworm *(Trichuris trichiura)* and hookworm *(Necator americanus)*.

National level

- In Armenia in 2011, it was reported that 4% of the adult and child population suffer from *ascaris* infections, 1% of *trichiura* infection and 26% from some form of *enterobacter* infections [64].
- In 2010, WHO estimated that 28,806 people in Armenia were in need of preventive chemotherapy for STH [65].

Regional level

- According to the 2005 ADHS, in Vayots Dzor, 8.7% of children under 5 were given de-worming medications in the 6 months preceding the survey.
- According to the 2005 ADHS, in Syunik 13% of children under 5 were given de-worming medications in the 6 months preceding the survey [42].

Study area

- At the health centres in the study area and Jermuk hospital it was reported that cases of STH are rarely notified, with more cases in summer.
- According to health staff, de-worming campaigns are routinely conducted twice a year, free of charge for children up to 12 years of age. According to the nurse in Gndevaz health post, the last one was conducted in October 2011.

7.4.3.3   Hepatitis A

Hepatitis A virus (HAV) is the most common viral cause of hepatitis worldwide and is hyper-endemic in many parts of the developing world. Transmission is via the faecal-oral route including ingestion of contaminated food or water. In most developed countries 75-100% of adults have acquired immunity to HAV, thus HAV is an uncommon cause of acute hepatitis in adults in these settings. If infected during childhood the infection is mild or subclinical. Infection as an adult results in symptoms of acute hepatitis.

National level

- Hepatitis A vaccination is not part of the national protocol on EPI. No information is available on vaccination coverage.

Study area

- There was no knowledge of this condition at the local level. With the prevailing sanitation situation it is likely that the community were exposed as children and now have immunity.

7.4.4 EHA #4 – Sexually-transmitted Infections, including HIV/AIDS

7.4.4.1   HIV/AIDS

Globally the HIV incidence has fallen by more than 25% between 2001 and 2009. However, the number of people living with HIV in the Europe and Central Asia region more than doubled between 2001 and 2007 [68]. While injecting drug use remains the main mode of transmission, HIV cases through sexual transmission have been increasing.

In the past few years the countries around the CIS and Central Asia region have experienced an increasing incidence of HIV positive patients. The response to and acknowledgment of the problem has been slow from national authorities and external donors still mainly finance prevention programs. A major challenge in many former Soviet Union countries is the negative public attitudes towards people living with HIV and related stigma, as well as towards those most at risk of contracting the disease: injecting drug users, sex workers, and men who have sex with men [70].

A case study in Georgia[1] related to HIV/AIDS knowledge, attitudes and behaviours in transport sector workers published in 2008 noted the following key findings [69]:

- Georgia like Armenia is experiencing an increase in HIV rates and its location near Russia and Ukraine poses an added risk as these latter two countries has the highest HIV prevalence in the region.
- The transport sector is important in Georgia is it was one of the fastest growing areas within the country and the location on the Black Sea is strategic in the region.
- The awareness of HIV/AIDS was high but knowledge on transmission and prevention was variable. Misconceptions and myths were common. For example, about 43% of Georgian truckers believe HIV can be transmitted by sharing food and nearly half of them believe it can be transmitted by a mosquito bite.
- HIV risk among transport workers is more likely through sexual transmission (particularly

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[1] The location of Georgia is relevant to the Project as the supply chain may pass through this country and it provides a regional example

through unprotected paid sex) than through intravenous drug use. 70% of Georgian truckers had paid sexual partners in the past 12 months.

- There was easy access to commercial sex workers (CSW) along transport routes, but condoms to prevent transmission of STIs were not readily available.

- High level of awareness does not necessarily change risk behaviour among transport workers.

National level

Prevalence

- Trends show that HIV prevalence among adults (aged 15-49 years) in Armenia have gradually increased in the past decade [71]. This trend is shown in Figure 17 with a current national prevalence estimated at 0.12% in 2008.

- In 2008, based on modelling it was estimated that there were just over 2,200 HIV + people in Armenia [71].
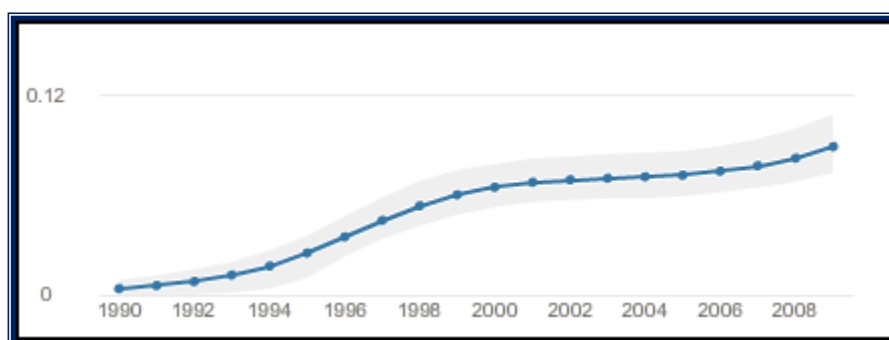
Figure 11: HIV trends in Armenia 1990-2008

Knowledge, Attitude, Behaviour

- Among the groups at risk (IV drug users, sex workers and men who have sex with men) HIV related knowledge remains limited. Nationally, 54% of sex workers, 74% of men having sex with men and 68% of IV drug users have adequate knowledge related to HIV prevention methods [71].

- In the 2005 ADHS, 91.6% of rural women and 91.5% of rural men had heard of HIV [42].

- The levels of consistent knowledge on HIV prevention, as reported in the 2010 ADHS, has changed little since the 2005 ADHS [117].

- In the 2010 ADHS, there was a strong correlation between the respondent's educational background and his or her knowledge of ways to prevent getting HIV [117].

- 72% of men who had more than one sexual partner in the 12 months preceding the survey reported condom use at their last sexual intercourse [117].

Treatment

- Anti-retroviral therapy (ART) has been scaled up in the past decade to address the increasing deaths related to AIDS. Figure 18 shows how the AIDS mortality rate plateaued, followed by a slow decline after the introduction of ART [71].

- ART is however, only available in Yerevan.
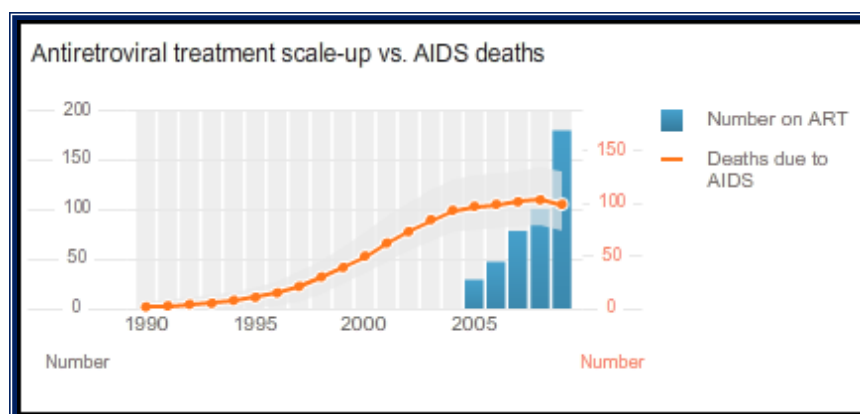
Figure 12: ARVS treatment scale up

Regional level

- In the 2005 ADHS, 98.8% of women and 89.6% of men from Vayots Dzor had heard of HIV. The preliminary results of the 2010 ADHS showed a decline where only

88.5% of women and 86.1% of men, respectively, had heard of HIV/AIDS in Vayots Dzor [117].

- In the 2005 ADHS, 96.7% of women and only <u>69.8%</u> of men from Syunik had heard of HIV. The 2010 results in Syunik was reported at 98% and 91%, respectively [117].

<u>Study Area</u>

- At the Vayk hospital, HIV screening is provided to the community. It is mandatory for all pregnant women to undergo screening for HIV. No cases have been reported in the past few years in this group.

- However, there are no screening facilities available in the health centres or Jermuk hospital. Patients are usually referred to Vayk or the Yeregnazor hospital.

- Five patients with HIV are currently followed up at the Jermuk hospital. It was reported that they were infected while working as migrant labour in Russia and that the transmission did not occur locally.

- In the FGDs HIV and related issues such as stigma were discussed with the women's groups.
  - Women believe they are well educated about HIV and know how to protect themselves. They usually receive brochures and leaflets with health education about HIV and believe that the blood is carefully tested before transfusion therefore they do not fear to becoming infected by the disease.
  - Women considered the level of stigma towards people living with HIV/AIDS (PLWHA) very low in the area since the population is educated and not prone not discriminate others. They think that most cases are imported from other areas or countries such as Russia, where people sometimes travel for temporary work.
  - Commercial sex work was described as very rare in the area, including Jermuk.
  -

7.4.4.2   Sexually Transmitted Infections

Sexually transmitted infections such as gonorrhoea, syphilis or chlamydia are an important global health priority because of their devastating impact on women and infants and their inter-relationships with HIV/AIDS. STIs and HIV are linked by biological interactions and because both infections occur in the same population cohorts. Infection with certain STIs can increase the risk of HIV acquisition and transmission as well as alter the course of HIV disease progression. In addition, STIs can cause long term health problems, particularly in women and infants.

National level

- STIs are often associated with high stigma. Doctors are obliged to report patients with STIs to relevant authorities and there is up to two years imprisonment for refusing to complete the prescribed treatment for STIs [73].

- STI treatment protocols are obsolete and mostly comprise lengthy inpatient treatment –for example for syphilis infection patients are treated using a complex methods of auto-transfusion of irradiated blood and substance derived from cerebral cell cultures, instead of a simple penicillin injection [73].

- In the 2005 ADHS, only 0.5% of women in the rural areas reported signs or symptoms of STIs in the recent past. None of the interviewed men in the rural areas reported signs of STIs [42].

Regional level

- At Vayk hospital, the health staff reported that they seldom manage patients with STIs. It was reported that reporting STIs is considered shameful and a taboo and people prefer to approach private practitioners rather than presenting to public health facilities.

Study Area

- At the Gorayk health centre, few cases of suspected STIs have been referred to specialized hospitals. The health centre provides health education and awareness for STIs. The other health posts have not encountered any suspected cases in the past few months and reported any cases to be rare.

7.4.4.3 Hepatitis B

Globally, Hepatitis B virus (HBV) infection is the largest cause of acute and chronic liver disease.

HBV is predominantly transmitted through sexual contact, contaminated blood products, or trans-placentally from mother to child; in a similar manner to HIV. In fact, HBV is much more infectious than HIV.

National level

- Three doses hepatitis B vaccination has been part of the Armenian EPI standard vaccination regime since late 1999 [59].

- In 2009, the reported immunization coverage of a completed three dose course in under 1 year olds was 93% [74].

Regional level

- The director of the Vayk hospital considered the vaccination coverage in the region very high.
- It was reported that the disease was uncommon with suspected cases referred for diagnostic confirmation in Yerevan.

Study Area

- Vaccination campaigns including hepatitis are regularly carried out at the health posts in the area and the nurses believed that the vaccination coverage for hepatitis is very high.
- Suspected cases are referred to specialist centres thus the disease is poorly recognised at the local level.

7.4.5 EHA #5 – Food- and Nutrition-related Issues

Access to land to sustain local livelihoods is important as agricultural produce is the major source of income and thus local livelihood, accounting for 54.6% of income in Gndevaz, 69.6% in Gorayk and 75.9%, Saravan, respectively [1]. The vast majority of people of working age were involved in some form of agricultural activity; often due to the fact that no other employment opportunities were available in the area. The most common food crops are wheat and potatoes with each community having a specific variety of preferred crops [1].

Animal husbandry and associated production of food products also plays an important local role. Sale and subsistence from agricultural products is important with Gndevaz producing more for subsistence and Gorayk and Saravan producing more for cash income. Cattle and poultry are the most popular livestock in the villages, followed by goats and sheep. Rearing of cattle was reported to be important with expansion of herds a local priority.

In general the community has adequate communal municipal land to graze their cattle during the summer months. Annual taxes are paid per head of cattle for this grazing right. This is limited to summer as animals are kept indoors in winter. Grazing lands are also utilised by migrant farmers from the south of the country who come to the area in search of good grazing.

In general women are involved in subsistence food production for the family unit or small scale agricultural business (cheese, butter). Men take care of crop and fodder production. Produce is either consumed by the household or sold to middle-men who visit the village. These sales are generally at low prices as the community has difficulty marketing the produce, with the cost to take the goods to markets in Yerevan, or other areas, reported as high.

In interviews as part of the social baselines it was mentioned that wild foods were collected from areas around the study area. This has been further assessed in an ethnobotany survey.

7.4.5.1   Malnutrition

Malnutrition is one of the greatest concerns in public health and the largest contributing factor to child mortality in less developed countries, where the majority of malnourished children are found. Socio-economic, climate, geography, agricultural and many other factors all contribute [75].

National level

- Since 2010, food prices have risen steeply in Armenia. While inflation has been reported at 9.7% food prices have risen uncontrollably, with some staple foods becoming nearly unaffordable; e.g. the potato price has risen by 150%, meat by 30% and cheese by 80% over a two year period [76].
- According to UNICEF, Armenia does experience elements of malnutrition. In the period from 2005 to 2009, it was reported 7% of babies born nationally had a low birth weight. Child growth monitoring statistics recorded between 2003-2009, revealed the following [77]:
    - 4% of children under five were moderately to severely underweight;
    - 5% were wasted (low weight for height and a sign of acute malnutrition); and
    - 18% were stunted (low height for age and a sign of chronic malnutrition).
- In the 2010 ADHS, it was found that 19% of children were stunted with 8% severely stunted. Four percent of children were reported as wasted with 2% as severely wasted. In general it was found that rural children and children born to mothers with less education are more likely to be stunted and wasted [117]. There has been little change in malnourished children over the past 10 years as shown in Figure 19.

- In the same 2010 ADHS, 15% of children were reported as obese, with the 48-59 months age group reported with figures as high as 20%. It was interesting that children born to mothers with higher education are twice as likely as children born to mothers with basic education to be overweight (17 percent and 8 percent, respectively) [117].
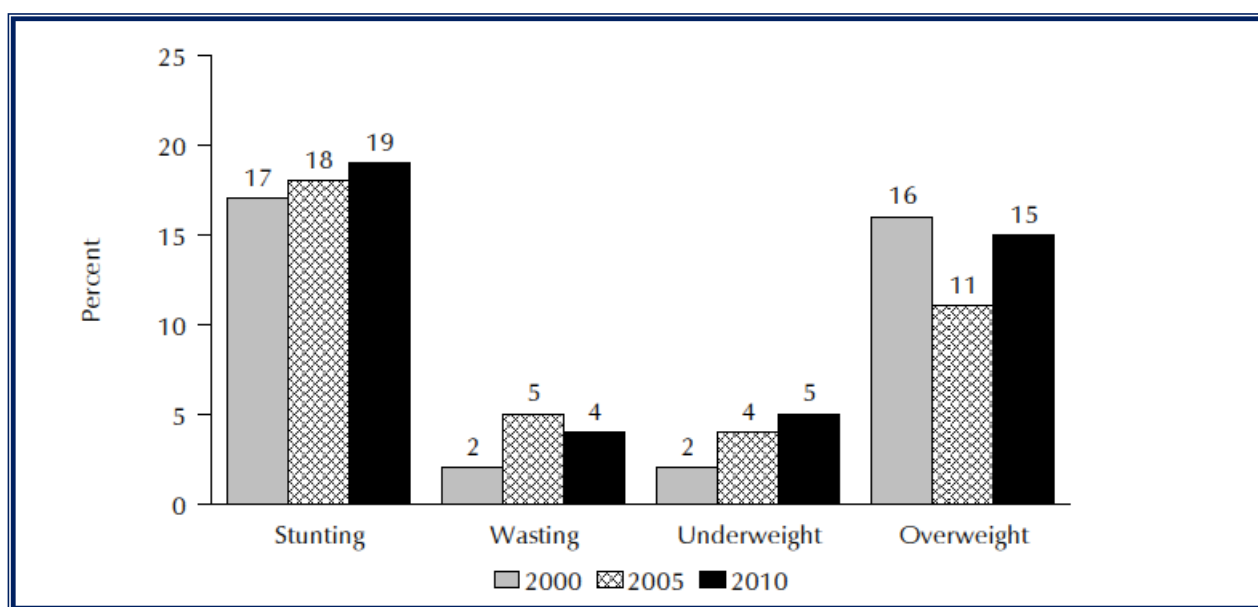

Figure 13: Trends in nutritional status in children under the age of 5 years

Regional level

- According to findings from the 2005 ADHS in Vayots Dzor Marz, 6.9% and 4.8% of children under 5 were moderately and severely stunted respectively. While none were severely wasted, 24.2% were moderately wasted and 11.3% of children were generally underweight [42].

- In Syunik Marz, 7.2% and 2.8% of children were moderately and severely stunted, respectively. Only 0.7% were moderately wasted with 1.9% of children generally underweight in the same area [42].

Study area

- At the health posts in Gndevaz and Saravan children under 12 years are regularly measured and weighed. The health staff did not report any cases of malnutrition and did not consider it a major challenge in the area.

- In the FGDs with women it was claimed that malnutrition was not a concern at the local level as food was generally available through the year. Most of the food is home-made or grown in the gardens and that includes fruits and vegetables, dairy-

products, marmalade and meat derivatives. Women are proud of their own food because they believe it is organic and healthy. The only difference pointed out during the group discussion is that more fresh fruits and vegetables are available in summer than in winter when the weather does not permit cultivation.

7.4.5.2   Anaemia

Anaemia is a severe health concern for several reasons. Firstly, in children, anaemia retards normal mental and physical development and therefore is a real handicap to language development and performance at school. Secondly, in women, anaemia increases fatigue and reduces resistance to infections. Consequently, anaemic mothers are more likely to die in childbirth or give birth to a child with low weight which itself increases the risk of infant mortality.

Due to the broad range of causative variables, anaemia is also a very good indicator of the status of health in communities.

National level

- In 2007, 0.5% of rural women (of reproductive age -15-49 years) and 0.6% of rural children were reported as having severe anaemia (with haemoglobin level of 7 g/dl) [78]. Thus, anaemia was relatively uncommon in the country.

Regional level

- In the same study in 2007, 2% of women of reproductive age in Vayots Dzor were reported as having severe anaemia. In Syunik, 0.6% of women had severe anaemia [78].
- In the 2005 ADHS, 2% of children under 5 in Vayots Dzor had severe anaemia and 10.6% had any form of anaemia (haemoglobin level of 11 g/dl) [42]. In Syunik, while no children had severe anaemia, 24.8% had any type of anaemia [42].

Project Area

- Jermuk hospital has the required diagnostic capabilities to test for anaemia but it was not reported to be common in either women or children. The clinical staff confirmed that they rarely encountered cases of anaemic patients.

7.4.6 EHA #6 – Non-communicable Diseases

Morbidity-mortality burden attributable to non-communicable diseases (NCDs) is on the increase worldwide. In middle and low income countries from Central Asia and the former Soviet Union, deaths from NCDs, as a share of total deaths, will increase to 4% before 2030 [86]. Cardiovascular diseases, injuries and other non-communicable diseases, which have been caused by poor nutrition, weak health-care systems and high levels of alcohol consumption, have driven a decline in life expectancy in these countries [79].

This increasing burden of NCD threatens to overwhelm already over-stretched health services. The most common NCD are cardiovascular diseases (CVD), diabetes, cancer and chronic respiratory conditions. The risk factors underlying the main chronic NCD are well documented and include: unhealthy diet, physical inactivity, alcohol consumption and smoking. Exposure to these modifiable risk factors accounts for at least 75% of all cardiovascular diseases [86].

The challenges of NCD in Armenia have been highlighted in a number of studies and reports:

- Eighty-three per cent of deaths in Armenia are attributed to NCDs followed by external causes (3%), communicable diseases (1%), and ill-defined conditions (4%). The leading causes of premature death (under 65) in Armenia are, in order of magnitude, diseases of the circulatory system, cancer, external injuries and poisoning [80].
- Based on 2008 estimates NCDs are estimated to account for 90% of all deaths in Armenia. This proportional mortality is shown in Figure 20 [82].
- 20% of all men and 11.6% of women under the age of 60 died from NCDs in 2008. The age standardized death rate per 100,000 population is 1156/100,000 in men and 693/100,000 in women
- Based on 2008 estimates, 55% of the population was overweight with 24% of the population classified as obese. This was higher in women with 61% overweight and 32% obese) [82].
- Tobacco consumption is rising rapidly, rising to 69.4% among men in the 24–65 years age group. The prevalence of smoking among women is also on the rise [81].
- Alcohol abuse is not a major problem; however, it is becoming more popular among those in the youngest age group (16–24) [81].
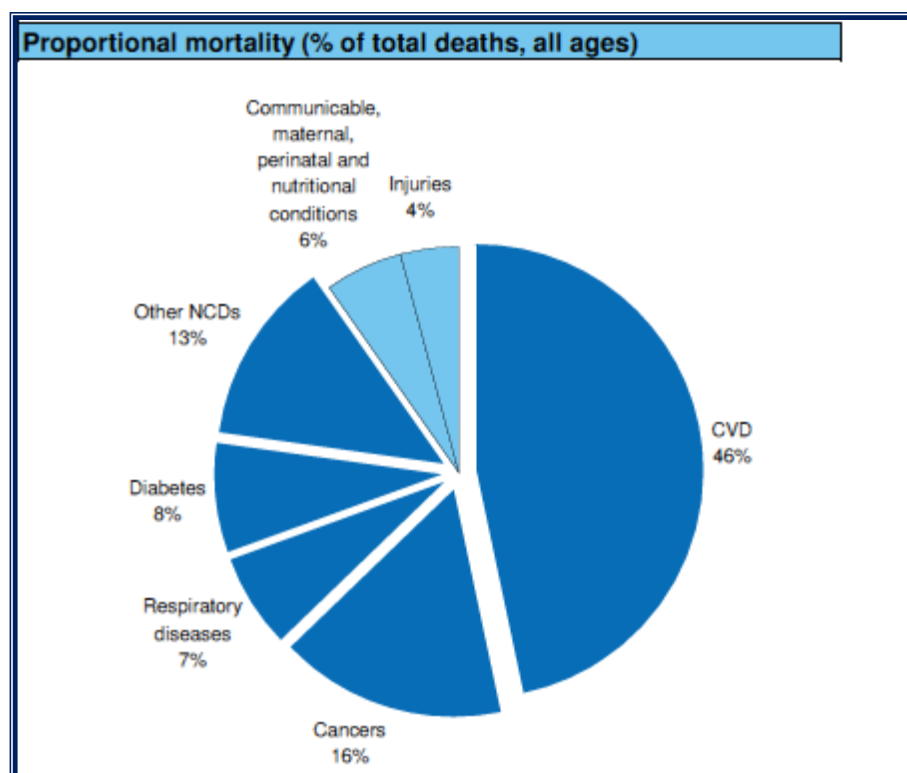- Unhealthy diet, obesity and low physical activity are common [81, 102].

Figure 14: Proportional Mortality in Armenia

7.4.6.1 Cardiovascular Disease

Over 80% of CVD deaths take place in low- and middle-income countries with the most significant burden of disease from these conditions in Eastern Europe and Central Asia as shown in Figure 21 [82].

Hypertension (HT) is the most frequent and important risk factor for CVD, including myocardial infarction, stroke, renal and heart failure, and peripheral vascular disease. Behavioural risk factors such as unhealthy diet, physical inactivity, tobacco use and harmful use of alcohol are becoming more common and are responsible for about 80% of coronary heart disease and cerebrovascular disease (stroke).
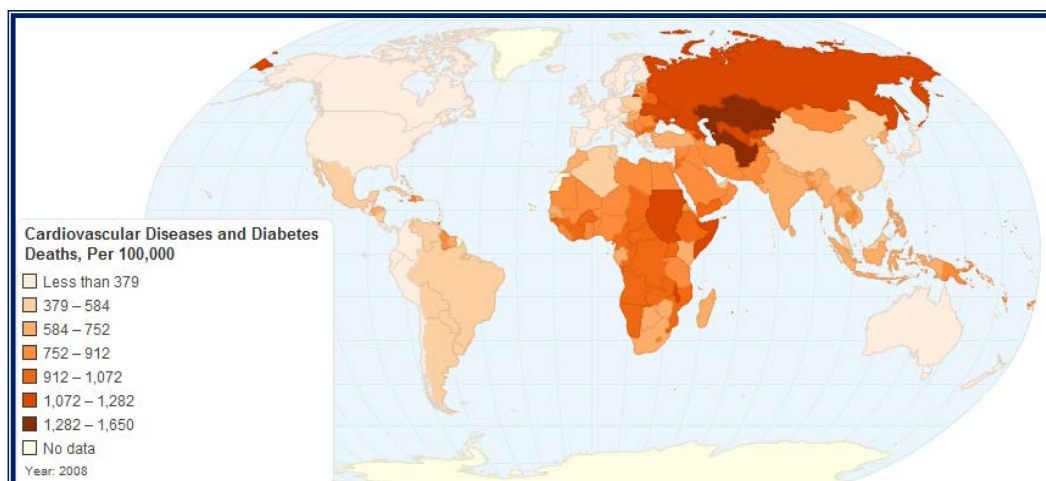
Figure 15: CVD and diabetes deaths per 100,000 population, 2008, WHO

National level

- Cardiovascular diseases accounted for 8.9% of all deaths and are among the highest cause of DALYs [39].

- In the country profile for Armenia in 2008, it was estimated that the prevalence of hypertension at the national level was 50.7% (male: female ratio- 51.5%: 50.1%) [82].

- It was reported that hypertension was under recognised and under reported in the country. Patients with mild hypertension are often asymptomatic and general health seeking behaviour practices do not support active screening programmes in the community. Access to health care and a preference to self-treat conditions due to lack of supply of medication and inability to afford services compound this [83].

Regional level

- According to the 2005 ADHS, 37.8% of women in Vayots Dzor and 17.7% of women in Syunik, suffered from hypertension, respectively [42].

- In the same survey, 41% of men from Vayots Dzor were reported with hypertension. However, only 5.9% of men in Syunik were reported with hypertension [42].

- At the Vayk hospital, hypertension is the most common reported condition. However, accurate statistics were not available as to the scale of the burden of disease in the area. The hospital staff reported that in general the community had good awareness of the disease, and the associated contributing factors, but has limited means to adopt a healthier lifestyle to prevent the disease or its complications.

Study Area

- At Gorayk health centre, in the period from June to November 2011, 1258 out of 7857 patients that consulted the clinic were diagnosed with hypertension [92]. Thus, the prevalence of the disease was estimated at 16% of all outpatient consultations. When one considers that the population of Gorayk is small and that the 7857 represented children or adolescents the true scale of the disease can be understood.

- At Saravan Health centre, in the period from June to November 2011, 16 patients out of 168 were diagnosed with HT [84].

- According to Oxfam, who are running a drug support programme in the area, 35 people from Saravan are registered to receive hypertension medication on a monthly basis. If one considers that 80% of the population in Saravan is above 16 years of age, then 16.5% of the population in Saravan is on treatment for hypertension (HT) [84].

- At Gndevaz health centre, in the period from June to November, 14 patients out of 300 were diagnosed with HT [84].

- Other than the reporting specifically for HT, other general CVD conditions were reported in the RHMIS statistics from the study area. In the period from June to November 2011 15%, at Gndevaz and Gorayk, and 24% of cases at Saravan were reported to be associated CVD diseases [84].

- In the KII with the health centre staff the causes of CVD and HT was questioned. All staff reported these health conditions as the main challenge in the area and that the cause was linked to the high altitude in the area and the stress that people are under to sustain their livelihoods.

- In the FGDs women claimed to be aware of the risk related to HT and CVDs and reported that they tried to avoid the risks from the diseases through following a healthy diet. It was reported from the FGD that stress and altitude were contributing factors. Women reported that they believed that there was not much that they could do to avoid or prevent hypertension.

7.4.6.2 Diabetes Mellitus

In the developing world, the prevalence of diabetes is highest in Europe and Central Asia. Diabetes is increasing significantly due to changes in diet and lifestyle, directly associated with increasing trends in obesity, unhealthy diets and physical inactivity [85].

National level

- In 2008, deaths related to diabetes were 709 per 100,000 males and 388 per 100,000 females among the Armenian population [82, 86].
- Figure 22 illustrates the gradual increasing trend of fasting blood glucose in Armenia [82].
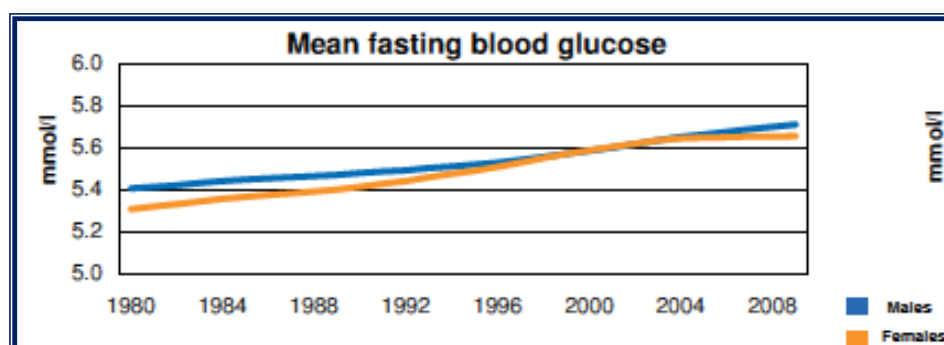

Figure 16: Trends in mean fasting blood glucose levels: Armenia 2008

Project Area

- There was no specific data available at the local level related to the burden of disease from diabetes. However, diabetes was mentioned as a concern by most of the staff in the local health centres. Nineteen patients are currently regularly followed up at the Gorayk health centre.
- Diabetes was not considered as a major challenge in the FGD with the local women.

7.4.6.3　Cancer

Approximately 60% of global cancer occurs in developing countries which is about 10 million new cases per year [82].

National level

- Different forms of cancers are among the highest DALYs in Armenia: lung cancer accounts for 1.4% of deaths and other forms of cancer account for 3.1% [39].
- Cancer is one of the three biggest killers in Armenia, causing about 20% of deaths [87].
- In 2008, 232 males and 131 females per 100,000 population died of cancer in Armenia. In the past decade the mortality rate for cancer has increased by over 70%, while the morbidity rate increased by 19% in the same period [87].

- The dynamics of cancer is particularly troublesome among adolescents and children: the morbidity for cancers among Armenians under 14 years was 115.8 per 100,000 population [87].

- Breast cancer and cervical cancers are among the biggest killers of women in Armenia. About 385 women are diagnosed with cervical cancer in Armenia every year. More than 200 women die annually of cervix cancer in the country [88].

- The Armenian health system is inadequately developed to support effective cancer screening programmes and the general lack of awareness and poor health seeking behaviours in the community play a role in the inability to reduce these risks [87, 90]. The public health policies and primary healthcare system in Armenia do not address early diagnosis of the cancer properly.

- The International Centre for Human Development has developed a programme in partnership with the local UNFPA office in Armenia to address cancers that directly affect the reproductive health of men and women in Armenia. These include prostate, cervical and breast cancers and the promotion of awareness so that men and women support preventative measures including regular screening. This education has also included the engagement of the local health professionals and attempting to drive policy changes through engaging key agents of change- the local health professionals in the public and private sector [89].

Study area

- Only Gorayk health centre had any data available on cancer at the local level. In the period from June to November 2011, there were 36 new cases of presumptively diagnosed cancer. As the diagnostic capabilities are limited at these facilities it is likely that the actual confirmatory diagnosis was carried out at some other health facility and that the cases were still recorded locally.

- The health facilities in the area usually refer patients to Vayk or Yerevan if they suspect cancer due to the limited diagnostic facilities. In January 2011, 5 deaths related to cancer were reported from the Gorayk health centre in the past year.

- Oxfam supports free health screening in remote villages for the early detection for breast and cervical cancer through its local programmes. This programme is functioning at the local level with Gorayk and Gndevaz health centres supported by a visiting gynaecologist [91].

- Cancer has been mentioned as a local health challenge in the FGDs. The respondents reported that men and women were affected equally with lung cancer

more common in men, and breast and cervical cancer more common in older women.

7.4.6.4   Chronic Respiratory Disease

Asthma often starts in infancy and, if not adequately treated, may have serious consequences throughout life. Its prevalence is increasing through the region, because of urbanization, smoking and air pollution.

The most important risk factor for chronic obstructive pulmonary disease is smoking, although air pollution from burning domestic waste, exhaust fumes and indoor air pollution through cooking or heating from biomass fuel are also contributors.

<u>National level</u>
- In 2002, deaths by chronic respiratory diseases were 4% of total deaths [91].
- Chronic respiratory diseases deaths per 100,000 people were 76.7 for the males and 53.7 for the female [82].

<u>Study Area</u>
- Chronic respiratory diseases and associated morbidity and mortality were not reported by the health facilities in the area and have never been mentioned in the FGDs.

7.4.7 EHA #7 – Accidents/Injuries

<u>National level</u>
- Injuries are the fifth leading cause of death in Armenia. The rates for all the unintentional injuries combined and for all intentional injuries are lower than the European Region averages [94].
- Injury mortality rates peaked in the late 1980s due to an earthquake in 1988, and the trend is now downward at levels below the European Union (EU) average (Figure 23) [94].
- The leading causes of unintentional injury-related death are road traffic injuries (6.4%), followed by poisoning (1.4%), drowning (0.9%), falls (0.9%) and fires (0.8%). The leading causes of intentional injury-related death are suicide followed by homicide (1.8%) [94].
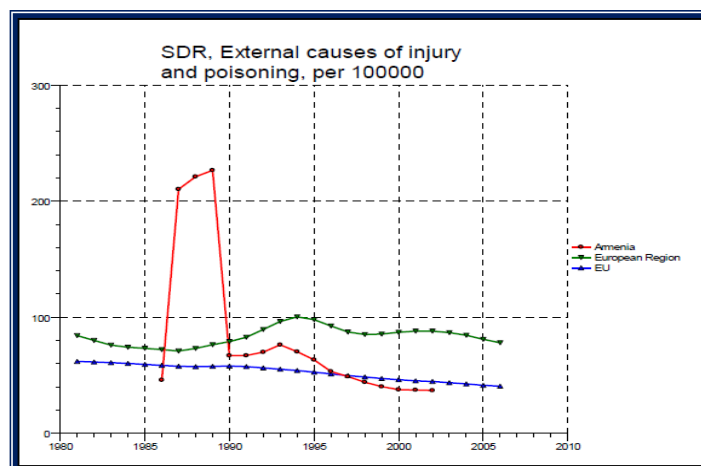
Figure 17: Standardized Death Rate for injury in Armenia

Study area

- Accident and injuries are considered uncommon in the study area. The staff at the health centre in Gorayk reported that on occasion RTAs happen on the highway towards Iran, but that RTAs in the PACs were rare.

- The local health centres and posts have minimal capacity to treat or care for injuries and accidents past immediate first aid. In-patient facilities and the diagnostic means and ability to support definitive care are limited. Thus, serious cases are referred to the Sisian or Vayk hospital for further treatment.

- Domestic violence is rare in the communities.

7.4.8 EHA #8 – Veterinary Medicine and Zoonotic Diseases

7.4.8.1   Rabies

Rabies is a viral infection that causes around 55,000 deaths per year (95% of deaths in Asia and Africa), a number which is very likely to be under-reported due to limited diagnostic ability [93]. Most deaths are caused by a bite from an infected dog.

National level

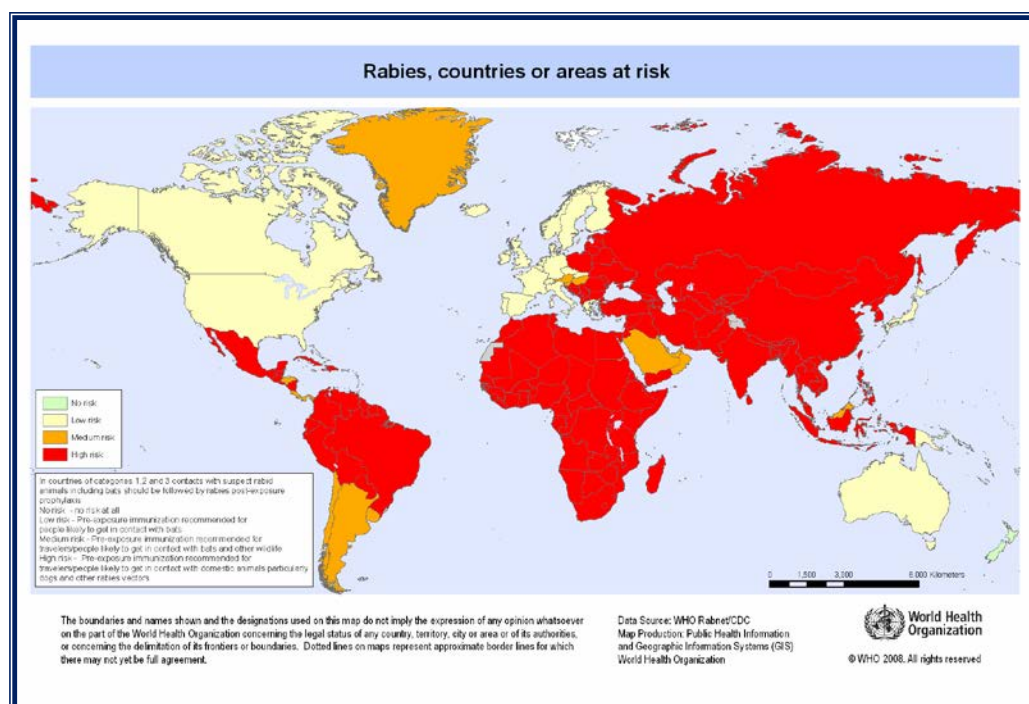- WHO confirmed presence of rabies in Armenia in 2007 as reported in Figure 24 [93].

Figure 18: Rabies, countries at risk, WHO, 2008

Regional level and Study area

The disease was not known or reported at the regional and local level.

7.4.8.2   Leptospirosis

Leptospirosis is a bacterial disease that affects both humans and animals. Rodents and other wild and domesticated species are most commonly affected.

Regional level and Project Area

The disease was not known at regional and local level.

7.4.8.3   Anthrax

Anthrax is a bacterial disease caused by *Bacillus anthracis*. Humans generally acquire the disease from infected animals or because of occupational exposure to contaminated animal products.

National level

- In Armenia, the first case of anthrax was recorded in the Shirakskaya region of Armenia in 2004. No other cases were reported after that [94].

Regional level and Project area

The disease was unknown at regional and local level

7.4.8.4　Crimean-Congo Haemorrhagic Fever

Crimean Congo haemorrhagic fever (CCHF) is a tick-borne viral disease with a widespread distribution and evidence for the virus has been found among ticks in Africa, Asia, the Middle East and Eastern Europe. In Europe, cases of human infections have been reported from Armenia amongst other countries with Figure 25 outlining the presence of the tick vector and serological evidence of CCHF nationally as reported by the WHO [95].
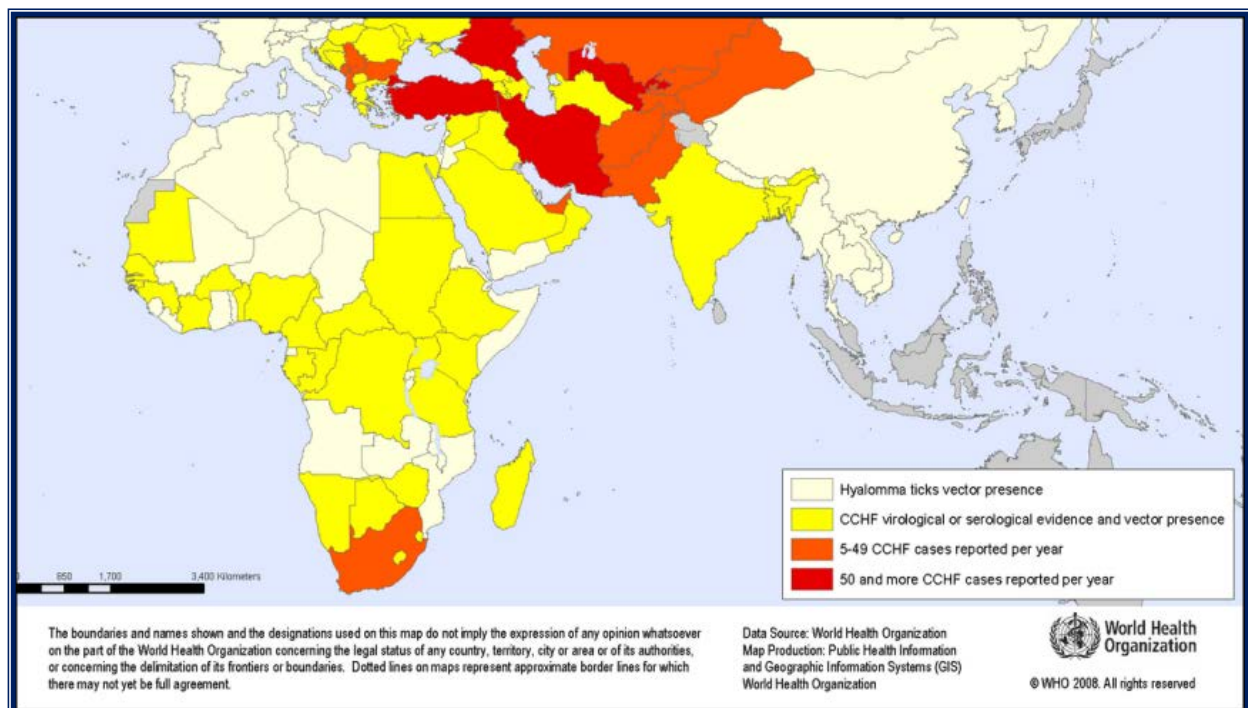
Figure 19: Geographic distribution of CCHF, WHO, 2008

National level

- In Armenia the only case of CCHF was reported in 1974, with other unconfirmed cases have been reported up to 2006 [96].

Regional level and Project area

- The disease was unknown and not reported at the regional and local level

7.4.8.5   Brucellosis

Brucellosis is a bacterial disease caused by various *Brucella* bacteria species, which mainly infect cattle and also swine, goats, sheep and dogs. Humans generally acquire the disease through direct contact with infected animals, by eating or drinking contaminated animal products, or by inhaling airborne agents. The majority of cases are caused by ingesting unpasteurized milk or cheese from infected goats or sheep. Person-to-person transmission is rare.

Regional level and Project area

- The disease is known at regional and local level and control strategies are implemented in the area. In Gorayk cattle are routinely tested and several contaminated animals were destroyed last year to reduce the risk of human transmission.

-

7.4.9 EHA #9 – Potentially Hazardous Materials, Noise and Mal-odours

These environmental health determinants include items such as pollution of air, soil and water as well as possible exposure to pesticides or other organic or inorganic pollutants, noise/vibration and malodours. The pathway to human exposure to pollutants can be complex and can occur from a variety of sources such as ambient air, drinking water and nutrition.

Water quality and quantity, noise/vibration, visual impacts, hazardous chemical substances and air quality management are crucial environmental health determinants that will need to be recognised and managed as part of the Projects development.

Mining in Armenia has recently created debate in the civil society and with environmental advocacy groups due to a perceived risk of degradation of the environment, deforestation and pollution of fresh water bodies. Much of this has been due to the legacy of past operations within the country, especially in Soviet times. These concerns have been linked to both the mines and general industrial sector. These included specific concerns related to human health impacts [97, 98].

The specific environmental health determinants will be discussed in the relevant impact assessment chapter. It is specifically noted that the baseline conditions for water quality (ground and surface), air quality, visual intrusion, noise and vibration and hazardous chemical substances will be discussed under the relevant biophysical specialist studies that

are being conducted as part of the ESIA. The HIA does not have the intent to reproduce these studies with their associated baseline studies and the reader is referred to the Geoteam website [4].

Some of the activities that may pose an environmental health risks have been discussed in section 2.4 (Project Description).

7.4.10　EHA #10 – Social Determinants of Health

7.4.10.1　Mental Health

Neuropsychiatric conditions are an often neglected public health problem, accounting for 12.7% of the global burden of disease [39]. In general, it is extremely challenging to understand the broader burden of disease caused by mental health and perceived well-being. Depression is the most common neuropsychiatric disease. Epilepsy, especially, is a health issue in developing countries, where it is estimated that 85% of the worldwide 50 million cases are found [39].

National level

- The mental health services in Armenia are currently described as very limited with poor integration in the general health care system with very low standards of care or respect to human rights [99].
- Mental health receives minimal support and attention from the MOH. Only 3% of health care expenditure is devoted to mental health services and 88% of this is designated for mental institutions leaving very little available for day care or outreach programmes [100].
- It was further reported that stigma related to mental disease was a factor limiting the ability of families to seek care for mentally ill family members. Lack of confidentiality further contributes to the stigma faced by mentally ill patients [38].
- There no community based psychiatric inpatients units or residential institutions in the country. None of the mental health hospitals are specialized for children and adolescents and there are no inpatient hospital beds available for children. Nationally, there are five outpatients facilities and 3 day treatment facilities, but these are limited to adults [100].
- Armenian psychiatrists are reported to have limited training and there are no psychiatrists, psychologists or nurses and social workers with more than 1 year of

training working in public mental health care sector. Around 20% of psychiatrists immigrate to other countries within five years of the completion of their training [100].

- Mental health is affecting children and adolescent more than any other age group. In a study conducted in 2004, 9% of boys and 10% of girls reported that they had considered suicide in the year preceding the survey. Approximately the same number of young people considered using alcohol or drugs to overcome their personal or social difficulties [101].

Regional level and Study area

- None of the surveyed health structures in the area claimed to have specific wards or to support outreach programs for mental health conditions. At Vayk hospital drugs for mental health problems are available but no specific ward is designed for them and normally drugs are dispensed on an out-patient basis.

- Mental illnesses were not mentioned as a major health concern in the communities. This may be due to stigma in acknowledging the conditions as the challenges. The high levels of poverty and poor social/environmental health conditions in the area may promote the risks of mental health disorders.

7.4.10.2 Health Seeking Behaviour

The manner in which people choose which health provider to consult, and when to consult them, depends on a variety of factors. It is essential to understand these factors in order to gain an understanding of why and how entry is made into the health care system. Culture and spirituality influence health-seeking behaviour. People may believe that western medicine may be effective in curing their ailment but their conviction is that mystical causes have also intervened; this obliges them to combine visits to the health care facilities with visits to traditional healers (as described in section 7.4.11).

National level

- The Armenian health system switched from the Semashsko model with free primary, secondary and tertiary care to a financing system after the collapse of former Soviet Union. The new financing system relies on payments by patients in more than 65% of cases for secondary and tertiary care. Fees for services are defined at regional level. Primary health care is serviced under the basics benefits package [102].

- Affordability of health care appears affects health seeking behaviour and in a study conducted in 2001 42.4% of respondents reported that they did not consult a health practitioner although they were exhibiting signs of a disease [103]. Affordability was

the main reason in 78% of the participants. They reported that in 65% of cases when they did seek care, they had to pay out-of-pocket, in the form of money, gifts, or both, to receive care.

- In the 2005 ADHS, 14% of women reported health problems in the 3 weeks prior the survey but only 7.4% actually consulted a health practitioner. The percentages are similar in men and children [42].

Regional level

- In the 2005 ADHS, 84.3% of women in Vayots Dzor reported that lack of money to pay for the treatment as the primary reason not to approach a health facility for care [42]. This was reported at 78.8% in Syunik.

- At Vayk the regional government decides hospital secondary and tertiary care fees. There is a co-pay system in place (divided between the hospital and the patient) as shown in Figure 26, but the fees were regarded as generally very high and unaffordable for the average family.

Local level

- Health staff and women in the FGDs raised the same concern about the inability of the local community to afford health care services. Health staff at the health centre and posts reported that people start treatment, often for chronic diseases such as diabetes or hypertension, but are unable to pay to continue the treatment and often stop taking drugs exacerbating their condition. People often neglect minor conditions such as cold or incessant cough and do not approach health facilities as they are afraid that they will not have sufficient funds to afford treatment. These minor conditions often escalate into more complicated illnesses due to late presentations.

Figure 20: List of health care services fee, Vayk hospital

7.4.10.3 Life Style

Substance misuse such as alcohol, tobacco or other drugs is not only an important health determinant but also closely linked to mental health [104]. It is further associated to crime and violence, prostitution and domestic violence.

National level

Tobacco

- Armenians are heavy smokers. According to the 2005 ADHS, 60.7% of the rural male population use tobacco in the form of pipes or cigarettes. 90.7% of the smokers smoke over 10 cigarettes per day.

Alcohol

- Although alcoholism has never been a widespread problem in Armenia, the situation is gradually deteriorating. This change is especially noticeable amongst the youth with the average age of patients admitted to the Yerevan Centre of Narcology changing from 40-45 years of age during Soviet rule to the present day when most people are younger than 35 years [105].

Regional Level

- In the 2005 ADHS, it was reported that 84.7% of men in Vayots Dzor are smokers. 85.4% smoke more than 10 cigarettes per day. In Syunik 63.8% of men are smokers and 95% smoke more than 10 cigarettes per day [42].

Study Area

- In the FGDs neither smoking nor alcohol abuse were considered as major problems in the local community. It was however reported that most men and women smoke which underscores the local perception that smoking does not pose health challenges.
- Alcohol is largely consumed on a social basis but opinions from both the KII and in the FGD was that it was rarely abused.

7.4.10.4 Inequalities

General inequalities in the community may result in some communities or groups within communities being vulnerable to certain health impacts. As women are often the gatekeepers of health in the family unit gender inequality is an important social determinant of health.

In 1993, Armenia acceded to the U.N. Convention on the Elimination of All Forms of Discrimination against Women (CEDAW). It was the first former Soviet Union country to do so. However, the actual implementation of the standards to ensure gender equality has proven to be problematic. At present more women than men are unemployed and the women have often been required to care for the household while the men undertook migrant work and send remittances home. Participation of women in politics is very low and Armenian women still embrace traditional roles and stereotypes. Men and women alike still believe that Armenian women's primary roles are as wives and mothers. Many women have internalized their subordinate positions and the expectations that society places on them [106].

A survey of 1,200 Armenian women, conducted by the Women's Rights Centre, showed that Armenian women still have a feeling of hopelessness. Women's responses showed an overwhelming sense that their situation had declined dramatically in the last decade. Nearly 40% of women said that women now carry the burdens of their families mostly on their own. Nearly 11% report that they have become more deprived of their rights and feel helpless,

while 9.6% state that women continue to remain legally unprotected. Nearly 9% state that women continue to remain oppressed by men [107].

Gender inequality was not evaluated at the local level as this was analysed in the SIA.

7.4.10.5 Education

Education is a key determinant to support and uplift the health status and well-being of an individual in a society and, indeed, community. Many studies have shown that educational attainment has a strong effect on reproductive behaviour, contraceptive use, fertility, infant and child mortality, morbidity, and attitudes and awareness related to family health and hygiene. Education is related to gender, poverty and social practices since females have less access to education then males [108]. Many of the health indicators recorded in the ADHS are linked to levels of education.

National level

- In the 2005 ADHS, 84.2% of rural women completed general secondary school. The median number of years of schooling for rural women was 9.7. 73.5% of men from rural areas have completed the general secondary schools and spent 9.1 years in the schooling system [42].
- In the 2010 ADHS, 94% of women and 88% have some form of secondary education [117].
- The youth literacy rate in the years 2004-2008 was 100% [19].

Study area

- No specific data is available about education in the study area but the impression gathered during the field visit is that the level of education would not differ very much from the general national education level. This is reported to be relatively good and would be adequate for women as well as men. However, very few of the community would have tertiary education or training as a professional.

7.4.11   EHA #11 – Cultural Health Practices

7.4.11.1   Traditional medicine

Traditional medicine (TM) plays an important role, especially in rural areas. For a number of reasons this is often the primary route of health consultation.

National level

- Armenia has a long history of TM, which started with the worship of pre-pagan idols and continued through the centuries, supported by ruling dynasties and influenced by Arab and Greek thinkers and philosophers. The use of herbs and plants as medicinal products has been passed down through the generations and forms an essential part of the current Armenian folk traditions [110].

- The only medical system currently recognized by the Armenian government is standardised modern medicine but a large number of additional healing techniques are used widely and accepted. These include herbal and other folk remedies, as well as therapies such as the use of leeches, magnets, and psychics to aid healing.

- The use of TM or alternative medicine is also related to the affordability and acceptability of the local health services as discussed in previous sections.

Study area

- In the FGDs, the use of TM did not appear to be important. However, the FGDs were very brief and there was not an opportunity to discuss these practices in detail. In addition, they are not likely to create any potential health impacts of concern so were not an area of focus. If required these practices would need to be investigated in more detail.

7.4.12   EHA #12 – Health Systems Issues

Human resources (quantity and quality of health personnel) and health infrastructure are the most important pillars of a health system. In order to meet the United Nations Millennium Development Goals (MDG) the WHO determined that 23 skilled clinical health workers per 10,000 population is the minimum ratio required to provide a basic standard of health care to a population. In 2006, there were 11,133 physicians and 14,806 nurses and midwifes working in Armenia. The ratio of physicians per 10,000 people was thus 37, which is above the MDG minimum goal [111]. There is however a significant urban/rural divide with most of the doctors present in the urban areas, although no specific statistics were available.

7.4.12.1 Health Infrastructure

The Armenian health system during the Soviet times was characterized by:

- Free primary, secondary and tertiary health care.

- Centralized management with limited consideration of local needs.

- Emphasis on structural and quantitative indicators.

- Focus on secondary care.

The system changed from a centrally run and free-of-charge system to a fragmented and state/self-financed health system. The reform was started in 1997 with the introduction of the basic benefit package which specified which health services were free for vulnerable groups such as widows, handicapped people etc. All the other groups had to pay, either partially or completely out of their own pocket for health services. The opportunities and challenges of the current Armenian health system are highlighted in Figure 27 [102].

OPPORTUNITIES	CHALLENGES
• BBP covers not only primary care but also in-patient services for certain socially vulnerable groups and treatment of certain diseases and medical conditions for the whole population (TB, oncology, urgent care, etc). • The Government has committed itself to continuing the health reform with emphasis on prevention, family care and community participation, and on reducing problems of financial protection and the barriers to health care access associated with this high share of OOPS. • In the last decade, Armenia has experienced strong economic growth and reduced poverty rates with potential positive effects on health and equity.	• Poor use is made of the health information system for decision-making • The BBP is not based on real costs of health care services and thus contributes to unofficial payments. • The essential drug list is not in active use. There is a wide practice of prescribing expensive brands that a large part of the population cannot afford. • There is a lack of modern technology and equipment. • TB and HIV services are too vertical and not well integrated in the overall health system • There are skill imbalances, mal-distribution of health professionals, lack of incentives to attract health workers to remote rural areas and lack of infrastructures for continuous professional development.

Figure 21: Opportunities and Challenges related to structure of Armenian health system

The Armenian health system is now structured as follows:

- <u>Primary health care:</u> through services running out of polyclinics and health posts or so-called outpatient services (such as the Saravan and Gndevaz health posts) located in small villages and supervised by a doctor and/or a nurse. Their focus is to provide basic health care and initial treatment for free.

- Secondary health care: health posts and regional/municipal hospitals (such as the Vayk and Jermuk hospitals) providing secondary care on a co-pay system (health expenses paid between the Government and the patient).

- Tertiary health care: specialized hospitals (such as the Abovyan TB hospital) on a co-pay system.

National level

- The health system during the Soviet era had a major focus on specialized care with a large number of big hospitals (on average 5 per 100,000 people in 1991). After the collapse of the Soviet Union the number of state hospitals reduced. At present 9.2% of the hospital beds are within the private sector [38].

- In 2005 the Armenian Government spent 29US$ per capita for health related expenses. There were 44 hospital beds for 10,000 people [111].

- The routine health information management system is weak at the local level for a number of reasons:
  - o Poorly motivated staff
  - o Manual systems at the health centres and health posts
  - o Relatively centralised referral centres resulting in the final diagnosis not being fed back to inform the trends at the local level.
  - o Poor health seeking behaviour of the local population

Regional level and Study area

- As previously discussed, whereas health facilities are available in the area, fees are not affordable for many people. Many facilities are supported by NGOs such as United Methodist Committee on Relief (UMCOR) and Oxfam who run programmes involving free distribution of drugs for those who cannot afford health care (UMCOR at Jermuk hospital) or that encourage patients to subscribe to a membership to receive health screening and medications for free (Oxfam at Gndevaz and Saravan health post). The uptake of the latter did not appear to be that high.

- Health posts in the area lack basic services such as heating and sanitation and in some cases running water. Some have structural issues and require rehabilitation of the flooring and walls.

- Health staff appeared to be competent and recently retrained by NGOs operating in the area.

- The limited supply of drugs and consumables in the area was evident. Diagnostic equipment was also limited and poses a challenge in providing adequate health care.

- Health facilities in the area divide attendance into two categories; i) treatment and ii) preventive medicine. As it can be observed in Figure 28 and Figure 29, the proportion of reported attendance varied across the different health facilities. In Gorayk Health Centre, an equal number of the community attended the health centres based on the two variables.

- It was not possible to gain any meaningful statistics from the routine health management information system (RHMIS) at the local level. This required specific permission, which were not forthcoming during the time period of the field visit. Information that was obtained from the local level was limited and it was not apparent if the RHMIS was reported in any form of international coding system (such as ICD 10). The following were added limitations of the RHMIS:

  o The health seeking behaviour of the community to the formal health sector was poor and thus statistics in the local area will not necessarily reflect the actual BOD.

  o All statistics are captured manually and while the systems or the statistics were not viewed it is recommended to recognise the potential limitation of local statistics when interpreting health trends. It is thus recommended that the Project attempt to track key health indicators through the development of a community health information system. This should be possible as the RHMIS follows a consistent and accurate recording of data. However poor health seeking behaviour will limit this.
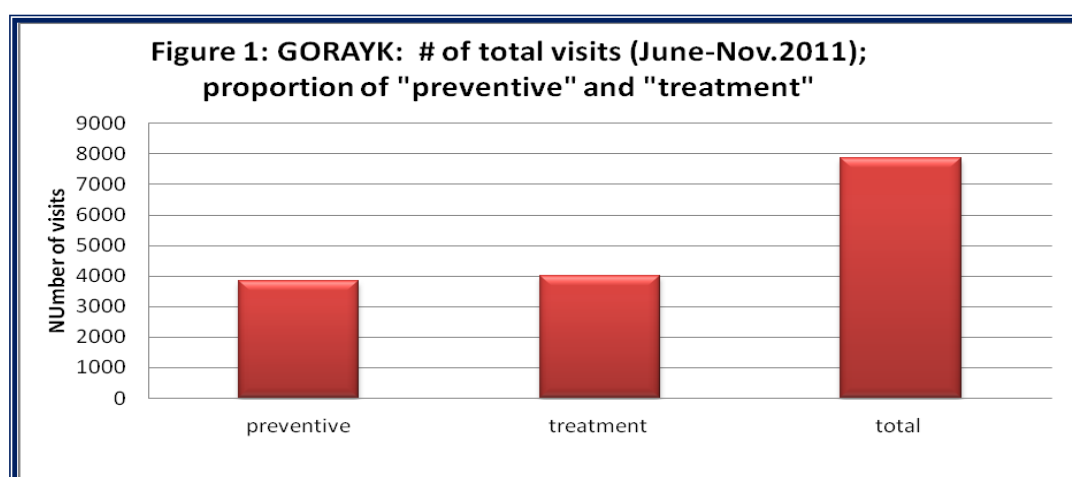

Figure 22: Attendance at Gorayk Health Centre, 2011

- At Gndevaz, more people attended care for curative treatment than for preventive medicine. The total number of patients consulted between June and November 2011 was 370.
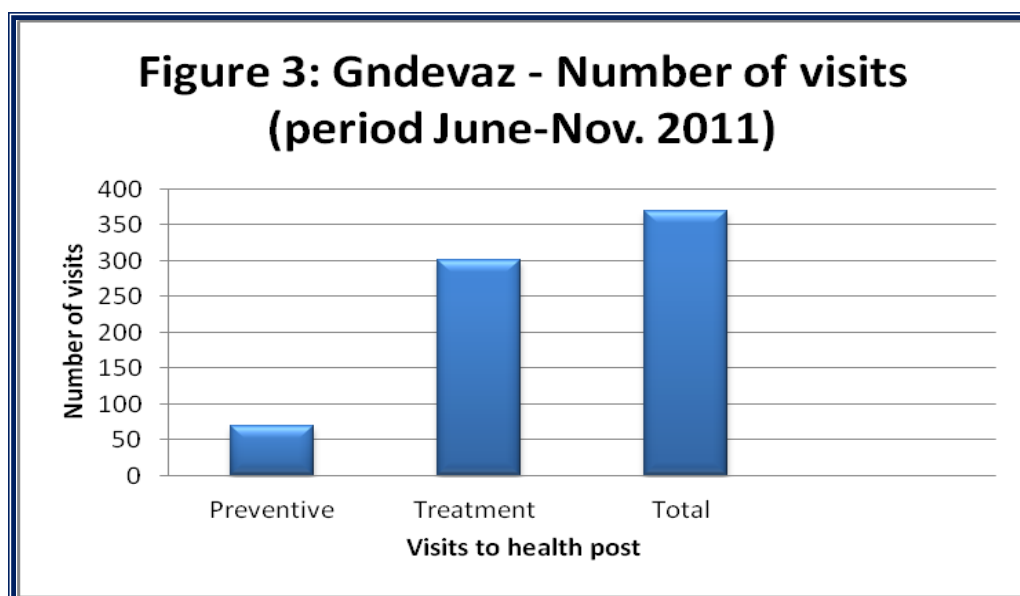
Figure 23: Attendance at Gndevaz Health Centre, 2011

The social baseline evaluated the perceptions of the local community to the health infrastructure and services provided locally [121, 122[2]]:

- Only 40% of residents in Saravan were satisfied with the medical care compared to 77% in Gndevaz and 83% in Gorayk.

- Affordability was a major issue as discussed above with 50%, 56% and 39% in Gndevaz, Gorayk and Saravan reporting that they could general afford health services. Those who reported full affordability were far lower.

- In Jermuk, only 5.6% reported that they were satisfied with the medical services with 56.3% unsatisfied to varying degrees. In Kechut, which shares services with Jermuk, 46% of respondents reported some degree of satisfaction.

- In Jermuk only 34% of respondents considered medical services as affordable. In Kechut, this was similar at 37.7% [122].

- In the qualitative study on the health services in Jermuk significant concerns were cited related to staff and the level of services provided.

A summary of the health facilities in the area is provided in Table 9.

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[2] These figures have a limitations as they represent data from FGD performed as part of the social survey

Table 2: Description of Health Facilities in Study Area

Summary of Findings on the Health Facilities in the Study Area			
Name of Institution	**Key informant interviewed**	**Key Findings**	**Challenges in facility**
Vayk State Hospital	Dr Aslanyan- Medical Superintendent	• Hospital has recently been refurbished by USAID. • 140 staff and 180 beds. Bed occupancy rates are very low at 10-20%. • UMCOR and UNICEF are supporting a medications supply programme at the facility.	• Limited financial resources with co-pay system that patients cannot afford • Lack of modern and updated diagnostics in contrast with the scope of the facility in providing adequate secondary and referral care.
Jermuk General hospital	Dr Sargsyan- Medical Superintendent	• 38 staff and 15 to 25 beds • Only sees 35-45 outpatients per day	• Lack of trained staff to operate modern equipment • The lack of clarity in policy implementation since policy is decided a regional level
Gorayk health centre	Dr Harutyunyan- medical doctor at health centre	• Staffed by 3 permanent medical staff • The doctor is generally satisfied with the community support she receives and describes the health situation in the general community as average to good • Facility sees about 20 outpatients per day, which is very low	• Health centre is in poor condition with poor ventilation and damp with humidity. Mould covers the walls • Lack of a heating systems and very cold inside facility. • No toilet inside or latrine outside facility
Gndevaz health post	Larisa Khachaturyan- registered nurse	• Only one permanent medical staff • Facility sees about 10-15 outpatients per day • Facility was rehabilitated by USAID in 1999 and it is supported by the Oxfam initiative for free drugs based on a subscription	• Lack of a heating systems and very cold inside facility. • No toilet inside or latrine outside facility
Saravan health post		• Only one permanent medical staff and comparable to facility in Gndevaz. • Supported by Oxfam initiative	• Lack of a heating systems or a latrine despite recent rehabilitation • No running water due to unpaid bills

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