

Final Report

Evaluation and Monitoring of the Anemia Prevention Programme among women of fertile age and children under 2 years old in the Republic of Karakalpakstan.

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UNICEF

Tashkent 2000

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ABBREVIATIONS.

IDA	Iron Deficiency anemia	MoH RUz	Ministry of Health of the Republic of Uzbekistan
OID	Occult Iron Deficiency		
ID	Iron Deficiency	MoH RKK	Ministry of Health of the Republic of Karakalpakstan
Hb	Hemoglobin	MM	Mass Media
Tf	Transferrin	SRI	Scientific Research Institute
Fer	Ferritin	TPD	Treatment Prophylactic Department
RKK	The Republic of Karakalpakstan		
APC	Anemia Prevention Control Programme		

Financing

Research was financed jointly by UNICEF Uzbekistan, the Ministry of Health of the Republic of Uzbekistan, Scientific-Research Institute of Hematology and Blood Transfusion.

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GRATITUDE

Participation of different people in better implementation of this project was needed. Contribution of these people is not big but very important. Daily and wide participation of others was also important for better implementation of the project. We would like to express gratitude to each person and organization, which helped us in implementation of these monitoring.

This research could not be implemented without UNICEF technical support. We would like to thank and avail our compliments to Mr. R.Rodrigues, UNICEF Assistant Representative in Uzbekistan for his constant interest and support of this project. We are extremely thankful for Mr. Shukhrat Rakhimdjano for his consultative support in this monitoring.

We also would like to express our gratitude to Mr. Yarkulov Ahror, Deputy Minister of Health of the Republic of Uzbekistan, Ms. Tureeva Nuriya, chief of the department of safe motherhood and childhood of the Ministry of Health of the Republic of Uzbekistan for providing organized and timely control of this project.

We are expressing our gratitude to Mr. Bakirhanov Kozim, director of the SRI of hematology and blood transfusion for his support in implementation of this project.



We are thankful to Professor Buglanov Anatoliy, Deputy director of the SRI of Hematology and Blood transfusion on science and to the workers of the laboratory for the provided consultative assistance, for timely and qualitative conduction of necessary laboratory blood testing.

We are also thankful to Professor Adylova Fatima, SRI of Cybernetics of the Academy of Science of the Republic of Uzbekistan for provided assistance in statistical processing of monitoring materials.

We are expressing gratitude to Mr. Bobonazarov D.R., Minister of Health of the Republic of Karakalpakstan, Ms. Ibadullaeva Kh.R., Deputy Minister on safe motherhood and childhood issues.

Also we are thankful to members of the working group from the Ministry of Health of the Republic of Karakalpakstan – Ms. Kurbanova S.K, chief hematologist and Ms. Valiahmedova A.F., chief child hematologist for their daily participation in monitoring implementation.

We are also thankful for medical workers from rayon hospital in Muynak and FAP Kyzyl-Shark in Muynak rayon, workers of the Beruny rayon hospital and SVP “Nur” of Beruny rayon, workers of the polyclinic No. 1 in Nukus for their professional participation in monitoring implementation.

Population of Nukus city, Muynak and Beruny rayons had determined success of our monitoring, because without their participation we were not able to gather necessary data, to conduct interviews listed in the report. We would like to thank all interviewed families. We hope, that results of implementation of APC Programme in Republic of Karakalpakstan will be achieved improvement of health of women and children, reducing of anemia level, improvement of population awareness on anemia issues.



Brief description.**Evaluation and monitoring of Anemia Programme among women of fertile age and children under 2 years old in the Republic of Karakalpakstan.****Introduction.**

Anemia is actual problem in the Republic of Uzbekistan. The Ministry of Health of the Republic of Uzbekistan, SRI of Hematology and Blood Transfusion is giving great attention for this problem during last decade. Scientific researches conducted by the workers of the SRI of Hematology and Blood Transfusion and also with other medical institutions during last decade, showed that anemia among children and women in different regions of the republic is vary from 45 to 87%. It was stated that main factor of anemia is iron deficiency (Annex 4). In the Republic of Karakalpakstan the SRI of Hematology and Blood Transfusion jointly with Crosslink studied prevalence and anemia caused in 1992. Researches showed that main cause of anemia in Karakalpakstan is iron deficiency and folic acid. In 1998 Ministry of Health of the Republic of Uzbekistan issue an order on conduction of Anemia Prevention Programme for women of fertile age and children under 2 years old in the Republic of Karakalpakstan. The SRI of Hematology and Blood Transfusion actively participated in implementation of this Programme (methodologically, consultations) UNICEF provided targeted group by ferrum sulfate and also with booklets and brochures for population awareness. This research is dedicated for efficiency of implementation of this Programme.

Anemia.

In accordance with WHO data, average frequency of anemia among women is 42%, among pregnant women 51% (SCN News 1993). Among developed countries in average the level of anemia is 10-20%, among developing countries about 80% and higher (1). There are big differences in anemia among age, gender, geographical situation, and nationality (2). Causes of anemia could be not sufficient quantity of iron with food, due to big losses of iron by the body or increased necessity of iron in the body. Researches conducted by the scientists from Uzbekistan showed, that causes of IDA among women and children in the Republic is combination of different factors, quite often simultaneous presence of iron deficiency in food, big necessity of iron in the body and big losses of iron from the body. Quite often, during testing people with anemia, simultaneously revealed deficiency of iron, folic acid, magnesium, zinc, copper, vitamin A and E, albumen. About 30-60% women of fertile age are affected by heightened blood loss related to menses (4). It is widely disseminated helminthic invasion, which is also one of the causes of anemia deficiency (3).

Previously conducted researches in Karakalpakstan served as a basis of the implementation of the APC Programme among women and children, weekly consumption of iron pills (in 30-60-120 mg ferrum sulfate, in accordance with age) is a main component of the Programme. Also one of the main components of this Programme was increasing of knowledge on anemia issues of medical workers and



chiefs of health department. The other no less important component of the Programme is conducting explanatory work among population and target groups: distribution of booklets, posters, enlightenment in Mass Media anemia issues (TV, radio, newspapers), conducting explanatory work to population by medical workers. It was planned to fortify wheat flour, but this project in stage of development.

Research and place of its conducting.

This research was conducted in Nukus city, Muynak and Beruny rayons. Muynak rayon is most injured by the economic disaster, its population is in worst social-economic conditions than other rayons of the Karakalpakstan. Beruny rayon is one of the best rayons on social- economic population status, and located on the South border of Karakalpakstan and bordering with Khorezm Oblast. Nukus is a capital of Karakalpakstan. The research involved children from 6 months till 2 years, women from 15 till 49 years. In accordance with list of target group, which are received weekly iron pills, women and children were invited to the polyclinic, SVP, FAP in their living place.

Totally it was tested 1027 women and children under 2 years. In Nukus city were tested 329 women and children, in Muynak rayon 411, and in Beruny - 287, data collection was done individually. In a stage of gathering data were use some methods of researching main issues: filling up individual card of monitoring (13 questions); filling up questionnaire on evaluation of knowledge of the medical staff (9 questions); filling up questionnaire on evaluation of knowledge of the population on anemia issues (11 questions). Blood tests were used for determination of hematological indexes – hemoglobin, and biochemical index – serum iron, transferrin, ferritin.

Dissemination and level of anemia severity in Karakalpakstan.

During Programme implementation it was determined that from 1027 children and women 1013 have anemia, i.e. the level of hemoglobin is lower than standards norm. Among anemic women and children with level of hemoglobin $N > Hb > 91$ are 397 (39,19%), women and children with hemoglobin level 90-70 gr./l are 524 (51,72%), with hemoglobin level 69-59 gr./l is 70 (6,9%), with hemoglobin level 58-40 gr./l are 22 (2,17%). And there is some statistical data with significant difference of hemoglobin level among target group, regularly using iron pills (94,85-96,85 gr./l) and groups do not using iron pills (79,20-80,29 gr./l). There are also reliable statistical data on different hemoglobin level among citizens of Nukus city, Muynak and Beruny rayons. The highest hemoglobin level was in target group of Beruny rayon and the lowest in Muynak rayon.

Causes, influencing for the efficiency of APC Programme implementation in Karakalpakstan.

By using interviewing method of special individual monitoring cards, were studied causes influencing on development of iron deficiency among women of fertile age and factors reducing efficiency of the weekly consumption of iron pills. It was prescribed that there is big amount of iron inhibitor in ration – black tea with milk 76% from the target groups, “kesek” (clay) – 31% which are interfering of absorption of iron



from the gastroenteric tract. It was also prescribed presence of chronic metrorrhagia – 38%, presence of chronic diseases of digestion organs and helminthic invasion –55%. Conducting interview in target group showed that 36% of women and children from target group have sufficient amount of iron in their food, 59% moderately reduced, y 5% sharply reduced. It is known that quality of nutrition is influencing on efficiency of anemia prevention, in our researches, 62% from the target group the food do not consisted of enough amount of iron. Awareness of medical workers, target groups and population on anemia issues is essentially influencing on efficiency of Programme implementation: as higher awareness as higher motivation of the target group, as higher average hemoglobin levels. There was revealed reliable differences in received data in Nukus city, Muynak and Beruny rayons.

Evaluation of level of knowledge of the medical workers involved in implementation of APC Programme showed not enough knowledge, especially among medical nurses and doctor's assistants.

Studying of organization and implementation of APC Programme in Karakalpakstan in different levels of health structure, introduction with activity of the working group of the MoH of the RKK, rayons, Mass Media has shown some constrains on organizational issues, which are reducing efficiency of the APC Programme and this constrains could be eliminated.

Recommendations.

Results of this research shows, that it is important to reveal and timely prevent all factors on each level of health system, which are reducing efficiency of the APC Programme implementation. In Karakalpakstan, including organizational matters. Increasing the level of knowledge on anemia issues among medical workers, population and target group awareness will also increase motivation of the target group for anemia prevention. Reveling of anemia risk factors such as chronic diseases of digestion organs, chronic metrorrhagia, helminthic invasion, intervals between pregnancies no less than 2-3 years, exception from food iron inhibitors, are the main factors, which are increasing efficiency of the APC Programme. Enough amount of iron in ration of women and children, knowledge of basis of nutrition ration are also influencing on the efficiency of the APC Programme. Important role in increasing APC Programme is related to the Mass Media, especially TV, via which 92% of target groups are receiving information. Together with medical workers it is necessary wide participation of public organizations in explanatory work among population – women counsels, makhallya counsels, youth organization, Children Fund, etc.

FINAL REPORT.

Evaluation and Monitoring of the Anemia Prevention Programme among women of fertile age and children under 2 years old in the Republic of Karakalpakstan.

Part 1. Introduction.

On anemia issues in the Republic of Uzbekistan is working Institute of Hematology and Blood Transfusion, which has specialized laboratory on anemia issues. Also as in other oblasts of the Republic of Uzbekistan in RKK there is a network of hematological institutions: hematological departments and rooms in Republican hospitals (for children and adults), hematologists room in each rayons and cities. In RKK, from 16 rayons in 13 rayons and Nukus city there are hematological departments, and in Beruny rayon there is hematological department for 30 beds. Totally in RKK working 32 hematologist, which are providing methodological, consultative assistance for pediatricians, therapeutists, obstetric-gynecologist on diagnostic issues, treatment, and anemia prevention. Two times a year on the meeting of the MoH of the RKK hematologists are giving situation analysis on problems of the hematological services and also on anemia issues.

IDA is widely spread in the RKK, in accordance with data of the joint researches of the SRI of Hematology and Blood Transfusion and Crosslink conducted in 1993, there are 88% cases of the IDA among children under 2 years, 82% among women of fertile age (WFA). Data of the annually hospitalization, conducted in RKK among children and women of fertile age has shown that 84% from them are anemic. Among pregnant women IDA is 100%. In 1997 in RKK were registered 4452.3 cases of IDA for 10.000 people, and in 1999 – 4690.9. Previously they do not give much attention to IDA, they thought that this is second disease, they do not have relevant diagnostic and registration. During last years, attention of the MoH of the RKK for that disease is grown up, in accordance with resolution of the MoH of the RKK, all women of fertile age, children of 1-2 year, 6 years, girls adolescents annually have hospitalization and their blood is tested for hemoglobin level for timely prevention, treatment and prophylactic of IDA. Pregnant women's blood is tested for hemoglobin level once in a quarter.

From November 1998 in RKK APC Programme is implemented by UNICEF technical support. The Programme was prepared by the workers of the laboratory on anemia issues of the SRI of Hematology and Blood Transfusion jointly with the MoH of the RUz. In target group were included 45 000 children under 2 years, 25 000 pregnant women, 350 000 women of fertile age. From UNICEF side were provided free of charge 30 000 000 pills of iron sulfate and iron syrup, 15 000 posters and 86 000 booklets in three languages (Russian, Uzbek and Karakalpak). Total sum was 3 millions dollars.

Researches conducted previously in the Republic of Karakalpakstan has shown that main cause of the iron deficiency among women and children are not only issues of nutrition, but also such factors as chronic metrorrhagia, chronic diseases of the gastroenteric tract, helmentic invasion, short interval between pregnancies, chronic infections. At the same time low rate of population and target group

awareness on anemia issues could not allow to timely conduct diagnostic and anemia prophylactic, to eliminate listed above risk factors. The level of knowledge of the medical staff of the primary level is determining the quality of the conducted prophylactic work among population, including motivation of the target group for anemia prevention. Advocacy work of the Mass Media is essentially influencing on motivation of the target group for anemia prevention, beside this increasing the level of awareness of the population, medical staff, public organizations, politicians. Conceptual model of interrelationship between direct causes reducing quantity of the iron in a body, factor which are increasing efficiency of iron deficiency prophylactic and results of the anemia prevention Programme are shown in Table 1 and in Chart 1.

Table 1.

List of conceptual components on individual level.

I. Variable Resulting

A. Anemia

Drop in hemoglobin level

II. Direct causes

A. Insufficient entering of iron into body

- a) insufficient quantity of iron in daily nutrition
- b) Absence of fortified food
- c) Absence of weekly iron micronutrients.

B. Increased use of iron

- a) frequent pregnancies, interval among pregnancies 2-3 years
- b) chronic metrorrhagia
- c) chronic blood loose (hemorrhoids, ulcer, helminthic invasion, etc.)
- d) excessive commitment, overwork

C. Insufficient assimilation of iron in gastroenteric tract

- a) chronic diseases of the digestion organs
- b) helminthic invasion

D. Consumption of big amount of iron inhibitors

- a) tea with milk
- b) clay

III. Factors, which could increase efficiency of APC Programme in target groups

A. High awareness of target groups

B. High level of knowledge of medical staff of the primary level, chiefs of TPD.

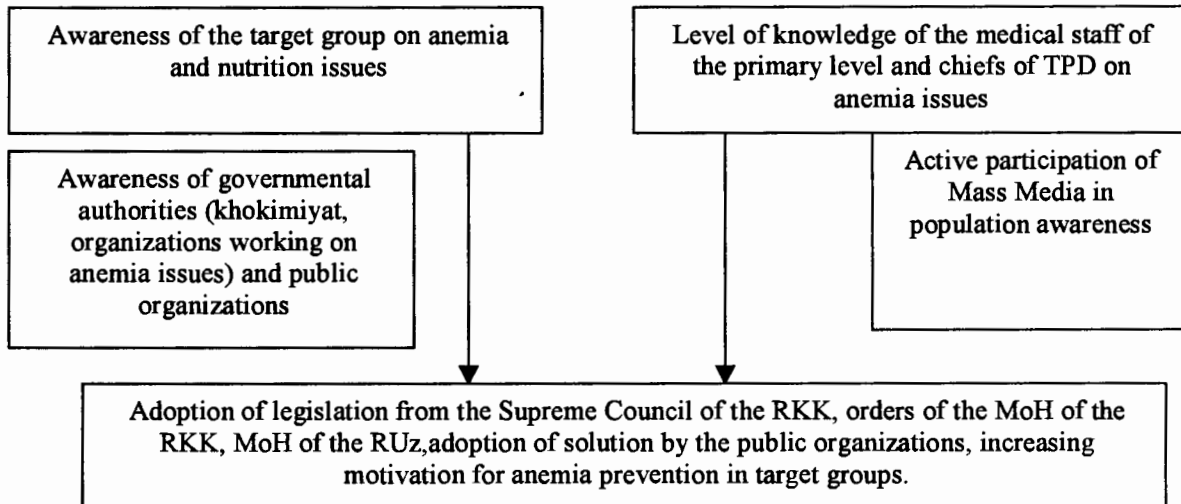
C. Awareness of the governmental authorities and public organizations on anemia issues.

D. Active participation of the Mass Media in increasing awareness of the population in target groups.

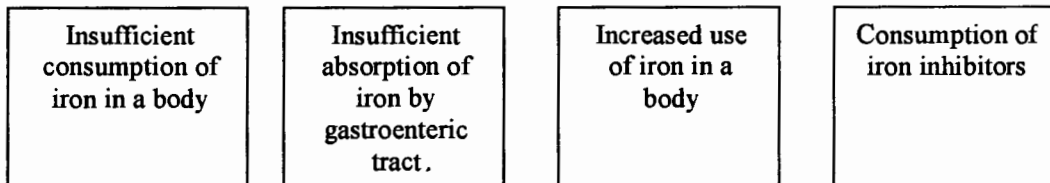
Chart 1.

Conceptual model of interrelationship between direct causes which are reducing content of iron in a body, factor increasing efficiency of the anemia prevention and results of anemia prevention.

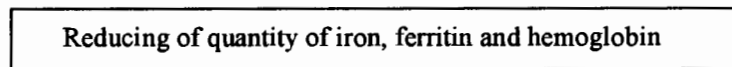
Factors influence for efficiency of the anemia prevention in target group:



Direct causes, leading for iron deficiency



Variable Resulting



Part II. Stages of organization and implementation of APC Programme in Karakalpakstan.

In accordance with order of the MoH of the RUz Согласно No. 528 dated on 16.11.1998 of the Republic of Karakalpakstan implementation of the APC Programme began. In November 1998 in Nukus city was conducted one day seminar for working group of rayons and MoH of the RKK by the representatives of UNICEF in Uzbekistan, MoH of RUz and representatives of the SRI of Hematology and Blood Transfusion. Working group of the MoH of the RKK was created and the following specialists were included: chief pediatrician, chief therapist, chief obstetric-gynecologist, adolescent doctor, hematologist, chief doctor of the "Health" Center, chief doctor of the "Nutrition Center". Chairman of the

working group is Deputy Minister of Health of the RKK on Safe Motherhood and Childhood, Ibadullaeva Kh.P.

List of staff members of the working group of the MoH of the RKK

Ibadullaeva H.P. – Deputy Minister of Health of the Republic of Karakalpakstan, chairman of the working group (responsible for Nukus, Ellikkalinskiy rayon);

Valiakhmedova A.F.- chief child hematologist of the Ministry of Health of the Republic of Karakalpakstan (responsible for Turtkul and Beruny rayons);

Bisalyev N.B. – director of the Aral Center of Child Nutrition, chief of the Faculty of Medical Institute of the Ministry of Health of the Republic of Karakalpakstan (responsible for Takhiatash city, Amudarya rayon);

Elgondiev A.K.- chief obstetric-gynecologist of the Ministry of Health of the Republic of Karakalpakstan (responsible for Muynak and Kungrad rayons)

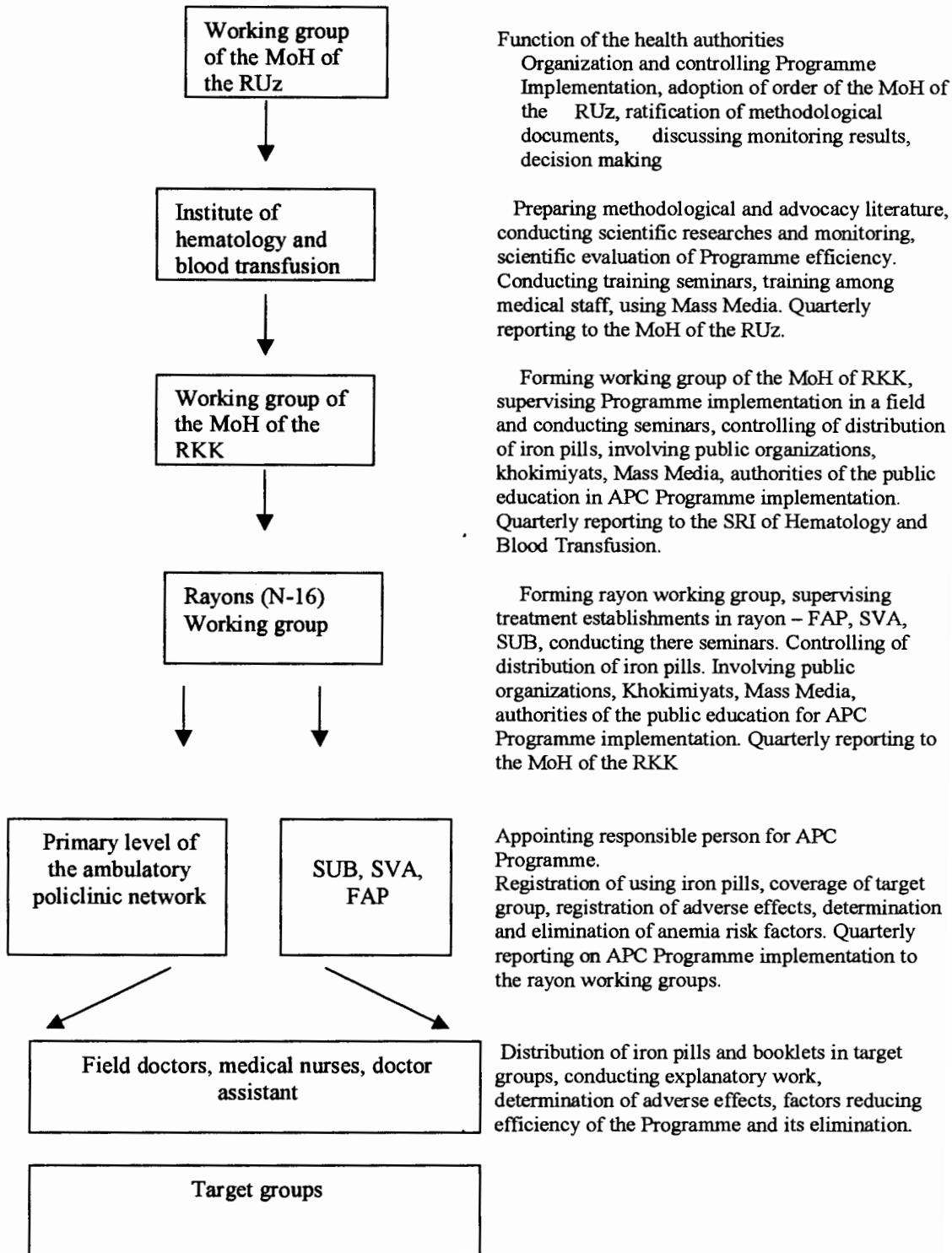
Urazalieva K.Yu. – chief therapist of the Ministry of Health of the Republic of Karakalpakstan (responsible for Shumanay and Kalykulskiy rayons);

Sabirova M.S. – chief pediatrician of the Ministry of Health of the Republic of Karakalpakstan (responsible for Kegely and Bozatau rayons);

Kurbanbaev S.K.- chief hematologist of the Ministry of Health of the Republic of Karakalpakstan (responsible for Takhatakupyr and Karauzyak rayons)

Karataeva S.K.- adolescent doctor of the Ministry of Health of the Republic of Karakalpakstan

ORGANIZATIONAL STRUCTURE OF THE ANEMIA PREVENTION CONTROL PROGRAMME IN THE REPUBLIC OF KARAKALPAKSTAN IN DIFFERENT LEVELS OF THE HEALTH SYSTEM



Working groups were created in each rayon, in these groups were involved: chief therapist, chief pediatrician, chief obstetric-gynecologist, chief hematologist, chief doctor of the "Health" Center. Orders of the MoH of the RKK were adopted on APC Programme implementation in the RKK, also relevant orders were adopted for rayons. Schedule of trips of the members of the MoH of the RKK working group was prepared, supervisors for each rayons were determined. All members of the working group of the MoH of the RKK and rayons working groups were provided by methodological recommendations, which was specially prepared by the workers of the SRI of Hematology and Blood Transfusion, MoH of the RUz and UNICEF.

Rayons working groups had conducted training seminars for medical workers in their rayons by using methodological recommendations. In accordance with resolution of the MoH of the RKK, Wednesday was declared as a day of anemia prevention, in this day TV and radio programs were conducted, articles in newspapers were published. "Health" Center (chief doctor Ismailov O.) is responsible for explanatory work. In December 1998, workers of the SRI of Hematology and Blood Transfusion jointly with hematologists of the RKK had conducted 6 inter rayon seminars (2-3 rayons involved per each seminar). For these seminars were invited all medical workers from rayons which are participating in APC Programme (chiefs of the working groups, chiefs of the FAP, SUB, SVA, SVP, chief doctors of the Central Republican Hospital, chiefs of the policlinics, field doctors and medical nurses, chief of the drugstores).

After conducted training for medical staff of the primary level, distribution of iron pills in target groups had been started. Iron pills were given by 12-13 pills for each for 3 months and 1 bottle of iron syrup for 1 child (for one year). Primary level workers – field medical nurses distributed iron pills for each households and also provided explanatory work for them. Chiefs of the drugstore were responsible for these iron pills, they were given to chiefs of the policlinics, chiefs of the SUB, SVA, SVP, FAP in accordance with provided documents. Later, chiefs distributed them to the field doctors and medical nurses. In each ambulatory card was marked about receipt of the tablets and there was signature of the recipient.

Goals and objectives of the present monitoring.

Monitoring was conducted from 18-28 April 2000.

Monitoring goal – to study results and efficiency of the APC Programme during 1999-2000, for that to test hemoglobin level in target groups from 3 rayons of the RKK, to compare results among target group which were taking iron pills and do not taking and to give assessment of the efficiency of the APC Programme in RKK, to determine factors which are reducing efficiency of the APC Programme.

For achieving this goals were set up the following objectives:

1. Hemoglobin level was tested among 1027 women and children from target group in Nukus, Muynak and Beruny rayons.
2. Biochemical analyses were taken from 175 women for testing level of iron serum, transferrin and ferritin.

3. The level of population awareness was studied in accordance with special questionnaire (250 people).
4. The level of knowledge of the medical workers of the primary level on anemia issues were studied (100 people).
5. 100 women from target group were interviewed by the individual monitoring cards.
6. Meetings of the working groups were conducted in MoH of the RKK, Muynak and Beruny rayons.
7. Meeting with Minister of Health of the RKK, Mr. Bobonazarov D.R. was conducted.
8. Meeting with responsible staff of the Supreme Council of the RKK Ms. Narimbetov K. and Nizametdinova N. was conducted.

Briefing notes about participants of the monitoring.

1. Suleymanova Dilorom, candidate of the medical sciences, working experience on anemia issues 22 year, chief of the laboratory on anemia issues of the SRI of Hematology and Blood Transfusion of the MoH of the RUz, responsible for the Programme monitoring. Coordinator of the APC Programme in RKK from the MoH of the RUz.
2. Davlatova Gulchekhra – scientific worker of the laboratory on anemia issues.
3. Khasenova Gulstan - scientific worker of the laboratory on anemia issues.
4. Uzakbaeva Yulduz – assistant of the laboratory of biochemistry and eritron patology of the SRI of Hematology and Blood Transfusion.

Part III. Methodological researches.

Researchers had covered women and children from target groups, living in Nukus, Muynak and Beruny rayons. Chart of the researches was developed after preliminary researches in November 1999, when in Nukus and Nukus rayon were researched and interviewed 60 women and children from target group.

The present research consisted from 4 parts: preliminary research and rayon selecting, experimental research, gathering data and data analysis. From each rayon were interviewed no less than 290 people, for providing adequate size of sample and statistical significance ($p < 0.05$) in each group.

Hemoglobin level was determined by the hemoglobinometer produced locally (Chirchik city) "GEMOGUE" and Sali apparatus. During researches were tested the difference in results of these three hemometers and correction was conducted, standard index was used.

Biochemical tests were taken only from women of target group, children under 2 years – it was not planned, because for full volume of the research it is needed no less than 5-6 ml of blood, it is impossible to take from children. In accordance with our opinion, researches conducted among women from target group could reflect dynamic of iron level and there is no any necessity to repeat that researches among children.

The blood from vein was taken by disposable needles to specially sterilized laboratory test-tube. After separation of the blood serum by the centrifuging, than it was poured into special bottle and kept in a freezer until the departure. Iced blood was transported to Tashkent, to the Institute of Hematology, where researches were continued. In stage of data gathering were used some methods of researching, including questionnaire, introduction with ambulatory cards.

In accordance with lists of target groups, field medical nurses invited to the polyclinic or SVP, FAP, women and children from target group. Firstly they checked ambulatory card, then they have conducted interview in accordance in individual monitoring card, examination and laboratory testing. During interview and examination, local doctors, hematologists, members of the working group were actively helping. During interview no more than 3 people were participating.

For using received data were used the following norms of hemoglobin level and anemic hemoglobin level.

Age	Hemoglobin level as a standard gr./l
Children 6-60 months	110
Children 5-11 years	115
Children 12-15 years	120
Women	120
Pregnant women	110
Men	130

Anemia severity.

Anemia severity	Hemoglobin level gr./l
Simple	90- less than norms
Average	70-90
Serious	Less than 70

Used biochemical indexes and their meaning for women.

Biochemical indexes	Unit of measuring	Meaning
Iron in blood serum	Mc mole/l.	>10,5 deficiency 10,5-25= norm <25 high
Transferrin	Gr./l.	3,2 = norm 3,3 > high
Ferritin in serum	Hg/ml.	>9-12 low 12> = norm

Size of samples in target groups is shown in table 2.

Table 2.

Size of sample in different types of researches.

No№	Age	Quantity	Hemoglobin gr/l	Serum iron McMole/l	Transferrin gr/l	Ferritin hg/l
1.	Children 6 months – 2 years	371	371	-	-	-
2.	Girls 15 - 17 years	151	151	24	24	24
3.	Women 18-49 years	382	382	151	151	151
4.	Medical workers (women 18-49 years)	123	123			
5.	TOTAL	1027	1027	175	175	175

Part IV. Results

1. Hemoglobin level in target groups.

For determination of peculiarities of iron prophylactics among girls of 15-17 years, which were the schoolgirls of high grades, we divided them into separate group. Also we included medical staff in separate group for determination of reliable difference in hemoglobin level in comparison with non-medical staff. We proposed that motivation for anemia prophylactic should be higher among medical workers than among women, medical workers should show their own examples for anemia prevention. For evaluation of results of hemoglobin level, we divided into 4 groups – children, girls of 15-17 years, women 18-49 years and women medical workers 18-49 years. All data is given in table 3 and chart (annex 7).

Table 3

Hemoglobin level in target groups.

Rayons	Hemoglobin level in target groups (gr/l)				
	Children from target group N M±m	Women from target group, from which			Total in Karakalpan n M±m
		Girls 15-17 age n M±m	Women 18-49 age n M±m	Medical staff 18-49 лет n M±m	

Muynak	27 91,5±2,09	51 78,13±2,05	256 82,0±0,75	77 92,75±1,30	411 86,10±0,17
Nukus	201 82,18±0,80	45 90,06±2,25	50 85,29±1,84	33 90,42±1,95	329 86,98±0,38
Beruny	143 90,05±0,89	55 88,26±1,45	76 91,42±1,66	13 94,46±2,95	287 91,05±0,65
Total hemoglobin level in average	371 87,91±0,85	151 85,48±0,90	382 86,24±0,65	123 92,54±1,27	1027 88,04±0,69

As it shown in a table, average level of hemoglobin in target group among children is 87,91±0,85, among girls 85,48±0,90, among women 86,24±0,65, among women medical workers 92,54±1,27. From three rayons, the best hemoglobin level in Beruny rayon. It is also necessary to note, that hemoglobin level among women medical workers is much higher than among other women, ($P<0,05$), it explained that medical workers are in-taking iron pills and followed to each recommendations on anemia prevention.

The lowest hemoglobin level among girls in comparison with women. Among three rayons the lowest hemoglobin level was revealed among girls and women in Muynak rayon - 78,13±2,05 and 82,00±0,75 gr/lt, and the highest in Beruny rayon.

All researched children and women were divided into 2 group, in-take or not in-take iron pills weekly. In first group were 283 children and 505 women, and in second 880 children and 151 women. All received data is shown in table 4 and chart (annex 5).

Table 4.

Comparison data of the hemoglobin level in target groups in comparison with weekly consumption of iron pills during 10 months.

Rayons	Children (n-371)			P	Women 15-49 years (n -656)			P
	Weekly consumption of iron pills				Weekly consumption of iron pills			
	In take n Hb gr/lt	Do not in- take n Hb gr/lt	Differen. in index Hb gr/lt		In take n Hb gr/lt	Do not in-take n Hb gr/lt	Differen. in index Hb gr/lt	
Muynak	14	13			307	77		
K-Zhar	103,0± 2,66	80,0± 2,75	23,0	<0,001	103,60± 0,75	80,66± 1,30	22,94	<0,001
SUB Shege					5			
Muynak city					91,1±0,88 292			
					87,9±1,2			

Nukus city	148 90,40± 1,38	53 80,40± 1,55	10,10	<0,001	73 91,53± 1,38	55 85,29± 1,45	6,24	<0,001
Beruny	121 91,14± 1,35	22 77,20± 1,85	14,41	<0,001	125 95,47±0,75	19 74,93± 1,92	20,54	<0,001
Average RKK	283 94,85± 0,66	88 79,20± 0,98	15,65	<0,001	505 96,87± 0,46	151 80,29± 1,30	16,58	<0,001

As it shown in a table, during weekly in-taking of iron pills the hemoglobin level among child is 94,85±0,66 gr/l (simple anemia severity), children do not in-taking iron pills, hemoglobin level was 79,20±0,98 gr/l (middle anemia severity).

So, in-taking iron pills during 10 months the hemoglobin level in average increased for 16,58 gr/l. Average hemoglobin level among women in-taking iron pills is 96,87±0,46 gr/l (simple anemia severity). Among women do not in-taking iron pill, hemoglobin level was 80,29±1,30 gr/l (middle anemia severity).

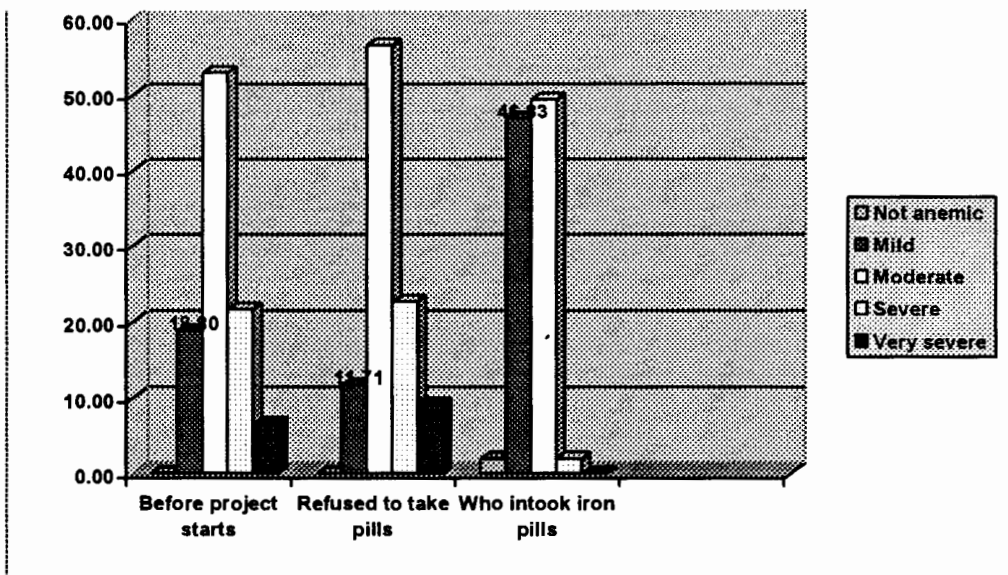
Among all rayons the highest hemoglobin level 103,6± 0,75 gr/l was in FAP Kyzyl-Zhar, the lowest - 80,66± 1,3 in SUB Shege (Muynak rayon). In FAP Kyzyl-Shark 100% from target group were in-taking iron pills, there were no cases of in-taking kesek, they drink less black tea with milk. In Shege, 70% of the population in-taking kesek, tea with milk, 92% of women and children did not in-take iron pills. In Muynak 292 women in-took iron pills, but hemoglobin level were not so high 87,9 ± 1,40 gr/l. Probably it could be explained that 65% of women and girls in Muynak were widely in-taking kesek, tea with milk.

We have studied correlation of people with simple anemia severity, middle and high anemia severity among target group weekly in-taking iron pills and did not in-take. Received data is in Table 5.

Table 5.

Correlation of the sick people with simple, middle and heavy anemia severity in target group.

Hemoglobin level gr/l	In-take iron pills		Did not in-take iron pills		Total	
	N	%	n	%	N	%
120 and higher (for women) 110 and higher (for children)	14	1,77	0		14	1,36
119 -91 (for women) 109 - 91 (for children)	369	46,84	28	11,72	397	38,66
90 - 70	389	49,36	135	56,49	524	51,02
69 - 59	16	2,03	54	22,59	70	6,82
58 - 40	0		22	9,2	22	2,14
Total	788	100	239	100	1027	100



As it is shown in table, among 1027 researched women and children, only 1,46% had normal hemoglobin level. Among them, who weekly in-take iron pills, there was not found heavy anemia severity (hemoglobin 40-58 gr/l.) Heavy anemia severity (59-69 gr/l.) was found among 2%, and middle anemia severity (70-90 gr/l.) from 49,36 %. Among 46,83% of the researched was determined simple anemia severity. Among them, who did not in-take weekly iron pills, there was not found any cases of normal hemoglobin level. At this group mainly was people with middle and heavy anemia severity (56-22%). Simple anemia severity is noted only among 11,71% of the researched peopled. Big attention attracts the fact, that among that group there are sick people with very heave anemia severity (9.2%) (hemoglobin 40-58 gr/l.)

Chart 2

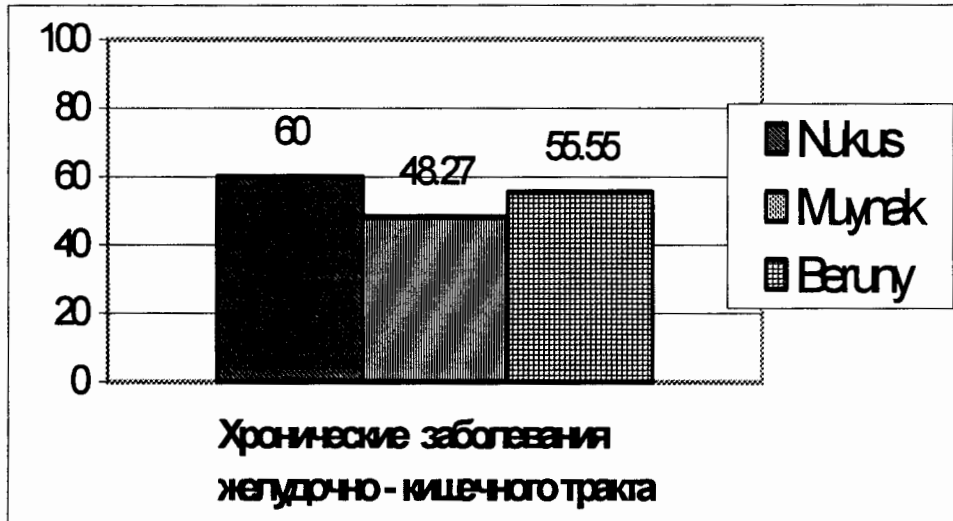
2. Results of the interview on cards of individual monitoring.

We have developed card for individual monitoring, consisting from 12 questions for studying efficiency of the weekly consumption of iron pills. The aim of the survey to find out factors which could decrease efficiency of iron pills, to find out causes of refusing, adverse effects, to specify women’s awareness on anemia issues. Received data is shown in a table (Annex 1).

As it is shown in a table, among interviewed women, 55% has chronic diseases of the gastroenteric tract, from which: chronic gastritis – 35%, chronic colitis – 13%, chronic Hepatitis- 4%, chronic cholecystitis, pancreatitis – 3%. Among the researched three rayons, the highest level of chronic diseases of the gastroenteric tract (60%) was among women in Nukus city. It is known, those chronic diseases of the gastroenteric tract reducing iron assimilation in a body and also reducing efficiency of APC Programme in target groups.

Number of women from target group with chronic diseases of gastroenteric tract

Chart 3

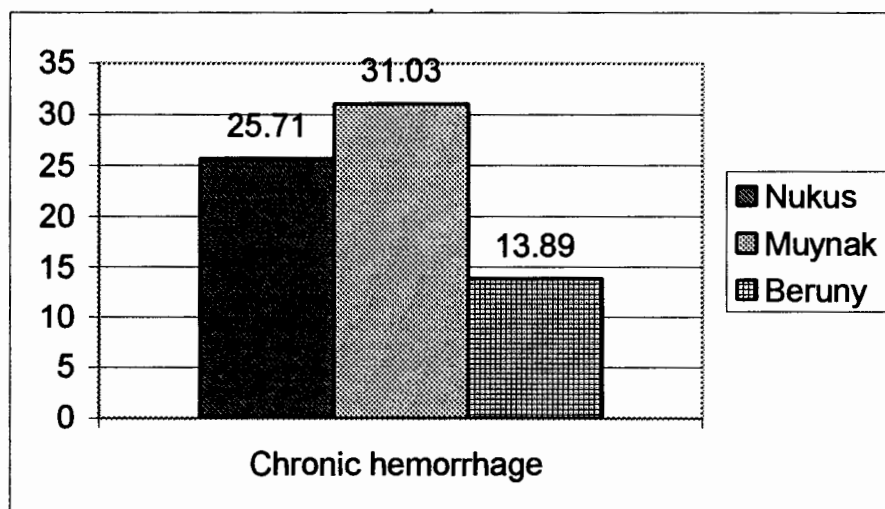


During interview we have found that more women have hemorrhage, which is reducing efficiency of the APC Programme.

We have found that 23 women had hemorrhage due to hemorrhoids (4%), ulcer (1%), chronic diseases of kidney (13%), helminthic invasion (5%). The highest level of the hemorrhage among women is in Muynak rayon 31.03%, the lowest – in Beruny Rayon 13.89%. During interview we have found that these women do not receive special anemia treatment (they weekly in-take 60 mg of iron).

Chronic hemorrhage among women in target group (%)

Chart 4

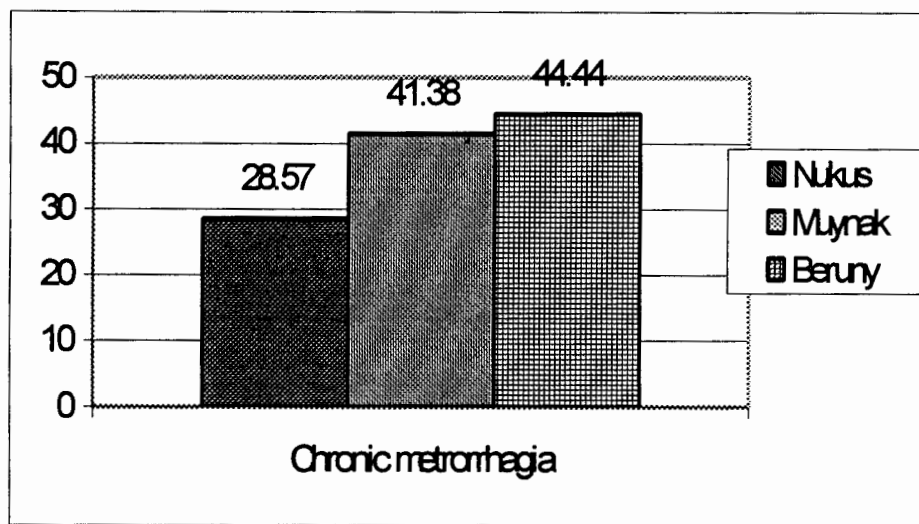


It is known, that chronic metrorrhagia is one of the main causes of anemia among women and girls. We have found out, how often there are cases of the metrorrhagia among women from target group, because it is reducing efficiency of the APC Programme.

Chronic metrorrhagia is related to the causes like fibromyoma, myoma, hyperpolymenorea, dysfunction are among 38% of the interviewed women. Among them 22% had intrauterine spiral, 12% hyperpolymenorea of the not determined etiology, 2% had dysfunction, 2% fubriomyoma and myoma. During interview we had found out, that these women did not get special anemia treatment, expect weekly in-taking of the iron sulphate 60 mg. These data is shown below in the chart.

Number of women with chronic metrorrhagia in target group

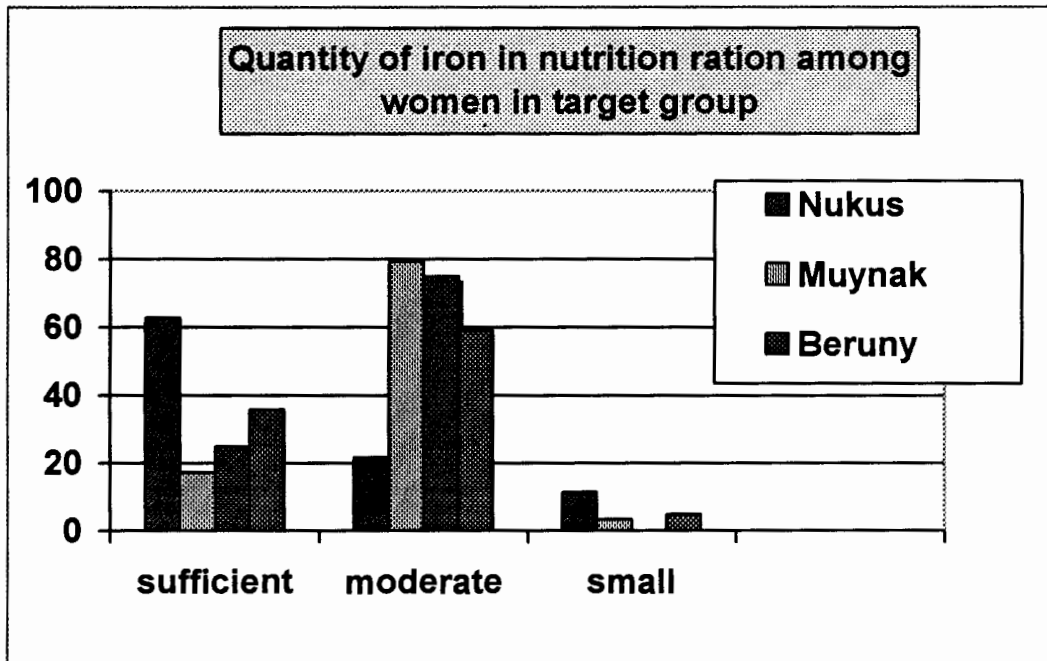
Chart 5



For the period 1999 – 2000, when women began to in-take weekly iron pills, 4% of the interviewed women had abortion, 3% deliveries, 5% miscarriage. It could be the main causes of the reducing of the hemoglobin level, because after deliveries, abortions and miscarriages women did not pass special anemia treatment besides in-taking 60 mg of iron sulfate.

Studying of the type of nutrition.

We have studied the type of nutrition among interviewed women and determined the consumption in nutrition ration the products reach with iron and vitamins (meat, fish, eggs, fresh vegetable and fruits, greens, beans, crops, dried fruits, etc.) If these products in-taken regularly, the meat are in-take 1-2 times, such nutrition is reach enough with iron. If meat and meat food were in-taken 3-6 times a week and other products in-taken regularly we could tell about moderate iron consumption. If meat and other products were in-taken less than 1-2 times a week we could tell about non-sufficient iron consumption. Certainly assessment of in-taking food rich with iron is not sufficient, but it helped us to divide into three groups and to study relations of type of nutrition. Received data is shown in a chart.



So, among 100 interviewed women 36% answered that their food is containing of enough products with iron, they are in-taking regularly them. 59% of interviewed women answered that they have moderate contain of iron and 5% answered that they have insufficient contain of iron in their nutrition.

Among three interviewed rayons, in Nukus city was the highest level of iron contain in nutrition ration – 62-86%, in Muynak rayon only 17.24%. In Beruny rayon only 25%. Insufficient contain of iron in nutrition iron was 11.43% in Nukus city, 3.45% in Muynak rayon and in Beruny rayon – there are no such cases. In Muynak and Beruny rayons the main part women (75-79%) had moderate contain of iron, and in Nukus city only 25.71%. Nutrition of women in rural areas is more monotonous than in urban areas and mainly consists of wheat products, in rural areas they are eating mainly bread, macaroni, sugar, oil, almost all meals are prepared on cotton oil. People in rural areas eating less fresh vegetable, greens, despite the price for them is less and they have own gardens. For example, in some villages of Muynak rayon the carrot, pumpkin, onion, egg-plant, beet, tomato, cucumber are grown much but they do not eating them. In Beruny rayon, they are growing enough quantity of vegetables, fruits, melons and gourds, beans, but despite of this women and children do not eating them.

In-taking iron inhibitors.

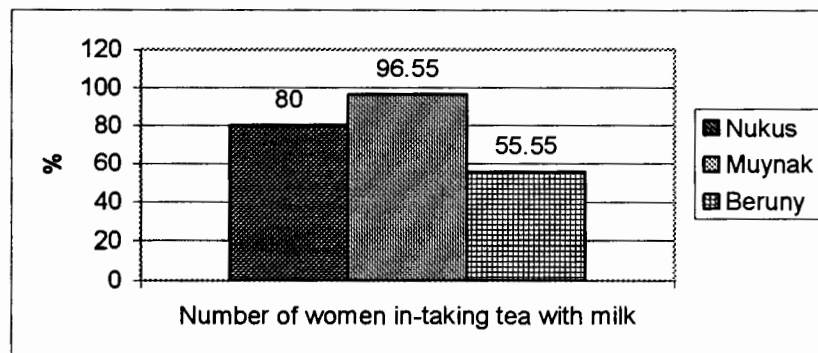
During interviewing women we tried to find out amount on iron inhibitors in nutrition among women, which could be the main cause of not sufficient assimilation iron from food and iron pills. The results had shown that many women, girls and children are regularly drinking strong black tea with milk. This drink is national tradition, men are drinking it not so often, they prefer to drink green tea. During interview it

was revealed that 76% of women regularly drinking tea with milk, 25% of them drank more than 1 liter per day. After conducting explanatory work, most of the women began to drink tea only after meal (after 1 hour), but they could not refuse to drink tea with milk. Most of the women drinking tea with milk instead of breakfast or dinner. They do not have habit to prepare compote, juices, drinks from dried fruits, etc.

From the early age and also to infants they give tea with milk. “Kesek” (clay) is another iron inhibitor which is used in Karakalpakstan, it is also sold in a market, and many women and girls, especially pregnant women are buying it. During interview it was revealed that in Muynak rayon 65.51% of interviewed women, regularly eating “kesek”. In Beruny rayon only one woman was eating “kesek”. In Nukus city 31.42% of women and girls has such habit. Only 14% of the interviewed women told that they do not drink tea with milk and eat “kesek”. Data on in-taking iron inhibitors is shown in chart.

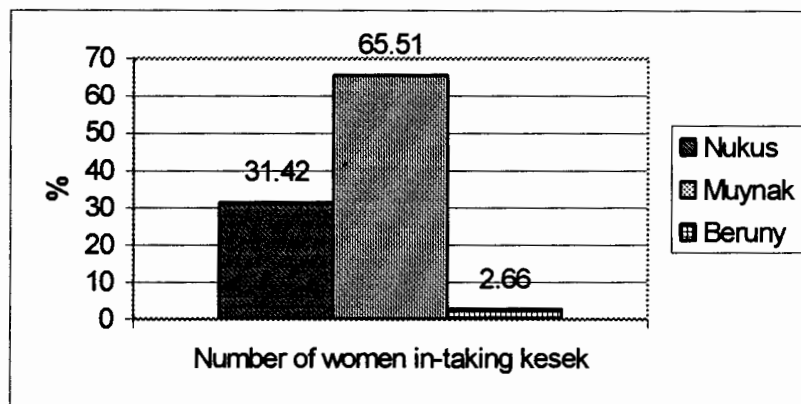
Number of women in-taking iron inhibitors – tea with milk

Chart 7



Number of women in-taking iron inhibitors – “kesek”

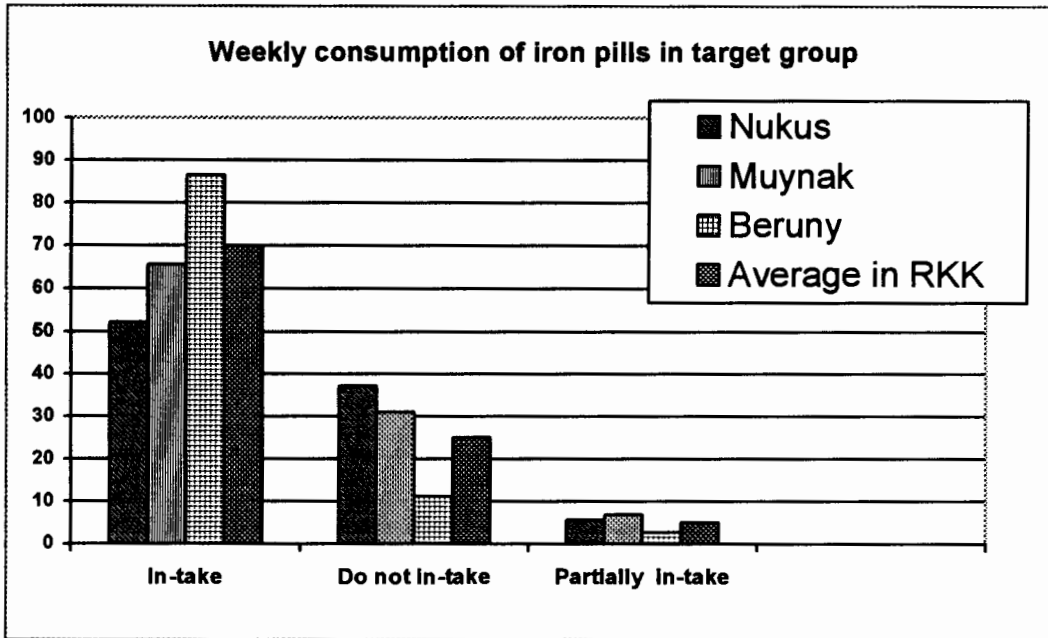
Chart 8



Weekly consumption of iron pills.

We have searched why women refused to in-take iron pills. Interview results showed that 70% of women regularly in-take iron pills, 25% refusing, and 5% do not in-take regularly. The highest coverage of the APC Programme was in Beruny rayon – 86.51% of women were regularly in-taking iron pills. In Muynak rayon – 65.52%, in Nukus city – 57.14%.

Chart 9



During finding out the causes of refusing to in-take iron pills, 12% of women told that they do not trust to iron pills, they afraid of adverse effects, believe to different rumors on negative influence. Once it was noticed diarrhea (2%), sickness (3%), allergy (3%), 3% told that they do not receive iron pills, vomiting (1%), allergy (1%). So, 25% of women refused to in-take iron pills, only two of them had serious adverse effects from the iron pills. The others could in-take iron pills after active explanatory work of the medical workers.

Awareness of women in target group on anemia issues.

During interviewing women we have found out that, 82% of interviewed women do not know the standards norm of hemoglobin. 76% of interviewed women do not know about consequences of anemia, 72% - about rational nutrition. The best knowledge on anemia issues was in Beruny rayon.

3. Evaluation of knowledge of medical workers

We have developed special questionnaire for the medical staff of primary level, which are implementing APC Programme in Karakalpakstan for determination level of knowledge of medical staff. This questionnaire consists of 9 questions on anemia issues. The knowledge of medical workers was estimated in 5 points system.

5- excellent knowledge, 4 – good, 3 – satisfactory, 2 – bad, 1 – very bad, 0 – do not know

Interview was conducted voluntarily, no more than three people were attending. Usually on interview were participating deputy chief doctors and chiefs of departments, chiefs of the polyclinic, senior medical nurse, hematologists, scientific workers of the institute of hematology. The points displayed jointly. The results of the interviews have shown in table.

Table 6

The level of knowledge of medical workers on anemia issues.

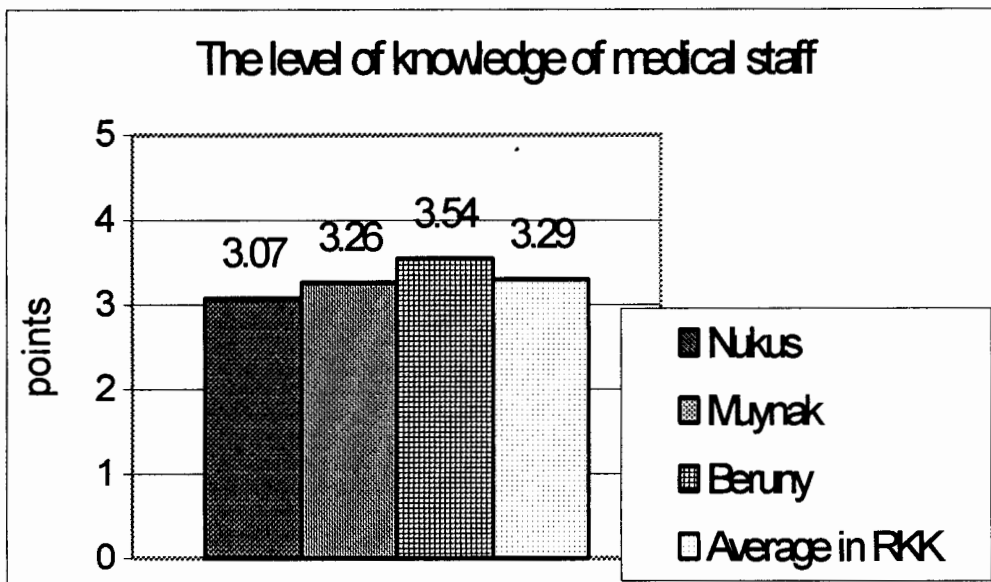
№	Questions	Nukus n-38 points M±m	Muynak n-34 points M±m	Beruny n-28 points M±m	Total n-100 points M±m
1.	What are the causes of anemia?	3,45±0,5	3,70±0,42	4,00±0,25	3,72±0,36
2.	What anemia consequences do you know?	3,26±0,38	2,86±0,27	3,90±0,45	3,34±0,45
3.	Which products are rich with iron, vitamins and useful in treatment of anemia?	2,83±0,43	3,03±0,37	3,5±0,45	3,12±0,48
4.	Which food products are iron inhibitors? ?	3,07±0,42	2,90±0,35	3,46±0,5	3,14±0,39
5.	What for is necessary to drink iron pills?	3,43±0,43	3,23±0,45	2,82±0,47	3,16±0,44
6.	How conducted prevention work on anemia issues in developed and developing countries?	2,33±0,35	1,26±0,28	2,28±0,38	1,96±0,39
7.	How to prevent anemia among pregnant women?	3,14±0,36	2,33±0,29	3,43±0,37	2,97±0,44
8.	What do you know about the products fortified with iron?	2,43±0,45	1,46±0,40	2,11±0,38	2,00±0,35
9.	What are the standards of hemoglobin level among women, children, adults and pregnant women?	3,75±0,46	2,76±0,38	3,82±0,45	3,44±0,40
	Total	3,08±0,45	2,61±0,33	3,25±0,45	2,98±0,36

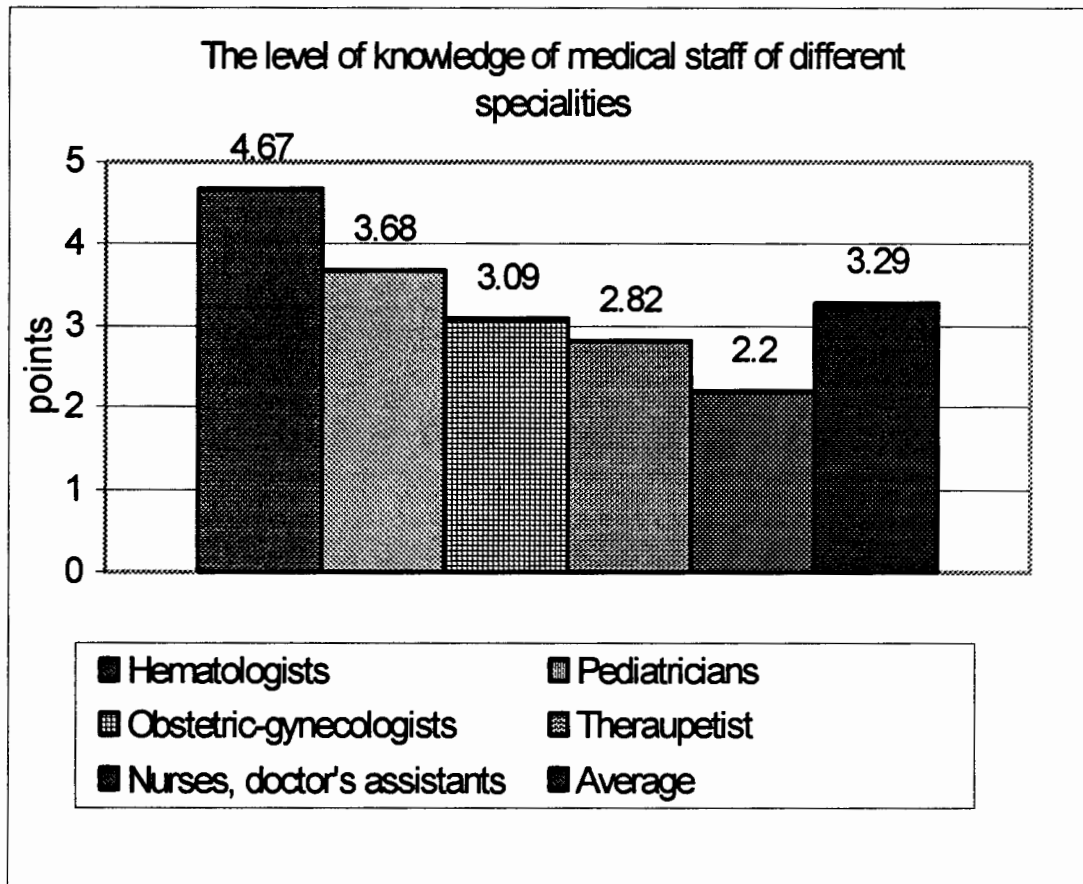
As it is shown in the table, 100 medical staff were interviewed, the highest level of knowledge in Beruny rayon – $3.25 \pm 0,45$, and the lowest in Muynak rayon - $2,61 \pm 0,33$. Besides interviewed therapeutists, pediatricians, medical nurses, also obstetric-gynecologists, hematologists were interviewed for comparison. (Annex 2). As it is shown in a table, the highest level was among hematologist $4,67 \pm 0,46$ points, not bad results among pediatricians - $3,68 \pm 0,45$ points. The knowledge among therapeutists is worse than among pediatricians - $2,82 \pm 0,3$ 5 points. Obstetric-gynecologist had - $3,09 \pm 0,38$ points. The lowest knowledge were among medical nurses and doctor assistants - $2,20 \pm 0,30$ points.

So, it is necessary to increase training work on improvement the level of knowledge on anemia issues among therapist, pediatricians, obstetric-gynecologists, doctor's assistants, medical nurses. The knowledge which they have, they are not able to provide sufficient explanatory work among population and target groups. Probably, the highest percentage of refusing in-take iron pills among women (25%) was due to bad explanatory work from the medical workers of the primary level. Higher knowledge of medical workers in Beruny rayon is correlate with higher coverage of target group (86.51%) in comparison with Muynak rayon (65.52%) (chart 10).

It is necessary to mark, that the main explanatory work in target group during distribution of iron pills was given to medical nurses, doctor's assistants. With so low knowledge, they are not able to convince women in target group actively participate in APC Programme and to increase their motivation. The highest knowledge was among hematologists, because in Uzbekistan hematologists are working on these issues, and the institute of hematology is a coordinator of the methodological center on anemia issues (chart 11).

Chart 10





There is hematological department in Beruny rayon, hematologist rooms are functioning, seminars on anemia issues are conducted systematically. Chief doctor of Beruny rayon Mr. Saburov B. personally participating in all seminars, he is interested in increasing level of knowledge among medical workers. Probably, because of this, the knowledge of medical staff in Beruny rayon is higher, explanatory work in target groups conducted better. It is necessary to note, that good knowledge among doctor's assistant in FAP Kyzyl-Shark in Muynak rayon, they have studied all methodological recommendations of the APC Programme, they have conducted good explanatory work in their target area, that's why there was not registered any cases of refusing to in-take iron pills.

4. Level of knowledge of the population.

To assess the knowledge of population and target groups on anemia issues was done by special questionnaires which was consisted from 12 questions. The interview was conducted by presence of: worker of the SRI of hematology, hematologist from Karakalpakstan, chief of departments, FAP, SUB, SVP. During interview were presenting not more than 3 people. Totally 250 people were interviewed, it was visitors of the polyclinic, passing, patients of the hospitals, housewives. All received data is shown in table (Annex 3). As it is shown in a table, 19.2% of the interviewed do not know about anemia, 53.2% - do not know methods of anemia preventing, 16.02% - think that anemia is not disease, 40.8% - do not

know the causes of anemia, 96.4% - think that main causes of anemia is bad nutrition. 56.4% - think that ecological situation in Karakalpakstan is main cause, 47.6% - do not have knowledge on rational nutrition, 45.6% - think that sugar is useful for anemia treatment. During elaboration of information sources on anemia issues we have found out, that 60.4% of the interviewed received information from their field doctors, 78.8% - from field medical nurses. 39.2% - from obstetric-gynecologists, 27.6% - from other medical staff, 51.6% - on radio, 92.4% - on TV, 43.2% - from newspapers, 4.4% - from other sources (scientific-popular brochures, magazines), 86.4% - from UNICEF booklets and posters.

So, the level of population awareness in target group on anemia issues is not so high, and population motivation for anemia prevention is related to this. As higher will be population awareness, as higher will be motivation for prevention. While 80% of the population received information from UNICEF booklets and brochures, this information is not sufficient to persuade population to change their habits, national traditions. It is necessary to conduct different, laborious, continuous explanatory work by the medical workers and in Mass Media sources.

In comparison with data from three rayons, in Beruny rayon population knowledge is much higher than in other, field doctors and medical nurses conducted more explanatory work with population.

It is necessary to take into consideration, that it is necessary to give more attention to nutrition issues, prevention and anemia causes. Because 92% of the population were receiving information from TV, it is necessary to conduct TV-programs more systematically, different and more interesting, not only 5-7 minutes.

5.Results of the biochemical researches.

175 women from target group have passed biochemical tests of the blood serum. Results are shown in Table 7.

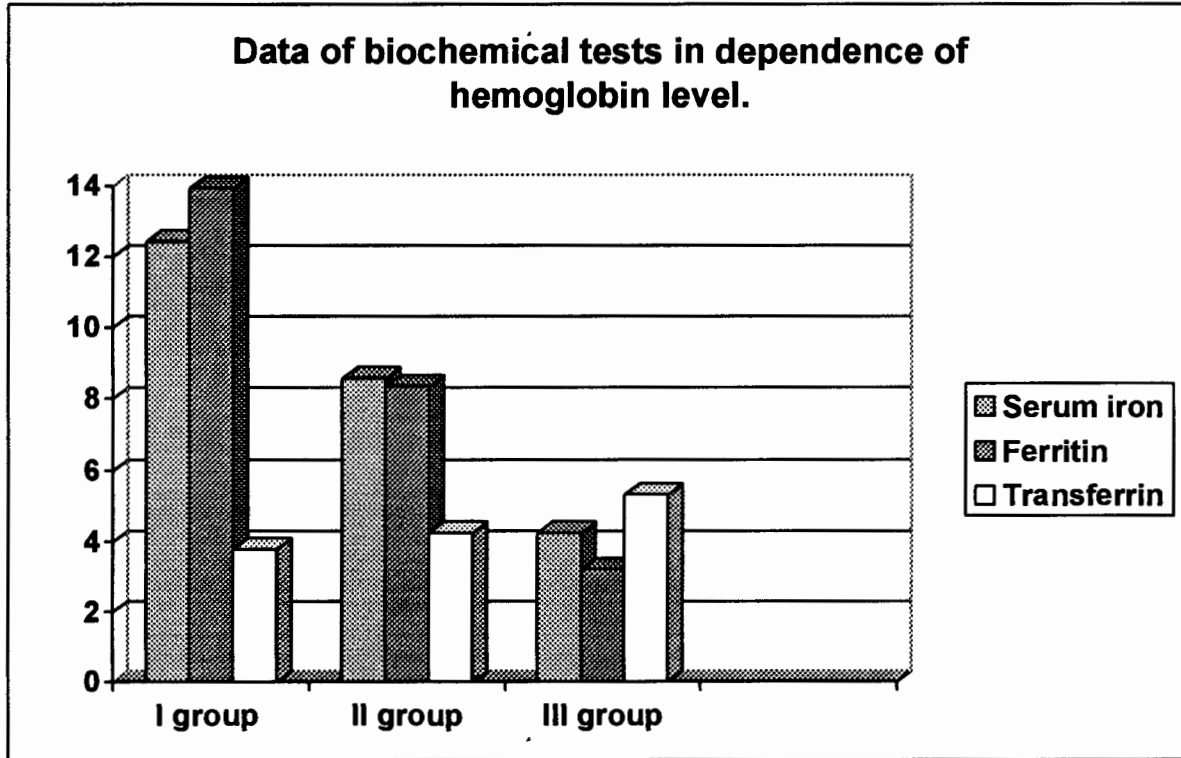
Table 7.

Results of the biochemical indicators in dependence of hemoglobin level

Biochemical indicators	Hemoglobin level in target groups				
	1 group n-49 91-120 gr/l M±m	2 group n-113 70-90 gr/l M±m	P	3 group n-13 40-69 gr/l M±m	P
Serum iron	12,43±0,96	8,57±0,72	<0,001	4,26±1,21	<0,001
Ferritin	13,95±1,20	8,34±0,92	<0,001	3,24±1,40	<0,001
Transferrin	3,80±0,23	4,26±0,20	<0,05	5,34±0,32	<0,05

As it is shown in table, 175 women which were passing biochemical tests were divided into three groups, in dependence of hemoglobin level. In first group were included women with 91-129 gr/l hemoglobin level, in second group – 70-90gr/l., third group – 40-69 gr/l. The indicators of iron serum, ferritin,

transferrin were differ among three groups and correlation was done between these indicators and hemoglobin level. As higher the level of hemoglobin, as higher indicators of the iron serum and ferritin. The level of hemoglobin was less than standard norm among 99% from target group which were in-taking iron pills during 10 months, but the hard severity of anemia is reduced. Biochemical tests had confirmed that women from target group still have anemia.



Conclusion.

Making conclusions of the APC Programme in RKK, we could conclude that APC Programme implementation in Karakalpakstan during 1999-2000 has positive results, it means that hemoglobin level in target groups increased for 15-16 gr/l, reducing anemia severity among women of fertile age and pregnant women. In comparison with 1998 in 2000 in Muynak rayon were registered decreasing of complications during pregnancy and after delivery, decreasing of infant and maternal mortality rate, decreasing of diseases. All these issues could be results of the iron prophylactics.

Attention from the Supreme Council, Ministry of Health of the RKK is increased during 1999-2000: firstly it was discussed on Supreme Council level the issues on anemia and nutrition, decisions were adopted; 2 times a year were discussed APC Programme issues on the meetings of the MoH of the RKK, and relevant decisions were adopted.

There was attention to anemia issues in Mass Media: Wednesday was declared as a day of anemia prevention, in this day on TV and radio were translated programs on anemia issues.

The results received during APC Programme implementation were used by laboratory on anemia issues of the SRI of Hematology and Blood Transfusion for development of the National Programme of Anemia Prevention in the Republic of Uzbekistan. The experience and results, which were received during monitoring, will be prepared as practical recommendations of the MoH of the RUz and could be used for future Monitoring of the National Programme.

Received results will help to forecast that in 2001 in target groups, hemoglobin level will increase for 15-20 gr/l., and number of sick people with light anemia will be only 50-60%, middle severity – 30-40%, difficult severity – no cases, normal hemoglobin level will be among 10-20% from the target area (Annex 6).

Making conclusions we could highlight the following issues which reduced efficiency of the **APC Programme implementation in Karakalpakstan:**

1. Working groups of the MoH of the RKK and working groups from rayons have conducted control and monitoring of the APC Programme not effectively in responsible rayons. Information received on seminars was not fully explained to medical workers on primary level (field doctors, medical nurses, doctor's assistants).
2. Level of awareness of the medical staff on anemia issues is not sufficient, especially among medical nurses and doctor's assistants, and it is reflected on the quality of the conducted explanatory work, motivation of the target groups for in-taking iron pills weekly.
3. Level of awareness of the population and target groups on anemia issues is increased in comparison with 1998, but it is still not enough. It is influencing on reducing motivation for anemia prevention, non-rational nutrition, widely in-taking iron inhibitors.
4. Advocacy work conducted by Mass Media (TV, radio and newspapers) and "Health" Center of the RKK was not so effective, because transmitting period was limited (4-5 minutes), programs were monotony, only one video spot. Public organizations, teachers and authorities were not involved in advocacy work. All explanatory work was conducted only by medical staff.
5. Medical staff do not show their personal example for population (weekly consumption of iron pills, not eating iron inhibitors, rational nutrition if it is possible).
6. Quantity of methodological guidelines for each medical workers of the primary level was not enough. Quantity of booklets and posters was not in sufficient amount, the volume of information was not sufficient.
7. Adverse effects after iron pills among women from target groups were 1-2%, among children 10%. After conducting better explanatory work in target group number of adverse effects could be reduced more.
8. Recommendations of the MoH of the RUz and UNICEF (special packages of iron pills with label of the pills, dozes, time of validity, signature of the doctor) were not observed during distribution of iron pills. Field medical nurses do not conducted enough explanatory work during distribution of iron pills, especially they do not tell them about possible adverse effectes and how to prevent them.

9. 76% from the target group in RKK were in-taking iron inhibitors like black tea with milk and clay "kesek" (also children were in-taking it) – it is also reducing efficiency of the iron prophylactics.
10. 38% of women and girls have chronic metrorrhagea, and 55% with chronic gastroenteric tract – it is also reducing efficiency of the weekly iron in-taking.
11. Insufficient quantity of iron in nutrition is mentioned by 65% of questioned people of target group, many of whom do not know the basics of rational nutrition.
12. Methodological support, control and monitoring of APC Programme in the RKK provided by Scientific-Research Institute of Hematology and Blood Transfusion should be conducted once a quarter along with discussion of the results at the meetings of work group of the Ministry of Health of Uzbekistan.

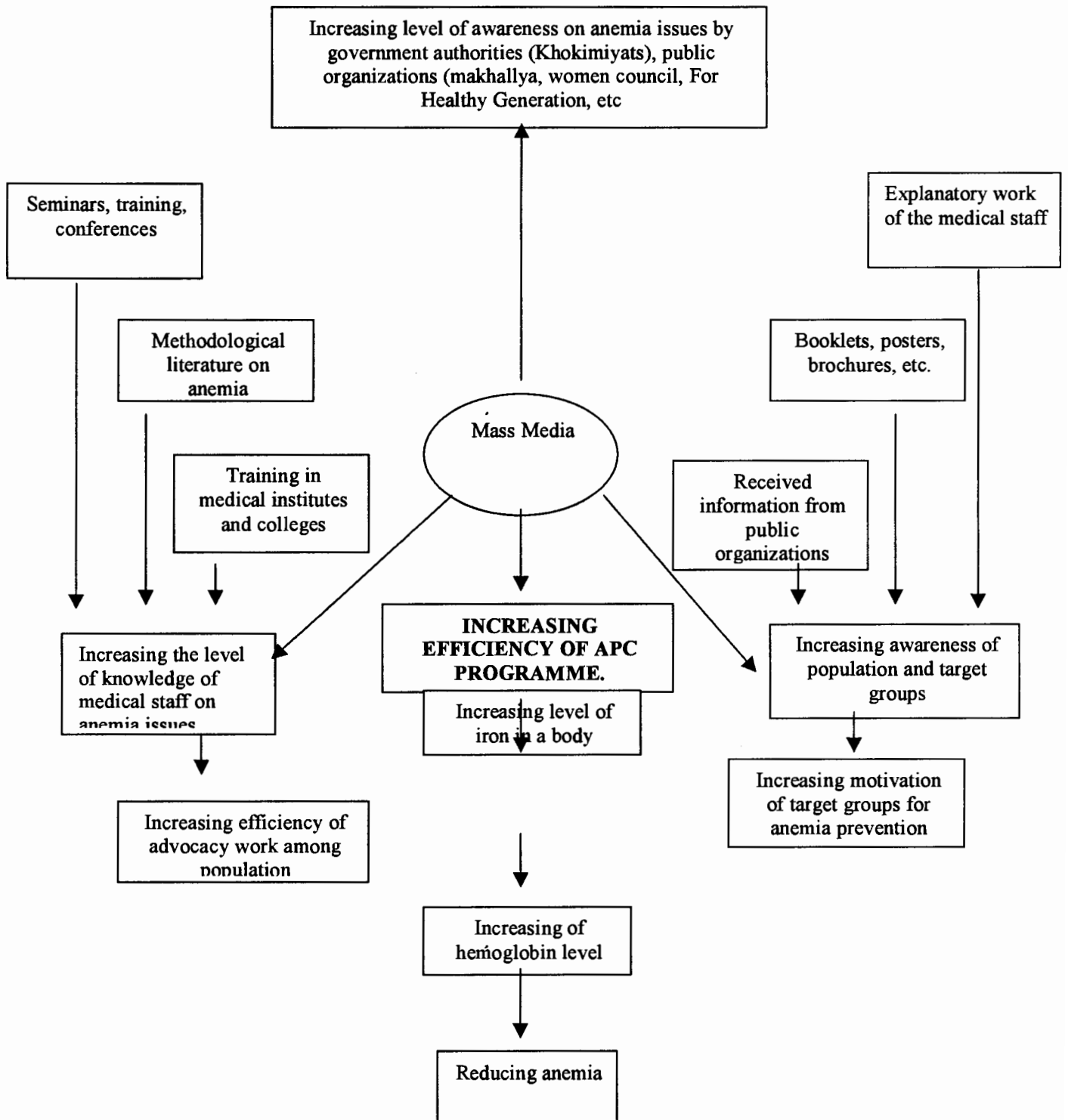
Recommendations.

In order to increase the efficiency of APC implementation in RKK following should be done:

1. Active and systematic enlightenment work with the population through Mass Media (TV, radio, newspapers) on the issues of anemia and rational nutrition.
2. Involving public organizations (women's and makhallya committees, youth organizations, public education departments, etc.) to the enlightenment work.
3. Providing sufficient quantities of various public scientific literature, booklets, and visual materials for the population.
4. Provide sufficient quantities of iron containing medicines to the drug stores, at acceptable price in small packs of 6-12 tablets.
5. Provide the medical workers of TPD leaders, workers of public organizations, public education departments with sufficient quantities of methodological literature on anemia and nutrition issues.
6. Conduct advocacy work among the population on using fortified food.
7. Conduct annual monitoring of hemoglobin in the target groups. Conduct selected monitoring of iron metabolism indicators (serous iron, transferrin, ferritin). This will give a scientific evaluation of APC implementation and make all necessary corrections to the Programme.
8. Illuminate and prevent risk factors of iron deficiency development (chronic metrorrhagia, chronic diseases of gastroenteric tract, helmentic invasion, frequent pregnancies, which decrease the efficiency of iron prophylactic) at the initial levels of the target groups.
9. Conduct expanded educational work among the population on the issues of rational nutrition, promote using iron-rich food, and exclude iron inhibitors
10. Increase the educational level of medical workers and the middle medical staff in particular on the issues of anemia.
11. Work groups of rayons, work groups of Ministry of Health of RKK should prepare reports, according to the developed form, every quarter on the APC implementation.

Below are shown factors influencing on increasing efficiency of the APC Programme implementation in the Republic of Karakalpakstan.

**FACTORS INFLUENCING FOR INCREASING EFFICIENTCY OF THE APC PROGRAMME
IMPLEMENTATION IN THE REPUBLIC OF KARAKALPAKCTAN.**



1. During APC Programme implementation in RKK during XI-1998 - IV-2000 hemoglobin level in target group increased in average for 12-20 gr/l.
2. Frequency of hard anemia severity (hemoglobin level is less than 60 gr/l) reduced two times.
3. Hard and middle anemia severity among pregnant women is reduced twice in 2000 in comparison with 1998.
4. Population and medical staff awareness on anemia issues increased for 20-30% in comparison with 1998.

	Abortion	3	8,57	1	3,45	-	-	4	4,00
	Birth	1	2,86	1	3,45	1	2,78	3	3,00
	Miscarriage	3	8,57	1	3,45	1	2,78	5	5,00
6.	Content of iron in a food								
	Sufficient	22	62,86	5	17,24	9	25,00	36	36,00
	Moderately reduced	9	25,71	23	79,31	27	75,00	59	59,00
	Sharply reduced	4	11,43	1	3,45	-	-	5	5,00
7.	Consumption of iron inhibitors: from which:								
	Black tea with milk,	*	80,00	**	96,55	20	55,55	76	76,00
	Including amount > 1l/per day	28	28,57	9	31,03	6	16,66	25	25,00
	Kesek (clay)	10	31,42	19	65,51	1	2,66	31	31,00
	No inhibitors in a food	11	5,71	1	3,45	11	30,55	14	14,00
8.	Consumption of iron pill weekly:								
	regularly	20	57,14	19	65,52	31	86,51	70	70,00
	Partially	2	5,71	2	6,92	1	2,66	5	5,00
	Do not use	13	37,14	8	27,59	4	11,11	25	25,00

9.	Causes of not using iron pills weekly: Distrust, fear of adverse effects Do not received iron pills from the medical staff After using iron pill noted once : Diarhea Nausea Allergy Noted many times: Vomition Allergy	7 1 1 1 1 1 1	20,00 2,86 2,86 2,86 2,86 2,86 2,86	5 2 - - 1	17,24 6,90 - - 3,45	- - 1 2 1	- - 2,77 55,55 2,77	12 3 2 3 3 1 1	12,00 3,00 2,00 3,00 3,00 1,00 1,00
10.	Do not know the level of hemoglobin as a norm and during anemia	30	85,71	25	86,21	29	80,55	84	84
11.	Causes of anemia not only rational nutrition	33	94,28	28	96,55	21	58,33	82	82
12.	Do not know basis of the rational nutrition	28	80,00	20	68,96	24	66,67	72	72
13.	Do not know consequences of the anemia	26	74,28	24	82,75	26	72,22	76	76

Note: * Simultaneous consumption of black tea with milk and kesek (clay) consumption registered among 4 women.

** Simultaneous consumption of black tea with milk and kesek (clay) consumption registered among 16 women

Evaluation of knowledge of the medical staff of different specialties on anemia issues.

№	Rayons	Number of interviewed medical workers and evaluation of their knowledge (rating in 5 points system)												Total	
		Pediatrician		Therapeutist		Obstetrician – gynecologist		Hematologist		Medical Nurses, Surgeon's assistant		n	Points		
		N	Points M±m	n	Points M±m	N	Points M±m	n	Points M±m	n	Points M±m				
1.	Nukus city	10	3,98± 0,45	8	2,37± 0,38	4	2,80± 0,30	10	4,63± 0,45	10	1,58± 0,28	4	3,07± 0,35	4	3,07± 0,35
2.	Muynak	3	3,22± 0,43	3	2,75± 0,35	1	3,33± 0,42	1	4,77± 0,46	22	2,24± 0,30	3	3,26± 0,38	0	0,38
3.	Beruny	6	3,84± 0,45	6	3,35± 0,40	6	3,14± 0,40	3	4,60± 0,44	7	2,78± 0,35	2	3,54± 0,35	8	0,35
	Total	19	3,68± 0,45	17	2,82± 0,35	11	3,09± 0,38	14	4,67± 0,46	39	2,20± 0,30	1	3,29± 0,40	0	0,40

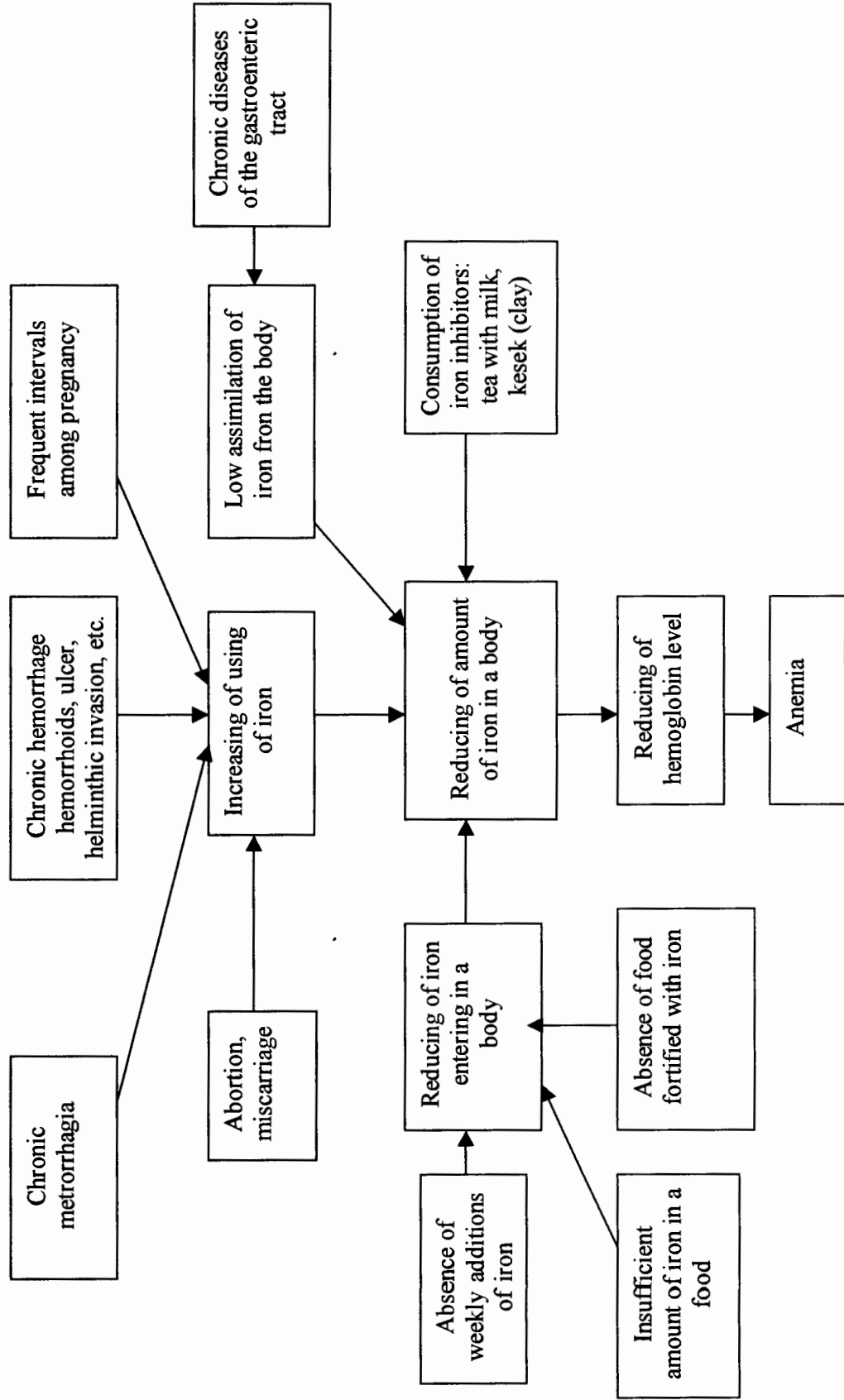
Evaluation of the population awareness on anemia issues.

№№	Asked questions	Received answers	Nukus		Muynak		Beruny		Total	
			n-70	%	n-90	%	n-90	%	n-250	%
1.	What is anemia?	Do not know	17		16		15		48	
			24,28		17,78		16,67		19,2	
2.	Do you think this is disease, is it necessary to treat it?	Do not think as disease	13		16		11		40	
			18,57		17,78		12,22		16,00	
3.	What should we do to prevent anemia?	Do not know	38		68		27		133	
			54,28		75,55		30,00		53,20	
4.	Causes of the anemia (know or not)	Do not know	33		45		24		102	
			47,14		50,00		26,67		40,8	
5.	Nutrition is only cause of the anemia	Do not think that nutrition is main cause of the anemia	68		88		85		241	
			97,14		97,77		94,44		96,4	
6.	Ecology is the main cause of the anemia	Think that ecology is main cause of the anemia	31		56		53		140	
			44,28		62,22		58,89		56,40	

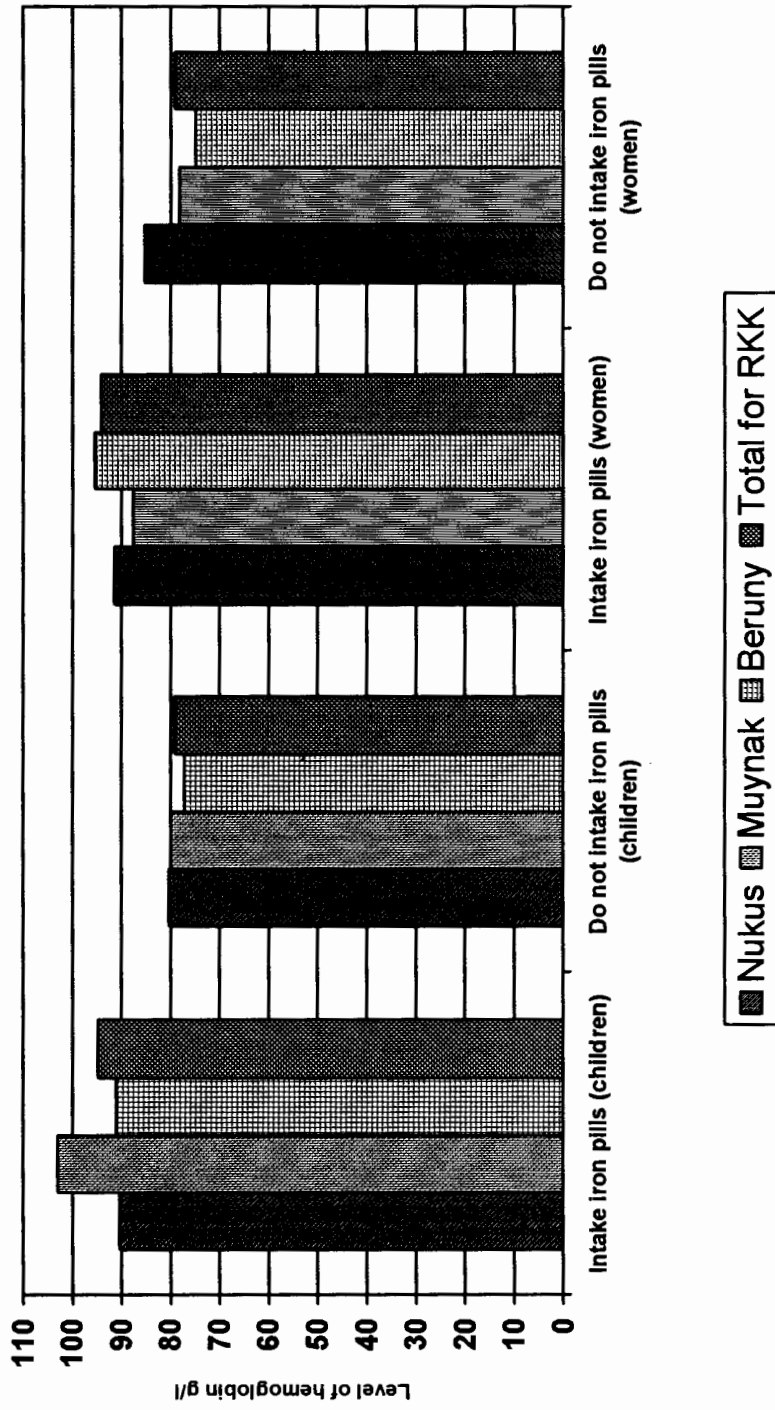
7.	How it is necessary to feed correctly to prevent anemia?	Do not know basis of rational nutrition	38	50	31	119
			54,28	55,55	34,44	47,6
8.	Is sugar useful for anemia treatment?	Yes	27	55	32	114
			38,57	61,11	35,55	45,6
9.	Information on anemia issues was received from:	-from your field doctors;	46	34	71	151
		-from field medical nurses;	65,71	37,78	78,88	60,4
		-from other specialists;	58	56	83	197
		-from obstetrician-gyn...;	82,86	62,22	92,22	78,8
			34	16	20	70
			48,57	17,78	22,22	28,0
			21	35	32	98
			30,00	38,89	35,55	39,2

10.	You received information on anemia issues on:		33	35	61	129
		-Radio;	47,14	38,89	67,78	51,6
		-TV;	67	82	85	234
		-Mass Media;	95,71	91,11	94,44	93,6
		-Other resources	35	35	38	108
			50,00	38,89	42,22	43,2
			4	3	4	11
			5,71	3,33	4,44	4,4
11.	Did you receive booklet-calendar?	Did not receive	9	14	11	34
			12,86	15,55	12,22	13,6

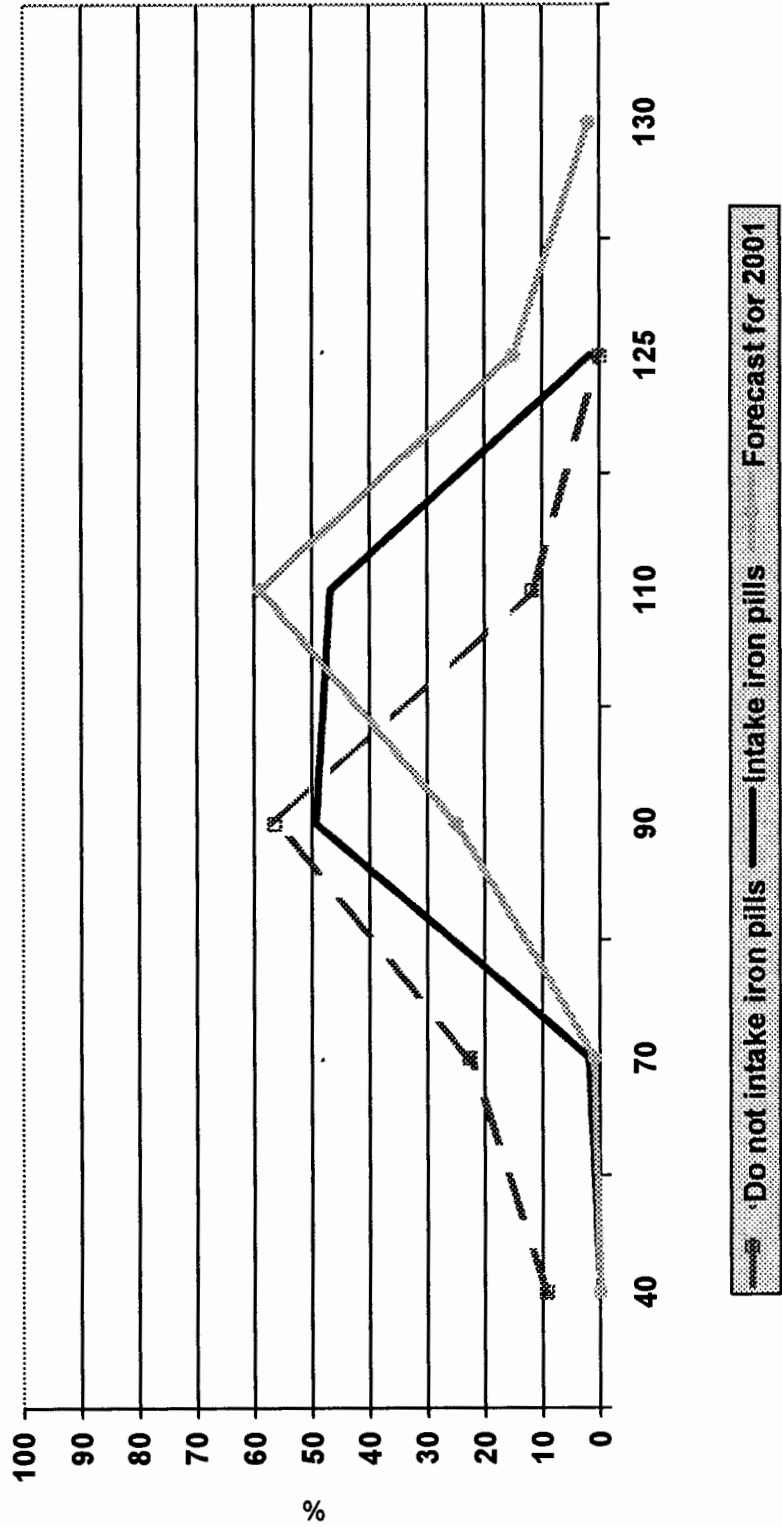
Conceptual model of interrelations between anemia risk factors in RKK.



Average level of hemoglobin in comparison with weekly iron consumption



Dynamic of hemoglobin level during weekly consumption of iron pills



Average level of hemoglobin in target group

