Hospitals Association
of the Kyrgyz Republic

Policy Research Paper # 65

Rational distribution of the sanitary vehicles by regional health organizations of the Kyrgyz Republic and efficiency of their exploitation

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LIST OF ABBREVIATIONS

KR	Kyrgyz Republic
MoH	Ministry of Health of the Kyrgyz Republic
RHIC	Republican Health Information Center
KSMIR&QU	Kyrgyz State Medical Institute of Retraining and Qualification Upgrading
MHI	Mandatory Health Insurance
MHIF	Mandatory Health Insurance Fund
DSES	Department of Sanitary-Epidemiological Surveillance
HO	Health Organization
FMC	Family Medicine Center
FGP	Family Group Practice
SES	Sanitary-Epidemiological Service
OMH	Oblast Merged Hospital
ECU	Emergency Care Unit
ECP	Emergency Care Point
EHC	Emergency Health Care
ECU	Emergency Care Unit
UOHCU	Urgent Outpatient Health Care Unit
TH	Territorial Hospital
RTA	Road Traffic Accident
RD	Regulatory Document
FAP	Feldsher-Midwifery Point
CP	Clinical Protocol
GPC	General Practice Center
ATH	Affiliate of a Territorial Hospital
AFMC	Affiliate of a Family Medicine Center

1. INTRODUCTION

Emergency Health Care plays a particular role in the health care system. Present-day health care delivered to patients and sufferers in full scale and at the earliest is a critical factor for saving their lives.

The Kyrgyz Emergency Health Care Service incorporates 496 stations (units) of emergency and urgent care where about 303,25 doctors and 1120,25 mid-level health personnel are engaged.

Staffing level of emergency health care subdivisions is as follows: doctors - 86,0% and mid-level health personnel - 95,2%. In 2008 emergency care facilities performed 483505 emergency calls, whereas workload per one medical team of general profile was 832,3 and feldsher team - 677,0 (See: Collection of the Republican Health Information Center of the MoH of the KR*, 2009*).

However, despite almost half million number of the performed emergency calls, the emergency health care system had a variety of problems and difficulties in delivering health services to the population of the republic. Not always proper consideration is given to provision of the stations (units) with sanitary transport, its equipment, rational use, timely repairs and supply with adequate volume of fuel and lubricants (GSM). Many emergency care stations and units are placed in poorly adjusted for this purpose buildings, not meeting sanitary-hygienic standards. Established by the Kyrgyz Government Resolution procedures (#222 dated 07.07.2006 “On decommissioning fixed assets”) are not adhered, many health organizations have not solved issues of repairs, supply with spare parts, placement in adjusted garages or under sheds. Sanitary transport is not completely supplied with radio communications. Its equipment with medical supplies is still unsatisfactory.

Ambulances are not equipped with medical equipment and supplies based on the List approved by the Kyrgyz MoH’ Decree (Prikaz) #32 dated January 28, 2004 – “On efforts to improve first and emergency/urgent health care to the population of the Kyrgyz Republic». Virtually everywhere inadequate attention is paid to equipage of emergency teams with facilities to do express-diagnostics, change of worn out and outdated diagnostic, anesthesiology, inspiratory equipment. In addition, ambulances are often exploited for other agendas.

Every year Ministry of Health of the Kyrgyz Republic receives sanitary vehicles from different sources, that are further distributed by health organizations. However, by no means always the received sanitary vehicles are assigned primarily to emergency care stations (units). There are cases when portable equipment is demounted and vehicles are used for economic needs.

This study analyses efficiency of the sanitary vehicles distribution and utilization in health organizations of the Kyrgyz Republic.

2. PURPOSE AND OBJECTIVES OF THE STUDY

Purpose of the study:

To explore rationality of the sanitary vehicles distribution and efficiency of their utilization in PHC and other health organizations delivering health services to the population in areas under the study.

Objectives of the study:

1. Analyze rational distribution of the sanitary vehicles by regional health organizations and sources of their supply as well as efficiency of their use, technical condition, equipment with medical supplies.
2. Assess service areas in regions under the study: by radius, number of population and geographic location.
3. Assess performance by appropriation and efficiency of the sanitary transport use.
4. Assess workforce capacity and infrastructures of emergency care points.
5. Analyze funding of the sanitary transport.
6. Study views of health and other personnel in TH, FMC and FGP as regards to operation of the medical transport.

3. STUDY METHODOLOGY AND INDICATORS

Study methods and indicators

Data collection for the study was done by different in variety of ways accepted in practice of social studies.

1. **Quantitative research** – retrospective analysis of medical documentation.

Accounting-reporting documentation was reviewed. Data relative to referral for hospitalization was sampled. There was also work done with data received from reporting forms of the Emergency Care Service and TH, which reflected performance indicators of the emergency care services and their financial condition.

2. **Qualitative research** – interview with health and other personnel of FMC, FGP where sanitary vehicles are available as well as territorial hospitals.

Key questions included elucidation of the health and other EC personnel' views about rationality of distribution and exploitation of the sanitary vehicles, access of the population to the emergency care service, issues related to organization of this service. (15 managers of the PHC, 6 hospital managers, 20 middle-level personnel, 15 drivers and 3 fitters were interviewed).

3. **Method of direct observation.** Number of available medical vehicles, technical condition and technical characteristics of available transport facilities, material-technical resources of EC (buildings, premises, garages, boxes, medical and technical equipment).

Studied performance indicators of emergency and urgent care units

1. Number of performed emergency calls per 1000 people of the serviced population.
2. Number of performed emergency calls by emergency care points (ECP) per day.
3. Number of acute self-referred and hospitalized patients by the emergency care service to territorial hospitals
4. Number of performed emergency calls on monitored diseases per people of the serviced population.
5. Proportion of emergency calls performed beyond 15 minutes.
6. Number of outpatient visits per 1000 population.
7. Workload per team per year.

Selection criteria for the areas to study

Criteria to select emergency care points were developed based on the literature review and working group discussions (see Table 1).

During discussions it was decided to select based on the following criteria:

1. regionality (north, south);
2. number of serviced population;
3. geographical location (highness above the sea) considering remoteness from raion centers;
4. size of financing.

The selected for the study health organizations are represented in Table 1 (number of population).

Table 1

Regions under study

#	Oblast	Raion	Number of population	North	South	Mountainous area	Flat area
1	Issyk-Kul	Tyup	48.5	+	-	+	-
2	Osh	Kara-Sui	340.4	-	+	+	+
3	Chui	Sokuluk	134.9	+	-	+	+
4	Jalal-Abad	Suzak	173,6	-	+	+	+
5	Talas	Bakai-Ata	43.5	+	-	-	+
6	Jalal-Abad	Suzak, Oktyabr area	59,1	-	+	+	-

**Collection of the Republican Health Information Center, MoH of the KR, 2009.*

4. BRIEF CHARACTERISTICS OF THE STUDIED AREAS

Suzak raion

Suzak raion is located to the north-west from Jalal-Abad town in the distance of 15 km between Bazar-Korgon and Toguz-Torouz raions.

Principal population settings are Suzak village and Kok-Jangak town in the distance of 30 km from Jalal-Abad.

Territorial Hospital and FMC are located in Suzak village.

Territory of Suzak raion is conventionally divided by 3 areas: Suzak, Oktyabr (in the distance of 17 km from TH) and Kok-Jangak (in the distance of 45 km from TH).

- Suzak TH and Suzak raion FMC serve 173625 people (Suzak area);
- ATH Octyabrskoye and FMC of Octyabrskoye village serve population of 59175 people. (Oktyabr area);
- GPC in Kok-Jangak town serve population of 10124 people. (Kok-Jangak area).

Suzak FMC has:

- 20 FGP (plus 1 FGP has sanitary vehicle);
- 27 FAPs;
- 1 emergency care unit (ECU);
- 1 ECP in Bek-Abad village.

Oktyabrskoye village of Suzak raion

Oktyabrskoye village is located in Suzak raion in the distance of 12 km from Suzak village. TH and FMC are located in Oktyabrskoye village.

- Oktyabrskoye TH (71 beds) and Oktyabrskoye FMC serve population of 59175 people. (Oktyabr area);
- ATH named by Batyrov (15 beds)

Oktyabr FMC consists of:
- 7 FGPs (including 1 FGP with medical transport);
- 20 FAPs;
- 2 emergency care points in: Oktyabrskoye vil., Jerghetal vil., included into FGP# 24.

Kara-Sui raion

Kara-Sui raion is situated in the north-west of Osh oblast in the distance of 26 km from Osh city, in the center between Aravan, Nookat, Alai and Uzghen raions. In the north-west it borders with Republic of Uzbekistan.

Raion center is Kara-Suu town with 20930 population.

91 villages are located in Kara-Sui raion. The remotest village is Kojokelen, which is situated in the distance of 150 km from Kara-Suu town, the nearest is Telman village in the distance of 3 km from the raion center.

Kara-Sui FMC is in possession of:
- AFMC (Kashgar Kyshtak vil.)
- AFMC (Kurmanjan Datka vil.)
- 25 FGPs (including 9 FGPs with available medical transport)
- 70 FAPs
- 4 ECPs

Tyup raion

Tyup raion is located in the north-eastern coast of Issyk-Kul lake, between Issyk-Kul and Ak-Sui raions. Raion center of Tyup raion is Tyup village where 10846 people reside. Raion center is in the distance of 35 km from oblast center (Karakol town). There are 35 villages in Tyup raion. The remotest village is Farm 4, in the distance of 96 km from Tyup village and the nearest is Birlik in the distance of 7 km from raion center.

Tyup raion FMC consists of:
- 9 FGPs (including 1 FGP – legal independent entity, and 2 FGPs with available medical transport);
- 23 FAPs;
- 1 ECP.

Bakai-Ata raion

Bakai-Ata raion is situated in the distance of 45 km from oblast center (Talas town). Raion center of Bakai-Ata raion is Bakai-Ata village where 7157 people reside. There are 22 villages in Bakai-Ata raion. The remotest village is May which is in the distance of 30 km from Bakai-Ata and the nearest is Namaybek village located in the distance of 5 km from raion center.

Bakai-Ata raion FMC has:
- 8 FGPs;
- 1 FGP with three beds in Booterek village;
- 9 FAPs;
- 3 ECPs.

Sokuluk raion

Sokuluk raion is situated westward from Bishkek in the distance of 45 km. Raion Center of Sokuluk raion is Sokuluk village. There are 44 villages in Sokuluk raion. The remotest is Kamyshanovka village located in the distance of 102 km from Sokuluk, the

nearest population settlement is Shopokov town located in the distance of 6 km from raion center.

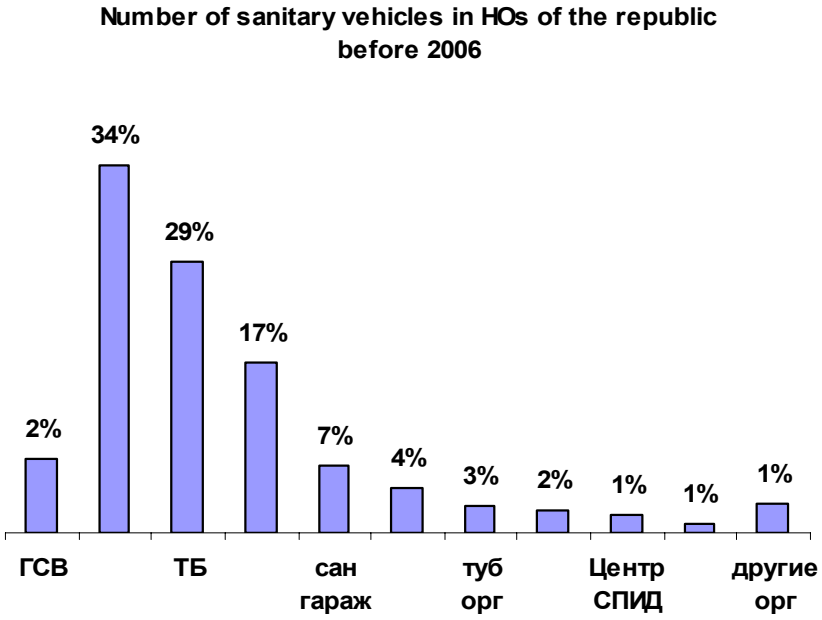
Sokuluk raion FMC has:
- 13 FGPs (including 1 legal independent FGP);
- 29 FAPs;
- 3 emergency care points (ECP);
- 1 GPC in Jany-Jer village.

5. FINDINGS OF THE STUDY

5.1. Distribution of medical transport received in the period before 2006, by regional health organizations and its technical characteristics

By late 2006 there were 1009 vehicles in health organizations of the republic. Distribution of vehicles by health organizations is shown in Figure 1.

Figure 1.



Main part of the sanitary vehicles are in FMC (34%), TH (29%) and DSES (17%). Percentage of available vehicles, their technical condition and types of transport in health organizations are shown in Table 2.

Table 2.

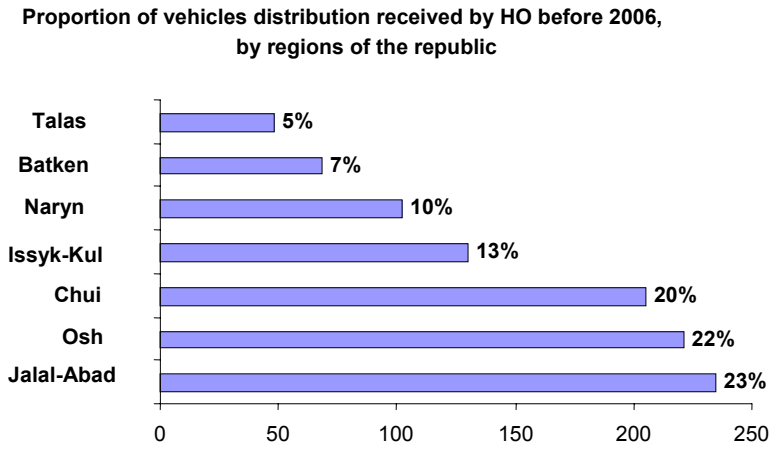
Technical condition of transport in FMC, TH and DSES which was received before 2006

Health organization	Number of cars out of all transport available in a health organization	Out of them cars of UAZ brand name	In operation
FMC	34%	79%	60%
TH	29%	50%	55%
DSES	17%	31%	54%

As it is seen from Table 2, main part of the medical transport received by HOs before 2006 is of UAZ brand mark. Currently, only half of them are in operation.

Figure 2 shows proportion of the medical transport distribution by regional health organizations in the period before 2006 year.

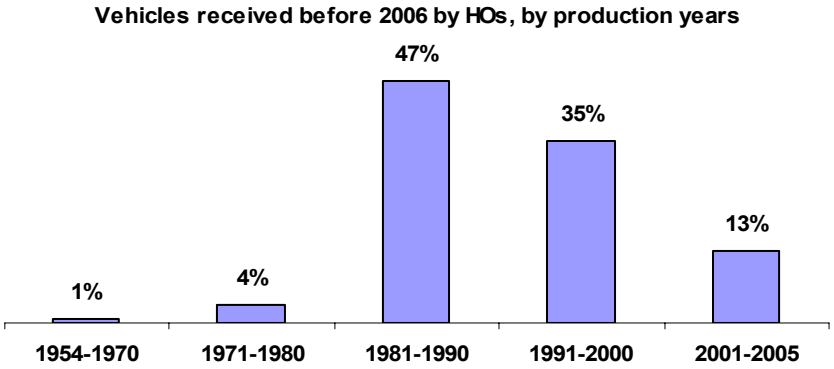
Figure 2.



Generally, the transport is concentrated in such regions like Jalal-Abad (23%), Osh (22%) and Chui (20%) oblasts.

As it is known, working lifespan of transportation means, particularly in contexts of the varied mountainous area, poor roads, extreme weather conditions is quite limited. Figure 3 shows production years of the transport received by health organizations in the period before 2006.

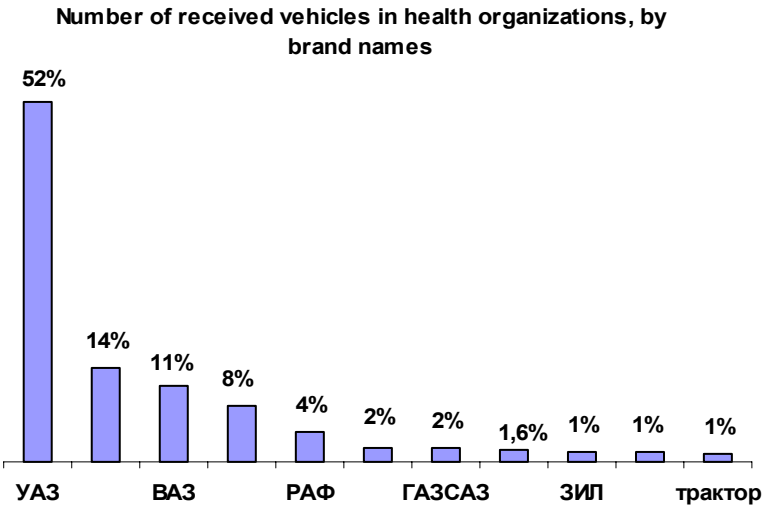
Figure 3.



As it is seen from Figure 3, half of the available vehicles are of 1981-2000 production year, however, it should be mentioned that there are also vehicles of 1950 - 1970 production year. From the interview of the EC staff the following undivided opinion was revealed. For the semicentennial working lifespan of vehicles produced in 1950 - 1970 years (40-60 years) the complete technical wear and tear of all component parts happened that makes their further exploitation in rural areas with remote distances and billowy mountainous area impossible. These vehicles are life-threatening for EC staff and patients and require replacement and urgent decommissioning not to burden balance of ECS.

Figure 4 illustrates vehicles received in the period before 2006, by make of vehicles.

Figure 4.



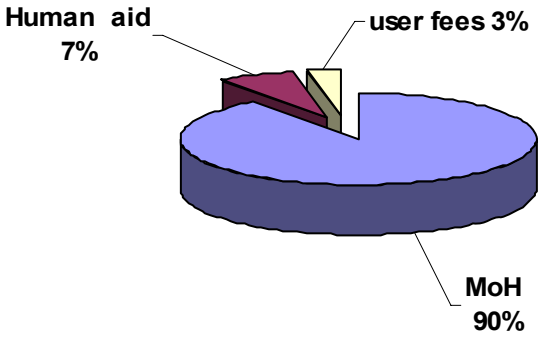
52% of all vehicles in health organizations are of UAZ vehicle brand, 14% - of GAZ vehicle brand and 11% – of VAZ vehicle brand.

The study found out that in Glossary of the Kyrgyz MoH Decree #32 ("On efforts to improve urgent and emergency health care delivered to population of the Kyrgyz Republic) dated January 28, 2004 there is no definition for medical (sanitary) transport. Specifically, all transport of health organizations irrespectively to trademark of vehicles and performed functions is called «sanitary».

Sources of receiving vehicles by HO before 2006 are shown in Figure 5.

Figure 5.

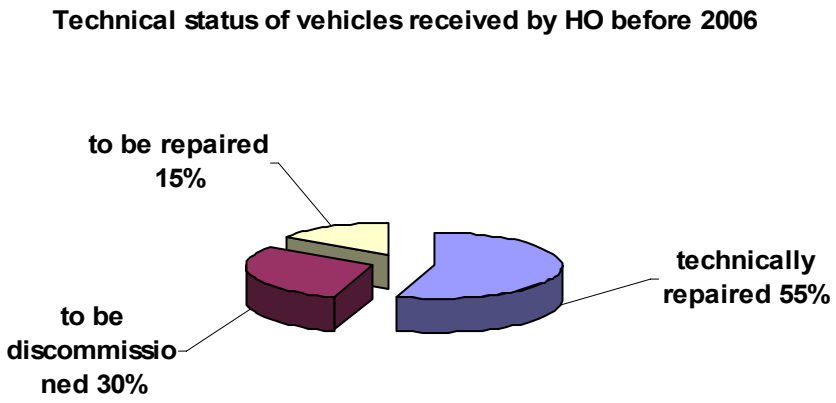
Sources of receiving vehicles by HO before 2006



90% of sanitary vehicles were received from the Ministry of Health, 7% – as humanitarian aid of such organizations like: World Bank, German Reconstruction and Development Bank (KfW), Presidential Property Management Department of the Kyrgyz Republic, Joint-Stock Company «KyrgyzNeftegas», Netherlands and Swiss Red Cross, ADB, JICA and 3% – owing to paid services.

Figure 6 shows technical condition of HO's transport received before 2006.

Figure 6.



As it is seen from Figure 6, half of the sanitary vehicles (55%) are in operation, third part (30%) requires decommissioning, occupying place in garages and burdening balance of health organizations, and 15% of vehicles should be repaired.

Opinion of TH and FMC managers

«It is necessary to repair roads, as it is one of the causes for frequent crash of the vehicles».

«Recently, transport rapidly goes down, basically the following parts of vehicles go down: running gear, engine, accumulator unit, starting device, back axle. Tire wear comes off. The reason for breakage are poor roads, furthermore we are supplied with spare parts produced in China, that are quickly go down».

«At the end of the exploitation period of the sanitary transport its opportune replacement is needed».

Opinion of mid-level personnel of THs

«Sanitary transport of the hospital is generally out of commission because requires repairs or decommissioning».

5.2. Distribution of the medical transport received in the period since 2006 to 2009 by regional health organizations and its technical characteristics

In order to improve material and technical equipage of the ECS in the period since 2006 to 2009, the Kyrgyz Ministry of Health obtained 167 vehicles for health organizations from different sources (see Table 3).

Table 3.

Medical vehicles received by health organizations since 2006 to 2009.

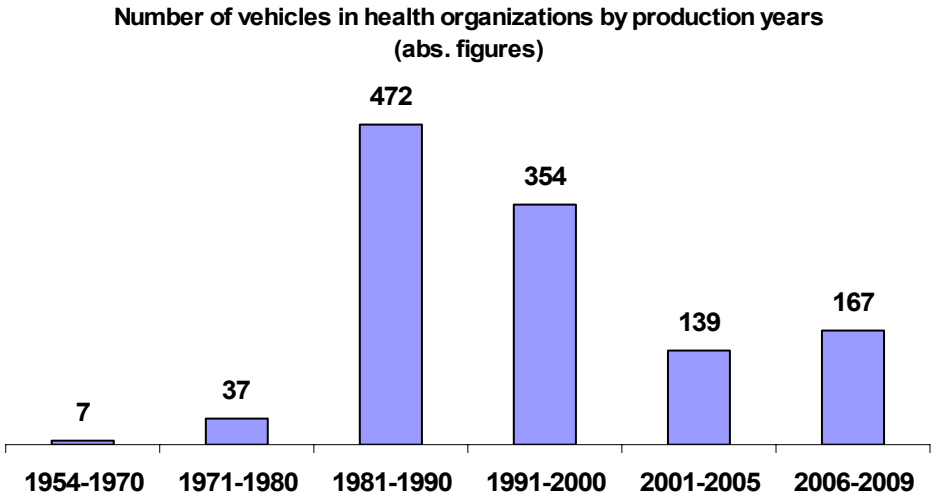
Regions	Total before 2006	2006	2007	2008	2009	Total	%
Batken	68	8	7	3		18	11%
Jalal-Abad	235	11	14	7	2	34	20%
Issyk-Kul	130	8	6	3		17	10%
Naryn	102	5	4	1		10	6%

Osh	221	12	11	5	2	30	18%
Talas	48	5	3		1	9	5%
Chui incl.	205	9	8	4		21	13%
Rep. facilities	-	5	13	2		20	12%
Bishkek	-	2	6			8	5%
Total in abs figures	1009	65	72	25	5	167	100%
Total in %		**39%**	**43%**	**15%**	**3%**	**100%**	

As it is seen from Table 3, generally vehicles for health organizations were obtained in 2006 and 2007. Considering high population density in Jalal-Abad, Osh and Chui oblasts, third part of the received vehicles were delivered to these regions.

Number of vehicles available in health organizations by production years is shown in Figure 7.

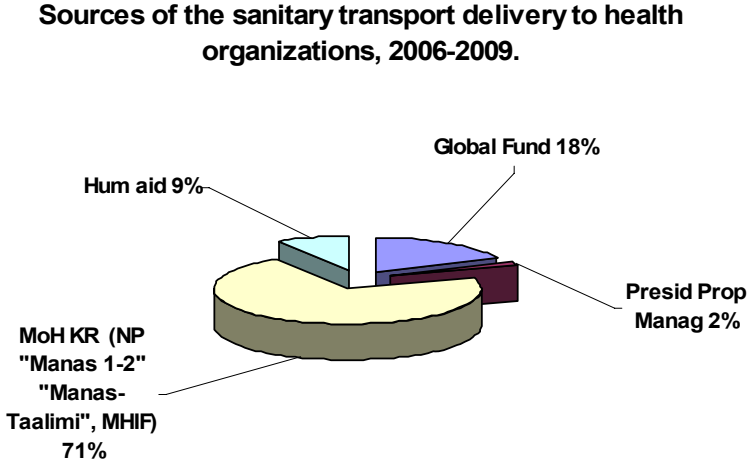
Figure 7.



As it is seen from Figure 7, basically vehicles of 1981-1990 production years are on the books of health organizations.

Sources of obtaining medical vehicles by HO since 2006 to 2009 are shown in Figure 8.

Figure 8.



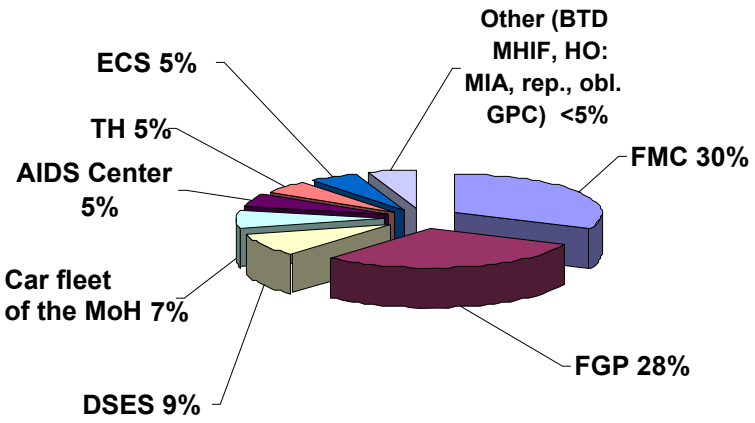
Vehicles received by HO in 2006-2009 were obtained from different sources: using funds of the MHIF, National Health Reform Programs “Manas 1”, “Manas 2”», “Manas Taalimi”, as well as such organizations like: World Bank, German Reconstruction and Development Bank (KfW), Global Fund to fight against AIDS, tuberculosis and malaria, Presidential Property Management Department of the Kyrgyz Republic and oth.

In 2009 totally 5 vehicles were obtained for HOs, these transport facilities were procured using funds of the “Health Care and Social Protection SWAp” Project.

Figure 9 shows distribution of vehicles received in 2006-2009 by health organizations (HO).

Figure 9.

Distribution of sanitary vehicles received by regional health organizations in 2006-2009



As it is seen from Figure 9, the received vehicles were basically distributed by FMC, FGP and DSES.

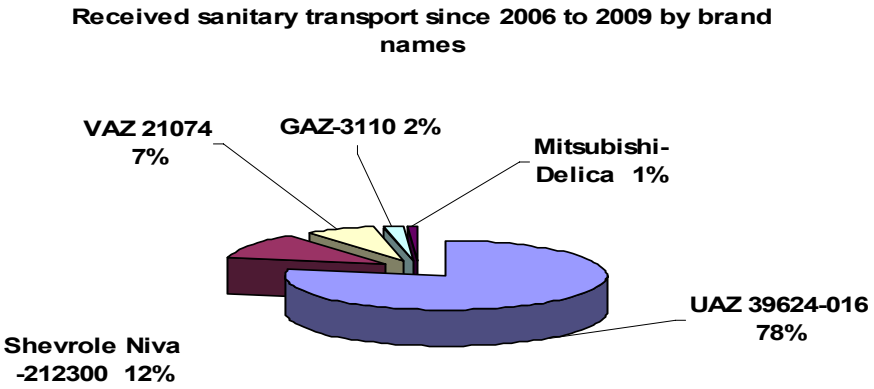
TH and emergency care stations received 5% each out of total number of the received transport facilities. In the process of this study it has been revealed that in the Kyrgyz Republic there is no regulatory framework with clearly set criteria to distribute medical vehicles, the transport facilities are distributed at the discretion of the MoH.

Opinion of FMC and TH managers about demand for sanitary vehicles

«Sanitary vehicles should be distributed based on the following criteria: radius of service, number of enrolled population, remoteness from ECP, incidence, terrain relief, roads and communications (bridges and oth.)».

Types and brands of vehicles received by regional health organizations in 2006-2009 are shown in Figure 10.

Figure 10.



Over three fourths (78%) of the received vehicles are of UAZ brand, which, as it is known consume large volume of fuel and lubricants.

Opinion of FMC and TH managers with regard to demand for medical vehicles

«HOs need medical transport with less consumption of fuel and lubricants».

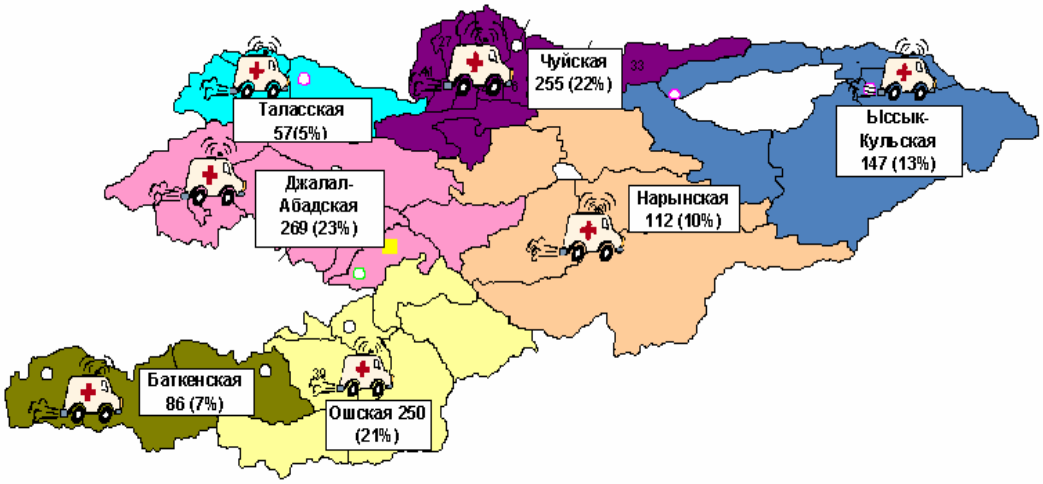
5.3. Number of medical vehicles in regional health facilities

Based on the findings of the study, by December 2009, totally 1176 medical transport units (totally in the republic) are in the regional health organizations (see Figure 1).

Figure 1.

Number of vehicles in health organizations by regions of the republic by December 1, 2009

Data are collected during the present study



As it is seen from Figure 1, main part of the transport facilities in health organizations are Jalal-Abad (23%), Chui (22%) and Osh (21%) oblasts, the least number is in Naryn (10%), Batken (7%) and Talas (5%) oblasts.

5.4. Efficiency of the medical transport distribution by health organizations in the regions under study

In 2006-2009, the studied regions received 14 units of medical vehicles. Their distribution is shown in Table 4.

Table 4.

Distribution of sanitary vehicles by health organizations in the studied regions (abs. figures)

Region	Vehicles in HO before 2006				**Totally by the end of 2006**	Distributed vehicles in HO since 2006 to 2009				Totally received	**Totally by the end of 2009**
	SES	TH	FMC	FGP		SES	TH	FMC	FGP		
Kara-Sui	5	6	3	10	**24**	0	0	1	3	4	**28**
Suzak	3	6	2	2	**13**	0	0	1	1	2	**15**
Oktyabr	2	4	1	1	**8**	0	0	1	1	2	**10**
Bakai-Ata	1	1	2	1	**5**	0	0	0	1	1	**6**
Sokuluk	6	5	7	4	**22**	0	0	2	1	3	**25**
Tyup	2	1	2	1	**6**	0	0	1	1	2	**8**
Total	**19**	**23**	**17**	**19**	**78**	**0**	**0**	**6**	**8**	**14**	**92**

Out of 14 transport units distributed by these regions, none of the medical vehicles was obtained by TH, SES and other HO. All vehicles were distributed by FMC and FGP. It should be mentioned that in order to deliver emergency care to the population, TH and SES badly need renovation of the car fleet as vehicles of 1970-1990 production years are on their books, half of them are in no operation and require decommissioning.

Out of all THs in the studied regions, only THs of Tyup, Suzak and Kara-Sui raions received medical vehicles of 2003-2004 production years. These medical vehicles were received in the line of German Development Bank (KfW) and are used exclusively for transportation of maternity patients and service of maternity departments in THs.

Opinion of TH manager

«For the recent 15 years our hospital did not receive medical vehicles. In order to drive a patient for consultation, you have to beg transport from management of the FMC or managers of other organizations».

Distribution of medical vehicles received by HO of Suzak raion is shown in Table 5.

Table 5.

Distribution of medical vehicles in Suzak raion

Health organization	**Enrolled population**	**Distance from raion center**	**Available EC post**	**Available vehicles before 2006**	**Received in 2006-2009.**
ECP Suzak vil., FMC		-	+	2 (2 requ. decommissioning)	1
FGP №1-2-4-5 Suzak vil.	20241	-	-	-	
FGP №3, Suzak vil.	5413	3 km	-	-	

FGP №6, Kumush-Azis vil.	3156	13 km	-	-	
FGP №7, Kirov vill.	6109	17 km	-	-	
FGP №8, Masadan vil.	5073	5 km	-	-	1
FGP № 9, Ak-Bashat vil.	4767	15 km	-	1(requ. repairs)	
FGP №10-11, Boston vil.	12956	20 km	-	-	
FGP №12, Janghyr-Tash vil	12666	28 km	-	1(requ. decommissioning)	
FGP № 13, Jiide vil.	5938	3 km	-	-	
FGP № 14, Jany-Jer vil.	4156	5 km	-	-	
FGP №15 and 16, Barpy vil.	13841	20 km	-	-	
FGP № 17, Komsomol vil.	7512	7 km	-	-	
FGP № 18, Taldy-Bulak vil.	8323	12 km	-	-	
FGP № 19, Tash-Bulak vil.	7258	13 km	-	-	
ECP in FGP, Bek-Abad vil.	11981	10 km	+	1	
Total				5	2

The transport facilities received by Suzak raion, were intentionally sent to FGP in Masadan village. Distance between this FGP and raion center is 5 km only. Herewith, an intensive need in medical vehicles was not met:

- FGP № 10-11 in Boston village, which is located in 20 km to raion center and serves 12956 people and
- FGP №15-16 in Barpy village located in 20 km from raion center with population 13841 people.

Opinion of FMC and TH managers with regard to need in medical vehicles

«Medical vehicles are received with indication from above of the specific population settlement for which they are assigned, and we, managers do not take part in distribution. Frequently, medical vehicles are got in the population settlement which is in the boundaries of raion center, city and are not received by remote villages which actually need sanitary transport».

Distribution of medical vehicles in Oktyabrskaya area of Suzak raion is shown in Table 6.

Table 6.

Distribution of medical vehicles in Oktyabrskaya area of Suzak raion

Health organization	Enrolled population	Distance from raion center	Available ECP	Available vehicle before 2006	Received in 2006-2009.
ECP in FMC, Oktyabrskoye vil.	22 356	3	+		2
ECP in Jergetal vil	11139	15	+	1	
FGP in Kara-Mart vil.	12602	64	+		1
FGP in Leninskoye vil.	2201	3	-		
FGP in Kara-Cholok vil.	3768	25	-		
FGP in Kadu vil.	2842	60	-		
Total				1	3

In Oktyabrskaya area of Suzak raion there is no need in additional medical transport of primary level.

Distribution of medical vehicles in Sokuluk raion is shown in Table 7.

Table 7.

Distribution of medical vehicles in Sokuluk raion

Health organization	Enrolled population	Distance to raion center	Available ECP	Available vehicle before 2006	Received in 2006-2009.
ECP in FMC, Sokuluk vil.	50224		+	7(3 requ. repairs)	2
FGP in Sokuluk vil.	25739				
FGP in Tash-Bulak vil.	3151	25km			
FGP in Asylbash vil.	3551	28 km		1(requ. repairs)	
FGP in Shopokovo vil.	17809	5 km			
FGP in Chat-Kul vil.	3721	14 km			
ECP in FGP, Voenno-Antonovka vil.	9105	20 km	+	1	
FGP in Novo-Pavlovka vil.	15616	23 km			
FGP in Frunze vil.	9105	34 km		1(requ. repairs)	
FGP in Kyzyl-Tuu vil.	4616	45 km			
FGP in Manas vil.	6749	32 km			
FGP in Pervomayskoye vil.	2784	12 km			
ECP in legal FGP, Kuntuu vil.	5892	50 km	+	1	1
Total				11	3

As it is seen from Table 7, half of medical vehicles of Sokuluk raion are in FMC.

FGP in Kuntuu village (population is 5 892 people) received additional medical vehicle, however, on its books there was already one vehicle requiring repairs. Herewith, the present study found out much more need in medical vehicles in FGP of Novo-Pavlovka village (population is 15616 people with 23 km remoteness from raion center), FGP of Manas village (distance from raion center, population settlement is situated on the route). These population settlements do not have any transport facility.

Distribution of medical vehicles in Tyup raion is shown in Table 8.

Table 8.

Distribution of medical vehicles in Tyup raion

Health organization	Enrolled population	Distance to raion center	Available ECP	Available vehicle before 2006	Received in 2006-2009.
ECP in FMC, Tyup village	14200		+	1	1
FGP in Taldy-Suu village	9532	20	-	1	
FGP in Santash village	6744	30	-		1
FGP in Michailovka village	3700	25	-		
FGP in Mayak village	7918	30	-		

FGP in Aral village	3266	30	-		
FGP in Tasma village	3052	34	-		
Total				2	2

As it is seen from Table 8, there is no demand for medical vehicles of primary level in Tyup raion.

Distribution of sanitary vehicles in Bakai-Ata raion is shown in Table 9.

Table 9.

Distribution of medical vehicles in Bakai-Ata raion

Health organization	**Enrolled population**	**Distance to raion center**	**Available ECP**	**Available vehicle before 2006**	**Received in 2006-2009**
ECP in FMC, Bakai-Ata village	17996		+	4	
ECP in FGP, Booterek village	9166	18	+	1	
ECP in FGP, Kyzyl-Oktyabr village	6563	8	+		1
FGP in Kenaral village	3008	32			
FGP in Ozgurush village	4670	25			
FGP in Akdobo village	5989	10			
FGP in Minbulak village	2588	10			
FGP in Kyrgyzstan village	4134	25			
FGP in Yntymak village	2204	12			
Total				5	1

As it is seen from Table 9, there is no need in medical vehicles of primary level in Bakai-Ata raion.

Distribution of sanitary vehicles in Kara-Sui raion is shown in Table 10.

Table 10.

Distribution of medical vehicles in Kara-Sui raion

Health organization	**Enrolled population**	**Distance to raion center**	**Available ECP**	**Available vehicle before 2006**	**Received in 2006-2009**
ECP in FMC, Kara-Suu town	46213		+	3 (1 requ. decommissioning)	1
FGP in Bash-Bulak village	10951	38 km		1	
FGP in Jany-Aryk village	19822	24 km	+	1	
FGP in Joosh village	24380	11 km		1	
FGP in Jylkeldi village	7626	6 km			
FGP in Ishkaban village	3641	27 km			

FGP in Kara-Soghot village	3500	67 km		1(requ. decommissioning)	1
FGP in Kara-Suu town	20930	800 m			
ECP in AFMC, Kashgar-Kyshtak	23093	9 km	+	1	
ECP in AFMC, in Kurmanjan Datka village	17866	21 km	+		1
FGP in Kyzyl-Kyshtak village	12965	28 km			
FGP in Kyzyl-Suu village	4685	55 km		1	
FGP in Kyshaban village	3714	25 km			
FGP in Mady village	8708	24 km			
FGP in Monok village	5241	18 km			
ECP in Nariman village	35790	13 km		1(requ. decommissioning)	
FGP in Otuz-Adyr village	15546	25 km			
FGP in Furkat village	15966	27 km			
FGP in Papan village	11820	110 km		1	
FGP in Savai village	7530	15 km			
FGP in Sarai village	23123	1 km		1	
FGP in Sary-Kolot village	5098	18 km			
FGP in Tashirova village	13363	5 km			
FGP in Uchar village	12363	32 km			
FGP in Shark village	18668	29 km			1
FGP in Jany-Turmush village	9319	27 km			
FGP in Kojo-Kelen village	1558	150 km		1	
Total				13	4

Totally, there are 14 medical transport units in Kara-Sui raion, out of them 4 are in FMC. The present study found out that despite the fact that in 2006-2009 Kara-Sui raion received 4 transport units, however, need in medical transport is still not met. At least, 5 vehicles are needed:

- FGP in Kyzyl-Kyshtak: population is 12965 people, distance is 28 km to raion center;
- FGP in Furkat village: population is 15966 people, distance is 27 km;
- FGP in Nariman village: population is 35790 people, distance is 13 km;
- FGP in Uchar village: population is 12363 people, distance is 32 km;
- FGP in Otuz-Adyr village: population is 15546 people, distance is 23 km.

Opinion of FMC managers

«It is necessary to develop regulatory document regulating distribution and operation of ambulances in FGP».

5.5. Efficiency of using medical vehicles in health organizations of the studied regions

5.5.1. ECP Service

Services of emergency health care are in 15 population settlements (Table 11).

Table 11.

ECPs and FGPs with sanitary vehicles in the studied regions

Oblast	Raions	HO of primary level with available sanitary transport	Enrolled population	Covered population by EC	% of serviced population by EC Service	Geographical characteristics	Radius of service
Osh	Kara-Sui	**Total population in raion**	**340,4**	**225 744**	**66%**		
		Total FGP in raion - 25					
		ECP in Kara-Suu town	46213	46213	100%	flat	70 km
		ECP in Kumanjan Datka	20010	19216	96%	flat	45 km
		ECP in Nariman village	85790	35850	42%	flat	80 km
		ECP in Kashgar-Kyshtak vil	28000	24682	88%	flat	70 km
		FGP in Sarai vil	23123	20122	87%	flat	15 km
		FGP in Papan vil	10810	8522	79%	mountain	13 km
		FGP in Jany-Aryk vil	19822	15222	77%	mountain	11 km
		FGP in Bash-Bulak vil	10951	8140	74%	flat	29 km
		FGP in Joosh vil	24380	18333	75%	flat	13 km
		FGP in Kyzyl-Suu vil	13111	11500	88%	mountain	7 km
		FGP in Kara-Soghot vil	3500	3500	100%	mountain	9 km
		FGP in Kojo-Kelen vil	1800	1233	69%	mountain	5 km
		FGP in Shark vil	18668	13211	71%	flat	5 km
Jalal-Abad	Suzak	**Total population in raion**	**210,5**	**149131**	**63%**		
		Total FGPs in raion -20					
		ECP in Suzak vil	132144	132144	100%	flat	15 km
		FGP in Masadan vil	5255	5255	100%	flat	3 km
		FGP in Bek-Abad vil	25200	11732	47%	flat	8 km
	skoye vil	**Total population in raion**	**61084**	**39307**	**64%**		

		Total FGPs in raion-7					
		ECP in Oktyabrskoye vil	22 356	21637	97%	flat	20 km
		ECP in Jergetal vil	11139	11139	100%	mountain	10 km
		FGP in Kara-Mart vil.	12602	6531	52%	mountain	50 km
Issyk-Kul	**Tyup**	**Total population in raion**	**59**	**30476**	**52%**		
		Total FGPs in raion-9					
		ECP in Tyup vil.	14200	7400	52%	mountain	10 km
		FGP in Taldy-Suu vil	9532	5155	54%	mountain	25 km
		FGP in Santash vil.	6744	3451	51%	mountain	10 km
Chui	**Sokuluk**	**Total population in raion**	**134,9**	**99836**	**74%**		
		Total FGPs in raion -11					
		ECP in Sokuluk vil	50224	50224	100%	flat	50 km
		ECP in Voenn-Antonovka vil.	27582	20599	75%	flat	39 km
		ECP in Kuntuu vil	9751	8414	86%	mountain	15 km
		GPC in Jany-Jer vil.	20599	20599	100%	mountain	15 km
Talas	**Bakai-Ata**	**Total population in raion**	**43,5**	**31584**	**73%**		
		Total FGPs in raion	**9**				
		ECP in Bakai-Ata vil	17996	17996	100%	flat	28 km
		FGP in Booterek vil.	9166	7025	77%	flat	34 km
		FGP in Kyzyl-Oktyabr vil.	6563	6563	100%	mountain	28 km

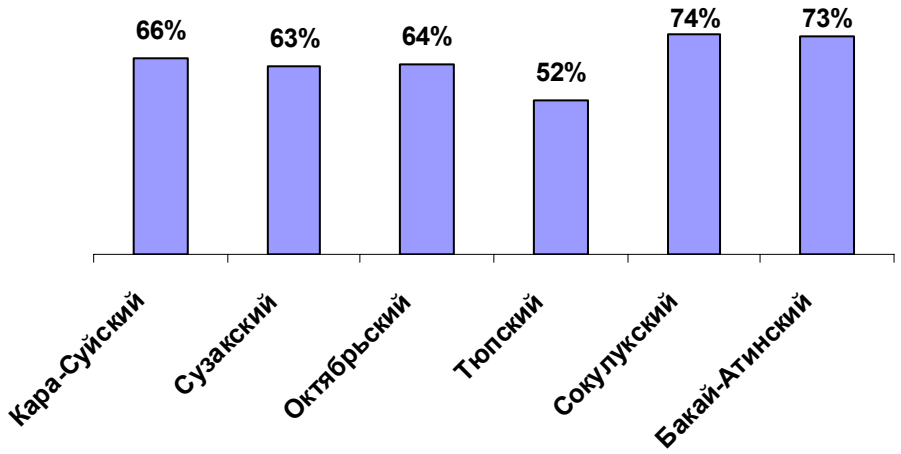
Note: Only feldsher teams of emergency care operate in each ECP.

According to paragraph 1.9 of Appendix 2 «Regulation on organizing operation of emergency and urgent care of the Center for urgent outpatient health care» of the MoH's Decree #32 dated January 28, 2004, one emergency team is established per 12500 people. Analysis of the Decree revealed lack of standard calculating service between urban and rural population. Also, the Decree does not consider remoteness of the population settlement in rural area from raion centers and specific geographical characteristics of the population settlements.

As it is seen from Figure 11, percentage of covered population by ECP in the studied regions looks as follows:

Figure 11.

Coverage of the serviced population with ECP in the studied regions



In none of the studied raions resident population was covered with EC service for 100%. Reasons for such situation were: inadequate number of emergency care points and medical vehicles, remoteness, irrational location of the population settlements and shortage of fuel and lubricants.

Opinion of FMC and TH managers as regards to demand for vehicles

«Additional medical vehicles are needed to completely cover all population settlements with emergency care service».

«It is desirable that all FGPs have own transport to perform emergency calls, go to enrolled FAPs, deliver patients for consultations to FMC and hospitalizations to TH».

«Paragraph 1.9. of Appendix # 2 of the MoH's Decree#32 dated January 28, 2004 states that emergency teams are established based on 1 team per 12500 people. (Note: 1 team is 6-hour shift). It is needed to replace 1 team with one twenty-four hour post. It is necessary to revise number of population, enrolled per one team, herewith to envisage separate standards for urban and rural population».

5.5.2. Personnel of the ECP

In all surveyed regions only feldsher teams work in ECP, staffing level with health and other personnel is 100%.

In accordance with training schedule in each FMC for EC health personnel annually workshops on emergency care are arranged with subsequent attestation.

The study found out that none of the ECPs has reference books, standards, guidelines and other normative documents on emergency care delivery which should be used by ECP staff in the process of work.

Opinion of TH managers.

«In order to deliver good-quality service to urgent patients it would be desirable to have a doctor in EC Service, as far as in paragraph 1.3. of Appendix 4 of the Kyrgyz MoH's Decree #32 dated January 28, 2004 it is stated that : "basic functional unit of the OEUM/OUOHC is feldsher team», however, nowhere it is written about medical teams that causes unclear issue of staffing medical teams».

Opinion of mid-level ECP and DGP personnel having medical vehicles, about EC Service

«In the process of work, when needed, we use our sketches of the workshop classes. We would like to make a suggestion to the MoH about need to develop clinical protocols, guidelines, pocket reference-books, visual aids on emergency care delivery for staff of the ECS».

5.5.3. Infrastructure of ECP

Out of 15 ECP buildings only ECP in Kara-Suu meets sanitary norms and rules.

Based on the Kyrgyz MoH' Decree #32 dated January 28, 2004 the structure of ECP envisages:

- Operation (dispatch unit),
- Communication unit,
- Office of medical statistics with archive,
- Office for outpatients reception,
- Premise for storage of medical equipment and preparation of medical kits,
- Premise for storage of drugs reserve and store equipped with fire and guard alarm system,
- Rest rooms for doctors, mid-level personnel, drivers of medical vehicles,
- Administrative and other premises,
- Garage, covered parking-boxes, set aside area with hard deposition for vehicles parking, matching in sizes to maximum number of vehicles operating simultaneously.

Administration of FMC in Kara-Suu constructed a new building for ECP using sponsor funds. It meets appropriate sanitary norms and rules with heated garage for sanitary vehicles (Figure 2).

Figure 2.

ECP, Kara-Suu town

Service of emergency health care is the round-the clock work, that is why one of the important criteria is establishment of comfortable conditions for the EC staff as it has been arranged by the FMC administration in Kara-Suu town (Figures 3, 4, 5).

Figure 3.

Rest room in ECP, Kara-Suu town

Figure 4.

Dispatching room, ECP in Kara-Suu town

Figure 5.

Room for medical procedures in ECP, Kara-Suu town

Emergency care points of the rest studied regions are located in one-two rooms of FMC and FGP buildings or in separate adjusted building (Figure 6).

Figure 6.

One of the ECP, total floor area is 9м^2

Opinion of drivers, machine men of ECP and FGP with available medical vehicles

«It is necessary to arrange rest rooms for drivers of the ECP».
«There are no conditions for the ECP drivers to rest».
«Special clothes are not issued for drivers».

Excluding ECPs in Kara-Suu and Oktyabrski raion, in all ECP and FGP with available medical transport there are no covered boxes that increases wear and tear of vehicles causing disability and deteriorating labor conditions of people.

There are no places for sanitary processing and daily maintenance (car wash). And even if there is a sanitary garage, it is not used at all because of remoteness from the ECP (Figure 7).

Figure 7.

Unused sanitary garages

Owing to lacking conditions for storage of sanitary vehicles in the HO, the vehicle is placed in the yard of the driver's house (Figure 8).

Figure 8.

In the absence of a garage (box), sanitary vehicle is in the yard of the driver's house

Opinion of drivers, machine men of ECP and FGP with sanitary vehicles

«A big problem is still absence of place for sanitary processing of the transport, daily attention (car wash) and lack of inspection pit for the vehicle inspection. To inspect the vehicle you should go to the strange garage».

«It is necessary to have a garage or covered shed for the vehicle in order to decrease wear and tear of sanitary vehicles».

«Instruments to make repairs of the vehicle are not enough».

Figure 9.

In the absence of a garage (box) the sanitary vehicle is in the open air beside the ECP building

Opinion of FMC managers

«It is needed to increase funding of the EC Service as it is necessary to renew hard and soft inventory, repair portable radio set in the EC vehicles, construct covered boxes for vehicles».

Figure 10 demonstrates shed built by administration of the FMC and ECP staff.

Figure 10.

Covered shed for sanitary transport

5.5.4. Equipage of the ECP with medical equipment

Based on the Decree of the MoH #32 dated January 28, 2004, in order to deliver good-quality emergency health care EC points should have 23 items of medical-technical equipment. In the surveyed areas none of the ECPs had an appropriate list. For example, portable electrocardiograph is available only in the ECP of Kara-Suu town and Suzak village.

Portable defibrillator, lung ventilator, portable blood glucose meter or blood glucose tests, oxygen flask, mechanical portable aspirator, intensive cure kits and other were absent in all ECPs.

In 5 ECPs sets of fixation splints to fix extremities require replacement.

Since 2000, hard and soft inventory is not renewed in ECPs.

All ECPs have telephone communication, however, none of the sanitary vehicles is equipped with portable radio set, and light beacon works only in 5 vehicles.

Opinion of drivers, machine men of ECPs and FGPs with sanitary vehicles

«Big problem is still lack of radio set in the car, when it is needed there is no opportunity to get in touch with dispatcher of the ECP».

Figures 11 and 12 show equipage of the ECPs' ambulances with medical equipment and supplies in different areas.

Figure 11.

Equipped sanitary transport.

Figure 12.

Sanitary transport without equipment

Opinion of TH managers about operation of the ECP

«There is not enough medical equipment in the ECP to deliver good-quality health care».

«Ambulances basically work for transportation of patients».

Opinion of FMC managers

«In the ECP there is not enough medical equipment to deliver good-quality emergency health care such as portable electrocardiograph, portable defibrillator with electrocardioscope, lung ventilator like «Pneumocomp», portable blood glucose meter, portable vacuum-extractor».

«It is required to revise Appendix #16 of the Kyrgyz MoH's Decree #32 dated January 28, 2004 «On efforts to improve emergency health care/urgent care to population of the Kyrgyz Republic, particularly "Drugs" part. It is necessary to take away those drugs which are essential and used in exigent conditions, for example: absorbent carbon and oth.».

Opinion of Mid-level health personnel

«Sanitary vehicles serve basically for transportation of patients, as the need arises splints are applied, intramuscular injections are made and deliveries are managed in the cabin of the vehicle. There are no conditions to put in an IV in the vehicle».

5.5.5. Performance of the ECPs in the surveyed regions

In order to assess efficiency of the ECP the following performance indicators of the emergency and urgent health care units were used:

1. Number of performed emergency calls per 1000 population in 2006 - 2008.
2. Number of performed emergency calls per day.
3. Number of urgent self-referred and hospitalized urgent patients by the EC Service to TH.
4. Number of performed emergency calls by monitored diseases
5. Proportion of emergency calls performed later than 15 minutes.
6. Number of outpatient visits per 1000 population.
7. Number of emergency calls per 1 feldsher team.

Assessment of the ECP's performance in the studied areas for the 2006-2008 period of time looks as follows:

1. Number of performed emergency calls per 1000 population in 2006-2008. (See table 12).

Table 12.

Number of performed emergency calls per 1000 population

ECPs by regions	Number of performed emergency calls per 1000 population		
	2006	2007	2008
Booterek vil. Bakai-Ata raion	146	138	152
Kara-Suu town, Kara-Sui raion	142	124	145
Sokuluk vil. Sokuluk raion	105	101	91
Nariman vil, Kara-Sui raion	121	143	126

Bek-Abad vil, Suzak raion	117	176	188
Kashgar-Kyshtak vil, Kara-Sui raion	109	105	101
Tyup vil, Tyup raion	96	82	52
V-Antonovka vil., Sokuluk raion	95	100	96
Bakai-Ata vil. Bakai-Ata raion	61	62	46
Bakai-Ata vil. Bakai-Ata raion	78	92	77
Jergetal vil. Oktyabrskaya area, Suzak raion	62	55	60
Otyabrskoye vil., Suzak raion	36	50	53
Suzak vil., Suzak raion	36	32	25
K.Datka vil., Kara-Sui raion	32	144	127
Kuntuu vil, Sokuluk raion	17	49	62

The most number of the performed emergency calls (over 100) per 1000 population is in the ECPs of Kara-Sui, Baka-Ata, Suzak and Sokuluk raions. As for the rest regions the indicators are below 100.

2. Number of performed emergency calls per day (Table 13).

Table 13.

Number of performed emergency calls per day
In 2006 - 2008.

ECP by regions	2006	2007	2008
Sokuluk v. Sokuluk raion	20	20	17
Kara-Suu town, Kara-Sui raion	18	16	18
Suzak v., Suzak raion	13	12	9
Nariman v., Kara-Sui raion	12	14	12
V-Antonovka v. Sokuluk raion	10	10	10
Kashgar-Kyshtak v., Kara-Sui raion	7	7	8
Bakai-Ata v., Bakai-Ata raion	4	4	3
Booterek v. Bakai-Ata raion	4	4	4
Bek-Abad v., Suzak raion	4	6	6
Kyzyl-Oktyabr v., Bakai-Ata raion	3	3	3
Tyup v., Tyup raion	3	3	2
Oktabrskoye v., Suzak raion	2	3	3
Jarghetal v., Oktyabrskaya area, Suzak raion	2	2	2
K. Datka v., Kara-Sui raion	2	7	7
Kuntuu v., Sokuluk raion	1	3	3

As it is seen from the Table, most part of the calls per day fall at ECPs in Sokuluk, Kara-Suu and Suzak villages. In these areas most of the population reside, these are the most thickly populated raion centers. 88% of calls in these settlements are performed directly within the raion center and only 12% of calls ensure distant villages. The present study found out that such distribution of the serviced calls occurs owing to insufficient amounts of the allocated fuel and lubricants (5 liters per day).

There are ECPs which perform not more than 2-3 calls per day. The reason is the same: insufficient amount of the allocated fuel and lubricants; and remoteness of the settlements. Thus, combination of three factors – remoteness, low density of the

population and insufficient volume of the allocated fuel and lubricants directly contributes to efficiency of the ECP performance.

Opinion of the mid-term personnel of ECPs and FGPs with available vehicles as regards to the EC Service performance

«You have to often use medical vehicles to get drugs, medical equipment, provide reports to the center, take a group of doctors for preventive examinations. Based on the request from the administration one have to provide medical transport to ensure election campaigns, accompany high level officials and do other things not related to emergency care needs.».

«No refusals to emergency calls occur, the emergency team goes to all received calls».

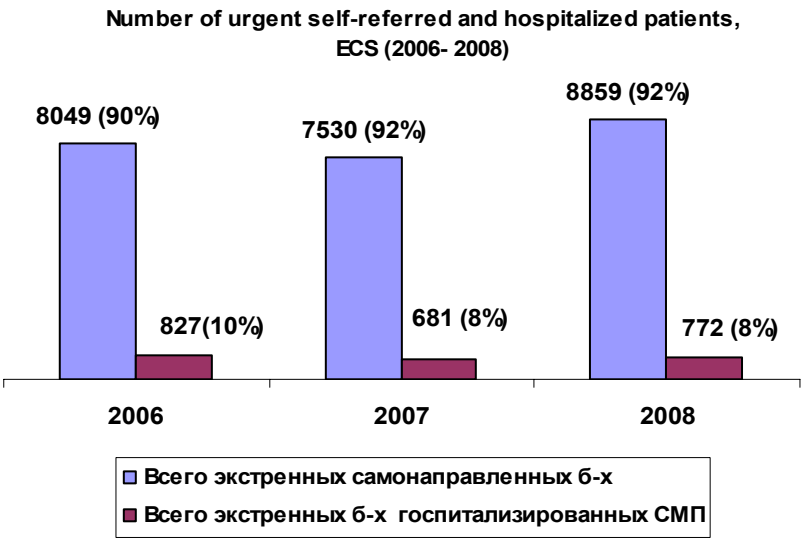
Drivers and machine men of the ECP about EC Service

«In average 5-10 liters of fuel are allocated per day (need of the sanitary transport is 18,2 liters of fuel per 100 km) and it is not enough. Whilst there are insufficient amounts of fuel and lubricants at night vehicles are serviced by fuel stations in debt, if there is a contract made, or as needed relatives of a patient provide fuel for the ambulance».

3. Number of urgent self-referred and hospitalized patients in TH by the ECP

Patients in emergency condition try to reach the hospital themselves not making emergency call.

Figure 12.



As it is seen from Figure 12, hospitalization rate of urgent patients by the emergency care service is annually decreasing. If in 2006 this rate was 10%, than in 2007-2008 this indicator decreased towards 8%. 92% of patients with emergency conditions are hospitalized themselves.

Number of urgent self-referred and hospitalized patients in TH by ECP by regions and hospitalization types is shown in Table 14.

Table 14.

Number of urgent patients self-referred and hospitalized by the EC Service in TH by types of hospitalization

in 2006 - 2008.

Years	Regions	Self-referred urgent patients				Urgent patients hospitalized by ECS			
			Urgent				Urgent		
		planned	before 24 h.	after 24 h.	Total	planned	Before 24 h.	after 24 h.	Total
2006	Kara-Sui TH	21	654	504	1158	6	14	7	27
	Oktyabrskaya TH	3	225	64	292	5	30	6	41
	Suzak TH	14	3740	574	4328	1	33	30	64
	Sokuluk TH	53	588	457	1098	15	467	192	674
	Bakai-Ata TH	-	840	156	996	2	7	7	16
	Tyup TH	-	168	9	177	-	4	1	5
	Total	**91**	**6215**	**1764**	**8070**	**29**			**827**
2007	Kara-Sui TH	4	472	326	802	-	16	1	17
	Oktyabrskaya TH	3	196	82	281	1	8	2	11
	Suzak TH	6	4197	650	4853	-	41	14	55
	Sokuluk TH	28	644	358	1030	3	381	153	537
	Bakai-Ata TH	5	304	179	488	9	14	29	52
	Tyup TH	-	55	21	76	-	3	6	9
	Total	**46**	**5868**	**1616**	**7530**	**13**	**463**	**205**	**681**
2008	Kara-Sui TH	28	682	423	1133		17	6	23
	Oktyabrskaya TH	-	151	74	225		9	7	16
	Suzak TH	5	4696	873	5574	2	36	15	53
	Sokuluk TH	27	810	426	1263	11	420	166	597
	Bakai-Ata TH	3	390	147	540	9	22	17	48
	Tyup TH	-	97	27	124	1	25	9	35
	Total	**63**	**6826**	**1970**	**8859**	**23**	**529**	**220**	**772**

Out of urgent self-referred patients: 77% urgent patients hospitalized before 24 hours and 22% urgent patients hospitalized after 24 hours and only 1% - are planned patients.

Out of total number of urgent patients only 8 % are hospitalized in TH by the EC Service: out of them 2% are elective, 70% are urgent patients hospitalized before 24 hours and 28% urgent patients hospitalized after 24 hours.

Thus, the ECS inadequately performs one of its main functions: delivery of urgent patients in the shortest possible time to a hospital in order to provide specialized health care of good quality.

Opinion of TH managers about performance of the EC Service

«Don't like performance of the EC service. During night times patients are brought to the hospital by private transport facilities and during a day ambulance bring basically elective patients for hospitalization».

«ECP feldshers bring mainly homeless people and alcoholics to the intensive cure units who have come out of critical condition, on the spot they leave the unit without making co-payment».

«Inadequate pre-hospital examination and treatment are provided by the emergency care service to patients with cardio-vascular pathology».

«There is no continuity between ECP and TH. The ECP staff not always collect punch-outs of assembly sheets from the hospital. There are cases of diagnose divergences, that are not jointly discussed at staff-meetings».

Opinion of FMC managers about performance of the ECP

«There is not enough continuity between FMC and TH».

*«In Paragraph 4.5 of the Appendix to the Kyrgyz MoH's Decree #32 dated January 28, 2004 «On efforts to improve emergency and urgent health care to population of the Kyrgyz Republic» it is stated that EHCU/*UOHCU *do not issue documents identifying temporary disability, medico-legal conclusions, do not examine alcoholic intoxication, however, on March 24, 2009 Ministry of Health of the KR issued Decree on introducing changes into this paragraph (without cancelling the paragraph of the previous decree as the ceased document) about medical evidencing the fact of alcoholic intoxication, its degree and use of psychoactive substances, not stipulating at what expense evidencing should be done. As a rule, at night the wrecked do not always have money».*

«Big problem is hospitalization of the following categories of patients:

- *Electrotraumas without burning signs (in sense and senseless),*
- *Pregnant women living in urban area without documents, registration and residence,*
- *Diabetes,*
- *Chronic diseases in the phase of compensation,*
- *Newly came children,*
- *Alcohol addiction in active phase combined with rhythm disorder,*
- *individuals without fixed address without clinical disease.*
- *acute cerebro-vascular accident in combination with coma,*
- *muttering Delirium against the background of alcohol addiction,*
- *mental diseases in combination with tbs,*
- *alcohol cardiomyopathy,*
- *urologic pathology,*
- *mild case of supercooling,*
- *children with mild non-food poisoning,*
- *suspicion for tbs (homeless people, discharged from prisons),*
- *chronic alcohol addiction, dipsomania».*

Decree #32 of the Kyrgyz MoH dated January 28, 2004 "On efforts to improve urgent and emergency care to population of the Kyrgyz Republic" states that in working hours of FGP (FMC) the ECPs serve only calls requiring emergency care delivery, however, there is no clear definition which conditions are emergent».

Opinion of mid-level personnel of the ECPs and FGPs with vehicles about performance of the EC Service

«It is necessary to approve indications for hospitalization of patients».

«In order to avoid driving a vehicle 15 km distance and more it is needed to open additional ECPs and decrease number of enrolled population per 1 emergency team».

4. Number of performed calls on monitored diseases in the surveyed regions in 2006 - 2008.

As it is seen from Table 15, annually, everywhere, except for ECPs in Bakai-Ata, Tyup and Kara-Sui raions, number of emergency calls on monitored diseases is reducing.

Table 15.

Number of performed emergency calls on monitored diseases, 2006 - 2008.

ECPs by regions	%		
	2006	2007	2008
Bakai-Ata v. Bakai-Ata raion	21	28	35
Booterek v. Bakai-Ata raion	16	17	12
Kyzyl-Oktyabr v., Bakai-Ata raion	25	21	16
Tyup v., Tyup raion	74	30	31
Oktyabrskoye v., Suzak raion	29	6	17
Jergetal v., Oktyabr area, Suzak raion	14	20	28
Sokuluk v., Sokuluk raion	21	19	20
Kuntuu v., Sokuluk raion	37	46	50
V-Antonovka v., Sokuluk raion	30	33	31
Suzak v. Suzak raion	10	15	17
Bek-Abad v. Suzak raion	40	44	41
Kara-Suu t., Kara-Sui raion	6	8	10
K. Datka v., Kara-Sui raion	24	17	11
Nariman v., Kara-Sui raion	13	11	10
Kashgar-Kyshtak v., Kara-Sui raion	13	19	16

Decrease in calls could be explained by the fact that every of emergency visits to patients with monitored diseases is fixed and considered by clinical managers of the FGP with family doctors of this district.

5. Proportion of calls performed later than in 15 minutes

One of the indicators of the emergency and urgent care efficiency is proportion of calls performed later that in 15 minutes (Table 16).

Table 16.

Proportion of calls performed later than in 15 minutes
2006 - 2008.

ECPs by regions	2006	2007	2008
Bakai-Ata v. Bakai-Ata raion	9,2	10,2	0,9
Booterek v. Bakai-Ata raion	1,1	0,6	0,9
Kyzyl-Oktyabr v., Bakai-Ata raion	0,5	-	0,5
Tyup v., Tyup raion	0,1	0,2	0,1
Oktyabrskoye v., Suzak raion	-	-	-
Jergetal v., Oktyabr area, Suzak raion	-	-	-
Sokuluk v., Sokuluk raion	3,9	3,5	2,1
Kuntuu v., Sokuluk raion	-	-	0,9
V-Antonovka v., Sokuluk raion	-	-	-
Suzak v. Suzak raion	0,7	-	-
Bek-Abad v. Suzak raion	-	-	-
Kara-Suu t., Kara-Sui raion	7,2		4,7
K. Datka v., Kara-Sui raion	3,3	2,7	2,9
Nariman v., Kara-Sui raion	0,7	0,7	1
Kashgar-Kyshtak v., Kara-Sui raion	1,2	1,4	1,5

In three years practically in all the surveyed ECPs there has been decrease in this indicator irrespectively to the service radius (from 10 to 70 km) and geographic characteristics. In rural area, considering available earth roads, lack of access ways and house numbers in new settlements, many calls continue to be performed later than in 15 minutes.

Opinion of FMC managers about performance of the EC Service

«It is needed to revise this indicator and increase time standard. Different time standards should be set for urban and rural areas».

Opinion of drivers and machine men of ECPs and FGPs with medical vehicles as regards to performance of the EC Service

«It is necessary to make plates with street names and house numbers, reconstruct roads. Because of poor roads it is impossible to reach patients in 15 minutes».

«In the roads drivers do not pay attention to light beacon and audio alarm of the ambulance and don't give the way».

6. Number of outpatient visits per 1000 population.

Number of outpatient visits per 1000 population is shown in Table 17 and Figure 13.

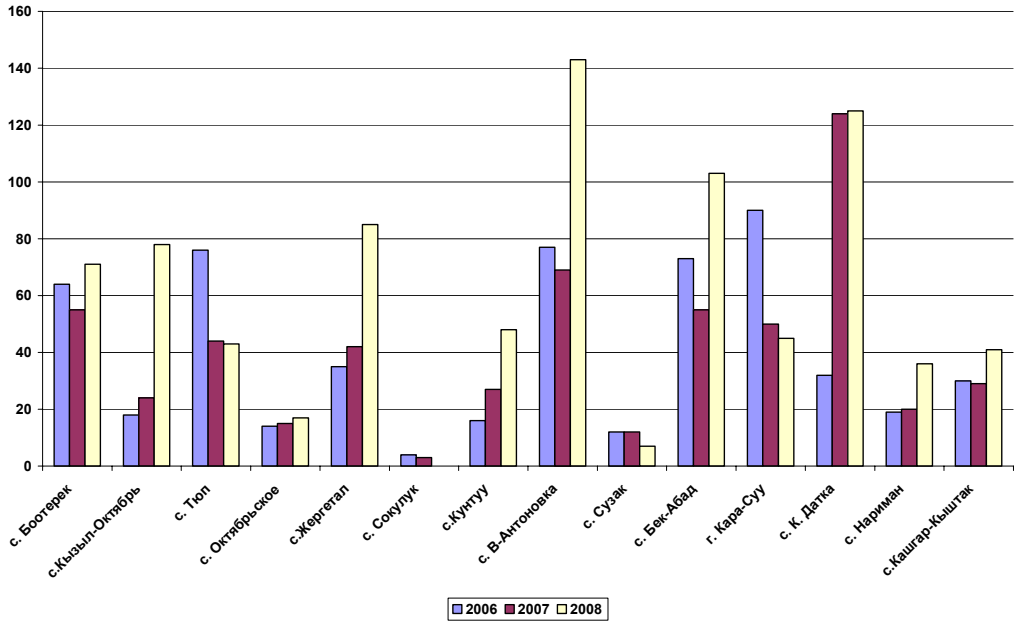
Table 17.

Number of outpatient visits per 1000 population in 2006 - 2008.

ECPs by regions	Number of outpatient visits per 1000 serv. popul.		
	2006	2007	2008
Bakai-Ata v. Bakai-Ata raion	64	55	71
Booterek v. Bakai-Ata raion	18	24	78
Kyzyl-Oktyabr v., Bakai-Ata raion	76	44	43
Tyup v., Tyup raion	14	15	17
Oktyabrskoye v., Suzak raion	35	42	85
Jergetal v., Oktyabr area, Suzak raion	4	3	-
Sokuluk v., Sokuluk raion	16	27	48
Kuntuu v., Sokuluk raion	77	69	143
V-Antonovka v., Sokuluk raion	12	12	7
Suzak v. Suzak raion	73	55	103
Bek-Abad v. Suzak raion	90	50	45
Kara-Suu t., Kara-Sui raion	32	124	125
K. Datka v., Kara-Sui raion	19	20	36
Nariman v., Kara-Sui raion	30	29	41

Figure 13.

Number of outpatient visits per 1000 serviced population



In spite of the fact that family doctors and mid-level health personnel in FMC and FGP work based on the schedule since 8 in the morning till 17 in the evening, in all regions except for Sokuluk raion, there is an increase in proportion of outpatient visits per 1000 population to ECPs.

7. Number of calls per 1 feldhser team

Load of annual calls per 1 feldhser team in the surveyed ECPs for the period of 2006-2008 is shown in Table 18.

Table 18.

Number of calls per 1 feldsher team
2006 - 2008.

ECPs by regions	**2006**	**2007**	**2008**
Bakai-Ata v. Bakai-Ata raion	336	342	256
Booterek v. Bakai-Ata raion	347	328	361
Kyzyl-Oktyabr v., Bakai-Ata raion	257	304	255
Tyup v., Tyup raion	347	297	187
Oktyabrskoye v., Suzak raion	198	280	296
Jergetal v., Oktyabr area, Suzak raion	171	151	168
Sokuluk v., Sokuluk raion	1844	1782	1605
Kuntuu v., Sokuluk raion	86	243	306
V-Antonovka v., Sokuluk raion	891	937	905
Suzak v. Suzak raion	1179	1071	829
Bek-Abad v. Suzak raion	350	524	561
Kara-Suu t., Kara-Sui raion	1642	1429	1676
K. Datka v., Kara-Sui raion	154	671	608
Nariman v., Kara-Sui raion	1087	1287	1129
Kashgar-Kyshtak v., Kara-Sui raion	674	649	625

If average republican indicator in 2008 was 677 calls per year per one feldsher team, then calls above this indicator are performed in ECPs of Kara-Suu town, Sokuluk v., Suzak v. and Nariman v.

Possibly, it is explained with the fact that most of the population is concentrated in these settlements and 88% of calls are performed within the raion center.

Opinion of FMC managers about performance of the EC Service

«There is a legal vulnerability of the emergency care staff and it is needed to amend the Administrative and Criminal Codes (on the basis of appropriate articles of the Kyrgyz Law «On health protection of the KR population») about bringing to responsibility of individuals who damaged physically and morally health professionals, ensure protection of health personnel from rudeness and manhandling from the side of population"

«In the glossary of terms in "emergency team" definition there is no word "driver", there are also no regulations on ambulance driver».

Opinion of mid-term personnel working in ECP and FGP with medical vehicles about performance of the EC Service

«We are not protected during service of an emergency call from rudeness and manhandling from the side of population».

5.6. Financial status of the ECPs in the surveyed regions

Funding in the surveyed ECPs comes from two sources – budget and MHI funds.

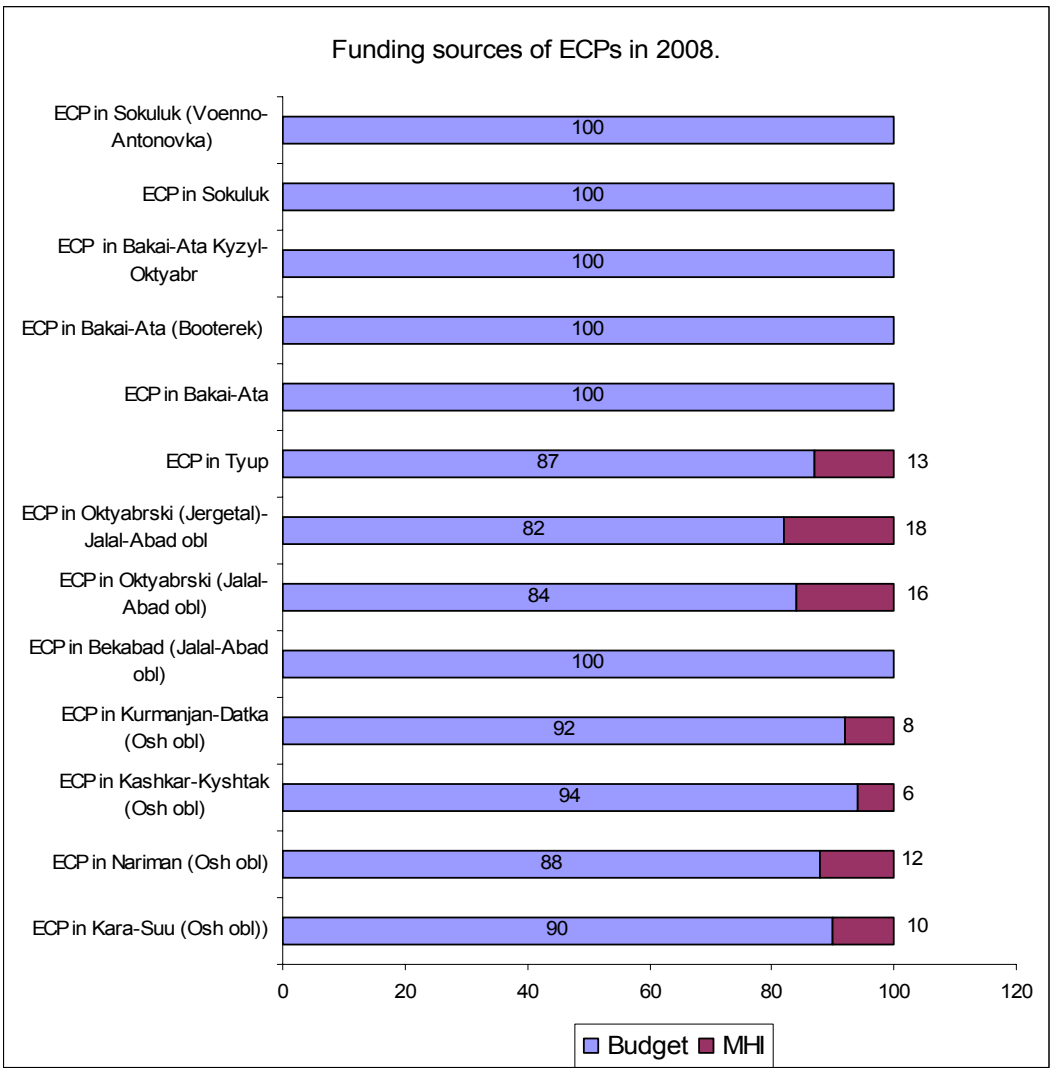
During the study it has been found out that in 6 ECPs in 2008 expenditures were produced using budget funds only for 100 %.

In the rest ECPs, expenditures were produced from two financing sources. Expenses from budget funds were from 82% to 94% and using MHI funds – from 6% to 18%.

Funding from two sources was provided in the following ECPs: Tyup v. of Issyk-Kul oblast, Jergetal v. (Oktyabr area) of Jalal-Abad oblast, Kara-Suu t., Nariman v., Kurmanjan-Datka v., Kashkar-Kyshtak v. of Osh oblast.

Funding sources of the surveyed ECPs are shown in Figure 14.

Figure 14.



Main expenditure items in ECPs are salary costs, drugs and transport expenses.

The most proportion of spending in the ECPs accounts for salary which varies from 61% to 90,6%.

Emergency teams in ECPs are staffed well enough.

The most salary expenditure proportion (90,6%) is in ECP of Nariman v. (Osh oblast) and the least (61%) is in ECP of Kurmanjan-Datka v. (Osh oblast).

Drugs account from 1,7% to 9,5%, and herewith the present study revealed that in the ECP of Kurmanjan-Datka v. (Osh oblast) there are no drug expenses at all.

Costs to maintain transport facilities are 9%-33,3%. In the ECP of Nariman v. (Osh oblast) this type of costs is absent owing to lack of the ambulance.

However, emergency calls in these ECPs are served, but costs to deliver emergency team or a patient by the ambulance are covered by patients themselves.

Opinion of mid-level health personnel

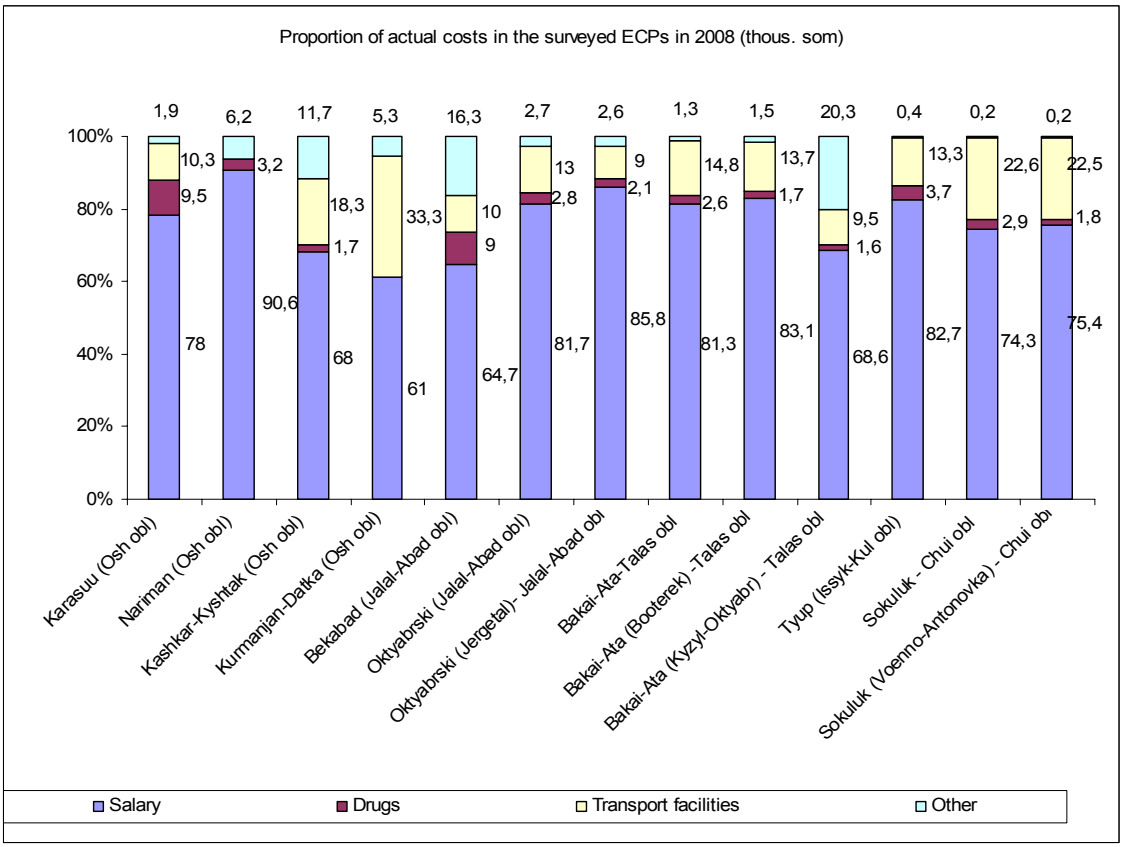
«Often we go using transport of relatives in order to save fuel and lubricants».

It was also found out that the ECP of Nariman v., owing to lack of costs to maintain vehicles, has had the most proportion of salary costs, in the meantime the ECP in Kurmanjan-Datka v. does not procure drugs, however, it has the most proportion of costs to maintain transport facilities (33,3%).

The other expenditures of the EC include expenditures related with maintenance of sanitary machines (utility costs).

Proportion of actual costs produced by the surveyed ECPs in 2008 is shown in Figure 15.

Figure 15.



In all ECPs proportions of the produced expenditures are different and conditioned with organization of the emergency care delivery (number of staff, volume of expenditures for drugs, supply with fuel and lubricants, service and maintenance of sanitary vehicles).

Drivers and machine men in ECPs about EC Service

«It is desirable to replace both hard and soft inventory in rest rooms of drivers».

«In average, 5-10 liters are allocated per day (need of a sanitary vehicle is 18,2 liters of fuel per 100 km) and this is not enough. Whilst there are insufficient amounts of fuel and lubricants at night vehicles are serviced by fuel stations in debt, if there is a contract made, or as needed relatives of a patient provide fuel for the ambulance».

In the process of cost-effectiveness analysis of using sanitary vehicles operational km per day and average radius of service per call were calculated using the received by ECP funding. This calculation is shown in Table 19.

Table 19.

Calculation of average service radius per 1 emergency call using the received funding by ECP in 2008

Health organization	Average number of calls per 1 day	Amount of costs for maintaining transport facilities per day (som)	Length of operational km (km) per day	Average radius of service per 1 call (km)
ECP in Kara-Suu t. (Kara-Sui raion, Osh oblast)	18	305	57	3
ECP in Nariman v. (Kara-Sui raion, Osh oblast)	12	0	0	0
ECP in Kashkar-Kyshtak v. (Kara-Sui raion, Osh oblast)	7	296	55	8
ECP in Kurmanjan-Datka v., (Kara-Sui raion, Osh oblast)	7	351	65	10
ECP in Bek-Abad v.(Suzak raion, Jalal-Abad oblast)	19	138	26	1
ECP in Oktyabrskoye v., (Suzak raion, Jalal-Abad oblast)	3	323	60	19
ECP in Jergetal v. (Suzak raion, Jalal-Abad oblast)	2	236	44	24
ECP in Tyup v., (Issyk-Kul oblast)	2	255	47	23
ECP in Bakai-Ata v. (Bakai-Ata raion, Talas oblast)	3	252	47	17
ECP in Booterek v., (Bakai-Ata raion, Talas oblast)	4	242	45	11
ECP in Kyzyl-Oktyabr v. (Bakai-Ata raion, Talas oblast)	3	185	34	12
ECP in Sokuluk v. (Sokuluk raion, Chui oblast)	17	1202	223	13
ECP in Voenno-Antonovka v. (Sokuluk raion, Chui oblast)	10	460	85	9

As it is seen from Table 19, in the surveyed ECPs sanitary vehicles were daily used. The least operational km was produced in the ECP of Bek-Abad v., its length was 26 km and in the ECP of Kyzyl-Oktyabr v. – 34 km.

In 9 ECPs medical vehicles produced daily from 44 to 65 operational km.

In the ECP of Sokuluk v., two sanitary vehicles annually produced 223 operational km. In the same raion the ECP in Voenno-Antonovka v. has one sanitary vehicle. Its daily operational km is 85 km.

All medical vehicles daily served emergency calls of the population. Based on number of calls per day we estimated average radius of service per one emergency call.

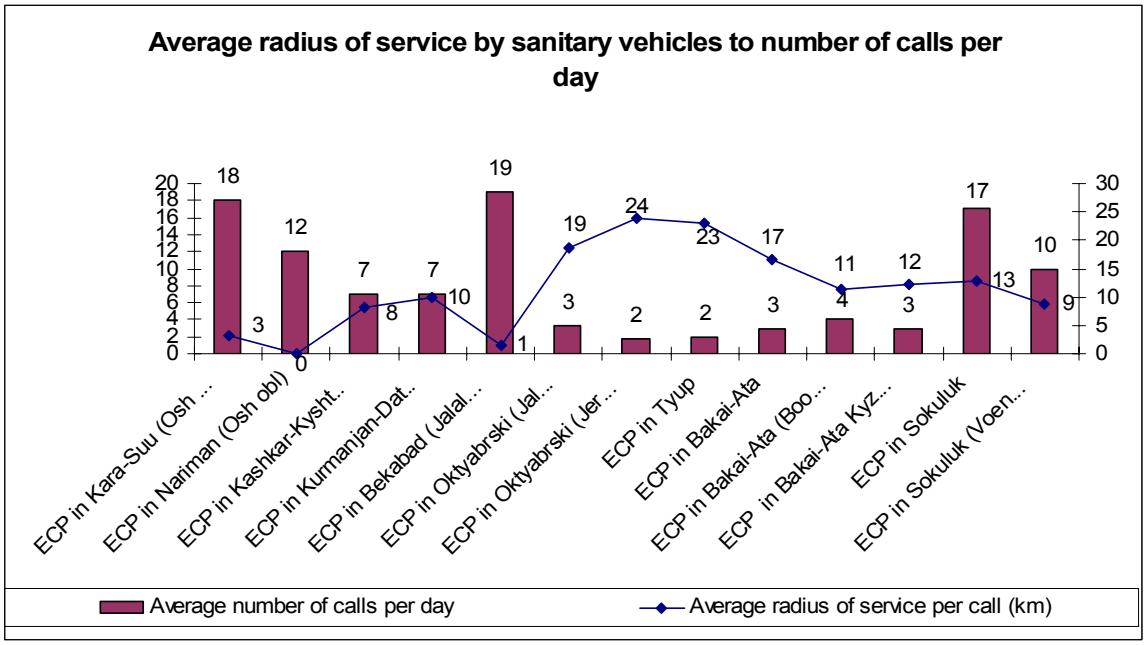
Thus, in the ECP of Bek-Abad v., average radius of service was 1 km under 19 calls, in the ECP of Kara-Suu t. – 3 km under 18 calls.

In 9 ECPs average radius of service of one call varies from 8 to 24 km, and number of calls was from 2 to 7 per day.

In the ECP of Sokuluk v., 17 emergency calls were per two sanitary vehicles with average radius of 13 km, in the ECP of Voenno-Antonovka v. under 10 calls radius of their service was 9 km per one call.

This picture is well shown in Figure 16.

Figure 16.



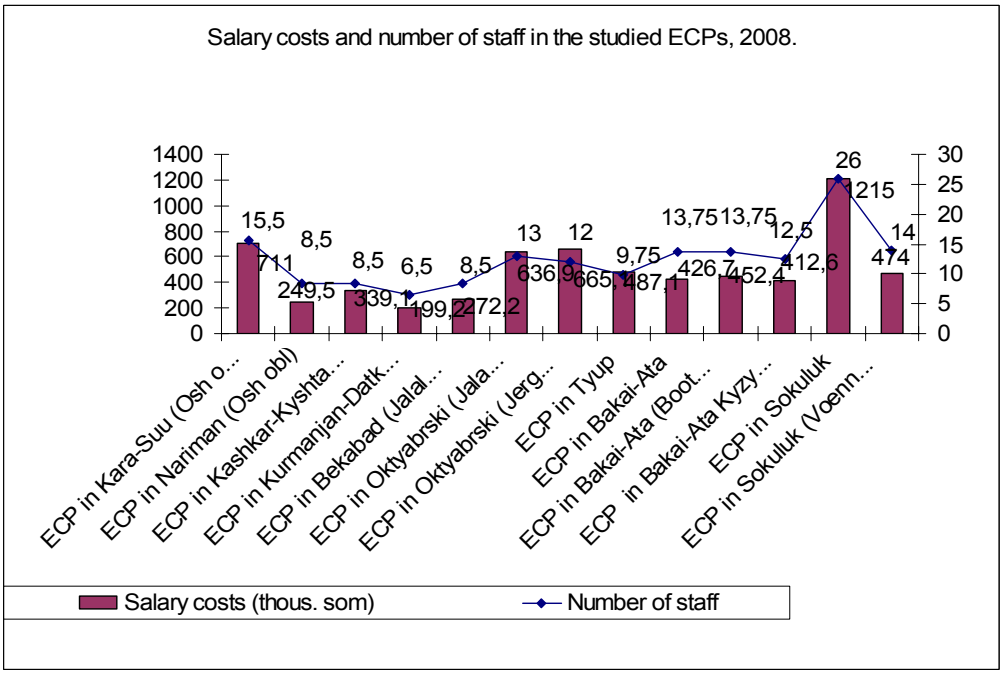
Made estimation found out direct relation between length of the operational km and number of serviced calls: as less the distance between an ECP and a patient, as more number of calls is managed, and vice-versa, as more the distance to a patient, as less patients could await for health care.

Salary costs in the surveyed ECPs are different and vary from 199,2 thous. som in the ECP of Kurmanjan-Datka v., to 1215,0 thous. som in the ECP of Sokuluk v. All ECPs are staffed with line emergency teams. Thus, 8 line emergency teams work in the ECP of Sokuluk v. The rest ECPs have by 4 line teams.

Size of salary costs in each of the ECPs differs. Staff units vary from 6,5 in the ECP of Kurmanjan-Datka vil. to 15,5 in the ECP of Kara-Suu town.

Ratio of salary costs to staff units in 2008 is shown in Figure 17.

Figure 17.



Accordingly, the conclusion is: as more funds for salary, as more staff is in the ECP, and this in its turn, impacts quality and volume of the services delivery.

Drivers and machine men of ECPs about EC Service

«It is necessary to increase salaries of drivers, as in one of the FGPs with medical transport a vehicle was out of operation for 3 months, because nobody desired to be employed as a driver due to low salary».

In 2008 funding standard per 1 line ambulance team was 140,0 thous. som (Decree of the Kyrgyz MoH *№ 225* dated May *20, 2008*).

Cost-effectiveness analysis of the ECP performance showed that actual costs per 1 line ambulance team in the ECPs of Nariman v., Kurmanjan-Datka v. and Bek-Abad v. were made within the standard of funding.

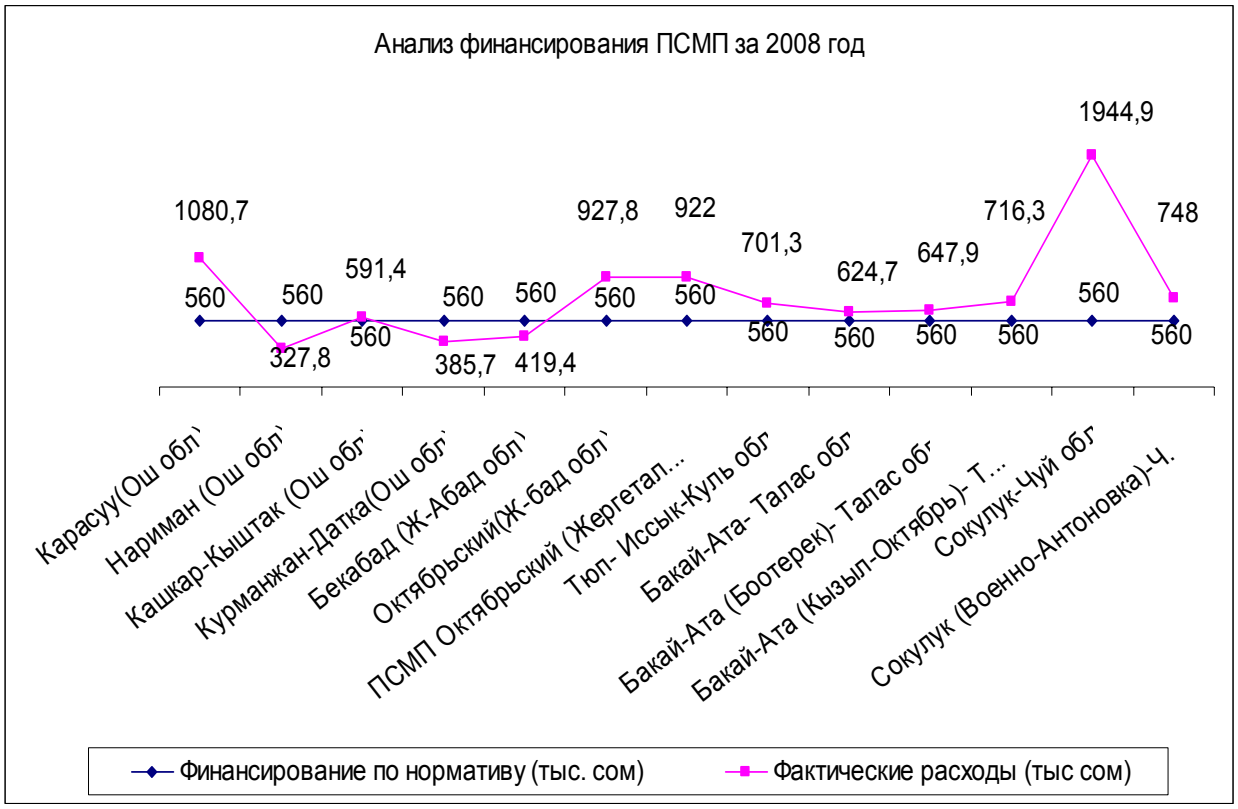
4 ambulance teams work in these ECPs, and standard of funding in 2008 was 560,0 thous. som, and salary costs were from 327,8 thous. som to 419,4 thous. som accordingly. However, as it was mentioned above, in these ECPs there were no expenditures for maintaining transport facilities because of no ambulance. In these ECPs there are no drug costs at all or small proportion.

In the rest of ECP expenditures associated with performance overbalance funding standard. Thus, 8 line ambulance teams work in the ECP of Sokuluk FMC and volume of funding per year was 1120,0 thous. som, and actual costs were 1944,9 thous. som.

In the rest of ECPs which have 4 ambulance teams, volume of funding per year was 560,0 thous. som per each ECP versus produced expenses from 591,4 thous. som to 1080,7 thous. som.

Financial condition of the surveyed ECPs is shown in Figure 18.

Figure 18.



The study found out that actual costs in the most of the ECPs overbalanced funding standard, and an assumptive conclusion is that funding standard per one line ambulance team does not cover needed operational costs of the ECP.

Opinion of FMC managers

«It is necessary to revise the Kyrgyz MoH's Decree #32 dated January 28, 2004 "On efforts to improve urgent and emergency health care to population of the Kyrgyz Republic with regard to financing standard per one team, because current standard does not cover needed costs for the EC performance».

6. CONCLUSIONS

The study on rational distribution and use of medical vehicles by regional health organizations of the Kyrgyz Republic has revealed inadequate efficiency in distribution of vehicles of this type. Lack of systematic planned approach and criteria for distribution with too small number of the supplied ambulances causes that there are raions which have few or don't have transport at all. Emergency care proves to be inaccessible for citizens of remote areas.

Besides, it has been found out that existing medical vehicles work inefficiently, principal functions are performed inadequately: delivery of competent health care on site and conveyance of acute (urgent) patients in the shortest possible time to the hospital for delivery of the competent and specialized health care. Deteriorated efficiency of the ECP's work is caused with several factors, the most important of them are: inadequately developed regulatory framework, which regulates operation of the EC service, inadequate funding, inadequate standards of the fuel and lubricants consumption, poor material and technical base, lack of multisectoral approach to repairs of roads, legal protection of health professionals, and also not clear policy and management of the emergency care service.

1. Study of the regulatory documentation educed the following:

1.1. There is no definition what type of vehicles should be referred to sanitary vehicles in the Glossary of the MoH's Decree #32 dated 28.01.04 «On efforts to improve emergency and urgent health care delivery to population of the Kyrgyz Republic.

1.2. There is also no definition for «emergency team/ambulance team».

1.3. In the same Decree there is an indicator - «proportion of emergency calls performed later than 15 minutes». However, it is evident that this indicator could not be applicable for the emergency care service, covering rural population often residing in settlements located too far from the raion centers.

1.4. There is no regulation on the ambulance driver and his job description.

1.5. No differentiation in service between urban and rural area. Estimated rate as 1 emergency team per 12500 people is efficient in areas with high density of the population, and is not efficient in remote areas with low number of people. Performance indicators of the emergency care service are not developed.

1.6. There are no reporting form and regulation on FGP with sanitary transport, no functions and tasks of the sanitary transport in FGP.

1.7. There are no criteria of demand for and distribution of medical vehicles by health organizations.

1.8. Reporting form «40-zdrav» should be considered as outdated, because this form does not reflect realistic number of working teams in a unit/emergency care point, no data about died patients before arrival and in attendance of an ambulance team.

1.9. The reporting form does not include reliable data on sanitary transport which is not on the balance sheet of the EC subdivision (if, for instance, there is a separate car fleet, vehicles are not shown in the report).

1.10. In Decree #673 of the Kyrgyz Ministry of Health dated March 24, 2009 «On introducing changes to the MoH's Decree «On efforts to improve emergency and urgent health care to the population of the Kyrgyz Republic № 32 dated January 28, 2004» it is stated that «units if emergency and urgent outpatient care do medical examination to establish degree of drunkenness or a fact of using psychoactive substances», herewith

this Decree contradicts ToR of the EC Service, regulated by sub-paragraph 4.5 of the Kyrgyz MoH' Decree #32 dated January 28, 2004.

1.11. Funding rate per one ambulance team, approved by the MoH's Decree №220 dated 6.06.2007 «On financing health organizations working in the Single Payer System» does not cover costs needed for the ECP operation.

1.12. Development of the multisectoral approach, particularly, preparation of joint Decree with the KR Ministry of transport and communications, local utility services and akkymiats as regards to reconstruction of roads, approach ways, equipping streets with name plates and house numbers.

1.13. The issue of legal protection of health professionals from rudeness and rough stuff during performance of calls requires solution.

2. The following negative factors decreasing efficiency of the regional emergency care services relate to inadequate material and technical base:

2.1. There are no methodological guidelines, clinical protocols, standards, reference books on emergency care delivery in the regional emergency care points.

2.2. Third part of vehicles available in health organizations requires decommissioning.

2.3. Transport facilities of UAZ brand name, consuming huge amounts of fuel and lubricants, account for over 50% of total sanitary vehicle fleet in regional health organizations.

2.4. Over half of the sanitary vehicles are not adjusted to deliver urgent health care in the cabin of the car.

2.5. In none of the regional health organizations with available sanitary transport there is a place for its daily technical inspection and repairs (inspection pit etc.) and processing (current and other types of disinfection). In most of the emergency care subdivisions there are no closed boxes to park sanitary transport. It is harmful for safe keeping of the transport as well as medical equipment within the cabin of it.

2.6. Practically, everywhere there is no radio communication between dispatchers and ambulances. In a number of points there is no fixed telephone communication.

2.7. Out of 15 buildings of the ECPs, only 1 building meets standards regulated by the Kyrgyz Republic MoH's Decree #32 dated January 28, 2004.

2.8. Managers of health organizations are not involved in distribution of the vehicles, with indication from above the transport arrives in a specific settlement without considering needs.

2.9. EC points do not cover attached to them raions of service due to remoteness of the settlements, their irrational location and shortage of petroleum.

2.10. Material and technical equipment to deliver competent emergency health care in all the surveyed ECPs do not correspond to the equipment list of a mobile team that is approved by the Kyrgyz MoH' Decree #32 dated January 28, 2004.

2.11. Medical vehicles are generally used for transportation of patients and women in labor. There are also cases of improper use of medical vehicles both on the part of raion administration and managers of health organizations.

2.12. Only 8% of the hospitalized acute patients are delivered to TH by ambulance.

2.13. In all regions except for Sokuluk raion, proportion of health seeking in ECPs by outpatients per 1000 population is increasing.

2.14. Not all THs have admission units on the first floor and convenient approach ways for the sanitary transport.

2.15. Inadequate quality of the EC specialists training.

7. RECOMMENDATIONS

Based on the obtained data it is suggested:

To organize workshop with participation of all stakeholders in order to establish working group to develop regulatory framework and solve the following issues:

1. revision of the regulatory framework, regulating the EC Service: develop criteria of the medical transport distribution considering needs of health organizations, revision of the EC performance indicators, funding standards of the EC Service;
2. revision of the reporting forms of the emergency care subdivisions;
3. development of the reporting form and regulations on FGP with medical transport;
4. development of regulations on a driver of ambulance and his job description;
5. development of methodological guidelines, clinical protocols, reference books for the emergency care service;
6. seeking possibilities to establish conditions for rational use and keeping medical vehicles;
7. accelerating the process of decommissioning old vehicles;
8. increasing number of EC specialists, who did training in the specifically developed programs on urgent health care delivery in the KSMIR&QU;
9. seeking opportunities to provide all the Emergency Care Points with fixed telephone communications and radio communications with vehicles (it is necessary to consider service radius of the EC unit/point to procure portable radio sets of adequate power).