Policy Research Paper #68

Situational analysis on appropriateness of hospitalization of children under 5 and pregnant women

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Abbreviations

WHO	World Health Organization
HD	Hypertensive disease
FGP	Family Group Practice
IMCI	Integrated management of childhood illnesses
CP	Clinical protocol
KSIR&CME	Kyrgyz State Institute of Retraining and Continuous Medical Education
MoH KR	Ministry of Health, Kyrgyz Republic
NCMCH	National Center of Mother and Child Health
SGBP	State-guaranteed Benefit Package
PHC	Primary Health Care
ORP	Oral rehydration point
RHIC	Republican Health Information Center
MHIF	Mandatory Health Insurance Fund
USE	Ultra-sound examination
FMC	Family Medicine Center

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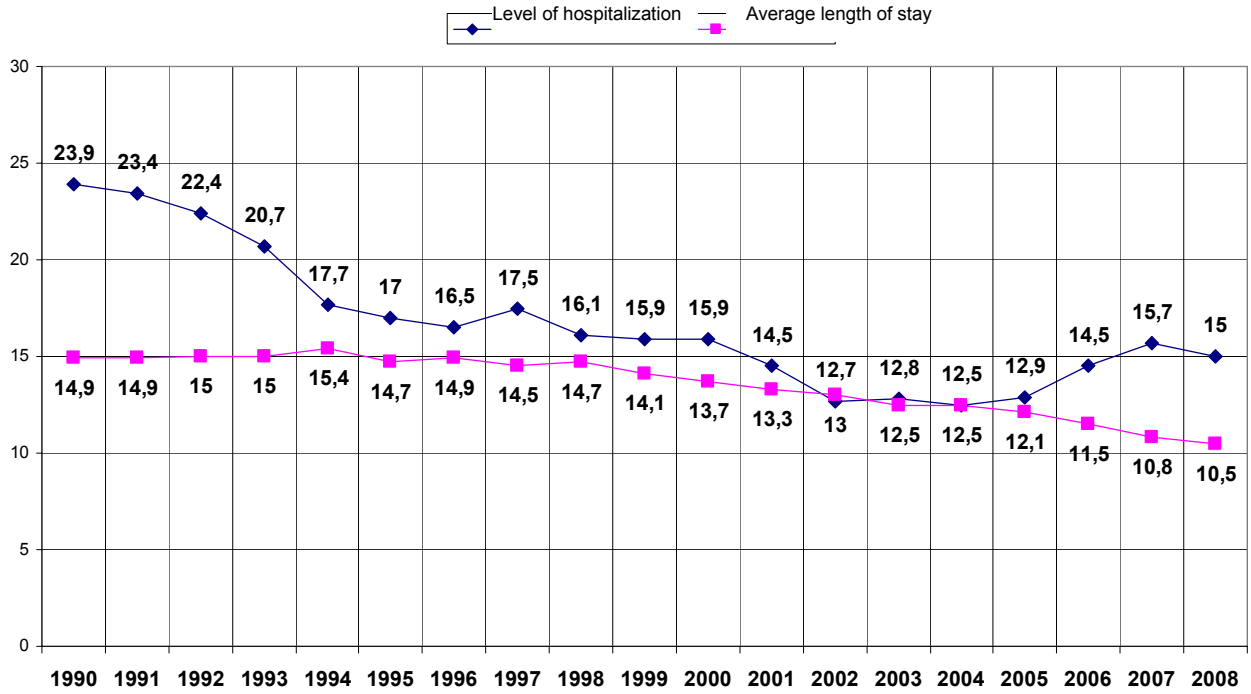
Section 1. Introduction

The issue of hospitalization appropriateness in health organizations of the Kyrgyz Republic has been coming under notice over the recent years. Relevance of this issue is conditioned by close link between hospitalization rate and quality of delivered services, namely between assurance of compliance of health care to objective condition of a patient at corresponding (outpatient or inpatient) level of health system and assurance of continuity of service delivery.

Data from Republican Health Information Center (RHIC) for 2006 – 2008 suggest significant increase in hospitalization rate (Figure 1). This trend was noted virtually in all regions of the country. This partially relates to the amendments made to the State-guaranteed Benefit Package (SGBP) and provided for free service delivery to children under 5 and people over 75. As a consequence, patients started to give preference to inpatient treatment over treatment at PHC level even with noncomplicated course of disease.

Figure 1. Level of hospitalization (%) and average length of stay of patients in hospital, Kyrgyzstan, 1990-2008



Data from MHIF suggest that rate of inappropriate hospitalization countrywide averages to 3% with slight annual variations. This figure is estimated on the basis of overall number of medical records selected for expert evaluation. It appeared that in the course of medical expertise hospitalization appropriateness in all regions of the country is evaluated mainly on the basis of professional experience of the expert doctor. There is no single set of objective and consistent criteria to evaluate appropriateness of hospitalization by disease or at least by disease group. Moreover, data on appropriateness of hospitalization among patients of different age groups by hospitalization profile is not available in MOH.

Given report contains the following information: brief description of methodology, rationale for selection of hospital admission criteria, separate analyses of hospital admissions among

children under 5 and among pregnant women, conclusion and recommendations derived from findings.

Section 2. Goal and objectives of the survey

Considering all the above mentioned factors as well as priority nature of mother and child health in health policy, Ministry of Health initiated given survey. Major **goal** of this survey is to undertake situational analysis on appropriateness of hospitalization of children under 5 and pregnant women to inform decision making on improving health care services.

The following **survey questions** were specified:

1) What criteria are currently used as the basis for hospital admission of children under 5 and pregnant women?
2) What kind of conditions/diagnoses prevail among hospitalized patients?
3) What is the percentage of inappropriate hospitalizations among children under 5 and pregnant women?
4) To what extend does inpatient care delivered in hospital corresponds to international guidelines/recommendations?

Survey question №4 initially was not part of this survey but its relevance became apparent during the pre-test of tools for data collection.

Section 3. Methodology

3.1. Description of sample

Retrospective analysis of medical records was undertaken in health organizations of the following regions:

- Bishkek city (Children's Clinical Hospital of Ambulance Care №3, National Center for Mother and Child Health, maternity hospitals №1 and №2);
- Chui oblast (Chui oblast merged hospital);
- Issyk-Kul oblast (Issyk-Kul oblast merged hospital, territorial hospitals of Jety-Oguz, Tyup and Ak-Suu rayons and Balykchy town);
- Osh oblast (Interregional Children's Clinical Hospital (Osh city), Municipal Perinatal Center in Osh city, territorial hospitals of Nookat, Aravan and Karasu rayons, Karasu pediatric hospital).

Medical records were selected predominantly from pediatric departments of common somatic conditions and departments for pregnancy pathology using random sampling method. Sample covered winter (January – February) and summer (July – August) periods and averaged from 20 to 30% of total number of submitted medical records. Altogether, 825 medical records of children under 5 and 755 medical records of pregnant women were analyzed within the context of current survey (Table 3.1.).

Table 3.1. Number of medical records in the sample

Region	Children under 5	Pregnant women
Bishkek	150	172
Chui oblast	83	41
Issyk-Kul oblast	409	343
Osh oblast	183	199
Total	**825**	**755**

3.2. Design of questionnaires for data collection

Questionnaires for data collection on hospitalized children under 5 and pregnant women were designed on the basis of international experience, effectual regulatory documents of the MOH KR, numerous consultations with experts – partners in survey implementation as well as with consideration of pre-test results.

Questionnaires contained the following information:

- Personal data of the patient;
- Referring health facility;
- Date/time and length of hospital stay;
- Diagnosis (at admission, clinical and at discharge);
- Medical history of the disease;
- List of major complaints and data on clinical-laboratory examination. Rationale for criteria selection to assess hospital admissions is provided in Section 4 in detail (see page 8);
- Treatment (prior to and at the time of hospitalization).

3.3. Criteria for treatment evaluation

During the questionnaire pre-test a decision was made to analyze prescribed treatment as well (survey question 4). In this respect, three indicators were selected on the basis of WHO recommendations[4].

Indicator 1. Average amount of drugs prescribed per patient

This indicator allows to estimate the level of excessive prescription of drugs and, respectively, prevalence of irrational drug prescription practice. Indicator was estimated using the following formula:

$$\textit{Average amount of drugs prescribed per patient} = \frac{\textit{Total number of drugs prescribed to the total number of patients}}{\textit{Total number of surveyed medical records}}$$

Indicator 2. Percentage of antibiotics prescriptions

This indicator determines general level of use of antibiotics, excessive use of which can cause the risk of microbe resistance to antibiotics. Indicator was estimated using the following formula:

$$\textit{\% of antibiotics prescription} = \frac{\textit{Total number of prescriptions of 1 or more antibiotics}}{\textit{Total number of medical records}} \times 100$$

Indicator 3. Percentage of injections prescriptions

Preferential use of injectable drugs (intramuscular, intravenous) as compared to oral drugs magnifies the risk of unfavorable reactions of the patient's body and transmission of certain diseases. Indicator was estimated using the following formula:

[4] Guidelines on proper prescriptions of pharmaceuticals, WHO, 1997.

$$\text{\% of injections prescriptions} = \frac{\text{Total number of patients prescribed with injections}}{\text{Total number of medical records}} \times 100$$

4. Selection of criteria for hospitalization

4.1. Brief overview of international experience in implementation of surveys on hospitalization appropriateness

Research of international literature showed availability of various approaches to evaluation of hospitalization appropriateness (*see Bibliography, № 1-8*). Design of the protocol/standard including list of criteria for hospitalization evaluation was, as a rule, the key step in the surveys. Criteria selection process took into account ***different parameters*** and combination of them:

1) ***Patient category:*** age group, department/pathology profile (e.g., internal medicine, surgery, trauma, gynecology, etc.);
2) ***Evaluation of one day of patient stay in hospital*** *(cross-sectional study)* ***or hospitalization case as a whole*** *(retrospective study)*;
3) ***Objective condition of the patient*** (e.g., fever, blood loss, coma, specification of diagnosis or DRG, etc.);
4) ***Occurrence of medical procedures and nature of these procedures*** (done by doctor, nurse);
5) ***Additional characteristics of hospitalization*** (emergency/planned, data, day and hour of admission, distance from home to hospital, length of stay, discharge criteria, etc.);
6) ***Additional characteristics of a patient*** (socio-demographic, education, marital status, employment/social support, etc.).

Selected criteria were used to estimate the percentage of inappropriate hospitalizations. For instance, in ***Canada*** there was a study undertaken to assess appropriateness of hospital stay of 852 patients aged from 0 to 20 (*Jane E. Gloor, Nianjan Kissoon and Gary I. Joubert, 1993*). Patients were categorized as follows: 0 - 2 months, 2 months - 1 year, 1 – 5 years, over 5 to 20. They evaluated 1 day in a month over 1 year using 26 selected criteria (list of criteria is given in Appendix 3). They examined all medical charts with the exception of medical charts of patients from resuscitation unit and newborns in norm (the norm implied the term over 35 weeks and weight of 2000 grams). Altogether, 475 medical days, 359 surgical days and 18 days of other types of services were evaluated. As a result, 24% of inappropriate hospitalizations were discovered.

Protocol of the survey implemented in ***India*** included mainly additional characteristics of hospitalization and the patient (*Aida Bianco, Claudia Pileggi, Francesca Trani and Italo F. Angelillo, 2003*). They evaluated 656 hospitalizations of children. Overall, 30% of hospitalizations and 55,5% of days of hospital stay were evaluated as inappropriate.

Methodology of the survey implemented in ***Spain*** (*David Oterino de Lafuente, Salvador Peir, Catalina Marchan, Eduard Portella, 1996*) implied examination of 611 medical charts of children under 7 for 2 complete months from every department of different profile in a selected hospital. Percentage of inappropriate hospitalizations constituted 43,9%.

In ***the United Kingdom*** (*Aneez Ismail, Julie Ann Quayle, Chris Roberts, 2000*) a large-scale survey of 3324 hospitalizations in 13 hospitals was implemented. All medical charts for 1 year were examined. Total number of charts was 3384 and of them 8% constituted inappropriate hospitalizations. Low percentage of inappropriate hospitalizations was associated with availability of advanced primary health care.

It should be mentioned that surveys on appropriateness of hospitalizations do not include analysis of prescribed medical procedures in hospital. Usually this kind of issues is considered in surveys on quality assessment of health services. Example of inpatient treatment is given in the context of survey implemented in Kazakhstan, Moldova and Russia (*Trevor Duke, Elena Keshishiyan, Aigul Kuttumuratova, at al*., *2006*).

At large, review of evaluation criteria of hospitalization appropriateness described in international literature showed that the majority of them require adaptation to be used in Kyrgyzstan context due to different terms of health organizations performance (level of equipment, difference in types and scope of services delivered at different levels of service delivery, etc.). Given survey borrowed the structure of those criteria, namely it used criteria related primarily to objective condition of the patient as a major list of criteria and it also used additional characteristics of hospitalizations and of the patients to draw a complete picture (page 8, paragraphs №5 and №6).

4.2. Criteria for hospitalization of children under 5

At the present time, primary health care specialists follow the underlying principles of Integrated Management of Childhood Illnesses strategy (WHO/UNICEF, 2001) and clinical protocols developed from this strategy (MOH KR Order №254 as of 30.05.2008 “On approval of new clinical protocols on IMCI”) when delivering care to children. List of approved clinical protocols includes the following four conditions:

- Unspecified purulent otitis media in children
- Unspecified acute tonsillitis
- Community-acquired pneumonia in children
- Acute enteric infections in children under 5

Alongside with information on diagnostics and treatment of most prevalent pathologies in children, the guidelines and clinical protocols define conditions that require hospitalization. These particular criteria were used as the basis for evaluation of hospitalization appropriateness among children under 5 in selected hospitals in Kyrgyzstan. The list consists of 33 criteria (Table 4.1.).

Table 4.1. Criteria for hospitalization of children under 5

№	Criteria for hospitalization
Common signs of hazard	
1	A child is not able to drink or suckle
2	A child has vomiting after any food intake or drinking
3	A child has cramps
4	A child is deferred or unconscious

Pneumonia	
5	Retraction of lower thorax at rest
6	Stridor at rest (wheezing as a result of obstruction of trachea and larynx)
7	Ineffective outpatient treatment within 3 days after the initiation of antibacterial therapy
8	Complications (toxic, septic, extrapulmonary)
9	Severe premorbid conditions (chronic nutrition disorder, 2nd and 3rd degree rickets, 2nd and 3rd degree anemia, malformations)
10	Pneumonia against the background of chronic conditions (nephritis, leukosis, systemic diseases of connective tissues, diabetes mellitus)
11	Unfavorable social factors (large families, asocial and needy families)
Diarrhea	
12	Hollow eyes
13	Not able to drink or drinks poorly
14	Skinfold smoothes very slow (within more than 2 seconds)
15	Ineffective therapy in ORP
16	Absence of effect from antibacterial therapy delivered at outpatient level
17	Severe nutrition disorder
18	Diarrhea for 14 and more days with dehydration (protracted, severe form)
19	Diarrhea for 14 and more days in infant (0-2 months) (protracted form)
20	Stool with mucus or blood in infant
21	Children from closed children's institutions
Fever (37,5º C and above)	
22	Fever for 5 and more days (protracted)
23	Stiff neck
24	Deep or major mouth ulcer
25	Aglia
Acute tonsillitis	
26	Not able to drink (pharyngeal abscess)
27	No drop in temperature or pain for 2 days against the background of outpatient treatment
Purulent otitis media	
28	Painful swelling behind the ear (mastoiditis)
29	Purulent discharge from the ear for 14 and more days
30	Late complications (2nd-3rd week) (rheumatic fever, post-streptococcal glomerulonephritis)
Nutrition disorder and anemia	
31	Obvious severe cachexia
32	Evident pallor of palms
33	Edema of both feet

4.3. Criteria for hospitalization of pregnant women

Certain difficulties were observed in the design process of the questionnaire containing criteria for hospitalization of pregnant women. By the time of initiation of this survey there were clinical protocols on obstetrical-gynecological care available in the country both for primary and secondary care levels which were approved by MOH KR Order №539 as of November 21, 2008 (see the list of disease units in Appendix 1). List of criteria for hospitalization of pregnant women was developed on the basis of these protocols. However these protocols did not include all pregnancy related pathologies. International recommendations and guideliness[5] contain more extensive list of indications for hospitalization of pregnant women. Yet, it was quite complicated to bring them to a common denominator and develop explicit criteria for all conditions.

Questionnaire pre-test showed that such diagnosis as “Threatened miscarriage” and “Threatened premature delivery” were prevailing conditions and yet there were no approved criteria for hospitalization for these conditions. Thus a decision was made to undertake situational analysis of all hospitalization cases over a certain period of time and to assess hospitalization criteria for hypertensive conditions and pyelonephritis as well as to analyze the criteria used as the basis for hospitalization under “Threatened miscarriage” and “Threatened premature delivery” diagnoses in order to develop specific recommendations. ”Premature delivery” diagnosis was excluded from hospitalization criteria since one of the inclusion conditions were cases not ended in delivery.

Thereby, a questionnaire was developed with explicit hospitalization criteria for hypertensive conditions and pyelonephritis (Table 4.2).

Table 4.2. Approved criteria for hospitalization of pregnant women

№	Criteria for hospitalization
Hypertensive disorders during pregnancy (hypertension of pregnant women, preeclampsia)	
1	High blood pressure (above 140/90) without proteinuria
2	Proteinuria (above 0,3 g/l) without hypertension
3	Hypertension (above 140/90) and proteinuria (above 0,3 g/l)
4	Hypertension/proteinuria in combination with any of the following symptoms: headache, abdominal and epigastric pains, flickering in the eyes, change in fetus motion activity, augmenting of edemas, reduced volume of urine)
Pyelonephritis gravidarum during pregnancy	
5	High body temperature (up to 39-40° C) in combination with leukocituria (over 2000 according to Nechiporenko)

[5] Integrated management of pregnancy and delivery: Delivery of care for complicated course of labor. Manual for doctors and nurses, WHO, 2000;

5. Analysis of hospitalizations among children under 5

5.1. General description of hospitalized children

Among 825 patients whose medical records were included in the sample the prevailing group consisted of children aged from 0 to 1 year old constituting 50.7% or 418 people (Figure 5.1.). Total number of boys was 58% and girls - 42 %.

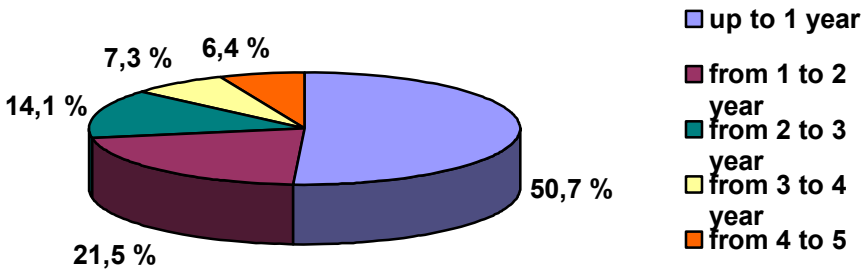


Figure 5.1. Distribution of children by age, in %, n - 825

As it was already mentioned, the survey covered only medical records of children hospitalized in general somatic departments. General condition of patients at the time of admission was assessed as mid-severe in 74.4% of cases (Figure 5.2.). Children aged from 0 to 1 year prevailed among children admitted in grave and very grave conditions.

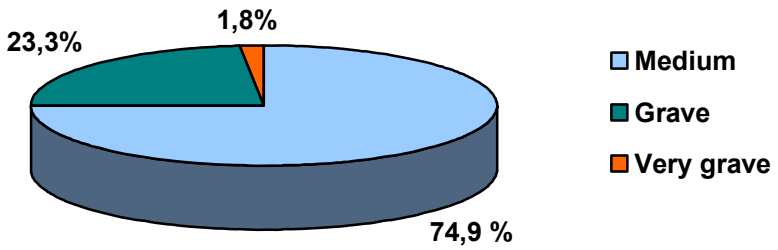


Figure 5.2. Distribution of children by condition severity, in %, n - 825

List of diagnoses specified in medical records as principal clinical diagnosis consisted of 28 different nosologies. Respiratory disease prevailed in all surveyed regions: up to 86,1% in age group of 0 – 1 year and 70,0% among children aged from 1 to 5 years (Table 5.1.).

Table 5.1. List of principal clinical diagnoses, n - 825

Principal clinical diagnosis	Under 1 year		1 to 5 years		Total
	Absolute figures	%	Absolute figures	%	Absolute figures
Respiratory diseases	360	86,1	285	70,0	**645**
Other	58	13,9	122	30,0	**180**
Total	**418**	**100**	**407**	**100**	**825**

Category "Other" mainly included such diseases as ARVI (93 persons), tonsillitis (27 persons), urogenital tract infections (12 persons), and by far less frequently – otitis, hypoxic encephalopathy, atopic dermatitis, streptococcal impetigo, epilepsy, diabetes mellitus and other (this list is comparable to concomitant diagnoses, presented in Table 5.3.). Respiratory diseases included four main diagnoses (Table 5.2.) where acute bronchial pneumonia was predominant diagnosis (48,7%).

Table 5.2. Data on respiratory diseases, by regions, n - 645

Diagnosis	Bishkek city		Chui oblast		Issyk-Kul oblast		Osh oblast		Total	
	Under 1	1 - 5	Under 1	1 - 5	Under 1	1 – 5	Under 1	1 - 5	Absolute figure	%
Acute laryngotracheitis and tracheobronchitis	-	-	3	2	16	11	2	4	**38**	**5,9**
Acute bronchitis	4	16	9	11	12	4	12	12	**80**	**12,4**
Acute obstructive bronchitis	33	24	16	7	76	44*	25	32	**213**	**33,0**
Acute bronchial pneumonia	17	51	3	17	100	56	32	38	**314**	**48,7**
Total	**54**	**91**	**31**	**37**	**204**	**115**	**71**	**86**	**645**	**100**

Note: including one case of bronchial asthma (Issyk-Kul oblast).

List of concomitant diagnoses is provided in Table 5.3. Most prevalent condition was anemia of 1st and 2nd degree.

It is important to note that definition of the same principal clinical diagnoses varied significantly in different health organizations and by regions. No single format was maintained, in other words in some cases there were no indication about severity of condition, in other – about clinical form, etc.

For example, the following options were observed for diagnosis "Anemia":

- "Deficient anemia";
- "Hypochromic anemia of mixed genesis";
- "Iron-deficient anemia".

And the following options for bronchial pneumonia:

- "Acute bilateral bronchial pneumonia, viral-bacterial etiology, grave severity";
- "Acute bilateral bronchial pneumonia, acute clinical course, grave severity";

- "Acute bilateral bronchial pneumonia, severe clinical course";
- "Acute bilateral bronchial pneumonia with obstructive syndrome".

Table 5.3. List of concomitant diagnosis, by regions, n - 825

Concomitant diagnosis	Bishkek city		Chui oblast		Issyk-Kul oblast		Osh oblast		Total	
	Under 1	1-5	Under 1	1-5	Under 1	1-5	Under 1	1-5		
	n - 64	n – 86	n- 40	n - 43	n-233	n-176	n - 81	n-102	n-825	%
Anemia 1st degree (91 – 110 g/l)	23	30	17	24	36	47	27	38	**242**	**29,3**
Anemia 2nd degree (below 90-71 g/l)	4	7	5	9	15	9	24	15	**88**	**10,7**
Anemia 3rd degree (below 70 g/l)	-	1	-	-	-	-	1	4	**6**	**0,7**
Congenital cardiac malformation	1	1	-	-	4	2	-	-	**8**	**1,0**
Hypoxic encephalopathy	5	2	2	2	6	1	16	3	**37**	**4,5**
Infantile cerebral paralysis	-	-	-	-	1	1	-	-	**2**	**0,2**
Epilepsy	-	2	-	-	-	-	-	-	**2**	**0,2**
Megalothymus	8	1	3	2	-	1	4	-	**19**	**2,3**
Acute gastroenteritis	-	-	-	-	2	-	1	-	**3**	**0,4**
Ascaridiasis, enterobiasis, lambliasis	-	2	-	4	2	11	-	2	**21**	**2,5**
Urogenital tract infection	-	4	-	3	4	3	-	-	**14**	**1,7**
Intrauterine infection	8	5	-	-	-	-	3	-	**16**	**1,9**
Atopic dermatitis	3	-	-	-	1	2	1	-	**7**	**0,8**

It should also be noted that establishment of principal and specifically concomitant diagnoses was not always substantiated by relevant entries in medical records in description of objective status or by laboratory data (e.g., for such conditions as anemia, hypoxic-ischemic encephalopathy, etc.).

Average length of stay was 10.6 days in Bishkek city, 8 days in Chui oblast, 8.5 days in Issyk-Kul oblast and 8.2 days in Osh oblast.

5.2. Period prior to hospital admission

Vast majority of children was referred for hospitalization by FGP/FMC (Figure 5.3.).

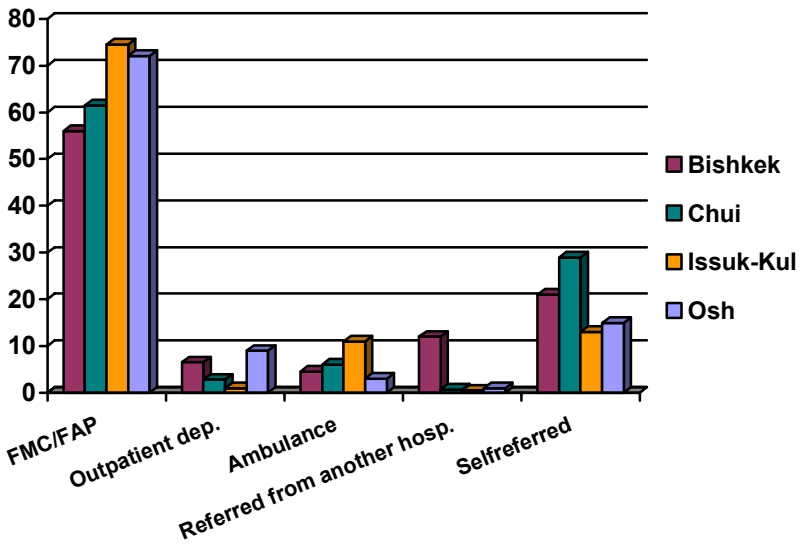


Figure 5.3. Referral for hospitalization, by regions, n - 825

In Bishkek city and Chui oblast this percentage proved to be lower as compared to other oblasts (56% and 61,5% accordingly). Highest percentage of self-referrals was observed in Chui oblast and Bishkek city (29% and 21% accordingly). Role of outpatient-diagnostic departments, clinical-diagnostic departments and ambulance service in referral of children for hospitalization was insignificant.

Doctors declare that many patients come to the hospital directly. Some of them have to be hospitalized and in such cases family members bring referral from FGP later. In the course of survey implementation the team observed how hospital doctors were compelled to consult outpatient patients, especially in health organizations of Bishkek city. Doctors in the regions suggest that overall awareness level of population regarding monitoring of child's health, intake of medicines and nursing during illness need to be improved. Many young parents, in particular mothers, do not have adequate skills on caring over child, especially over child under 1 year old.

Approximately two thirds of hospitalizations were routine hospitalizations with the following breakdown by time of day (Table 5.4.). Admission at night time may serve as indirect indication of severity (emergency) of condition at admission.

Table 5.4. Time of patient admission to hospital, n - 825

Region	from 8.00 a.m to 5.00 p.m.	after 5.00 p.m. and at night
	%	%
Bishkek city	67,8	32,2
Chui oblast	85,5	14,5
Issyk-Kul oblast	84,9	15,1
Osh oblast	85,8	14,2

Treatment at outpatient level prior to hospitalization was in majority of cases provided under the supervision of family doctor (Figure 5.4.).

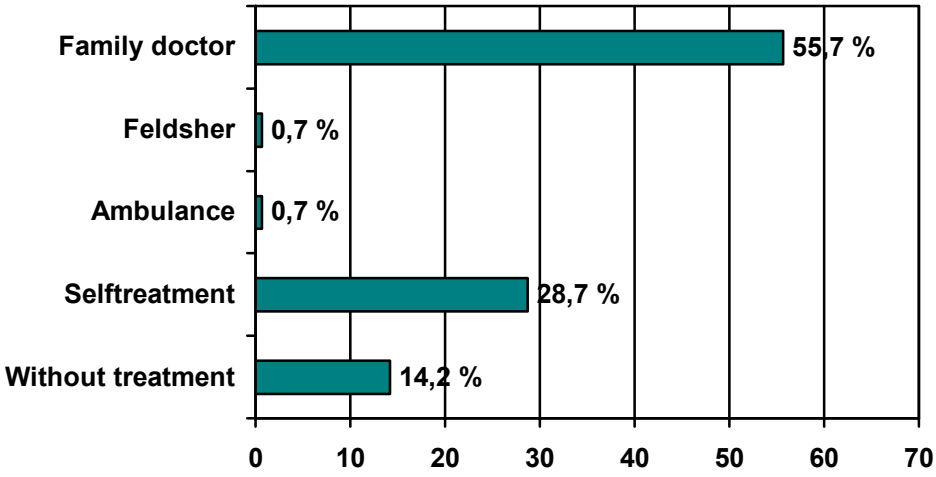


Figure 5.4. Treatment at pre-hospital stage, n – 825

At the same time, percentage of parents who practiced self-medication or did not take any action proves to be very high (42,9%). Medical history data suggest that some parents confined themselves to administering antifebrile and expectorant agents during initial days of the disease and sought inpatient care only if condition of a child worsened drastically. Other parents at their own discretion started to administer antibiotics oftentimes without maintaining dosage or frequency of medicine intake. In addition, it is important to say that ambulance care typically provided transportation to a patient while therapeutic manipulations included only prescription of lytic mixture.

Antifebriles such as Paracetamol, Panadol, Nurafen, antiflu, analgyn+diphenhydramine hydrochloride (i.m.) and aspirin are predominantly used at pre-hospital stage. Among antibacterial agents preference is given to aminopenicillins and penicillins (amoxicillin, ampicillin, ampiox, penicillin), cephalasporins (cefasolin, ceftriaxone) and sulfanilamides (biceptol, cotrimaxasol). From expectorant agents the following were used most frequently: ambrosan, mucaltin, lynax, cough lozenges, ambrobene).

Average number of days of illness prior to hospitalization among children was 5.3 days in winter period (January – February) and 6.4 days in summer period (July – August).

5.3. Assessment of selected criteria for hospital admission

Medical records of 825 children were examined in the course of this survey. Complaints, medical history, objective status, laboratory data and treatment prescribed prior to hospitalization were taken into account.

Entries in medical records show that **7 out of 33 approved criteria for hospitalization were used most frequently** among children under 5 (Table 5.5.). Patients with description of other criteria including criteria on diarrhea and otitis happened not to fall into the sample which is most likely relates to specificity of general somatic departments.

Highest percentage accounts for (1) fever for than 5 days; and (2) ineffective outpatient treatment of pneumonia within 3 days after the initiation of antibacterial therapy, in other words for criteria related to respiratory diseases.

Table 5.5. Frequency of criteria for hospitalization of children under 5, n - 825

№	Criteria	Bishkek city		Chui oblast		Issyk-Kul oblast		Osh oblast		Total	
		n-64	n-86	n-40	n-43	n-233	n-176	n-81	n-102	n-825	%
Common signs of hazard											
1	Cramps	-	1	2	1	6	10	2	3	**25**	**3,0**
2	Deferred or unconscious	-	1	-	-	1	2	-	-	**4**	**0,5**
Pneumonia											
3	Stridor at rest	5	4	3	2	15	11	-	3	**43**	**5,2**
4	Ineffective outpatient treatment within 3 days after the initiation of antibacterial therapy	11	16	6	7	22	15	12	18	**107**	**13,0**
Fever											
5	Temperature 37,5^{0}C and above for more than 5 days	10	29	19	27	92	55	23	36	**291**	**35,3**
6	Stiff neck	-	-	-	-	1	3	-	-	**4**	**0,5**
Acute tonsillitis											
7	Pharyngalgia for 2 days against the background of outpatient treatment	-	-	2	-	5	10	-	-	**17**	**2,1**

Thereby, slightly over one third of hospitalized children had fever for more than 5 days at the time of admission (291 persons, 35,3%). Yet, body temperature, as a rule, normalized within 1 – 2 days after the admission in virtually 90% of children. This figure does not include patients who had temperature for less than 5 days. The fact that some children had recurrent temperature rise at 3rd – 9th day of hospital stay (secondary infection case) comes under notice (Bishkek city and Chui oblast – in 14% of children, Issyk-Kul oblast – in 4,2%, Osh oblast – in 6%).

Among bronchopulmonary diseases the most significant cause for seeking hospital care was occurrence of rough breathing (“a child started to gasp”, “it was difficult to breath”, “couldn’t breath”, etc.). Stridor being one of the approved criteria constituted only 5.2% (43 out of 825 persons). However, medical records frequently describe other objective signs of respiration disturbances such as tachypnoea (38,5%), involvement of adjuvant sinews in respiration act including intercostal retraction (46,1%), difficult inspiration, protracted expiration or asthmatoid respiration (15,8%) (Table 5.6.).

Table 5.6. Frequency of respiration disturbance symptoms, n - 825

№	Criteria	Bishkek city		Chui oblast		Issyk-Kul oblast		Osh oblast		Total	
		n-64	n-86	n-40	n-43	n-233	n-176	n-81	n-102	825	%
1	Intercostal retraction	21	32	4	5	137	84	46	51	**380**	**46,1**
2	Tachypnoea (0-2 months – 60 per minute and more; 2-12 months – 50 per minute and more; 1-5 years – 40 per minute and more)	13	30	2	7	149	66	18	33	**318**	**38,5**
3	Asthmatoid respiration (protracted expiration, involvement of adjuvant sinews)	10	17	3	6	53	29	5	7	**130**	**15,8**

Each of these symptoms on a stand-alone basis is not an indication for hospitalization. For example, asthmatoid respiration (difficult inspiration, involvement of prelum abdominal, thoracic wall muscles, shoulder blade, lateral spinal muscles and neck muscles in respiration process) are treatable at outpatient level in accordance to IMCI strategy. Yet, according to expert opinions it is essential to distinguish between manifestations of inspiratory dyspnea (tachypnoea, difficult inspiration, involvement of neck muscles in respiration act, intercostal retraction, jugular fossa and supraclavicular fossa retraction) because in its presence the patient must be hospitalized. Examination of medical records proved that doctors did not accentuate such differentiation and, as a result, from medical entries it was not possible to distinguish between patients with inspiratory dyspnea and expiratory dyspnea. Moreover, such approved criterion as “retraction of lower thorax at rest” was almost never seen in medical records because doctors mainly write the following: “intercostal retraction”. In this respect, all three manifestations indicated in Table 5.6. were considered as ***obstructive syndrome***.

Furthermore, clinical picture of laryngotracheitis, bronchitis, obstructive bronchitis and bronchopneumonia for the most part had similar manifestations (fever, cough, rales, obstructive syndrome) while differences were mainly related to severity of general condition and data on laboratory-instrumental examination. Degree of instrumental examination of patients had variations by regions (Table 5.7.). Possibility to obtain diagnosis validation through X-ray in case of bronchopulmonary disease is greater in Bishkek city.

Table 5.7. Frequency of instrumental examinations, in %, n - 825

Examination	Bishkek city	Chui oblast	Issyk-Kul oblast	Osh oblast
Thorax X-ray	84	24	32,3	32,7
ECG	8	-	2,4	5,5
Echocardiogram	-	-	1,7	-
Ultra sound	14	16	-	7,1

It was also very difficult to collect data on such criterion as “unfavorable social factors”, because medical records contain not enough of objective information to qualify certain family as low-income or asocial.

5.4. Analysis of hospitalization appropriateness

Taking into account the fact that all the above-mentioned criteria predominantly relate to bronchopulmonary system diseases (acute laryngotracheitis, acute bronchitis, acute obstructive bronchitis and acute bronchopneumonia) it was decided to analyze hospitalization appropriateness using this group of diseases (645 persons out of 825). Table 5.8. lists all criteria combinations observed in the sample.

Table 5.8. Combination of criteria on bronchopulmonary diseases among children under 5, by regions, n - 645

№	Criteria	Bishkek city		Chui oblast		Issyk-Kul oblast		Osh oblast		Total	
		Under 1	1-5	Under 1	1-5	Under 1	1-5	Under 1	1-5	Abs. fig.	%
Acute laryngotracheitis, n – 38											
1	Cramps + fever and obstructive syndrome	-	-	-	-	1	-	-	-	**1**	**0,2**
2	Stridor at rest + obstructive syndrome	-	-	-	-	1	2	-	1	**4**	**0,6**
3	Fever + obstructive syndrome and cough	-	-	2	2	14	10	-	1	**29**	**4,5**
4	Obstructive syndrome and cough	-	-	1	1	1	-	1	-	**4**	**0,6**
Acute bronchitis, n – 80											
5	Fever + cough	1	5	12	8	1	-	3	6	**36**	**5,6**
6	Obstructive syndrome	-	5	6	-	-	-	2	-	**13**	**2,0**
7	Tachypnoea + cough	3	7	-	-	2	4	8	7	**31**	**4,8**
Acute obstructive bronchitis, n – 213											
8	Cramps + fever and obstructive syndrome	-	-	-	-	-	2	-	-	**2**	**0,3**
9	Fever + tachypnoea and obstructive syndrome	5	6	3	1	43	22	7	10	**97**	**15,0**
10	Obstructive syndrome + cough	30	18	-	-	17	9	18	22	**114**	**17,7**
Bronchopneumonia, n – 314											
11	Fever + tachypnoea, obstructive syndrome and cough	3	10	9	14	70	53	21	18	**198**	**30,7**
12	Obstructive syndrome + cough	14	23	6	16	25	2	10	20	**116**	**18,0**

The following conclusions may be drawn based on presented data:

- Combination of clinical manifestations № 1, 2 and 8 are absolute indications for hospitalization (cramps and stridor at rest);
- In combinations № 3, 5, 9 and 11 the leading criteria is fever. At least 291 out of 360 children falling into these categories had fever for more than 5 days, while the rest 69 children had fever for less than 5 days;
- Obstructive syndrome, tachypnoea and cough (combinations № 4, 6, 7, 10 and 12) are not officially approved criteria for hospitalization.

Thereby, out of 645 children with bronchopulmonary disease diagnosis only 298 (46,2%) were hospitalized in accordance with approved criteria, while 347 children (53,8%) did not correspond to these criteria.

5.5. Inpatient treatment

Analysis of treatment provided in accordance with three selected indictors was also undertaken among children with respiratory diseases.

Indicator 1. Average amount of drugs prescribed per patient

Table 5.9. Average amount of drugs prescribed per child, n-645

Region	Acute bronchitis		Laryngotracheitis, tracheobronchitis		Acute obstructive bronchitis		Bronchopneumonia	
	Under 1	1-5	Under 1	1-5	Under 1	1-5	Under 1	1-5
	n-37	n-43	n-21	n-17	n-150	n-63	n-152	n-162
Bishkek city	4,3	4,4	-	-	5	4,4	5,9	4,4
Chui oblast	5,1	4,2	5,3	4,9	5,4	5	5,7	5,2
Issyk-Kul oblast	7	7,5	7,4	7,7	5,8	9,6	8,1	8,5
Osh oblast	11	9,3	-	11	11,1	8,6	13,6	10,2
Total	**6,9**	**6,4**	**6,4**	**7,9**	**6,8**	**6,9**	**8,3**	**7,1**

Overall, average amount of drugs prescribed per child for different conditions ranged from 6.4 to 8.3, which is undoubtedly higher than recommended benchmarks. According to WHO guidelines, prescription of more than 3-4 medicines is qualified as excessive prescription (polypragmasy). One fact comes under notice: the more severe is the condition of a child, the larger amount of drugs is prescribed to him. Situation in Bishkek city and Chui oblast is more favorable (4,2-5,9) as compared to Issyk-Kul oblast (5,8-9,6) and especially in Osh oblast (8,6-13,6). For example, in Osh oblast 13.6 various drugs were prescribed to children under 1 with bronchopneumonia with major share are administered parenterally.

Indicator 2. Percentage of antibiotics prescriptions

Note that up-to-date guidelines[6] recommend prescribing antibacterial medicines for bronchopulmonary diseases only in case of bronchopneumonia because there pathogenic agent is bacterial infection (E.coli and other Gram-negative flora, Gram-positive flora – staphylococcus, pneumococcus, hemophilic bacillus, etc., atypical flora – mycoplasma, chlamydia).

In all other cases (laryngotracheitis, tracheobronchitis, obstructive bronchitis and bronchitis without obstruction) the disease, as a rule, is caused by viruses and thus prescription of antibiotics is unreasonable[7]. Preference in treatment should be given to pathogenetic and symptomatic medications (glucocorticosteroids, bronchodilators, antifebriles). In the

[6] (i) BTC guidelines for the management of community acquired pneumonia in children. British Thoracic Society, 2009, www.brit-thoracic.org;
(ii) Clark, J.E., Hammal, D., Hampton, F. et al. (2007). Epidemiology of community-acquired pneumonia in children seen in hospital. Epidemiology and Infection 135 (2), 262-269;
(iii) Alberta Medical Association (2008) Guideline for the diagnosis and management of croup. Alberta Medical Association. www.topalbertadoctors.org.

[7] www.cks.nhs.library

framework of current survey ***indicator "Percentage of antibiotic prescription" reached 100%,*** which contradicts international recommendations.

List of antibacterial medicines prescribed for bronchopneumonia is provided below.

Table 5.10. Antibiotics prescribed for acute bronchopneumonia, n-314

Antibiotics	Bishkek city		Chui oblast		Issyk-Kul oblast		Osh oblast		Total	
	Under 1	1 - 5	Under 1	1 – 5	Under 1	1 - 5	Under 1	1 - 5		
	n-17	n-51	n-3	n-17	n-100	n-56	n-32	n-38	Abs.fig.	%
Aminopenicillins (Ampicillin, Amoxicillin)	4	10	1	4	91	48	7	9	**174**	**55,4**
Cephalosporins of I generation (Cefasolin)	2	21	3	5	30	28	13	11	**113**	**36,0**
Cefalexin		1							**1**	**0,3**
Cephalosporins of III generation (Ceftriaxone, Ceftazidime, Cefotoxime)	8	21	5	13	5	2	16	22	**92**	**29,3**
Aminoglycosides (Gentamicin, Amikacin)	3	6	-	-	13	18	1	2	**43**	**13,7**
Natural penicillins	-	1	-	-	11	5	-	-	**17**	**5,4**
Combined penicillins (Ampiox)	-	-	-	-	-	-	4	6	**10**	**3,2**
Classic fluoroquinolones (Ciprofloxacin)	-	1	-	-	-	2	2	2	**7**	**2,2**
Macrolides (Erythromycin, Midecamycin, Azithromycin, Clarithromycin)	2	4	-	-	2	4	3	6	**21**	**6,7**
Lincosamides (Lincomycin)	3	7	-	-	-		1	-	**11**	**3,5**
Nitraimidazoles (Metronidazole)	-	1	-	-	-	-	-	1	**2**	**0,6**
Sulfanilamides (Biceptol, Contrimazole)	-	-	-	-	2	-	1	2	**5**	**1,6**

Below are comments on the list of antibiotics used for bronchopneumonia:

- In treatment of bronchopneumonia preference for the most part was given to parenteral (i.m.) administration of aminopenicillins, particularly ampicillin, although international guidelines for this group recommend prior use of amoxicillin administered orally which is, according to international recommendations, considered to be safer way of administration;

- It is necessary to point out the observed pattern of prescription of III generation cephalosporins for bronchopneumonia as first choice medicine without consideration of recommendations provided in international clinical guidelines (there are examples when they were prescribed at outpatient level and for children in older age-group). This group of medicines is a reserved group and thus strict adherence to indication for their application in pediatrics will help to prevent resistance development and retain high activity of III generation cephalosporins in treatment of severe infections[9];
- Prescription of fluoroquinolones (Ciprofloxacin) is usually not recommended for respiratory diseases in children or they can be prescribed by vital indications in case of absence of safer alternative as stated in the Kyrgyz Republic Formulary of Essential Drugs (2003), British National Formulary (2008) – www.bnf.org, and WHO Formulary;
- Sulfanilamides (sulfamethoxazole + trimethoprom - biceptol) are also reserved medicine used, for example, for treatment of pneumocystosis against the backround of HIV/AIDS.

Below are comments on regimen of antibiotics prescription for bronchopneumonia:

- Inpatient treatment of pneumonia in children presumes parenteral administration of antibiotics (staged therapy[8]: i.v. 2-3 days and then transfer to oral administration). International recommendations suggest intravenous administration of antibiotics only in cases when a child has disturbed absorption (e.g., vomiting) or in the presence of dangerous signs or symptoms. Finding from this survey show that antibiotics were administered parenterally (only i.m.) throughout the course of treatment which indicates poor clinical management;
- Analysis of treatment sheets revealed that one and the same drug was prescribed in parallel but under different names: e.g., Ceftrex (brand) and Ceftriaxone (generic);
- Moreover, there were found cases when disease history showed previous prescription of antibiotics from one group without any positive effect but after hospital admission the same antibiotic was prescribed again: e.g., ampicillin or penicillin prescribed before hospitalization and same ampicillin prescribed in hospital, or a child was treated with ceftriaxone without any success and yet they prescribed cefazolin to him in hospital;
- It is essential to mention that antibacterial medicines are divided into dosage-dependant (aminoglycoside (Gentamicin)) and time-dependant (all other groups of antibiotics). Findings show that frequency of antibiotic administration was not maintained (ampicillin – 2 times a day instead of 4 times a day) and dosages per kilogram of body weight were not followed.

As it was already mentioned, antibiotics were prescribed for laryngotracheitis, bronchitis and obstructive bronchitis in 100% of cases without any indications and thus the above comments may be applied to these cases as well.

It is worth mentioning individually, that for laryngotracheitis the following medicines were prescribed along with antibiotics: bronchodilators (salbutamol, aminophylline) – in 100% of cases, hormonal medicines – prednisolone, i.m. for 32 persons and dexamethazone, i.m. for 5 persons and no prescriptions – 1 person. At the same time, international clinical guidelines recommend to administer compulsory short course of hormonal therapy with

[8] Smolensk Institute of Antibiotic Therapy website: www.antibiotic.ru

preference given to dexamethazone[9], since it has longer biological half-life and results in by far less relapses and more frequent favorable outcome.

Indicator 3. Percentage of injections prescriptions

This indicator was accounted for 100%, .i.e., all hospitalized children had parenteral prescriptions (i.m. and i.v.). Table below shows the share intravenous injection prescriptions as percent of all parenteral prescriptions.

Table 5.11. Share of children receiving intravenous injections, in %, n-645

Region	Acute bronchitis		Laryngotracheitis, tracheobronchitis		Acute obstructive bronchitis		Bronchopneumonia	
	Under 1	1-5	Under 1	1-5	Under 1	1-5 лет	Under 1	1-5
	n-37	n-43	n-21	n-17	n-150	n-63	n-152	n-162
Bishkek city	24	33	-	-	34	9,7	13	5,3
Chui oblast	17	23	34	57	43	36	9	6,4
Issyk-Kul oblast	57,1	36,4	33,3	44	44	49	66,2	62
Osh oblast	54,2	34	-	71	76,3	77	80	78,3

Highest percentage of intravenous prescriptions was observed in Osh oblast: from 54,2 to 80% among children under 1 and from 34 to 78,8% among children aged 1 to 5.

This fact is conditioned by excessive prescription of infusion solutions (REopolyglucin, Glucose 5%, 10%, saline solution, Infesol, Dissol), electrolytes (potassium chloride, calcium gluconate), hormonal agents (Dexamethazone, Prednisalon, Hydrocortisone), vitamins (vitamin C, vitamin PP, vitamins B_1, B_6, B_{12}) and other groups of medicines (diphenhydramine hydrochloride; aminophylline; magnesium sulphate; metrid; Novocain; Analgin; Furosemide; Diazepam; Actovegin; Piracetam, Cavinton, Cerucal). No evidence-based indications of efficacy of the majority of the above-mentioned medicines were found in international guidelines/clinical protocols and Russian standards of health care delivery for bronchopneumonia. Longest list of medicines administered parenterally was found in Osh oblast (25 entries). Similar list from Issyk-Kul oblast had 17 entries, Chui oblast – 6 entries and Bishkek city – 6 entries.

5.6. Summary

- In all regions, patients hospitalized to general somatic departments were predominantly comprised of children with respiratory diseases (645 persons out of 825, or 78,2%) and aged from 0 to 1 year (418 persons out of 825, or 50,7%);

- High percentage of parents either practiced self-medication or did not take any actions (42,9%). In the opinion of hospital doctors, parents do not have sufficient knowledge and skills to recognize severity of condition and care over child in case

[9] (1) Efficacy of a small dose of oral dexamethazone in croup, Biomedical Research 16 (1), 65-72, 2005;

(2) Fifoot, A.A. and Tong, J.Y. (2007) Comparison between single doze oral prednisolon and oral dexamethazone in the treatment of croup: a randomized, double blinded clinical trial. Emegency Medicine Australia, 19 (1), 51-58.

of disease. There remains high percentage of self-referrals especially in hospitals on Bishkek city and Chui oblast;

- The approved list of criteria requires revision for the following reasons. First, many of them are barely seen in daily practice, even with specificity of general somatic department. For example, description of only 7 out of 33 approved criteria was found in the sample of 825 medical records. Second, it appears to be difficult to find objective verifications for some criteria because of lack of entries is medical records (e.g., unfavorable social factors). Third, analysis of hospitalizations among children under 5 showed large number of patients with obstructive syndrome (up to 46.1%) while therapeutic approach for this condition is not specified anywhere and same applies to clinical protocols. Yet, entries in medical records suggest that this condition was one of the decisive reasons to seek hospital care and, moreover, parents in such cases are poorly aware of therapeutic approach;

- Based on criteria for hospitalization verified by entries in medical records, namely (1) cramps, (2) stridor at rest, (3) fever above 37,5°C for more than 5 days and (4) ineffective outpatient treatment within 3 days after the initiation of antibacterial therapy it was identified that 298 children (46.2%) out of 645 children with bronchopneumonia diagnosis were hospitalized in accord with approved criteria and 347 children (53.8%) did not comply to these criteria;

- Medical procedures prescribed to hospitalized children require essential adjustment and control. Analysis of treatment for compliance to three indicators on appropriate prescription of drugs (WHO, 1997) revealed presence of the following: (1) polypragmasy (e.g., 13.5 different medicines were prescribed to children under 1 for bronchopneumonia); (2) irrational antibacterial therapy (prescription without indications, use of reserve medicines as first choice medicines, simultaneous prescription of antibiotics from the same group of drugs, nonobservance of drug administration frequency and dosage); (3) excessive administration of parenteral interventions – in 100% of cases in the context of current survey with 80% comprised of intravenous infusions (Osh oblast).

6. Analysis of hospital admissions among pregnant women

6.1. General description of pregnant women

As it was indicated earlier, analysis of hospitalizations was done only in pregnancy pathology departments. Patients from obstetric and resuscitation units were included in the sample. General description of pregnant women by age and pregnancy terms is provided in Table 6.1.

Table 6.1. General description of hospitalized pregnant women, n - 755

Regions	Average age, years ±	Pregnancy term, weeks ±
Bishkek city	27,4±6,2	19,0±10,3
Chui oblast	25,3±5,2	23,5±7,3
Osh oblast	24,0±4,8	24,6±10,0
Issyk-Kul oblast	24,4±6,2	30,1±7,1

Table 6.2. describes general list of principal clinical diagnoses.

Table 6.2. Description of principal clinical diagnoses, by regions, n - 755

№	Principal diagnoses	Bishkek city	Chui oblast	Issyk-Kul oblast	Osh oblast
		n - 172	n - 41	n - 343	n - 199
1	Threatened miscarriage or spontaneous abortion (under 22 weeks)	73 (42,4%)	10 (24,4%)	44 (12,8%)	63 (31,7%)
2	Threatened premature delivery (after 22 weeks)	27 (15,7%)	23 (56,1%)	141 (41,1%)	61 (30,7%)
4	False labor pains / labor precursors	7 (4,1%)	4 (9,8%)	38 (11,1%)	7 (3,5%)
5	Gestational hypertension / preeclampsia	15 (8,7%)	1 (2,4%)	42 (12,2%)	12 (6%)
6	Pyelonephritis gravidarum	20 (11,6%)	2 (4,9%)	56 (16,3%)	17 (8,5%)
7	Vomiting of pregnant	18 (10,5%)	-		9 (4,5%)
8	Anemia	1 (0,6%)	--	10 (2,9%)	11 (5,5%)
9	Fetoplacental insufficiency / intrauterine fetal hypoxia	4 (2,3%)	1 (2,4%)	2 (0,6%)	4 (2%)
10	Isthmic-cervical incompetence	3 (1,7%)	-	-	1 (0,5%)
11	Uterine scar after C-section	2 (1,2%)	-	2 (0,6%)	3 (1,5%)
12	Extragenital pathology (from respiratory system side – ARVI, acute pharyngitis, bronchitis)	1 (0,6%)	-	1 (0,3%)	8 (4,1%)
13	Extragenital pathology (from cardiovascular system side, diabetes mellitus)	1 (0,6%)			1 (0,5%)
13	Other pathologies (intracranial pressure, varicosity, clamidiosis, ovarian cyst)			4 (1,2%)	1 (0,5%)
14	Gestational edemas			3 (0,9%)	1 (0,5%)

Most frequently observed pathological conditions in pregnant women in all regions were the following:

- Threatened miscarriage or spontaneous abortion – 12,8 - 42,4%;
- Threatened premature delivery – 15,7 - 56,1%;
- Pyelonephritis gravidarum – 4,9 – 16,3%;
- Gestational hypertension / preeclampsia – 4,9 – 12,2%;
- False labor pains / labor precursors – 3,5 – 11,1%.

Unit weight of other diagnoses varies depending on the region. For example, such diagnosis as “Vomiting of pregnant” was specific for Bishkek city and Osh oblast with unit weight being relatively high and constituting 10.5% in Bishkek city and 4.5% in Osh oblast. Another feature of the two mentioned regions was occurrence of such diagnosis as “Isthmic-cervical incompetence”. Patients with this diagnosis were hospitalized with a purpose of surgical correction. This probably relates to the fact that health organizations in Bishkek city and Osh oblast deliver more highly-specialized services as compared to rayon hospitals. Composition of principal diagnosis also contained patients with diagnosis “Uterine scar after C-section” (except for Chui oblast) who were hospitalized for the

purpose of consultation with surgeon about possibility of having repeated C-section. Diagnoses “Fetoplacental insufficiency” and “Intrauterine fetal hypoxia” were registered in all regions and their unit weight ranged from 0,6 to 2,4%. Extragenical diseases (from respiratory system side and cardiovascular system side) were also observed in the composition of hospitalizations. High rate of respiratory system diseases (ARVI, acute bronchitis and pharyngitis) was observed in Osh oblast.

From concomitant disease “Anemia” was most frequently obaserved (87%). Wording of this diagnosis had different variations (“Deificient anemia”, “Iron-deficient anemia” or “Anemia of pregnant”). Pyelonephritis was established as concomitant diagnosis in 54% of hospitalization cases (chronic pyelonephritis). Colpitis of different origin was also widely present as concomitant condition or pregnancy complication (gestational colpitis).

6.2. Description of hospital admissions

Referrals and length of hospital stay

Analysis of medical records of pregnant women revealed comparatively high level of referrals from private clinics (7.18%) and self-referrals (34.36%) in Bishkek city. Moreover, relatively low level of referrals from FMC/FGP (51.28%) was observed in Bishkek city as compared to Osh (74,13%), Issyk-Kul (60,91%) and Chui (62,5%) oblasts (Table 6.3.). No significant difference was revealed in terms of length of hospital stay: Bishkek city (7,3±4,75), Chui oblast (6,5±4,8), Issyk-Kul oblast (6,84±2,42) and Osh oblast (7,2±5,18).

Table 6.3. Referral for hospitalization, n - 755

Region	Referral			
	Ambulance service	FMC/FGP/FAP	Private clinic	Self-referral
Bishkek city	7,2%	51,3%	7,28%	34,36%
Chui oblast	2,4%	62,5%	2,8%	32,3%
Issyk-Kul oblast	8,2%	60,91%	1,4%	29,55%
Osh oblast	1,9%	74,1%	2,9%	20,89%

Quality of medical charts recording

Data collection and analysis in the process of survey implementation was largely complicated by poor quality of medical charts recording. There was an impression that entries in medical records of the patients did not reflect their objective condition and dynamics to full extent at the time of admission. Below are several excerpts from medical records.

- Diagnosis at admission: “Pregnancy, 23 weeks. Chronic pyelonephritis (ultrasound examination) in acute condition”. Complaints: back pain, dysuria; objectively: normal body temperature, Pasternatsky's symptom – positive, urine test shows leukocituria and proteinuria below 0,3 g/l. Clinical diagnosis remains as “Chronic pyelonephritis, acute condition”. Treatment sheet reflects prescription of antibacterial medicine and lytic mixture (analgin + diphenhydramine hydrochloride) for fever. Description of objective examination of pregnant woman does not have such criteria as fever. Yet,

prescribed lytic mixture “for fever” gives ground for assumption of fever in pregnant woman at admission. Occurrence of such cases complicates the process of objective evaluation.

- Diagnoses “Intrauterine fetus hypoxia”, “Fetoplacental insufficiency”, “Oligoamnios” and “Hydramnios” were established only on the basis of ultrasound examination results (USE). At the same time, objective status description did not contain any other deviations from sound condition and the description itself complies to sound condition. Yet, there are explicit criteria for diagnosis validation for “Fetoplacental insufficiency” and, in fact, in case of severe FPI pregnant woman needs to be hospitalized for meticulous examination and reasons identification. In our case, patients were hospitalized solely for administration of drugs which were not evidence-based.

- Diagnosis “Gestational edema”: edemas, according to international publications, may be a normal manifestation of pregnancy if they are not followed by high proteinuria or hypertension (in medical records no other symptoms besides edemas were specified).

- It was difficult to evaluate diagnosis “Threatened premature delivery” because there was no exact description of nature of contractions (duration, interval). It caused great difficulties in evaluation since this diagnosis was one the most prevalent groups in general composition of diagnoses.

- Overall, medical records contain very scarce data on objective examination of pregnant women. Sometimes important piece of information was missing in assessment of some conditions. For example, section on objective examination in “Preeclampsia” and “Gestational hypertension” did not have data on arterial blood pressure at admission. It is necessary to note that wording and validation of clinical diagnoses are not standardized. Yet, these blocks are decisive for delivery of effective health services of good quality to pregnant women.

Correctness of establishment of certain diagnoses

Possibilities of laboratory-instrumental diagnostics in pregnancy pathology departments had no major differences by regions. Primary list of examinations included general clinical investigations (complete urine test, complete blood test, Nechiporenko sedimen count), blood test for HIV/AIDS, biochemical screen (according to indications), smear from parturient canal, ultrasound examination (if available). In general, this list complies with facilities of health organizations at primary care level. However, pregnancy pathology departments as more specialized institutions must have better facilities for diagnostics of pregnancy pathologies. Analysis of validation of such diagnoses as “Pyelonephritis” and “Anemia” was undertaken in order to assess depth of examination and quality of pregnancy management.

It is necessary to note that urogenital tract infections, “Pyelonephritis” in this particular case, can cause conditions threatening life of a mother and her fetus. Thus, it is essential to ensure accurate detection of this disease and adequate therapy at early stage. Establishment of this diagnosis requires presence of (1) fever and (2) leukocituria (leukocytes <2000 by Nechiporenko) according to clinical protocol on pyelonephritis gravidarum. Survey findings discovered that criteria required for diagnosis were present only in 13,6 - 50% of women with pyelonephritis (Table 6.4.). In all other cases diagnosis was established on the basis of USE results and leukocituria. Although it is known that in majority of cases leukocituria can be conditioned by, for example, nonobservance of urine collection rules (shortcomings of instruction, clean containers, etc.). Moreover, in hospital

settings this diagnosis requires validation by urine inoculation for microflora with antibiotic sensitivity test. Antibacterial medicines were prescribed to 90% of patients with "Pyelonephritis" diagnosis. Based on these findings we can conclude that "Pyelonephritis" diagnosis in pregnant women was not always established correctly.

Table 6.4. Validation of pyelonephritis gravidarum, n-141

Criteria	**Bishkek city (n=21)**		**Chui oblast (n=2)**		**Issyk-Kul oblast (n=74)**		**Osh oblast (n=44)**	
	abs.	%	abs.	%	abs.	%	abs.	%
Fever (39-40 C) + leukocituria (by Nechoporenko)	10	47,6	1	50	14	18,9	6	13,6
Back pain + leukocituria / USE results	11	52,4	1	50	60	81,1	38	86,4

Survey findings suggest general picture of poor diagnostics quality of anemia in pregnant women. Overall number of pregnant women with anemia of various degrees is relatively hight (Table 6.5.).

Table 6.5. Diagnostics of anemia in pregnant women, n - 755

	Bishkek city (n=42)		Chui oblast (n=25)		Osh oblast (n=112)		Issyk-Kul oblast (n=177)	
	abs.	%	abs.	%	abs.	%	abs.	%
Anemia, 1st degree (based on hemoglobin level test)	32	76,2	21	84	62	55,4	97	54,8
Anemia, 2nd degree (based on hemoglobin level test)	7	16,7	2	8	35	31,3	49	27,7
Anemia, 3rd degree (based on hemoglobin level test)	0	-	0	-	8	7,1	19	10,7
"Anemia" diagnosis without low hemoglobin level	3	7,1	2	8	1	0,9	12	6,8
Low hemoglobin level (<110 g/l), without establishment of "Anemia" diagnosis	18	-	0	-	43	-	58	-

Unit weight of pregnant women with severe degree of anemia was observed in Osh oblast and constituted 74% with the account of women without established diagnosis. In Issyk-Kul and Chui oblasts this figure was 64 and 58% accordingly. In Bishkek city anemia was detected in 33% of women. Particular attention should be paid to the number of pregnant women with low level of hemoglobin (<110 g/l) for which anemia diagnosis was not established. Thereby, findings of undertaken survey show that diagnostics quality of anemia in pregnant women is very poor and requires effectual measures to be taken.

6.3. Analysis of hospitalization appropriateness

Assessment of hospitalization appropriateness among pregnant women included following conditions: "Pyelonephritis" and "Hypertensive disorders".

Table 6.6. Detection of approved criteria on hypertensive disorders (hypertension of pregnant, mild and severe preeclampsia) in pregnant women hospitalized in pregnancy pathology department

Criteria	Bishkek city		Chui oblast		Issyk-Kul oblast		Osh oblast		Total	
	n - 15		n - 2		n - 42		n - 12			
	Abs.fig.	%	Abs.fig	%	Abs.fig	%	Abs.fig	%	n-71	%
High blood pressure (above 140/90 mm m.c.) without proteinuria	9	60	1	50	17	40,5	5	41,7	**32**	**45,1**
Proteinuria (above 0,3 g/l) without hypertension	-	-	-	-	1	2,4			**1**	**1,4**
Hypertension + proteinuria (above 0,3 g/l)	5	33,3	-	-	8	19,1			**13**	**18,3**
Total	**15**	**93,3**	**1**	**50**	**23**	**61,9**	**5**	**41,7**	**46**	**64,8**

Detection rate of approved criteria on hypertensive disorders averaged to 64,8% (Table 6.6). Remaining 35,2% of hospitalized patients with hypertensive disorders did not comply to criteria approved by clinical protocols on these conditions. For example, there were patients with “Hypertension of pregnant” diagnosis whose blood pressure level remained within normal range during the whole hospitalization period but who had proteinuia <0.1 g/l or edemas. However, nature of occurrence of these edemas was not described anywhere (sudden, generalized, etc.).

Table 6.7. Detection of approved criteria on pyelonephritis (acute pyelonephritis, gestational pyelonephritis, chronic pyelonephritis in acute condition) in pregnant women hospitalized in pregnancy pathology department

Criteria	Bishkek city		Chui oblast		Issyk-Kul oblast		Osh oblast		Total	
	n - 20		n - 2		n - 56		n - 17			
	abs.fig.	%	abs.fig.	%	abs.fig.	%	abs.fig.	%	n-95	%
Fever (39-40º C) + leukocituria (> 2000)	10	50	1	50	14	25	6	35,3	**31**	**32,6**

Detection rate of approved criteria on pyelonephritis was considerably lower than on hypertensive disorders and averaged to 32,6%. It should be noted, that total number included only diagnosis specified as principal clinical diagnosis. It should also be mentioned that in majority of cases pyelonephritis diagnosis was established based on USE results. Such cases were clinically validated by low back pain (100%), dysuria (78%) and positive Pasternatsky's symptom (95%). Leukoceturia was observed in almost 100% of cases but the leukocytes level did not always correspond to diagnostics criteria (> 2000). Hence it can be stated that “Pyelonephritis” diagnosis is not always grounded on approved criteria and that overdiagnosis of pyelonephritis gravidarum is in place.

Evaluation of hospitalization appropriateness in regard to other conditions/diagnoses such as “Threatened miscarriage” and “Threatened premature delivery” was not feasible. One of the reasons was lack of clinical protocols or other standards approved and recognized in our country which would help to identify list of criteria on these conditions. Another reason was related to insufficient information due to incomplete and poor-quality description of patient condition. There is an approved and recognized clinical protocol on “Premature delivery” available in the country. It gives explicit description of manifestations of this condition (nature of contractions – duration, frequency; changes in uterine cervix; etc.). However, medical records with “Threatened premature delivery” diagnosis contain only such descriptions as: “spasmodic abdominal pains” (in 100% of cases) and “uterus hypertonus” without anything being said about frequency nature and ultrasound examination results (21%) without further specification.

Table 6.8. Detection rate of other symptoms in pregnant women, n-755

Criteria	Bishkek city (n=73/27)		Chui oblast (n=9/23)		Issyk-Kul oblast (n=44/141)		Osh oblast (n=63/61)		Total (n=178/252)	
	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%
Threatened miscarriage/abortion (spontaneous abortion, stillbirth) at early pregnancy term (below 22 weeks) *										
Blood-tinged discharge / parturient canal hemorrhage + low abdominal pain (spasmodic, drawing)	4	5,5	1	11,1	4	9,1	10	15,9	**19**	**10,7**
Low abdominal pain (spasmodic, drawing) + hypertonus / uterus erethism / USE results	63	86,3	7	77,8	32	72,7	47	74,6	**149**	**83,7**
Total	**67**	**91,8**	**8**	**88,9**	**36**	**81,8**	**57**	**90,5**	**168**	**94,4**
Threatened premature delivery (after 22 weeks of pregnancy): 22-27 weeks – very early delivery; 28-33 weeks – early delivery; 33-36 weeks – premature delivery**										
Blood-tinged discharge / amniotic fluid leakage + low abdominal pain + hypertonus / uterus erethism / USE results	8	29,6	2	8,7	4	2,8	6	9,8	**20**	**7,9**
Low abdominal pain (spasmodic, drawing) + hypertonus / erethism / USE results	15	55,6	16	69,6	128	90,8	51	83,6	**210**	**83,3**
Total	**23**	**85,2**	**18**	**78,3**	**132**	**93,6**	**57**	**93,4**	**230**	**91,3**

Thereby, the following can be said in regard to evaluation of hospitalization appropriateness:

- Rate of hospitalization appropriateness compliant to approved criteria was 64.8% for hypertensive disorders and 32.6% for pyelonephritis among pregnant women;
- It was difficult to estimate hospitalization appropriateness rate for “Threatened miscarriage” and “Threatened premature delivery” diagnoses due to lack of explicit and approved criteria. Yet, this rate was estimated to be 7.9% and 10.7% accordingly based on objective criteria that were likely to threaten pregnancy;
- It was also difficult to estimate hospitalization appropriateness rate on other conditions due to absence of approved criteria for hospitalization of pregnant women.

6.4. Treatment

In the context of this survey there was an opportunity to analyze quality of delivered health care services from the point of view of safety and efficiency of treatment. To date no standardized tool has been approved for implementation of such kind of evaluation. Nonetheless, some aspects of pharmacotherapy were analyzed based on data from international recommendations. Certain conclusions may be drawn from those aspects. Safety of delivered therapy was evaluated using medication of threatened miscarriage (Table 6.6.).

Table 6.9. General description of pharmacotherapy of pregnant women with threatened miscarriage

	Bishkek city (n=88)	Chui oblast (n=25)	Issyk-Kul oblast (n=41)	Osh oblast (n=67)
Amount of drugs per patient	4,3	4,1	2,9	2,8
Total amount / % of drugs in parenteral form	99/26,2%	12/29,3%	39/34,2%	70/37,6%
Ratio of i.m. and i.v. injections, in %	45/54	2/10	10/29	26/44

Survey findings show that pregnant women with “Threatened miscarriage” diagnosis had from 41 to 378 medicines prescribed in different organizations. Converted per woman this figure appeared to be largest in Bishkek city (4,3) and Chui oblast (4,1). Same figure was lower in Osh (2,8) and Issyk-Kul oblasts. On the other hand, percent of parenteral administration of medicines was higher in Osh (37,6%) and Issyk-Kul (34,2%) oblasts as compared to Bishkek city (26,2%) and Chui oblast (29,3%). Thereby, on average 1.1 medicines was administered parenterally to each woman with this diagnosis. Prescription of drugs for the purpose of maintenance of pregnancy does not have evidence base. Findings of some studies indicate positive effect from prescription of bed regime although no randomized studies on efficiency of this approach have been conducted yet. Hormonal replacement therapy (progesterone, estrogen) also does not have evidence base regarding maintenance of pregnancy.

Treatment of urogenital tract infections and range of antibacterial medicines prescribed for this condition were analyzed to evaluate efficiency of delivered therapy. Findings suggest that in Chui oblast and Bishkek city preference in treatment of urogenital tract infections is given to ***combination*** of antibacterial medicines as against Osh and Chui oblasts.

It was difficult to determine why some antibacterial drugs were favored against the others since there were no entries in medical records containing this information (e.g., information about previous antibacterial therapy). Moreover, in many cases medical records did not contain entries about efficiency of antibacterial therapy. Duration of antibacterial therapy was from 5 to 7 days while clinical protocol recommends providing therapy for not less than 14 days.

Table 6.10. Range of antibacterial medicines used for treatment of urogenital tract infections in pregnant women (pyelonephritis, cystitis, bacteriuria)

	Bishkek city (n=21)	Chui oblast (n=2)	Issyk-Kul oblast (n=74)	Osh oblast (n=44)
Total number of prescriptions of antibacterial medicines for urogenital tract infections	**20**	**2**	**66**	**35**
Total, monotherapy (abs.fig. / %)	**9/45%**	**0**	**44/66,7%**	**18/51,4%**
Ampicillin (i.m.)	8	-	31	6
Amoxicillin (orally)	-	-	1	
Cefazolin (i.m.)	-	-	7	5
Megacef (Cefuroxime, i.m.)	-	-	-	1
Penicillin (i.m.)	-	-	4	-
Nitroxoline	1	-	-	7
Gentamicin	-	-	1	-
Combination of 2 antibacterial medicines (abs.fig. / %)	**11/55%**	**2/100%**	**22/33,3%**	**17/48,6%**
Ampicillin + Cefazolin	-	-	3	1
Ampicillin + Nitroxoline	7	2	15	11
Erythromycin + Nitroxoline	-	-	-	1
Penicillin + Nitroxoline	1	-	1	-
Gentamicin + Ampicillin	-	-	2	-
Cefazolin + Nitroxoline	2	-	1	3
Megacef + Nitroxoline	1	-	-	1

6.5. Summary

- Women under 30 prevailed among pregnant women hospitalized in pregnancy pathology departments;
- Leading causes of hospital admissions: “Threatened miscarriage or spontaneous abortion” – 12,8 – 42,4%; “Threatened premature delivery” – 15,7 - 56,1 %; “Pyelonephritis gravidarum” – 4,9 - 16,3%; “Gestational hypertension / preeclampsia” – 4,9 – 12,2 %;
- Poor quality of recording of medical charts of pregnant women comes under notice. Medical records contain scarce information both about medical history (what kind of therapeutic manipulations were undertaken before hospital admission, which doctor managed the case, i.e., continuity with PHC, etc.) as well as objective status at admission. As a result, medical records don’t always contain objective validation of clinical diagnosis (principal, concomitant, complications);
- There was overdiagnosis of some conditions (e.g., pyelonephritis (without fever and leukocituria), threatened miscarriage and threatened premature delivery) and underdiagnosis of other (e.g., anemia);
- Diagnoses “Threatened miscarriage” and “Threatened premature delivery” were the most prevailing pathological conditions of pregnant women. Majority of cases (83,3 and 83,7% accordingly) did not have indications for hospitalization and could have been managed at outpatient setting. However, absence of approved standards/protocols on management of such conditions at primary care level facilitates referral of this category of patients for hospitalization without any particular need for it. Therefore, it is necessary to develop clinical protocols on management of these conditions at outpatient level with specification of explicit criteria for hospitalization of pregnant women;
- Appropriateness rate of hospitalization of pregnant women on hypertensive disorders constituted 64,8% and on pyelonephritis - 32,6%;

- Observations of therapeutic manipulations also revealed irrational antibacterial therapy of urogenital tract infections and high level of prescription of parenteral drugs often without evidence-based effectives.

7. Conclusion

This survey analyzing hospitalization appropriateness rate was undertaken by the request of MOH KR in light of growing hospitalization rate in recent years. Mother and child health is a priority in health policy and thus it was decided to undertake situational analysis particularly among children under 5 and pregnant women. Survey covered health organizations of different levels (national, oblast and rayon) from Bishkek and Osh cities, Chui, Issyk-Kul and Osh oblasts. Overall 825 medical records of children under 5 hospitalized in general somatic departments and 755 medical records of pregnant women hospitalized in pregnancy pathology departments were selected for analysis purposes.

Selection process of criteria for evaluation of hospitalization appropriateness among children under 5 and pregnant women revealed that to date only a limited list of clinical protocols for both categories of patients was developed and approved.

So, doctors at PHC level mainly follow IMCI strategy and 4 clinical protocols derived from this strategy when delivering care to children under 5. No protocols are available for secondary care level. The fact that children with bronchopulmonary diseases predominated among patients of pediatric departments of general somatic proved that criteria specified in IMCI were not functioning well with regard to specifics of general somatic departments. For example, in hospitalized children only 7 criteria matched out of 33 selected criteria. Many criteria were very rare or difficult to measure. At the same time no criteria were available for the most prevalent conditions (e.g., obstructive syndrome) that would help to differentiate among cases subject to management at outpatient and inpatient level.

Similar situation was observed in regard to hospitalization of pregnant women. Recent digest of clinical protocols approved at the end of 2008 was in the process of revision in the middle of 2009. The bulk of protocols was designed for delivery of care at secondary and tertiary care levels. Approved criteria for hospitalization were rarely observed (2 out of 7 approved criteria). Moreover, there were some conditions without any reference found in official regulatory documents.

Children from 0 to 1 year (50.7%) prevailed among all hospitalized children. From bronchopulmonary diseases (643 persons out of 825, or 70%) leading place belongs to bronchopneumonia (48.7%) and almost all forms of respiratory diseases had obstructive syndrome (up to 46.1%). Percentage of valid hospitalizations in accordance with selected criteria formed 46,2%.

Women under 30 prevailed among pregnant women hospitalized in pregnancy pathology departments. Leading causes of hospital admissions included such diagnoses as threatened miscarriage and premature delivery, pyelonephritis and hypertensive disorders. Appropriateness rate of hospitalization of pregnant women on hypertensive disorders constituted 64,8% and on pyelonephritis - 32,6%.

The following factors have to be taken into account when assessing results of hospital appropriateness (46,2% among children under 5; and 64,8% on hypertensive disorders and 32,6% on pyelonephritis among pregnant women): (1) absence of clinical protocols on many common conditions; (2) over- and underdiagnosis of conditions; (3) poor quality of medical charts recording both in pediatric somatic departments and in pregnancy pathology departments.

Findings obtained from this survey on inpatient treatment also revealed series of problems. Prescribed treatment was assessed on the grounds of three selected criteria according to WHO guidelines on proper prescription of pharmaceuticals. In prescriptions for children under 5 the following facts were detected: polypragmasy (excessive prescription) (primarily in Issyk-Kul and Osh oblast), irrational antibacterial therapy (prescription without indications, nonobservance of drug administration frequency and dosage, etc.) and excessive administration of parenteral interventions (in 100% of cases among children) with 80% comprised of intravenous infusions (Osh oblast). Prescriptions both for children and pregnant women consisted of rather long list of medicines without evidence-based efficiency.

8. Recommendations

Recommendation 1.
Develop additional clinical protocols including criteria for hospitalization on most common pathological conditions among children under 5 and pregnant women. This will contribute to improved management of these conditions both at PHC level as well as at hospitalize level of service delivery.

Recommendation 2.
Bring to attention and improve quality of medical charts recording (especially with regard to pregnant women) including validation of clinical diagnosis, prescribed treatment and hospitalization in general.

Recommendation 3.
Design activities aimed at improvement of knowledge of medical staff on prescription of rational therapy based on evidence-based medicine including antibacterial therapy.

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APPENDICES

APPENDIX 1

Clinical conditions in obstetrics-gynecology with developed clinical protocols (Digest №4 from 2008)

I-BLOCK

1. Normal delivery
2. Multiple labor
3. Labor at term, fully spontaneous
4. Multiple labor at term, fully spontaneous
5. Spontaneous delivery in pelvic presentation
6. Premature labor activity
7. Acute tocolysis
8. Perineal ruptures of II degree derived from delivery
9. Perineal ruptures of III degree derived from delivery
10. Perineal ruptures of IV degree derived from delivery
11. Premature rupture of fetal membranes
12. Puerperal sepsis
13. Postpartum hemorrhage for II-III levels
14. Therapeutic abortion
15. Induced labor
16. Surgical obstetrical wound infections
17. Other specified postpartum infections
18. Prolonged labor and cefalopelvic disproportion
19. Pyelonephritis gravidarum
20. Asymptomatic bacteriuria
21. Cesarean section

II-BLOCK

1. Gestational hypertension for I level
2. Mild preeclampsia for I level
3. Severe preeclampsia for I level
4. Eclampsia for I level
5. Gestational hypertension for II-III levels
6. Mild preeclampsia for II-III levels
7. Severe preeclampsia for II-III levels
8. Eclampsia for II-III levels

III- BLOCK – PARASITIC DISEASES

1. **Nematodosis:** 1.1. Ascaridiasis;1.2. Enterobiasis; 1.3. Hookworm disease; 1.4. Strongyloidiasis;1.5. Trichinellosis; 1.6.Trichocephaliasis;
2. **Cestodiasis:** 2.1. Beef tapeworm disease; 2.2. Teniasis; 2.3. Cysticercosis; 2.4. Hymenolepiasis; 2.5. Diphyllobothriasis;
3. **Distomiasis:** 3.1. Fascioliasis; 3.2. Opisthorchiasis;
4. **Larval helminthosis:** 4.1. Echinococcosis; 4.2. Alveococcosis; 4.3. Toxocariasis
5. **Protozoasis:** 5.1. Amebiasis; 5.2. Giardiasis; 5.3. Toxoplasmosis.

APPENDIX 2

Protocol of appropriateness of pediatric hospitalizations used in survey in Canada[10]

A. Therapeutic manipulations

1. Surgical procedures;
2. One pre- and postsurgical day;
3. Cardial catheterization day;
4. Angiography day;
5. Invasive diagnostic procedures including organ biopsy (not bone or skin biopsy), thoracocentesis, paracentesis, ventricular tap bypass grafting;
6. Tests that require strict dietary control, sample collection by time during >8 hours;
7. Experimental or new treatment with frequent dosage changes which requires medical supervision;
8. Thorough medical monitoring including physical examination more than 3 times within 24 hours;

B. Nursing manipulations

1. Management of respiratory pathology including physiotherapy more than 3 times a day and inhalations more than 4 times a day;
2. Oxygen therapy (pressure chamber) for more than 8 hours a day;
3. Intravenous infusions for more than 8 hours a day;
4. I.m. or subcutaneous injection more than 3 times a day, including insulin;
5. Strict sampling and measuring of results including estimation of calories;
6. Care over large surgical wounds and drainage including suction drainage;
7. Thorough nursing monitoring, including cardiorespiratory monitoring and monitoring within 24 hours after its suspension or by vital indications that require more attention than usual;

C. Patient condition

1. Any two of the following four conditions:
i. Physiotherapy, oxygen therapy, speech therapy;
ii. Above 5, not ambulatory and requiring care because of acute conditions;
iii. Specification of educational program for patient;
iv. Psychological or social assistance.
In the course of 24 hours of estimated day:
2. Infeasibility of discharge because of acute condition;
3. Transfusions in case of excessive blood loss;
4. Children presumably abused or abandoned;
5. Suspected suicidal efforts;
6. Fever over 38.5 C in children admitted with different causes;
7. Coma;
8. Acute mental confusion;
9. Acute hematological problems: neutrophils <500, thrombocytes <20 000, hematocrit <20;
10. Progressive acute neurological pathology;
II. Weight <2000 gr. at term of <35 weeks

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