American University of Armenia

Center for Health Services Research and Development

Baseline Knowledge, Practices, and Coverage (KPC) Survey for the Integrated Management of Childhood Illnesses (IMCI) Project in Gegharkunik, Armenia

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Participants

American University of Armenia
Center for Health Services Research and Development

Michael E. Thompson, **MS, DrPH**
Director

Tsovinar L. Harutyunyan, **MPH**
Senior Program Manager

Gayane G. Ghukasyan, **MPH**
Technical Consultant

Anush Sahakyan, Izabella Mirzoyan, Nune Truzyan, Lusine Abrahamyan
Research Interviewers/Data Entry/Analysts

American Red Cross Delegation in Armenia

Eric Baranick, MPH
Country Representative, Health Delegate

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List of Acronyms

AIDS	Acquired Immunodeficiency Syndrome
ARC	American Red Cross
ARCS	Armenian Red Cross Society
AUA	American University of Armenia
CATCH	Rapid Core Assessment Tool on Child Health
CHSR	Center for Health Services Research and Development of AUA
DHS	Armenia Demographic and Health Survey
HIV	Human Immunodeficiency Virus
IMCI	Integrated Management of Childhood Illnesses
IRB	Institutional Research Board
KPC	Knowledge, Practice, and Coverage
MOH	Ministry of Health
NCHS	National Center for Health Statistics
SRS	Simple Random Sampling
UNICEF	United Nations Children's Fund
WHO	World Health Organization

Executive Summary

Socio-economic difficulties experienced by Armenia following independence have negatively impacted the health status of the population. The decline of living standards and poverty translated into high rates of malnutrition among children.

The American Red Cross (ARC) and the Armenia Red Cross Society (ARCS) seek to alleviate malnutrition in children through programs targeting maternal and child health and nutrition practices in the Martuni Region of the Gegharkunik *marz*, where health status of the population was shown to be particularly unfavorable. ARC chose an Integrated Management of Childhood Illness (IMCI) strategy as a comprehensive approach to improve maternal and child health in the Martuni Region.

ARC contracted the American University of Armenia's Center for Health Services Research and Development (AUA/CHSR) to support its evaluation component by conducting baseline and final surveys in Martuni to measure the results of the project. The face-to face interviews were conducted with 300 mothers of children less than 2 years of age in the 16 IMCI pilot project villages in Martuni region of Gegharkunik *marz*. The households were chosen with the help of weighted (stratified) Simple Random Sampling (SRS) of households containing a child under 24-months. To determine the respondents, the policlinic/ambulatory records of births for each village were used as a sampling frame.

The KPC_{2000+} Rapid Core Assessment Tool on Child Health (CATCH), which contains a concise set of indicators to assess the health situation in the region, was adapted for the construction of the questionnaire. The main domains for which the information was sought were Anthropometry, Maternal and Newborn care, Breastfeeding and Nutrition, Child Immunization, Integrated Management of Childhood Illnesses, HIV/AIDS, Men's participation in care of children, and Water/Sanitation.

The baseline data confirmed previous research conducted in Gegharkunik *marz* and highlighted health areas particularly unfavorable and demanding intervention/support of ARC.
Responses of mothers showed the need for training/information for mothers in the following areas
- ❑ **Correct child spacing** (only 42.4 % of the recent live births had an interval of more than 24 months)
- ❑ **Breastfeeding and nutrition practices** (only 17% of mothers of children age 0-5 months inclusive exclusively breastfeed their babies; 54.5 % of children age 6-9 months receive breast milk and complementary food
- ❑ **Knowledge of child illness signs** (only 35% of women know at least 2 of 8 signs of illness that indicate the need for treatment)
- ❑ **Knowledge of HIV/AIDS** (nineteen percent of women know at least 2 known ways of reducing HIV risk)

❑ **Proper hand washing practices** (only 61% of women wash their hands with soap/ash before food preparation, before feeding children, after defecation, and after attending to a child who has defecated).

The survey also revealed deficiencies in the immunization coverage of children less than 24 months of age. Only 1 child (7.7% of 13 children 12-23 months of age for which the vaccination cards were available), was completely vaccinated before first birthday according to MOH vaccination plan in Armenia. Only 77% of the children age 12-23 months had received measles vaccine according to their mothers. Incomplete coverage of population by skilled delivery assistance was also recorded (about 7% of the mothers did not receive skilled delivery assistance).

The survey revealed low percentage of malnourished children in Martuni (only 2% underweight according to the WHO/NCHS standards). However, it should be taken into consideration that the survey determined weight-for-age indicator, whereas previous research reported high percentage of malnourished children in Gegharkunik based on height-for-age indicator (chronic malnutrition).

It is recommended for ARC to design interventions at the community level for knowledge/behavior change in the areas of breastfeeding, HIV prevention, childcare, nutrition, personal/ family hygiene, and birth spacing. Insufficient antenatal care, assistance and medical care at delivery, and vaccination coverage are related to the provision of health services, and can be addressed through corresponding improvements in the health care system.

1. Background

1.1 Introduction

Like many of the Newly Independent States of the former Soviet Union, Armenia suffered major disruption to its economy following independence in 1991.[1] These adverse socio-economic conditions have drastically impacted on the maternal and child health in Armenia.

Malnutrition in children under-five is considered a significant problem. According to the Armenia Demographic and Health Survey (DHS) and UNICEF, 13% of children under 5 are stunted (chronic malnutrition), and 3% are severely stunted, while 2 % of children are wasted and 3 % are underweight.[2, 3] An increasing trend in the levels of malnutrition is observed since 1998.[4] Significant regional variation in the prevalence of stunted children was recorded, with a low of 8% stunting in Kotayk and high of 32% in Gegharkunik *marz*.[2] The American Red Cross (ARC) and the Armenia Red Cross Society (ARCS) seek to address this serious problem by improving maternal and child health and nutrition practices in the Martuni Region of the Gegharkunik *marz*.[5]

The Integrated Management of Childhood Illness (IMCI) strategy was chosen as a comprehensive approach to reduce childhood disease burden among children under 5 in the Martuni Region.[5] IMCI is a global WHO/UNICEF strategy to combat the leading causes of under 5-childhood morbidity and mortality using an integrated approach. The development by UNICEF and WHO of the Integrated Management of Childhood Illness (IMCI) unites effective, simple, and inexpensive interventions for the prevention and management of major preventable childhood diseases.[6] It is a flexible strategy, which can be easily modified according to a country's needs, socio-economic status, and health conditions.[6]

The Armenia Ministry of Health (MOH) included IMCI in its national policy in 1999. Training of health care professionals in IMCI was conducted in 3 pilot sites of Armenia in 2001 (Martuni region of Gegharkunik *marz*, Ijevan region of Tavush *marz*, and Artik region of Shirak *marz*).[1] In Martuni Region 42 health care providers were trained in the clinical IMCI methodology.

ARC and ARCS operate the community/household IMCI strategy in Gegharkunik *marz* employing a community-based peer health education and a mass media campaign. ARCS volunteers received training in maternal and child health, particularly in breastfeeding, prevention of diarrhea and acute respiratory infections, appropriate hygiene practices, and nutrition. Trained ARCS volunteers counsel and educate mothers in the community on key nutrition and health practices and proper referral mechanisms.[5] A mass media campaign will complement ARCS volunteer efforts using radio and television spots, newspaper, posters, and brochures. ARC and ARCS will strengthen health services by organizing IMCI meetings with key stakeholders to coordinate efforts and advocate for increased supply of IMCI drugs and supplies to pilot villages.[5]

1.2 Purpose of the research

ARC contracted the American University of Armenia's Center for Health Services Research and Development (AUA/CHSR) to conduct a baseline and final evaluation to measure the results of the project. The evaluation includes a baseline and a final survey of 300 households in the 16 IMCI pilot project villages in Martuni region of Gegharkunik *marz*.

The CHSR was contracted to
- ❑ Translate and adapt the KPC (Knowledge, Practice, and Coverage) Rapid Assessment survey into Armenian
- ❑ Develop a sampling strategy to draw a representative sample of 300 mothers/children under 24 months of age from the 16 target villages
- ❑ Conduct face-to face interviews with 300 mothers of children under 24 months of age in 16 target villages
- ❑ Enter and descriptively analyze the data
- ❑ Prepare and submit descriptive survey report

2. Methods

2.1 Sampling Strategy

The study is a pre-post independent samples design, with an estimated 300 mothers of children under 24 months surveyed at baseline and follow-up. Based upon the data provided by American Red Cross, a weighted (stratified) Simple Random Sampling (SRS) of households containing a child under 24-months was utilized. The population of children under 5 in each program village was used to determine a weight from which the number of respondents to be selected from each village was calculated as a fraction of the total sample (Appendix 1). To determine the respondents, policlinic/ambulatory records of births for each village were used as the sampling frame.

This approach has several advantages over cluster sampling (cluster size 10) routinely used in KPC. First, SRS is the preferred/gold standard and introduces no design effect, allowing reduced sample sizes or providing greater precision of measurement for a given sample size. Second, cluster sampling requires repeated attempts to fill a quota starting from a given address. In this case, the density of children under two is estimated at 1in 5 to 1 in 7 households, requiring 50-70 attempts on average to complete each cluster, whereas SRS will lead interviewers to house known to have a valid respondent (with the exception of recent emigration, bad addresses, etc). Third, given the small size of the villages, the added travel time/costs for moving from location to location adds little to the cost of the project relative to a cluster sample, and those costs are more than offset by the value of an SRS sample.

The possible disadvantages to this approach is that the cluster sampling technique would allow unregistered children to be included in the sample (though evaluations of the policlinic registrations indicate >95% inclusion by age 2) and the potential for oversampling of households with multiple children under 2 as each child under two is given an equal chance of inclusion, not each mother or household (though this bias is small and both methods face the issue of multi-family households).

2.2 Implementation phase

CHSR interviewers participated in the process of random selection of the women with children under 2 from the policlinic/ambulatory records. At the start, the interviewers generated the list of women/children under 2 in each village, whom they had to contact. The list contained the number of the respondents identified for each village (this number was given to interviewers beforehand), plus half of that number (this was done to have a sufficient number of addresses in case of refusal, absence, inability to find the address, etc.). Each address was selected at random with help of calculator generating random numbers (using "RANDI" function).

Random addresses were recorded and confirmed with a nurse/local person. A village nurse in each village was involved in the process of finding the selected addresses to reduce time spent finding addresses.

2.3 Survey instrument

The survey instrument was collaboratively developed by CHSR and ARC staff (Appendix 2). The KPC_{2000+} Rapid Core Assessment Tool on Child Health (CATCH) was used as a basis for the questionnaire. The KPC is a research tool that yields a concise and practical set of indicators to examine and estimate the results of Child Survival activities.[7] Some questions were incorporated from detailed KPC modules or existing Ministry of Health instruments. Several questions/sections not appropriate for local conditions were excluded from the questionnaire. The questionnaire was translated into Armenian by CHSR staff. The instrument underwent several iterations of pre-testing in its Armenian format. The final interviewer-administered instrument consisted of 37 questions, was 12 pages in length, and required in average of 12 minutes to complete.

The instrument included the following nine sections:
- General information
- Anthropometry
- Maternal and Newborn care
- Breastfeeding and Nutrition
- Child Immunization

❑ Integrated Management of Childhood Illnesses

❑ HIV/AIDS

❑ Men's participation in care of children

❑ Water/Sanitation

All interviews were conducted in separate rooms where the respondent and the interviewer were alone during the interview. In addition to completing the interviews, interviewers completed journal forms (Appendix 3), where information was logged on compliance with the sampling protocol and response patterns.

2.4 Interviewer training/pre-test

Baseline interviewer training (1.5 days) and pre-testing (0.5 days) took place the week of April 21, 2003, with a final retraining on the revised instrument/protocol occurring on April 25, 2003. A total of 4 interviewers, all women, were utilized. The training guide, containing important information regarding the research objectives, methods, sampling/questionnaire administration, tips for interviewing, and timeline, was prepared and delivered to interviewers (Appendix 4). Data collection started on April 28, 2003 and ended on May 3, 2003. A senior member of the CHSR staff observed each interviewer at least two times during the pre-testing phase. Spot checks in Martuni villages were conducted by senior CHSR staff during fielding phase to assure compliance with the survey protocol and proper interviewer techniques.

2.5 Ethical considerations

The AUA Committee on Human Subjects (IRB) approved the study. Before the start of the interview, an oral consent statement was read to each respondent. It included information about the benefits and risks for the research participants and information that participation in the study is voluntary (Appendix 5).

2.6 Data entry/analysis

Data were entered into a computer database and analyzed using SPSS 10.0 software. Double entry and subsequent cleaning was used to ensure the accuracy of the data entry. The Chi-square test, one-way ANOVA, and independent samples T-test were used for the analysis.

3. Results

The baseline survey served as the baseline measure of the ARC program and portrayed the current state of maternal and child health and nutrition-related knowledge and practices in the Martuni Region of Gegharkunik *marz*. The data collected allowed to determine several priority child health indicators in Gegharkunik (according to the list of KPC indicators provided in KPC 2000+ tabulation guide), and provide a reference against which the changes in the community subsequent to the ARC program implementation can be measured.

The data are presented according to main areas of interest/sections in the questionnaire. Each section contains the main indicator for that section and supporting/additional data. Where applicable, the tabulation of data according to the sex of the youngest child, and age of a mother (<25 and ≥25) is presented.

3.1 Administrative/General

A total of 300 women from 16 villages of Martuni region responded to the baseline survey. Surveys on average took 12 minutes to complete. Overall, it took 375 attempts to complete 300 interviews. The primary reason for non-response was the absence of a mother (9.9%) or absence of all the household members (2.2%), followed by the respondent moved to another city/village in Armenia (1.9%) and respondent had moved elsewhere in the same village (0.8%). The houses of four of the respondents were impossible to reach because of weather conditions. Three of the respondents did not meet the selection criteria. The explicit refusal rate (either the selected respondent refused or someone refused on behalf of the entire household) was 0%.

The information on age and marital status of the respondents was obtained. The mean age of the respondents was 23.1. About 98 % of the respondent women were married, and 1.7% were married, but living apart from their husbands.

Of surveyed children, 54.7% were boys and 45.3% were girls. The mean age of the youngest child was 9.6 months.

3.2 Child Spacing

On average, there were 1.84 children under 5 years of age in the household. The mean number of biological children was 1.55 per woman. The mean difference in age between the two youngest siblings under 5 was 22.93 months.

INDICATOR 1: Birth interval between two youngest surviving children: percentage of children age 0-23 months who were born at least 24 months after the previous surviving child.

The survey results showed that in the families where there was more than 1 child under 5, only 42.4 % of the recent live births were spaced at an interval of the recommended 24 months (Table 1, Figure 1). This is significantly lower than what was found in DHS, according to which in rural areas 60% of second and higher order births occur after the interval of more than 24 months.[2]

Analysis revealed statistically significant association between the spacing practice and the age of a mother. As it can be seen from Figure 1, higher percentage of older women (>= 25) space their children (67.6% in older women versus 33.6% in younger women).

Table 1. Birth interval between two youngest surviving children in the families with more than 1 child

Birth spacing % (n)*	Age category of the respondent		
	Total	**<25**	**>25**
Correctly spaced (*at an interval of at least 24 months*)	42.4 (61)	33.6 (36)	67.6 (25)
Incorrectly spaced (*at an interval of less than 24 months*)	57.6 (83)	66.4 (71)	32.4 (12)
Total	100.0 (144)	100.0 (107)	100.0 (37)

* - the differences are statistically significant, p < 0.05

The under-five household density was also analyzed: about 18% of the households had more than two children under five. The additional tabulation of main indicators/variables by children density did not indicate any statistically significant/noteworthy associations.

Figure 1. Birth spacing practice of mothers

Correct spacing (at an interval of at least 24 months)
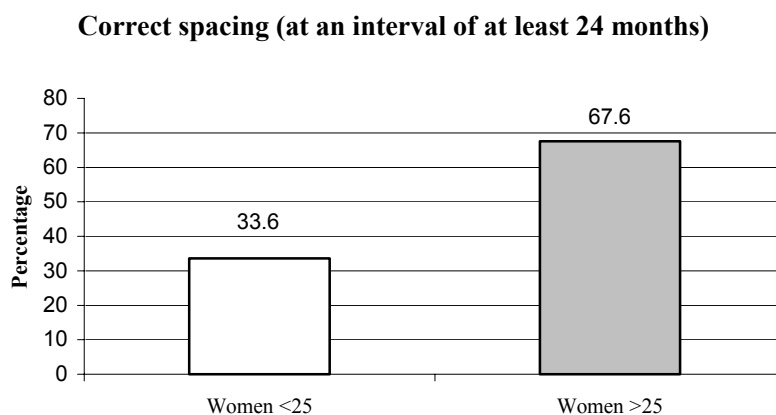
* - the differences are statistically significant, p < 0.05

3.3 Anthropometry

INDICATOR 2: Underweight (low weight-for-age) prevalence: percentage of children age 0-23 months who are below 2 standard deviations (-2SD) from the median weight-for-age, according to WHO/NCHS (National Center for Health Statistics) reference population.

Of the surveyed children (n=300), 2% (four males and two females) were underweight according to the WHO/NCHS standards (Table 2).

Table 2. Prevalence of underweight (low weight-for-age) children age 0-23 months

Nutritional status % (n)	Children age 0-23 months		
	Total	Male	Female
Underweight	2.0 (6)	2.4 (4)	1.5 (2)
Normal	98.0 (294)	97.7 (160)	98.5 (134)
Total	100.0 (300)	100.0 (164)	100.0 (136)

This finding slightly differs from the data provided by DHS, according to which the percentage of underweight children under 5 in Armenia was 3%.[2] The small number of underweight children did not allow for additional analyses for significant associations between the child being underweight and incorrect spacing, under-five household density, and sex of the child.

3.4 Maternal and Newborn Care

Questions regarding the maternal and newborn care included place of delivery of the youngest child, skilled delivery assistance, timing of the first antenatal care received by a respondent during last pregnancy, and number of antenatal care visits during last pregnancy.

About 84% of respondents delivered their youngest baby at the maternity house, while 16% at home. The high indicator of 41% home deliveries in Gegharkunik marz reported by the DHS was not confirmed [2].

INDICATOR 3: Skilled delivery assistance: percentage of children age 0-23 months whose births were attended by skilled health personnel.

According to the data, 92.7% of the mothers received skilled delivery assistance (attended by a doctor and/or a nurse) (Table 3). This data differ from DHS findings (97% of deliveries).

Table 3. Birth attendance by skilled health personnel

Skilled delivery assistance % (n)	Total	Sex of the youngest child		Age of the respondent	
		Male	Female	<25	≥25
Yes	92.7 (278)	94.5 (155)	90.4 (123)	93.7 (207)	89.9 (71)
No	7.3 (22)	5.5 (9)	9.6 (13)	6.3 (14)	10.1 (8)
Total	100.0 (300)	100.0 (164)	100.0 (136)	100.0 (221)	100.0 (79)

The deliveries of 63.7% of women were assisted by a doctor, of 84.3% by nurse/midwife, and of 1.7% (n=5) by another person with medical education (the options mentioned were anesthesiologist, aunt, neighbor, and sister-in-law) (Table 4). About 8% of deliveries were assisted by another person without medical education. Two women delivered babies without any assistance.

Table 4. Assistance with delivery of the youngest child*

Who assisted	% (n)
Nurse/midwife	84.3 (253)
Doctor	63.7 (191)
Other person without medical education	7.7 (23)
Other person with medical education	1.7 (5)
No one	0.7 (2)
Traditional birth attendant	0.3 (1)

* - multiple responses for the question were obtained

The survey revealed that on average, women have had their first antenatal care visit on 3rd month of pregnancy (median =3, SD =2.2), and had on average 2.5 antenatal visits during the whole pregnancy period (median =2, SD =1) (less than a minimum of 4 antenatal visits recommended by WHO).

3.5 Breastfeeding and Nutrition

Ninety-nine percent of respondents had ever breastfed their babies. Of them, 70.4% breastfed immediately/within first hour after delivery, 23.2% within the first day, and 6.4% after the first day. Women were asked about the reasons for late initiation of breastfeeding, and the most frequent responses were "That is the normal time for breastfeeding" (25%) and "Mother is sick" (18.1%) (Table 5). The other frequently mentioned options were "Child was sleeping" (9.7%), "Health personnel brought the child late" (9.7%), "Low infant birth weight" (8.3%), and

"Caesarian section" (6.9%). Of those women who ever breastfed their babies, the mean duration of breastfeeding (any type of breastfeeding) was 6 months. Sixty percent of ever breastfeeding women were currently breastfeeding at the time of interview.

Table 5. Reasons for late initiation of breastfeeding

Reason	% (n)
That is the normal time	25.0 (18)
Mother was sick	18.1 (13)
Baby was sleeping	9.7 (7)
Health personnel brought the baby late	9.7 (7)
Low infant birth weight	8.3 (6)
Caesarian section	6.9 (5)
Baby was sick	5.6 (4)
Baby did not take the nipple	5.6 (4)
Did not know that have to breastfeed earlier	4.2 (3)
Delivery complications	2.8 (2)
RH conflict	1.4 (1)
Mother-in law advised	0.3 (1)

INDICATOR 4: Exclusive breastfeeding rate: percentage of infants age 0-5 months who were exclusively breastfeed in the last 24 hours.

The data showed that 16.7% of mothers of children age 0-5 months were exclusively breastfeeding their babies (Table 6).

Table 6. Exclusive breastfeeding rate for infants age 0-5 months who were exclusively breastfed in the last 24 hours

Exclusive breastfeeding % (n)	Total	Infants age 0-5 months		Age of the respondent	
		Male	Female	<25	≥25
Yes	16.8 (17)	15.3 (9)	18.6 (8)	16.7 (13)	16.7 (4)
No	83.2 (85)	84.7 (50)	81.4 (35)	83.3 (65)	83.3 (20)
Total	100.0 (102)	100.0 (59)	100.0 (43)	100.0 (78)	100.0 (24)

This indicator differs from the one reported by UNICEF for Armenia (30%).[3]

INDICATOR 5: Complementary feeding rate: percentage of infants age 6-9 months receiving breastmilk and complementary foods.

The data indicate that 54.5 % of infants age 6-9 months receive breastmilk and complementary foods (all foods which could be identified as mashed, pureed, solid, or semi-solid) (Table 7).

Table 7. Complementary feeding rate for infants age 6-9 months (receiving breastmilk <u>and</u> complementary foods)

Complementary feeding received % (n) *	Total	Children age 6-9 months		Age of the respondent	
		Male	Female	<25	≥25
Yes	54.5 (36)	51.3 (20)	59.3 (16)	44.7 (21)	78.9 (15)
No	45.5 (30)	48.7 (19)	40.7 (11)	55.3 (26)	21.1 (4)
Total	100.0 (66)	100.0 (39)	100.0 (27)	100.0 (47)	100.0 (19)

* - the differences are statistically significant, $p < 0.05$

Additional analysis showed statistically significant association between the age of a mother and the above-mentioned indicator (Figure 2). Women over 25 are more likely to feed their children age 6-9 months with breastmilk and complementary food than women in younger age category (79% versus 44.7%).

Figure 2. Complementary feeding rate: percentage of infants age 6-9 months receiving breastmilk and complementary foods.
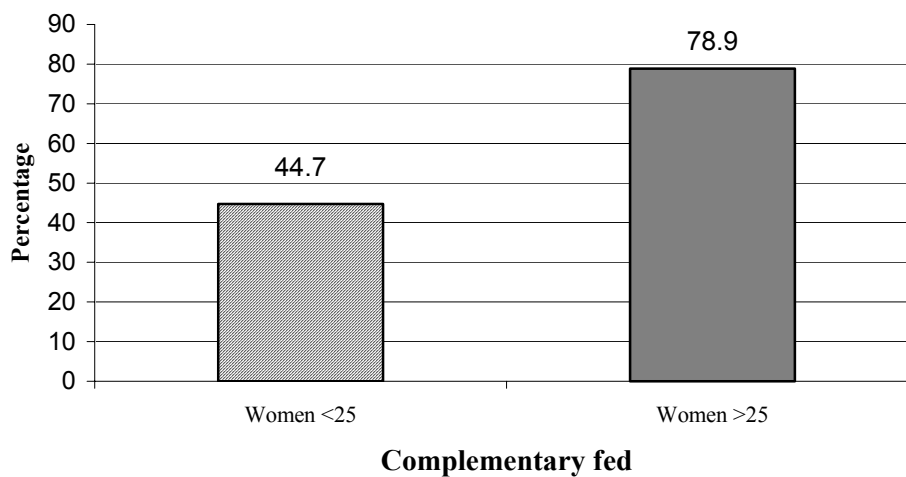
* - the differences are statistically significant, $p < 0.05$

3.6 Child Immunization

The awareness of women about the diseases prevented by immunization was assessed. Responses revealed low awareness with regard to this issue: the diseases most frequently cited by women as preventable by immunization were measles (66.3%), diphtheria (46%), "jaundice/ hepatitis" (not differentiated by women) (33.7%), and mumps (30.7%) (Table 8). Tuberculosis

was mentioned by 17.7% of women, Hepatitis B by 15.3%, polio by 12.3% of women, rubella by 11.3%, and whooping cough and tetanus by 7.7% and 3% respectively.

Table 8. Diseases cited as preventable by immunization*

Diseases	% (n)
Measles	66.3 (199)
Diphtheria	46.0 (138)
Jaundice/hepatitis	33.7 (101)
Mumps	30.7 (92)
Tuberculosis	17.7 (53)
Hepatitis B	15.3 (46)
Chicken pox	14.7 (44)
Polio	12.3 (37)
Rubella	11.3 (34)
Flu	8.0 (24)
Whooping cough	7.7(23)
Pneumonia	3.7 (11)
Tetanus	3.0 (9)
Allergy	0.7 (2)

***-** multiple responses for the question were obtained

When asked about what are the post-vaccination reactions, respondents mentioned fever (83.3%), eruption (21.3%), and anxiety most frequently (19.7%). Other common signs indicated by women were general weakness (18.7%), redness on the injection spot (16.7%), and nausea/vomiting (4.3%) (Table 9).

Table 9. Post-vaccination signs indicated by the respondents*

Signs	% (n)
Fever	83.3 (50)
Swelling	21.3 (64)
Anxiety	19.7 (59)
General weakness	18.7 (56)
Redness on injection spot	16.7 (50)
Nausea/vomiting	4.3 (13)
Bad appetite/anorexia	3.3 (10)
Pain, inflammation on the injection	2.7 (8)
Convulsions	2.3 (7)
Malaise	1.3 (4)
Insomnia/sleep disturbance	1.0 (3)
Diarrhea	1.0 (3)
Rash	1.0 (3)
Allergy	1.0 (3)

***-** multiple responses for the question were obtained

Vaccination card was available and seen by interviewer in 9.8 % of cases. The rest of the women either did not have a card at the time of interview (51.4%), or never had a card (38.9%).

INDICATOR 6: Full immunization coverage before the first birthday: percentage of children age 12-23 months who are fully vaccinated (against the five vaccine-preventable diseases) before the first birthday.

The five vaccine-preventable diseases are poliomyelitis, diphtheria, pertussis, tetanus, and measles. The above-mentioned indicator could not be calculated from the survey data, because according to the vaccination program accepted in Armenia since 2000, measles vaccine (which is one of the five diseases determining the indicator) is administered at 12 months. Therefore, it was not possible to locate children completely vaccinated before their first birthday according to NCHS/WHO standards. Full vaccination coverage in Armenia also includes Hepatitis B vaccine and BCG (tuberculosis vaccine). In order to get an estimate of vaccination coverage in Martuni, two other indicators were calculated: complete vaccination before first birthday according to vaccination plan accepted by MOH of Armenia, and partial vaccination coverage, which includes vaccination against four vaccine-preventable diseases identified by WHO/NCHS (measles excluded).

The data showed that of 29 children, for which vaccination cards were available, 3.4% were completely vaccinated before their first birthday according to MOH vaccination plan in Armenia, and 34.5% of children were vaccinated against four vaccine-preventable diseases (poliomyelitis, diphtheria, pertussis, and tetanus) before their first birthday. The vaccination coverage of children age 12-23 months who had a vaccination card was also calculated. Of 13 children age 12-23 months who had a vaccination card available, 1 child (7.7%) received full vaccination coverage according to MOH vaccination plan, and 38.5% were vaccinated against four vaccine-preventable diseases.

The data indicate very poor vaccination coverage in Martuni. As this can be due to late vaccination, another estimate was calculated, which indicates the percentage of children age 12-23 months who received BCG, DPT3, OPV3 and measles vaccine at any time. The data showed that 23.1 % of 13 children age 12-23 months who had vaccination cards, received BCG, DPT3,

OPV3 and measles vaccine at any time. This rate is lower than the one reported in DHS survey (75.7%)[2].

INDICATOR 7: Measles vaccination coverage based on maternal recall: percentage of children age 12-23 months who received a measles vaccine.

About 77% of the children age 12-23 months received measles vaccine according to their mothers (Table 10). This data repeat DHS findings (79%) and suggest home vaccination cards are not a reliable source of data.

Table 10. Measles vaccination coverage for children age 12-23 months based on maternal report

Received injection to prevent measles	% (n)
Yes	76.7 (79)
No	23.3 (24)
Total	100.0 (103)

3.7 Integrated Management of Childhood Illnesses (IMCI)

In this section, the questions were asked regarding the timely recognition of signs in children that indicate the need for treatment, and appropriate management of illnesses. The most frequently mentioned sign of illness in children was high fever (74.3%), followed by cough (58%), and not eating or drinking (23%) (Table 11). Diarrhea, anxiety, rhinitis/sneezing, and looking unwell/not playing normally were the next most frequently cited signs (19.3%, 19%, 17.3%, and 13.3% of respondents respectively). Seven percent of women named option "vomits everything", 4.3% "lethargic or difficult to wake" and 3.3% convulsions. Blood in stool as a sign of illness was mentioned by one respondent.

Table 11. Cited signs of illness in children that indicate a need for treatment*

Signs of illness	% (n)
High fever	74.3 (223)
Cough	42.0 (126)
Not eating or drinking	23.0 (69)
Diarrhea	19.3 (58)

Signs of illness	% (n)
Anxiety	19.0 (57)
Flu/rhinitis/sneezing	17.3 (52)
Looks unwell or not playing normally	13.3 (40)
Malaise/weakness	10.0 (30)
Eye redness/inflammation	9.7 (29)
Vomits everything	7.0 (21)
Sleep disturbance/insomnia	6.7 (20)
Crying	5.0 (15)
Lethargic or difficult to wake	4.3 (13)
Rash	4.0 (12)
Fast or difficult breathing	3.3 (10)
Convulsions	3.3 (10)
Changes in eyes' expression, swelling around eyes	3.0 (9)
Nausea	2.3 (7)
Ear ache	2.3 (7)
Face/skin redness	1.7 (5)
Sore throat	1.7 (5)
Paleness	1.3 (4)
Sweating	1.3 (4)
Blood in stool	0.3 (1)

*- multiple responses for the question were obtained

INDICATOR 8: Maternal knowledge of child danger signs: percentage of mothers who know at least two signs of childhood illness that indicate the need for treatment.

The data indicate that 35% of women with children age 0-23 months know at least 2 signs of illness that indicate the need for treatment (Table 12).

Table 12. Maternal knowledge of child danger signs of illness

Know at least 2 danger signs % (n)	Total	Mothers < 25	Mothers ≥ 25
Yes	35.0 (105)	33.5 (74)	39.2 (31)
No	65.0 (195)	66.5 (147)	60.8 (48)
Total	100.0 (300)	100.0 (221)	100.0 (79)

The surveyed women were asked about the illness signs experienced by their children in the past two weeks (Table 13). The most frequent condition reported by mothers was cough (38.7%), followed by diarrhea (29.4%), and fever (25%). The diarrhea rate recorded in this survey was consistent with the findings of Food Security and Nutritional Status Survey conducted in

Armenia in 2000 (31% for Armenia).[4] "Difficult breathing", and "fast breathing/short, quick breaths" were experienced by 16.3% and 9.7% of children respectively. Blood in stool was reported by 1% of the respondents, and one person reported convulsions. No malaria signs were indicated by the surveyed women (Martuni is not the region with high risk for malaria). The children of 36.7% women had no illness in the past 2 weeks.

Table 13. Illnesses signs seen in children in the past two weeks as reported by the respondents*

| Illness	% (n)
Cough	38.7 (116)
Diarrhea	29.4 (88)
Fever	25.0 (75)
Difficult breathing	16.3 (49)
Fast breathing/short, quick breaths	9.7 (29)
Flu	4.3 (13)
Nasal discharge/rhinitis	2.7 (8)
Digestion problems (vomiting, constipation)	2.0 (6)
Ear ache	2.0 (6)
Eye problems (catarrh, redness, swelling)	1.7 (5)
Green/mucous faeces	1.0 (3)
Blood in the stool	1.0 (3)
Convulsions	0.3 (1)
None of the above	36.7 (110)

* - multiple responses for the question were obtained

Additional analysis showed that 39.8% of children had more than 1 illness signs in the past two weeks, while 21.8% had more than 2 signs. About 14% of children had 3 illness signs in the past two weeks, 4.7% had 4, 2.7% had 5, and 2 children (0.7%) had 6.

Among those who reported any illness in the past 2 weeks, 44.6% sought the help outside the house. Of those seeking help, 54% applied to a physician first, while for 46% the first point of contact was a nurse. No one reported applying to another person with/ without medical education or traditional practitioner. Of those first applying to a nurse, 36.6% applied to a physician as a second point of contact.

A statistically significant association was observed between the age of the respondents and the first contact for care. According to the data, older women (>25) tend to apply to physicians first more often, while younger women use nurses as a first contact (Figure 3).

Figure 3. First contact for care when seeking advice or treatment for a sick child

First contact for care
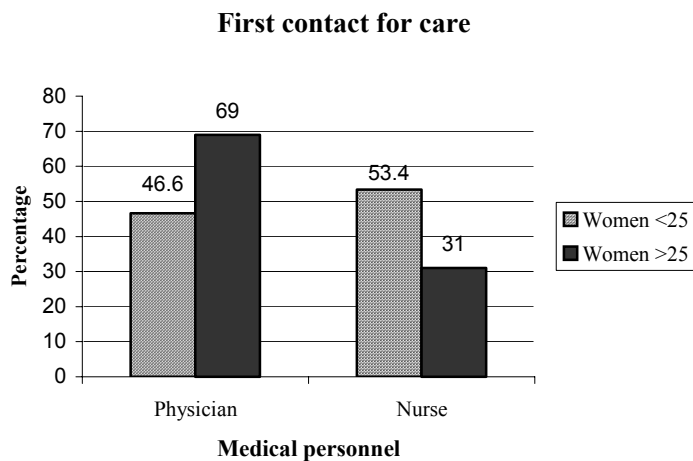
* - the differences are statistically significant , p < 0.05

3.8 HIV/AIDS

Approximately 85% of survey respondents had ever heard about AIDS. When asked about what can a person do to avoid getting AIDS or the virus that causes AIDS, 40.7% responded "Don't know" (Table 14). The next most frequent response was "Avoid contact with people who are sick with AIDS" (21.7%). Using condoms as a mean of protection from AIDS was cited by 18.2% of respondents, whereas staying faithful to one partner and limiting number of sexual partners was named by 17.8% and 9.1% respectively. Six percent of the respondents mentioned "Keeping cleanliness" as another option.

Table 14. Knowledge of ways on how to avoid getting AIDS or the virus that causes AIDS*

Ways to avoid getting AIDS	% (n)
Avoid contact with people who are sick with AIDS	21.7 (55)
Use condoms	18.2 (46)
Stay faithful to one partner	17.8 (45)

| Ways to avoid getting AIDS	% (n)
Limit number of sexual partners	9.1 (23)
Avoid blood transfusions	6.7 (17)
Keep clean everything	6.0 (18)
Avoid injections	4.7 (12)
Avoid kissing	4.3 (11)
Avoid sex with persons who have many partners	4.0 (10)
Abstain from sex	3.2 (8)
Avoid sex with prostitutes	3.2 (8)
Avoid sex with persons who inject drugs i/v	2.8 (7)
Avoid drug injections	2.0 (5)
Be cautious w/clothes and dishes of ill persons	2.0 (6)
Refer to a doctor	1.7 (5)
Use disposable syringes	1.7 (5)
Avoid intercourse with persons of the same sex	1.6 (4)
Avoid casual sexual relations/contacts	0.7 (2)
Avoid sharing razors, blades	0.4 (1)
Don't know	40.7 (103)

* - multiple responses for the question were obtained

INDICATOR 9: Maternal knowledge of HIV risk reduction: percentage of mothers of children age 0-23 months who cite at least two known ways of reducing the risk of HIV infection.

The survey revealed that only 19% of women know at least two ways of preventing HIV infection (Figure 4). The additional analysis showed that the indicator significantly varies in different age categories. About 34% of women over 25 know at least two ways of reducing HIV risk versus only 13.2% of younger women (Figure 4).

Figure 4. Maternal knowledge of HIV risk reduction

Percentage of mothers who cite at least two known ways of reducing the risk of HIV infection
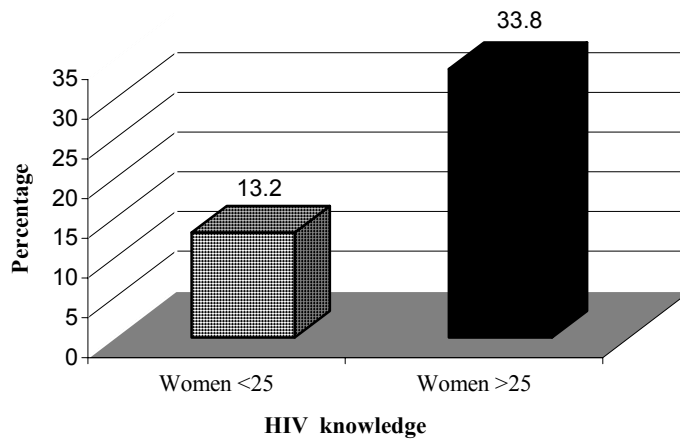

The additional analysis was conducted to compare the indicator in the categories of women less than 19 years of age and over 19. It was found that the percentage of mothers who cite at least two known ways of reducing HIV infection risk was even lower in the youngest age category (only 5.6% of 36 women under 19), which shows distinct correlation between the age and HIV prevention knowledge.

3.9 Men's participation in care of children

The survey revealed moderate involvement of husbands in the care of children. When asked about how frequently the husband assists in feeding the child, the highest portion (34.7%) of women mentioned "never", while 26.2% mentioned "always", 21.8% "rarely", and 17.3% "sometimes" (Figure 5).

Figure 5. Frequency of husband's assistance in feeding the child
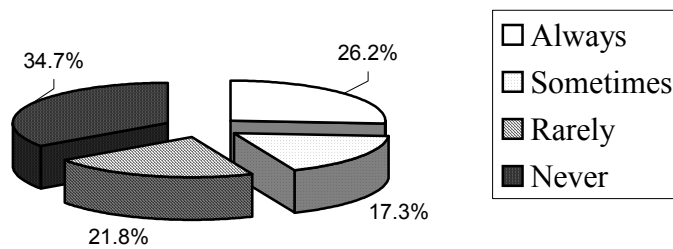
The data on husband's assistance in feeding the child were cross-tabulated by two age categories of children (less than 6 months of age and $\geq$ 6 months). The statistically significant association was found between the age of a child and husband's involvement (Table 15).

Table 15. Husband's assistance in feeding the child by the age of a child

Frequency the husband assist in feeding the child % (n) *	Total	Children < 6 months	Children $\geq$ 6 months
Always	26.2 (77)	23.2 (23)	27.8 (54)
Sometimes	17.3 (50)	11.1 (11)	20.1 (39)
Rarely	21.8 (64)	20.2 (20)	22.7 (44)
Never	34.7 (102)	45.5 (45)	29.4 (57)
Total	100.0 (293)	100.0 (99)	100.0 (194)

* - the differences are statistically significant, $p < 0.05$

The percentage of husbands assisting with bathing the child was even lower: 57% of husbands never assist with bathing, 15.6% assist rarely, 12.6% sometimes, and 14.6% always (Figure 6)

**Figure 6. Frequency of husband's assistance with bathing the child**
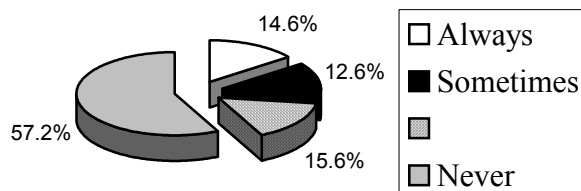
A statistically significant association was found between the frequency of husband assisting with bathing and age of the respondents. The data showed that husbands of older women tend to assist with bathing more frequently than those of younger women (Figure 7). No significant association between the frequency of assistance and the age of a child was noticed.

Figure 7. Frequency of husband's assistance with child bathing by age of the respondents
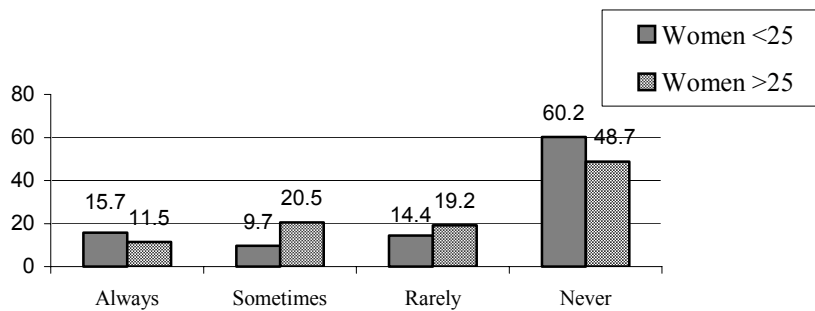
Husbands are intensively involved in playing with children. About 74% of husbands always play with the child, 13.6% sometimes, 8.1% rarely, and only 4.1% of husbands never play with the child according to women (Figure 8). No significant association between the frequency of playing with the child and the age of a child was found.

Figure 8. Frequency of husband's involvement in playing with the child
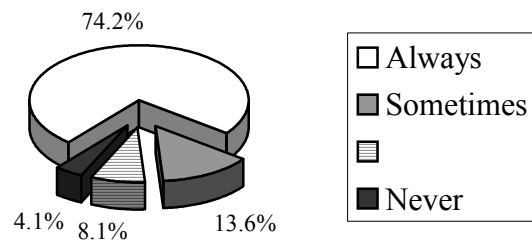
3.10   Water/Sanitation

According to the data, the main source of drinking water for the overwhelming majority of surveyed households is piped water (91%), followed by surface water (6%), and water from covered well (2.3%) (Figure 9). These findings are similar to Food Security and Nutritional Status Survey findings (97% reported using piped water).[4] Two women reported using water from open well. In 46% of cases, the source of water was located in the house, and in 35.7% of cases in the dwelling yard/plot near the house. Thirteen percent of respondents were using a water source located within village (in 100 meters), while 5% were carrying the water from a source located more than 100 meters away from the house (but within the village). No one reported using a water source out of the village. Virtually all of the respondents get drinking water from the same source throughout the year (91.5%).

Figure 9. Main source of drinking water for households in Martuni region, Armenia
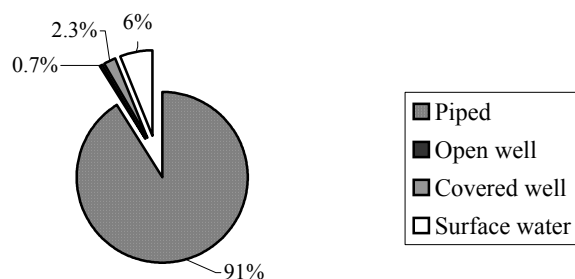
3.11   Hand Washing

The respondents were asked about when do they wash their hands with soap/ash. Most of the respondents (91%) reported washing their hands with soap after defecation, before feeding the children (79.7%), after attending to a child who has defecated (78%), and before food preparation (75.7%) (Table 16). Women also mentioned washing their hands in the morning (18.3%), after work in cow house (11.3%), after ground work (10.7%), in the evening/before sleep (7.7%), after laundry (7.3%), after dirty work (7.3%), after housecleaning (6.7%), any type of child care (feeding, clothing, washing, (4%)), and outside work (3.3%).

Table 16. Hand washing practices*

Washing hands with soap	% (n)
After defecation	90.7 (272)
Before feeding children	79.7 (239)
After attending to a child who has defecated	78.0 (234)
Before food preparation	75.7 (227)
In the morning	18.3 (55)
After work in cow house	11.3 (34)
After groundwork	10.7 (32)
In the evening/before sleeping	7.7 (23)
After laundry	7.3 (22)
After dirty work	7.3 (22)
After house cleaning/any type of work	6.7 (20)
Before taking care of a child (feeding, dressing, washing)	4.0 (12)
Many times during a day/always	3.7 (11)
After outside work	3.3 (10)
After dishwashing	3.0 (9)

Washing hands with soap	% (n)
Never	0.7 (2)

* - multiple responses for the question were obtained

INDICATOR 10: Maternal hand-washing behavior: percentage of mothers of children age 0-23 months who wash their hands with soap/ash before food preparation, before feeding children, after defecation, and after attending to a child who has defecated.

According to the data, 61% of mothers of children age 0-23 employ correct hand-washing practice (washing hands with soap/ash before food preparation, before feeding children, after defecation, and after attending to a child who has defecated) (Table 17). No difference by maternal age was observed.

Table 17. Maternal hand-washing behavior

Correct hand-washing practices % (n)	Total	Women < 25	Women ≥ 25
Yes	61.0 (183)	60.2 (133)	63.3 (50)
No	39.0 (117)	39.8 (88)	36.7 (29)
Total	100.0 (300)	100.0 (221)	100.0 (79)

4. Discussion

Overall, the results of the survey supported previous findings[1, 2, 4], demonstrating the need for the community–based programs in the sphere of maternal and child health. Since the survey's objective was to gather and analyze data that would allow ARC to plan their future programmatic activities in Gegharkunik *marz*, the conclusions stress problem areas, which may need selected child survival interventions to be carried out by ARC and/or other humanitarian organizations.

❑ **The correct spacing of births in Martuni region is low**. Only 42.4 % of the recent live births had an interval of more than 24 months. The comparison of the data to previous findings allows concluding that birth intervals in Martuni are among the shortest ones in Armenia. This can be partially explained by the deficiency in the knowledge regarding the correct child spacing, or lack of access to/knowledge on the family planning options.

□ **The percent of underweight children in Martuni is low**. Of the surveyed children, only 2% were underweight according to the WHO/NCHS standards. This positive finding is also consistent with other surveys conducted in Armenia previously. However, weight-for-age is not the most sensitive indicator for chronic malnutrition, which is reported to be high in Gegharkunik by other research[2].

□ **Skilled delivery assistance in Martuni is high, but is somewhat low in comparison with the rate for Armenia in general**. Approximately 93% of the mothers in Martuni received skilled delivery assistance, whereas 97% of deliveries throughout Armenia are assisted by skilled personnel according to DHS.

□ **Home deliveries occur frequently in Martuni villages**. About 16% of mothers delivered their youngest baby at home. This finding matches with DHS data on the home deliveries in rural regions of Armenia (16%) and probably can be explained by larger distances to/difficulties with reaching health facilities in rural areas, and economic factors, as well as the education level of women.

□ **The exclusive breastfeeding rate of children under 6 months of age is low in Martuni region.** Only 16.7% of mothers of children age 0-5 months exclusively breastfeed their babies. This indicator is much lower than the one reported by UNICEF for Armenia (30%) and indicates the need for promotion of breastfeeding in Martuni villages.

□ **Half of the infants age 6-9 months in Martuni villages receive breastmilk and complementary food (54.5 %).** Women over 25 are more likely to feed their children age 6-9 months with breastmilk and complementary food than women in younger age category. The additional analysis did not show any correlation between the parity and complementary feeding, which rules out the assumption that this could be due to older women being more experienced in childcare.

□ **There were no children age 12-23 months in Martuni villages fully vaccinated according to WHO standards before the first birthday.** This indicator does not

correspond to the current immunization plan in Armenia. The estimates for immunization coverage were calculated, according to which 7.7% of children age 12-23 months for which the vaccination cards were available, were completely vaccinated before their first birthday according to MOH vaccination plan in Armenia (3.4% of all children with vaccination cards), and 38.5% of children age 12-23 months were vaccinated against four vaccine-preventable diseases (poliomyelitis, diphtheria, pertussis, and tetanus) before their first birthday (34.5% of all children with vaccination cards). About 77% of the children age 12-23 months received measles vaccine according to their mothers.

The data suggest that vaccination coverage is inadequate in Martuni region. However, it should be taken into account, that the sample size employed for the calculations of vaccination coverage was rather small due to lack of vaccination cards at respondents' homes, and could be not representative for the population. It is also possible that the information recorded in the vaccination cards kept by mothers at home is not complete/inadequate. It can be recommended for further studies using health facility based cards or health facility records (especially in rural areas) for obtaining data on vaccination coverage.

❑ **Maternal knowledge of child danger signs is low.** Only 35% of women with children age 0-23 months know at least 2 signs of illness that indicate the need for treatment. The data show very low awareness for diarrhea signs and fast/difficult breathing, which indicates the need for knowledge/behavior change interventions among Martuni women in the areas of diarrhea and pneumonia case management.

❑ **Maternal knowledge of HIV risk reduction is extremely low.** Only 19% percent of women know at least two ways of preventing HIV infection. The lack of knowledge of HIV prevention in Martuni women can be attributed to low prevalence of AIDS in Armenia and lack of information sources regarding HIV in a village. Less than 6% of women under 19 and about 13% of women under 25 knew the ways of reducing HIV risk, which indicates the need for targeting women in younger age categories with AIDS awareness campaigns.

❑ **Husbands are moderately involved in the care of children**. About 43.5% of husbands always/sometimes assist with feeding the child, 27% always/sometimes assist with bathing. Most of the husbands do play with their child. While Armenian mothers are apparently primary caregivers for children under two and thus should be the main target for IMCI interventions, the initial steps towards more intensive involvement of husbands in the childcare can be undertaken by program implementers.

❑ **Access to piped water is high.** Virtually all respondents (91%) have access to piped water; in 46% of cases the water is piped into the house.

❑ **About 40% of mothers do not use correct hand washing practices** (61% of women wash their hands with soap before food preparation, before feeding children, after defecation, and after attending to a child who has defecated.

It can be concluded that some of the indicators show particularly unfavorable conditions in Martuni as compared to the situation in Armenia in general (including spacing, skilled delivery assistance, exclusive breastfeeding, and vaccination coverage). These areas need special attention of ARC and other humanitarian organizations planning to reduce childhood disease burden in Gegharkunik marz.

Most of the interventions in the problem areas indicated by the survey can be incorporated into second and third component of the IMCI strategy, which include improving the overall health system and improving household and community practices.

❑ The deficiencies in the knowledge/behavior in the areas of breastfeeding, HIV prevention, childcare, nutrition, personal/ family hygiene, and, partially birth spacing, can be addressed by the appropriate interventions at the community level

❑ Insufficient antenatal care, assistance and medical care at delivery, and vaccination coverage are problems directly related to the health services quality and organization, and availability of drugs/supplies, and therefore cannot be completely alleviated without corresponding improvements in the health care system.

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