

HEALTH SYSTEM PERFORMANCE ASSESSMENT

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ARMENIA HEALTH SYSTEM PERFORMANCE ASSESSMENT

2018

Yerevan

HEALTH SYSTEM PERFORMANCE ASSESSMENT

Yerevan

2018

A Health System Performance Assessment, Armenia 2018/

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The ninth report on Health System Performance Assessment (HSPA) 2018 presents key challenges of the Republic of Armenia health system, general health status of the population, most prevalent morbidity and mortality causes, prevalence of risk factors of non-communicable diseases, quality of and financial access to health care services, system response to population demands, availability and distribution of health system human resources, as well as availability of needed specialists in places.

The HSPA report summarizes achievements and shortcomings of the health system performance and is aimed at development and strengthening of the system capacities.

Each section of the report includes an overview of the challenges of the health system of Armenia and recommendations on improvement of the performance effectiveness and efficiency.

HSPA report is designed for health system organizers, health experts, clinicians, as well as other specialists interested and involved in health system issues.

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1 ABBREVIATIONS

NIH	National Institute of Health after Academician S. Abdalbekyan, Ministry of Health of the Republic of Armenia
NHA	National Health Accounts
HFA-DB	European Health for All Database
HPIU	Health Project Implementation Unit
HHR	Health system human resources
HSPA	Health system performance assessment
WHR	World Health Report
WHO	World Health Organization
MoH	Ministry of Health of Republic of Armenia
CSD	Circulatory system diseases
CIS	Commonwealth of Independent States
CerC	Cervical cancer
NSS	National Statistical Service of Armenia
NHIAC	National Health Information Analytical Centre
a.n	Absolute number
DK	Don't know
EU-26	Union of 26 Eastern European states
EU-27	Union of 27 Eastern and Central European states
YSMU	Yerevan State Medical University
AH	Arterial hypertension
AP	Arterial pressure
BC	Breast cancer
MDGs	Millennium Development Goals
r.n.	Relative number
NGO	Nongovernmental organization
ICD-10	International statistical classification of diseases and related health problems, 10th revision
GDP	Gross domestic product
BMI	Body mass index
MTEF	Medium-term expenditure framework

DM	Diabetes mellitus
SHA	State Health Agency
Pap test	Cervical screening method used to detect potentially pre-cancerous and cancerous processes in the cervix (Papanicolaou test)
RF	Risk factors
IHD	Ischemic heart disease
AMI	Acute myocardial infarction
CerVD	Cerebrovascular disease
NCO	National Center of Oncology

Please refer to 'Armenia Health System Performance Assessment, 2018', Yerevan, 2018, when you use data published in HSPA.

2 FOREWORD

Every year the NIH publishes Statistical Yearbook of Health and Healthcare, which in addition to other healthcare data contains also ample data on inpatient care in Armenia. Statistics in the yearbook is usually presented according to the number of regional and district hospitals, as well as general indicators of hospital resources and activities.

For a deeper and more comprehensive insight of Armenia hospital resources and provision of inpatient care, this section will focus on availability of specialized hospital departments, their resources and provided care.

Preventive measures implemented for population health strengthening and improvement are among overarching goals of any health system all over the world. Population health strengthening and promotion is the warrant of a country's socioeconomic development.

The Government of Armenia, being faithful to its commitments, continues targeted elaboration and implementation of population health improvement efforts, since healthy society implies reduction of the health system financial burden and development of the country's economy.

It is not a secret that financial resources of any country are rather limited and budget deficit is inevitable. However this should not hamper investments in population health improvement.

Annual health budget allocation requests should be supported by adequate rationales. This requires strengthening key functions targeted at bridging the system gaps.

The 2017-2018 health reforms were targeted at (a) modernization of the system and public health strengthening, (b) early detection and proper control of cardiovascular diseases, malignancies and diabetes, thus contributing to reduction of the burden of non-communicable diseases, (c) improvement of the quality of hematological and oncological care and services, (d) establishment of infrastructures, as well as (e) population health needs assessment. Interagency cooperation is one of the key challenges of the health system, since it can seriously facilitate implementation of strategic public health programs on both national and periphery levels.

Improvement of health system performance and effective management require implementation of an integrated electronic health information system with transparent and accurate data collection and assessment, which is critical for drafting further reforms, clear-cut strategies and policies.

The Ministry of Health of Armenia is committed to the engagements of the Government and assumes responsibility for easy access to healthcare, reduction of financial risks, improved population satisfaction, and population health improvement and strengthening, through effective interagency cooperation and being guided by the WHO Health 2020 Strategy.

Health system performance assessment (HSPA) is a tool, which enables observing and assessing effectiveness of health system performance, the reform progress and impact on population health. Adequate assessment of the system is prerequisite to reforms and a valid argument for future investments.

3 GENERAL CONCEPT

Health system performance assessment is a strong argument for improvement of the system and further investments. It helps shaping reforms and improves social wellbeing through meeting population expectations.

HSPA reflects health system functions, population health status, the burden of diseases and the prevalence of risk factors as well as the effectiveness of intersectoral collaboration for implementation of reforms.

HSPA helps performing realistic assessment of the role and importance of the health system and answering below three questions raised by the society:

- How can investments in the health system improve population health, economic and social wellbeing?
- What guarantees can an effective health system performance offer in the future?
- How to manage the health system and improve its performance in order to ensure maximum effectiveness?

Health system performance has a multi-layer domain, hence integration of governance levels (central, regional) and public - private sectors is a key function. Reforms of the system imply accurate definition of responsibilities, application of effective and flexible regulations, clear understanding that many key health functions are outside the scope of health system and require coordinated intersectoral cooperation.

Recently countries in the European Region, and Armenia as well, seem to attach greater importance to assessment of the health system performance.

Health system performance depends on reliability of information, which enables assessing the outcomes of the system performance. Application of information technologies facilitates data collection and analysis, ensures more accurate estimation of costs, revenues and current situation in order to make target decisions.

The analysis data should be presented in a way that every stakeholder, i.e. patients, providers, health organizers can find interesting and useful information.

Of course addressing this problem is not easy, since many functions need to be observed and linked to end data results. Carefully chosen and clearly defined indicators can show the level of achievement of the target and pinpoint the steps needed to improve the effectiveness.

The effectiveness of performance assessment depends on how useful is the implementation of the health system. Hence it cannot stand alone from political levers ensuring factual improvement. Drafting and enforcement of activities aimed at performance improvement require very careful approach. Besides, the process should not be limited to implementation of short-term goals and should not ignore innovations.

Collection of reliable and valuable data, their transparent analysis, coordinated use of the findings during planning and evaluation, as well as support to informed public discussions are part of the management function of the Ministry of Health. All these factors together ensure smooth implementation of health system goals and targets and management of compromises between them. Health system organizers are responsible not only for assessment of the system effectiveness but also for further improvement of the system performance.

Each health system decides independently about what activities should be implemented to improve population health and social wellbeing and how to implement them.

In June 2008, the 53 Member States of the WHO European Region met in Tallinn, Estonia, and endorsed the “Health Systems, Health and Wealth”(Tallinn Charter). A regular process of health system performance assessment (HSPA) is an important first step to meeting the Charter commitments.

Armenia implemented the first HSPA in 2007. The process was institutionalized and a unit for health system performance assessment was established at the National Institute of Health of the Ministry of Health. The HSPA 2016 is the seventh report published by the country. Armenia is one of the few countries in the European Region that conducts regular assessment of health system performance.

HSPA Armenia has three ultimate goals:

- To assess progress in implementation of the key health system goals and monitor changes in the system.
- To initiate summary assessment of the health system performance.
- To position health system performance in the limelight of the national health policy.
- To help improving effectiveness of the health system management.
- To make possible the assessment of the health system effectiveness.
- To highlight priority areas within the functions and efforts aimed at improvement of the health system performance.

- To promote more complete search and collection of health system data and the latter's accurate analysis.

Selecting the right indicators is critical in assessment of any system performance. This is done within the framework of HSPA strategy.

Below are the prerequisites of selection of HSPA indicators and development of the package.

- The relation of indicators with health system reform goals and the strategy.
- Availability and reliability of data.

When assessing the system performance the team observed annual results of indicators and studied recent trends. Results were also matched with targets set in the RA Government strategies or the MDGs.

HSPA IMPLEMENTATION

HSPA was based on statistics reported by healthcare facilities of Armenia and the ad hoc sample survey data.

Findings of population health and health system performance assessments were compared with corresponding rates of a number of other countries and the weighted mean of three groups of European countries. Comparisons were made with immediate neighbors in the region - Georgia, Azerbaijan and Turkey. Country groups included the 12 countries of the Commonwealth of Independent States (CIS), EU members before May 2004 (EU 15), including EU-13 (EU members after May 2004 (EU 13), as well as the WHO European Region. International comparisons were mostly based on the European Health for All database (HFA-DB), where the most recent data available refer to 2015 or 2016.

HEALTH STATUS

Morbidity and mortality rates reflect the population health status and are directly dependent on a number of factors, including genetic predisposition, sex, age, lifestyle, i.e. behavioral and biological risk factors (unhealthy diet, tobacco use, excessive consumption of alcohol, sedentary lifestyle, hypertension, raised level of blood glucose and cholesterol), socioeconomic, i.e. low socioeconomic status, absence of any social support, stress at work and personal life, depression, anxiety, hostility, education, environment and health system performance.

Population health assessment enable outlining the country's demographic and socioeconomic situation, as well as key public health challenges.

4 Demographic overview

Population number and composition

As of 1st January 2018 permanent population of Armenia was estimated to be 2 972 700, which has declined by 13 400 compared with 2016. This is due to natural surplus and estimated¹ external migration during the reference year (NSS Armenia, 2018).

In 2018 the proportion of urban population was 63.7% and the rural population was 36.3%. Males comprised 47.4% and females 52.6% of the population.

According to the UN demographic aging scale when the proportion of 65 and above population exceeds 7% of the population structure, the latter is considered aging. Between 1990 and 2015 the share of 0-15 children drastically declines in the permanent population structure. In 1990 it accounted for 32.2%.

- The share of 65 and over population was 11.6%. This is one of the key population aging factors in Armenia. Population aging is the result of long-term demographic changes, changes in population reproduction, birth rate, mortality and the correlations thereof as well as migration.
- Low natural reproduction remains a priority demographic problem in Armenia.

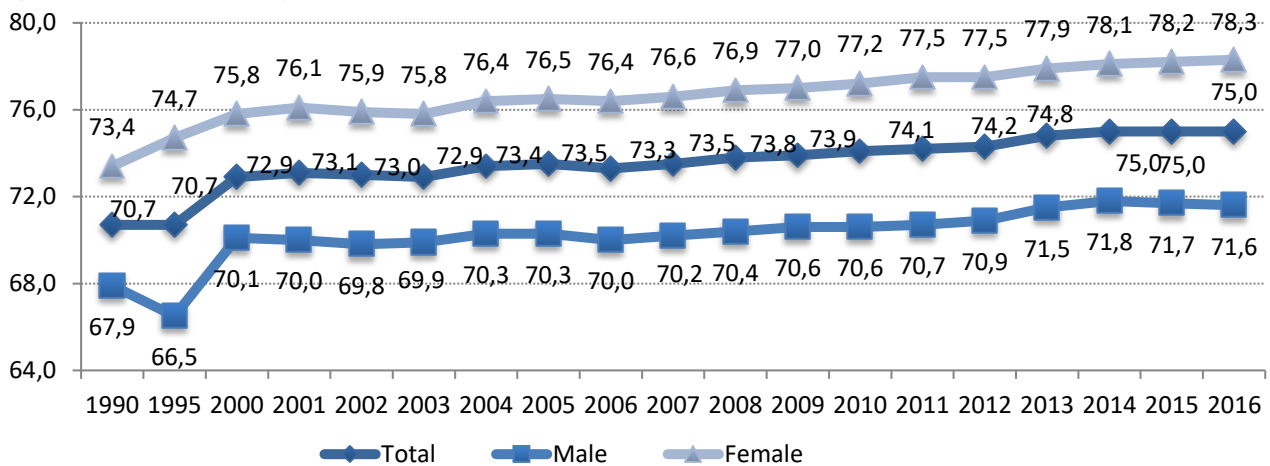
Natural increase of population

Unstable economic, social and political situation of Armenia has shaped the population reproduction behavior. The total birth rate per 1000 population accounted for 12.7‰ in 2017 and 13.6‰ in 2016 versus 22.5‰ in 1990.

Life expectancy

As of 2017 life expectancy in Armenia is 75 years. At that, women live 6.7 years longer than men (Figure 1).

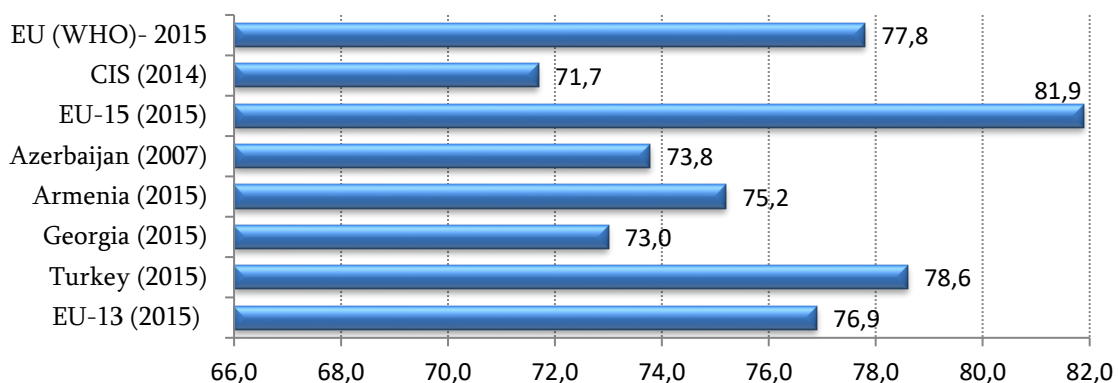
Indicators were adjusted based on the figures taken from the Integrated Household Living Standards Survey conducted in the year preceding the reference period, and the same year aggregated migration data. For methodology details see <http://www.armstat.am/am/?nid=82&id=1547>:

Figure 1. Life expectancy at birth, 1990, 1995, 2000-2017

Source: NSS, 2017

The rate increased by 4.3 years compared with 1990.

As international comparisons suggest Armenia has a higher rate of life expectancy at birth compared with CIS countries. The rates do not vary much compared with Georgia and Azerbaijan, but are below the average level of developed European countries (Figure 2).

Figure 2. Life expectancy at birth, selected countries and country groups, 2007, 2013-2015

Source: HFA DB, WHO

According to WHO estimates, life expectancy at birth is actually lower in Armenia than the officially reported results by 5-6.5 years. This statement is explained by the fact that Armenia public agencies do not have the capacity to ensure accurate estimation of deaths of RA citizens residing outside the territory of the country.

The possible rate of births and death not registered in Armenia since 1991 is unknown because no large-scale and comprehensive professional study has been conducted. This means that no accurate statistics on natural reproduction is available.

Natural reproduction of population

The total mortality rate showed decline tendency between 1949 and 1989 due to annual improvement of the country's socioeconomic situation, wellbeing and development of the health system (Figure 3). In 1949 the total mortality rate was 10,9 per 1000 population, in 1989 it dropped to 6,0. The drastic increase of mortality in 1988 (reaching 10,3) was due to a natural disaster – the Spitak earthquake.

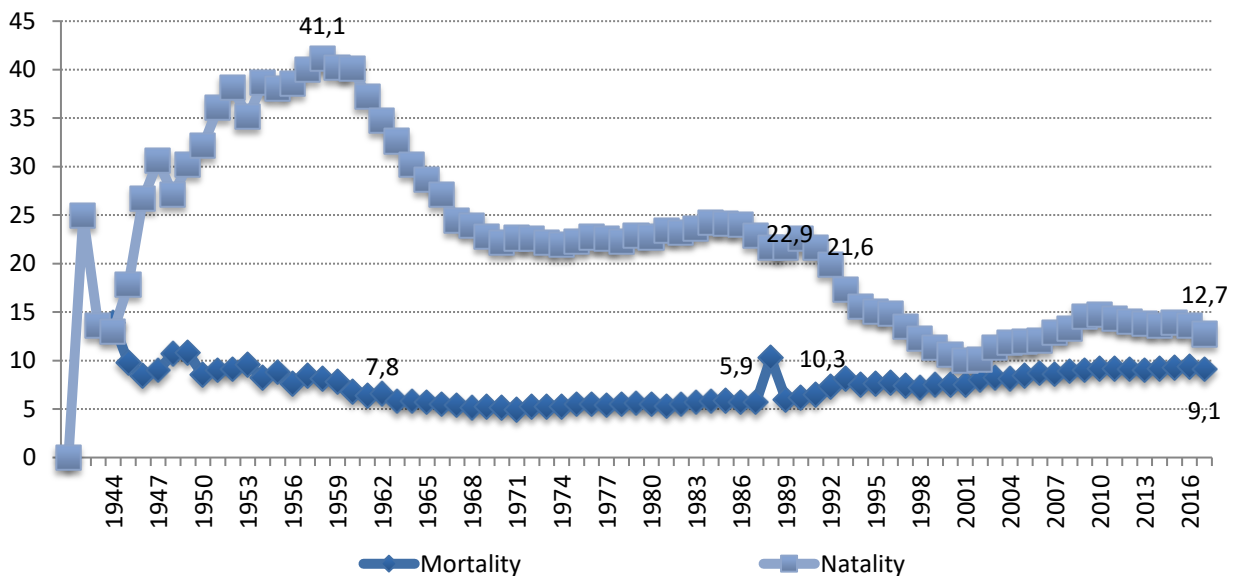
In post-Soviet period the total mortality rate increased from 6,5 in 1991 to 9,1 in 2017.

- **The change of population age structure (population aging) is one of the main components contributing to increase of the total mortality ratio.**

Total mortality ratio of 55 and older population significantly exceed the lower age ratios, hence population aging leads to the increase of the total mortality rate.

Economic collapse, that was triggered by reforms in Armenia implemented the 1990-s, resulted in mass migration of reproduction age population and mass poverty which had a negative spin-off on birth rate. The lowest rate was recorded in 2001, followed by very slow natural reproduction.

Figure 3. Total mortality and natality rates of RA population, 1942-2017



Source: NSS, 2015

- **Another important factor contributing to low birth rate in Armenia is the vast spread of self-centered values and consumer culture, limiting the number of children to 1 or 2. Luckily, the recent years see some back down of this tendency.**

5 Causes of mortality

A total of 27 157 deaths were registered in Armenia in 2017 (911.49 per 100 000 population).

Most prevalent causes of mortality in Armenia did not change much between 2009 and 2015 (Table 1).

The proportion of deaths due to NCD is 81.4% and communicable diseases 0.7%. At that, CSDs are the main killers (55.6%), followed by malignancies (20.4%), diabetes (3.0%), traumas, COPD (bronchitis, asthma, other pulmonary and bronchiectatic diseases) (2.4%).

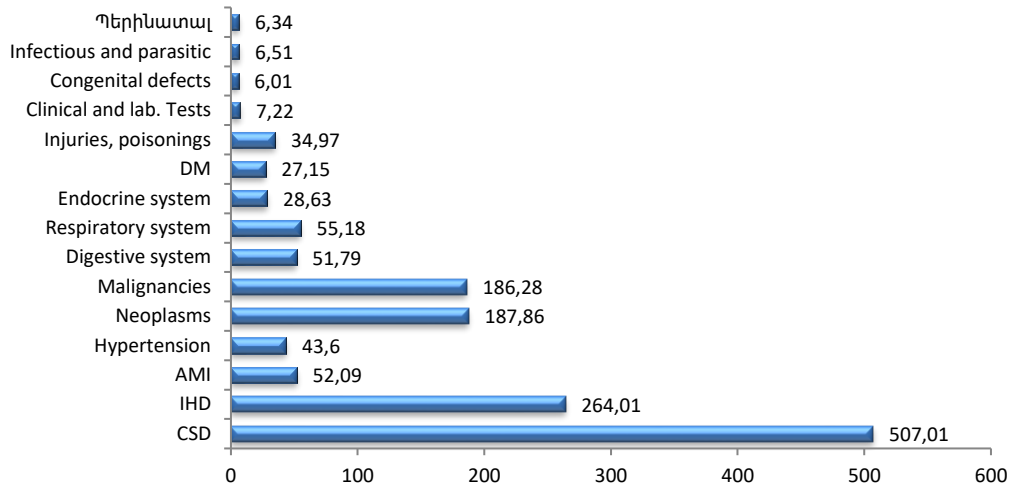
Table 1. Causes of mortality in Armenia, 2009-2017, % in total mortality structure

Causes of death	2009	2010	2011	2012	2013	2014	2015	2017
Circulatory system diseases	49.1%	48.9%	47.6%	48.3%	47.7%	47.9%	46%	55.6%
Neoplasms	19.6%	19.8%	19.9%	20.4%	20.6%	20.6%	21.8%	20.4%
Respiratory system diseases	6.5%	5.9%	6.1%	5.8%	6%	6.7%	7.6%	6.1%
Digestive system diseases	5.9%	5.8%	6.3%	5.8%	6%	5.9%	5.9%	5.7%
Injury, intoxication and certain other consequences of external causes	4.4%	4.5%	4.9%	4.9%	4.7%	4.5%	4.9%	3.8%
Endocrine, nutritional and metabolic disorders	5.2%	5.2%	5.0%	4.8%	4.9%	4.5%	4.7%	3.1%
Diseases of the genitourinary system	2.6%	2.9%	2.8%	2.9%	3.4%	3.2%	3.0%	1.1%
Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	2.9%	2.9%	3.2%	2.8%	2.6%	2.6%	2.0%	0.8%
Congenital malformations, deformations and chromosomal abnormalities	1.1%	1.5%	1.7%	1.6%	1.7%	1.6%	1.4%	0.7%
Certain infectious and parasitic diseases	1.0%	1.1%	0.9%	1%	0.9%	1.01%	1.1%	0.7%
Certain conditions originating in the perinatal period	0.7%	0.7%	0.8%	0.7%	0.6%	0.62%	0.56%	0.70%
Diseases of the nervous system	0.5%	0.6%	0.4%	0.5%	0.4%	0.41%	0.42%	0.62%
Duodenal ulcer	0.3%	0.3%	0.3%	0.3%	0.3%	0.39%	0.44%	0.46%
Diseases of the musculoskeletal system and connective tissue	0.2%	0.2%	0.2%	0.2%	0.4%	0.15%	0.23%	0.17%
Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism	0.1%	0.1%	0.1%	0.08%	0.07%	0.07%	0.05%	0.10%
Diseases of the skin and subcutaneous tissue	0.1%	0.1%	0.0%	0.1%	0.3%	0.09%	0.06%	0.10%
Pregnancy, childbirth and the puerperium	0.0%	0.0%	0.0%	0.0%	0.3%	0.02%	0.03%	0.01%
Mental and behavioral disorders	0.0%	0.0%	0.0%	0.0%	0.0%	0.01%	0.05%	0.04%

Source: NHIAC, 2018

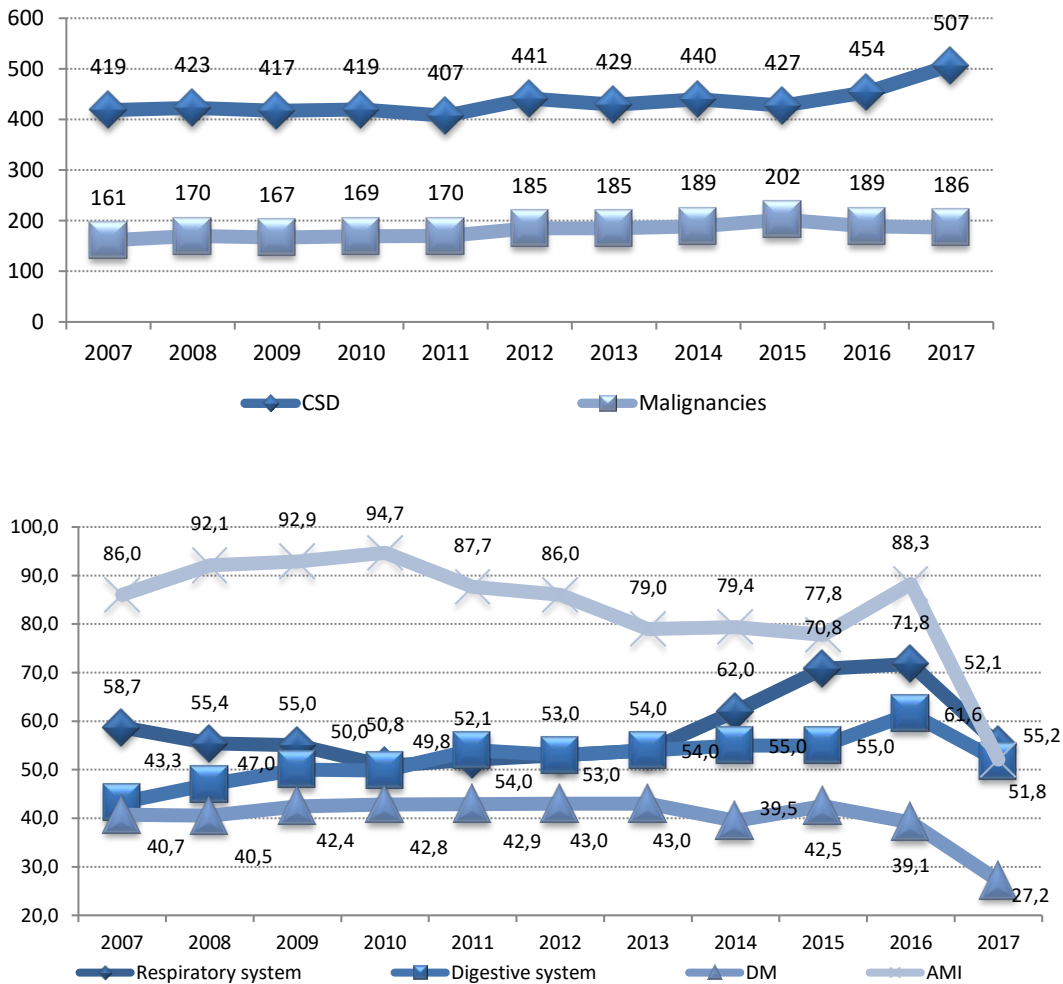
The relative rate of deaths due to main causes is presented in Figure 4 and the dynamics in Figure 5 A and B.

Figure 4. Mortality according to the causes, 2017, per 100 000 population



Source: NHIAC, 2018

Figure 5. A-B. Mortality due to most prevalent diseases, per 100 000 population, 2007-2017



Source: NHIAC, 2018

Premature mortality

Premature (under 65) mortality according to causes mimics the NCD mortality structure (Table 2). It shares 26.6% of the total mortality structure. This means that every third person dies before reaching the age of 65.

Table 2. Premature mortality of RA population according to causes and gender, 2017

Disease according to ICD 10	Gender	Premature (under 65)	Per 100 000 population
Malignancies (C00-C99)	Male	1181	92,3
	Female	890	65,4
	Total	2071	78,5
Diabetes (E10-E14)	Male	124	9,7
	Female	107	7,9
	Total	231	8,8
Circulatory system diseases (I00-I99)	Male	1962	153,4
	Female	713	52,4
	Total	2675	101,4
Respiratory system disease (J00-J99)	Male	203	15,9
	Female	96	7,1
	Total	299	11,3
Accidents (V01-V99)	Male	167	13,1
	Female	41	3,0
	Total	208	7,9
Other external causes of injuries during accidents (W00-W99)	Male	58	4,5
	Female	8	0,6
	Total	66	2,5
Contact with poisonous animals and plants (X20-X29)	Male	2	0,2
	Female	0	0,0
	Total	2	0,1
Intentional self-harm X60-X84	Male	28	2,2
	Female	5	0,4
	Total	33	1,3
Other and unspecified transport accidents (Y00-Y98)	Male	296	23,1
	Female	56	4,1
	Total	352	13,3
TOTAL	Male	4911	383,9
	Female	2327	171,1
	Total	7238	274,2

Source: NHIAC, 2018

Premature mortality accounts for 26.6% and the 35-65 age groups – for 23.2% of the total mortality structure, which negatively impacts the country's socioeconomic development.

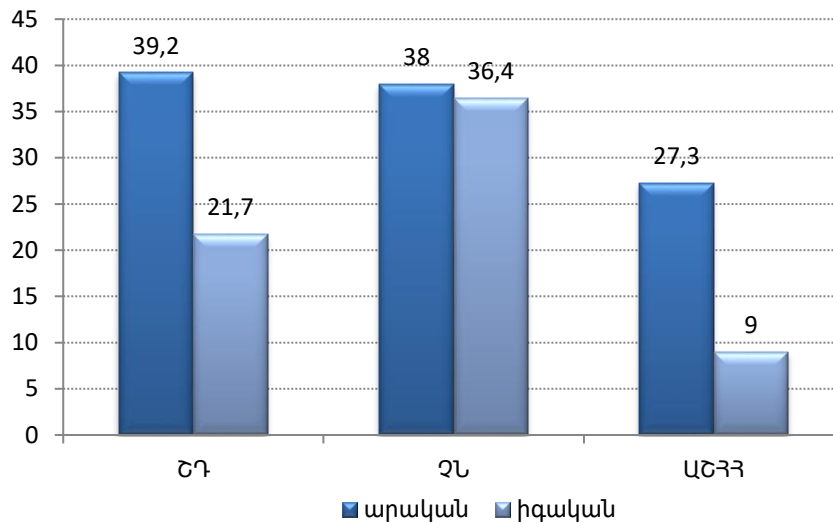
Table 3. Premature mortality of RA population according to causes, gender and age groups, 2017

	Total	0-65	Total categories %	35-65	Total categories %
Total	27157	7238	26,7	6290	23,2
Female	13316	2327	17,5	1996	15,0
Male	13841	4911	35,5	4294	31,0
Diabetes (E10-E14)	809	231	28,6	227	28,1
Female	493	107	21,7	105	21,3
Male	316	124	39,2	122	38,6
Malignancies (C00-C99)	5550	2071	37,3	1996	36,0
Female	2446	890	36,4	855	35,0
Male	3104	1181	38,0	1141	36,8
CSD (I00-I99)	15106	2675	17,7	2620	17,3
Female	7928	713	9,0	694	8,8
Male	7178	1962	27,3	1926	26,8

Source: NHIAC, 2018

Analysis of premature deaths according to the causes and gender revealed that the rate is nearly 4 times high in males, with the exception of malignancies (Figure 6).

Figure 6. Premature mortality according to causes and gender, % of total deaths, 2017



Source: NHIAC, 2018

CSD mortality

Shares of deaths due to different CSD nosologies are presented in below Table 4. The situation has not changed much between 2009 and 2017. The lead cause is IHD (29%), followed by CerVD (9.1%) and AMI (5.7%).

Table 4. Mortality according to CSD nosologies, 2009-2017

Cause of death	2009	2010	2011	2012	2013	2014	2015	2016	2017
Ischemic heart disease, chronic and others	29.1%	29.4%	29.5%	30.5%	31.2%	30.9%	29.1%	30.5%	29.0%
Cerebrovascular diseases	11.5%	10.6%	10.4%	10.2%	9.4%	9.5%	8.7%	8.7%	9.1%
Acute cardiac infarction	9.7%	10.0%	9.1%	9.4%	8.8%	8.6%	8.4%	9.4%	5.7%
Hypertensive diseases	3.6%	3.9%	3.2%	2.8%	2.4%	2.2%	2.5%	2.2%	4.8%

Source: NHIAC, 2017

Table 5. Total and premature CSD mortality according to nosologies, 2017

Cause of death	2017			
	All age groups	%	Premature (under 65)	%
Ischemic heart disease (I20-I25)	7866	52,1	1553	58.1
Including Angina (I20)	8	0,1	1	0.03
Acute cardiac infarction (I21)	1552	10,3	340	12.7
Double cardiac infarction (I22)	318	2,1	59	2.2
Cerebrovascular diseases (I60-I69)	2466	16,3	403	15.1
Hypertensive diseases (I10-I15)	1299	8,6	161	6.0

Source: NHIAC, 2018

According to 2017 statistics, a total of 55 441 CSD cases were detected in 15 and over population (2243.8 per 100 000 population). In fact the total number of patients accounted for 250 171 (10503.9 per 100 000 population), and the total number of deaths - 15 106 (507.01 per 100 000 population).

Table 6. CSD prevalence in 18 and older population, morbidity and incidence, 2017

	Prevalence		Incidence	
	Absolute	Relative	Absolute	Relative
Total	249016	10911.7	52878	2317.1
Hypertension-induced diseases	133480	5849.0	24178	1059.5
Ischemic heart disease	76418	3348.6	15396	674.6
Including angina	26487	1160.6	5809	254.5
Acute cardiac infarction	2209	96.8	2181	95.6
Double cardiac infarction	597	26.2	550	24.1
Cerebrovascular diseases	19040	834.3	5766	252.7
Including hemorrhage	2231	97.8	947	41.5
Cerebral infarction	2662	116.6	1063	46.6
Stroke unspecified, as hemorrhage or infarction	2029	88.9	859	37.6
Occlusion and narrowing of precerebral and cerebral arteries not provoking cerebral infarction	5857	256.6	1722	75.5

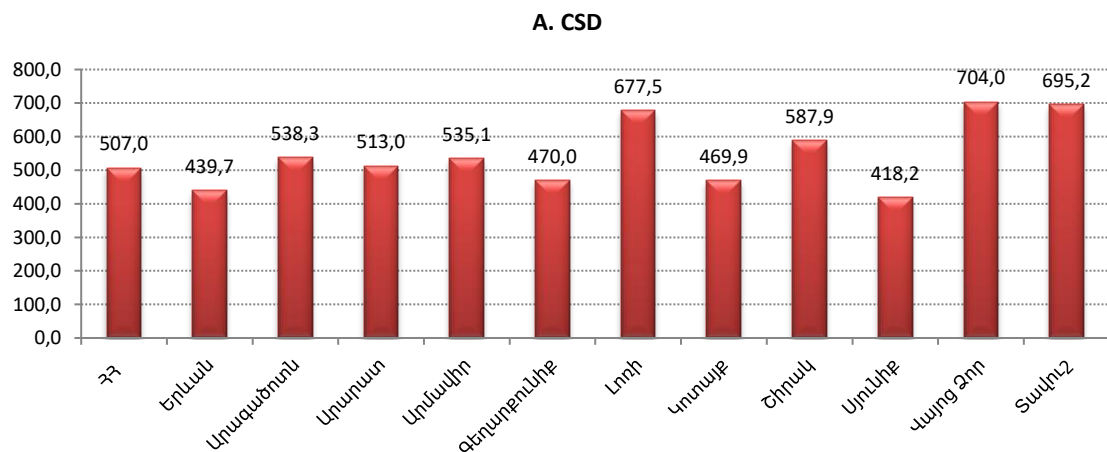
Source: NHIAC, 2018

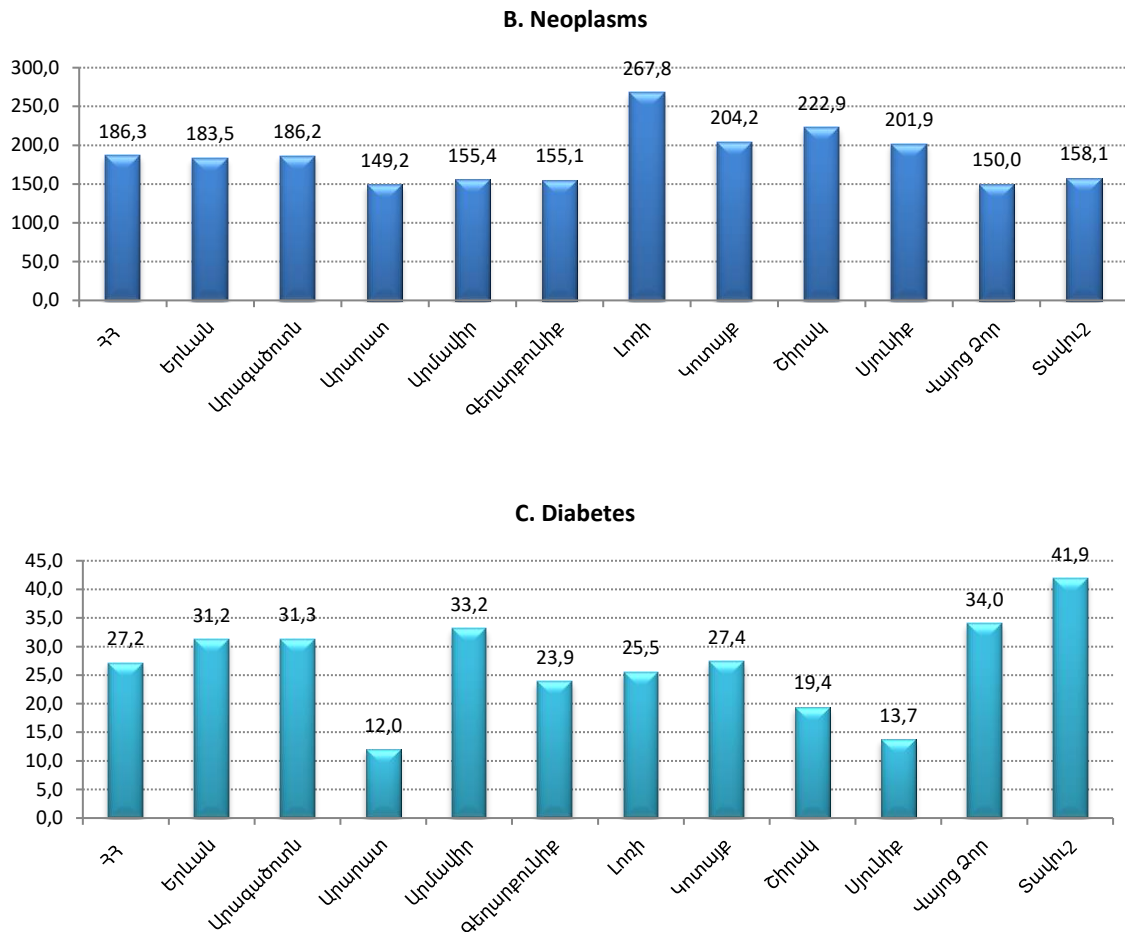
Most prevalent causes of death across marzes

Figure 7-A, B and C present most prevalent cause of death in marzes of Armenia. According to them:

- CSD-induced mortality is essentially higher in Tavoush and Lori marzes.
- Mortality due to malignancies is higher in Lori.
- Mortality due to diabetes is higher in Tavoush.

Figure 7. Most prevalent mortality causes, RA marzes, per 100 000 population, 2017

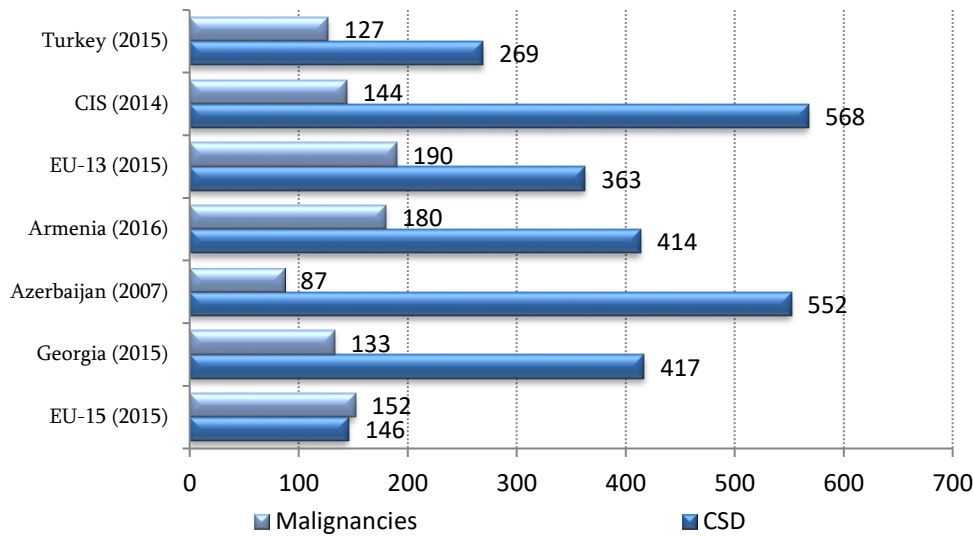




International comparison of most prevalent causes of mortality

The European Health for All Database does report age-standardized mortality rates due to different causes. Figure 8 presents Armenia's mortality rates for circulatory system diseases and malignant neoplasms, compared with other countries. In Armenia the mortality rate due to circulatory system diseases is lower than in CIS and Eastern Europe countries, almost equal to Azerbaijan and higher than in Georgia. However, when it comes to malignancy-induced mortality rates Armenia shares one of the highest positions among the aforementioned countries.

Figure 8. Standardized mortality rates per 100 000 population due to CSD and malignancies, selected countries and country groups, most recent year available, 2007, 2014-2016

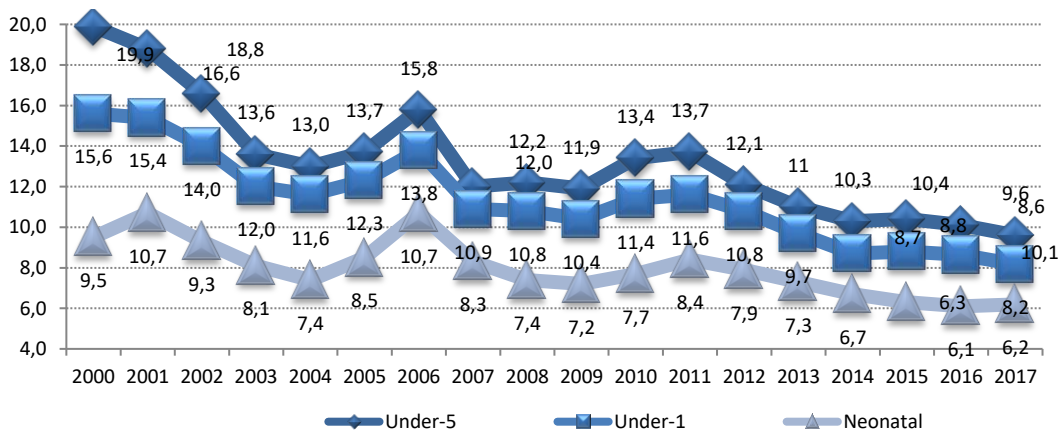


Source: HFA DB, WHO

Infant, child, neonatal and maternal mortality

These indicators are closely linked to socioeconomic development of the country. In 2005, Armenia adopted the WHO standard definition of live birth, which may partially account for the unusual increase in 2006. Hence, data of 2006 are taken as baseline for extrapolations. Figure 9 presents tendencies of child, infant and neonatal mortality rates since 2000.

Figure 9. Infant, child and neonatal mortality per 1000 live births, 2000-2017

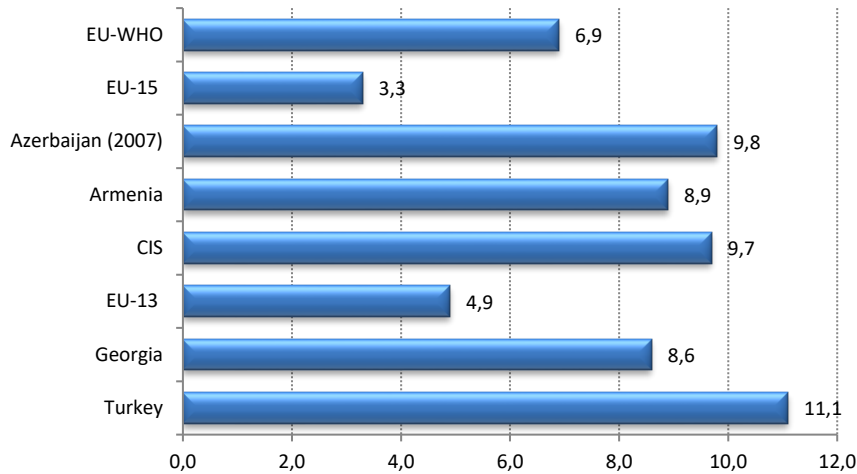


Source: NHIAC, 2018

Data depict decline of all 3 indicators of under-5 mortality rates during 2011-2015. In fact, the rates approached the MDGs and MCH Strategy targets.

Overall, Armenia has a lower infant mortality rate than in CIS, Eastern Europe, Georgia and Turkey (Figure 10).

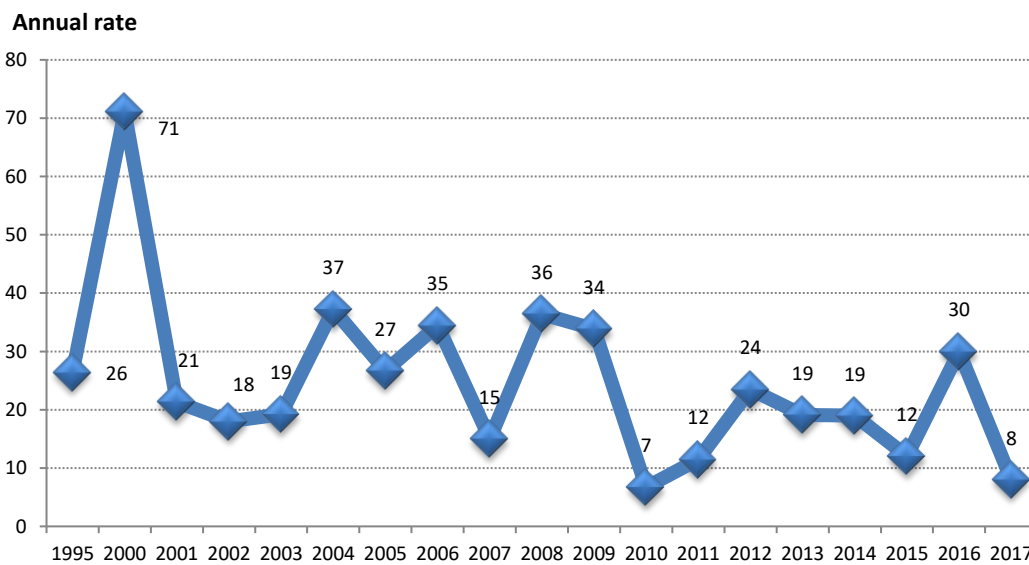
Figure 10. Infant mortality ratio per 1000 live births, selected countries and country groups, recent years available



Source: HFA DB, WHO, 2016 (data updated on 15 June, 2018)

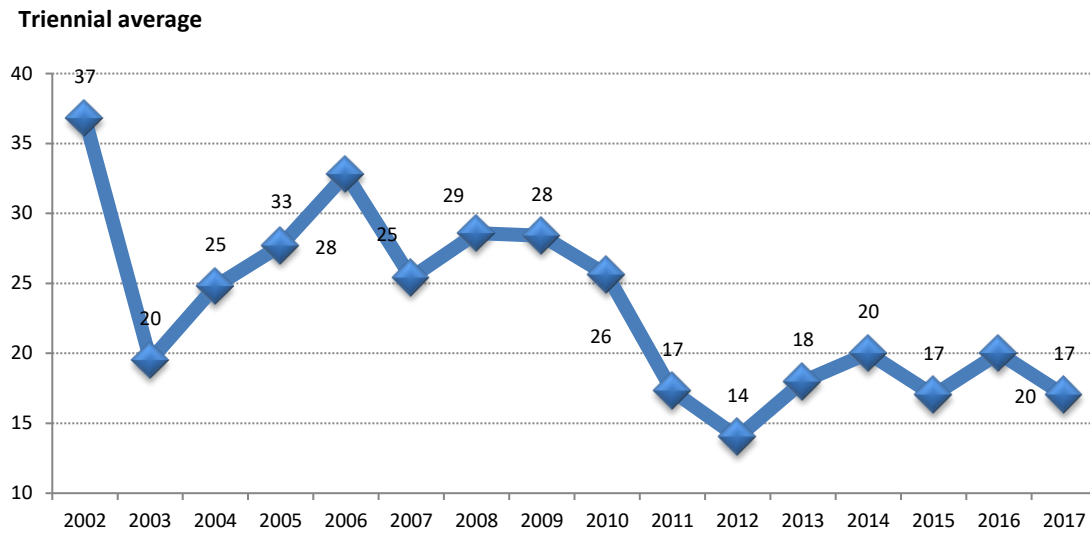
Both the annual and the triennial average ratios for maternal mortality are presented in Figures 11 and 12.

Figure 11. Maternal mortality ratio per 100,000 live births, 1995 and 2000-2017



Source: NHIAC, 2018

Figure 12. Maternal mortality ratio per 100,000 live births, 1995 and 2000-2017 (triennial average)



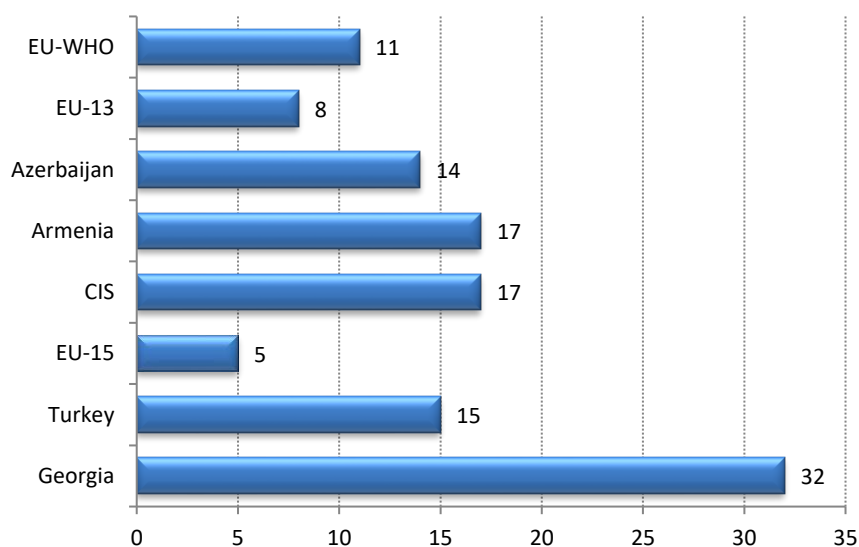
Source: NHIAC, 2018

Maternal mortality ratio (triennial average) in 2011-2017 is in line with the National Maternal and Child Strategy target. Hence:

- It is reasonable to set a new maternal mortality target adopting the MDG one – 10 deaths per 100 000 live births.

Given the instability in annual ratios, international comparisons should be made with caution. Armenia's maternal mortality ratio is much lower than in neighboring countries and the average ratios in the ER-26 and the CIS. It is almost close to the rates of developed European countries (Figure 13).

Figure 13. Maternal mortality ratio per 100,000 live births, selected countries and country groups, 2013-2016



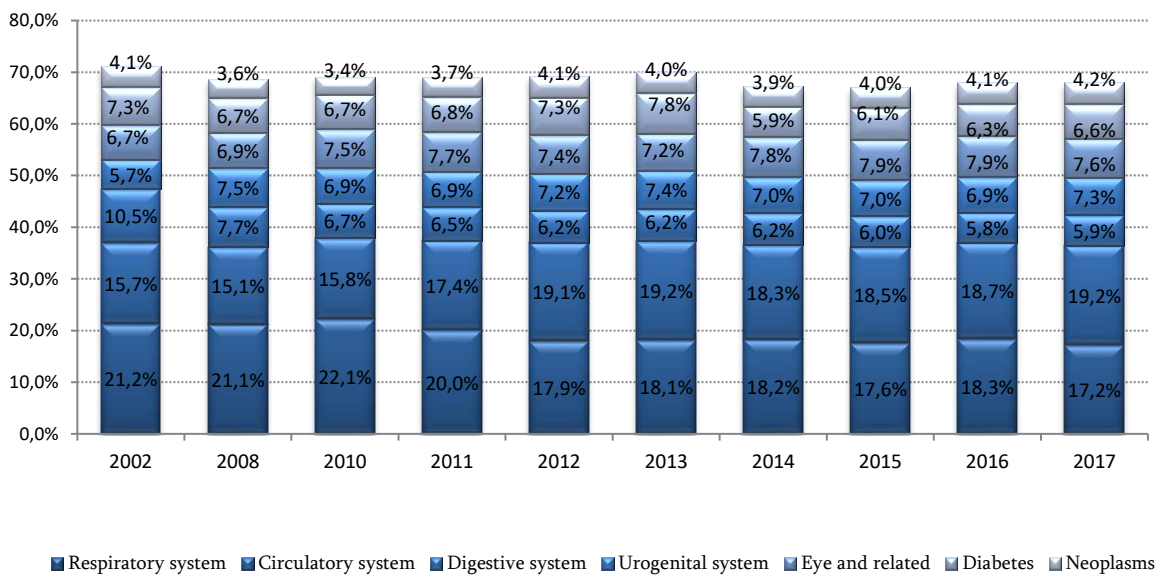
Source: HFA DB, WHO

Disease prevalence trends

The total of seven most prevalent diseases in Armenia account for 68.0% of the total morbidity rate. These diseases include respiratory system diseases, circulatory system diseases, digestive system diseases, urogenital system diseases, eye and related diseases, endocrine system diseases and neoplasms.

The prevalence structure of these diseases in 2002, 2008, 2010 - 2017 is presented in Figure 14. The number of CSD cases increased over the past 12 years, which speaks of improved utilization of primary care services.

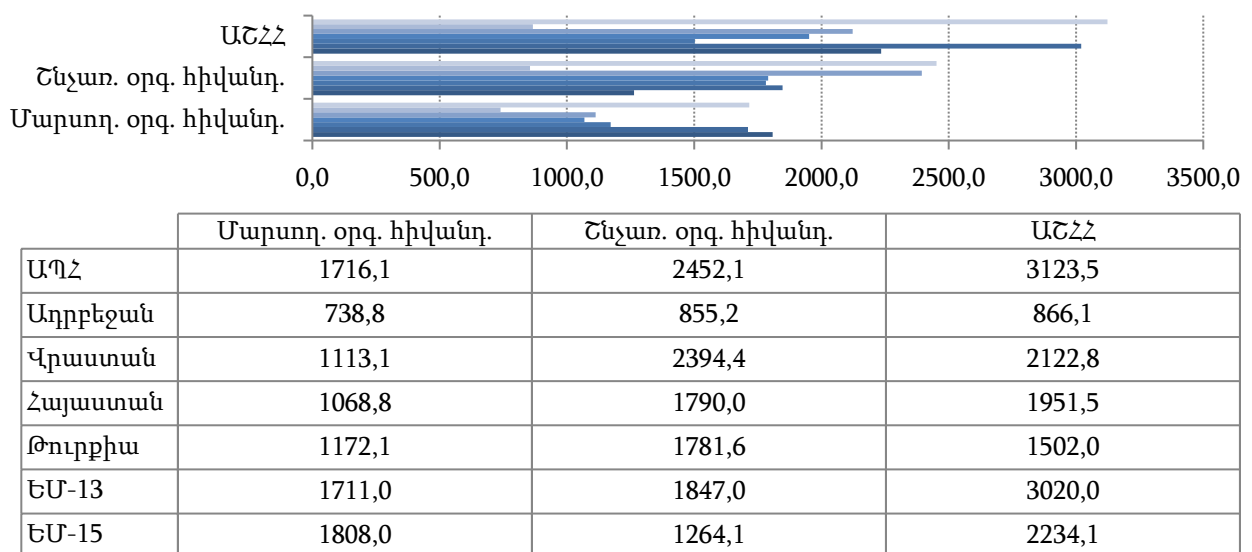
Figure 14. Most prevalent diseases, 2002, 2008, 2010-2017



Source: NHIAC, 2018

Figure 15 presents international comparisons of hospitalization rates according to causes of diseases.

Figure 15. Hospital discharges per 100 000 population by selected diseases, selected international comparisons, 2016



Source: HFA DB, WHO, 2018

As the Figure shows rates are close to those of Georgia and Turkey.

In 1995 the economy was collapsed, the population was poor, the infrastructures was destroyed, PHC services were paid making healthcare difficult-to-access. As a result the impoverished population preferred not seeking care when needed.

Hospitalization rate largely depends on access to hospital care in the country.

- In 1995 morbidity rates for all diseases dropped drastically. It has obvious explanation – utilization of healthcare services was poor.

The 2005-onward increase of the total morbidity rate at PHC level for all diseases is first of all due to improved access to primary care services and not the health status of the population. Improved utilization of healthcare services was due to health system reforms. The data imply that if the population is more eager to utilize PHC services, their health status is supposed to be improved. This requires sample surveys of population health in order to shape the reliable picture of population health status and particularly the reasons for not seeking care when needed, as well as the prevalence of various health conditions and symptoms.

Table 7. Total morbidity of 15 and older population of Armenia according to disease groups and years, 1990, 1995, 2005, 2010-2017

Disease	1990	1995	2000	2005	2010	2012	2013	2014	2015	2016	2017
TOTAL	62665	35944	25537	31964	41969	48263	49352	50439.0	52604.8	54741.0	54798.1
Respiratory system diseases	16420	8145	5825	7535	9292	9135	9419	9200.4	9253.8	10003.4	9429.4
Circulatory system diseases**	8709	5588	4047	4430	6599	8645	8903	9226.4	9723.8	10250.1	10503.9
Eye and adnexa diseases	-	-	-	1626	3117	3756	3790	3911.3	4161.3	4312.6	4162.5
Endocrine, nutritional and metabolic disorders	2003	1766	1703	2237	2777	3398	3706	3930.9	4402.7	4824.5	5021.8
Genitourinary system diseases	3450	1948	1383	1948	2870	3372	3536	3532.7	3702.0	3795.6	3976.0
Digestive system diseases	11813	4992	2751	2751	2824	3059	3084	3116.2	3163.3	3156.0	3209.2
Diabetes	1434	1350	1331	1576	2056	2515	2771	2955.4	3186.9	3430.7	3600.6
Mental health disorders	2978	2126	1796	1897	2296	2456	2445	2522.0	2437.1	2478.1	2500.4
Pregnancy, childbirth and the puerperium complications*	2521	1274	1530	2043	1948	2335	2353	2169.2	2753.7	2387.3	2148.9
Infectious and parasitic diseases	1600	1333	1488	1899	2241	2499	2274	2274.5	2326.1	2277.7	2216.4
Diseases of the musculoskeletal system and connective tissue	1965	962	724	941	1462	1915	1961	2022.2	2082.9	2152.9	2165.8
Diseases of the nervous system	4600	2719	1785	1265	1588	1834	1875	1957.0	2077.2	2146.4	2220.0
Neoplasms	1152	1085	931	1219	1433	1849	1855	1962.6	2114.0	2227.1	2298.2
Injury, intoxication and certain other consequences of external causes	4945	3065	1689	1495	1678	1851	1852	1945.0	1950.8	1928.8	1842.8
Diseases of the skin and subcutaneous tissue	1965	1504	659	1037	1541	1798	1807	1967.4	2010.0	2077.5	2105.3
Diseases of the ear and mastoid process	-	-	-	584	1020	1233	1318	1410.9	1515.0	1493.0	1586.7
Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	41801	79	41779	43	146	157	202	214.9	227.0	248.8	256.6
Congenital malformations, deformations and chromosomal abnormalities	58	47	43	77	95	100	111	100.5	96.7	97.7	89.9

Source: MoH NHIAC, 2018

6 Utilization of healthcare services

An effective health system implies delivery of maximally effective and adequate health care services to the population against compatible level of resources.

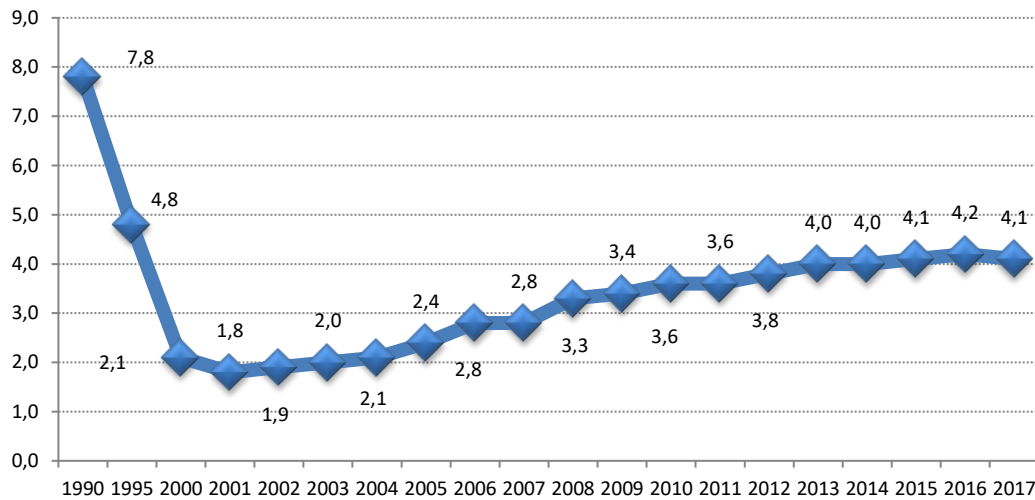
According to the WHO definitions there are three types of access:

- **Financial:** when the ability to access care is limited due to financial restrictions of the household.
- **Geographic:** when the ability to access care is limited due to physical distance of the health settings or their absence.
- **Information:** when the ability to access care is limited due to lack of information and citizens' not being aware of their rights to health services.

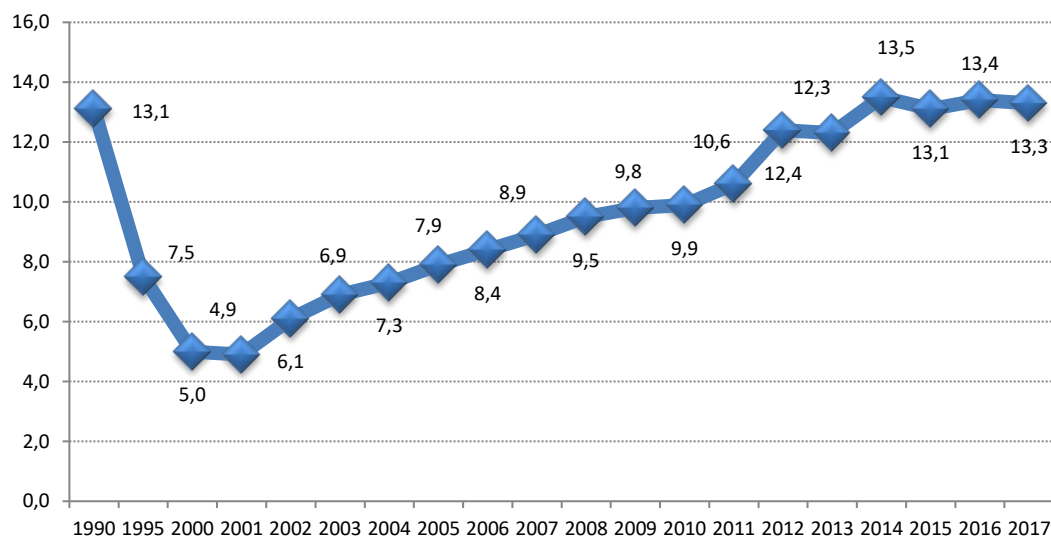
The level of poverty dropped from 29.4% in 2016 to 27.6% in 2008, and the share of very poor declined from 12.6% in 2008 to 9.8% in 2016. The level of extreme poverty increased to 1.8% as compared to.

In 2016 the general level of poverty remained higher by 1.8 percentage points (or by 6.5%) as compared with 2008, whereas the level of extreme poverty increased by only 0.2 percentage points. At the same time, after the crises the number of poor increased by 2.9 percentage points compared with 2008.

Despite the variety of different benefits and regulations facilitating utilization of healthcare services, many people are not aware of them and make voluntary or forced out-of-pocket spendings which could be avoided. So, informational barrier to health care deserves special attention. The number of per capita per annum outpatient visits and the number of per capita per annum hospital admissions in Armenia declined abruptly between 1990 and 2017 (Figures 16 and 17). The indicators increased from 2000 supported with the significant economic growth in the country. Nonetheless the rate of hospital visits increased more than that of outpatient ones, because most of population passes by outpatient settings and turns to hospital narrow specialists.

Figure 16. PHC per capita visits, 1990, 1995 and 2000-2017

Source: NHIAC, 2018

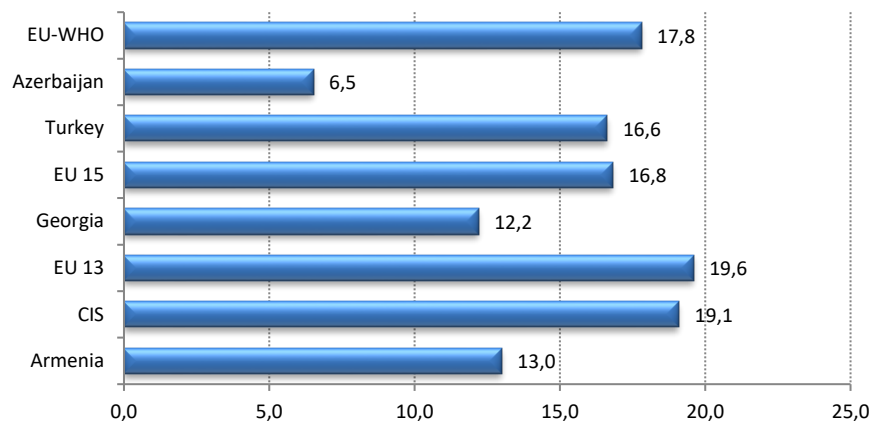
Figure 17. Annual hospitalization rate per 100 population, 1990, 1995 and 2000-2017

Source: NHIAC, 2018

The presented indicators can be explained as figures reflecting increased access to both inpatient and outpatient services by the population.

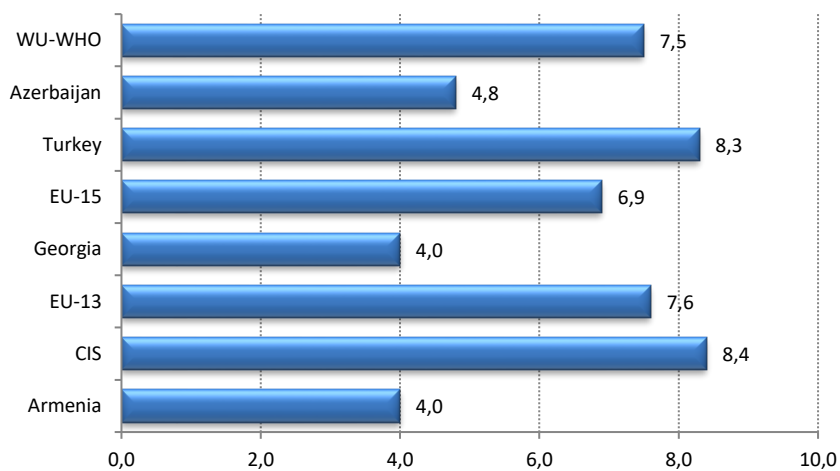
The hospitalization rate for Armenia is higher than the rates for Azerbaijan and Georgia, and below the rate of Turkey, CIS, EU-15 and EU-13 countries. A similar picture is seen in outpatient visits (Figures 18 and 19).

Figure 18. Hospitalization rate per 100 population, selected countries and country groups, 2014



Source: HFA DB, WHO

Figure 19. Ambulatory visits per capita, selected countries and country groups



Source: HFA DB, WHO

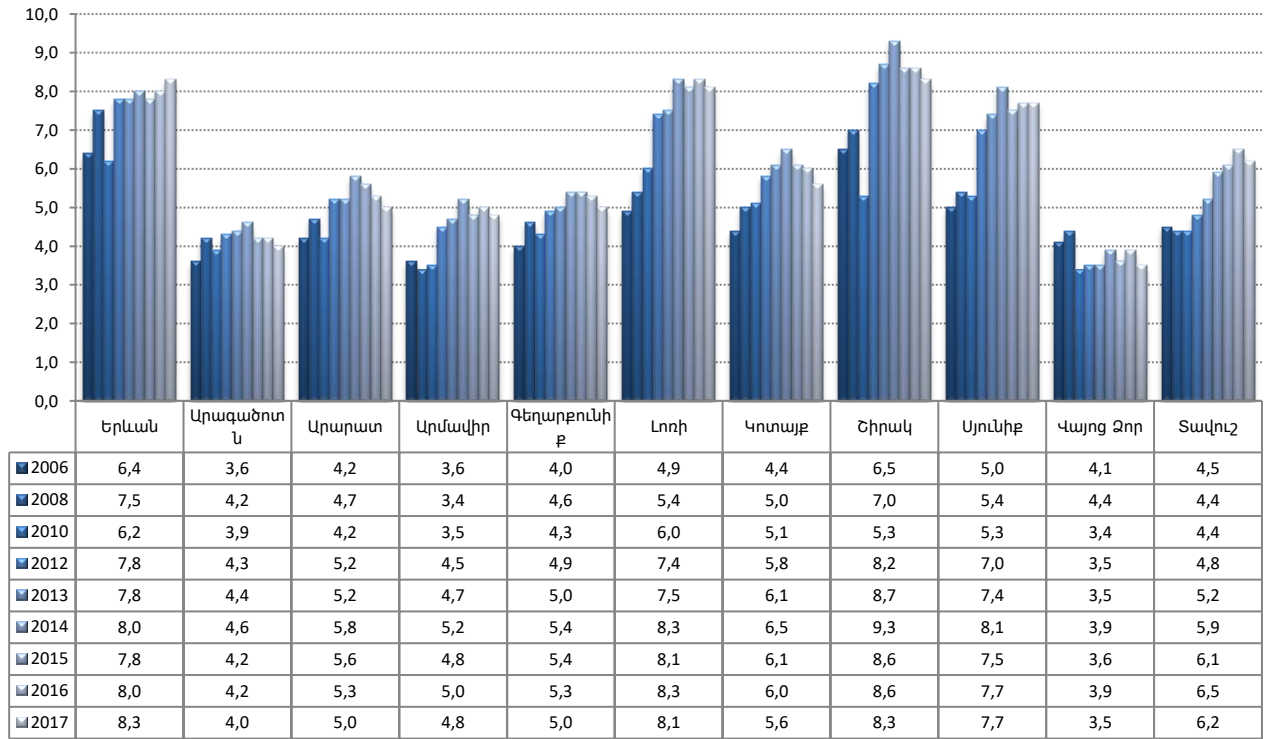
Hospitalization across marzes

Figure 20 shows hospitalization rate between 2006 and 2017 per marz, per 100 population. The figure evidences that:

- Hospitalization rates have increased in all marzes between 2010 and 2016. But in 2017 some decline was detected compared with the previous year, except for Syunik marz. Drastic decline of hospitalization was recorded in Kotayk and Vayots Dzor marzes.

This fact is probably the result of regional population migration or the absence of relevant specialists in marz hospitals.

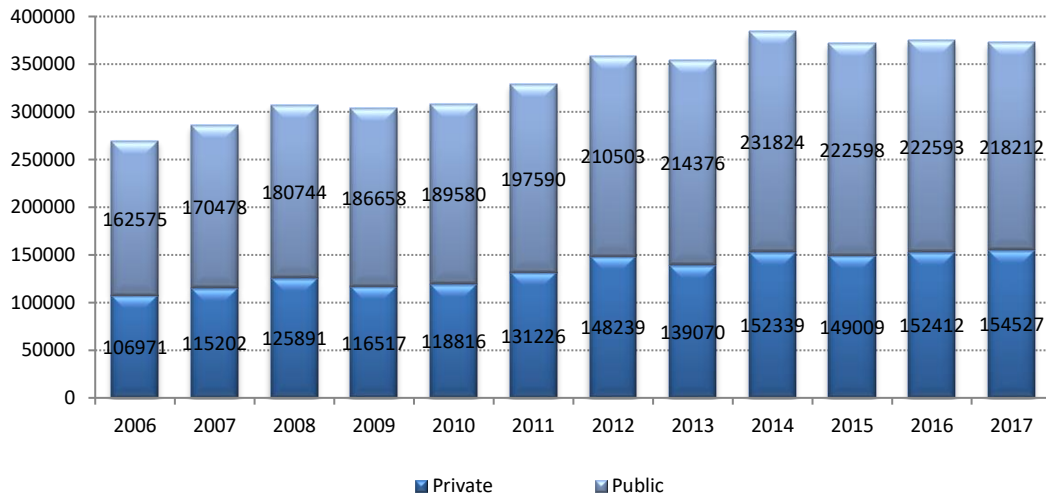
Figure 20. Hospitalization rate per marzes per 100 population, 2006-2017



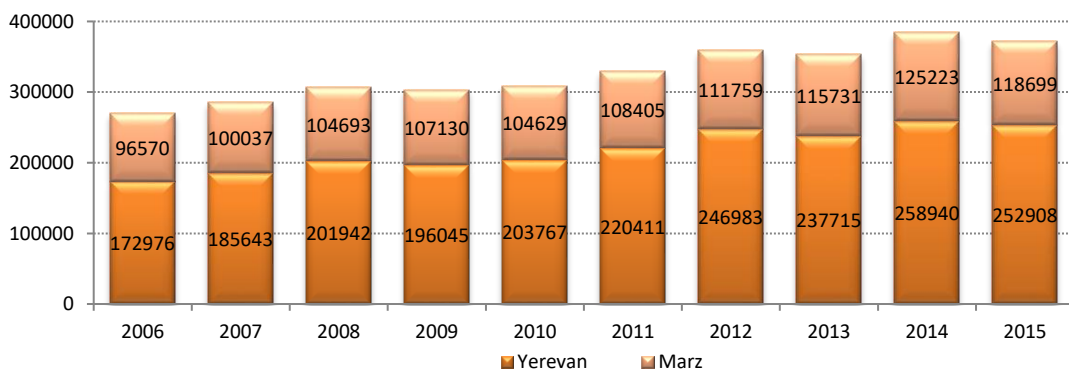
Source: NHIAC, 2018

It is noteworthy that

- The number of both public and private hospital admissions has increased between 2012 and 2014, but showed a declines tendency in 2017 (Figure 21).
- Figure 22 shows that the number of marz hospital admissions has significantly increased between 2012 and 2014.

Figure 21. Public and private hospital admissions (absolute figures), 2006-2017

Source: NHIAC, 2015

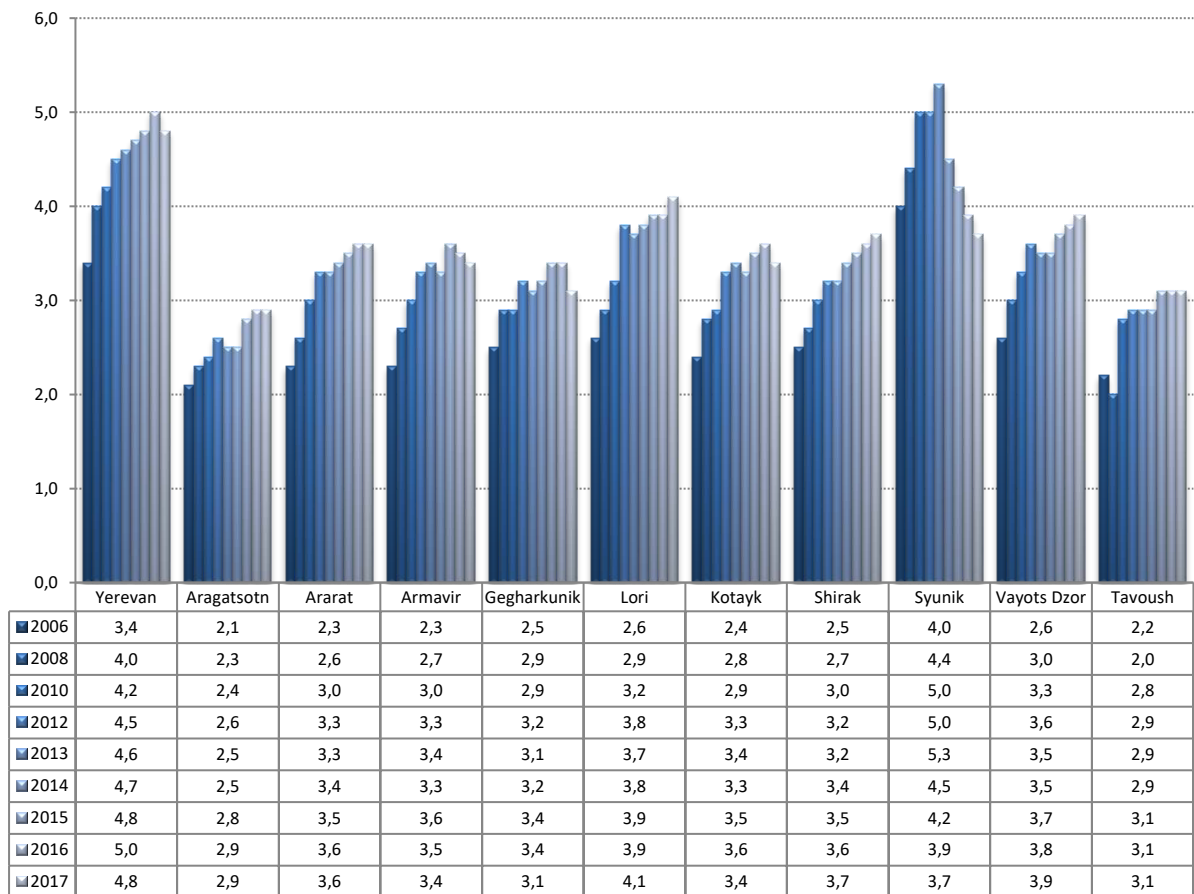
Figure 22. Number of patient admissions, Yerevan versus marz hospitals (absolute figures), 2006-2015

Source: NHIAC, 2015

Ambulatory visits across marzes

Marz breakdown of ambulatory visits shows different dynamics. An increase of per capita ambulatory visits is evident in all marzes between 2006 and 2017, which means that population access to ambulatory care improved due to implemented reforms.

Figure 23. Annual ambulatory visits per capita, by marz, 2006-2017



Source: NHIAC, 2018

7 Quality of healthcare services

Quality and safety of healthcare services

To assess the quality of healthcare services the chapter looks at the following indicators:

- Detection rates and treatment effectiveness for malignant neoplasms including
 - Breast cancer and
 - Cervical cancer
- Hospital fatality rates

Detecting and treating malignant neoplasms

According to evidence-based medicine 40% of cancers are preventable and treatable. Among them are breast cancer and cervical cancer (BC, CC), which develop in nearly 5-10 years. The probability of cancer treatment increases if detected in early stages. Due to comprehensive BC and CC monitoring programs the number of new cases and the mortality rate due to these two cancers dropped 60-80% in a number of developing countries during the last decade.

Both types of cancer are the lead killers among cancer diseases in women, occupying the first and second places correspondingly. They are most prevalent in women of 35-55 age groups. BC and CC are quite rare in women under 20 and most cases are detected in 65 and older women.

According to 2017 data issued by the National Oncology Centre (NOC) and NHIAC, 26,1% of BC cases were detected at stages III and IV. In fact, 60.2% of CC was detected at stages III and IV. Also, 1118 new cases of BC and 262 cases of CC in women were detected.

Successful treatment of cancer strongly depends on the stage at which the disease is detected. Data on detection of cancers per stages of the disease between 2003 and 2017 is presented in Figure 24.

As data witness:

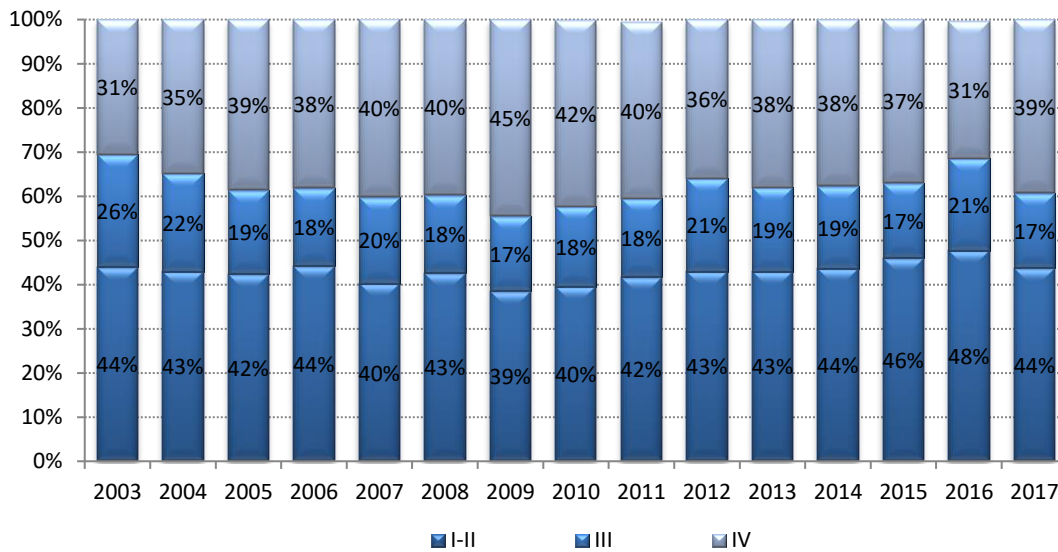
- **Unfortunately, no progress is seen in early detection of cancer.**

In 2017 less than half (44%) of cancer cases were detected at stages I-II and more than half (56%) at stages III and IV.

Therefore:

- **Early detection of cancers continues to be a serious challenge for 10 years already and requires fundamental interventions in order to improve the situation.**

Figure 24. Detection of malignant neoplasms according to disease stage, all cancers, 2003-2017

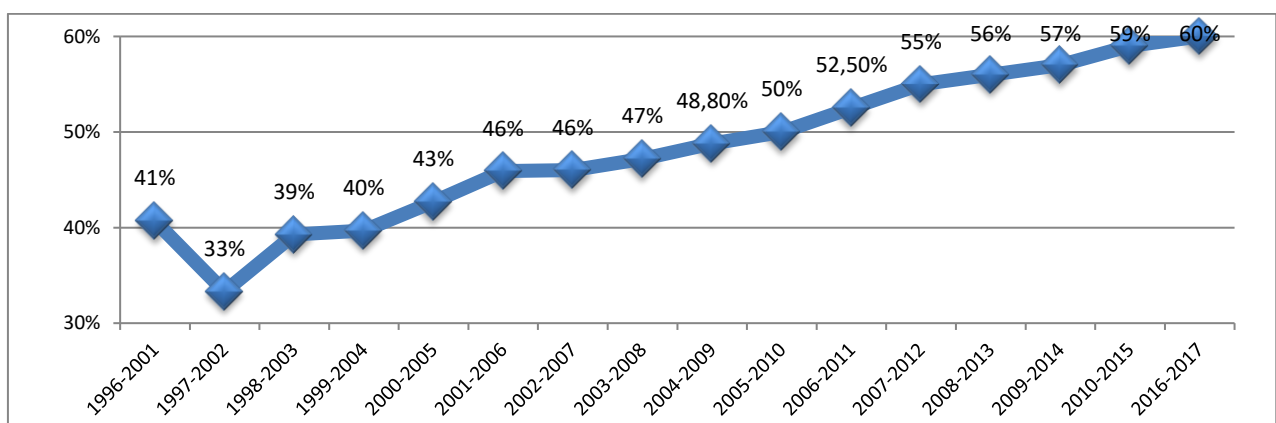


Source: National Oncology Center, 2018

Detection of breast cancer

Breast cancer is one of the types of malignant neoplasm. Statistics of BC is run by the National Oncology Institute. The integral indicator of treatment of malignant neoplasms is the probability of five-year survival after diagnosis of breast cancer. The indicator applies to females (Figure 25). The Figure shows slow but steady increase of the rate since 2002. The question whether or not this increase can be considered satisfactory is to be answered by relevant specialists.

Figure 25. Five-year survival rate following diagnosis of breast cancer



Source: National Oncology Center, 2018

A change in survival rates for cancer can result from transition in the stage at which the disease is detected as well as from changes in the quality of treatment. Figure 26 helps to attribute differences

in survival rates specifically to one of these factors. The data above show detection rates for various stages of this cancer type between 2003 and 2017.

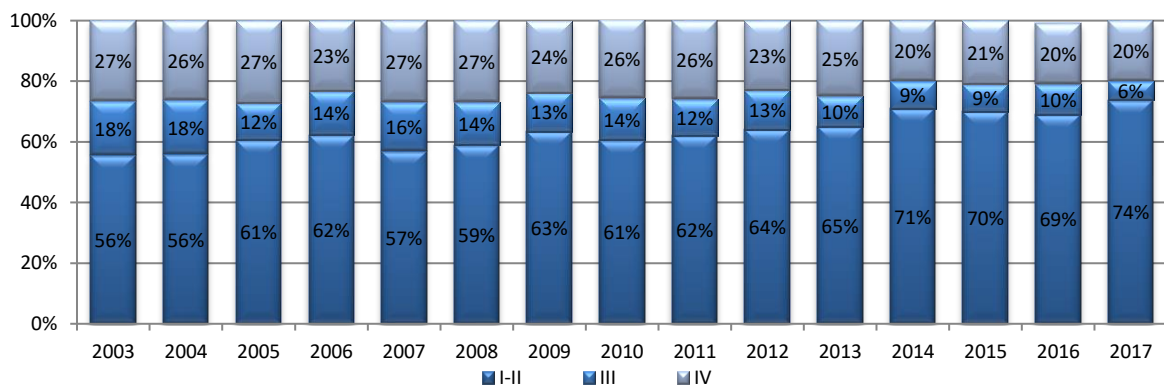
As data demonstrate, the stage I and II detection rates for breast cancer went up between 2010 and 2017, hence it could be assumed that

- **The increase of the probability of five-year survival after diagnosis of breast cancer to some extent depends also on the increase of the probability of early detection.**

On the other hand, data speak of an unexplainable periodicity - cancer detection in stages I-II has 3-4 years increase followed by a decline of early detection. In particular, an increase of the detection rate of BC stages I-II was recorded during 2004 - 2006, 2007 - 2009 and 2010-2014 and a decline during 2006-2007, 2009-2010 and 2014-2017.

No explanation is available for this periodicity.

Figure 26. Detection of breast cancer according to stage of disease, 2003-2017



Source: National Oncology Center, 2017

As Figure 26 suggests:

- **There are no grounds to assume a declining probability of late breast cancer detection at stage IV.**

All in all 20 % of breast cancer cases were detected in 2017, versus 26% in 2011, which suggests improvement of the detection rate.

Hence it can be concluded that:

- **The increase of the survival rate in women with diagnosed breast cancer should be attributed merely to improvement of the treatment quality.**

Any progress in combating cancer is highly appreciated. Armenia has remarkable potential for improved treatment of breast cancer in women, particularly early detection of the disease. Any new technology is much more expensive when it is just introduced as opposed to the old technologies. Consequently it is believed that improvement in the quality of cancer treatment is coupled with the increase of the costs. Hence, progress in early detection of neoplasms can essentially improve the treatment effectiveness and make it essentially cheaper.

This means that:

- Financial resources allocated to early detection of cancer can help reducing per patient treatment costs and spending the amount on treatment of many more patients. Eventually this approach can end up in better results than implementation of new technologies.

Challenges related to malignancies

According to 1985-2017 statistics the incidence of malignancies in RA population has increased almost 1.8 times (Table 8).

Table 8. Population incidence of malignancies

Year	Number of patients with primary confirmed diagnosis of malignancy enrolled with an oncology clinic		Number of patients under long-term follow-up by oncology clinic at the end of the year	
	a.n.	r.n.	a.n.	r.n.
1985	4710	140.6	17584	522.0
1987	5119	148.8	20045	578.7
1988	5227	151.0	21228	613.4
1989	5270	150.9	22067	632.0
1990	5162	145.1	20929	588.2
1991	4905	135.7	21787	602.6
1992	4462	121.1	21584	585.6
1993	4586	122.9	21670	580.7
1994	4515	120.5	21709	578.4
1995	4705	125.2	21290	565.3
1996	4757	126.1	20721	548.1
1997	4709	124.4	20602	543.4
1998	5145	135.6	21605	568.8
1999	5415	142.5	22589	593.9
2000	5413	142.3	21972	577.8
2001	5666	149.1	23451	617.1
2002	5737	178.6	24384	759.6
2003	5951	185.3	25580	796.3
2004	6174	192.1	26522	824.7
2005	6396	198.8	26512	823.6
2006	7163	222.4	27963	867.6
2007	7294	226.1	28439	880.4
2008	7336	226.8	28692	886.1
2009	7657	236.1	30117	926.8
2010	7593	233.2	31550	967.0
2011	7858	240.4	32580	995.0
2012	7877	260.5	34400	1136.5
2013	7911	261.8	36660	1215.1
2014	8365	277.6	38918	1292.7
2015	8372	278.6	40862	1362.7
2016	8376	279.9	42821	1434.0
2017	8389	281.6	43830	1474.4

r.n per 100000 population

- Malignancy incidence increases drastically in 35 and older age group and reaches its peak in the 65 and older age group (Table 9).

Table 9. Gender-age breakdown of RA population morbidity of malignancies

Age	2016 p.						2017 p.					
	Number of patients with primary confirmed diagnosis of malignancy, who are enrolled with an oncology clinic						Number of patients with primary confirmed diagnosis of malignancy, who are enrolled with an oncology clinic					
	Total		Males		Females		Total		Males		Females	
	a.n.	r.n.	a.n.	r.n.	a.n.	r.n.	a.n.	r.n.	a.n.	r.n.	a.n.	r.n.
0-14	65	11.0	40	12.7	25	9.0	35	5.9	17	5.3	18	6.4
15-17	10	9.8	5	9.2	5	10.5	8	8.0	7	13.2	1	2.2
18-24	38	12.8	18	12.2	20	13.5	43	15.8	24	17.6	19	13.9
25-34	157	29.5	64	25.0	93	33.5	168	31.7	55	21.7	113	40.7
35-44	373	95.7	124	67.5	249	120.8	416	104.2	127	67.6	289	136.8
45-54	1066	288.9	451	270.1	615	304.5	959	271.1	395	248.3	564	289.8
55-59	1101	507.1	537	548.5	564	473.2	1136	520.6	572	586.1	564	467.7
60-64	1219	754.8	653	924.9	566	622.7	1289	765.9	692	942.8	597	629.1
65 and older	4347	1309.3	2467	1877.5	1880	937.2	4335	1274.6	2331	1737.0	2004	973.3
Total	8376	279.9	4359	306.1	4017	256.1	8389	281.6	4220	298.6	4169	266.2

r.n. per 100000 population

- The prevalence of breast, cervical, uterine and ovary cancers is very high in female population (Table 10).
- Males are mostly affected by tracheal, bronchial, pulmonary, bladder, and prostate cancer (Table 10).
- Moreover, during the recent years stomach and colorectal cancer incidence has increased notably in both males and females which could be attributed to sedentary lifestyle and unhealthy eating patterns (Table 10).

Table 10. Malignancy incidence according to gender and age groups, 2015 (absolute numbers)

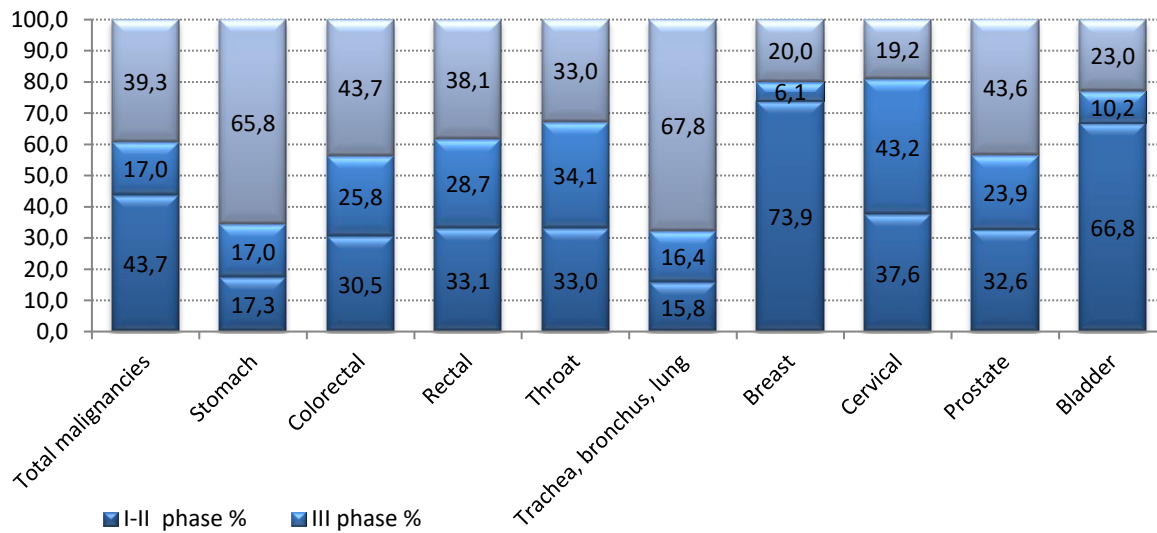
Description	ICD10	Total	0-14	15-17	18-24	25-34	35-44	45-54	55-59	60-64	65+ >
Females											
Breast	C50	1118			1	31	124	198	196	189	379
Cervical	C53	262				9	41	64	61	33	54
Uterine	C54	250					7	21	50	48	124
Ovary	C56	204			3	6	11	38	26	38	82
Trachea, bronchus, lung	C33- C34	204					4	15	13	26	146
Stomach	C16	221				5	5	16	21	24	150
Colorectal	C18	291				1	3	23	25	46	193
Males											
Trachea, bronchus, lung	C33- C34	1109				5	13	86	161	219	625
Throat	C32	112					1	18	17	28	48
Stomach	C16	339			1	3	6	36	49	50	194
Colorectal	C18	232			1		13	13	29	27	149
Liver and intrahepatic bile duct	C22	174	2			1	2	12	24	26	107
Prostate	C61	332						6	26	48	252
Bladder	C67	338			1	2	8	25	44	58	200

Table 11. Malignancy prevalence (morbidity), 2017

	ICD 10	a.n..
Females		
Breast	C50	10784
Cervical	C53	3116
Uterine	C54	1912
Ovary	C56	1256
Trachea, bronchus, lung	C33- C34	325
Stomach	C16	594
Colorectal	C18	1395
Malignant lymphoma	C81-90, C96	1033
Males		
Trachea, bronchus, lung	C33- C34	1649
Throat	C32	1138
Stomach	C16	999
Colorectal	C18	1243
Prostate	C61	1330
Bladder	C67	2328
Malignant lymphoma	C81-90, C96	1186

- More than 63,4% of lung and stomach cancer cases are detected at stage IV, and only 15-17% at stage III. This means that nearly 80% of cases are diagnosed at late stage, which explains the treatment effectiveness and survival rates.

Figure 27. Detection of malignancies according to nosologies and stages, 2017

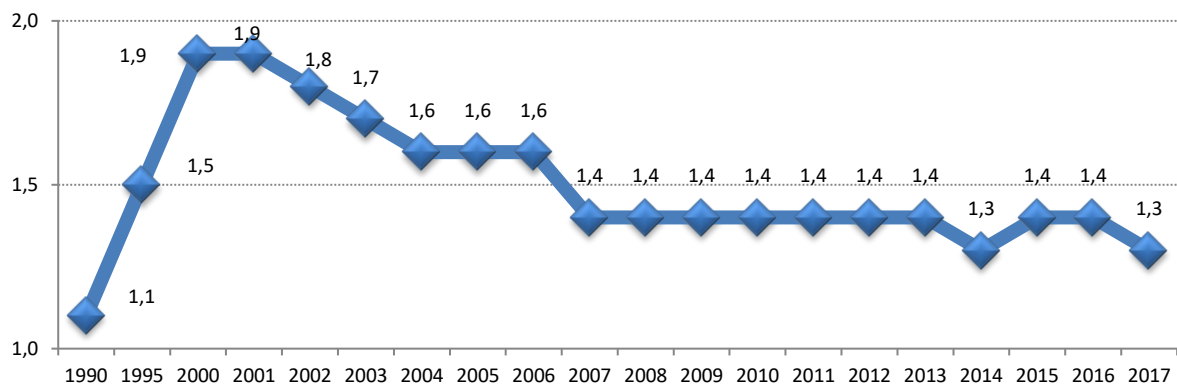


Hospital fatality

Total rate of hospital fatality and rates for each disease describe the quality of hospital care organization and delivery.

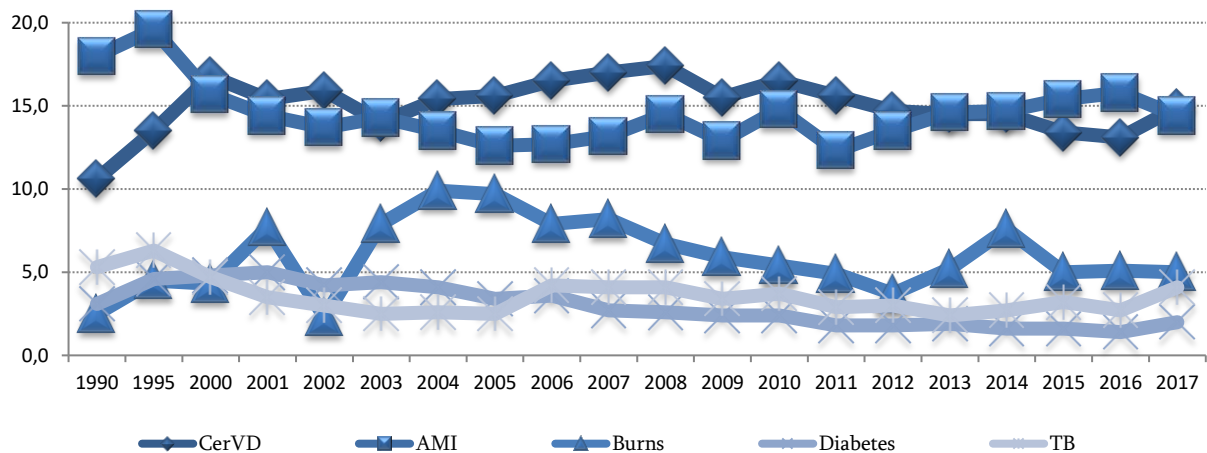
Total rate of in-hospital fatality for the period covering 1990-2017 is presented in Figure 28. The data show a steady decline of hospital fatality between 2001 and 2014, which was maintained in 2015 and 2016, and reached 1,3 in 2017 which speaks of improved hospital care organization and quality.

Figure 28. Hospital fatality rate per 100 admissions, all cases, 1990, 1995 and 2000-2017



Source: NHIAC, 2018

Figure 29. Hospital fatality rate per 100 admissions, selected conditions, 1990, 1995 and 2000-2017



CerVD – cerebrovascular diseases, AMI – acute myocardial infarction

Source: NHIAC, 2018

Analysis of hospital fatality per selected diseases (Figure 29) leads to the following conclusions.

- A decline tendency of hospital fatality due to CerVD is recorded between 2008 and 2017.
- An increase tendency of hospital fatality due to burns is recorded between 2012 and 2017.
- An increase tendency of hospital fatality due to TB is recorded between 2014 and 2017.
- An increase tendency of hospital fatality due to diabetes is recorded between 2014 and 2017.

Quality of maternity and child healthcare services

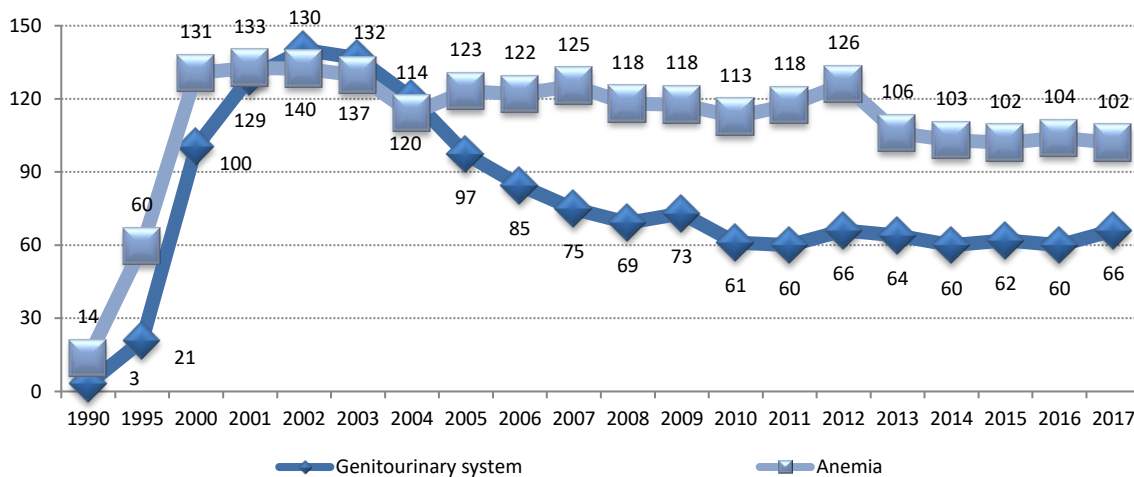
Two groups of indicators are monitored to assess the quality of health care services delivered to women and children, namely

1. Indicators of natal and postnatal complications, including rates of caesarean sections;
2. Indicators of postnatal care, breastfeeding and immunization.

Natal and post-natal complications

Between 2010 and 2017 the prevalence of essential natal and postnatal complications related to genitourinary system and anemia are almost steady (Figure 30).

Figure 30. Rates of selected natal and postnatal complications per 1000 deliveries, 1990, 1995 and 2000-2017



Source: NHIAC, 2018

These data pinpoint important specifics. Despite the decline of these rates between 2002 and 2010, they stay very high compared with the level of 1990.

In particular, the rate of anemia in 1990 covered 14‰ of the number of births, whereas of genitourinary system complications shared as little as 3‰.

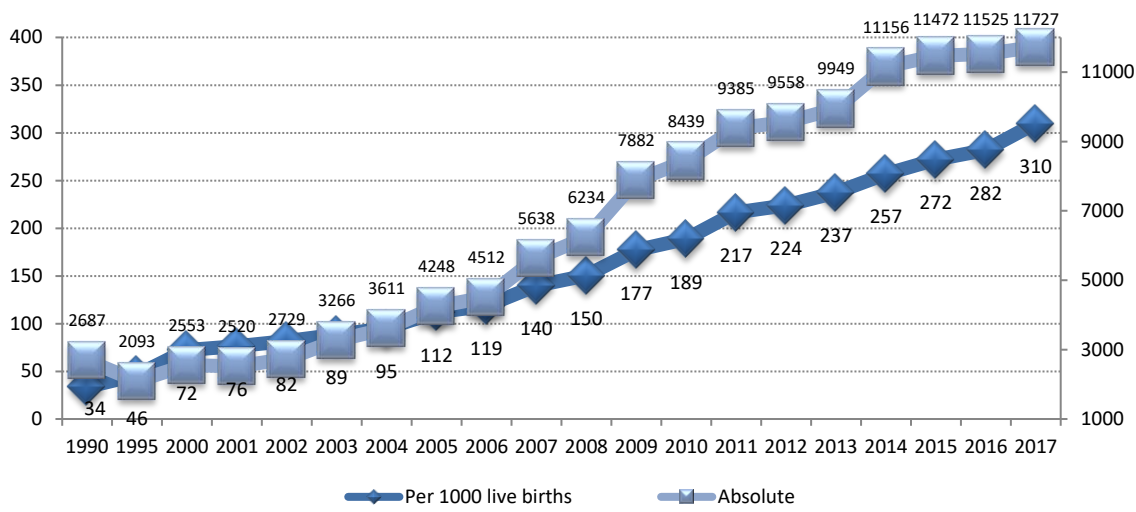
The National Maternal and Child Health Care Strategy for 2003–2015 set a target of reducing complications from anemia by 50% by 2015, but the target is not expressed explicitly and no baseline is designated.

Caesarean sections

The rate of caesarean sections in Armenia increases firmly. It reached 310 per 1000 births in 2017.

The total number of sections was 11 727 (Figure 31).

Figure 31. Caesarean sections, rate per 1000 live births and absolute number, 1990, 1995 and 2000-2017



Source: NHIAC, 2018

It is straightforward that postnatal complications are more common in caesarean sections. In addition, after caesarean section women are advised by physicians to plan the next birth in 2 - 3 years, therefore:

- Reduction of the number of caesarian sections in Armenia is a strong leverage contributing to the increase of the number of births.

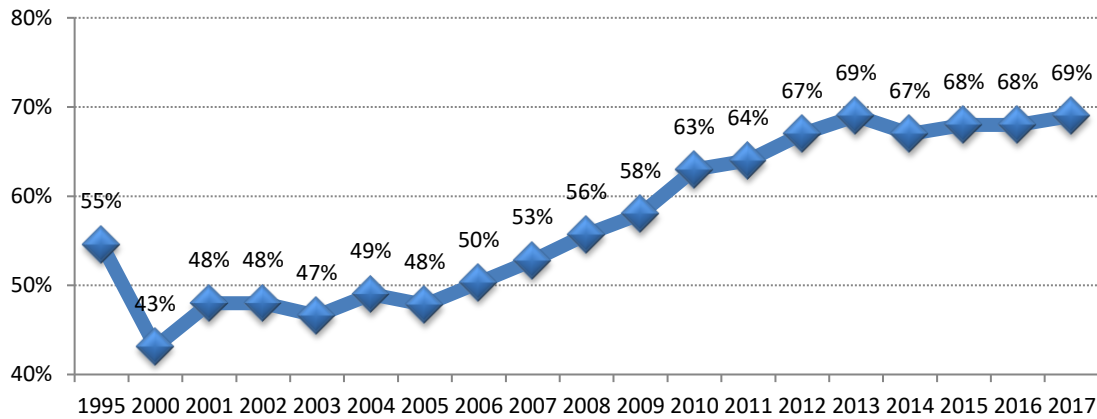
Maternal and child health care

The core indicators for the quality of maternal and child health care services address:

- Early coverage of prenatal care
- Breastfeeding rate
- Child immunization

Early coverage of prenatal care: This rate showed steady growth between 2005 and 2013, but is still below the target of 90% defined in the National of Maternal and Child Health Strategy for 2003–2015. The rate of early coverage of prenatal care is lower compared with that recorded back in 1995 - 55% (Figure 32).

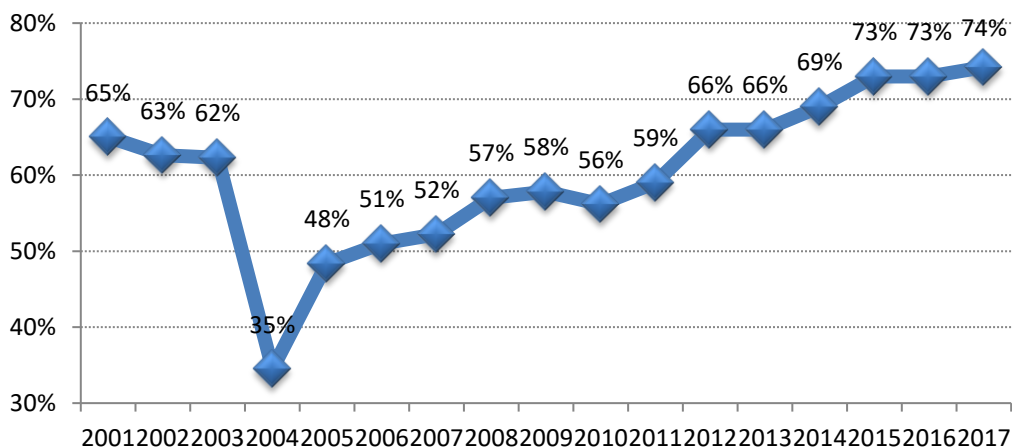
Figure 32. Proportion of expectant mothers receiving early prenatal care (prior to 12 weeks), 1995, and 2000-2017



Source: NHIAC, 2018

Breastfeeding coverage: The National of Maternal and Child Health Strategy for 2003–2015 envisages “ensuring by 2009 that 65% of infants under 4 months and 40% of infants under 6 months are exclusively breastfed and maintain the continuity throughout the second year of the child’s life.” Between 2010 and 2017 the rate increased significantly - from 65% to 74% (Figure 33).

Figure 33. Percent of Armenian infants 0–6 months old who are breastfed, 2001-2017



Source: NHIAC, 2018

8 Health system human resources

Health system professional workforce is the cornerstone of healthcare service delivery, quality of medical services and management of health system.

Assessment of health system human resources serves several goals, including evaluation of health planning and monitoring efforts, as well as health policy, programs and interventions. Existence of reliable information is critical for development and management of health system human resources.

The 'resource management/ building' function of the health care system deals with proper training of health personnel, their continuing education, professional development, availability of specialists, as well as their adequate breakdown and sufficient number to meet workforce needs of health care facilities.

Recently the World Health Organization Regional Office for Europe has adopted a number of decrees (EUR/RC57/R1, EUR/RC59/R4) to address problems of health system human resources. They suggest member states ways to improve management of information on health workforce, to draft and approve strategies on development of human resources.

The Health System Human Resources Development Strategy and Action Plan were approved by the RA Government session decision No 5 of 6 February 2014. This document describes actions targeted at development of human resources strategy.

Health system development and delivery of quality medical services to the population require professional education and continuing development of healthcare specialists.

International practices demonstrate that continuing professional development contribute to improvement of the quality of medical services, reduction of morbidity and mortality rates and improvement of other health indicators.

Given the aforementioned and also taking into consideration, that continuing professional development is a key precondition for delivery of quality health services, not harming the patient and duly addressing health problems, Armenia also introduced the aforementioned system, which was facilitated by a number of amendments and additions to the acting legal framework. In particular, the following laws and regulations were adopted: Law HO 113-N 'On Amendments and Addenda to the RA Law on Population Medical Assistance', 'On Amendments and Addenda to the RA Code on Administrative Offences' and 'On Amendments and Addenda to the RA Law on State Duty'. A chapter was added in the Law HO 113-N 'On Amendments and Addenda to the RA Law on Population Medical Assistance' (Chapter 3.2), which defines principles of organization of the continuing professional development (CPD), the order of collecting CPD credits, organizations implementing various types of CPD, key requirements to accreditation, health providers were clear separated in accordance with their educational attainment and activities.

The section reflects on key challenges of health system workforce (doctors and nurses), training of doctors and nurses, continuing professional education and upgrading, workforce availability, their concentration

and demand. The Chapter of Health System Human Resources encompasses trends reflected in the HSPA 2009 and beyond.

Education of health system human resources

Professional education of healthcare human resources in Armenia is provided by Yerevan State Medical University (YSMU) and five private higher education medical institutions. Vocational education of secondary medical workforce is performed by 20 secondary medical vocational institutions, of which 12 are public and 8 are private.

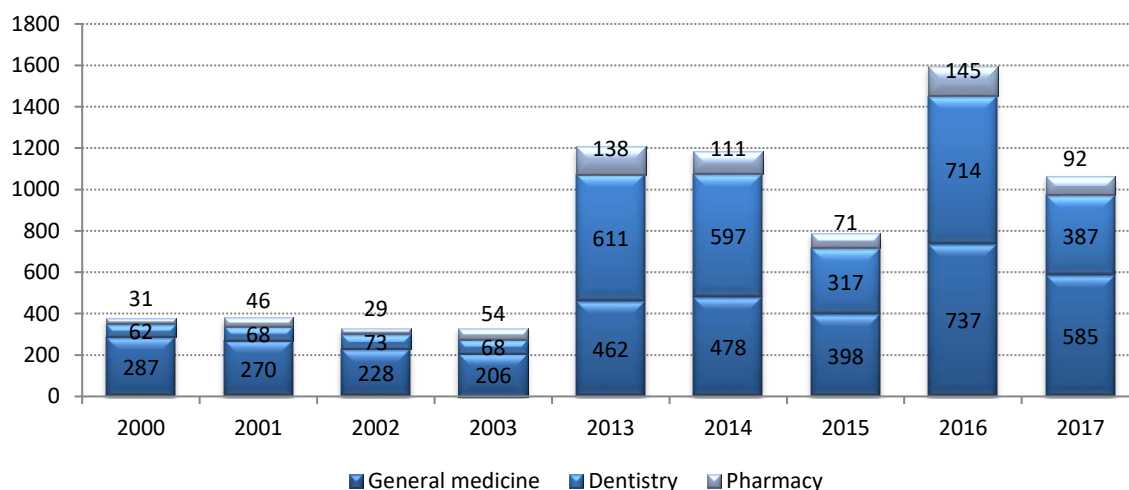
Table 12. The number of higher and secondary medical educational institutions in Armenia, 2010-2017

		2010	2011	2012	2013	2014	2015
Higher educational institutions	Public	1	1	1	1	1	1
	Private	6	6	6	6	5	5
	Total	7	7	7	7	6	6
Secondary educational institutions	Public	12	11	11	11	11	12
	Private	10	10	11	12	13	8
	Total	22	21	22	23	24	20

Source: NSS, 2015

The number of graduates from public and private higher medical institutions is presented in Figure 34, Tables 13 and 14. The data suggest an increase of graduates of dental specialties during the recent years. On the other hand however, from 2010 onward the number of active dentists decreased, which may be due to migration to other CIS countries, particularly Russia where the demand of dentists is bigger, coupled with better payment and wider professional upgrading opportunities.

Figure 34. Number of graduates of higher public and private medical educational institutions according to specialties (data on private institutions are presented for 2008-2017 only)



Source: NSS, 2017

Table 13. Number of graduates of public higher medical educational institutions according to specialties, 2010-2017

Specialty	Total							
	2010	2011	2012	2013	2014	2015	2016	2017
General medicine	284	344	295	294	305	277	565	433
General medicine in armed forces	33	33	39	31	23	10		
Dentistry	132	-	250	265	219	115	217	155
Pharmacy	58	-	99	96	63	41	119	61
Public health						10	11	6
Total	507	377	683	686	610	453	912	655

Table 14. Number of graduates of private higher medical educational institutions according to specialties, 2010-2017

Specialty	Total							
	2010	2011	2012	2013	2014	2015	2016	2017
General medicine	120	231	125	137	150	101	172	152
Dentistry	257	535	360	346	378	202	497	232
Pharmacy	36	63	57	42	48	30	26	31
Healthcare	90	-	-	-	-	-		
Total	503	829	542	525	576	333	695	415

Source: NSS, 2017

In mid-1990s the healthcare system possessed a rather significant manpower potential (39 doctors per 10,000 population), who until 2002 were mainly educated by the YSMU - the only higher educational institution performing accredited diploma medical education. In 1990-1999 the annual number of graduates of all specialties varied from 600 to 700 and that of the secondary medical personnel from 1200 to 2500.

From 2004 education of medical specialists stepped up involving accredited public and private medical educational institutions. Particularly, during 2006-2016 YSMU produced 6455 graduates, in 2017 a total of 1070 people graduated from all public and private medical higher educational institutions.

In 2013 private higher educational institutions accounted for 912 graduates, while in 2016 their number dropped to 655, which means that in the past 3 years the number of graduates of all specialties has decreased. Meantime, the number of graduates of private higher educational institutions has decreased 1.6 times.

In 2017 YSMU provided 63% of graduates from higher educational institutions, 24% of which were from dentistry and 66% from general medicine department. Most (567%) of graduates of private higher educational institutions were also dentists.

Table 15. Number of graduates of secondary public vocational institutions according to specialties, 2010-2017

Specialty	Total							
	2010	2011	2012	2013	2014	2015	2016	2017
Nursing	1480	1282	890	895	796	1079	679	572
Midwifery	831	698	553	433	417	490	266	215
Pharmacy	579	483	480	478	503	548	458	420
Dental prosthesis	370	328	309	402	418	380	372	251
Therapeutic cosmetology	83	21	42	57	96	92	180	131
Organization of nursing	36	150	185	104	204	179	155	127
Therapeutic massage	34	14	14	16	28	19	21	8
General patient care						18	19	20
Total	3413	2976	2473	2385	2462	2805	2150	1744

Source: NSS, 2015

Table 16. Number of graduates of secondary private vocational institutions according to specialties, 2010-2017

Specialty	Total							
	2010	2011	2012	2013	2014	2015	2016	2017
Nursing	59	86	50	91	59	80	71	50
Midwifery	74	70	35	70	68	30	40	21
Pharmacy	25	60	75	152	148	74	78	40
Dental prosthesis	22	37	57	162	83	88	91	72
Therapeutic cosmetology	-	21	27	34	47	61	65	47
Organization of nursing	-	-	-	-	-		13	8
Therapeutic massage	-	-	-	-	-			
Total	180	274	244	509	405	333	358	238

Source: NSS, 2015

To ensure accurate analysis of acting health workforce, and their geographic and professional breakdown, the patterns and trends of 2001-2017 NHIAC data were perused.

Concentration of active health workforce

Dynamics of the number of doctors and nurses and the doctor-nurse ratio

According to 2017 data the absolute number of workforce (doctors and nurses) employed at public, private, academic, research, higher and secondary vocational educational institutions was 29,760 and the absolute number of doctors including all specialties (dentists inclusive) was 12 964 (43.51 per 10 000 population), which compared with 2011 is less by 526 – i.e. 13 490, (41 per 10 000 population), and for nurses by 1688, accounting 16 796 in 2017 (56.5 per 10 000 population).

Table 17. Active health workforce, 2005-2017 (private dental clinics included)

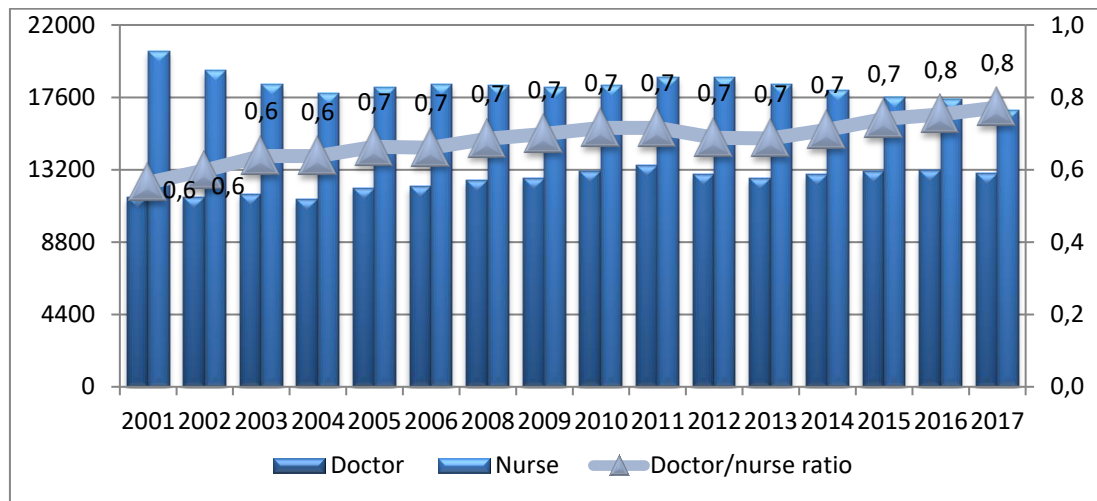
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Doctors of all specialties (including dentists)	12307	12388	12251	12964	13177	13591	13490	12922	12664	12896	13117	13148	12964
Nurses	18364	18574	18595	18594	18516	18649	18484	18784	18426	18053	17632	17464	16796
Total	30671	30962	30846	18594	31693	32240	31974	31706	31090	30949	30749	30612	29760
Number of hospitals	145	140	135	130	127	130	130	129	129	130	132	129	125
Number of hospital beds (thousand)	14.4	14.3	13.1	12.4	12.1	12.1	12.2	12.2	12.3	12.5	12.5	12.5	12.5
PHC settings	458	460	467	474	487	504	506	513	514	509	504	505	501
Pharmacists	143	157	163	176	204	214	199	176	228	232	225		
Pharmacologists	113	118	121	124	125	129	137	130	124	133	116		

Source: NHIAC, 2016

The number of nurses ranged between 18,181 and 18,820 from 2009 to 2011. At that, from 2012 onward their number declined (Figure 35). Starting from 2011 a decline of the number of doctors of all specialties was recorded, which was followed by an increase in 2015 and a decline in 2017 (18 less compared with 2016).

According to the Armenia Health System Optimization Concept, an increase of doctor/nurse ratio was expected. The latter showed stable level (0,74) between 2010 and 2015, followed by a visible increase to 0,77.

Figure 35. Number of active doctors and nurses, doctor-nurse ratio, 2001-2017



Source: NHIAC, 2015

Concentration of doctors and nurses across marzes

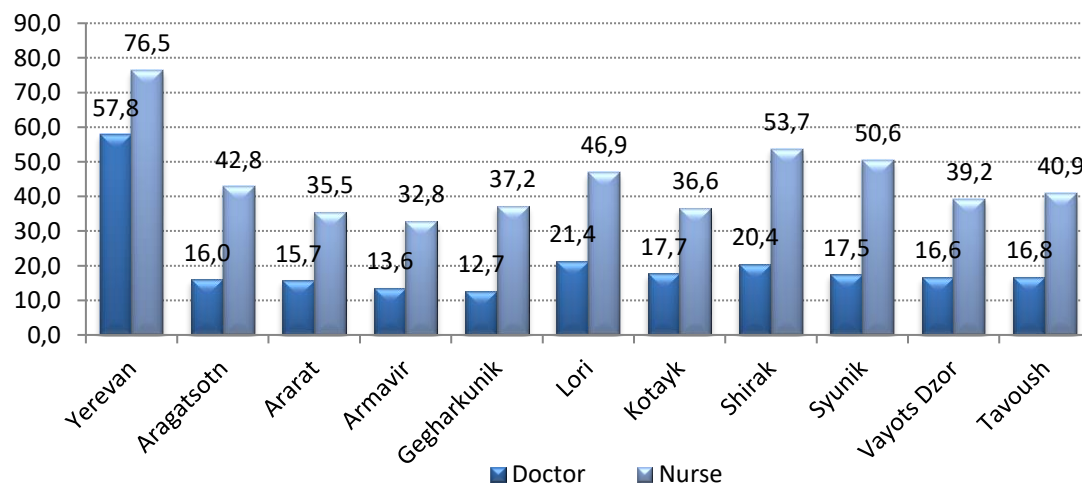
As mentioned earlier, in 2017 the number of doctors of all specialties (dentists included) was 12,964 (43,6 per 10 000 population), and of nurses 16 796 (56.5 per 10 000 population).

According to 2017 statistics, the number of PHC doctors was 5149 (17.24 per 10 000 population) and of nurses 7706 (25.86 per 10 000). The number of hospital doctors was 4231 (14.17 per 10 000 population) and of nurses 8346 (28.01 per 10 000). In fact, the concentration of healthcare professionals should be assessed on the basis of the number of active doctors and nurses.

The overall concentration of active physicians for Armenia differs greatly across the capital city and peripheries. In 2017 the number was 57,8 per 10000 population in Yerevan (Figure 36) and only 21,4 in marzes (Lori marz). The lowest rates are seen in Gegharkunik (12,7 per 10 000 population) and Armavir (13,6).

Concentration of active nurses, both outpatient and inpatient, is also uneven. Here again the situation looks better in Yerevan (76.5 per 10 000 population) and much worse in marzes (Figure 36).

Figure 36. Concentration of inpatient and outpatient healthcare workforce per 10 000 marz population, 2017

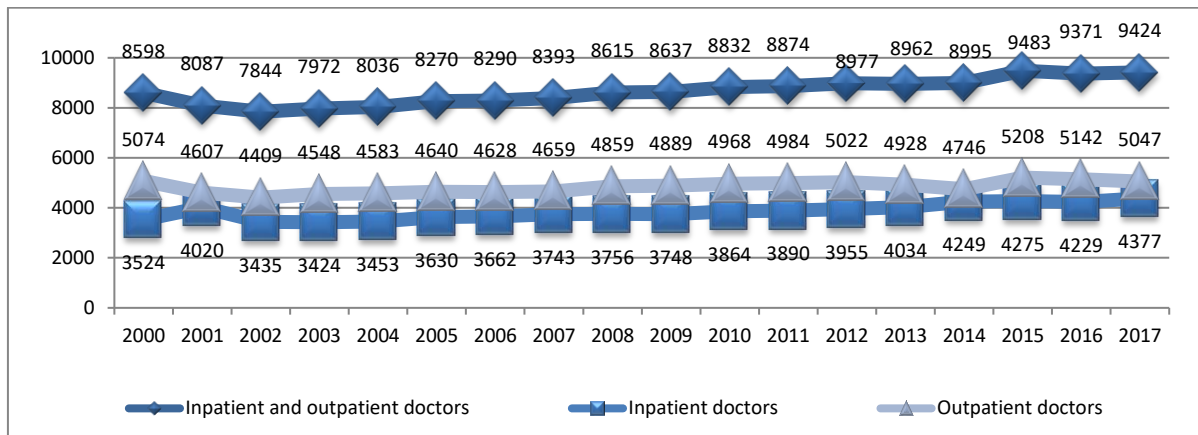


Source: NHIAC, 2018

Workforce concentration in outpatient and inpatient levels

According to the Armenia Health System Optimization Concept breakdown of workforce across inpatient and outpatients settings declined during 2000-2001 by 511 doctors and 685 nurses, where 90% of doctors were from PHC (from 5,074 in 2000 to 4,607 in 2001, i.e. by 467 doctors).

Figure 37. Numbers of inpatient and outpatient doctors, 2000-2017



Source: NHIAC, 2018

From 2002 onward the number of PHC and hospital doctors increased reaching 9424 in 2017 (Figure 37).

Concentration of doctors per main specialties and professional profiles

Concentration of PHC and hospital health workforce per population as well as main specialties and profiles during the recent years is presented in Table 18.

Between 2011 and 2017 the concentration of pharmacists increased by 29, the supply of dentists declined during this period by 148.

Table 18. Concentration of doctors and nurses of main specialties, 2011 - 2017

Year	Dentistry department	Pharmacy department
2000	62	31
2001	68	46
2002	73	29
2003	68	54
2004	85	45
2005	82	41
2006	79	35
2007	72	32
2008 ²	322	73
2009	306	77
2010	389	94
2011	535	63
2012	610	156
2013	611	138
2014	597	111
2015	317	71
2017	387	92

Source: NHIAC, 2015

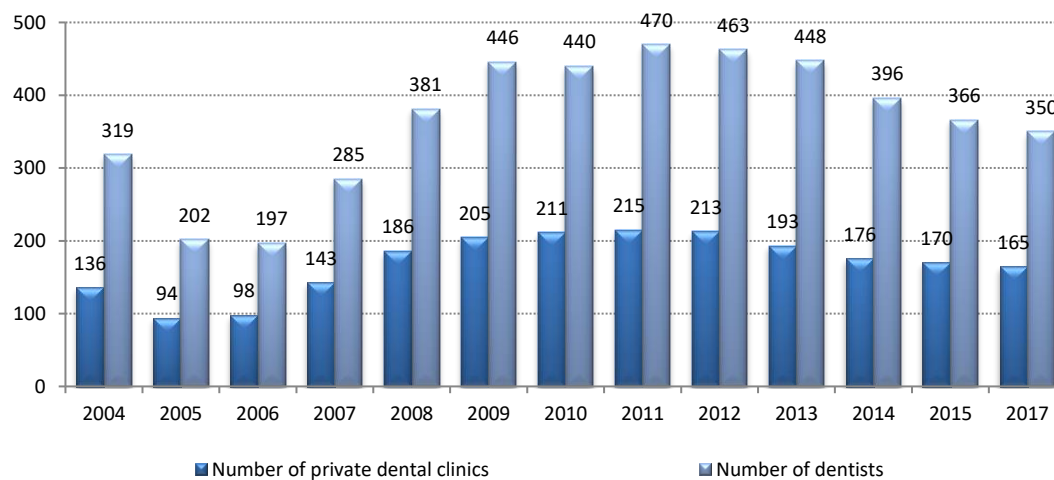
²Data on graduates of YSMU dental and pharmacy departments are presented for the period 2000-2007 and from 2008 data of 6 private higher educational institutions were included as well.

Table 19. Number of dentists per profiles, 2004-2017

Year	Dentists Therapists and surgeons Total	Dentists Therapists	Dentists Surgeons
2000	834	659	175
2001	614	498	116
2002	594	474	120
2003	780	610	170
2004	884	682	202
2005	1171	969	202
2006	1254	1066	188
2007	1177	954	223
2008	1755	1508	247
2009	1987	1711	276
2010	2180	1843	337
2011	2097	1788	309
2012	1782	1460	322
2013	1606	1319	287
2014	1629	1292	337
2015	1606	1278	328
2017	1554	1223	331

Source: NHIAC, 2018

Figure 38. Number of private dental clinics and dentists, 2004-2017



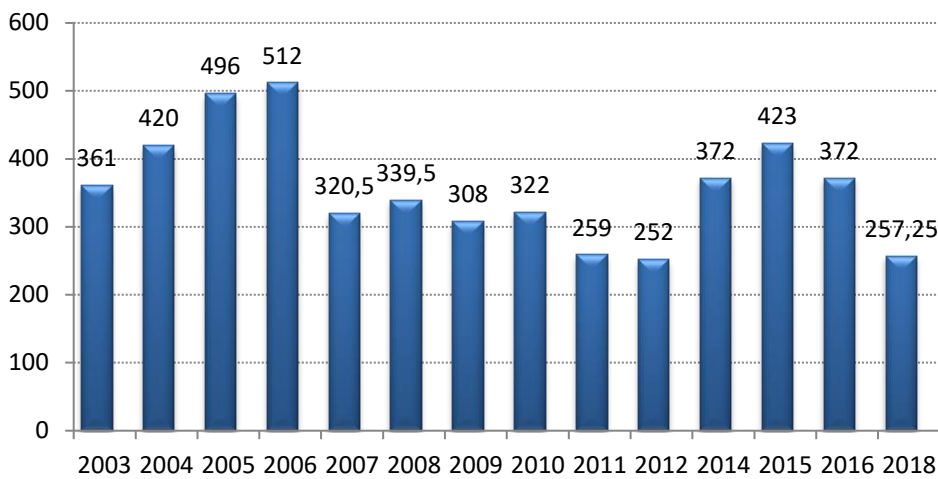
Source: NHIAC, 2018

Health system job vacancies for doctors

Along with education and training of physicians in Armenia, the country nonetheless faces job vacancies for health practitioners. The dynamics of vacancies for doctors between 2003 and 2016 can be divided into three phases (Figure 39).

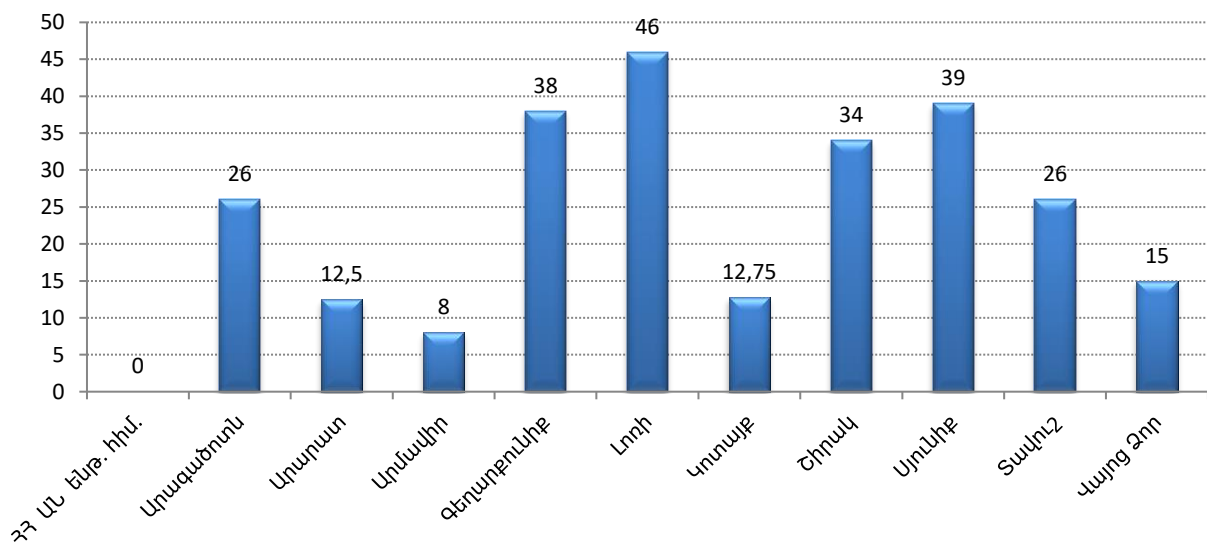
- The number of vacancies for doctors of different specialties has increased 1,4 times between 2003 and 2006 (361 versus 512).
- The absolute number of vacancies decreased 1.3 times between 2007 and 2012.
- And again, between 2014 and 2016 a 1,5 times increase was recorded.

Figure 39. Job vacancies for doctors, 2003-2018



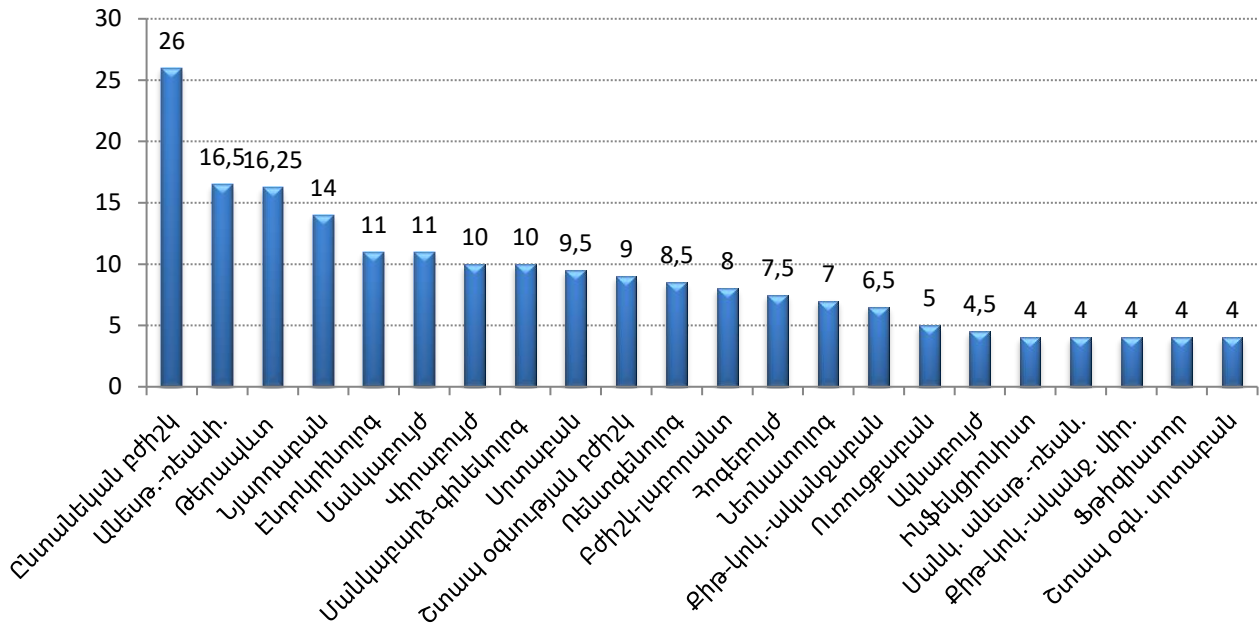
Especially significant are the vacancies for doctors of different specialties in remote marzes: Lori (46), Syunik (39), Gegharkunik (38), Shirak (34) (Figure 40). In fact, the biggest demand is for family physicians, anesthesiologists, therapists, neurologists, endocrinologists and others (Figure 41).

Figure 40. Vacancies for doctors across marzes, as of July 2018



Source: MoH, 2018

Figure 41. Vacancies for doctors per specialties, as of July 2018



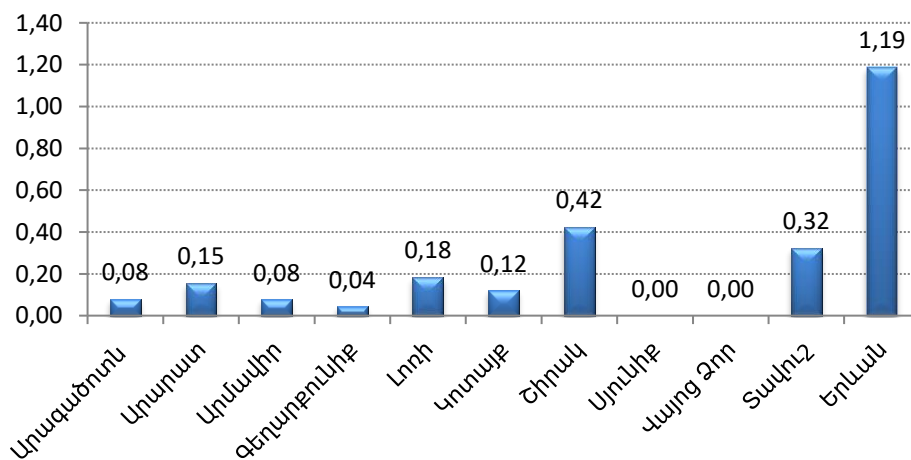
Source: MoH, 2016

The workforce drain to Russia and European Region is rather big. In fact, Armenia is a donor for other countries in terms of workforce development.

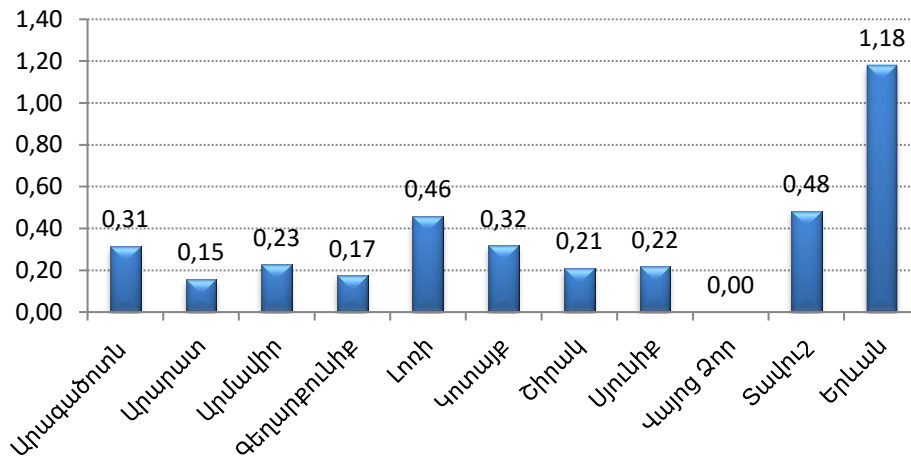
One of the mechanisms to meet workforce demand in marzes is mandatory secondment of graduates to regions within the framework of state order. International practices suggest that over 70 countries globally use the principle of mandatory job assignment.

Figure 42

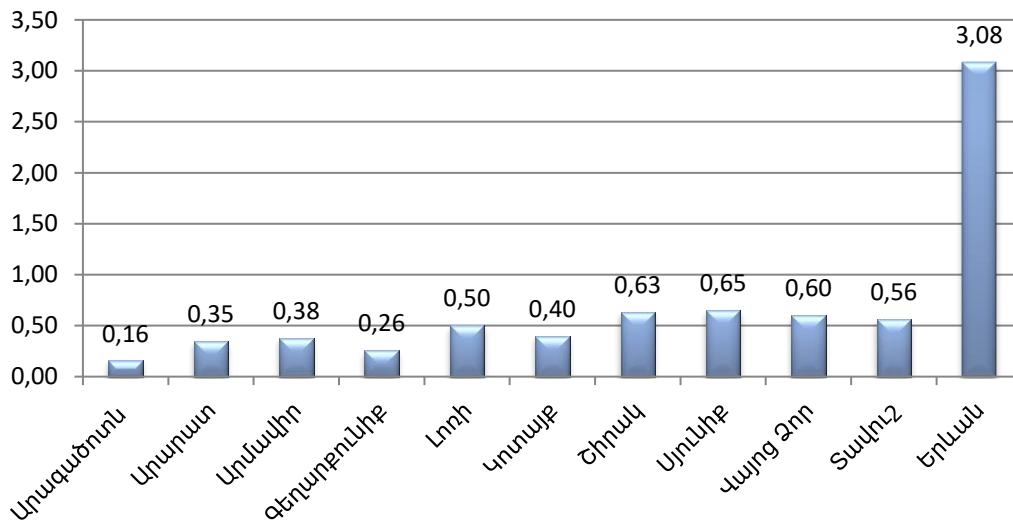
Oncologists



Endocrinologists



Cardiologists



9 SECTION 2

Methodology

Analysis of the use of bed capacity was based on the reporting form ‘2-1000 Bed Capacity and Its Use’ (see) submitted by the hospitals on annual basis. These data are used by the NHIAC to build its database ‘2-1000 Bed Capacity and Its Use’.

The data base for 2010-2017 contains 6,597 lines, where each line presents data describing bed capacity for a specific year, specific hospital, and specific department. Annual data for each hospital reflect a combination of several lines, given that hospitals have different number of departments.³

Excluding double calculations

To avoid double calculations during the analysis all TOTAL lines were singled out, which contained aggregated data for a given year, **all departments** of a given hospital, lines ‘In addition, Rehabilitation’ and «Rehabilitation – Adults’, [pediatric] including lines ‘Neonatal’ and [pediatric] infancy’, lines ‘[Tuberculosis] including bone and joint patients’ and ‘Tuberculosis-adults’, as well as lines ‘[Narcological] including mandatory treatment’ and ‘Narcological’ departments.

Thus, measures ensuring exclusion of double calculations helped to single out 1311 lines, and 5286 were left.

³ The ‘2-1000’ data base contained 85 numbers, each corresponding to a specific type of department.

Average annual bed occupancy in days

The 'Reporting Form 2-1000' and therefore the database did not include data on the average annual bed occupancy in days. The analysis required calculations for each line of the database. The rate was calculated using below formula.

$$\text{'Daily rate of annual average bed occupancy'} = (\text{'number of bed-days'}) / (\text{'average annual number of beds'})$$

To estimate the number of bed-days, the number of days with effectively occupied beds in all departments are added together.

Data analysis revealed that the bed occupancy rate systematically exceeds 365 which is illogical and unacceptable⁴. Statistical analysis of those weird findings showed a rather big number of such calculations. As the NHIAC expert explained, sometimes several patients may occupy the same bed for a short time (1 to 2 hours) during the day, thus creating a higher bed occupancy rate. In this case it is not the bed-days that are taken into calculation, but the case, which results in flaws in the database. Table 20 presents analysis of the 'average annual bed occupancy in days' in absolute numbers and according to years and Table 21 shows the percentages for all hospital departments during that year.

Table 20. Average annual bed occupancy in days, absolute numbers

Average annual bed occupancy in days	2010	2011	2012	2013	2014	2015	2016	2017	2010-2017
[0-365]									
[0-50]	78	76	81	100	91	94	94	94	708
(50-100]	92	86	84	98	92	105	105	113	775
(100-150]	112	103	93	95	97	100	120	114	834
(150-200]	116	110	93	83	83	88	81	90	744
(200-250]	82	85	90	83	83	72	74	73	642
(250-300]	67	58	65	72	63	51	72	60	508
(300-365]	47	50	63	53	49	69	62	59	452
[0-365] Total	594	568	569	584	558	579	608	603	4663
(365 <]									
(365-400]	10	15	13	17	24	17	19	16	131
(400-500]	17	22	19	25	38	30	30	34	215
(500-1000]	11	18	23	21	36	32	39	34	214
(1000-3818]	3	6	4	5	4	4	3	10	39
(365 <] Total	43	62	60	72	105	92	93	96	623
Total	637	630	629	656	663	671	701	699	5286

⁴ Excluding leap years when rate exceeding 366 is acceptable.

Table 21. Average annual bed occupancy in days, proportion in %

Average annual bed occupancy in days	2010	2011	2012	2013	2014	2015	2016	2017	2010-2017
[0-365]									
[0-50]	12.2%	12.1%	12.9%	15.2%	13.7%	14.0%	13.4%	13.4%	13.4%
(50-100]	14.4%	13.7%	13.4%	14.9%	13.9%	15.6%	15.0%	16.2%	14.7%
(100-150]	17.6%	16.3%	14.8%	14.5%	14.6%	14.9%	17.1%	16.3%	15.8%
(150-200]	18.2%	17.5%	14.8%	12.7%	12.5%	13.1%	11.6%	12.9%	14.1%
(200-250]	12.9%	13.5%	14.3%	12.7%	12.5%	10.7%	10.6%	10.4%	12.1%
(250-300]	10.5%	9.2%	10.3%	11.0%	9.5%	7.6%	10.3%	8.6%	9.6%
(300-365]	7.4%	7.9%	10.0%	8.1%	7.4%	10.3%	8.8%	8.4%	8.6%
[0-365] Total	93.2%	90.2%	90.5%	89.0%	84.2%	86.3%	86.7%	86.3%	88.2%
(365 <]									
(365-400]	1.6%	2.4%	2.1%	2.6%	3.6%	2.5%	2.7%	2.3%	2.5%
(400-500]	2.7%	3.5%	3.0%	3.8%	5.7%	4.5%	4.3%	4.9%	4.1%
(500-1000]	1.7%	2.9%	3.7%	3.2%	5.4%	4.8%	5.6%	4.9%	4.0%
(1000-3818]	0.5%	1.0%	0.6%	0.8%	0.6%	0.6%	0.4%	1.4%	0.7%
(365 <] Total	6.8%	9.8%	9.5%	11.0%	15.8%	13.7%	13.3%	13.7%	11.8%
∑Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

NHIAC, 2018

In order to avoid biased estimation of the average annual bed occupancy in days, it was decided to perform a generalized analysis of the rate for Armenia, marzes or hospital departments, excluding all figures beyond 365.

Average length of hospital stay

This is another indicator of hospital efficiency and is calculated on the basis of the database of the 'Reporting Form 2-1000- Bed Capacity and Use'. The rate is calculated with below formula.

$$\text{'Average number of days of hospital stay'} = (\text{'number of bed-days'}) / (\text{'number of discharged'} + \text{'number of died'})$$

If any of the database lines shows other than 0 'number of hospital bed-days', the figure is theoretically considered for the hospital department and means patient admission. In fact, this indicator also cannot exceed 365, therefore 'very big numbers' should not see often. They are possible only for a few specific departments such as psychiatric or oncology clinics.

Breakdown of the average hospital length of stay is presented in Table 22 and the % proportion for all hospital departments during the reference year is presented in Table 23.

Table 22. Breakdown of average hospital length of stay, absolute numbers

Average bed-days	2010	2011	2012	2013	2014	2015	2016	2017	2010-2017
[0-3]	60	65	65	78	86	88	94	105	641
(3-7]	281	289	320	312	326	330	365	359	2582
(7-10]	170	159	128	142	135	135	124	125	1118
(10-15]	58	52	55	44	47	51	54	44	405
(15-20]	16	17	12	20	21	18	22	28	154
(20-40]	26	25	27	25	18	17	18	16	172
(40-60]	7	6	6	5	6	3	5	3	41
(60-100]	3	5	2	4	2	2	3	3	24
(100-200]	1	1	4	2	2	3	2	3	18
(200-365]		4	3	5	4	5	6	4	31
(365-3989]	4	5	7	7	7	7	8	7	52
No patient admitted	9	-	-	12	9	12	-	-	42
Total	637	630	629	656	663	671	701	699	5286

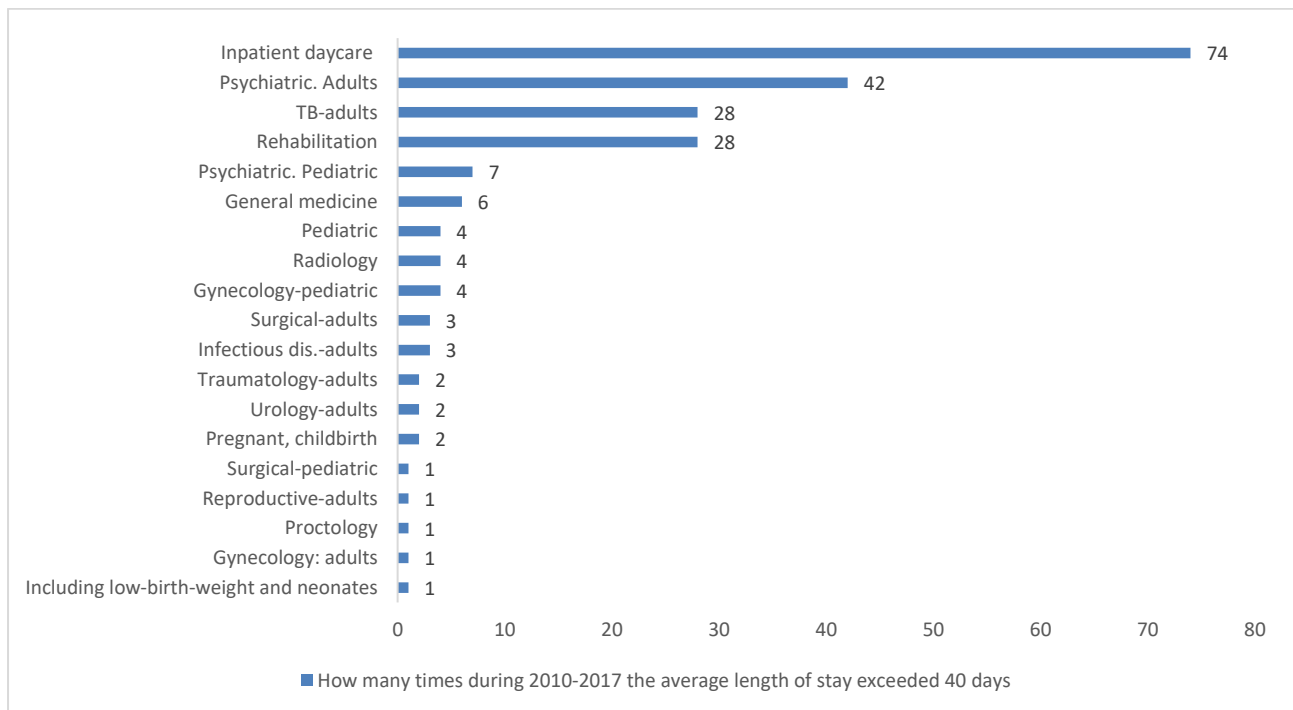
Table 23. Breakdown of average hospital length of stay, %

Average bed-days	2010	2011	2012	2013	2014	2015	2016	2017	2010-2017
[0-3]	9.4%	10.3%	10.3%	11.9%	13.0%	13.1%	13.4%	15.0%	12.1%
(3-7]	44.1%	45.9%	50.9%	47.6%	49.2%	49.2%	52.1%	51.4%	48.8%
(7-10]	26.7%	25.2%	20.3%	21.6%	20.4%	20.1%	17.7%	17.9%	21.2%
(10-15]	9.1%	8.3%	8.7%	6.7%	7.1%	7.6%	7.7%	6.3%	7.7%
(15-20]	2.5%	2.7%	1.9%	3.0%	3.2%	2.7%	3.1%	4.0%	2.9%
(20-40]	4.1%	4.0%	4.3%	3.8%	2.7%	2.5%	2.6%	2.3%	3.3%
(40-60]	1.1%	1.0%	1.0%	0.8%	0.9%	0.4%	0.7%	0.4%	0.8%
(60-100]	0.5%	0.8%	0.3%	0.6%	0.3%	0.3%	0.4%	0.4%	0.5%
(100-200]	0.2%	0.2%	0.6%	0.3%	0.3%	0.4%	0.3%	0.4%	0.3%
(200-365]	0.0%	0.6%	0.5%	0.8%	0.6%	0.7%	0.9%	0.6%	0.6%
(365-3989]	0.6%	0.8%	1.1%	1.1%	1.1%	1.0%	1.1%	1.0%	1.0%
No patient admitted	1.4%	0.0%	0.0%	1.8%	1.4%	1.8%	0.0%	0.0%	0.8%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Data of above table suggest a need of focusing on departments where the average length of stay is rather high.

Figure 43 reflects on departments where the rate exceeded 40 between 2010 and 2017. High rates are seen mostly in four departments: inpatient daycare, adult psychiatric, adult TB, and adult ICU. Long-term treatment is natural for the last 3 departments, but the high rate of the first department (daycare) pinpoints the problem mentioned earlier.

Figure 43. Cases with above-40 days average length of stay during 2010-2017



General overview of marzes in Armenia

Administrative territorial structure of Armenia determines specifics of health infrastructure, their current situation and development plans, as well as population and territorial distribution. Nearly one third (36.3%) of the population resides in the capital city of Yerevan which occupies 0.7% of the country's territory. Yerevan enjoys the status of a marz. That is why marzes are classified as Yerevan, being a unique administrative territory and 'the rest of the marzes'. This unevenness is presented in Figure 44, which shows the marzes of Armenia disposed in 'territory' and 'number of population' coordinate system. As the Figure shows Yerevan is quite far from other marzes, which are grouped in one big cluster. Therefore comparisons across marzes and size classifications were done excluding Yerevan. This comparison is shown in Figure 45 which is identical to Figure 6A where the axis of population number was zoomed four times. As a result Yerevan appeared outside the Figure (right side) and the differences across the remaining 10 became more apparent.

Figure 44. RA marz population and territories including Yerevan, as of 1st July 2018

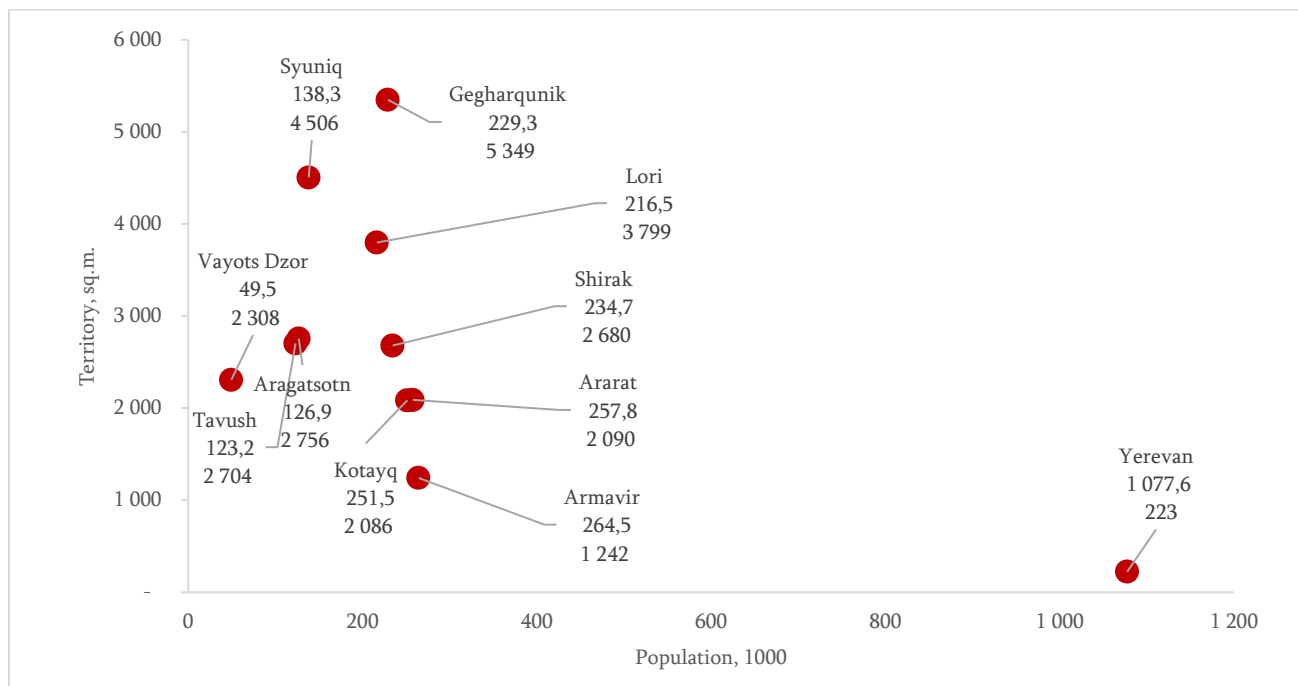
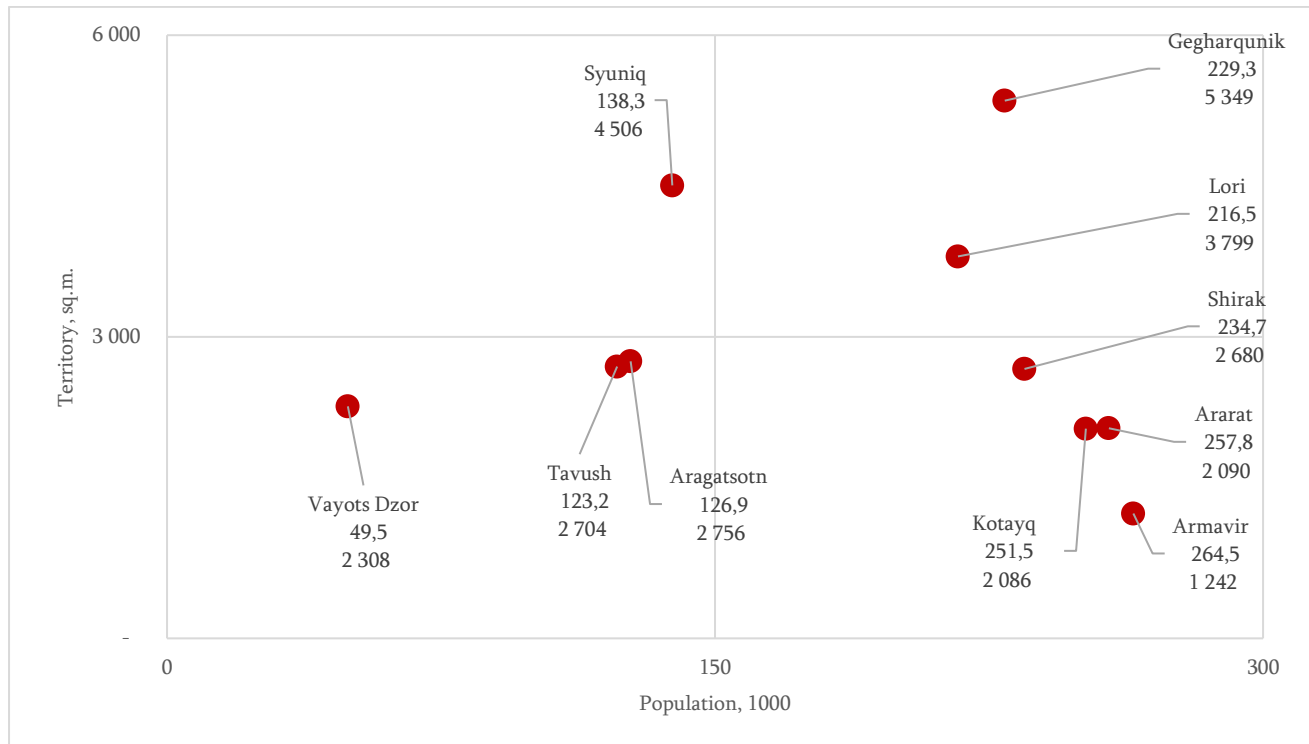


Figure 45. RA marz population and territories including Yerevan, as of 1st July 2018

This figure enables making several classifications of marzes, which are applicable for certain analytical needs.

First classification is based on marz population and enables singling out marzes into three groups.

1. Marzes with big population number, such as Armavir (264,500), Ararat (257,800), Kotayk (251,500), Shirak (234,700), Lori (216,500), Gegharkunik (229,300).
2. Marzes with moderate population number, such as Syunik (138,300), Aragatsotn (126,900) and Tavoush (123,200).
3. Marzes with small population number, including Vayots Dzor with as little population as 49,500, i.e. nearly 2.5 less than in the previous group marzes.

The second classification takes into consideration the territory occupied by the marz and comprises two groups.

1. Marzes with relatively large territory, including Gegharkunik, Syunik and Lori. In fact, most of the territory of Gegharkunik province is covered by Lake Sevan.
2. Marzes with relatively small territory, such as Armavir, Ararat, Kotayk, Shirak, Aragatsotn, Tavoush and Vayots Dzor.

The third classification dwells on population number and territory size. There are four groups.

1. Marzes with big territory and number of population –Gegharkunik and Lori.

2. Marzes with small territory and big population -Ararat, Armavir, Kotayk and Shirak. This group encompasses marzes in the vicinity of Yerevan and Gyumri.
3. Marzes with big territory and small population – Syunik, which is also a remote marz.
4. Marzes with small territory and small population –Aragatsotn, Tavoush and Vayots Dzor.

It is obvious that given the health behavior of marzes, particularly in terms of seeking inpatient care, as well as the distance of marzes from Yerevan and major cities (Gyumri and Vanadzor), provision of high quality hospital care is especially critical.

The aforementioned uneven concentration has historically led to a situation, when the overwhelming part and most developed economic, cultural and social (including health) infrastructures have concentrated in the capital city. Besides, most of specialized hospitals are located in Yerevan. This uneven concentration has developed a stable behavior of seeking the best services, particularly inpatient care, in Yerevan hospitals.

Dynamics of hospital performance indicators in Armenia, 2010-2017

Error! Reference source not found. 24 and **Error! Reference source not found.25** depict dynamics of key hospital performance indicators, including the number of beds, the number of deaths, bed-days, average annual bed occupancy in days and the average length of hospital stay.

Table 48 presents the absolute figures and Table 49 reflects on the change dynamics compared with baseline 2010 taking it as 100%. Diagrams in **Error! Reference source not found.-24-** are not interrelated and show dynamics on that line only, whereas in **Error! Reference source not found.25** the diagram heights are standardized and compatible. It enables making preliminary visual comparisons between different indicators. The diagrams suggest that the relative increase of bed capacity in 2010-2017 was smaller (4.1%) compared with the relative increase of hospital admissions (nearly 24.4%).

Given the applied methodology, the bed-day, average annual bed occupancy and the average length of hospital stay in days presented in these tables were calculated excluding data of inpatient daycare service.

Table 24. Main hospital indicators (bed-days, average annual bed occupancy and the average length of hospital stay in days, excluding inpatient daycare)











Ցուցանիշ	2010	2011	2012	2013	2014	2015	2016	2017	Դիագրամ
Մահճակալների միջին տարեկան թիվը	12,686	12,733	12,880	12,927	13,121	13,157	13,281	13,206	
Ընդունվել են՝ ընդամենը	334,830	358,093	389,490	388,884	424,219	412,455	418,582	416,375	
Ընդունվել են 0-14 տարեկան	52,474	60,400	64,629	69,127	81,600	81,561	84,669	82,896	
Ընունվել են 15-17 տարեկան	13,025	13,840	13,814	13,466	13,517	12,469	11,800	12,302	
Դուրս են գրվել, ընդամենը	328,987	352,157	383,716	381,450	417,198	405,158	411,241	408,844	
Մահացել են	4,592	4,750	4,978	5,104	5,376	5,586	5,675	5,403	
Մնում են	3,865	4,306	4,328	5,147	5,186	5,362	5,341	5,787	
Մահճ. x օր	2,723,956	2,760,870	2,906,805	2,913,624	3,094,889	3,015,893	3,056,181	3,042,285	
Մահճակալի տարեկան միջին զբաղվածությունը, օր	215	217	226	225	236	229	230	230	
Հիվանդանոցում մնալու օրերի միջին քանակը	8.2	7.7	7.5	7.5	7.3	7.3	7.3	7.3	

Table 25. Main hospital indicators (including all departments, bed-days, average annual bed occupancy and the average length of hospital stay in days, excluding inpatient daycare)

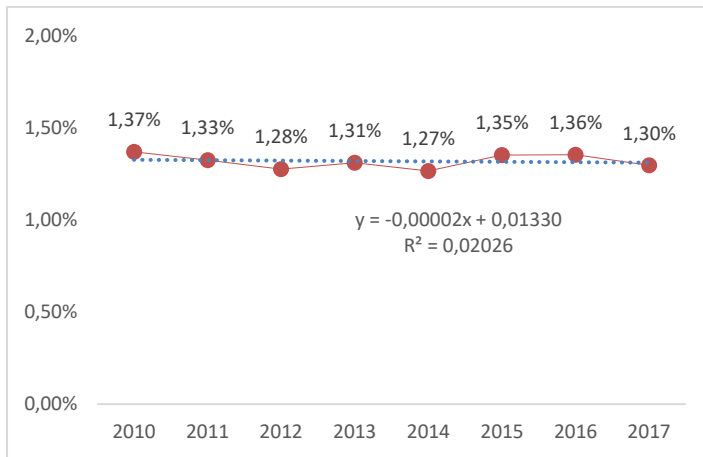
Ցուցանիշ	2010	2011	2012	2013	2014	2015	2016	2017	Դիագրամ
Մահճակալների միջին տարեկան թիվը	100.0%	100.4%	101.5%	101.9%	103.4%	103.7%	104.7%	104.1%	
Ընդունվել են՝ ընդամենը	100.0%	106.9%	116.3%	116.1%	126.7%	123.2%	125.0%	124.4%	
Ընդունվել են 0-14 տարեկան	100.0%	115.1%	123.2%	131.7%	155.5%	155.4%	161.4%	158.0%	
Ընունվել են 15-17 տարեկան	100.0%	106.3%	106.1%	103.4%	103.8%	95.7%	90.6%	94.4%	
Դուրս են գրվել, ընդամենը	100.0%	107.0%	116.6%	115.9%	126.8%	123.2%	125.0%	124.3%	
Մահացել են	100.0%	103.4%	108.4%	111.1%	117.1%	121.6%	123.6%	117.7%	
Մնում են	100.0%	111.4%	112.0%	133.2%	134.2%	138.7%	138.2%	149.7%	
Մահճ. x օր	100.0%	101.4%	106.7%	107.0%	113.6%	110.7%	112.2%	111.7%	
Մահճակալի տարեկան միջին զբաղվածությունը, օր	100.0%	101.0%	105.1%	105.0%	109.9%	106.8%	107.2%	107.3%	
Հիվանդանոցում մնալու օրերի միջին քանակը	100.0%	94.7%	91.6%	92.3%	89.7%	89.9%	89.8%	89.9%	

As Tables 24 and 25 show, increase of inpatient care indicators was recorded between 2010 and 2017, except for the number of hospitalized 15-17 years old patients and the average length of hospital stay in days.

In particular, the number of hospital beds increased by 4.1% (or 520) from 12,686 in 2010 to 13,206 in 2017.

Hospital admissions increased by 81,545 or 24.4% (334,194 admissions in 2010 vs. 416,375 in 2017). This indicator went up by 26.7% from 2010 to 2014 and dropped by 3.4% in 2015. Afterwards, an increase by 1.2% was recorded between 2015 and 2017. The figures demonstrate an improved affordability of hospital care. Also, the number of hospitalized patients aged 15-17 years has declined by 5.6% or by 723 (13,025 in 2010 vs. 12,302 in 2017). This decline may be due to avoidance of military service by young men who try to emigrate from Armenia reaching the age 15.

The hospital fatality rate has increased by 811 (17.7%) - from 4,592 in 2010 to 5,403 in 2017. The hospital admission-hospital deaths ratio for 2010-2017 presented in Figure 46 grasps the hospital fatality dynamics. Data do not show any increase tendency. The rate varied within the range of 1.32% during that period.

Figure 46. The ratio of in-hospital deaths and hospital admissions,2010-2017

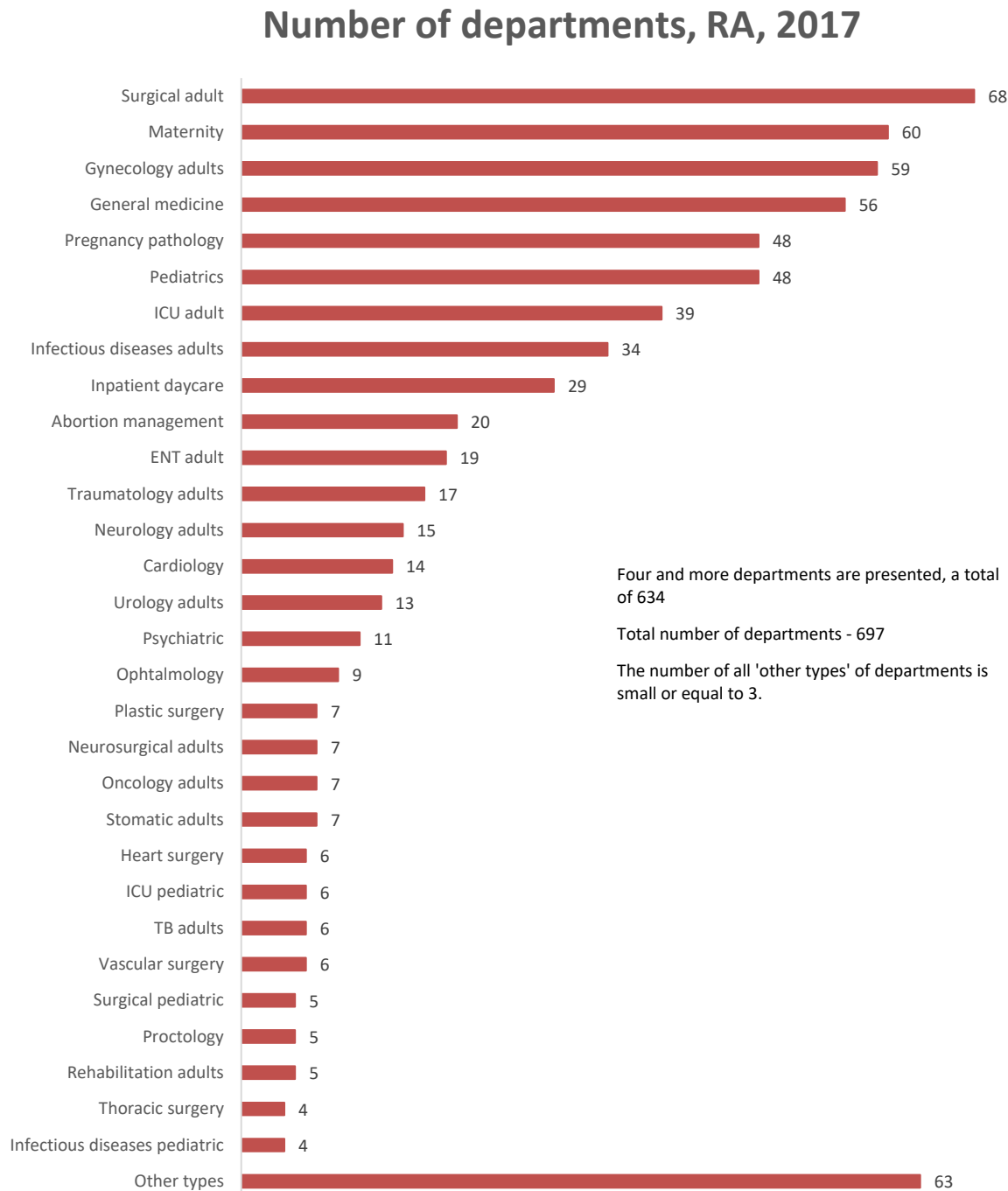
An increase of the annual average bed occupancy (from 215 to 230) and a decline of the average length of stay (from 8.2 to 7.3) were recorded between 2010 and 2017.

As the data above witness, financial access to and the utilization of inpatient care did not improve after 2015. Moreover, some decline was seen after 2016-2017.

10 General overview of hospital departments

A total of 72 types of hospital departments were functioning in Armenia in 2017. Figure 47 presents the number of each inpatient department type as of 2017.

Figure 47. Number of hospital departments in Armenia, 2017 (4 and more departments)



The total number of hospital departments has grown from 636 to 697 between 2010 and 2017. The dynamics of each department type is presented in Table 26. Below is the list of most prevalent departments as of 2017.

- Surgical department for adults (68, ↓)⁵,
- Maternity (60, ↓),
- General medicine (56, ↓),
- Gynecology for adults (59, ↑),
- Pregnancy pathologies (48, ↑) and
- Pediatric (48, ↑) department

Table 26. Number of departments according to the type, 2010-2017

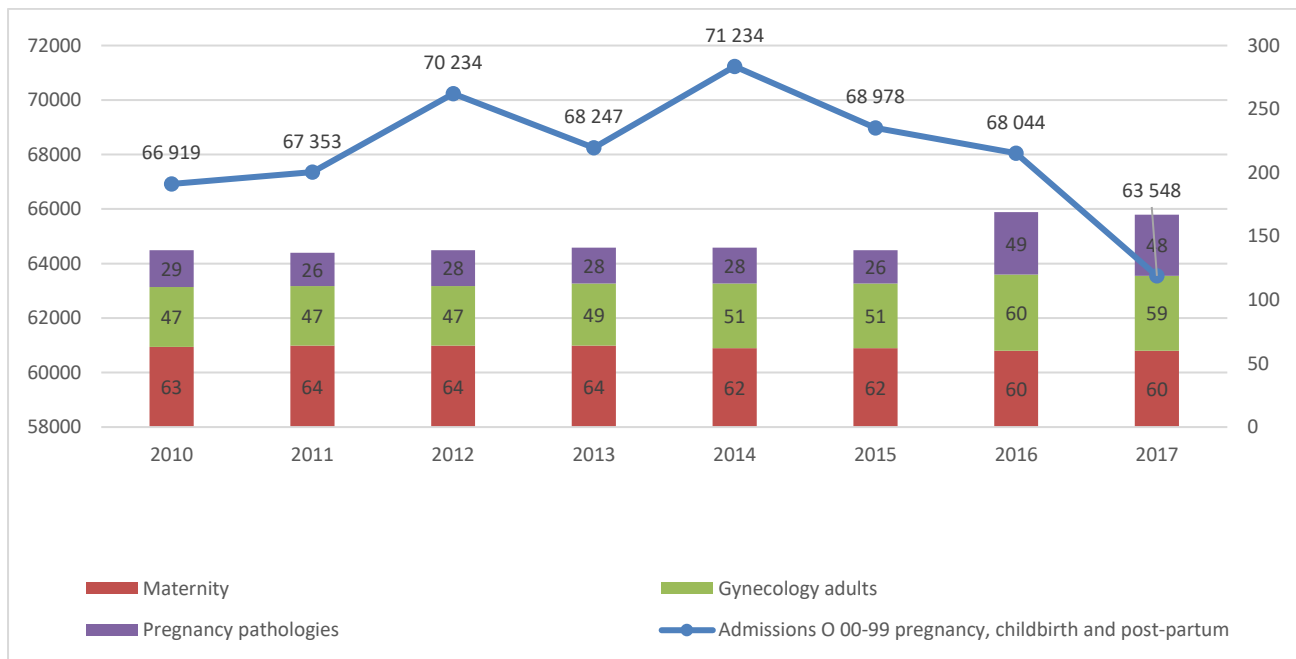
Բաժանմունք	2010	2011	2012	2013	2014	2015	2016	2017	Դիագրամ
Ընդամենը՝ բաժանմունք	636	628	627	654	661	668	699	697	
Վիրաբուժակ. մեծ.	66	66	64	66	70	70	69	68	
Հղիների եւ ծննդ.	63	64	64	64	62	62	60	60	
Գինեկ. մեծ.	47	47	47	49	51	51	60	59	
Թերապևտիկ	63	61	59	58	59	58	55	56	
Հղիության պաթոլոգ.	29	26	28	28	28	26	49	48	
Մանկաբուժական	46	45	44	45	46	47	47	48	
Վերակենդ. մեծ.	36	38	39	39	42	42	37	39	
Ինֆեկցիոն մեծ.	38	36	36	37	37	36	34	34	
Ցեր. ստաց.	21	25	28	27	26	30	29	29	
Վիժու. կատար.	18	17	15	16	16	16	20	20	
Քիր-կոկորդ-ականջ մեծ.	18	18	17	19	19	18	18	19	
Վնասվածքաբ. մեծ.	16	15	17	20	18	19	19	17	
Նյարդաբան. մեծ.	16	15	14	14	14	16	16	15	
Սրտաբանական	14	14	15	14	15	16	15	14	
Ուռոյոգիական մեծ.	10	10	10	14	13	13	14	13	
Հոգեբուժ. մեծ.	11	11	12	11	11	11	11	11	
Ակնաբուժական մեծ.	5	5	4	5	6	7	8	9	
Ուռուցքաբան. մեծ.	4	4	3	3	4	4	6	7	
Ստոմատ. մեծ.	5	5	5	5	6	6	7	7	
Նյարդավիրաբ. մեծ.	6	5	6	7	8	7	7	7	
Պլաստիկ վիրաբ.	2	3	6	7	4	6	8	7	
Տուբերկուլ. մեծ.	9	9	9	9	7	6	6	6	
Սրտային վիրաբուժ.	5	5	4	4	5	5	6	6	
Վերակենդ. մանկ.	6	4	4	5	4	7	6	6	
Անոթային վիրաբ.	3	3	3	6	6	6	6	6	
Պրոկտոլոգիական	2	2	2	4	3	4	4	5	
Վիրաբուժակ. մանկ.	5	6	6	7	7	6	6	5	
Վերականգնող. մեծ.	5	4	4	5	5	5	5	5	
Ինֆեկցիոն մանկ.	4	4	4	4	4	4	4	4	
Կրծք. վիրաբ. մեծ.	2	2	2	2	3	3	3	4	

⁵↓ This arrow means a decline tendency in the number of departments and ↑ shows and increase tendency.

Բաժանմունք	2010	2011	2012	2013	2014	2015	2016	2017	Դիագրամ
Միկրովիրաբ.	3	3	2	3	3	3	3	3	■ ■ _ ■ ■ ■ ■ ■ ■ ■
Թմբարանական	3	3	3	3	3	3	3	3	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Առիթմոլոգիական							2	3	_ ■ ■ ■ ■ ■ ■ ■ ■
Վնասվածքաբ. մանկ.	4	4	3	3	3	3	3	3	■ ■ _ _ _ _ _ _ _ _
Օրթոպեդիկ մեծ.	3	3	3	3	3	3	3	3	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Ներզատ. մեծ.	4	4	4	4	6	5	4	3	_ _ _ _ ■ ■ ■ ■ _ _
Նյարդաբան. մանկ.	3	3	3	3	3	3	3	3	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Աղետամոքսային մեծ.	2	2	2	2	2	2	2	2	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Երիկամ. մեծ.	3	3	3	3	3	3	3	2	■ ■ ■ ■ ■ ■ ■ ■ _
Քիթ-կոկորդ-ականջ մանկ.	1	1	1	2	2	2	2	2	_ _ _ ■ ■ ■ ■ ■ ■ ■ ■
Ռևմատոլոգ. մեծ.	2	2	2	2	2	2	2	2	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Ակնաբուժական մանկ.	2	2	2	2	2	2	2	2	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Ընդհանուր	1	1	1	1	1	1	2	2	_ _ _ _ _ _ _ ■ ■ ■
Օրթոպեդիկ մանկ.	2	2	2	2	2	2	2	2	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Ստոմատ. մանկ.	1	2	1	2	2	2	2	2	_ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Ճառագայթ. Ռենտգեն	2	2	2	2	2	2	2	2	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Անհետաձգ. մանկ. ք/օ							2	2	_ _ _ _ _ ■ ■ ■ ■ ■
Նյարդավիրաբ. մանկ.	1	1	1	1	1	1	1	1	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Արյունաբ. մեծ.	1	1	1	1	1	1	1	1	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Ալերգոլոգիական մեծ.	1	1	1	1	1	1	1	1	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Թոքաբան. մանկ.	1	1	1	1	1	1	1	1	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Ֆիզիոթերապևտիկ	1	1	1	1	1	1	1	1	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Թոքաբանական մեծ.	1	1	1	1	1	1	1	1	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Ոսկրածուծի փոխպատվ.								1	_ _ _ _ _ ■ ■ ■ ■ ■
Սուր թունավորման	1	1	1	1	1	1	1	1	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Մաշկավեճ. մեծ.	1	1	1	1	1	1	1	1	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Տուբերկուլ. մանկ.	1	1	1	1	1	1	1	1	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Գինեկ. մանկ.	2	1	1	2	2	2	1	1	■ ■ _ ■ ■ ■ ■ ■ ■ ■
Աղետամոքսային մանկ.	1	1	1	1	1	1	1	1	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Երիկամ. մանկ.	1	1	1	1	1	1	1	1	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Վերականգնող. մանկ.	2	1	1	1	1	1	1	1	■ _ _ _ _ _ _ _ _ _
Ալերգոլոգիական մանկ.	1	1	1	1	1	1	1	1	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Փսիխոսոմատիկ	1	1	1	1	1	1	1	1	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Ուռուցիկական մանկ.	1	1	1	1	1	1	1	1	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Հոգեբուժ. մանկ.	1		1	1	1	1	1	1	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Ուռուցքաբան. մանկ.	1	1	1	1	1	1	1	1	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Արյունաբ. մանկ.	1	1	1	1	1	1	1	1	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Այրվածքային	1	1	1	1	1	1	1	1	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Կրծք. վիրաբ. մանկ.	1	1	1	1	1	1	1	1	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Ռեպրոդուկտոլոգիա	1	1							■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Թարախ. վիրաբ. մեծ.	1	1	1	1	1	1	1		■ ■ ■ ■ ■ ■ ■ ■ ■ ■

As the list above suggests there is a decline in the number of departments providing care to the general population, which is in direct proportion to the number of population. The latter continues to decrease over the past 26 years, both due to mass migration and falling birth rates. This is relevant to adult surgical, maternity, as well as general medicine departments.

On the hand, there is an increase of the number of women’s reproductive health and pediatric departments.

Figure 48. The number of reproductive health departments and childbirth and post-partum diseases

The number of Surgical Departments dropped by 2 during 2015- 2017, and the Maternity Departments by 4 compared with 2012. Instead, the number of Gynecology Departments for Adults saw drastic increase over 2013- 2016. In 2017 the number reached 59 as opposed to 10 Departments in 2013.

The number of Infectious Disease Departments for Adults has also decreased (38 in 2010 vs. 34 in 2017).

The number of inpatient daycare services increased from 2010 to 2017 (from 21 to 29).

On the one hand, the total number of Surgical, General Medicine and Maternity Departments shrank during 2010-2017, but on the other hand there was an increase of the number Adult Gynecology and Pregnancy Pathologies Departments.

The number of departments in marzes in 2017 is presented in Table 27. The departments are grouped according to their availability in the marz. For example, the list is led by Surgical Departments for Adults, which are available in all 11 marzes (including Yerevan city). The last ones are Physiotherapy, TB and other departments, available in one marz only.

Table 27. Concentration of hospital departments across marzes, 2017

N	Department	Ag	Am	Ar	Gh	Yer	Lo	Ko	Sh	Sy	V D	Ta	Total	Available in marzes
1	Surgical adults	4	3	4	5	24	5	6	6	5	2	4	68	11
2	Maternity	6	2	4	5	12	6	5	6	5	3	6	60	11
3	Gynecology adults	3	2	4	5	19	4	5	6	5	2	4	59	11
4	General medicine	4	3	4	5	13	6	4	4	5	2	6	56	11
5	Pregnancy pathologies	4	2	4	5	10	4	3	6	5	1	4	48	11
6	Pediatric	4	3	4	5	6	5	3	4	5	3	6	48	11
7	Infectious dis. adults	2	3	3	5	2	5	3	2	4	1	4	34	11
8	Inpatient daycare		2	1	2	13	1	1	5	2	1	1	29	10
9	Medical abortion	2	1	2	2	1	1	1	4	2		4	20	10
10	ICU adults	2	3	1	3	21	2	3	2	2			39	9
11	ENT adults	2	1	1		11		1	2			1	19	7
12	Neurology adults		1	1		8	1	2	1			1	15	7
13	Psychiatrics adults			1	1	4	1	2	1	1			11	7
14	Traumatology adults		1			11	1		2	1		1	17	6
15	Cardiology		2			9	1		1	1			14	5
16	TB adults					1	1	1	1	2			6	5
17	Urology adults	1				10	1		1				13	4
18	Ophthalmology adults		1			6	1					1	9	4
19	Infectious dis. pediatric					1	1		1	1			4	4
20	Rehabilitation adults					3		1	1				5	3
21	Narcology					1			1	1			3	3
22	Plastic surgery					6		1					7	2
23	Oncology adults					6			1				7	2
24	ICU, pediatric					5			1				6	2
25	Cardiac surgery					5				1			6	2
26	Surgical pediatric					4	1						5	2
27	Total								1			1	2	2
28	Orthopedics pediatric			1		1							2	2
29	Neurosurgical adults					7							7	1
30	Stomatology, adults					7							7	1
31	Vascular surgery					6							6	1
32	Proctology					5							5	1
33	Thoracic surgery adults					4							4	1
34	Orthopedic adults					3							3	1
35	Arrhythmology					3							3	1
36	Microsurgery					3							3	1
37	Traumatology pediatric					3							3	1
38	Endocrinology adults					3							3	1
39	Neurology pediatrics					3							3	1
40	Nephrology, adults					2							2	1
41	ENT pediatric					2							2	1
42	Beam radiotherapy					2							2	1
43	Gastroenterology adults					2							2	1
44	Rheumatology adults					2							2	1
45	Emergency care, pediatric					2							2	1
46	Stomatology, pediatric					2							2	1
47	Ophthalmology pediatric					2							2	1
48	Neurosurgical, pediatric					1							1	1
49	Gynecology pediatric					1							1	1
50	Marrow transportation					1							1	1
51	Allergology adults					1							1	1
52	Psychosomatic					1							1	1
53	Pulmonology adults					1							1	1
54	Physiotherapy							1					1	1

N	Department	Ag	Am	Ar	Gh	Yer	Lo	Ko	Sh	Sy	V D	Ta	Total	Available in marzes
55	TB pediatric							1					1	1
56	Allergology, pediatric					1							1	1
57	Dermatovenerology, adults					1							1	1
58	Psychiatric, pediatric			1									1	1
59	Thoracic surgery, pediatric					1							1	1
60	Renal, pediatric					1							1	1
61	Rehabilitation, pediatric					1							1	1
62	Acute intoxication					1							1	1
63	Gastroenterology, pediatric					1							1	1
64	Pulmonology, pediatric					1							1	1
65	Burns					1							1	1
66	Urology, pediatric					1							1	1
67	Hematology, pediatric					1							1	1
68	Oncology, pediatric					1							1	1
69	Hematology, adults					1							1	1
	Number of departments	34	30	36	43	295	48	44	60	48	15	44	697	-
	Number of different types of departments	11	15	15	11	65	19	18	23	17	8	14	69	-

Only below 7 out of all 69 different department types are available in all marzes: surgical department for adults, surgical department for children, general medicine department, pregnancy and childbirth department, pregnancy pathologies department, pediatric department and department of infectious disease for adults.

Two department types – inpatient daycare and medical abortion, are available in all marzes. Only Aragatsotn marz does not have an Inpatient Daycare unit and Vayots Dzor does not have an Medical abortion Department.

ICU for Adults is available in 9 marzes, and does not exist in Vayots Dzor and Tavoush marzes.⁶

Three department types are available in 7 marzes only. They include ENT (does not exist in Gegharkunik, Lori, Syunik and Vayots Dzor), Neurology Department for Adults (does not exist in Aragatsotn, Gegharkunik, Syunik and Vayots Dzor) and Psychiatric Department for Adults (does not exist in Aragatsotn, Armavir, Vayots Dzor and Tavoush).

Departments with very limited geographic concentration are as follows.

Only one marz is furnished with all 43 department types. Of them 40 are available only in Yerevan and three in other marzes. These departments include Psychiatric for Children, which is located in Ararat marz (Armash Health Center after academician A. Hayriyan), TB Pediatric (National TB Dispensary) and Physiotherapeutic Departments (Arzni Railway Hospital Rehabilitation Center), both in Kotayk marz (Abovyan city).

⁶The impact of having no ICU unit in Vayots Dzor and Tavoush marzes needs some further review. It is anyway compensated by the existence of an ICU unit in Ararat (e.g. Jermuk-Ararat 121 km) and Ijevan (e.g. Berd-Ijevan 51 km).

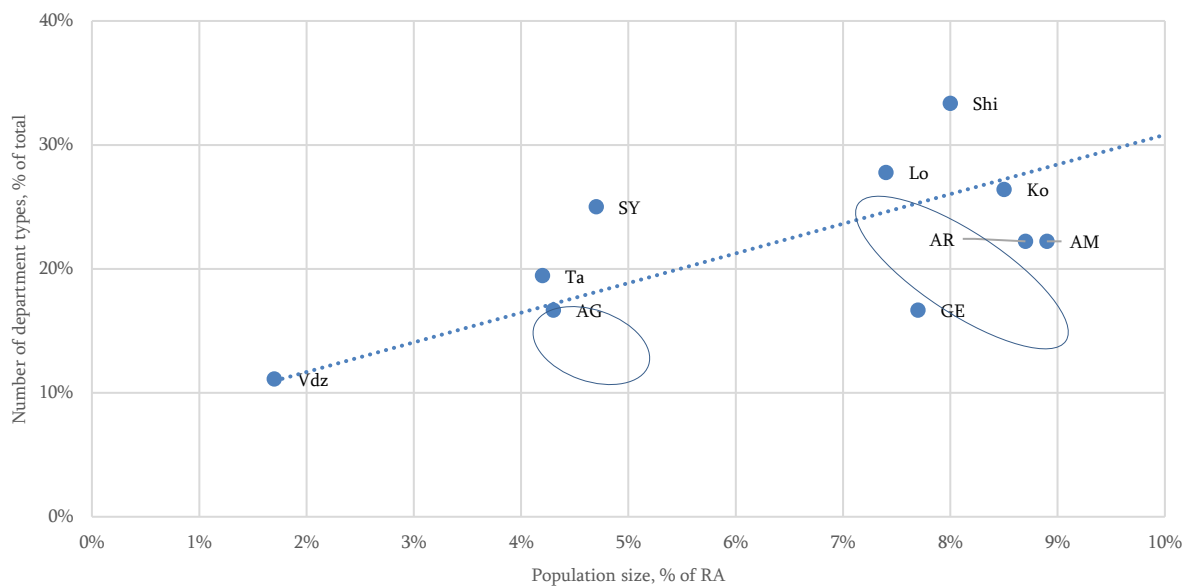
Only one marz has 7 departments, including Oncology for Adults (Yerevan, Shirak), Plastic Surgery (Yerevan, Kotayk), Cardiac Surgery (Yerevan, Syunik), ICU for Children (Yerevan, Shirak), Surgical for Children (Yerevan, Lori), Orthopedic for Children (Yerevan, Ararat) and General Profile⁷ (Shirak, Tavoush).

The highest concentration of department types (more than one same-type department in one marz) is in Yerevan, where 65 (or 94%) out of total 69 types are functioning. This is followed by Shirak which has 23 types of hospital departments. Next come Lori (19), Kotayk (18) and Syunik (17).

Vayots Dzor population needs require special assessment, since this marz has the lowest concentration of inpatient units. Also it should be understood if Ararat marz hospitals somehow cover this gap.

Preliminary classification of marzes according to hospital departments and marz population is presented in Figure 49. It does not depict Yerevan, because it significantly exceeds all other marzes in terms of sizes (36% of population) and number of department types (94%), hence is left outside the figure span.

Figure 49. Marzes of Armenia according to number of hospital department types and population size, 2017



As the Figure suggests, marzes can be grouped into three categories.

The first group includes Tavoush, Aragatsotn, Lori, Kotayk, Ararat, Armavir and Vayots Dzor marzes, where the ‘population-number of department types’ ratio reflects the most prevalent and typical situation for the country (relatively closer to the regression line).⁸

⁷In the Statistical Data Collection Form N2 the category General Profile includes non-specialized units.

⁸ Regression line shows the ‘ideal’ number of different hospital department types if it were in line with the relative number of marz population.

The second group includes Shirak and Syunik, where availability of inpatient unit types exceeds the population size (higher and far from regression line). These marzes are in better shape as regards availability of hospital departments, compared with the typical national situation. In fact, the latter is seen in Yerevan city as well.

There is only one marz in the third group –Gegharkunik, where the variety of units is modest compared with the typical situation (lower and far from regression line). This marz is far behind the typical national situation.

Availability of hospital units in Gegharkunik marz requires further analysis.

11 Main indicators of department performance, 2017

Armenia

Table 28 presents hospital department performance indicators at the national level. The coloring of the table cells helps comparing the indicators. Each column has its shading. The higher the value of the indicators, the darker is the shading of red in the cell. The darker is the green shade of the cell, the lower is the value of the indicators. Yellow color in the column shows the cells with moderate or average values.

Is data are observed according to departments, then the more red shares in the line, the higher is the level of admissions and the more intensive is the performance of that department. In 2017, for example, the highest level of patient admissions was recorded in Surgical Department for Adults, General Medicine Department, Psychiatric Department for Adults, Pediatric Department, ICU for Adults, Maternity Department, Cardiology Department and Inpatient Daycare Department.

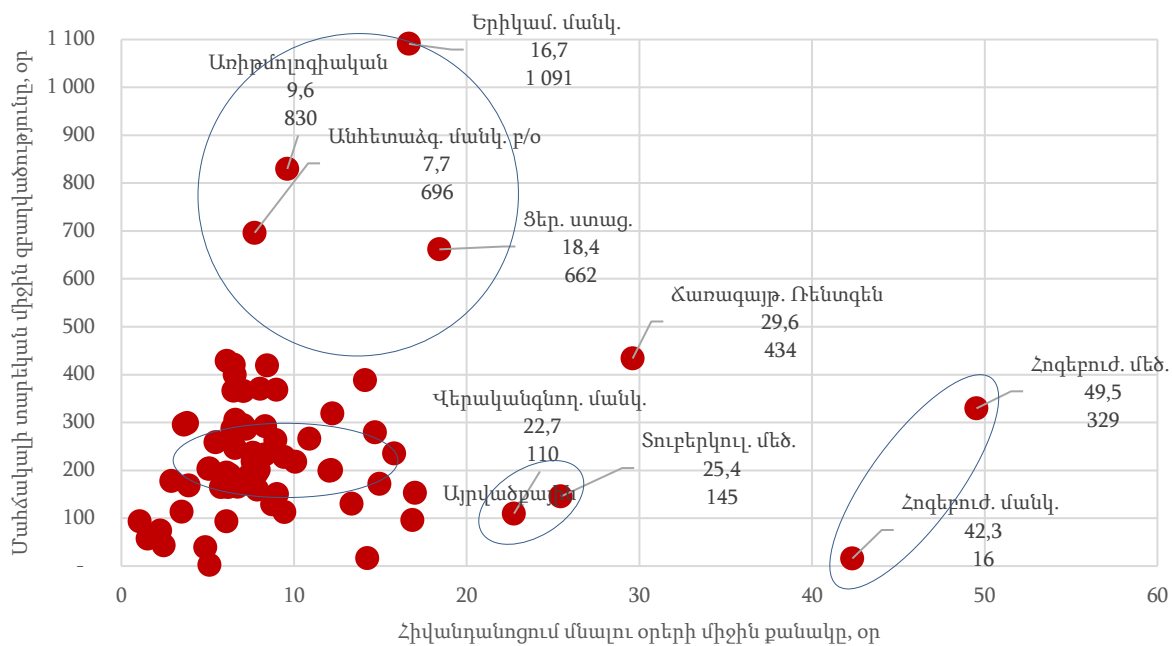
Table 28. Main indicators of department performance, RA, 2017

Department	# of Dpts	Average annual bed capacity	Total admissions	Admissions 0-14	Admissions 15-17	Discharged	Died	On treatment	Bed-day	Average annual bed occupancy in days	Average length of stay in days
Allergology, pediatric	1	13	534	462	72	840	0	2	5,465	420	6.5
Allergology, adults	1	17	1,315	8	194	1,338	0	3	5,083	299	3.8
Ophthalmology, pediatric	2	38	671	377	294	671	0	0	1,645	43	2.5
Ophthalmology, adults	9	226	13,852	100	470	13,820	0	33	40,145	178	2.9
Gastroenterology, pediatric	1	20	566	533	33	574	0	0	4,368	218	7.6
Gastroenterology, adults	2	85	2,571	0	67	2,626	12	43	20,110	237	7.6
Burns	1	50	273	95	5	445	5	15	7,652	153	17.0
Emergency care, pediatric	2	25	5,949	5,921	28	2,255	0	50	17,407	696	7.7
Vascular surgery	6	61	2,460	1	127	2,459	43	59	22,471	368	9.0
Arrhythmology	3	51	4,198	0	381	4,400	3	62	42,305	830	9.6
Hematology, pediatric	1	25	372	289	83	372	0	13	5,879	235	15.8
Hematology, adults	1	28	745	0	0	691	39	21	8,920	319	12.2
Gynecology, pediatric	1	20	239	207	19	239	0	0	2,258	113	9.4
Gynecology, adults	59	495	15,995	52	43	16,060	1	40	56,215	114	3.5
Nephrology, pediatric	1	30	1,818	1,587	113	1,965	0	30	32,729	1,091	16.7
Nephrology, adults	2	60	1,324	2	74	1,462	5	19	15,964	266	10.9
General profile	2	10	80	34	0	80	0	0	389	39	4.9
General medicine	56	800	30,078	1,345	464	31,438	333	190	229,393	287	7.2
Narcology	3	80	1,323	0	0	1,313	5	33	15,901	199	12.1
Pulmonology, pediatric	1	20	381	372	9	1,403	0	22	8,562	428	6.1
Pulmonology, adults	1	30	590	0	35	603	5	15	4,784	159	7.9
Infectious dis., pediatric	4	195	6,156	5,803	353	6,258	0	60	38,071	195	6.1
Infectious dis., adults	34	433	10,587	3,826	114	10,627	4	118	71,683	166	6.7
Thoracic surgery, pediatric	1	20	443	424	13	505	0	2	4,023	201	8.0
Thoracic surgery, adults	4	82	1,732	2	12	1,981	0	36	18,672	228	9.4
Maternity	60	924	36,839	1	57	39,805	1	284	155,613	168	3.9
Pregnancy pathologies	48	340	18,933	1	59	16,090	0	102	87,819	258	5.5
Psychiatric, pediatric	1	8	3	2	1	3	0	0	127	16	42.3
Psychiatric, adults	11	1,355	8,968	11	100	8,979	34	1,075	446,306	329	49.5

Department	# of Dpts	Average annual bed capacity	Total admissions	Admissions 0-14	Admissions 15-17	Discharged	Died	On treatment	Bed-day	Average annual bed occupancy in days	Average length of stay in days
Beam radiotherapy	2	110	1,606	5	5	1,610	1	57	47,698	434	29.6
Pediatrics	48	654	33,786	33,022	440	36,855	12	630	239,709	367	6.5
Dermatology	1	100	2,960	326	317	2,953	0	37	26,354	264	8.9
Microsurgery	3	48	803	20	12	800	0	14	7,213	150	9.0
Endocrinology, adults	3	77	4,688	321	417	4,684	0	44	30,754	399	6.6
Neurology, pediatric	3	52	1,293	1,128	141	1,453	0	7	12,108	233	8.3
Neurology, adults	15	383	15,113	5	581	15,676	252	149	112,636	294	7.1
Neurosurgical, pediatric	1	20	539	510	29	701	0	9	5,834	292	8.3
Neurosurgical, adults	7	164	2,112	4	10	2,692	14	54	32,898	201	12.2
Marrow transplantation	1	7	8	0	0	8	0	0	114	16	14.3
Urology, pediatric	1	20	989	898	57	992	0	6	8,383	419	8.5
Urology, adults	13	245	9,101	30	714	9,152	7	67	60,408	247	6.6
Oncology, pediatric	1	30	173	95	68	170	1	0	2,883	96	16.9
Oncology, adults	7	487	9,291	54	13	9,212	38	108	135,926	279	14.7
Plastic surgery	7	42	1,380	64	2	1,381	0	2	3,120	74	2.3
Proctology	5	81	2,072	1	20	2,069	4	11	15,442	191	7.4
Rheumatology, adults	2	60	885	0	50	881	1	6	7,711	129	8.7
Acute intoxication	1	25	944	4	18	919	14	2	1,426	57	1.5
Dental, pediatric	2	23	1,859	1,744	34	1,879	0	3	6,790	295	3.6
Dental, adults	7	85	3,374	353	116	3,392	0	11	17,325	204	5.1
Cardiology	14	535	24,311	7	1,001	24,257	478	186	163,474	306	6.6
Cardiac surgery	6	170	4,313	215	14	4,677	67	43	28,995	171	6.1
Rehabilitation, pediatric	1	45	217	213	4	217	0	0	4,934	110	22.7
Rehabilitation, adults	5	345	3,940	35	8	3,956	4	72	59,184	172	14.9
ICU, pediatric	6	84	4,026	3,945	64	2,118	194	103	32,639	389	14.1
ICU, adults	39	517	29,501	4,816	217	17,313	3,488	256	105,024	203	5.0
Medical abortion	20	30	2,653	0	0	2,653	0	0	2,809	94	1.1
Surgical, pediatric	5	65	2,838	2,624	171	2,900	0	24	18,665	287	6.4
Surgical, adults	68	1,549	40,270	2,796	1,164	41,103	221	329	255,509	165	6.2
Traumatology, pediatric	3	67	1,628	1,411	63	1,656	0	16	13,010	194	7.9
Traumatology, adults	17	329	9,436	731	1,181	9,928	10	62	62,535	190	6.3
TB, pediatric	1	30	291	126	133	293	0	6	3,906	130	13.3
TB, adults	6	328	1,852	1	9	1,848	25	89	47,661	145	25.4
Inpatient daycare	29	407	14,716	2,742	626	14,553	72	980	269,296	662	18.4
Psychosomatic	1	15	304	0	0	321	3	15	3,265	218	10.1
ENT, pediatric	2	45	2,315	2,190	42	2,323	0	1	16,440	365	7.1
ENT, adults	19	241	6,834	596	551	6,874	0	32	39,676	165	5.8
Orthopedic, pediatric	2	30	460	399	38	460	0	0	2,804	93	6.1
Orthopedic, adults	3	100	4,489	10	752	4,603	7	29	37,013	370	8.0
Physiotherapy	1	20	10	0	0	10	0	0	51	3	5.1
TOTAL	697	13,206	416,375	82,896	12,302	408,844	5,403	5,787	3,311,581	251	8.0

Figure 50 shows location of departments, the average length of hospital stay in days, and the average annual bed occupancy (distance-wise). From this standpoint, hospital units can be organized into six groups.

Figure 50. Disposition of hospital departments, the average length of hospital stay in days, and the average annual bed occupancy, 2017



Group 1. The biggest group of hospital units, where the average annual bed occupancy is within the range of [3; 319] and the average length of stay within [1; 17] range.

Group 2. Includes nine units (circled in blue oval). The average annual bed occupancy is within the range of [367; 428] and the average length of stay is within [6.1; 14.1] range.

Group 3. Encompasses four units. Here the average annual bed occupancy is the biggest and includes Renal, pediatric (1,091 days), Arrhythmology (830), Emergency Care, Pediatric (696) and Inpatient Daycare (662). On the other hand, this group can be divided into two subgroups according to Length of Hospital Stay in Days. The variables of the 1st subgroup are close to the average national, and include Emergency Care, Pediatric (7.7) and Arrhythmology (9.6). The other subgroup includes Nephrology, Pediatric (16.7) and Inpatient Daycare (18.4). As explained by NHIAC the latter is mostly involved in hemodialysis.

Group 4. Includes two departments – Rehabilitation, pediatric (annual bed occupancy 110, average length of stay in days 22.7) and TB for Adults (145 and 25.4 correspondingly).

Group 5. Has only one department – Beam radiotherapy. Since it is equally ‘close’ to or ‘far’ from the second, third and fourth groups, it did not join any of these units. Here the average annual bed occupancy 434 (exceeds 356) and the average length of stay is 29.6.

Group 6. Comprises two departments, Psychiatric Department for Children and Psychiatric Department for Adults, which have the highest average annual bed occupancy and the average length of stay - 42 and 50 days correspondingly. However they are different when it comes to the

average annual bed occupancy. In the Psychiatric Department for Children (which is presented only via Armash Health Center) it equals 16 days and in the Psychiatric Department for Adults (11 hospitals presented) 329 days.

Marz comparison of hospital department performance indicators

Analysis of the hospital performance efficiency requires review of the performance of similar types of departments across marzes. The findings can be applied for their optimization.

Allergology Departments for Children and Adults

One pediatric and one adult allergology department functions only in Yerevan. Instead of comparison across marzes it was more reasonable to review performance indicators of adult and pediatric departments (Table 29).

Table 29. Main performance indicators of Allergology Department according to marzes, 2017

Marz	Department	# of Departments	Average annual bed occupancy	Total admissions	Admissions 0-14	Admissions 15-17	Discharged	Deaths	On treatment	Bed-day	Average bed occupancy in days	Average length of stay in days
Yerevan	Allergology Dpt for Children	1	13	534	462	72	840	0	2	5,465	420	6.5
Yerevan	Allergology Dpt for Adults	1	17	1,315	8	194	1,338	0	3	5,083	299	3.8

In 2017 the Allergology Department for Children (available only in Arabkir Institute of Child and Adolescent Health) received 534 patients and discharged 840. This fact emphasizes the need of further review of the department performance indicators for 2010-2017, and to get the real picture it is necessary to consider the number of patients from the previous year (not discharged) who moved to the current year (as patients on treatment).

Ophthalmology Departments for Children and Adults

Ophthalmology Department for Children functions only in Yerevan, at the Malayan Eye Care Center and Qanaqer-Zeytun Medical Center.

Ophthalmology Department for adults exist in Yerevan, Armavir, Lori and Tavoush marzes. The highest annual bed occupancy rate is recorded in Yerevan (183 days), followed by Lori (95), Armavir (56) and Tavoush (53). Most probably patients from Armavir Ophthalmology Department prefer seeking care at Yerevan eye care hospitals. As for Lori and Tavoush marzes, the need of having an ophthalmology unit there is explained by their remoteness. *Given this, there is a need of further studies to understand if Syunik also needs a separate eye care center or unit, since it is also a remote region.*

Table 30. Main performance indicators of Ophthalmology Department according to marzes, 2017

Marz	Department	# of Departments	Average annual bed occupancy	Total admissions	Admissions 0-14	Admissions 15-17	Discharge d	Deaths	On treatment	Bed-day	Average bed occupancy in days	Average length of stay in days
Yerevan	Ophthalmology Dpt for Children	2	38	671	377	294	671	0	0	1,645	43	2.5
Armavir	Ophthalmology Dpt for Adults	1	5	157	0	0	156	0	0	282	56	1.8
Yerevan	Ophthalmology Dpt for Adults	6	216	13,304	100	470	13,273	0	33	39,431	183	2.7
Lori	Ophthalmology Dpt for Adults	1	4	338	0	0	338	0	0	379	95	1.1
Tavoush	Ophthalmology Dpt for Adults	1	1	53	0	0	53	0	0	53	53	1.0

Gastroenterology Department for Children and Adults

One Gastroenterology Department for children and two for adults function only in Yerevan.

Table 31. Main performance indicators of Gastroenterology Department according to marzes, 2017

Marz	Department	# of Departments	Average annual bed occupancy	Total admissions	Admissions 0-14	Admissions 15-17	Discharge d	Deaths	On treatment	Bed-day	Average bed occupancy in days	Average length of stay in days
Yerevan	Gastroenterology for Children	1	20	566	533	33	574	0	0	4,368	218	7.6
Yerevan	U Gastroenterology for Adults	2	85	2,571	0	67	2,626	12	43	20,110	237	7.7

Hematology Department for Children and Adults

This medical unit exists only in Yerevan –Hematology Center after Professor R. Yolyan.

Table 32. Main performance indicators of Hematology Department according to marzes, 2017

Marz	Department	# of Departments	Average annual bed occupancy	Total admissions	Admissions 0-14	Admissions 15-17	Discharge d	Deaths	On treatment	Bed-day	Average bed occupancy in days	Average length of stay in days
Yerevan	Hematology. Children's	1	25	372	289	83	372	0	13	5,879	235	15.8
Yerevan	Hematology, for adults	1	28	745	0	0	691	39	21	8,920	319	12.2

Gynecology Department for Children and Adults

Children's gynecology department functions only in Yerevan, at the Center for Family Planning and Reproductive Health, opened in 2017.

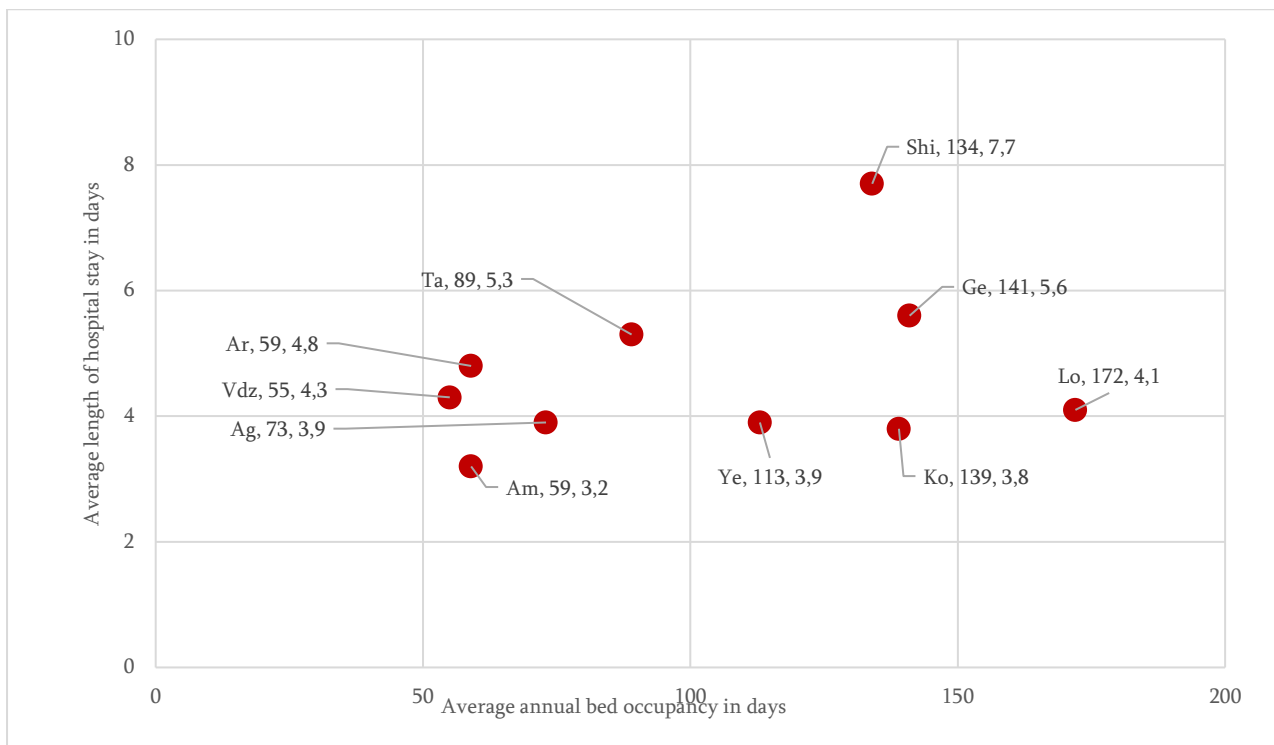
There are 19 Gynecology Department for adults in Yerevan and 40 in other marzes. A total of 73 of patients are admitted to Yerevan departments, 7% seek care at Kotayk marz.

Table 33. Main performance indicators of Gynecology Departments according to marzes, 2017

Marz	Department	# of Departments	Average annual bed occupancy	Total admissions	Admissions 0-14	Admissions 15-17	Discharges	Deaths	On treatment	Bed-day	Average bed occupancy in days	Average length of stay in days
Yerevan	Gynecology, children's	1	20	239	207	19	239	0	0	2,258	113	9.4
Aragat.	Gynecology, fer adults	3	5	99	0	0	98	0	1	365	73	3.9
Armavir	Gynecology, fer adults	2	20	375	0	2	374	1	0	1,183	59	3.2
Ararat	Gynecology, fer adults	4	30	385	0	0	383	0	3	1,783	59	4.8
Geghar.	Gynecology, fer adults	5	18	558	0	0	558	0	0	2,532	141	5.6
Yerevan	Gynecology, fer adults	19	326	11,707	51	38	11,791	0	26	36,686	113	3.9
Lori	Gynecology, fer adults	4	13	463	0	0	461	0	2	2,239	172	4.1
Kotayk	Gynecology, fer adults	5	28	1,092	0	1	1,081	0	3	3,891	139	3.8
Shirak	Gynecology, fer adults	6	34	694	1	2	688	0	3	4,555	134	7.7
Syunik	Gynecology, fer adults	5	10	444	0	0	449	0	2	2,105	211	4.7
Vayots D	Gynecology, fer adults	2	3	52	0	0	52	0	0	164	55	4.3
Tavoush	Gynecology, fer adults	4	8	126	0	0	125	0	0	712	89	5.3

In fact the Yerevan rates of gynecology care utilization is not highest (see Figure 51). In terms of annual bed occupancy Yerevan is ahead of Lori, Gegharkunik, Kotayk and Shirak, but is the 6th when it comes to the average length of hospital stay in days.

Figure 51. Disposition of Gynecology Departments for Adults in marzes in relation to the 'average length of hospital stay in days' and 'average annual bed occupancy', 2017



Nephrology Departments for Children and Adults

One Nephrology Departments for children (at Arabkir Health Center for Child and Adolescent Health) and two for adults (at Armenia National Medical Center and St. Grigor Lusavorich Medical Center) function only in Yerevan.

The highest average bed occupancy was found at the Children's Nephrology Department, it exceeds 365 nearly three times. However, because of its small weight this rate does not have any impact on the national hospital rates.

Table 34. Main performance indicators of Nephrology Departments according to marzes, 2017

Marz	Department	# of Departments	Average annual bed occupancy	Total admissions	Admissions 0-14	Admissions 15-17	Discharge	Deaths	On treatment	Bed-day	Average bed occupancy in days	Average length of stay in days
Yerevan	Nephrology, children's	1	30	1,818	1,587	113	1,965	0	30	32,729	1,091	16.7
Yerevan	Nephrology, adults	2	60	1,324	2	74	1,462	5	19	15,964	266	11.1

General medicine Department

There are General Medicine Departments in all marzes. The specifics of this type of unit is that they have relatively equal patient concentration across marzes.

Table 35. Main performance indicators of General Medicine Departments according to marzes, 2017

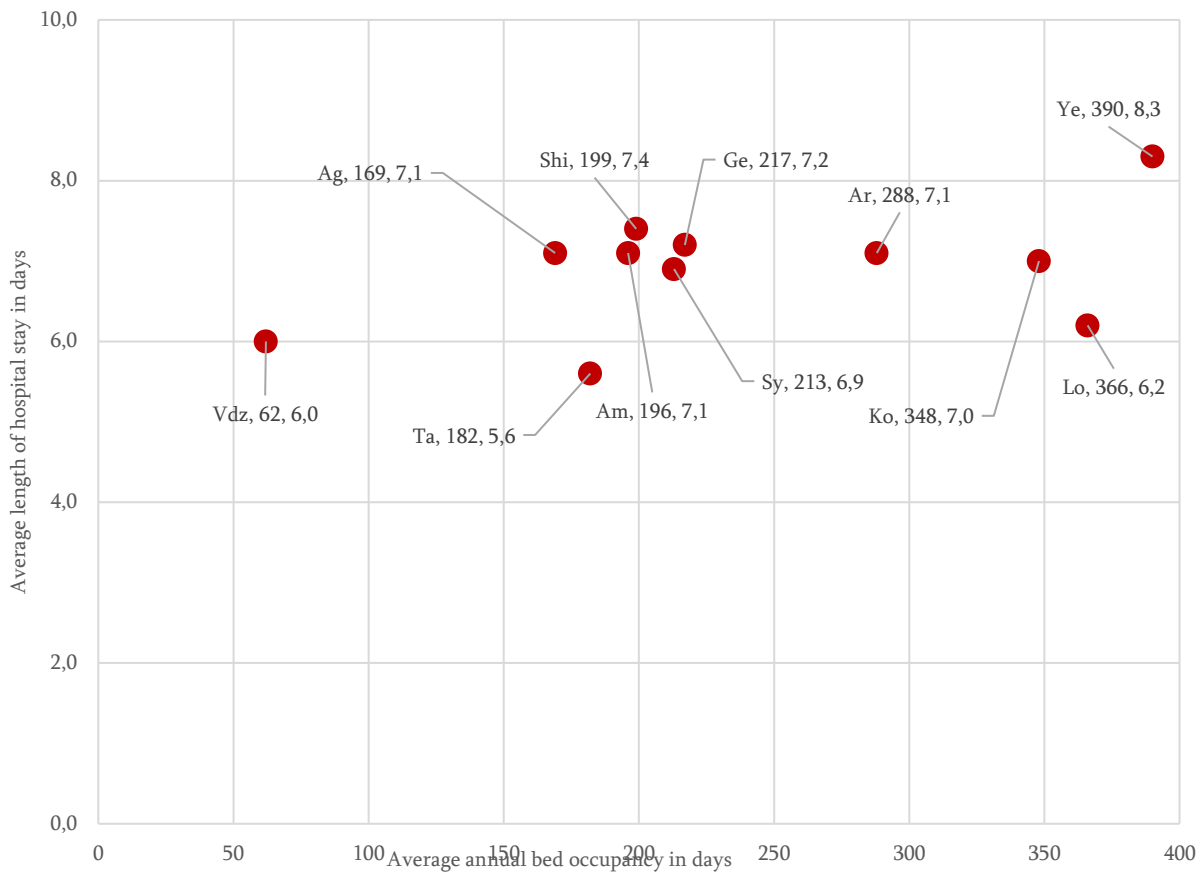
Marz	Department	# of Departments	Average annual bed occupancy	Total admissions	Admissions 0-14	Admissions 15-17	Discharge	Deaths	On treatment	Bed-day	Average bed occupancy in days	Average length of stay in days
Aragats	General Medicine	4	39	866	0	3	892	6	1	6,599	169	7.1
Armavir	General Medicine	3	53	1,436	0	0	1,465	3	5	10,392	196	7.1
Ararat	General Medicine	4	66	2,520	0	12	3,013	31	17	18,985	288	7.1
Gegh.	General Medicine	5	59	1,726	0	0	1,792	11	8	12,794	217	7.2
Yerevan	General Medicine	13	212	8,772	3	376	9,560	3	55	82,711	390	8.3
Lori	General Medicine	6	94	5,616	287	39	5,462	163	35	34,408	366	6.2
Kotayk	General Medicine	4	63	3,040	1,055	15	3,134	23	35	21,896	348	7.0
Shirak	General Medicine	4	82	2,300	0	14	2,237	38	12	16,289	199	7.4
Syunik	General Medicine	5	68	1,875	0	5	1,980	24	14	14,500	213	6.9
Vayots D	General Medicine	2	7	72	0	0	72	0	0	433	62	6.0
Tavoush	General Medicine	6	57	1,855	0	0	1,831	31	8	10,386	182	5.6

The performance indicators are presented in above Table and the annual average bed occupancy and the average length of stay in days in below

Figure . The lowest bed occupancy is found in Vayots Dzor (62) and the highest in Yerevan (390), followed by Lori (366) and Kotayk (348). This rate exceeds 365 in Yerevan and Lori.

The rate is rather high in Ararat and the rest of the marzes make a big ix group where the rate ranges within 169-217.

Figure 52. Disposition of General Medicine Departments in marzes in relation to the ‘average length of hospital stay in days’ and ‘average annual bed occupancy’ indicators, 2017



Narcology Departments

Only three marzes have Narcology Departments - Yerevan, Shirak and Syunik. Their geographic disposition is apparently well-grounded – two are located in marzes with big population and one is in a remote marz. This explains the modest annual average bed occupancy rates in Shirak and Syunik.

Table 36. Main performance indicators of Narcology Departments according to marzes, 2017

Marz	Department	# of Departments	Average annual bed occupancy	Total admissions	Admissions 0-14	Admissions 15-17	Discharge d	Deaths	On treatment	Bed-day	Average bed occupancy in days	Average length of stay in days

Marz	Department	# of Departments	Average annual bed occupancy	Total admissions	Admissions 0-14	Admissions 15-17	Discharge d	Deaths	On treatment	Bed-day	Average bed occupancy in days	Average length of stay in days
Yerevan	Narcology	1	60	1,187	0	0	1,178	4	29	14,396	240	12.2
Shirak	Narcology	1	10	63	0	0	63	0	1	905	91	14.4
Syunik	Narcology	1	10	73	0	0	72	1	3	600	60	8.2

Pulmonology Department for Children and Adults

Only Yerevan has pulmonology departments - one for children and one for adults. The latter functions within the Armenia National Medical Center and the children's department is part of the Arabkir Institute for Child and Adolescent Health.

Table 37. Main performance indicators of Pulmonology Departments according to marzes, 2017

Marz	Department	# of Departments	Average annual bed occupancy	Total admissions	Admissions 0-14	Admissions 15-17	Discharge	Deaths	On treatment	Bed-day	Average bed occupancy in days	Average length of stay in days
Yerevan	Pulmonology, children's	1	20	381	372	9	1,403	0	22	8,562	428	6.1
Yerevan	Pulmonology, adults	1	30	590	0	35	603	5	15	4,784	159	7.9

Infectious Diseases Department for children

An infectious disease department for children functions in Yerevan, Lori, Shirak and Syunik marzes. *Their performance indicators enable assuming that there is a need for such department also in other marzes such as Tavoush, Vayots Dzor and Gegharkunik.*

Table 38. Main performance indicators of Infectious Disease Departments for Children according to marzes, 2017

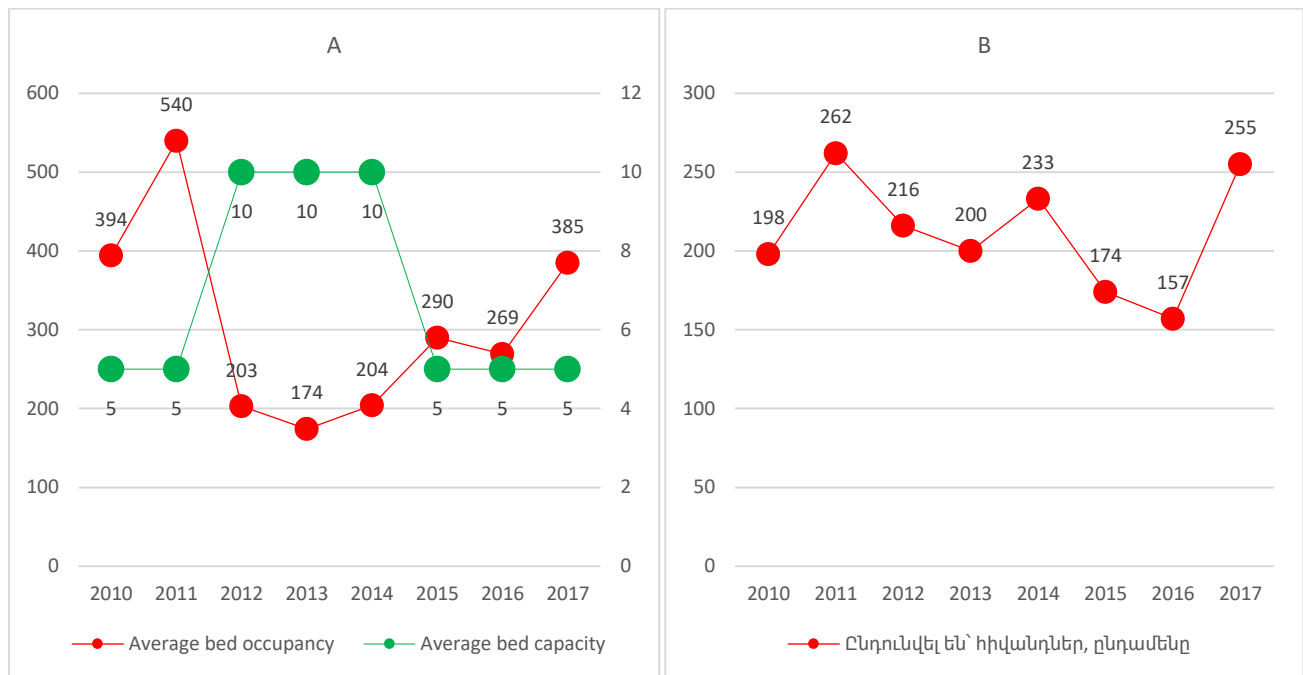
Marz	Department	# of Departments	Average annual bed occupancy	Total admissions	Admissions 0-14	Admissions 15-17	Discharge	Deaths	On treatment	Bed-day	Average bed occupancy in days	Average length of stay in days
Yerevan	Infectious Diseases, children's	1	145	4,702	4,438	264	4,791	0	53	28,061	194	5.9
Lori	Infectious Diseases, children's	1	20	577	562	15	578	0	2	3,900	195	6.7
Shirak	Infectious Diseases, children's	1	25	622	580	42	623	0	4	4,186	167	6.7
Syunik	Infectious Diseases, children's	1	5	255	223	32	266	0	1	1,924	385	7.2

The annual bed occupancy was quite higher in Syunik (part of Goris Medical Center) compared with other marzes, whereas the average length of hospital stay was slightly higher. The Syunik department accommodates only 5 beds.

Analysis of the annual average bed occupancy of Goris MC during 2010-2017 suggests that the number of beds doubled between 2012 and 2014 (from 5 to 10) and no bed occupancy problems occurred. In 2011 the bed occupancy was above 365 (which is problematic in case of infectious diseases), but it dropped in 2012. Most probably the bed occupancy doubling during 2010-2011 was due to projections based on the growing number of patients.

Figure 53. A. Annual average bed capacity and annual average bed occupancy in Goris MC, 2010-2017,

B. Number of patients admitted to the Children's Department for Infectious Diseases of Goris MC, 2010-2017



However in 2014 the bed capacity dropped to 5 and in 2017 a problem with annual average bed occupancy occurred, i.e. it went beyond 365 again (385).

Therefore there is a need of highlighting the *problem of increasing the number of beds in Syunik Infectious Disease Department for Children. In this particular case the reasonable number will be 7 or 8.*

Infectious Diseases Department for adults

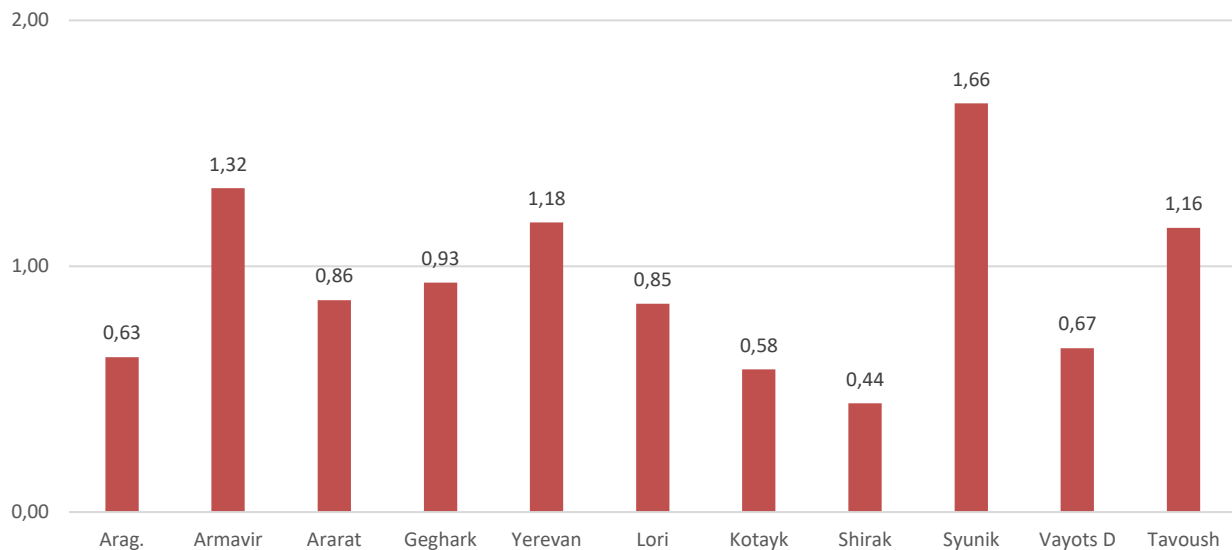
Infectious Diseases Departments for adults are available in all marzes. Except for Yerevan, these departments hospitalize also patients under 17 years of age. Comparison of indicators for infectious diseases is difficult because they may be endemic.

Figure 54– presents the ratio of patient admissions (proportion (%)) to infectious diseases department of marz hospitals due to all infectious diseases; the proportion (%) of marz populations and the total population of Armenia. In 2017 the rate of infectious diseases in Yerevan, Syunik, Armavir and Tavoush marzes exceeded the national level.

Table 39. Main performance indicators of Infectious Diseases Departments according to marzes, 2017

Marz	Department	# of Departments	Average annual bed occupancy	Total admissions	Admissions 0-14	Admissions 15-17	Discharge d	Deaths	On treatment	Bed-day	Average bed occupancy in days	Average length of stay in days
Aragats	Infectious Diseases, adults	2	9	287	215	5	288	0	0	2,166	241	7.7
Armavir	Infectious Diseases, adults	3	43	1,213	1,015	10	1,210	0	16	7,667	178	6.4
Ararat	Infectious Diseases, adults	3	24	812	651	20	814	0	4	4,788	200	5.8
Gegh.	Infectious Diseases, adults	5	25	761	519	13	757	0	8	4,273	171	5.7
Yerevan	Infectious Diseases, adults	2	197	4,492	0	0	4,463	3	61	32,353	164	7.3
Lori	Infectious Diseases, adults	5	35	664	244	27	662	1	6	3,968	113	6.0
Kotayk	Infectious Diseases, adults	3	17	522	322	22	598	0	4	4,389	258	7.3
Shirak	Infectious Diseases, adults	2	20	375	81	0	377	0	2	2,928	146	7.8
Syunik	Infectious Diseases, adults	4	30	827	264	6	825	0	12	6,014	200	7.4
Vayots D	Infectious Diseases, adults	1	10	120	85	2	120	0	0	590	59	4.9
Tavoush	Infectious Diseases, adults	4	23	514	430	9	513	0	5	2,547	111	5.5

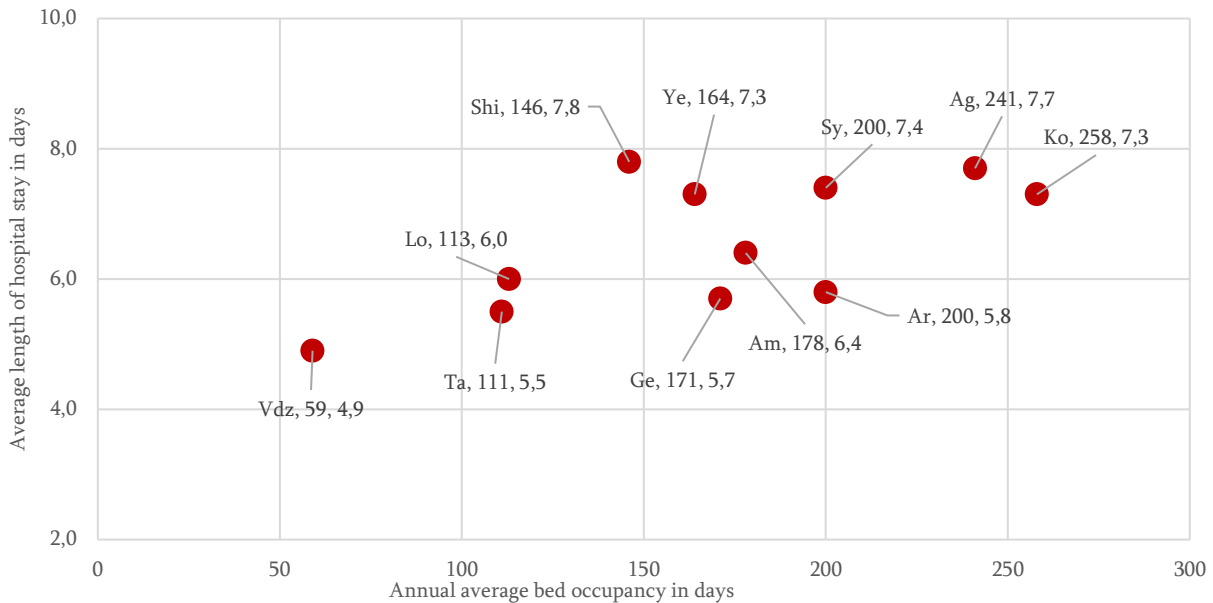
Figure 54. Ratio of admissions in marz Infectious Diseases Departments and marz populations



Disposition of Marz Infectious Diseases Departments in relation to 'average length of stay' and 'annual average bed occupancy' (

Figure 55) shows that the highest rate of the latter is found in Kotayk (258) and Aragatsotn (241), whereas the lowest is recorded in Vayots Dzor (59), where it is 4.4 times lower compared with Kotayk.

Figure 55. Disposition of Marz Infectious Diseases Departments in relation to 'average length of hospital stay in days' and 'annual average bed occupancy in days', 2017



Thoracic Surgery Departments for Children and Adults

A Thoracic Surgery Department for Children is available only in Yerevan, at Surb Astvatsamayr (Holy Mother) Medical Center, and a similar departments for adults are available at the Astghik Medical Center, Surb Grigor Lusavorich Medical Center, Medline Clinic and L Mikaelyan Surgery Institute.

Table 40. Main performance indicators of Thoracic Surgery Departments according to marzes, 2017

Marz	Department	# of Departments	Average annual bed occupancy	Total admissions	Admissions 0-14	Admissions 15-17	Discharged	Deaths	On treatment	Bed-day	Average bed occupancy in days	Average length of stay in days
Yerevan	Thoracic Surgery, children's	1	20	443	424	13	505	0	2	4,023	201	8
Yerevan	Thoracic Surgery, adults	4	82	1,732	2	12	1,981	0	36	18,672	228	9.5

Maternity Departments

Maternity Departments are available in all marzes (Table 41), accounting for a total of 60 departments. Data of the column 'Number of departments' show that these units are equally concentrated in that region, according to the marz population number. Detailed study of their distribution suggests that a maternity Department exists in every former area and town (see **Error! Reference source not found.**).

Table 41. Main performance indicators of Maternity Departments according to marzes, 2017

Marz	Department	# of Department	Average annual bed occupancy	Total admissions	Admissions 0-14	Admissions 15-17	Discharged	Deaths	On treatment	Bed-day	Average bed occupancy in days	Average length of stay in days
Aragats	Maternity	6	37	775	0	0	781	0	1	2,787	75	3.5
Armavir	Maternity	2	40	1,488	0	12	1,489	0	6	5,087	127	3.5
Ararat	Maternity	4	66	2,353	0	0	2,365	0	12	9,006	136	4.0
Gegh.	Maternity	5	45	2,213	0	5	2,220	0	8	7,992	178	3.8
Yerevan	Maternity	12	429	18,516	1	33	21,362	0	155	83,372	194	4.0
Lori	Maternity	6	79	3,429	0	4	3,459	1	22	14,033	178	4.2
Kotayk	Maternity	5	58	2,135	0	1	2,137	0	23	8,778	151	4.1
Shirak	Maternity	6	73	3,181	0	1	3,167	0	29	12,060	165	4.2
Syunik	Maternity	5	39	1,196	0	0	1,223	0	11	5,571	143	4.5
Vayots D	Maternity	3	15	366	0	0	364	0	4	1,533	102	4.5
Tavoush	Maternity	6	43	1,187	0	1	1,238	0	13	5,394	125	4.2

Analysis of the column 'Total admissions' (postpartum women) hints about a problem of underutilization of marz departments. The relative number of Yerevan admissions (50%, see Figure) exceeds the relative number of Yerevan population by 38% (36%), which means that Yerevan Maternity Departments receive significant flow of patients from nearby marzes. As the Figure shows, the relative number of patients admitted to Armavir Maternity Departments is 55% higher than the marz population. Same picture is seen in Armavir (27%), Aragatsotn (51%), Kotayk (32%), Vayots Dzor (42%), Gegharkunik (22%). The rate exceeds 100% also in Shirak (109%) and Lori (128%). It can be assumed that patients from Tavoush turn to Lori maternities and those from settlements near Aragatsotn seek care in Shirak marz.

The average length of stay in days is very short. The lowest rates are found in Aragatsotn and Armavir (3.5) and the highest in Vayots Dzor and Syunik (4.5).

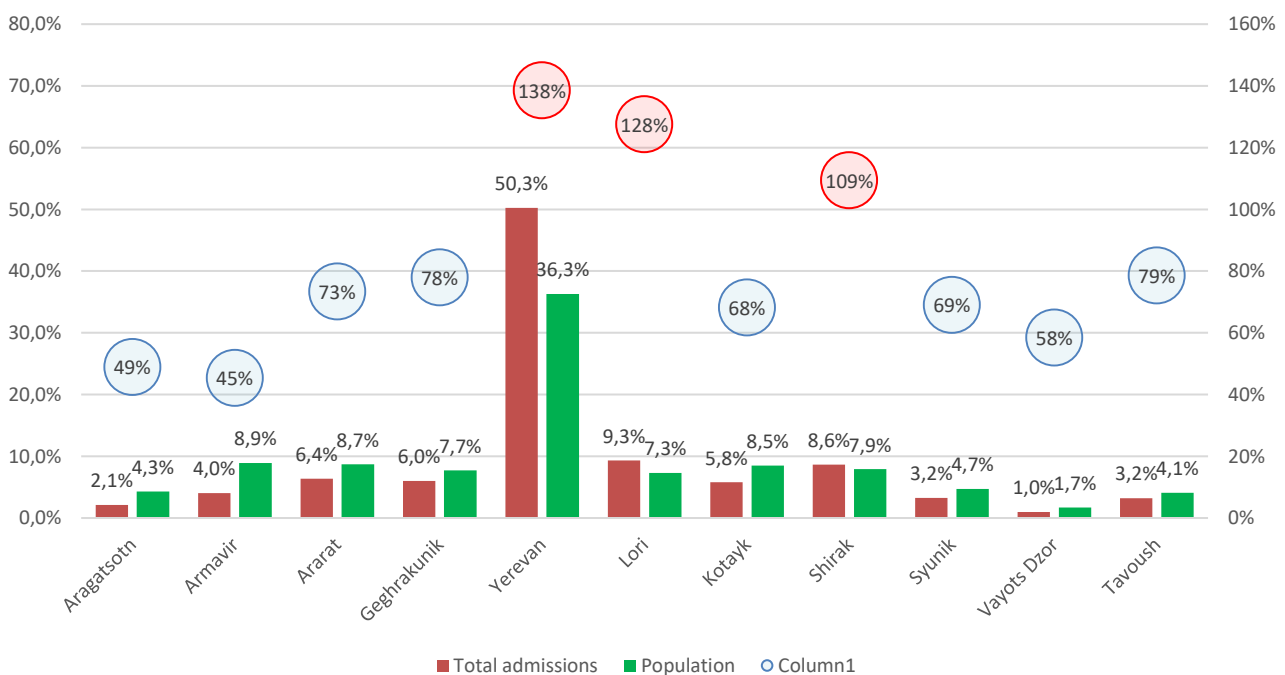
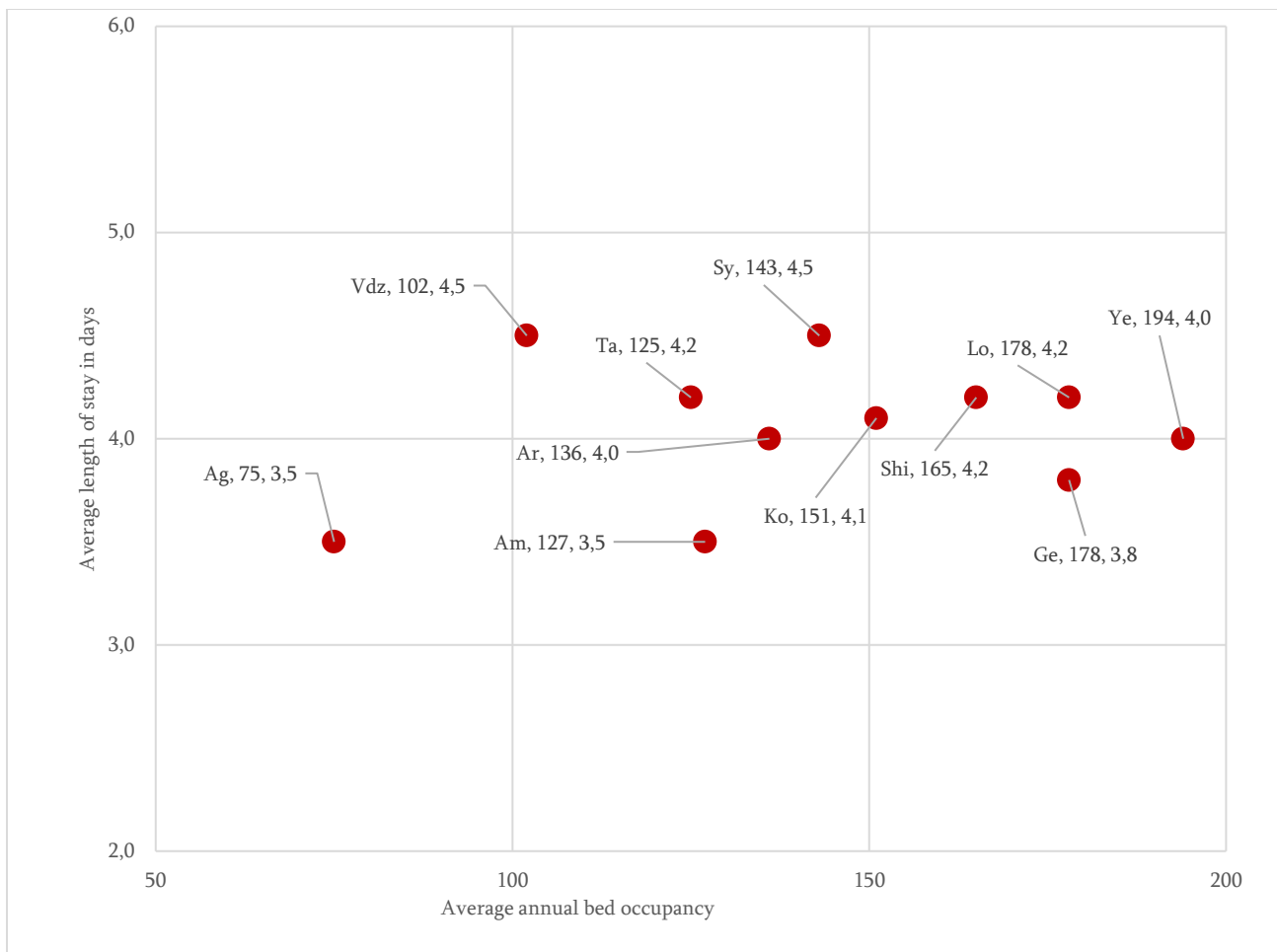
Figure 56. Relative numbers of patients admitted to Maternity Departments and the marz population

Figure 57. Disposition of marz maternity departments in relation to the 'average length of hospital stay in days' and 'average annual bed occupancy in days', 2017



The annual bed occupancy rate changes with rather significant difference. It has the highest value in Yerevan (194), which is quite expected, and the lowest rate is in Aragatsotn (75). Also, the figure is high in Shirak and Lori, i.e. in regions where the admissions-population ratio is above 100%.

Department of pathological pregnancies

Departments of pathological pregnancies are available in all marzes. The total number of such units is 48. Their regional concentration is close to that of the maternity departments (see **Error! Reference source not found.**).

Table 42. Main performance indicators of Departments of Pathological Pregnancies according to marzes, 2017

Marz	Department	# of Department men ts	Average annual bed occupan cy	Total admissions	Adm issio ns 0-14	Admissi ons 15-17	Discharg ed	Deaths	On treat ment	Bed-day	Average bed occupan cy in days	Average length of stay in days
Aragatsotn	Pathological pregnancies	4	7	195	0	0	194	0	0	700	100	3.4
Armavir	Pathological pregnancies	2	15	681	0	10	681	0	0	2,834	189	4.1
Ararat	Pathological pregnancies	4	19	901	0	0	890	0	1	4,359	229	5
Gegh.	Pathological pregnancies	5	20	488	0	0	491	0	1	2,062	103	4.5
Yerevan	Pathological pregnancies	10	203	13,773	1	46	11,046	0	86	64,227	316	5.9
Lori	Pathological pregnancies	4	8	339	0	3	321	0	1	1,372	172	4.4
Kotayk	Pathological pregnancies	3	10	393	0	0	391	0	2	1,559	156	4
Shirak	Pathological pregnancies	6	23	1,026	0	0	1,026	0	5	5,281	230	5.6
Syunik	Pathological pregnancies	5	16	814	0	0	774	0	5	3,877	242	4.9
Vayots D	Pathological pregnancies	1	3	59	0	0	59	0	0	319	106	5.4
Tavoush	Pathological pregnancies	4	16	264	0	0	217	0	1	1,229	77	5.6

The marz admissions-population ratio (Figure 58) shows that in Yerevan these departments admit more patients than the maternity ones. The ratio accounts 200% in Yerevan. More than one-third (36.3%) of the country population lives in Yerevan, hence 72.7% of pregnant women with various pathologies seek care in relevant Yerevan departments. In all marzes the rate is equal to 100%, though relatively higher in Syunik (91%), which may be due to significant distance from Yerevan. In fact, in Tavoush and Lori, which are also quite far from the capital, the rates account for 34% and 25%. These facts suggest that population has low trust towards regional divisions for pregnancy pathologies. Some further studies are needed to understand if lack of confidence dwells on objective (poor qualification of doctors, technical/ hardware capacities of departments, etc) or subjective (people simply do not trust without any good reason) judgments.

Figure 58. Department admissions - marz population ratio

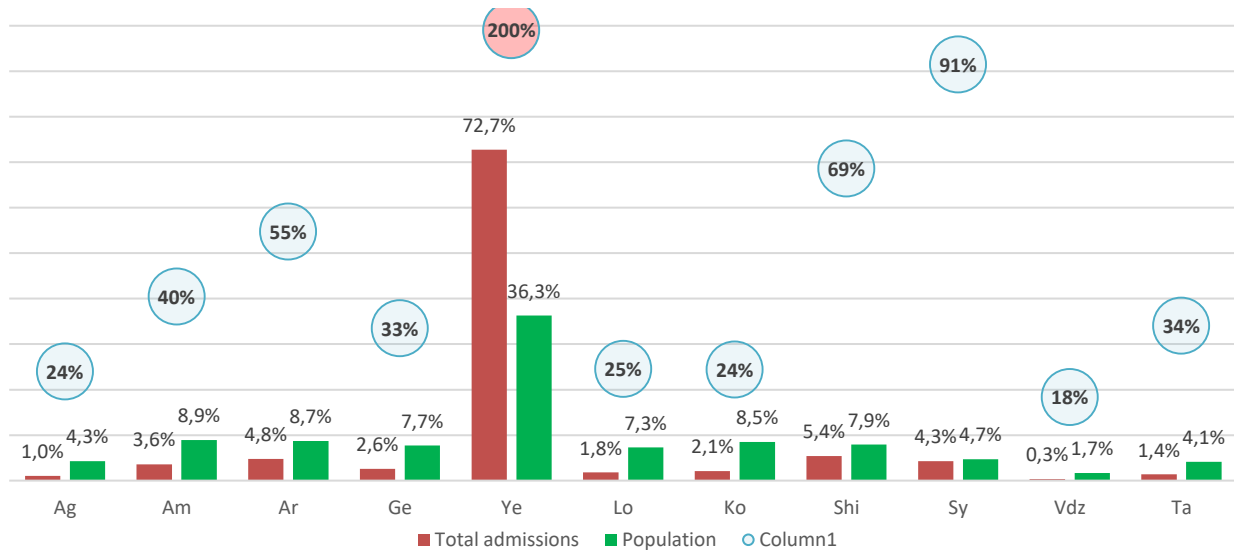
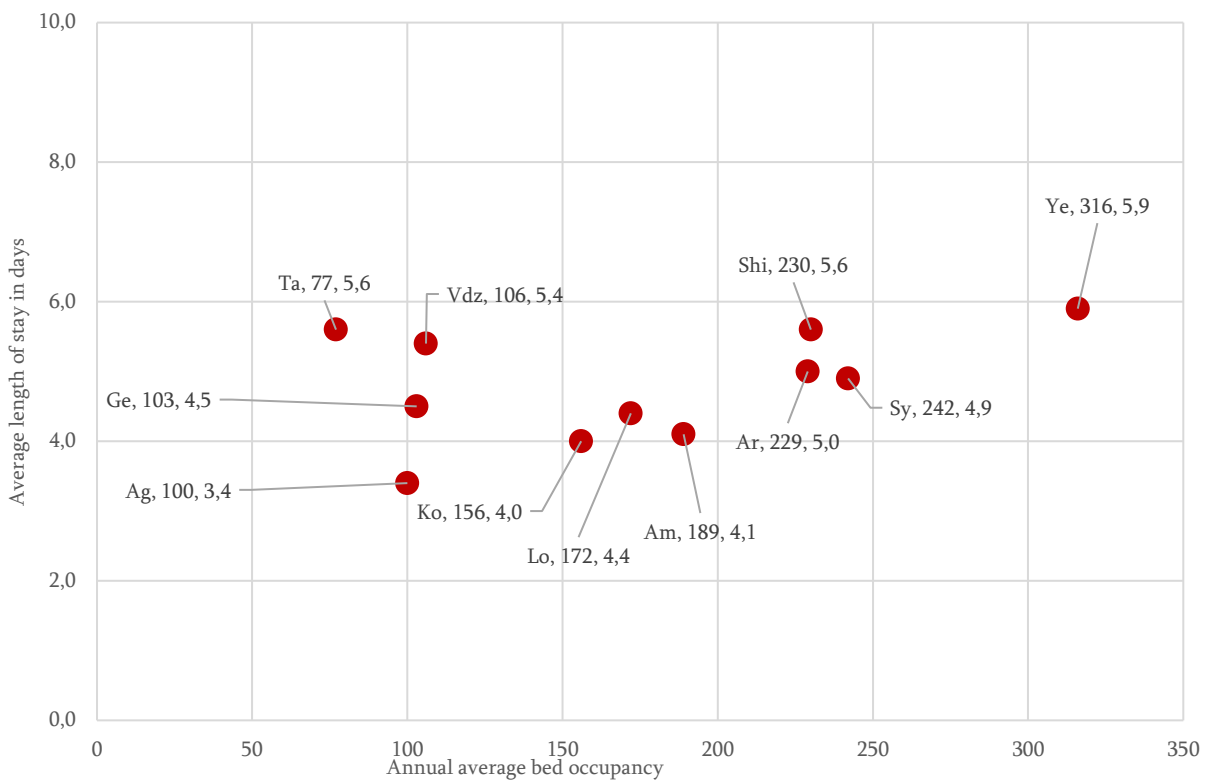


Figure 59. Disposition of marz pregnancy pathologies departments in relation to the 'average length of hospital stay in days' and 'average annual bed occupancy in days', 2017



An indirect evidence of objective reasons is found in Shirak, where the rate is high (91%) and close to the 'norm'.

Child and adult psychiatry departments

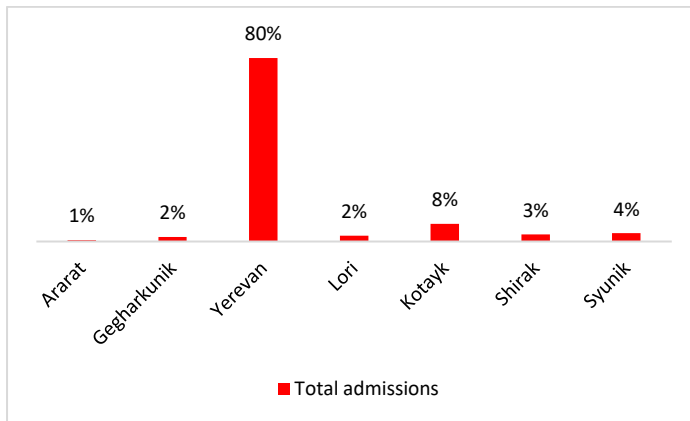
There is only one children's psychiatry department (Armash Health Center in village Armash, Ararat marz). Three patients were admitted to this division in 2017. The average annual bed capacity is 8.

Adult psychiatry departments are available in 7 marzes - Ararat, Gegharkunik, Yerevan (4 departments), Lori, Kotayk (2 departments), Shirak and Syunik. In 2017 Yerevan psychiatry departments admitted 80% of all patients.

Table 43. Main performance indicators of psychiatry departments according to marzes, 2017

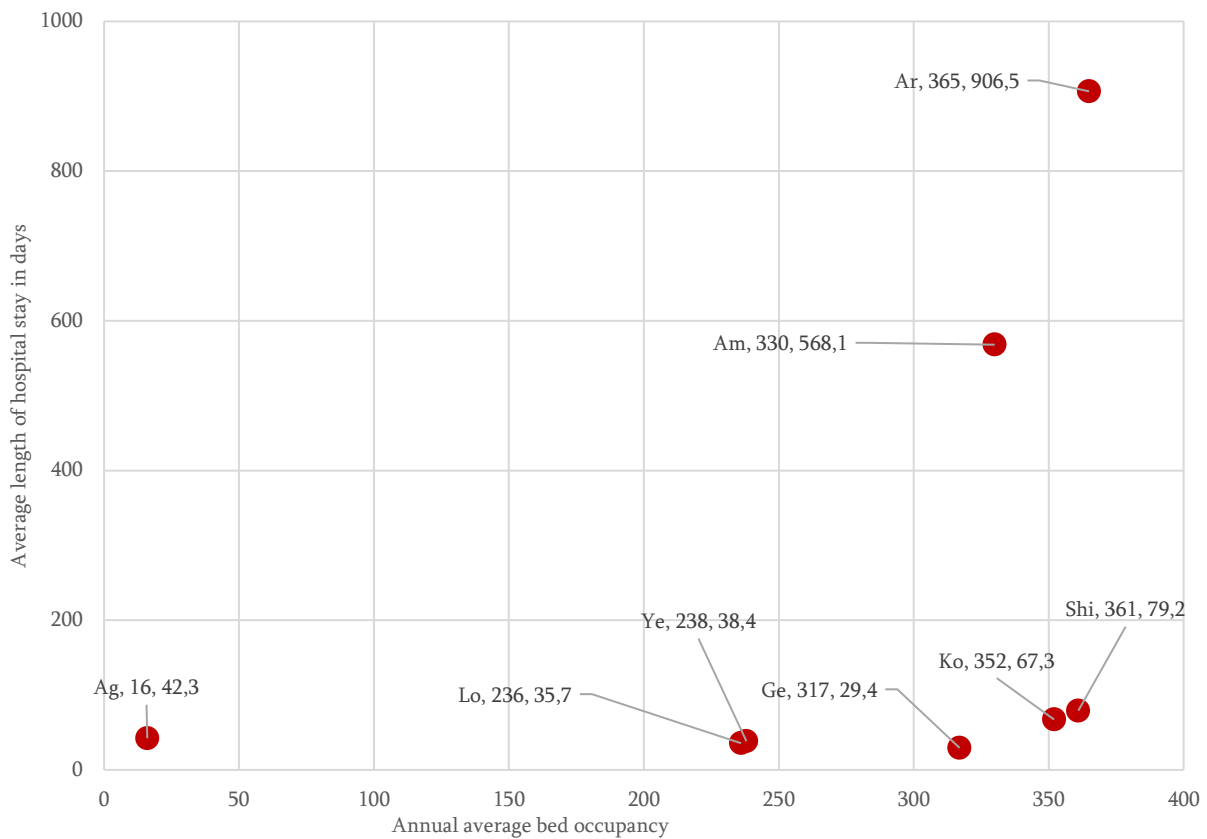
Marz	Department	# of Departments	Average annual bed occupancy	Total admissions	Admissions 0-14	Admissions 15-17	Discharge	Deaths	On treatment	Bed-day	Average bed occupancy in days	Average length of stay in days
Ararat	Psychiatry, children	1	8	3	2	1	3	0	0	127	16	42.3
Arm	Psychiatry, adults	1	100	54	0	0	54	4	91	32,951	330	568.1
Gegh	Psychiatry, adults	1	420	174	0	0	162	7	422	153,192	365	906.5
Yer	Psychiatry, adults	4	595	7,214	10	98	7,231	16	404	188,336	317	29.4
Lori	Psychiatry, adults	1	35	223	0	0	217	0	22	8,343	238	38.4
Kota	Psychiatry, adults	2	80	698	0	0	713	2	23	18,844	236	35.7
Shirak	Psychiatry, adults	1	55	281	0	0	287	1	50	19,379	352	67.3
Syun	Psychiatry, adults	1	70	324	1	2	315	4	63	25,261	361	79.2

Figure 60. Marz concentration of patients admitted to adult psychiatry departments



Disposition of adult psychiatry departments in relation to 'average length of hospital stay in days' and 'annual average bed occupancy in days' in 2017 is presented in Figure 61. It also shows data for Armash child psychiatry department (lowest left dot).

Figure 61. Disposition of marz adult psychiatric departments in relation to the ‘average length of hospital stay in days’ and ‘average annual bed occupancy in days’, 2017



The highest rate (906 days) of average length of hospital stay is found in Gegharkunik (Sevan Psychiatric Hospital) and Ararat (568 days) (Armash Health Center), which is due to specifics of patients admitted to these units. Annual average bed occupancy is also high - 365 days and 330 days correspondingly. The latter is high also in Kotayk, Lori, Yerevan, Shirak and Syunik departments (the rate varies within [236; 361] range). However the average length of hospital stay in days is significantly lower than in Gegharkunik and Ararat (within [29; 79] range).

Beam Radiotherapy Departments

There are two Beam Radiotherapy Departments and both are located in Yerevan. One is part of Fanarjyan Oncology Center and the other functions within the National Research Center of Radiation Medicine and Burns.

Table 44. Main performance indicators of Beam Radiotherapy Departments according to marzes, 2017

Department	# of Departments	Average annual bed occupancy	Total admissions	Admissions 0-14	Admissions 15-17	Discharges	Deaths	On treatment	Bed-day	Average bed occupancy in days	Average length of stay in days
Yerevan Beam Radiotherapy	2	110	1,606	5	5	1,610	1	57	47,698	434	33.3

Pediatric departments

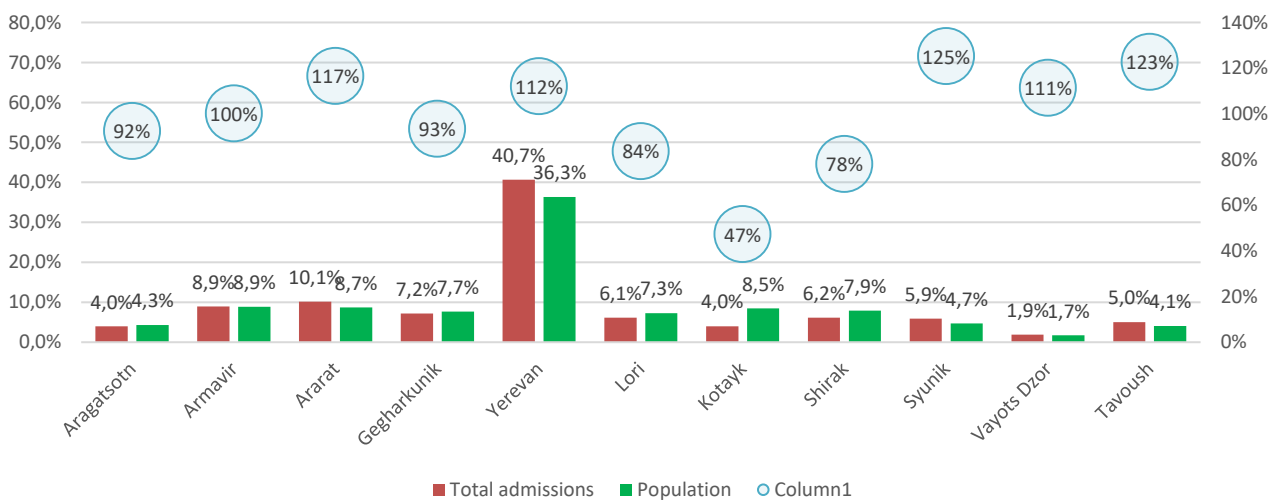
Pediatric departments are easily accessible in all marzes. The figures are presented in Table 45–.

Figure 62 demonstrates patient proportions and marz population ratios.

Table 45. main indicators of Pediatric Department performance across marzes, 2017

Marz	Department	# of Dep art men ts	Average annual bed occupan cy	Total admissio ns	Admissi ons 0-14	Admissi ons 15-17	Discharg ed	Deat hs	On treatm ent	Bed-day	Average bed occupan cy in days	Average length of stay in days
Aragats	Pediatric dpt	4	26	1,343	1,219	3	1,340	0	6	8,301	319	6.2
Armavir	Pediatric dpt	3	53	3,014	2,990	7	2,984	0	55	19,122	361	6.4
Ararat	Pediatric dpt	4	45	3,425	3,406	19	3,393	0	67	20,596	458	6.1
Gegh.	Pediatric dpt	5	39	2,431	2,408	23	2,440	2	14	12,164	312	5.2
Yerevan	Pediatric dpt	6	265	13,742	13,486	256	16,944	0	319	121,346	458	7.2
Lori	Pediatric dpt	5	51	2,064	2,028	27	2,040	0	34	12,067	237	5.9
Kotayk	Pediatric dpt	3	14	1,358	1,342	11	1,281	0	12	7,355	525	5.9
Shirak	Pediatric dpt	4	58	2,081	2,052	29	2,076	0	49	14,718	254	6.6
Syunik	Pediatric dpt	5	42	1,988	1,938	43	2,024	0	52	12,781	304	6.3
Vayots D	Pediatric dpt	3	22	640	484	2	640	10	3	3,617	164	5.5
Tavoush	Pediatric dpt	6	39	1,700	1,669	20	1,693	0	19	7,642	196	5.0

Figure 62 Relative number of patients - marz population ratio

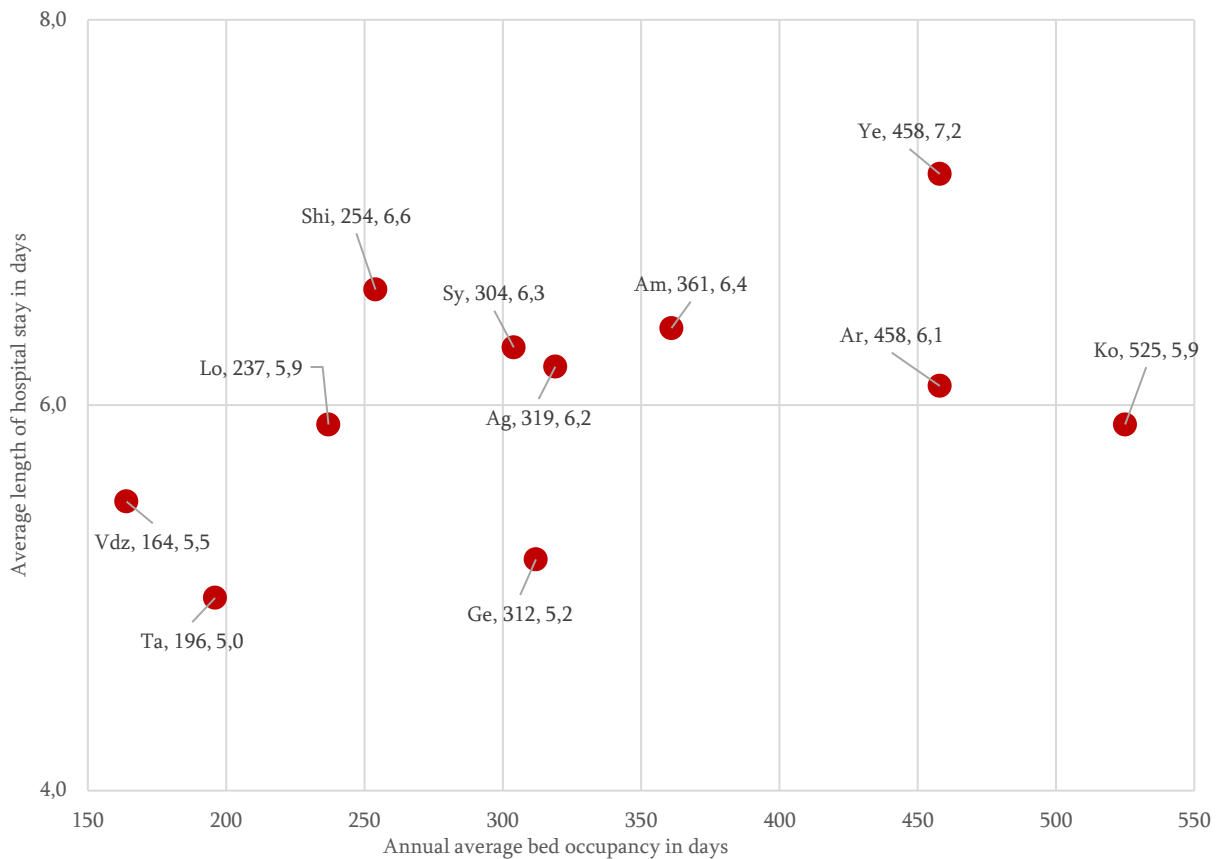


There is no clear tendency of referring patients to Yerevan. Only Kotayk may be an exception, where the ratio is 47%. Exceedance of 100% in small and remote marzes may be explained by higher morbidity rate in children.

Disposition of Pediatric Departments in relation to 'average length of hospital stay in days' and 'annual average bed occupancy in days' in 2017 is presented in

Figure . Annual bed capacity in Kotayk, Yerevan and Ararat significantly exceeds 365 and is equal to 525, 458 and 458 correspondingly. The lowest rates are found in Vayots Dzor, Tavoush (196) and Lori (237).

Figure 64. Disposition of marz pediatric departments in relation to the 'average length of hospital stay in days' and 'average annual bed occupancy in days', 2017



Adult dermatology/STI, microsurgery, endocrinology departments

Adult dermatology/STI, microsurgery, endocrinology departments are available only in Yerevan. There are one Dermatology/STI Department and three Microsurgery and Endocrinology Departments.

Table 46. Main performance indicators of adult dermatology/STI, microsurgery, endocrinology departments according to marzes, 2017

Marz	Department	# of Departments	Average annual bed occupancy	Total admissions	Admissions 0-14	Admissions 15-17	Discharge d	Deaths	On treatment	Bed-day	Average bed occupancy in days	Average length of stay in days
Yerevan	Dermatology, STI, adults	1	100	2,960	326	317	2,953	0	37	26,354	264	8.9
Yerevan	Microsurgery, adult	3	48	803	20	12	800	0	14	7,213	150	9.7
Yerevan	Endocrinology, adults	3	77	4,688	321	417	4,684	0	44	30,754	399	6.7

Neurology Departments for Children and Adults

Armenia has three children's neurology departments, all located in Yerevan.

A total of 15 adult neurology departments are available in Armenia. They are absent in Aragatsotn, Vayots Dzor, Syunik and Gegharkunik marzes.

Overwhelming majority (91.4%) of adult patients are admitted to Neurology Departments in Yerevan, which cover 85.1% of the total bed capacity of the country.

Disposition of adult neurology departments in relation to 'average length of hospital stay in days' and 'annual average bed occupancy in days' in 2017 is presented in

Figure.

The highest rates of annual average bed occupancy in days are recorded in Yerevan (316) and Armavir (315). Shirak (10.0) and Yerevan (7.7) have the lead locations as regards the average length of hospital stay in days. The lowest figures are in Kotayk (5 and 5.1 correspondingly).

Table 47. Main performance indicators of neurology departments according to marzes, 2017

Marz	Department	# of Departments	Average annual bed occupancy	Total admissions	Admissions 0-14	Admissions 15-17	Discharge	Deaths	On treatment	Bed-day	Average bed occupancy in days	Average length of stay in days
Yerevan	Neurology, children's'	3	52	1,293	1,128	141	1,453	0	7	12,108	233	9.6
Armavir	Neurology, adults	1	13	637	0	0	661	2	4	4,096	315	6.2
Ararat	Neurology, adults	1	4	117	0	4	181	0	0	964	241	5.3
Yerevan	Neurology, adults	8	326	13,815	5	576	14,306	230	136	103,112	316	7.7
Lori	Neurology, adults	1	5	142	0	0	135	16	2	949	190	6.3
Kotayk	Neurology, adults	2	18	114	0	1	114	0	0	908	50	5.1
Shirak	Neurology, adults	1	15	226	0	0	221	0	6	2,210	147	10
Tavoush	Neurology, adults	1	2	62	0	0	58	4	1	397	199	6.4

Figure 65. Marz concentration of patients admitted to adult neurology department

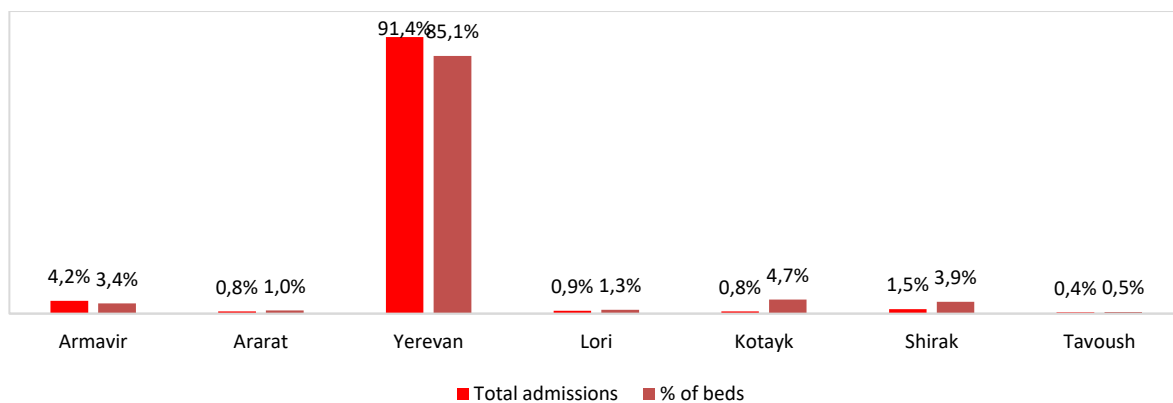
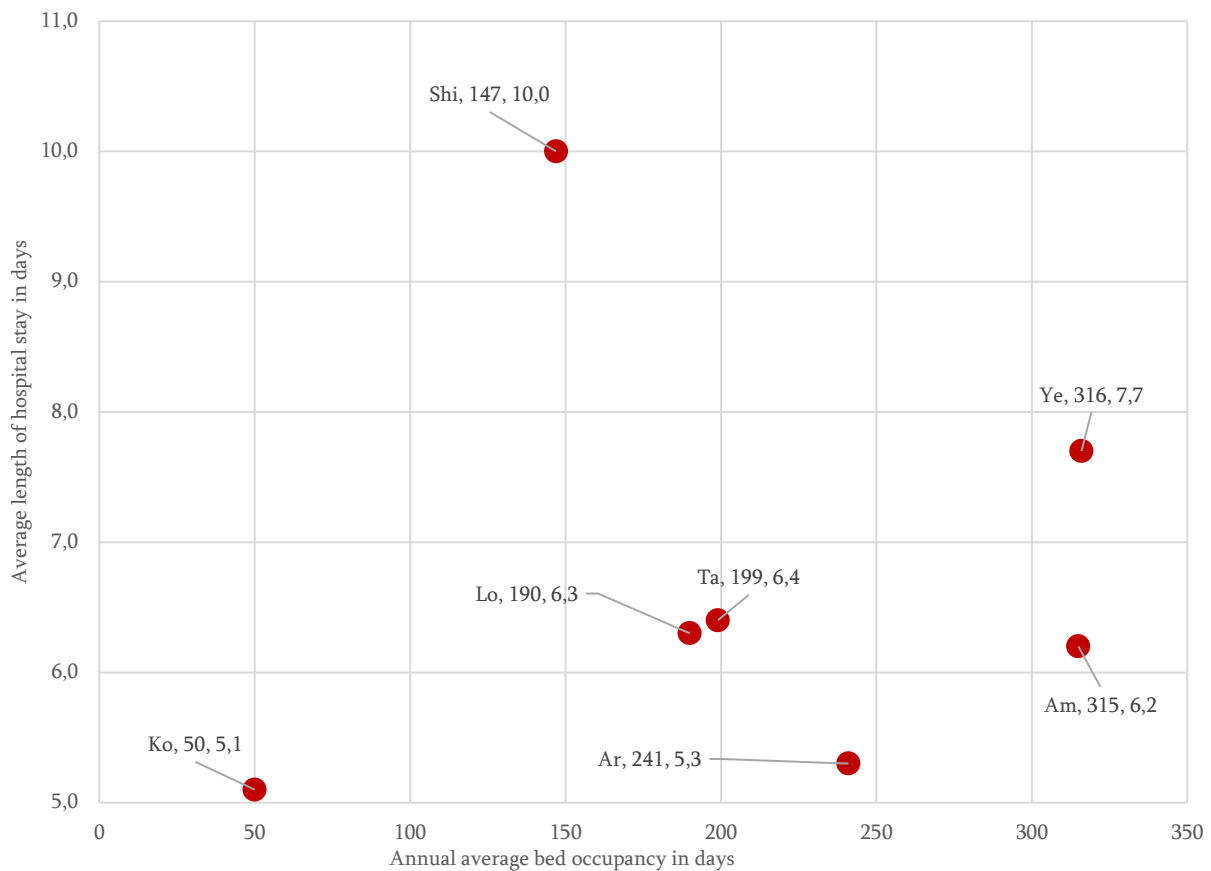


Figure 66. Disposition of marz adult neurology departments in relation to the 'average length of hospital stay in days' and 'average annual bed occupancy in days', 2017



Neurosurgical departments for children and adults

There is only one children's neurosurgical department in Armenia (at Surb Astvatsamayr MC in Yerevan). The three adult neurosurgical departments are also available only in the capital.

The annual bed occupancy is higher in children's department and the average length of hospital stay in days is higher in adult's department.

Table 48. Main performance indicators of neurosurgical departments according to marzes, 2017

Marz	Department	# of Departments	Average annual bed occupancy	Total admissions	Admissions 0-14	Admissions 15-17	Discharge	Deaths	On treatment	Bed-day	Average bed occupancy in days	Average length of stay in days
Yerevan	Neurosurgical, children's	1	20	539	510	29	701	0	9	5,834	292	8.3
Yerevan	Neurosurgical, adults	7	164	2,112	4	10	2,692	14	54	32,898	201	12.9

Bone marrow transplantation

There is only one bone marrow transplantation department in Armenia (Hematology Center after professor L. Yolyan in Yerevan).

Table 49. Main performance indicators of bone marrow transplantation departments according to marzes, 2017

Marz	Department	# of Departments	Average annual bed occupancy	Total admissions	Admissions 0-14	Admissions 15-17	Discharged	Deaths	On treatment	Bed-day	Average bed occupancy in days	Average length of stay in days
Yerevan	Bone marrow transplantation	1	7	8	0	0	8	0	0	114	16	14.3

Urology departments for children and adults

Only Yerevan has an urology department for children (Arabkir Child and Adolescent Health Institute). There are 13 urology departments for adults, of which 10 are located in Yerevan. In addition, one adult's urology department is available in Aragatsotn, one in Lori and one in Shirak.

Table 50. Main performance indicators of urology departments according to marzes, 2017

Marz	Department	# of Departments	Average annual bed occupancy	Total admissions	Admissions 0-14	Admissions 15-17	Discharged	Deaths	On treatment	Bed-day	Average bed occupancy in days	Average length of stay in days
Yerevan	Urology, children	1	20	989	898	57	992	0	6	8,383	419	8.5
Aragat.	Urology, adults	1	5	79	8	0	79	0	0	221	44	2.8
Yerevan	Urology, adults	10	207	8,978	18	714	9,028	7	67	59,910	289	6.9
Lori	Urology, adults	1	3	38	4	0	39	0	0	224	75	5.7
Shirak	Urology, adults	1	30	6	0	0	6	0	0	53	2	8.8

Yerevan hosts 84.5% of the bed capacity of adult urology departments and 98.7% of eligible patients. In addition, annual bed occupancy in other marzes, particularly in Shirak is as small as 2 days. All these facts pinpoint *the problem of technical capacity of these departments and /or the need of qualification trainings for healthcare providers.*

Also, opening an adult urology department in other marzes, particularly in Syunik, needs to be considered.

Oncology departments for children and adults

An oncology department for children is available only in Yerevan (National Oncology Center after V. Fanarjyan). There are six oncology departments for adults in Yerevan and one is available in Shirak. Here also Yerevan units are overloaded and the Shirak Oncology Dispensary department demonstrates modest rates for both average annual bed occupancy and average length of hospital stay.

Table 51. Main performance indicators of oncology departments according to marzes, 2017

Marz	Department	# of Departments	Average annual bed occupancy	Total admissions	Admissions 0-14	Admissions 15-17	Discharged	Deaths	On treatment	Bed-day	Average bed occupancy in days	Average length of stay in days
Yerevan	Oncology, children's	1	30	173	95	68	170	1	0	2,883	96	16.9
Yerevan	Oncology, adults	6	457	8,968	54	13	8,888	38	108	133,063	291	18.1
Shirak	Oncology, adults	1	30	323	0	0	324	0	0	2,863	95	8.8

Plastic surgery

Plastic surgery departments perform in Yerevan (6) and Kotayk (1). Yerevan patients make up 61% of all admissions to these departments and Kotayk patients cover 39%. Annual average bed occupancy (81) and average length of hospital stay (4.2) in Yerevan are higher, most probably because more complicated interventions are performed in the capital city.

Table 52. Main performance indicators of plastic surgery departments according to marzes, 2017

Marz	Department	# of Departments	Average annual bed occupancy	Total admissions	Admissions 0-14	Admissions 15-17	Discharged	Deaths	On treatment	Bed-day	Average bed occupancy in days	Average length of stay in days
Yerevan	Plastic surgery	6	32	840	64	2	841	0	2	2,580	81	4.2
Kotayk	Plastic surgery	1	10	540	0	0	540	0	0	540	54	1.0

Proctology and rheumatology departments for adults, acute intoxications departments

Five proctology, 2 rheumatology and 1 acute intoxication departments are available in Yerevan. No marz has the said medical units.

Table 53. Main performance indicators of adult proctology and acute intoxication departments according to marzes, 2017

Marz	Department	# of Departments	Average annual bed occupancy	Total admissions	Admissions 0-14	Admissions 15-17	Discharged	Deaths	On treatment	Bed-day	Average bed occupancy in days	Average length of stay in days
Yerevan	Proctology	5	81	2,072	1	20	2,069	4	11	15,442	191	7.8
Yerevan	Adult rheumatology	2	60	885	0	50	881	1	6	7,711	129	8.8
Yerevan	Acute intoxication	1	25	944	4	18	919	14	2	1,426	57	1.5

Dental care departments for children and adults

Two children's and seven adult dental care departments function in Yerevan (N/A in marzes).

Table 54. Main performance indicators of dental care departments according to marzes, 2017

Marz	Department	# of Departments	Average annual bed occupancy	Total admissions	Admissions 0-14	Admissions 15-17	Discharged	Deaths	On treatment	Bed-day	Average bed occupancy in days	Average length of stay in days
Yerevan	Dental, children's	2	23	1,859	1,744	34	1,879	0	3	6,790	295	4
Yerevan	Dental, adults	7	85	3,374	353	116	3,392	0	11	17,325	204	5.8

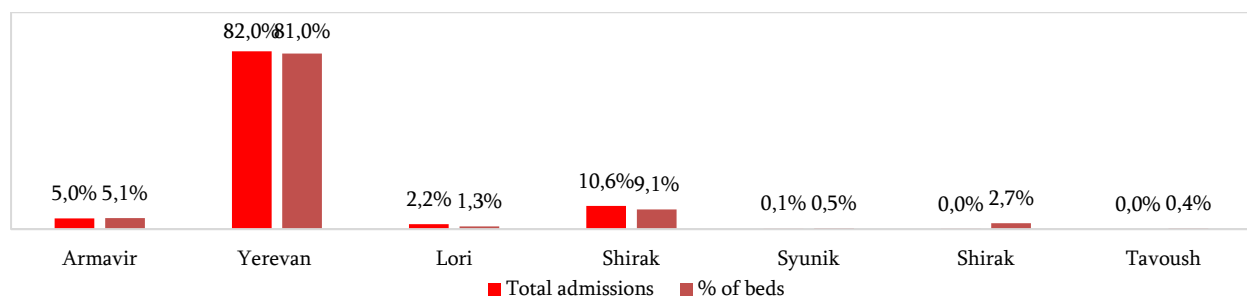
Cardiology departments

There are cardiology departments in Yerevan (9), Armavir (2) and one such unit in Lori, Shirak and Syunik marzes.

No essential differences were revealed across marzes as regards bed capacity and admissions to cardiology units.

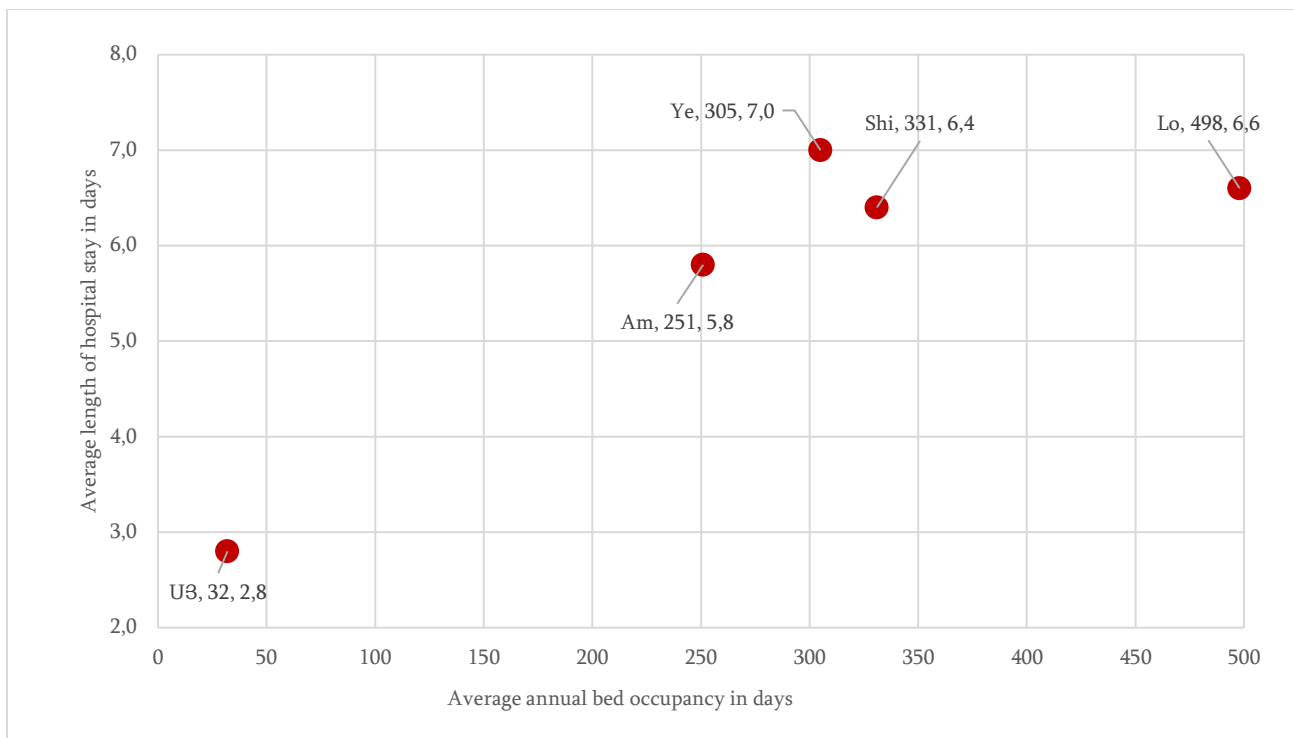
Table 55. Main performance indicators of cardiology departments according to marzes, 2017

Marz	Department	# of Departments	Average annual bed occupancy	Total admissions	Admissions 0-14	Admissions 15-17	Discharged	Deaths	On treatment	Bed-day	Average bed occupancy in days	Average length of stay in days
Armavir	Cardiology	2	28	1,206	0	0	1,215	25	2	7,038	251	5.8
Yerevan	Cardiology	9	447	19,943	7	1,001	19,949	391	171	136,286	305	7.0
Lori	Cardiology	1	7	539	0	0	516	11	4	3,484	498	6.6
Shirak	Cardiology	1	50	2,589	0	0	2,545	49	9	16,570	331	6.4
Syunik	Cardiology	1	3	34	0	0	32	2	0	96	32	2.8

Figure 67. Marz concentration of patients admitted to cardiology departments

As for disposition of marz departments in relation to average annual bed occupancy in days and average length of hospital stay in days (Figure 68), in 2017 the annual bed occupancy rate in Lori stood at 498 (i.e. exceeded 365). Syunik demonstrated the lowest rate of the average annual bed occupancy in days and the average length of hospital stay in days (32 and 2.8 correspondingly).

Figure 68. Disposition of marz adult cardiology departments in relation to the 'average length of hospital stay in days' and 'average annual bed occupancy in days', 2017



Cardiac surgery

There are cardiac surgery departments in Yerevan (5) and Syunik (1). In fact, the number of hospitalized patients in Syunik accounts for 10.0% of Yerevan admissions, despite the fact that the average annual bed occupancy in Syunik covers 3.7% of Yerevan rate. Also, the average length of hospital stay in days in Syunik marz (1.9) is significantly lower compared with Yerevan (9.7). In addition, the number of patients discharged from Yerevan cardiosurgery departments (4287) exceeds those admitted by 369 (3918).

Table 56. Main performance indicators of cardiosurgery departments according to marzes, 2017

Marz	Department	# of Departments	Average annual bed occupancy	Total admissions	Admissions 0-14	Admissions 15-17	Discharged	Deaths	On treatment	Bed-day	Average bed occupancy in days	Average length of stay in days
Yerevan	Cardiosurgery	5	164	3,918	215	14	4,287	62	43	28,239	172	9.7
Syunik	Cardiosurgery	1	6	395	0	0	390	5	0	756	126	1.9

Rehabilitation departments for children and adults

One Rehabilitation Department functions in Yerevan under the National Children's Rehabilitation Center. As for adults, 3 Rehabilitation Departments are available in Yerevan, one in Kotayk and one in Shirak.

Yerevan shares 81% of the total bed capacity of Rehabilitation Departments for adults and admits 98% of all patients. Also, Yerevan (210) is much ahead of Shirak (25) and Kotayk (1) in terms of both the annual average bed occupancy, and the average length of hospital stay (Yerevan 16.2, Shirak 8.2 and Kotayk 3.8).

Table 57. Main performance indicators of rehabilitation departments according to marzes, 2017

Marz	Department	# of Departments	Average annual bed occupancy	Total admissions	Admissions 0-14	Admissions 15-17	Discharged	Deaths	On treatment	Bed-day	Average bed occupancy in days	Average length of stay in days
Yerevan	Rehabilitation, children's	1	45	217	213	4	217	0	0	4,934	110	22.7
Yerevan	Rehabilitation, adults	3	280	3,879	18	8	3,895	4	72	58,751	210	16.2
Kotayk	Rehabilitation, adults	1	50	15	0	0	15	0	0	57	1	3.8
Shirak	Rehabilitation, adults	1	15	46	17	0	46	0	0	376	25	8.2

Intensive Care Units for children and adults

Hospital ICUs for children are available in Yerevan (5) and Shirak (1). Yerevan ICUs admit 95% of all patients despite of 88% bed capacity.

Yerevan is much ahead of Shirak in terms the annual average bed occupancy (309 vs. 120) and the average length of hospital stay (15.2 vs. 7.1).

ICUs for adults operate in all marzes, except for Vayots Dzor and Tavoush.

Table 58. Main performance indicators of ICUs according to marzes, 2017

Marz	Department	# of Departments	Average annual bed occupancy	Total admissions	Admissions 0-14	Admissions 15-17	Discharged	Deaths	On treatment	Bed-day	Average bed occupancy in days	Average length of stay in days
Yerevan	ICU, children's	5	74	3,833	3,756	60	1,959	185	100	31,442	309	15.2
Shirak	ICU, children's	1	10	193	189	4	159	9	3	1,197	120	7.1
Aragatsotn	ICU, adults	2	5	590	6	3	510	46	1	836	54	1.9
Armavir	ICU, adults	3	0	802	30	7	593	121	2	1,509	-	-
Ararat	ICU, adults	1	0	633	2	6	0	45	0	886	-	-
Gegharkunik	ICU, adults	3	10	752	0	0	645	39	4	1,236	102	1.8
Yerevan	ICU, adults	16	140	21,165	800	135	12,715	2,582	129	59,696	227	13.1
Lori	ICU, adults	2	4	46	0	2	25	12	0	63	16	1.7
Kotayk	ICU, adults	3	10	698	21	0	404	151	11	2,233	90	18.3
Shirak	ICU, adults	1	0	363	0	0	119	243	5	1,744	-	-
Syunik	ICU, adults	2	0	426	12	0	184	55	1	1,120	-	-

Medical abortion

All marzes, except for Vayots Dzor have departments for medical abortion. Armavir, Yerevan, Lori, Kotayk have 1, Aragatsotn, Ararat, Gegharkunik and Syunik have 2, and Shirak and Tavoush have 4 such department.

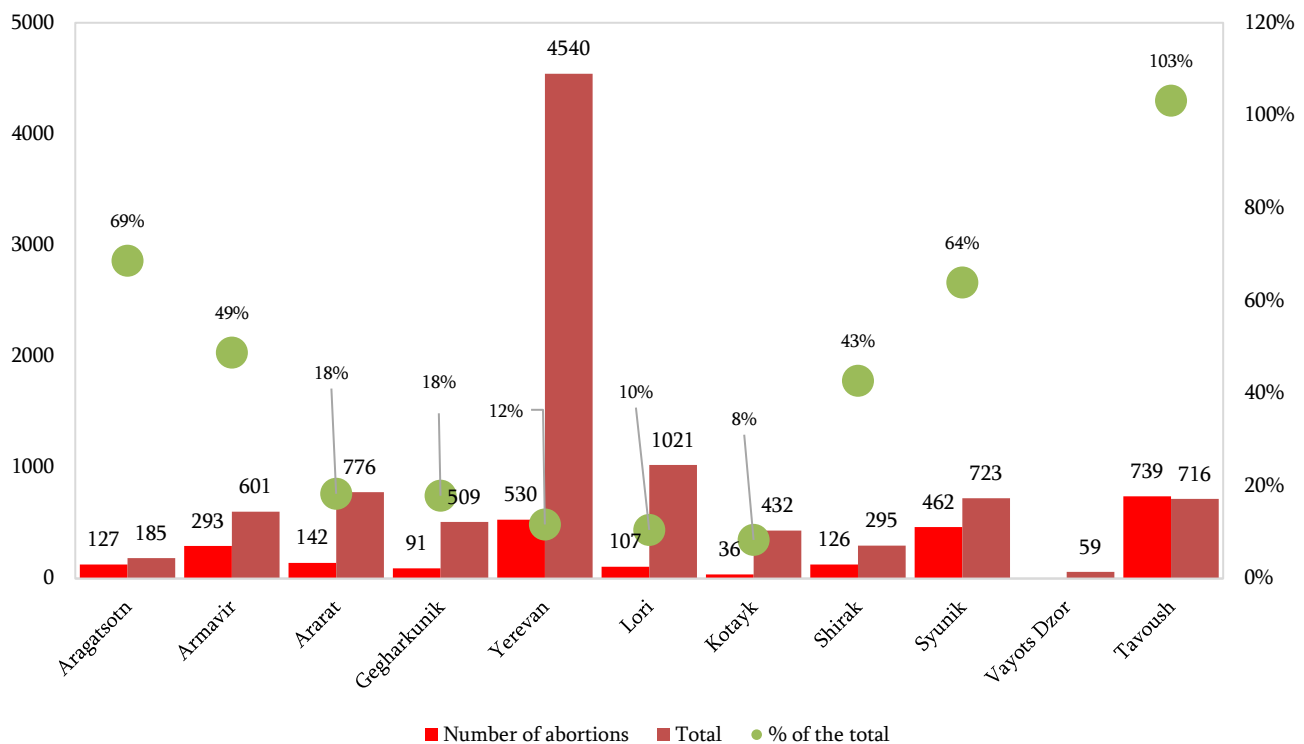
The annual average bed occupancy in Yerevan is 530, which exceeds 365.

Table 59. Main performance indicators of Medical Abortion Departments according to marzes, 2017

Marz	Department	# of Departments	Average annual bed occupancy	Total admissions	Admissions 0-14	Admissions 15-17	Discharged	Deaths	On treatment	Bed-day	Average bed occupancy in days	Average length of stay in days
Aragatsotn	Medical abortion	2	2	127	0	0	127	0	0	127	64	1
Armavir	Medical abortion	1	5	293	0	0	293	0	0	309	62	1.1
Ararat	Medical abortion	2	3	142	0	0	142	0	0	146	49	1
Gegharkunik	Medical abortion	2	2	91	0	0	91	0	0	91	46	1
Yerevan	Medical abortion	1	1	530	0	0	530	0	0	530	530	1
Lori	Medical abortion	1	1	107	0	0	107	0	0	107	107	1
Kotayk	Medical abortion	1	1	36	0	0	36	0	0	36	36	1
Shirak	Medical abortion	4	6	126	0	0	126	0	0	136	23	1.1
Syunik	Medical abortion	2	4	462	0	0	462	0	0	477	119	1
Tavoush	Medical abortion	4	5	739	0	0	739	0	0	850	170	2

As the data suggest these departments perform just some part of medical abortion. Figure 69 shows the number of women admitted to marz MA departments in 2017, as well as the total number of abortions and the ratio of the two.

Figure 69. The number of admissions to Medical Abortion Departments, the total number of abortions and the ratio of these two



Yerevan departments of medical abortion perform 12% of abortions, Kotayk 8%, Gegharkunik 18% and Ararat 18%.

The proportion of performance of abortions at these departments is relatively high in Tavoush 103%, Aragatsotn 69% and Syunik 64%. However some further study is needed to understand why *in Tavoush the number of medical abortions performed at MA departments exceeds the total number of abortions performed in that marz by 23.*

Surgical departments for children

Children's surgical departments operate in Yerevan (4) and Lori (1). No essential differences were revealed across marzes. Only in Yerevan the average length of hospital stay in days is higher 6.8, than in Lori (4.4).

Table 60. Main performance indicators of Children's Surgical Departments according to marzes, 2017

Marz	Department	# of Departments	Average annual bed occupancy	Total admissions	Admissions 0-14	Admissions 15-17	Discharged	Deaths	On treatment	Bed-day	Average bed occupancy in days	Average length of stay in days
Yerevan	Surgical, children's	4	55	2,172	1,970	159	2,239	0	20	15,745	286	6.8
Lori	Surgical, children's	1	10	666	654	12	661	0	4	2,920	292	4.4

Surgical departments for adults

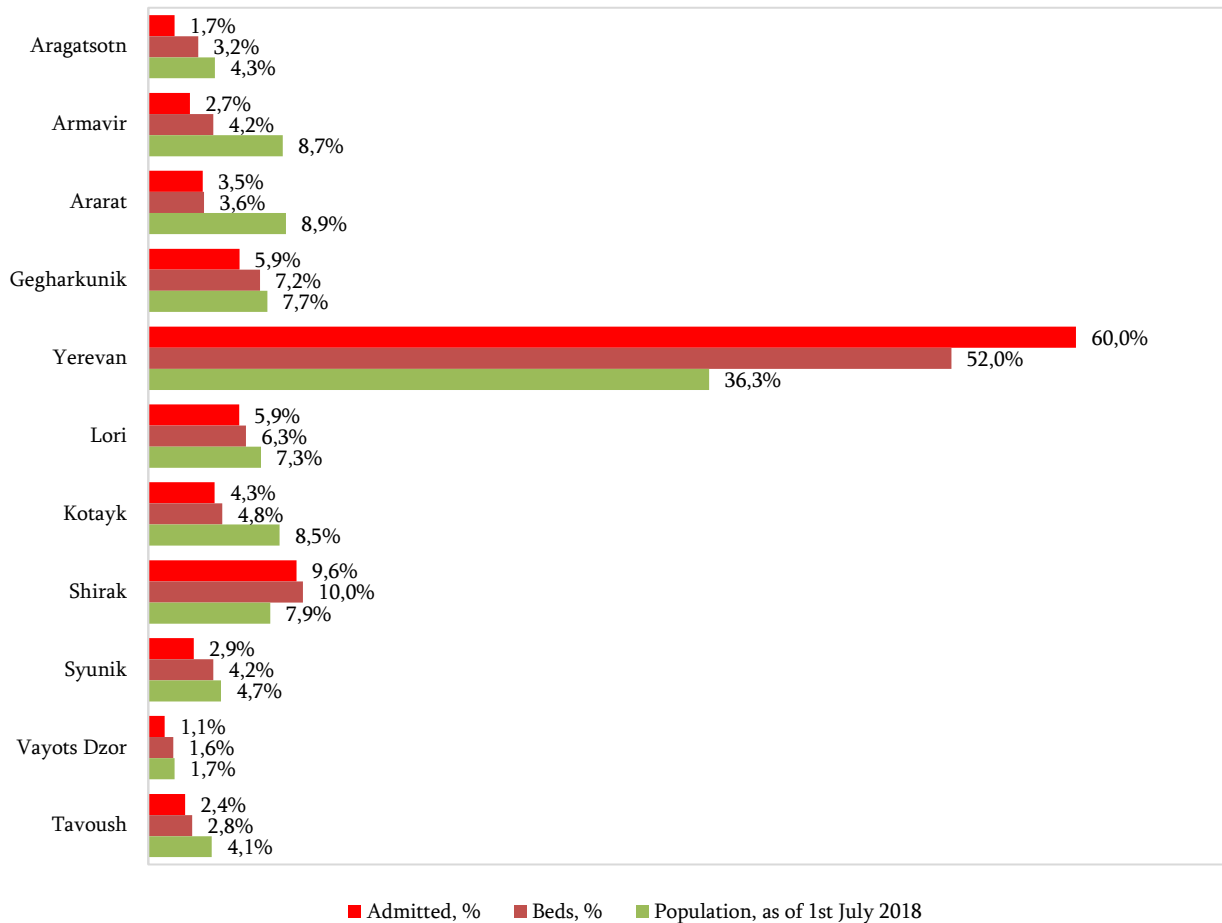
All marzes have access to surgical departments for adults.

Table 61. Main performance indicators of Surgical Departments for Adults according to marzes, 2017

Marz	Department	# of Departments	Average annual bed occupancy	Total admissions	Admissions 0-14	Admissions 15-17	Discharged	Deaths	On treatment	Bed-day	Average bed occupancy in days	Average length of stay in days
Aragatsotn	Surgical, adults	4	50	685	80	27	688	2	0	3,588	72	5.1
Armavir	Surgical, adults	3	65	1,085	39	48	1,079	6	9	7,020	108	6.5
Ararat	Surgical, adults	4	56	1,418	41	40	1,418	3	18	10,853	194	7.5
Geghargunik	Surgical, adults	5	112	2,378	837	113	2,357	1	7	11,691	104	4.9
Yerevan	Surgical, adults	24	805	24,180	490	430	25,042	120	218	154,974	193	7.5
Lori	Surgical, adults	5	98	2,366	85	79	2,310	62	32	17,829	182	7.5
Kotayk	Surgical, adults	6	74	1,730	125	92	1,743	3	4	10,187	138	5.6
Shirak	Surgical, adults	6	155	3,862	852	167	3,880	10	21	25,069	162	6.9
Syunik	Surgical, adults	5	65	1,184	73	71	1,215	3	10	7,369	113	6.3
Vayots Dzor	Surgical, adults	2	25	425	73	29	422	2	6	2,501	100	5.8
Tavoush	Surgical, adults	4	44	957	101	68	949	9	4	4,428	101	4.7

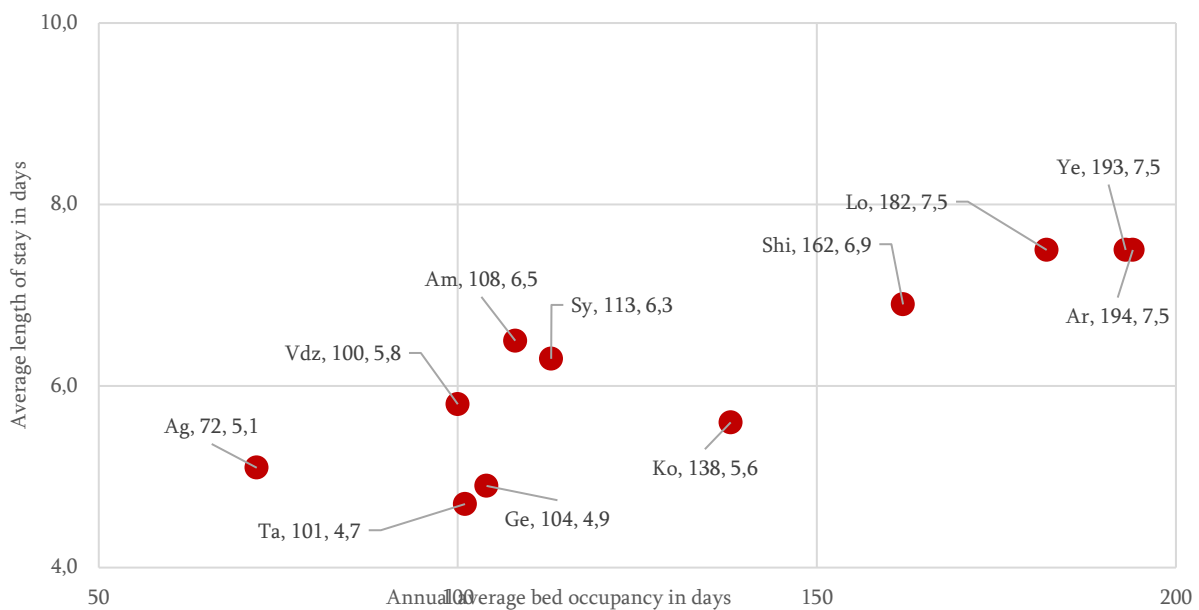
Proportions of marz population, bed capacity of adult's surgical departments, as well as admissions, compared with the national figures are presented in Figure 70.

Figure 70. Marz concentration of admissions to adult's surgical departments



Yerevan surgical departments for adults have relatively more beds and higher rate of admissions. Almost same situation is found in Shirak marz. In other marzes this ratio is smaller, i.e. relative number of beds in these departments is lower compared with relative number of marz population (except for Vayots Dzor), and the relative number of beds outnumbers that of admitted patients (except for Ararat). Both, the annual average bed occupancy and the average length of hospital stay in days are higher in Yerevan, Lori and Shirak, and lower in Aragatsotn, Tavoush, Gegharkunik and Vayots Dzor.

Figure 71. Disposition of marz adult surgical departments in relation to the 'average length of hospital stay in days' and 'average annual bed occupancy in days', 2017



Traumatology departments for children and adults

Three children's traumatology departments are available in Yerevan. The other marzes have no access to it.

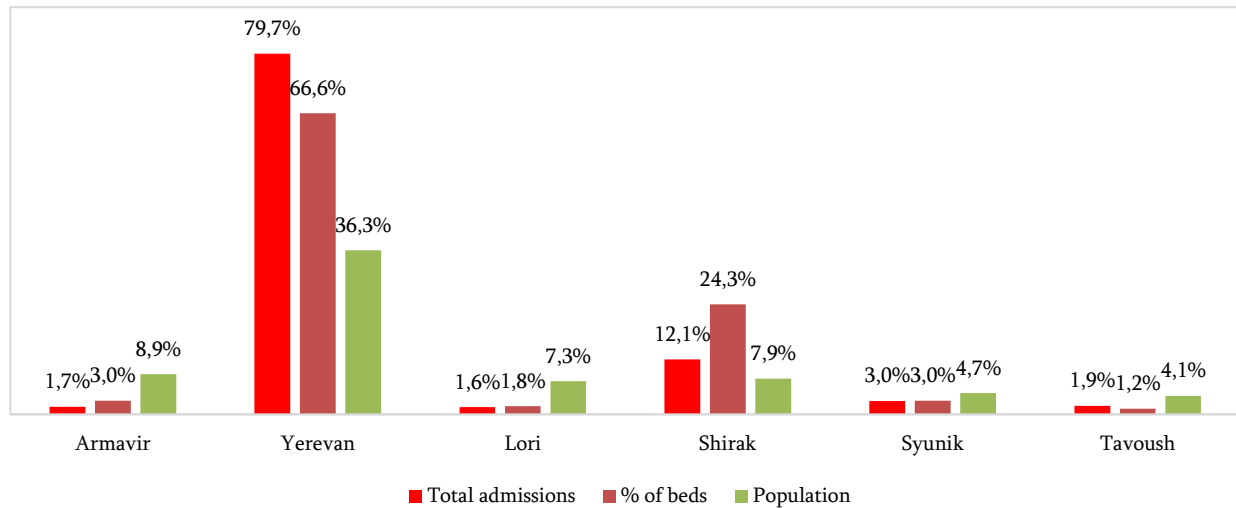
Only six marzes have a traumatology department for adults, the remaining five (Aragatsotn, Ararat, Kotayk, Gegharkunik and Vayots Dzor) do not have it.

Table 62. Main performance indicators of Traumatology Departments according to marzes, 2017

Marz	Department	# of Departments	Average annual bed occupancy	Total admissions	Admissions 0-14	Admissions 15-17	Discharged	Deaths	On treatment	Bed-day	Average bed occupancy in days	Average length of stay in days
Yerevan	Traumatology, children's	3	67	1,628	1,411	63	1,656	0	16	13,010	194	9.2
Armavir	Traumatology, adults	1	10	157	12	7	161	0	2	1,588	159	9.9
Yerevan	Traumatology, adults	11	219	7,523	495	1,101	7,993	5	48	48,396	221	9.1
Lori	Traumatology, adults	1	6	152	29	4	151	0	4	1,366	228	9.0
Shirak	Traumatology, adults	2	80	1,144	93	59	1,161	1	4	7,082	89	7.0
Syunik	Traumatology, adults	1	10	280	62	8	282	1	4	3,552	355	12.6
Tavoush	Traumatology, adults	1	4	180	40	2	180	3	0	551	138	3.0

Yerevan traumatology departments for adults admit 80% of patients. Most probably they include also those from Aragatsotn, Ararat, Kotayk and maybe also Gegharkunik.

Figure 72. Marz concentration of adult traumatology department admissions



In Syunik marz the annual average bed occupancy is 355 and the average length of hospital stay in days is 12.6, which are the lowest rates. *There is a need of increasing the bed capacity in this marz.*

Tuberculosis departments for children and adults

There is only one children's TB department which is part of the National Anti-TB Dispensary in Abovyan city, Kotayk marz.

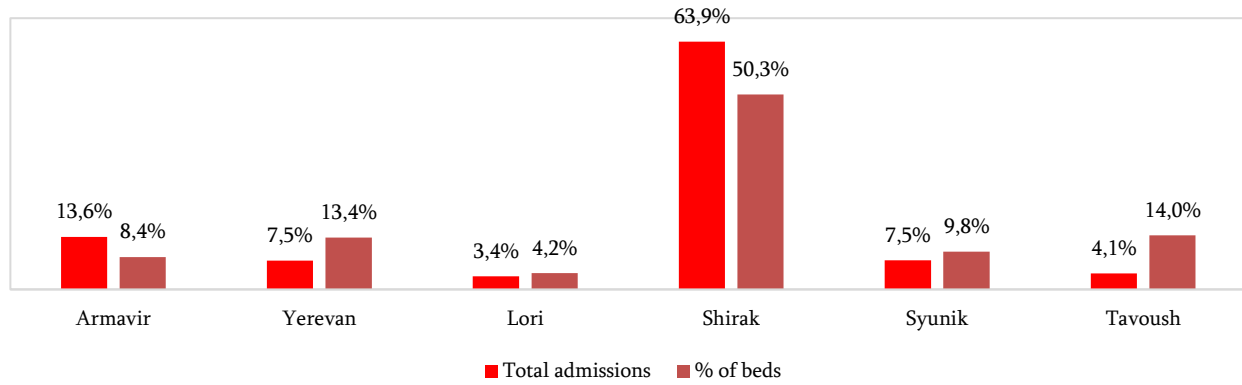
One TB department for adults is available in Yerevan, Lori, Kotayk, Shirak (1) and two in Syunik (Goris and Kapan Medical Centers).

Table 63. Main performance indicators of TB Departments according to marzes, 2017

Marz	Department	# of Departments	Average annual bed occupancy	Total admissions	Admissions 0-14	Admissions 15-17	Discharged	Deaths	On treatment	Bed-day	Average bed occupancy in days	Average length of stay in days
Kotayk	TB, children's	1	30	291	126	133	293	0	6	3,906	130	13.3
Yerevan	TB, adults	1	48	160	0	1	163	0	16	6,187	129	38.0
Lori	TB, adults	1	15	73	0	0	69	3	6	2,378	159	33.0
Kotayk	TB, adults	1	180	1,370	1	8	1,350	22	54	32,608	181	23.8
Shirak	TB, adults	1	35	161	0	0	170	0	8	4,074	116	24.0
Syunik	TB, adults	2	50	88	0	0	96	0	5	2,414	48	35.4

The National Anti-TB Dispensary in Abovyan city admits most (64%) of TB patients. It has the highest annual bed occupancy (181), but the lowest average length of stay (23.8).

Figure 73. Marz concentration of beds in and admissions to adult TB departments



Inpatient daycare departments

Inpatient Daycare Departments are available in all marzes, except for Aragatsotn.

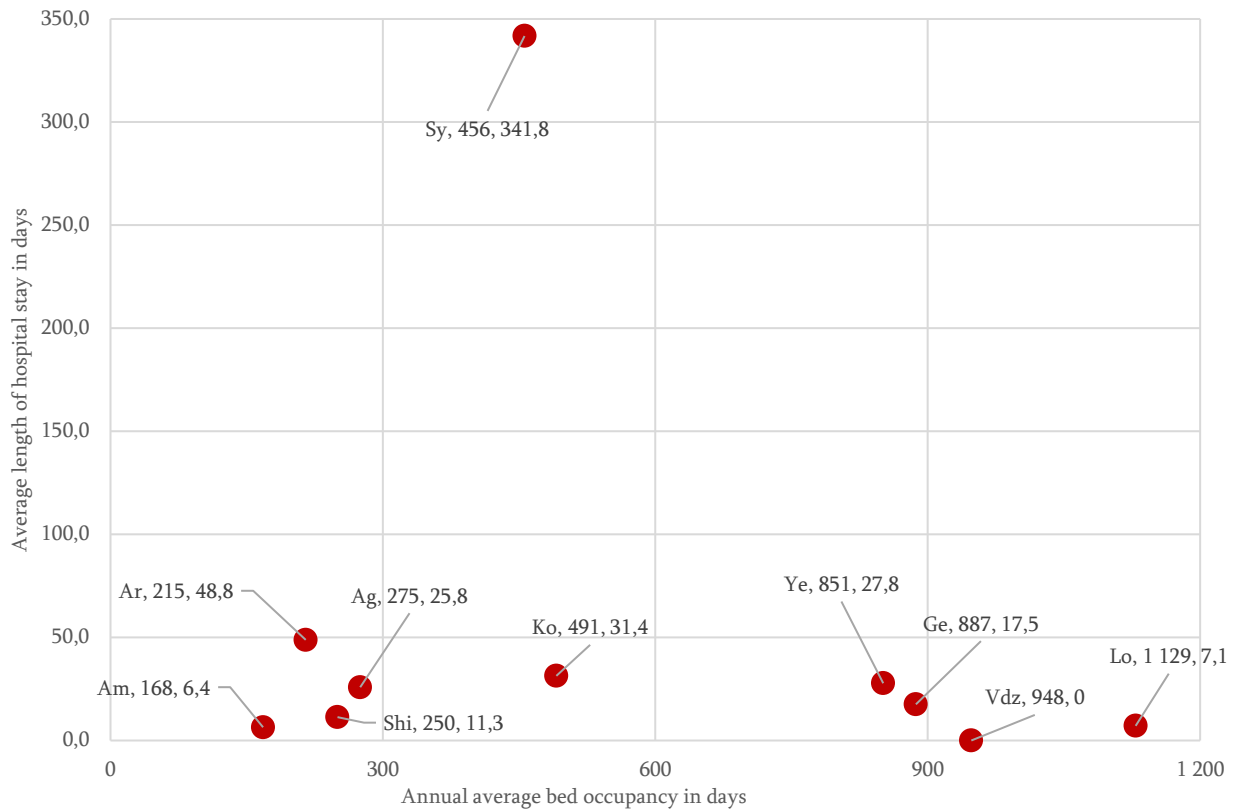
A remarkable feature of these departments is that the annual bed occupancy significantly exceeds 365 days in majority of marzes. As

Figure shows it accounts for 456 in Vayots Dzor, 491 in Shirak, 851 in Lori, 887 in Yerevan, 948 in Tavoush, and 1129 in Kotayk. If there is a common reason behind this, then why it did not impact the rates in other marzes? The average length of hospital stay is missing for Tavoush marz, because the value (discharged + deaths) required for its calculation [denominator] is equal to 0.

Table 64. Main performance indicators of Inpatient Daycare Departments according to marzes, 2017

Marz	Department	# of Depa rtme nts	Average annual bed occupan cy	Total admissio ns	Admissi ons 0-14	Admissi ons 15-17	Discharg ed	Deaths	On trea tme nt	Bed-day	Average bed occupan cy in days	Average length of stay in days
Armavir	Inpatient daycare	2	14	149	0	0	149	0	18	3,851	275	205.6
Ararat	Inpatient daycare	1	14	380	260	6	365	0	17	2,345	168	6.4
Gegharkunik	Inpatient daycare	2	25	111	0	0	108	2	32	5,371	215	104.7
Yerevan	Inpatient daycare	13	222	11,249	1,612	596	11,177	45	637	196,922	887	189.6
Lori	Inpatient daycare	1	14	424	0	0	422	7	56	11,915	851	27.8
Kotayk	Inpatient daycare	1	2	317	21	0	317	0	0	2,258	1,129	7.1
Shirak	Inpatient daycare	5	62	1,013	321	24	969	1	156	30,415	491	220.4
Syunik	Inpatient daycare	2	48	1,061	528	0	1046	13	33	12,007	250	11.6
Vayots Dzor	Inpatient daycare	1	3	8	0	0	0	4	12	1,367	456	341.8
Tavoush	Inpatient daycare	1	3	4	0	0	0	0	19	2,845	948	-

Figure 74. Disposition of marz inpatient daycare departments in relation to the ‘average length of hospital stay in days’ and ‘average annual bed occupancy in days’, 2017



Psychosomatic medicine departments

There is only one Psychosomatic medicine department in the country, at the ‘Armenia’ Medical Center.

Table 65. Main performance indicators of Psychosomatic Medicine Departments according to marzes, 2017

Marz	Department	# of Departments	Average annual bed occupancy	Total admissions	Admissions 0-14	Admissions 15-17	Discharged	Deaths	On treatment	Bed-day	Average bed occupancy in days	Average length of stay in days
Yerevan	Psychosomatic medicine	1	15	304	0	0	321	3	15	3,265	218	10.1

Ear-nose-throat departments for children and adults

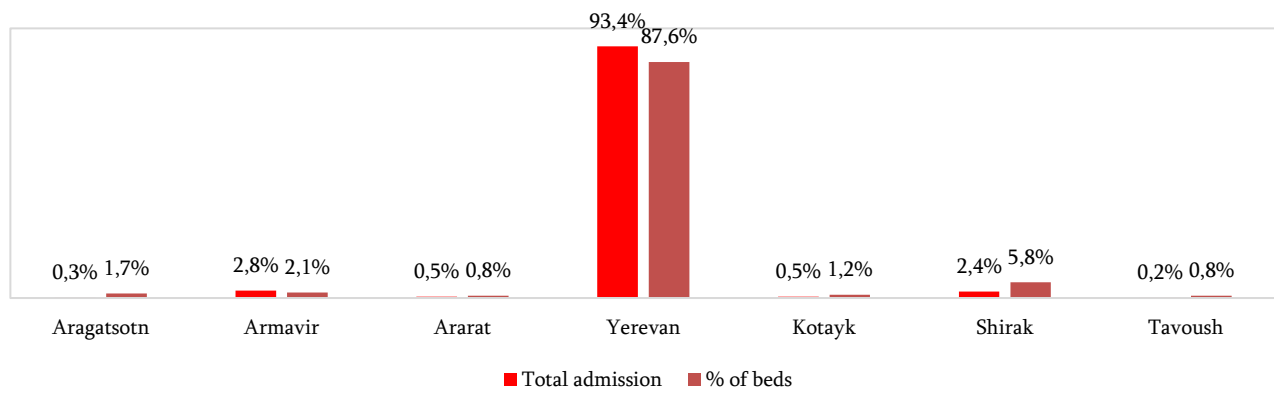
Children’s ENT departments are available only at two Yerevan hospitals – Surb Astvatsamayr (*Holy Mother*) MC and Arabkir Institute of Child and Adolescent Health.

ENT departments for adults function in seven marzes and are not available in Gegharkunik, Lori, Vayots Dzor and Syunik.

Table 66. Main performance indicators of ENT Departments according to marzes, 2017

Marz	Department	# of Department	Average annual bed occupancy	Total admissions	Admissions 0-14	Admissions 15-17	Discharged	Deaths	On treatment	Bed-day	Average bed occupancy in days	Average length of stay in days
Yerevan	ENT, children	2	45	2,315	2,190	42	2,323	0	1	16,440	365	7.0
Aragatsotn	ENT, adults	2	4	21	12	0	21	0	0	45	11	2.3
Armavir	ENT, adults	1	5	190	94	12	189	0	0	465	93	2.5
Ararat	ENT, adults	1	2	33	8	2	33	0	0	33	17	1.0
Yerevan	ENT, adults	11	211	6,381	474	520	6,422	0	32	38,487	182	7.5
Kotayk	ENT, adults	1	3	33	3	3	33	0	0	134	45	4.1
Shirak	ENT, adults	2	14	162	4	13	162	0	0	479	34	4.0
Tavoush	ENT, adults	1	2	14	1	1	14	0	0	33	17	2.4

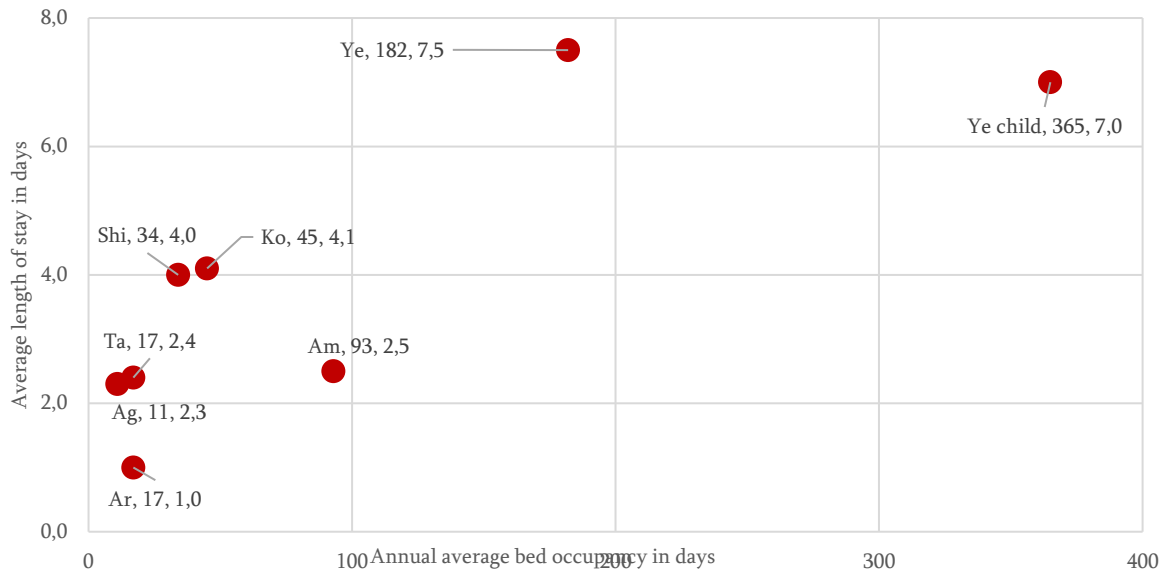
Figure 75. Marz concentration of beds in and admissions to ENT departments



Comparison of children's and adult departments shows that *Yerevan children's departments are essentially overloaded compared with adult departments in Yerevan*. In their turn, these adult's department work with bigger workload than those in marzes (see

Figure 76-).

Figure 76. Disposition of marz adult and children's ENT departments in relation to the 'average length of hospital stay in days' and 'average annual bed occupancy in days', 2017



Orthopedics departments for children and adults

In 2017 children's orthopedics departments functioned in Ararat (Masis orthopedics hospital), which was closed by the end of the year and in Yerevan (Arabkir Institute of Child and Adolescent Health).

Adult orthopedics departments (3) are available only in Yerevan. Their annual average bed occupancy is 370, which is above 365.

Table 67. Main performance indicators of orthopedics Departments according to marzes, 2017

Marz	Department	# of Departments	Average annual bed occupancy	Total admissions	Admissions 0-14	Admissions 15-17	Discharged	Deaths	On treatment	Bed-day	Average bed occupancy in days	Average length of stay in days
Ararat	Orthopedics	1	25	207	182	3	207	0	0	2,090	84	10.1
Yerevan	Orthopedics	1	5	253	217	35	253	0	0	714	143	2.8
Yerevan	Orthopedics	3	100	4,489	10	752	4,603	7	29	37,013	370	8.3

Physiotherapy departments

This department exists only at Rehabilitation Center of Kotayk Arzni Railway Hospital.

Table 68. Main performance indicators of physiotherapy departments according to marzes, 2017

Marz	Department	# of Departments	Average annual bed occupancy	Total admissions	Admissions 0-14	Admissions 15-17	Discharged	Deaths	On treatment	Bed-day	Average bed occupancy in days	Average length of stay in days
Kotayk	Physiotherapy	1	20	10	0	0	10	0	0	51	3	5.1

12 Number of patients at marz departments

One of challenges of health system is that overwhelming majority of marz population prefers seeking hospital care in Yerevan even if the necessary hospital department is available in their marzes. To improve access to marz hospital care a general profile hospital was chosen in each marz, which was further renovated and furnished with modern instruments and equipment (see **Error! Reference source not found.**).

There is a need of further study to understand if the above challenge was addressed and if not, then which marzes are still lagging and how serious is the problem.

To get insight into the current situation, let us imagine that, **at equal conditions**, the proportions of marz hospital admissions and marz population should be more or less equal. In other words, % concentration of patients across marz departments should be approximately equal to marz breakdown of Armenia population.

Apparently the reality may differ from above assumption due to various reasons. For example, marzes may lack in relevant hospital units, the severity of incidences may essentially differ from other similar departments, the population sex and age structure may be different, the settlement may be in one marz whereas the needed hospital division in the neighboring marz, etc. Besides, the de jure population of Yerevan, based on current NSS estimates, is in fact much bigger due to internal migration. Often people from marzes move to Yerevan for permanent residence without changing their registration address. Naturally they seek hospital care in Yerevan which leads to higher utilization.

Excluding the key reason (relevant hospital department does not exist in the marz), the assessment was conducted for hospital units available in all eleven marzes. There are seven such departments: surgical, maternity, gynecology for adults, general medicine, pregnancy pathologies, pediatric and adult infectious diseases departments.

The assessment results are presented in Figures 77 and 78. Proportions of patients admitted to the studied marz departments in 2017 are depicted with dots (●) of different colors and are assessed against 2017 national admission rates.

In all columns red diamonds (◆) show the proportion of the given marz population from the total population of the country. If in the relevant marz column the symbol showing a given department (●) exceeds marz population (◆), that will mean that the number of patients admitted to that department is higher than the defined 'norm'. And if ● is below ◆, then the department admissions is also below the desired 'norm'.

Figure 77 presents the estimations, including Yerevan city. Since choosing a scale that will be good for Yerevan will make visual assessment of other marzes quite complicated, Figure 78 shows the

situation without capturing Yerevan. Because of the scale of the vertical axis the Lori marz General Medicine Department was left out (it is equal to 18.7%).

The Figure shows the line connecting ◆ symbols, because the curves are sometimes overlapped by ● symbols.

To avoid overloading figures with too many digits, the latter are presented separately in Table 69. To be able to compare data of all marz departments, Table 70 presents standardized data of Table 69. Standardization was done by dividing data of every marz department by the marz population. Table 70 cells are colored. Cells where the data is higher than 1, i.e. the department performance efficiency exceeds the norm, are colored in red shades. The higher the data, the darker is the shade of red, whereas the cells with figures below 1 (the department performance efficiency is below the norm) are colored in shades of blue.

Figure 77. Concentration of all marz department admissions across marzes, 2017

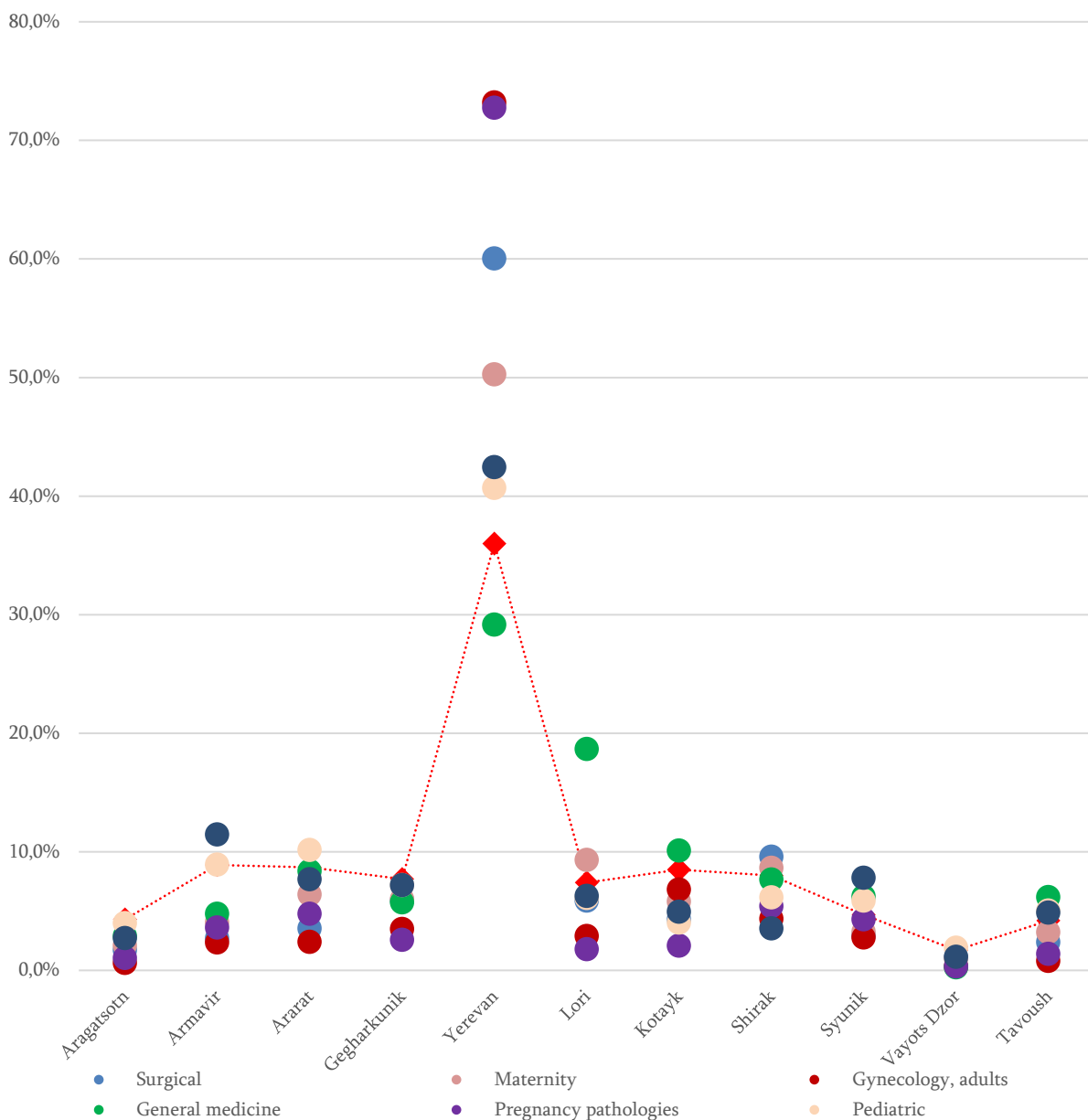


Figure 78. Concentration of all marz department admissions across marzes, 2017 (without Yerevan)

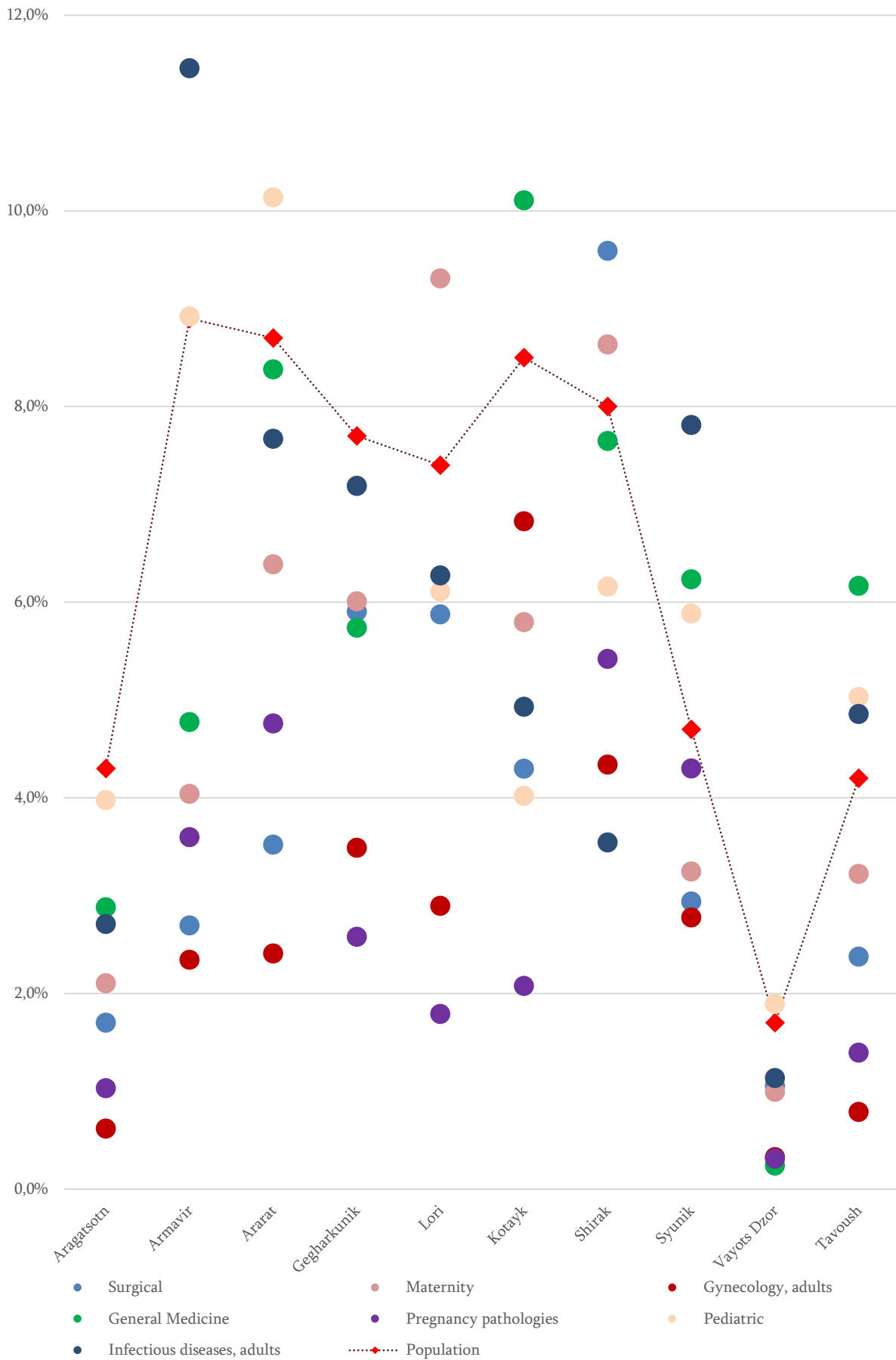


Table 69. Concentration of all marz department admissions across marzes, 2017

	Arag	Arm	Ararat	Gegh	Yer	Lori	Kot	Shirak	Syun	Vay.D	Tav
Surgical	1.7%	2.7%	3.5%	5.9%	60.0%	5.9%	4.3%	9.6%	2.9%	1.1%	2.4%
Maternit	2.1%	4.0%	6.4%	6.0%	50.3%	9.3%	5.8%	8.6%	3.2%	1.0%	3.2%
Gynecology, adults	0.6%	2.3%	2.4%	3.5%	73.2%	2.9%	6.8%	4.3%	2.8%	0.3%	0.8%
General medicine	2.9%	4.8%	8.4%	5.7%	29.2%	18.7%	10.1%	7.6%	6.2%	0.2%	6.2%
Pregnancy pathologies	1.0%	3.6%	4.8%	2.6%	72.7%	1.8%	2.1%	5.4%	4.3%	0.3%	1.4%
Pediatric	4.0%	8.9%	10.1%	7.2%	40.7%	6.1%	4.0%	6.2%	5.9%	1.9%	5.0%
Infec.diseases, adults	2.7%	11.5%	7.7%	7.2%	42.4%	6.3%	4.9%	3.5%	7.8%	1.1%	4.9%
Population	4.3%	8.9%	8.7%	7.7%	36.0%	7.4%	8.5%	8.0%	4.7%	1.7%	4.2%

Table 70. Concentration of all marz department admissions across marzes (standardized values), 2017

Department	Arag	Arm	Ararat	Gegh	Yer	Lori	Kot	Shirak	Syun	Vay.D	Tav
Surgical	0.40	0.30	0.40	0.77	1.67	0.79	0.51	1.20	0.63	0.62	0.57
Maternit	0.49	0.45	0.73	0.78	1.40	1.26	0.68	1.08	0.69	0.58	0.77
Gynecology, adults	0.14	0.26	0.28	0.45	2.03	0.39	0.80	0.54	0.59	0.19	0.19
General medicine	0.67	0.54	0.96	0.75	0.81	2.52	1.19	0.96	1.33	0.14	1.47
Pregnancy pathologies	0.24	0.40	0.55	0.33	2.02	0.24	0.24	0.68	0.91	0.18	0.33
Pediatric	0.92	1.00	1.17	0.93	1.13	0.83	0.47	0.77	1.25	1.11	1.20
Infec.diseases, adults	0.63	1.29	0.88	0.93	1.18	0.85	0.58	0.44	1.66	0.67	1.16
Population	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

The Figures enable doing a preliminary visual assessment of the results, and Table 70 helps with analysis. Since the data of the Table are standardized, they give rather good insight into the following:

- Comparative performance efficiency of all seven marz departments,
- Comparative performance efficiency of each of the seven departments in different marzes.

The analysis was based on the following approach. If the relative number of patients admitted to a given marz department is significantly lower than the relative number of marz population (relevant cell colored in dark blue), then the department has problems.

The Table does not specify the nature of the problem, such as geographic location of the hospital (difficult-to-access), justified or unjustified lack of public confidence in providers of the department, poor capacities of the department or other reasons. Further professional assessment is required. Analysis of extremely low rates weaken the possibility of facing a problem and pinpoint on cases described in italic on page 128.

Below is the observation of performance efficiency of hospital departments in terms of adequate patient admissions.

Six out of seven departments in Yerevan are found above the 'norm'. Among them are particularly the departments of adult gynecology (73.2% hospitalized in Yerevan departments) and pregnancy pathologies (Yerevan receives 72.7% of patients).

Yerevan surgical (60.0% of all surgical cases) and maternity (50.3% of patients) departments also are overloaded.

In Yerevan only departments of general medicine have workload below the 'norm'. In 2017 these units received 29.2% of all patients in Armenia, given that 36.0% of the country population resides in Yerevan. This may be explained by availability of specialized departments, where patients are referred, while general medicine units could easily provide the needed care.

The above-mentioned suggests that Yerevan hospitals continue to 'attract' regional population, even for hospital divisions that are well-equipped and easily available in marzes.

As Table 70 shows the biggest challenge rests with departments of **pregnancy pathologies**. The lowest rates are in Aragatsotn, Armavir, Ararat, Vayots Dzor and Tavoush marzes. The first three are geographically close to the capital and patients prefer utilizing services of Yerevan hospitals, and Vayots Dzor and especially Tavoush require further study.

Figures for adult **gynecology** units are very modest in Aragatsotn, Armavir, Ararat, Vayots Dzor, Tavoush, Lori and Kotayk.

Surgical departments are lagging in close-to-Yerevan marzes, including Aragatsotn, Armavir and Ararat. Here also people prefer seeking care in the capital, rather than in regional medical centers.

Relatively favorable is the situation in **pediatric** and **adult infectious disease** departments, where very low rates are uncommon, particularly in **Kotayk** pediatric departments and **Shirak** infectious disease departments.

When assessing marz department performance the following two groups were singled out. The first includes Aragatsotn, Ararat and Armavir where three to five departments with extremely low indicators were found. Here the problem is more related to lack of trust. The second group includes Tavoush and Vayots Dzor where some further studies are needed to understand the reasons behind.

13 The average bed capacity dynamics of hospital departments in 2010-2017

This section studies the average bed capacities according to hospital departments at local, regional and national levels.

Annual average bed capacity in marzes

Hospital bed capacity in Armenia showed monotonic growth tendency between 2010 and 2016 - from 12,395 to 12,951, or by 4.5% (see Table 71), followed by a decline to 12,858 in 2017. The increase of the number of hospital beds is mostly due to their increase in Yerevan (from 7,485 in 2010, which shares 60.39% of the national bed capacity, to 8,190 in 2017, which is the 63.7% of the national capacity (Table 72).

An increase of hospital bed capacity during the reference period was recorded in Syunik (from 423 to 476 or by 1.5%), Armavir (from 339 to 381 in 2014, followed by a decline to 369 in 2015, which was maintained though 2017).

Monotonic decline of bed capacity in 2010-2017 was found in Lori. Their number dropped from 593 to 502 or by 15.3%. In 2014 the number of beds decreased in Ararat. In Tavous the decrease tendency started in 2012 (296) and reached 252 in 2017 (or by 15%).

Table 71. Average number of beds in marzes, 2010-2017

Մարզ	2010	2011	2012	2013	2014	2015	2016	2017	Դիագրամ
ԱԳ	208	198	203	210	210	210	200	189	
ԱՄ	335	338	339	339	381	369	369	369	
ԱՐ	577	569	577	577	552	552	520	462	
ԳԵ	815	815	779	775	775	775	775	775	
ԵՐ	7,485	7,641	7,766	7,771	8,022	8,000	8,196	8,190	
ԼՈ	593	580	533	528	500	500	500	502	
ԿՈ	675	675	630	660	660	690	668	668	
ՇԻ	909	867	926	947	910	935	901	887	
ՍՅ	423	423	443	463	472	463	481	476	
ՎՁ	95	95	95	95	82	80	88	88	
ՏԱ	280	275	296	276	276	261	253	252	
Ընդամենը	12,395	12,476	12,587	12,641	12,840	12,835	12,951	12,858	

Table 72. Number of beds in marzes, % from the total

Մարզ	2010	2011	2012	2013	2014	2015	2016	2017	Դիագրամ
ԱԳ	1.68%	1.59%	1.61%	1.66%	1.64%	1.64%	1.54%	1.47%	
ԱՍ	2.70%	2.71%	2.69%	2.68%	2.97%	2.87%	2.85%	2.87%	
ԱՐ	4.66%	4.56%	4.58%	4.56%	4.30%	4.30%	4.02%	3.59%	
ԳԵ	6.58%	6.53%	6.19%	6.13%	6.04%	6.04%	5.98%	6.03%	
ԵՐ	60.39%	61.25%	61.70%	61.47%	62.48%	62.33%	63.28%	63.70%	
ԼՈ	4.78%	4.65%	4.23%	4.18%	3.89%	3.90%	3.86%	3.90%	
ԿՈ	5.45%	5.41%	5.01%	5.22%	5.14%	5.38%	5.16%	5.20%	
ՇԻ	7.33%	6.95%	7.36%	7.49%	7.09%	7.28%	6.96%	6.90%	
ՍՅ	3.41%	3.39%	3.52%	3.66%	3.68%	3.61%	3.71%	3.70%	
ՎՁ	0.77%	0.76%	0.75%	0.75%	0.64%	0.62%	0.68%	0.68%	
ՏԱ	2.26%	2.20%	2.35%	2.18%	2.15%	2.03%	1.95%	1.96%	
Ընդամենը	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	

Dynamics of the total number of hospital department beds in Armenia

Dynamics of the total bed capacity is presented in Table 73, where hospital departments are organized according to their decline in 2017.

Department for adults

1. Surgical
2. Psychiatric

These units have the biggest bed capacity. In 2017 their number was 1,549 and 1,355 correspondingly (or 12.0% and 10.5% of the total bed capacity). Together they share 22.6% of the total hospital bed capacity.

Below departments also share significant proportion of hospital bed capacity.

3. Maternity
4. General Medicine
5. Pediatric
6. Cardiology
7. Gynecology for adults

These seven departments cover 49.1% of the national bed capacity.

Another six hospital units, namely Oncology (adults), Infectious Diseases (adults), Inpatient daycare, Neurology (adults) Rehabilitation (adults), and Pregnancy Pathologies (adults) are in the top 13 hospital departments with good bed capacity. They account for 2/3 or 67.7% of the national capacity.

Twenty hospital units share 80% of the national bed capacity. Their dynamics is presented in Table . Departments are organized in descending order in 2017.

Next 23 department types are listed in Table 74 in accordance with descending of the number of beds. They cover 15% of the national bed capacity. Table 75 shows the last 28 department types, also by the number of beds descending.

According to Table 75, the number of beds in units with the biggest capacity dropped in the last 2-3 years. Among them was the Adult Surgical Department (from 1573 in 2015 to 1549 in 2017). In 2014 the number of beds at the Adult Psychiatric Department was cut by 50 (from 1405 beds in 2013 to 1355 beds in 2017).

Table 73. Number of beds according to departments, RA, 2010-2017 (includes hospital departments covering 80% of the national bed capacity in 2017)

N	Բաժանմունք	2010	2011	2012	2013	2014	2015	2016	2017	Դիագրամ	% ընդամենից, 2017	% գումարային, 2017
1	Վիրաբուժակ. Մեծահասակ	1,516	1,554	1,514	1,453	1,557	1,573	1,549	1,549		12.0%	12.0%
2	Հոգեբուժակ. Մեծահասակ	1,375	1,375	1,394	1,405	1,380	1,380	1,355	1,355		10.5%	22.6%
3	Հղիների եւ ծննդ.	962	996	1,010	1,016	1,028	1,028	926	924		7.2%	29.8%
4	Թերապևտիկ	863	861	834	825	829	822	786	800		6.2%	36.0%
5	Մանկաբուժական	518	527	553	560	641	671	649	654		5.1%	41.1%
6	Սրտաբանական	476	482	491	499	536	552	577	535		4.2%	45.2%
7	Գինեկոլոգիակ. Մեծահասակ	468	478	468	474	500	443	494	495		3.8%	49.1%
8	Ուռուցքաբան. Մեծահասակ	471	471	466	476	479	479	491	487		3.8%	52.9%
9	Ինֆեկցիոն մեծահասակ	461	434	432	437	415	411	434	433		3.4%	56.2%
10	ցերեկային ստացիոնար	269	333	391	416	349	401	402	407		3.2%	59.4%
11	Նյարդաբանակ. Մեծահասակ	350	364	363	362	377	400	392	383		3.0%	62.4%
12	Վերականգնող. Մեծահասակ	319	300	300	310	345	345	345	345		2.7%	65.1%
13	Հղիության պարոլոգ.	221	220	260	255	260	227	344	340		2.6%	67.7%
14	Վնասվածքաբ. Մեծահասակ	297	295	311	334	312	332	337	329		2.6%	70.3%
15	Տուբերկուլ. Մեծահասակ	418	418	418	418	373	333	328	328		2.6%	72.8%
16	Ուռուցքաբանական մեծահասակ	205	205	215	227	232	242	263	245		1.9%	74.7%
17	Քիթ-կոկորդ-ականջ մեծահասակ	242	244	226	234	236	240	234	241		1.9%	76.6%
18	Ակնաբուժական մեծահասակ	256	254	244	208	217	218	215	226		1.8%	78.4%
19	Ինֆեկցիոն մանկական	195	197	200	200	200	195	195	195		1.5%	79.9%

Bed capacity of Maternity departments saw a drastic decline (from 1028 in 2015 to 924 in 2017 or by 104 beds, or 10%). Instead the number of beds at Pregnancy Pathologies Departments improved significantly (from 220 in 2011 to 340 in 2017, or by 120 or 50%).

Monotonic decrease of beds was found in General Medicine Departments between 2010 and 2017 (from 863 to 800 or by 63 beds or 7%).

The number of Pediatric Department beds increased to 671 between 2010 and 2015, and dropped to 654 in 2017.

Bed capacity of Cardiology Departments increased from 476 in 2010 to 577 in 2016 (by 101 or 21%).

The number of Adult Oncology Departments beds increased from 471 in 2010 to 491 in 2016 (or by 20 or 4%).

Table 74. Number of beds according to departments, RA, 2010-2017 ((includes hospital departments covering 15% of the national bed capacity in 2017)

N	Բաժանմունք	2010	2011	2012	2013	2014	2015	2016	2017	Դիագրամ	% ընդամենից, 2017	% գումարային, 2017
20	Սրտային վիրաբուժ.	141	141	133	138	144	148	182	170		1.3%	1.3%
21	վերականգնողական Մեծահասակ	88	107	119	138	178	157	161	169		1.3%	2.6%
22	Նյարդավիրաբ. Մեծահասակ	141	121	137	148	159	169	169	164		1.3%	3.9%
23	Ճառագայթ. Ռենտգեն	100	100	100	100	100	100	110	110		0.9%	4.8%
24	Մաշկավեներակ. Մեծահասակ	100	100	100	100	100	100	100	100		0.8%	5.5%
25	Օրթոպեդիկ մեծահասակ	95	95	95	95	97	101	105	100		0.8%	6.3%
26	Աղեստամոքսային մեծահասակ	70	70	70	70	70	70	63	85		0.7%	7.0%
27	Ստոմատոլոգ. Մեծահասակ	64	67	67	59	73	68	93	85		0.7%	7.6%
28	վերականգնողական մանկական	59	59	64	64	60	76	81	84		0.7%	8.3%
29	Կրծք. Վիրաբուժ. Մեծահասակ	75	75	75	75	78	78	68	82		0.6%	8.9%
30	Պրոկտոլոգիական	76	76	76	75	69	68	70	81		0.6%	9.6%
31	Թմբաբանական	80	80	80	80	80	80	80	80		0.6%	10.2%
32	Ներզատաբան. Մեծահասակ	130	130	130	110	146	119	97	77		0.6%	10.8%
33	Վնասվածքաբ. Մանկական	83	84	65	65	63	63	66	67		0.5%	11.3%
34	Վիրաբուժակ. Մանկական	105	111	108	112	105	95	95	65		0.5%	11.8%
35	Անոթային վիրաբ.	47	49	48	58	58	69	59	61		0.5%	12.3%
36	Երիկամաբան. Մեծահասակ	85	85	85	85	85	90	72	60		0.5%	12.8%
37	Ռեւմատոլոգիական մեծահասակ	60	60	60	59	59	59	60	60		0.5%	13.2%
38	Նյարդաբանակ. Մանկական	42	52	52	52	52	52	52	52		0.4%	13.6%
39	Առիթմոլոգիական							27	51		0.4%	14.0%
40	Այրվածքային	60	60	60	60	60	60	50	50		0.4%	14.4%
41	միկրովիրաբուժական	50	48	36	55	51	51	41	48		0.4%	14.8%
42	Վերականգնող. Մանկական	70	45	45	45	45	45	45	45		0.3%	15.1%

Table 75. Number of beds according to departments, RA, 2010-2017 ((includes hospital departments covering 5% of the national bed capacity in 2017)

N	Բաժանմունք	2010	2011	2012	2013	2014	2015	2016	2017	Դիագրամ	% ընդամենից, 2017	% գումարային, 2017
43	Քիթ-կոկորդ-ականջ մանկական	20	20	20	30	45	45	45	45		0.3%	15.5%
44	ալլաստիկ վիրաբուժ.	6	6	53	43	20	31	43	42		0.3%	15.8%
45	Ակնաբուժական մանկական	53	53	53	38	38	38	38	38		0.3%	16.1%
46	Երիկամաբան. Մանկական	30	30	30	30	30	30	30	30		0.2%	16.3%
47	Թոքաբանական մեծահասակ	30	30	30	30	30	30	30	30		0.2%	16.6%
48	Ուռուցքաբան. Մանկական	30	30	30	30	30	30	30	30		0.2%	16.8%
49	Վիժումների կատար.	46	35	33	31	28	24	30	30		0.2%	17.0%
50	Տուբերկուլ. Մանկ.	35	35	30	30	30	30	30	30		0.2%	17.3%
51	Օրթոպեդիկ մանկական	55	55	55	55	55	55	55	30		0.2%	17.5%
52	Արյունաբան. Մեծահասակ	60	53	50	50	50	50	50	28		0.2%	17.7%
53	Անհետաձգելի մանկական բուժօգնություն							25	25		0.2%	17.9%
54	Արյունաբան. Մանկական	30	26	25	25	25	25	25	25		0.2%	18.1%
55	սուր թունավորման	25	25	25	25	25	25	25	25		0.2%	18.3%
56	Ստոմատոլոգ. Մանկական	16	12	13	20	20	20	22	23		0.2%	18.5%
57	Աղետամոքսային մանկական	20	20	20	20	20	20	20	20		0.2%	18.6%
58	Գինեկոլոգիա. Մանկական	25	20	20	25	25	5	20	20		0.2%	18.8%
59	Թոքաբանական մանկական	19	19	19	19	20	20	20	20		0.2%	19.0%
60	Կրծք. Վիրաբուժ. Մանկական	20	20	20	20	20	20	20	20		0.2%	19.1%
61	Նյարդավիրաբ. Մանկական	20	20	20	20	20	20	20	20		0.2%	19.3%
62	Ուռուցքիական մանկական	20	20	20	20	20	20	20	20		0.2%	19.4%
63	Ֆիզիոթերապևտիկ	50	50	50	50	20	20	20	20		0.2%	19.6%
64	Ալերգոլոգիական մեծահասակ	19	19	18	20	20	20	20	17		0.1%	19.7%
65	Փսիխոսոմատիկ	15	15	15	15	15	15	15	15		0.1%	19.8%
66	Ալերգոլոգիական մանկական	10	10	10	10	13	13	13	13		0.1%	19.9%
67	Ընդհանուր	5	5	5	5	5	5	10	10		0.1%	20.0%
68	Հոգեբուժակ. Մանկական	8		8	8	8	8	8	8		0.1%	20.1%
69	Ոսկրածուծի փոխպատվաստում								7		0.1%	20.1%
70	Թարախ. Վիրաբ. Մեծահասակ	20	20	20	20	10	6	5			0.0%	20.1%
71	ռեպրոդուկտոլոգիա	5	5								0.0%	20.1%

Dynamics of annual average bed occupancy in Armenia

Annual average bed occupancy in days in 2017 is presented in Figure 79. The rate exceeds 365 from Children's Nephrology Departments to Pediatric Departments. Explanations are provided in the Methodology section. The latter needs to include also the rate of the Children's ENT department which was equal to 365.

Annual average bed occupancy in days is very high at adult Psychiatric (329), adult Hematology (319) departments. They suggest about possible situation, when hospital admissions are too big and the bed capacity is small and the needed care is not provided. Further study of this issue is needed.

Bed occupancy below 100 days were found in the following hospital units.

- Children's oncology 96
- Medical abortion 94
- Children's orthopedic 93
- Plastic surgery 74
- Acute intoxication 57
- Children's ophthalmology 43
- Bone marrow transplantation 16
- Children's psychiatric 16
- Physiotherapy 3

Poor workload of these departments is not critical due to their social importance. Exceptions include only plastic surgery and physiotherapy departments. Underload of the latter is explained not by inferior importance, but the high treatment costs. If this assumption is true, then actions should be taken to make these services more affordable for the patients.

Dynamics of annual average bed occupancy is provided in Table 76 and Table 77.

Figure 79. Annual average bed occupancy in departments, 2017

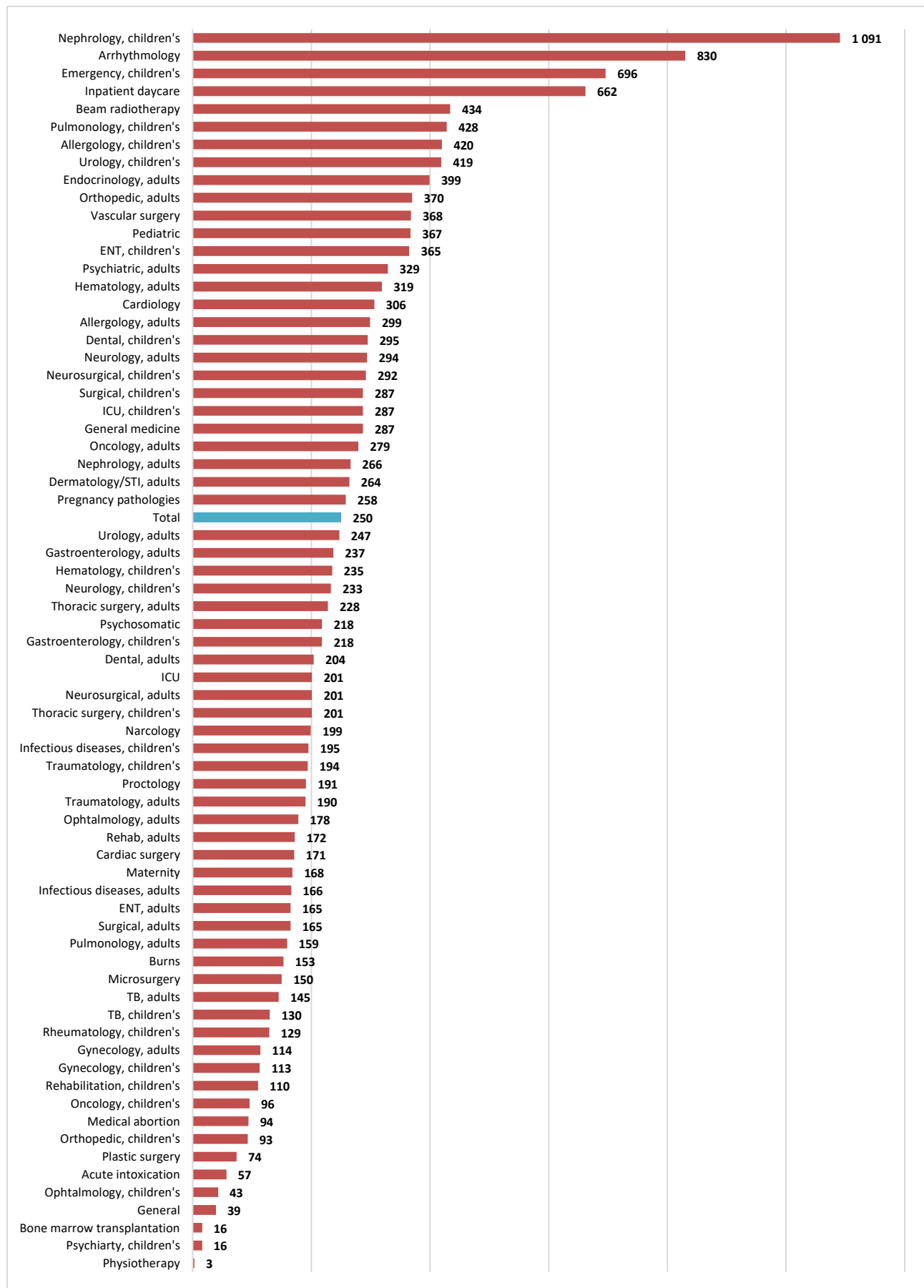


Table 76. Annual average bed occupancy across departments, RA, 2010-2017

N	Բաժանմունք	2010	2011	2012	2013	2014	2015	2016	2017	Դիագրամ
1	Ալերգոլոգիական մանկական	333	308	321	339	332	374	437	420	
2	Ալերգոլոգիական մեծահասակ	195	225	217	329	349	300	272	299	
3	Ակնաբուժական մանկական	28	37	106	40	73	41	42	43	
4	Ակնաբուժական մեծահասակ	176	203	175	169	148	162	162	178	
5	Աղեստամոքսային մանկական	176	172	156	186	216	217	240	218	
6	Աղեստամոքսային մեծահասակ	238	279	266	265	269	203	233	237	
7	Այրվածքային	133	136	128	107	127	116	143	153	
8	Անհետաձգելի մանկական բուժօգնություն	-	-	-	-	-	-	739	696	
9	Անոթային վիրաբ.	297	323	334	245	315	280	313	368	
10	Առիթմոլոգիական	-	-	-	-	-	-	588	830	
11	Արյունաբան. Մանկական	207	239	241	219	225	235	259	235	
12	Արյունաբան. Մեծահասակ	194	266	242	263	283	193	211	319	
13	Գինեկոլոգիական. Մանկական	65	83	88	83	67	-	108	113	
14	Գինեկոլոգիական. Մեծահասակ	143	138	150	135	132	131	115	114	
15	Երիկամաբան. Մանկական	484	617	749	1,110	1,301	1,460	991	1,091	
16	Երիկամաբան. Մեծահասակ	202	206	229	229	233	219	293	266	
17	Ընդհանուր	46	51	52	55	92	82	42	39	
18	Թարախ. Վիրաբ. Մեծահասակ	170	122	155	122	222	195	227	-	
19	Թերապևտիկ	185	193	230	250	326	297	314	287	
20	Թմբաբանական	236	231	226	222	234	217	256	199	
21	Թոքաբանական մանկական	424	409	420	484	562	479	515	428	
22	Թոքաբանական մեծահասակ	171	192	206	171	197	191	194	159	
23	Ինֆեկցիոն մանկական	182	179	173	167	188	228	185	195	
24	Ինֆեկցիոն մեծահասակ	160	166	166	166	201	194	172	166	
25	Կրծք. Վիրաբուժ. Մանկական	99	109	132	144	154	150	199	201	
26	Կրծք. Վիրաբուժ. Մեծահասակ	168	174	185	227	223	222	261	228	
27	Հոլիստիկ եւ ծննդ.	210	188	187	180	184	184	183	168	
28	Հոլիստիկ պարթոլոգ.	241	291	268	284	298	274	262	258	
29	Հոգեբուժական. Մանկական	91	-	54	36	37	98	31	16	
30	Հոգեբուժական. Մեծահասակ	308	295	305	299	321	313	329	329	
31	Ճատագայթ. Ռենտգեն	258	265	280	244	276	289	295	434	
32	Մանկաբուժական	283	324	325	358	368	353	368	367	

Table 77. Annual average bed occupancy across departments, RA, 2010-2017 (continuation)

N	Բաժանմունք	2010	2011	2012	2013	2014	2015	2016	2017	Դիագրամ
33	Մաշկալեներակ. Մեծահասակ	309	342	349	296	292	333	315	264	
34	միկրովիրաբուժական	119	127	207	132	177	161	157	150	
35	Ներզատարան. Մեծահասակ	262	283	302	336	300	354	317	399	
36	Նյարդաբանակ. Մանկական	280	201	251	212	225	224	243	233	
37	Նյարդաբանակ. Մեծահասակ	266	256	295	306	338	309	299	294	
38	Նյարդավիրաբ. Մանկական	282	313	260	261	286	291	292	292	
39	Նյարդավիրաբ. Մեծահասակ	209	235	234	217	171	149	189	201	
40	Ոսկրածուծի փոխպատվաստում	-	-	-	-	-	-	-	16	
41	Ուռուղիական մանկական	347	375	264	287	379	409	406	419	
42	Ուռուղիական մեծահասակ	218	228	231	231	243	237	210	247	
43	Ուռուցքաբան. Մանկական	159	215	110	110	102	95	128	96	
44	Ուռուցքաբան. Մեծահասակ	235	229	238	212	211	246	271	279	
45	պլաստիկ վիրաբուժ.	98	100	49	36	74	50	144	74	
46	Պրոկտոլոգիական	144	143	181	192	214	186	191	191	
47	ռեպրոդուկտոլոգիա	-	7	-	-	-	-	-	-	
48	Ռեւմատոլոգիական մեծահասակ	135	120	106	125	140	141	156	129	
49	սուր թունավորման	37	51	57	44	45	56	68	57	
50	Ստոմատոլոգ. Մանկական	194	357	347	395	359	305	337	295	
51	Ստոմատոլոգ. Մեծահասակ	164	165	237	232	205	167	143	204	
52	Սրտաբանական	273	281	356	402	342	316	286	306	
53	Սրտային վիրաբուժ.	250	269	275	260	231	188	147	171	
54	Վերականգնող. Մանկական	310	257	199	203	126	117	112	110	
55	Վերականգնող. Մեծահասակ	245	233	180	189	162	164	169	172	
56	վերակենդանացման մանկական	245	279	276	296	330	292	281	287	
57	վերակենդանացման Մեծահասակ	295	279	298	281	243	174	215	201	
58	Վիժու մեդիկատար.	27	30	28	31	33	47	95	94	
59	Վիրաբուժակ. Մանկական	204	201	214	217	224	256	237	287	
60	Վիրաբուժակ. Մեծահասակ	165	164	180	176	171	165	174	165	
61	Վնասվածքաբ. Մանկական	171	226	251	154	267	246	227	194	
62	Վնասվածքաբ. Մեծահասակ	207	218	184	167	189	179	175	190	
63	Տուբերկուլ. Մանկ.	262	212	325	329	218	125	114	130	
64	Տուբերկուլ. Մեծահասակ	280	258	259	237	193	195	180	145	
65	ցերեկային ստացիոնար	369	610	591	546	714	649	678	662	
66	Փսիխոսոմատիկ	211	223	231	207	235	252	234	218	
67	Քիթ-կոկորդ-ականջ մանկական	328	436	459	324	318	313	301	365	
68	Քիթ-կոկորդ-ականջ մեծահասակ	162	173	210	190	192	162	152	165	
69	Օրթոպեդիկ մանկական	141	168	163	172	191	155	129	93	
70	Օրթոպեդիկ մեծահասակ	353	398	452	344	400	356	337	370	
71	ֆիզիոթերապևտիկ	5	10	10	12	15	14	20	3	
	Ընդամենը	223	234	245	244	255	247	250	250	

The only Purulent Surgery Department for adults, which was closed down in 2017. It was part of the Leben Ltd. In 2016 annual bed occupancy of the department was 227 days, which is slightly below the annual average rate of 2017.

Dynamics of average length of hospital stay in days in Armenia

Annual average length of hospital stay in days across hospital departments in 2017 is presented in Figure 80. Very high rates were found in the following departments.

- Psychiatric for adults - 345.7 days
- Inpatient daycare - 156.8 days

In the first case very high rate is easily explained, but some further study is needed to understand the reasons behind high figures found in daycare departments.

Below four hospital department types were found to have significantly wide range of the rate.

- Psychiatric for children 42.3
- Beam radiotherapy 33.3
- TB for adults 28.1
- Rehabilitation, children's 22,7

These departments are followed by a big group with gradually and slowly decreasing figures. Dynamics of the rate across hospital departments between 2010 and 2017 is presented in Table 78 and Table 79.

The line 'Total' in Table 78 includes inpatient daycare department, hence it significantly differs from figures depicted in the last line of other tables, which exclude daycare units.

Figure 80. Average length of hospital stay in days, 2017 (the line for Total includes inpatient daycare)

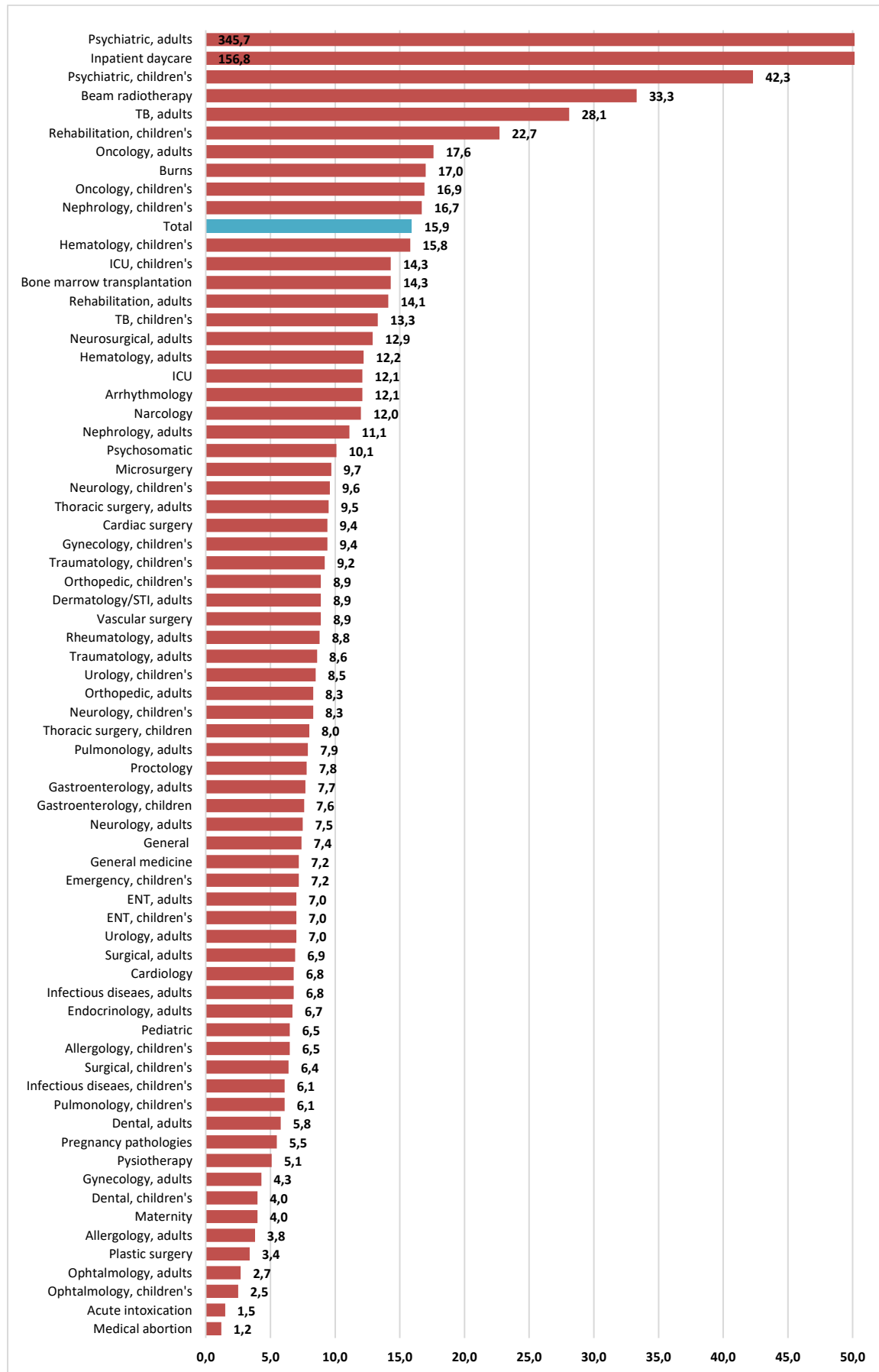


Table 78 Average length of hospital stay in days across departments, RA 2010-2017

N	Բաժանմունք	2010	2011	2012	2013	2014	2015	2016	2017	Դիագրամ
1	Ալերգոլոգիական մանկական	8.7	6.5	6.8	7.2	7.2	6.5	6.7	6.5	
2	Ալերգոլոգիական մեծահասակ	4.4	4.9	4.7	3.9	4.6	3.6	4.0	3.8	
3	Ակնաբուժական մանկական	2.3	2.6	4.2	1.3	2.4	2.0	2.0	2.5	
4	Ակնաբուժական մեծահասակ	4.2	4.2	3.7	2.8	2.3	2.4	2.7	2.7	
5	Աղեստամոքսային մանկական	10.5	9.1	7.8	7.9	8.6	8.4	7.8	7.6	
6	Աղեստամոքսային մեծահասակ	7.1	7.0	6.3	7.5	6.5	7.0	7.2	7.7	
7	Այրվածքային	19.0	16.6	14.1	15.1	15.4	16.2	16.3	17.0	
8	Անհետաձգելի մանկական բուժօգնություն	-	-	-	-	-	-	7.6	7.2	
9	Անոթային վիրաբ.	8.0	8.2	6.5	8.5	8.9	8.4	8.4	8.9	
10	Առիթմոլոգիական	-	-	-	-	-	-	11.5	12.1	
11	Արյունաբան. Մանկական	14.8	15.2	14.8	14.3	10.5	15.3	16.2	15.8	
12	Արյունաբան. Մեծահասակ	9.2	10.5	8.9	9.4	8.2	10.9	10.8	12.2	
13	Գինեկոլոգիական Մանկական	10.9	11.8	13.1	12.8	12.1	-	9.2	9.4	
14	Գինեկոլոգիական Մեծահասակ	5.0	5.1	5.1	5.0	4.8	4.5	4.4	4.3	
15	Երիկամաբան. Մանկական	15.6	17.7	18.6	24.3	23.8	25.6	17.9	16.7	
16	Երիկամաբան. Մեծահասակ	11.0	10.9	11.1	11.6	11.1	11.1	10.9	11.1	
17	Ընդհանուր	3.7	4.0	3.5	3.3	4.9	4.9	5.9	7.4	
18	Թարախ. Վիրաբ. Մեծահասակ	28.3	21.4	27.9	23.6	22.9	18.8	21.5	-	
19	Թերապևտիկ	7.8	7.6	7.6	7.4	7.5	7.2	7.1	7.2	
20	Թմբաբանական	14.7	16.2	14.8	14.9	13.7	12.9	15.8	12.0	
21	Թոքաբանական մանկական	8.6	7.2	6.7	6.7	6.8	6.1	5.8	6.1	
22	Թոքաբանական մեծահասակ	7.6	8.4	8.4	8.3	8.3	8.2	7.7	7.9	
23	Ինֆեկցիոն մանկական	8.2	7.4	6.7	6.8	6.4	6.6	6.3	6.1	
24	Ինֆեկցիոն մեծահասակ	8.7	8.4	7.4	7.5	7.3	6.9	6.9	6.8	
25	Կրծք. Վիրաբուժ. Մանկական	6.4	6.4	7.0	8.5	7.7	7.8	8.0	8.0	
26	Կրծք. Վիրաբուժ. Մեծահասակ	14.0	16.3	10.7	12.0	11.0	7.6	9.6	9.5	
27	Հղիների եւ ծննդ.	4.2	3.9	4.1	4.1	4.0	4.1	4.0	4.0	
28	Հղիության պատրուկ.	7.0	7.7	6.5	5.6	5.7	5.7	5.6	5.5	
29	Հոգեբուժակ. Մանկական	-	-	144.7	71.8	58.4	112.4	41.5	42.3	
30	Հոգեբուժակ. Մեծահասակ	229.8	292.5	203.2	294.2	335.2	347.9	321.6	345.7	
31	Ճառագայթ. Ռենտգեն	27.4	30.0	28.8	35.4	32.7	33.6	35.5	33.3	
32	Մանկաբուժական	7.0	6.9	6.7	6.8	6.7	6.6	6.3	6.5	

Table 79. Average length of hospital stay in days across departments, RA, 2010-2017

N	Բաժանմունք	2010	2011	2012	2013	2014	2015	2016	2017	Դիագրամ
33	Մաշկավեներակ. Մեծահասակ	7.2	6.5	5.7	7.9	8.8	9.8	9.5	8.9	
34	միկրովիրաբուժական	7.7	10.1	13.0	9.4	7.7	8.4	8.4	9.7	
35	Ներզատաբան. Մեծահասակ	7.0	7.1	7.0	6.9	7.0	7.9	6.7	6.7	
36	Նյարդաբանակ. Մանկական	8.5	7.4	8.9	9.7	9.2	10.2	10.2	9.6	
37	Նյարդաբանակ. Մեծահասակ	9.1	8.4	8.3	8.6	8.3	8.0	7.8	7.5	
38	Նյարդավիրաբ. Մանկական	9.8	8.3	7.9	8.3	8.3	8.2	8.2	8.3	
39	Նյարդավիրաբ. Մեծահասակ	14.2	15.3	14.4	15.7	13.8	12.9	12.5	12.9	
40	Ոսկրածուծի փոխպատվաստում	-	-	-	-	-	-	-	14.3	
41	Ուռուցիկական մանկական	8.8	8.3	7.1	7.7	8.0	8.4	8.5	8.5	
42	Ուռուցիկական մեծահասակ	6.3	6.4	6.3	7.2	6.3	7.1	6.9	7.0	
43	Ուռուցքաբան. Մանկական	19.4	16.1	20.1	17.6	21.6	17.1	18.5	16.9	
44	Ուռուցքաբան. Մեծահասակ	17.2	18.9	19.5	20.8	21.0	17.0	17.9	17.6	
45	սլլատիկ վիրաբուժ.	4.1	4.5	2.3	3.3	5.9	4.0	4.9	3.4	
46	Պրոկտոլոգիական	8.4	8.1	9.1	9.6	9.1	8.4	8.3	7.8	
47	ռեպրոդուկտոլոգիա	-	8.5	-	-	-	-	-	-	
48	Ռեմատոլոգիական մեծահասակ	8.2	8.3	7.7	7.3	7.9	8.2	8.6	8.8	
49	սուր թունավորման	1.5	1.8	1.6	1.5	1.3	1.5	1.7	1.5	
50	Ստոմատոլոգ. Մանկական	3.9	5.2	5.7	5.0	4.5	4.6	4.2	4.0	
51	Ստոմատոլոգ. Մեծահասակ	7.4	7.2	6.8	8.2	7.7	7.2	6.1	5.8	
52	Սրտաբանական	6.8	6.4	6.5	6.8	6.2	6.3	6.0	6.8	
53	Սրտային վիրաբուժ.	11.3	11.0	9.9	10.2	8.7	7.4	8.8	9.4	
54	Վերականգնող. Մանկական	24.4	23.8	23.5	23.1	21.8	20.3	22.4	22.7	
55	Վերականգնող. Մեծահասակ	19.2	17.9	19.5	19.3	18.4	18.1	16.6	14.1	
56	վերակենդանացման մանկական	25.0	17.7	17.2	14.3	13.4	12.3	13.1	14.3	
57	վերակենդանացման Մեծահասակ	4.9	4.9	5.6	6.0	4.8	4.3	24.1	12.1	
58	Վիժումների կատար.	1.2	1.2	1.4	1.2	1.1	1.1	1.2	1.2	
59	Վիրաբուժակ. Մանկական	6.7	6.0	6.3	6.4	5.7	6.1	6.1	6.4	
60	Վիրաբուժակ. Մեծահասակ	7.5	7.1	7.1	7.0	6.8	6.8	7.4	6.9	
61	Վնասվածքաբ. Մանկական	11.7	10.6	10.1	6.7	11.4	12.0	11.5	9.2	
62	Վնասվածքաբ. Մեծահասակ	9.1	9.4	9.1	9.6	8.9	9.1	8.9	8.6	
63	Տուբերկուլ. Մանկ.	14.6	12.1	12.7	11.0	8.3	8.9	10.4	13.3	
64	Տուբերկուլ. Մեծահասակ	33.6	32.9	31.4	29.2	24.4	26.9	31.9	28.1	
65	ցերեկային ստացիոնար	63.7	160.8	157.8	154.7	153.3	143.7	133.3	156.8	
66	Փսիխոսոմատիկ	11.7	10.6	10.4	10.1	8.7	9.4	8.9	10.1	
67	Քիթ-կոկորդ-ականջ մանկական	4.3	5.1	5.1	5.1	5.6	5.9	6.1	7.0	
68	Քիթ-կոկորդ-ականջ մեծահասակ	5.8	5.4	6.0	6.7	6.4	6.7	6.9	7.0	
69	Օրթոպեդիկ մանկական	13.2	14.3	14.3	15.2	13.9	12.3	10.9	8.9	
70	Օրթոպեդիկ մեծահասակ	5.5	5.2	5.1	5.2	6.6	8.1	7.5	8.3	
71	Ֆիզիոթերապևտիկ	7.5	13.2	10.7	10.9	10.3	10.8	6.7	5.1	
	Ընդամենը	12.9	15.1	22.0	16.1	16.1	18.1	21.3	15.9	

The combination of annual average bed occupancy and average length of hospital stay in days in 2017 is presented in Figure 81.

Significant deviations from the 'norm' were revealed in the following hospital department groups.

First group

1. *Children's nephrology* (annual bed occupancy 1091 days⁹),
2. *Arrhythmology* (annual bed occupancy 830 op),
3. *Children's emergency care* (annual bed occupancy 696 days)
4. *Inpatient daycare* (annual bed occupancy 662 days). This department has also very high rate of average length of hospital stay in days (156.8 days)

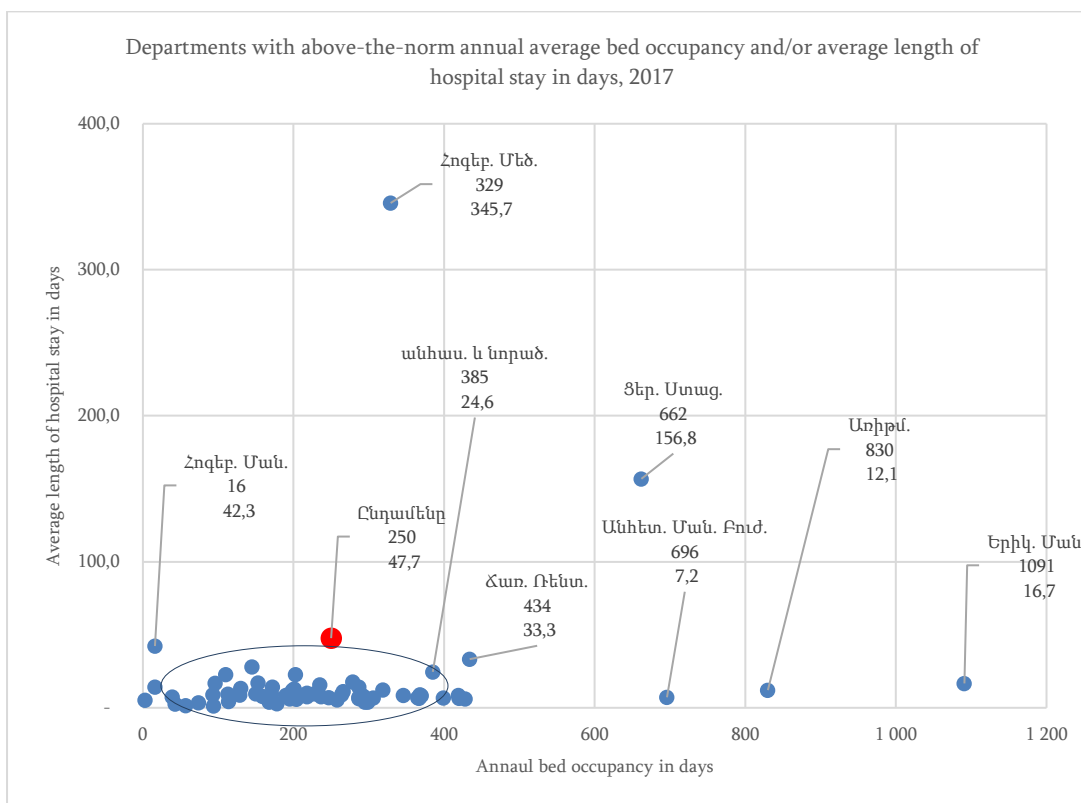
Second group

Very high rates of average length of hospital stay were found in the following departments.

5. *Psychiatric for adults* (345.7 days)
6. *Psychiatric for children* (42.3 days)
7. *Beam radiotherapy* (33.3 days)

The **average length** of hospital stay has also artificially increased (47.7 days) because of high rate.

Figure 81. Departments with above-the-norm annual average bed occupancy and/or average length of hospital stay in days, 2017

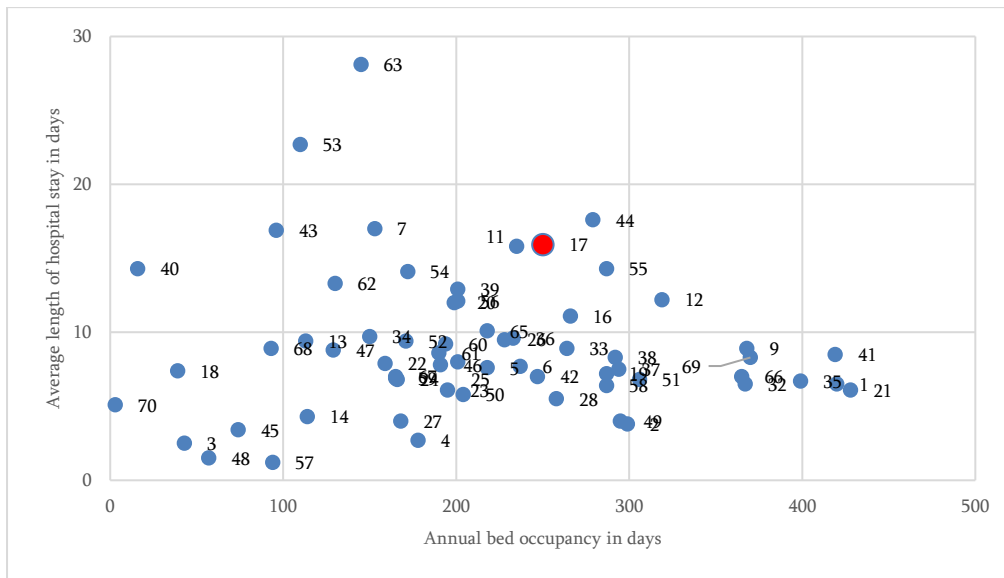


If departments with significant deviations from the norm are removed from the Figure (when annual bed occupancy is limited to 450 and length of hospital stay is 30 days), mapping of the departments looks like in Figure 82, where departments in previous Figure's ellipse are zoomed in.

⁹Meaning that patients stay here for nearly 3 years and their length of hospital stay is summed up on annual basis.

Departments corresponding to the dots of the Figure are listed in the bottom part.

Figure 82. Concentration of departments according to annual bed occupancy and average length of hospital stay in days, 2017



- | | | | | | |
|----|--|----|-------------------------------------|----|-----------------------------------|
| 1 | <i>Allergology, children's</i> | 24 | <i>Infectious diseases, adults</i> | 47 | <i>Rheumatology, adults</i> |
| 2 | <i>Allergology, adults</i> | 25 | <i>Thoracic surgery, children's</i> | 48 | <i>Acute intoxication</i> |
| 3 | <i>Ophthalmology, children's</i> | 26 | <i>Thoracic surgery, adults</i> | 49 | <i>Dental, children's</i> |
| 4 | <i>Ophthalmology, adults</i> | 27 | <i>Maternity</i> | 50 | <i>Dental, adults</i> |
| 5 | <i>Gastroenteral, children's</i> | 28 | <i>Pregnancy pathologies</i> | 51 | <i>Cardiology</i> |
| 6 | <i>Gastroenteral, adults</i> | 29 | <i>Psychiatric, children's</i> | 52 | <i>Cardiosurgery</i> |
| 7 | <i>Burns</i> | 30 | <i>Psychiatric, adults</i> | 53 | <i>Rehabilitation, children's</i> |
| 8 | <i>Emergency care, children's</i> | 31 | <i>Beam radiotherapy</i> | 54 | <i>Rehabilitation, adults</i> |
| 9 | <i>Vascular surgery</i> | 32 | <i>Pediatric</i> | 55 | <i>ICU, children's</i> |
| 10 | <i>Arrhythmology</i> | 33 | <i>Dermatology/STI, adults</i> | 56 | <i>ICU, adults</i> |
| 11 | <i>Hematology, children's</i> | 34 | <i>Microsurgery</i> | 57 | <i>Medical abortion.</i> |
| 12 | <i>Hematology, adults</i> | 35 | <i>Endocrinology, adults</i> | 58 | <i>Surgical, children's</i> |
| 13 | <i>Gynecology, children's</i> | 36 | <i>Neurology, children's</i> | 59 | <i>Surgical, adults</i> |
| 14 | <i>Gynecology, adults</i> | 37 | <i>Neurology, adults</i> | 60 | <i>Traumatology, children's</i> |
| 15 | <i>Nephrology, children's</i> | 38 | <i>Neurosurgical, children's</i> | 61 | <i>Traumatology, adults</i> |
| 16 | <i>Nephrology, adults</i> | 39 | <i>Neurosurgical, adults</i> | 62 | <i>TB, children's</i> |
| 17 | <i>Total</i> | 40 | <i>Bone marrow transplantation</i> | 63 | <i>TB, adults</i> |
| 18 | <i>General</i> | 41 | <i>Urology, children's</i> | 64 | <i>Inpatient daycare</i> |
| 19 | <i>General medicine</i> | 42 | <i>Urology, adults</i> | 65 | <i>Psychosomatic</i> |
| 20 | <i>Narcology</i> | 43 | <i>Oncology, children's</i> | 66 | <i>ENT children's</i> |
| 21 | <i>Pulmonology, children's</i> | 44 | <i>Oncology, adults</i> | 67 | <i>ENT, adults</i> |
| 22 | <i>Pulmonology, adults</i> | 45 | <i>Plastic surgery</i> | 68 | <i>Orthopedic, children's</i> |
| 23 | <i>Infectious diseases, children's</i> | 46 | <i>Proctology</i> | 69 | <i>Orthopedic, adults</i> |
| | | | | 70 | <i>Physiotherapy</i> |

14 Hospital deaths

This section describes hospital deaths between 2010 and 2017 at regional and national levels. The section includes:

- Absolute number of hospital deaths,
- Breakdown of hospital deaths according to following age groups: 0-14, 15-17 and 18 and above,
- Hospital - all deaths ratio,
- Absolute number of hospital deaths according to ICD-10 in absolute values,
- Absolute number of hospital deaths according to ICD-10 as % of all hospital deaths,
- Hospital fatality in marzes according to ICD-10,
- Hospital fatality in Armenia according to ICD-10,
- Comparative analysis of diseases with highest fatality rate across marzes.

Number of hospital deaths, 2010-2017

The rate of hospital deaths among adult population (18 and above) increased from 3903 in 2010 to 5130 in 2016, and declined in 2017, nearly reaching the level of 2015 (Figure 83). Meantime, monotonic decline (by nearly 41%) of under-14 hospital deaths was recorded between 2010 (559) and 2017 (332). These two trends were reflected also in **Error! Reference source not found.83-B** – the relative number of hospital deaths among 18 and older population increased, and among 0-14 decreased.

Absolute figure of deaths in 15-17 age group is very small (Table 80) varying within the range of 7-15 in the reference years.

Figure 83. A. Absolute number of hospital deaths, 2010-2017 and B. Breakdown of hospital deaths across age groups

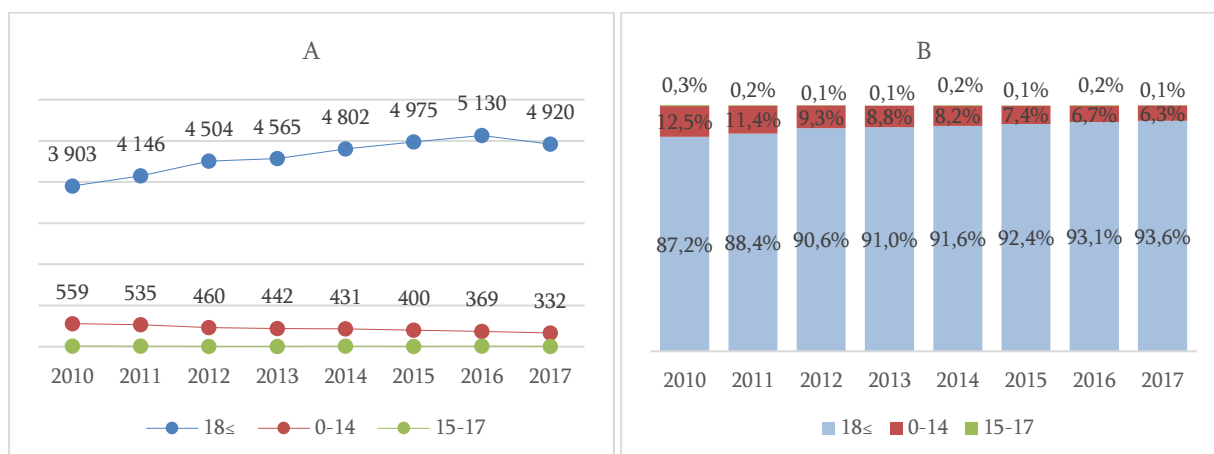


Table 80. Hospital deaths, 2010-2017

Year	18≤	0-14	15-17	Total	18≤	0-14	15-17	Total
2010	3,903	559	15	4,477	87.2%	12.5%	0.3%	100.0%
2011	4,146	535	10	4,691	88.4%	11.4%	0.2%	100.0%
2012	4,504	460	7	4,971	90.6%	9.3%	0.1%	100.0%
2013	4,565	442	7	5,014	91.0%	8.8%	0.1%	100.0%
2014	4,802	431	11	5,244	91.6%	8.2%	0.2%	100.0%
2015	4,975	400	7	5,382	92.4%	7.4%	0.1%	100.0%
2016	5,130	369	10	5,509	93.1%	6.7%	0.2%	100.0%
2017	4,920	332	7	5,259	93.6%	6.3%	0.1%	100.0%

In Armenia almost every fifth death occurs at hospital settings. Hospital deaths account for 19.4%. Hospital deaths, as % of all registered deaths in the country has not changed much in 2015-2017. In 2017 it was 19.4% (Figure 84).

The ratio of hospital deaths and all deaths is above the average national rate only in Yerevan (Figure 84 and Table 81). In 2017 it was 44%: In all other marzes the ratio is below (Shirak, Lori, Kotayk) or very much below (Aragatsotn, Ararat, Gegharkunik, Vayots Dzor, Tavoush) the national average. The breakdown suggests that relative number of hospital deaths is higher in marzes wither big towns [for Armenia] such as Shirak (Gyumri), Lori (Vanadzor), Kotayk (Abovyan, Hrazdan) and six more towns, and is relatively smaller in marzes where urban settlements are small.

Relative number of hospital deaths in marzes did not change much between 2015 and 2017. The only exception was Armavir, which demonstrated a decline tendency (9% in 2015, 8% in 2016 and 7% in 2017).

Figure 84. Hospital deaths as % of all deaths

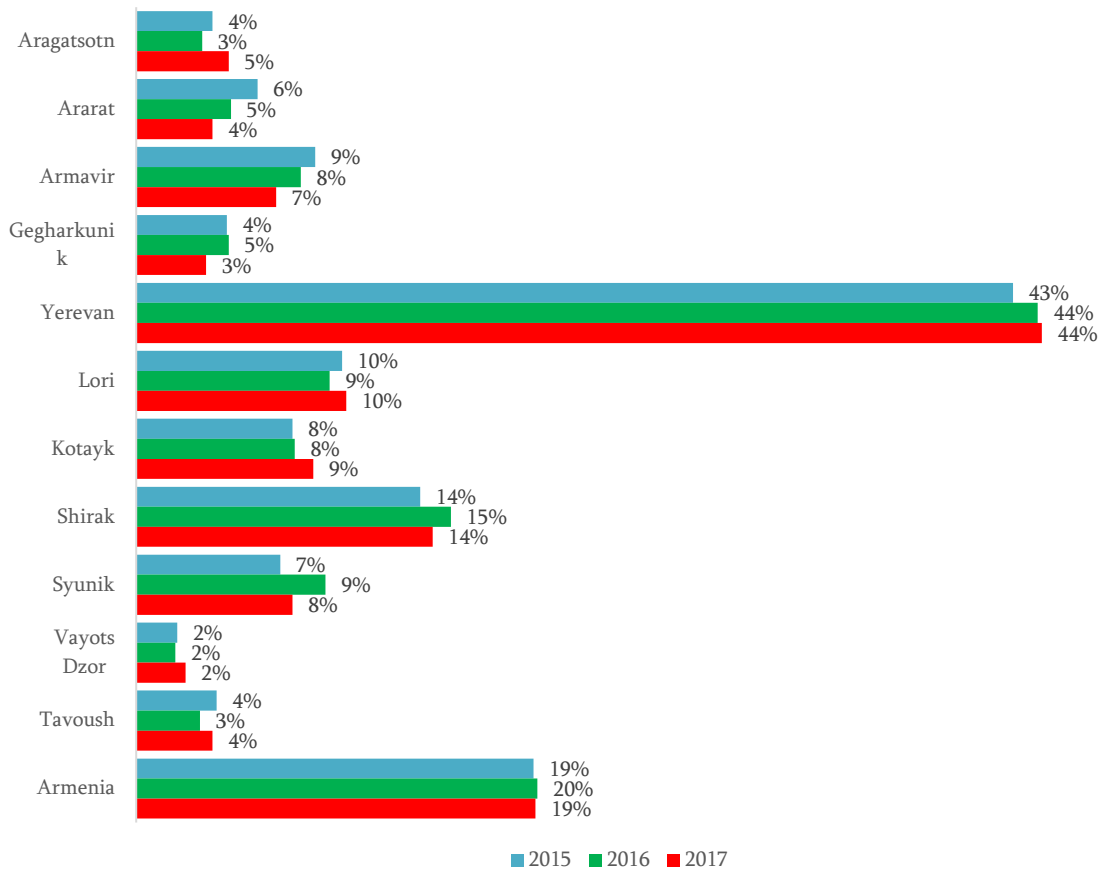


Table 81. Hospital deaths and all deaths

Marz	All deaths			Hospital deaths			Hospital deaths as % of all deaths		
	2015	2016	2017	2015	2016	2017	2015	2016	2017
Aragatsotn	1,186	1,162	1,196	44	37	54	3.7%	3.2%	4.5%
Ararat	2,238	2,413	2,242	133	111	83	5.9%	4.6%	3.7%
Armavir	2,309	2,337	2,354	202	187	160	8.7%	8.0%	6.8%
Gegharkunik	1,839	1,926	1,784	80	87	61	4.4%	4.5%	3.4%
Yerevan	9,264	9,274	8,882	3,944	4,059	3,904	42.6%	43.8%	44.0%
Lori	2,832	2,875	2,709	282	269	275	10.0%	9.4%	10.2%
Kotayk	2,350	2,341	2,336	179	180	201	7.6%	7.7%	8.6%
Shirak	2,613	2,615	2,512	361	399	361	13.8%	15.3%	14.4%
Syunik	1,284	1,367	1,285	90	126	98	7.0%	9.2%	7.6%
Vayots Dzor	543	513	531	11	10	13	2.0%	1.9%	2.4%
Tavoush	1,420	1,403	1,326	56	44	49	3.9%	3.1%	3.7%
Armenia	27,878	28,226	27,157	5,382	5,509	5,259	19.3%	19.5%	19.4%

Absolute number of hospital deaths among 18 and older population is presented in Table 82. During 2010-2015 and in 2016 an increase was detected in this age group in Armavir, Gegharkunik, Yerevan, Shirak, Syunik and Vayots Dzor. However in 2017 the absolute number of hospital deaths dropped in all marzes.

Between 2010 and 2017 the absolute number of hospital deaths in 0-14 age group demonstrated a decline tendency in all marzes (Table 83).

Table 82. Absolute number of hospital deaths in marzes among 18 and older population, 2010-2017

Մարզ	Տարիք	2010	2011	2012	2013	2014	2015	2016	2017	Դիսագրամ
ԱԳ	18≤	47	55	38	43	40	44	37	54	
ԱԴ	18≤	134	146	136	142	174	131	106	83	
ԱՍ	18≤	147	157	171	183	192	200	184	158	
ԳԵ	18≤	51	66	68	63	62	72	84	58	
ԵԴ	18≤	2657	2887	3223	3247	3394	3604	3743	3602	
ԼՈ	18≤	251	246	251	258	300	269	259	269	
ԿՈ	18≤	205	175	206	182	173	178	176	201	
ՇԻ	18≤	278	270	258	311	325	327	371	342	
ՍՅ	18≤	85	87	108	88	98	85	119	95	
ՎՁ	18≤	5	8	8	8	8	11	10	11	
ՏԱ	18≤	43	49	37	40	36	54	41	47	

Table 83. Absolute number of hospital deaths in marzes among 0-14 age group, 2010-2017

Մարզ	Տարիք	2010	2011	2012	2013	2014	2015	2016	2017	Դիսագրամ
ԱԳ	0-14	2	3	2	2	1	0	0	0	
ԱԴ	0-14	10	7	4	9	4	2	3	0	
ԱՍ	0-14	10	11	6	1	3	2	3	2	
ԳԵ	0-14	21	18	5	12	3	8	3	3	
ԵԴ	0-14	385	375	354	332	353	334	310	295	
ԼՈ	0-14	30	20	16	11	10	13	9	6	
ԿՈ	0-14	12	8	9	6	6	1	4	0	
ՇԻ	0-14	64	74	50	50	38	34	28	19	
ՍՅ	0-14	14	14	9	11	9	4	7	3	
ՎՁ	0-14	5	2	0	3	2	0	0	2	
ՏԱ	0-14	6	3	5	5	2	2	2	2	

Absolute number of hospital deaths and their breakdown across age groups in 2010-2017 are presented in **Error! Reference source not found.**

Hospital deaths according to diseases, 2010-2017

Absolute numbers of hospital deaths in all age groups according to diseases are presented in **Error! Reference source not found.**, and **Error! Reference source not found.84_**. The latter lists diseases, which caused more than 100 deaths in 2017.

Data of some of the deadliest diseases are depicted also in Figure 85, Figure 86, Figure 87, Figure 88 and Figure 89.

Diseases of the circulatory system I00-I99. Here the absolute number of deaths increased by 27% (from 2337 in 2010 to 2972 in 2016), and dropped to 2904 in 2017.

Cerebrovascular diseases I60-I69 -related deaths show monotonic increase by 15.7% (from 1104 in 2010 to 1278 in 2017).

Acute myocardial infarction I21-I23 -related deaths had an increase tendency between 2011 and 2016, following by a decline in 2017.

Deaths due to **cerebral infarction I63** saw drastic increase in 2016 and 2017. If in 2015 they accounted for 448 of all deaths, in 2017 the figure reached 617 (37.7% increase)

During 2015-2017 increase was found also in deaths due to **Intracerebral haemorrhage and Other nontraumatic intracranial haemorrhage I61-I62**, and a decrease of deaths induced by **Stroke, not specified as haemorrhage or infarction I64** (from 298 in 2015 to 138 in 2017 or by 64%).

Figure 85. Absolute number of hospital deaths due to some diseases of circulatory system, 2010-2017

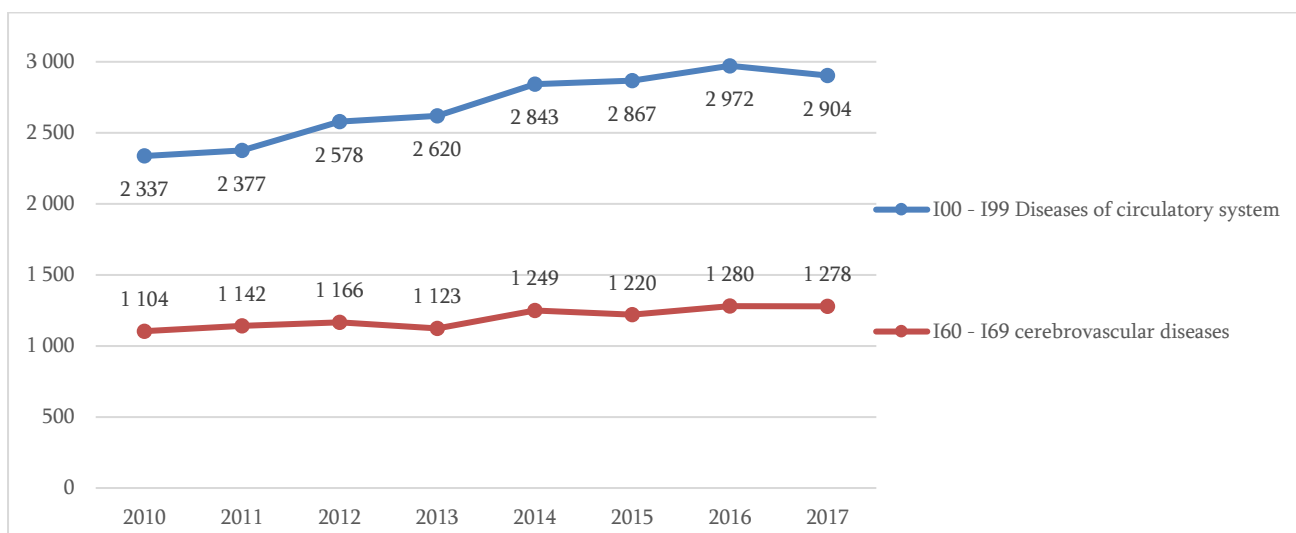
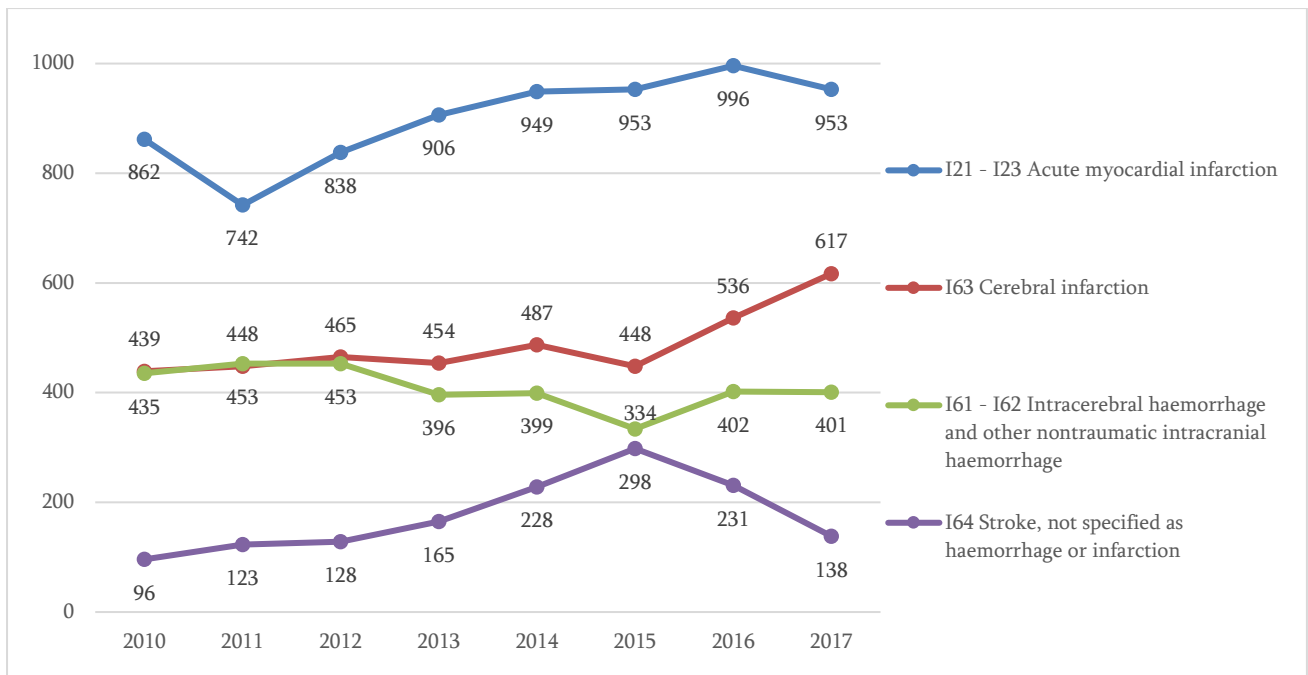
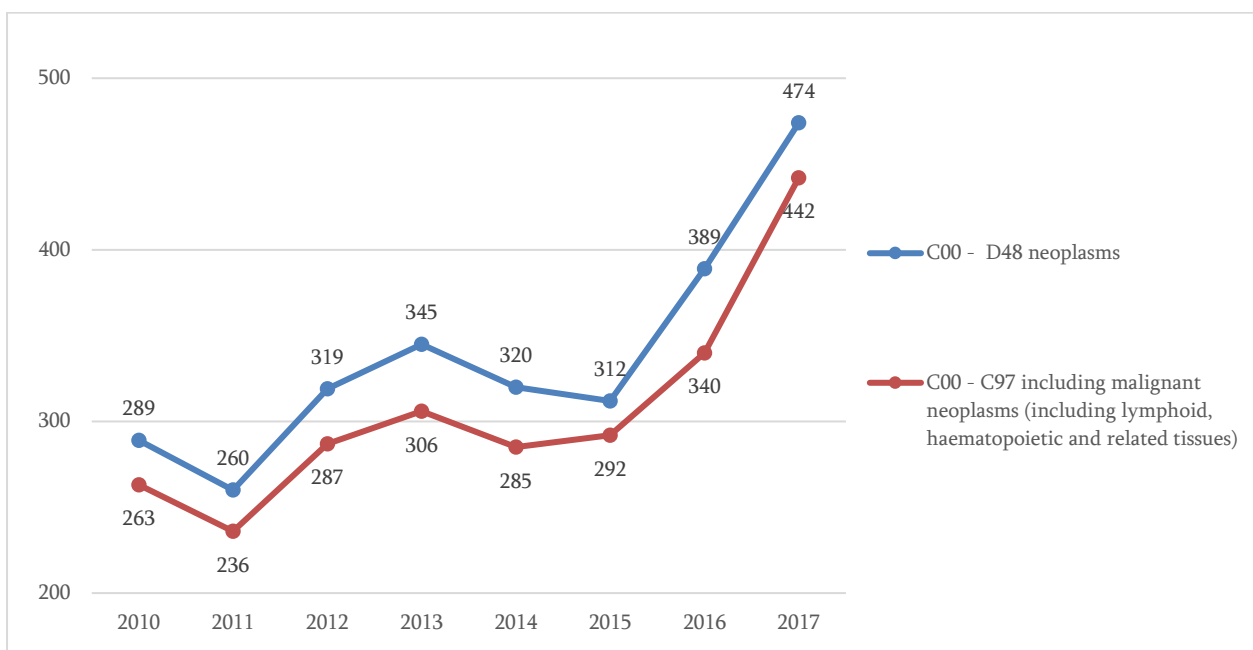


Figure 86. Absolute number of hospital deaths due to some diseases of circulatory system (I21-23, I63, I61-62, I64), 2010-2017



Despite the decline of 2014-2015, deaths due to **Neoplasms (C00-D48)** increased in 2017, reaching 474 (vs. 289 in 2010) or by 64%. During that time period deaths due to **malignant neoplasms (including lymphoid, hematopoietic and related tissues) C00-C97** increased by 68% (from 263 to 442).

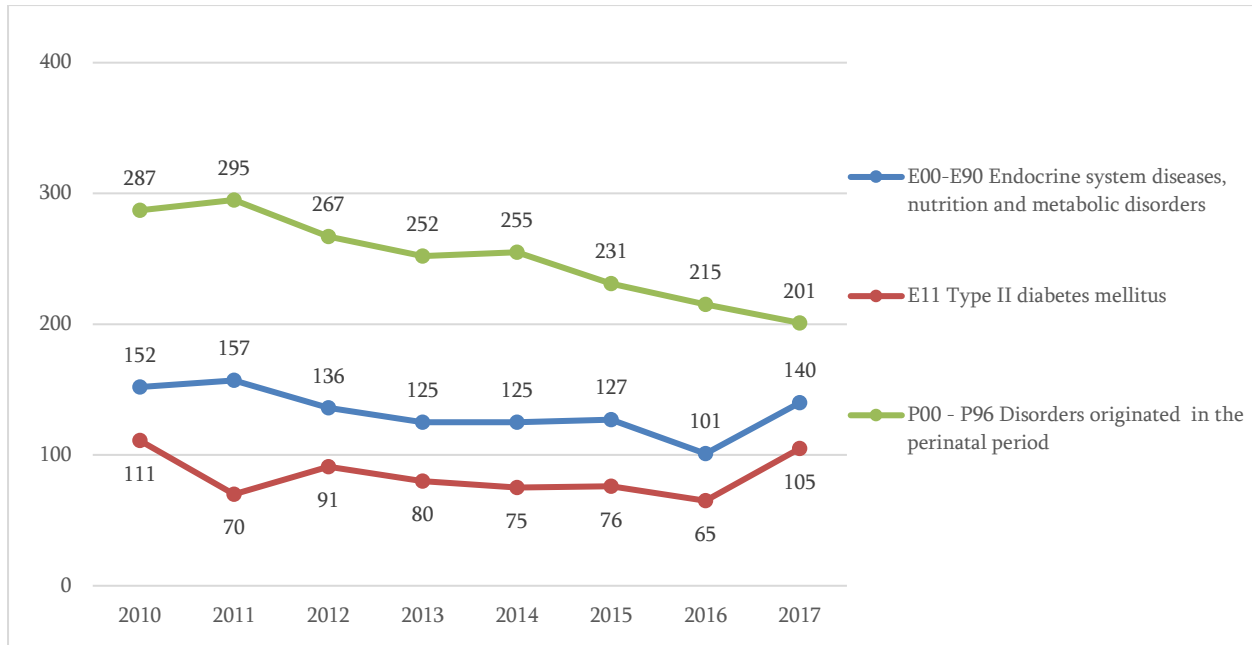
Figure 87. Absolute number of hospital deaths due to neoplasms (C00-D48, C00-C97), 2010-2017



Endocrine system E00-E90 diseases as well as **Type II Diabetes Mellitus E11** – related deaths declined between 2012 and 2016, and stepped up in 2017. In 2016 deaths related to **E00-E90** diseases accounted for 101 and in 2017 that figure reached 140 (39% increase).

In 2012-2017 monotonic decline by 32% was found in deaths related to **Certain conditions originated in perinatal period P00-P99** (from 295 in 2012 to 201 in 2017).

Figure 88. Absolute number of hospital deaths due to endocrine (E00-E90, E11), perinatal period (P00-P96) diseases, 2010-2017



Dynamic changes were found in the number of deaths due to **Respiratory diseases J00-J99**. Abrupt increase by 75% was recorded between 2010 and 2011, followed by slow increase tendency in 2012-2014, another steep growth by 37% in 2015, followed by drastic decline in 2016 and 2017. In 2017 the rate figure stood at 244, which is 58% less compared with 2015.

General increase was found in the numbers of deaths due to **Digestive system diseases**, as well as **Injury, poisoning and certain other consequences of external causes S00-T98**.

On the contrary, decline of the death rate was recorded for **Infectious and parasitic diseases**.

Figure 89. Absolute number of hospital deaths due to injuries (K00-K93), respiratory system (J00-J99), injuries, poisoning (S00-T99), infectious and parasitic (A00-B99) diseases, 2010-2017

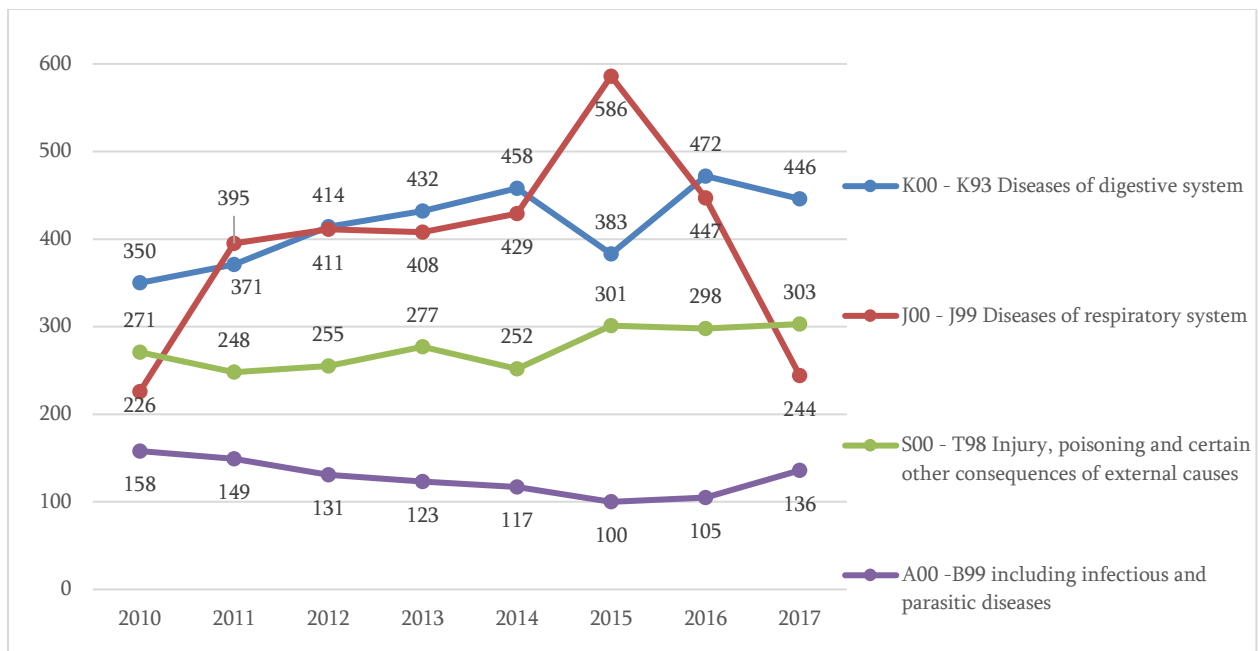


Table 84. Proportion of hospital deaths in 18 and older population of the total deaths

ICD-10 Disease	2010	2011	2012	2013	2014	2015	2016	2017
A00 - T98 Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
I00 - I99 Diseases of circulatory system	59.8%	57.2%	57.2%	57.4%	59.1%	57.5%	57.8%	58.9%
I60 - I69 Cerebrovascular diseases	28.3%	27.5%	25.9%	24.6%	26.0%	24.5%	25.0%	25.9%
I21 - I23 acute myocardial infarction	22.1%	17.9%	18.6%	19.8%	19.8%	19.1%	19.4%	19.4%
I63 Cerebral infarction	11.2%	10.8%	10.3%	9.9%	10.1%	9.0%	10.4%	12.5%
C00 - D48 Neoplasms	7.0%	6.1%	6.8%	7.3%	6.3%	6.1%	7.4%	9.5%
K00 - K93 Diseases of digestive system	8.9%	8.8%	9.1%	9.3%	9.4%	7.6%	9.1%	9.0%
C00 - C97 of them malignant neoplasms (including lymphoid, hematopoietic and related tissues)	6.5%	5.5%	6.1%	6.5%	5.7%	5.7%	6.5%	8.9%
I61 - I62 intracerebral and other intracranial haemorrhage	11.1%	10.9%	10.1%	8.7%	8.3%	6.7%	7.8%	8.1%
S00 - T98 Injury, poisoning and certain other consequences of external causes	6.3%	5.5%	5.5%	5.7%	5.0%	5.8%	5.6%	6.0%
J00 - J99 Diseases of respiratory system	4.7%	8.7%	8.8%	8.2%	8.2%	11.4%	8.3%	4.5%
E00-E90 Diseases of endocrine system, nutrition and metabolic disorders	3.9%	3.8%	3.0%	2.7%	2.6%	2.5%	2.0%	2.8%
R00 - R99 Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	2.1%	3.3%	3.6%	2.8%	3.1%	3.3%	3.4%	2.8%
I64 Stroke, not specified as haemorrhage or infarction	2.5%	3.0%	2.8%	3.6%	4.7%	6.0%	4.5%	2.8%
K70 - K76 Diseases of liver	2.6%	2.5%	2.5%	2.8%	3.1%	2.3%	2.9%	2.6%
A00 - B99 including infectious and parasitic diseases	2.9%	2.5%	2.2%	2.0%	1.9%	1.5%	1.7%	2.5%
S02,12,22,32, 42,52,62,72, 82,92,T02,08, 10,12,14.2 of them fractures	1.0%	0.9%	1.0%	1.0%	1.0%	1.0%	0.8%	2.3%
E11 Type II diabetes mellitus	2.8%	1.7%	2.0%	1.8%	1.6%	1.5%	1.3%	2.1%

K50 – K52, K55 – K59 Noninfective gastroenteritis and colitis, and other enteric diseases	1.1%	0.9%	1.2%	1.2%	1.4%	1.1%	1.2%	1.9%
I25 Chronic ischemic heart diseases	2.1%	2.2%	2.3%	2.5%	2.2%	2.5%	2.0%	1.7%
N00 - N99 Diseases of genitourinary system	1.7%	1.7%	1.3%	1.7%	1.7%	2.2%	1.9%	1.6%
K25 - K26 of them gastric and duodenal ulcer	1.6%	1.6%	1.6%	1.6%	1.6%	1.4%	1.7%	1.5%
J12 - J18 Pneumonia	2.2%	1.0%	0.8%	1.1%	1.3%	1.1%	1.6%	1.4%
I60 including Subarachnoid haemorrhage	1.7%	1.3%	1.5%	1.2%	1.1%	1.3%	1.3%	1.3%
J44, J47 chronic obstructive pulmonary disease, bronchiectasis	0.4%	0.7%	0.8%	0.7%	0.5%	0.9%	0.9%	1.0%
A15 - A16, A19 Respiratory tuberculosis	2.0%	1.5%	1.6%	1.2%	1.1%	1.0%	0.7%	1.0%
N00 – N19, N25 – N28 of them glomerular disease and tubulointerstitial nephritis, renal failure, other diseases of kidney and urethra	1.4%	1.2%	1.1%	1.5%	1.5%	1.9%	1.6%	0.9%
F00 - F99 Mental and behavior disorders	1.0%	0.9%	1.0%	0.6%	0.9%	0.7%	0.9%	0.9%
S06 Intracranial injury	1.7%	1.0%	1.2%	1.1%	0.9%	1.2%	1.5%	0.8%
G00 - G99 Diseases of nervous system	0.6%	0.7%	0.6%	0.8%	1.0%	0.5%	0.7%	0.8%
I65 - I66, I67.0,1, 3-9 Occlusion and stenosis of precerebral arteries, not resulting in cerebral infarction, other cerebrovascular diseases	1.0%	0.9%	0.7%	0.9%	1.0%	1.2%	0.6%	0.7%
K80 - K83 Disorders of gallbladder, biliary tract and pancreas	0.7%	0.8%	0.9%	0.7%	0.7%	0.7%	0.5%	0.6%
T36 – T65 Poisoning by drugs, medicaments and biological substances, as well as toxic effects of substances chiefly nonmedicinal as to source	1.3%	1.0%	0.9%	0.9%	0.7%	0.9%	0.7%	0.5%

Hospital fatality in Armenia and across marzes

Hospital fatality in the country and across marzes is presented in Table 85. The overall hospital fatality rate suggested an increase tendency between 2010 and 2016. In 2015 it was 1.54% and in 2016 it went up to 1.70% (Table 85) and then down to 1.64% the following year.

In 2017 the highest hospital fatality rate was recorded in Shirak (2.20%), followed by Lori, Armavir and Kotayk. The rates of these four marzes exceed national average. The lowest rate in 2017 was found in Gegharkunik (0.79%) Next come Tavoush, Ararat, Vayots Dzor, Syunik, Aragatsotn and Yerevan. The latter accounted for 1.63% and was slightly below the national indicator.

Hospital fatality is relatively low in marzes with underdeveloped hospital infrastructures (people poorly utilize inpatient services especially in case of severe and terminal patients) and is higher in those with better facilities and resources (major towns or big number of urban settlements).

Table 85. Hospital fatality in marzes, 18 and older population

Մարզ	2010	2011	2012	2013	2014	2015	2016	2017	Դիագրամ (Max-Min)/Max	
ՇԻ	1.72%	1.71%	1.57%	1.76%	1.74%	1.92%	2.21%	2.20%		29%
ԼՈ	1.87%	1.87%	1.89%	1.94%	2.06%	1.92%	1.85%	2.00%		10%
ԱՄ	2.09%	2.15%	2.08%	2.19%	2.15%	2.54%	2.15%	1.96%		23%
ՎՈ	1.73%	1.49%	1.80%	1.57%	1.43%	1.55%	1.54%	1.93%		26%
ՀՀ	1.54%	1.56%	1.56%	1.62%	1.57%	1.68%	1.70%	1.64%		9%
ԵՐ	1.55%	1.57%	1.57%	1.65%	1.57%	1.71%	1.73%	1.63%		11%
ԱԳ	1.09%	1.32%	0.88%	1.01%	0.92%	1.16%	0.98%	1.55%		43%
ՍՅ	1.35%	1.34%	1.49%	1.16%	1.23%	1.10%	1.56%	1.25%		29%
ՎՁ	0.36%	0.61%	0.64%	0.68%	0.62%	0.98%	0.89%	1.12%		68%
ԱՐ	1.47%	1.65%	1.50%	1.60%	1.75%	1.35%	1.19%	1.00%		43%
ՏԱ	0.98%	1.21%	0.87%	0.90%	0.70%	1.02%	0.76%	0.91%		42%
ԳԵ	0.65%	0.84%	0.88%	0.83%	0.76%	0.88%	1.05%	0.79%		38%

Yerevan is an exception, as the hospital fatality in the capital is lower than in marzes with major towns. This can probably be because Yerevan hospital settings provide higher quality care and survival chances of sever patients are much higher.

Hospital fatality in Armenia according to diseases

Hospital fatality in Armenia during 2010-2017 according to ICD-10 are presented in Table 86. The first column lists the diseases and codes according to ICD-10. The column stability is presented partially in order to ease comprehension of the Table. Diseases in full, without abbreviations are presented in **Error! Reference source not found.**

To facilitate the reader's work with ample number of figures, the latter are presented in three separate tables.

Firstly, Error! Reference source not found.86- was created to help the reader to easily find data on a particular group of diseases. This Table presents all disease groups, used by NHIAC for data collection. Diseases are arranged in alphabetical order according to their Latin code. The first line shows fatality per all diseases which coincides with line RA of **Error! Reference source not found.86.**

Column **2010-2017** shows % of fatality in disease groups.

Column **Diagram** shows the dynamics of fatality from the disease group for the period 2010-2017. It is noteworthy that diagrams according to disease groups are not compatible. If no death was recorded in a given year from a given disease, the relevant diagram column is missing.

Column **Deaths 2017** shows absolute number of hospital deaths from a given disease group in 2017.

Column **Percentage A00-T98** show the proportion of hospital deaths from a given disease group against the total hospital deaths. The sum of the column percentages (without first line) does not

make 100%, because there are lines that are part of other general codes. For example, data of 'C00-C97 of them malignancies (including lymphoid and hematopoietic tissues)' are included in data of line 'C00 - D48 Malignancies'.

Column **Rank, deaths 2017** shows the regular number of a given disease group, if data were arranged according to decrease of the absolute number of deaths in 2017. For example, figure 5 in column 'C00 - D48 Neoplasms' means that the absolute number (468) of deaths due to that disease group occupied the 5th place in 2017.

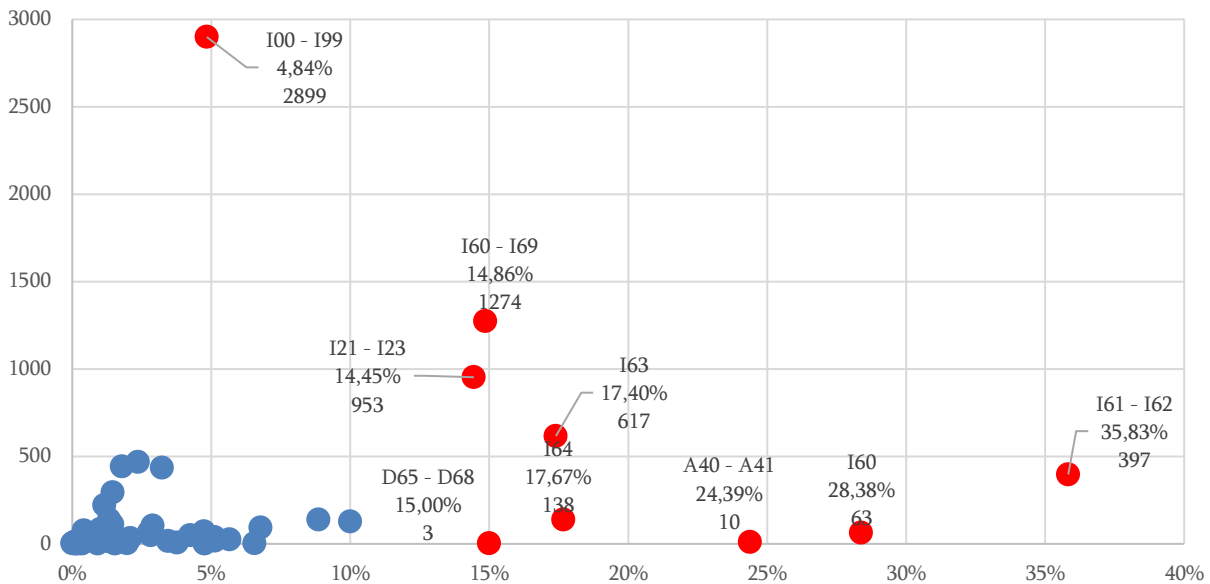
Figure in column **Rank, From Fatality, 2017** shows the place occupied by hospital fatality related to a given disease group among data presented in the Table. For example, hospital fatality from 'I61 - I62 intracerebral and other nontraumatic haemorrhage' in 2017 was the second in its size (35.83%). This is important from the standpoint of reduction of hospital fatality and improvement of the quality of care, because in 2017 the absolute number of deaths due to these diseases was 397 or 8.1% of all hospital deaths. The picture is different with the group 'D65 including defibrination syndrome' (from 'D65 - D68 coagulation defects), with 100% fatality, which killed only 1 person in 2017 or 0.02% of all deaths. According to the number of deaths it is equal to 57.

The second, for the readers to easily work with most deadly disease groups, the **Error! Reference source not found**.presents 17 disease groups that have caused more than 100 deaths in 2017.

The third, to facilitate readers' work with highest mortality disease groups, the latter with more than 5% mortality was grouped under a Table 87presenting the year 2017.

Since absolute number of deaths according to mostly deadly diseases and the fatality are the main focuses of the above Tables, it is suggested to observe Figure 90 depicting the range of these indicators. Disease groups with fatality $\geq 15\%$ and/or number of deaths exceeding 500 are presented in red dots.

Figure 90. Hospital deaths and fatality across disease groups, 2017



The Figure presents below main disease groups with the highest rates of hospital deaths and fatality.

- **'I00 - I99 Diseases of circulatory system'**, which are the leading cause of hospital deaths. In 2017 this disease group killed 2,899 people or 58.9% of all hospital deaths. Hospital fatality in these groups accounted 4.84% in 2017. In this group hospital fatality rate showed decline tendency between 2010 (5.75%) and 2017 (16%).
- **'I60 - I69 Cerebrovascular diseases'** group is the subgroup of 'I00 - I99'. It took 1,274 lives in 2017. Here however hospital fatality is much higher (14.86%). Hospital fatality declined in 2010-2016, but increased in 2017.
- **'I21 - I23 Acute myocardial infarction'** subgroup caused 953 deaths in 2017. Fatality tendency increased in 2011-2016 reaching 15.78% in 2016 and then dropping to 14.45% the following year.
- **'I63 Cerebral infarction'** subgroup caused 617 deaths in 2017. Fatality rate between 2011 and 2016 decreased following a drastic increase in 2017 (from 14.35% in 2016 to in 17.40% in 2017).
- **'I64 stroke, not specified as hemorrhage or infarction'** subgroup has the lowest number of deaths, but quite essential fatality rate of 17.67%. The latter increased over 2012-2016 and dropped in 2017.

Below two subgroups in the Circulatory System Diseases have very high fatality.

- **'I61 - I62 intracerebral and other nontraumatic intracranial haemorrhage'** with number of deaths as high as 397 and the highest fatality (35.83%). Every 3rd inpatient case in this group is terminal.
- **'I60 including subarachnoid hemorrhage'**. Here the fatality shared 28.38% in 2017, but the number of deaths was relatively lower (63). Fatality increased in 2012-2016 and shrank in 2017.

Two more disease groups present very high fatality rates. They are

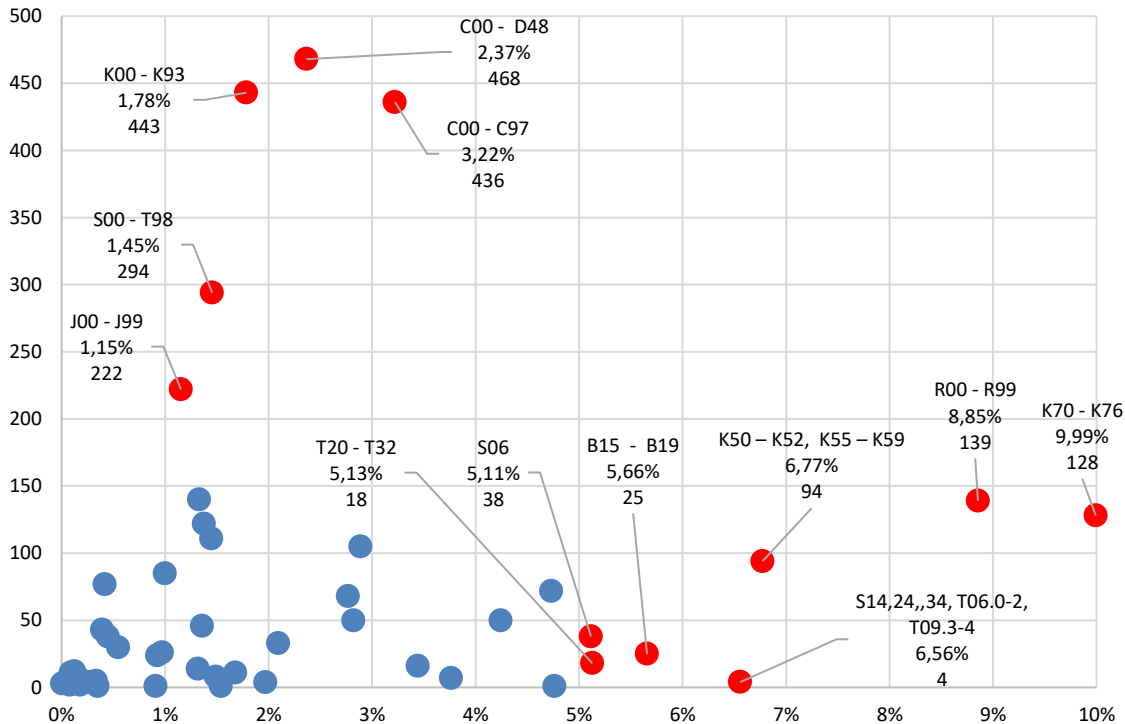
- **'A40 - A41 sepsis'** with fatality rate 24.39%, and

- 'D65 - D68 coagulation defects' - 15.00%

The number of deaths in above disease groups was not high in 2017 (10 and 3 correspondingly).

To study the other disease groups it is suggested to view the same data, this time zoomed in. The bigger scale is shown in Figure 91. Red dots show disease groups with $200 < \text{number of deaths} < 500$ and/or $5\% < \text{fatality} < 10\%$.

Figure 91. Hospital deaths and fatality across disease groups, 2017



There are several clusters¹⁰ on the Figure.

The first cluster

- ‘**C00 - D48 Neoplasms**’ group - 468 deaths or 9.5% of all hospital deaths. Fatality is 2.37% which exceeds national fatality rates by 0.73%.
- Subgroup ‘**C00 - C97 of them malignancies (including lymphoid and hematopoietic tissues)**’ with 436 deaths. It shares 93% of deaths in ‘**C00 - D48**’ group or 8.9% of all hospital deaths.
- ‘**K00 - K93 diseases of digestive system**’ – 443 deaths and 2.37% fatality.

The second cluster is close to the first in terms of absolute number of deaths.

- ‘**S00 - T98 Injury, poisoning and certain other consequences of external causes**’, 294 deaths and 1.45% fatality.
- ‘**J00 - J99 Diseases of respiratory system**’ – 222 deaths and 1.15% fatality

The third cluster has high mortality rate and average number of deaths. It includes the following diseases.

- ‘**K70 - K76 diseases of liver**’
- ‘**R00 - R99 Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified**’
- The group ‘**K50 – K52, K55 – K59 noninfective enteritis and colitis**’ is also close to the previous two clusters members.

¹⁰The term ‘cluster’ was used to avoid possible confusions related to the use of ‘group’.

The fourths cluster covers disease with above 5% fatality and small number of deaths. They are within the [18; 38] range and include

- ‘S06 intracranial injury’ -5.11% fatality, 38 deaths
- ‘B15 - B19 viral hepatitis’ - 5.66% fatality, 25 deaths
- ‘T20 - T32 Burns and corrosions’ - 5.13% fatality, 18 deaths

Table 86. Hospital fatality in Armenia, 2010-2017, 18 and older population

ՀՄԴ-10 Հիվանդություն	2010	2011	2012	2013	2014	2015	2016	2017	Դիագրամ	Մահեր 2017	Տոկոս՝ A00-T98	Ռսիզ մահեր 2017	Ռսիզ մահաբ. 2017
A00 -T98 Ընդամենը	1.54%	1.56%	1.56%	1.62%	1.57%	1.68%	1.70%	1.64%		4,920	100.0%	-	32
A00 - A09 դրանցից՝ աղիքայ	0.11%	0.20%	0.24%	0.32%	0.15%	0.04%	0.09%	0.08%		2	0.0%	55	61
A00 -B99 այդ թվում՝ Վարակ	1.06%	0.97%	0.86%	0.90%	0.86%	0.77%	0.96%	1.37%		122	2.5%	15	37
A15 - A16, A19-մաս շնչառակ	3.72%	2.93%	3.11%	2.43%	2.75%	3.26%	2.80%	4.24%		50	1.0%	24	20
A40 - A41 սեպսիս	10.34%	28.57%	4.17%	14.29%	15.79%	16.67%	16.67%	24.39%		10	0.2%	42	4
B15 - B19 վիրուսային հեպա	1.12%	2.35%	1.70%	0.88%	1.37%	0.85%	2.48%	5.66%		25	0.5%	33	14
C00 - D48 Նորագոյացություն	1.81%	1.66%	1.93%	2.28%	1.87%	1.71%	2.01%	2.37%		468	9.5%	5	27
C00 - C97 դրանցից՝ չարորա	2.81%	2.72%	3.10%	3.92%	2.84%	2.59%	2.63%	3.22%		436	8.9%	7	23
D50 - D62, D64 դրանցից՝ սս	4.20%	4.03%	2.94%	10.05%	2.16%	2.80%	7.48%	3.76%		7	0.1%	44	21
D50 - D89 Արյան և արյունա	2.40%	1.82%	1.86%	4.92%	0.91%	1.28%	3.95%	1.68%		11	0.2%	39	31
D65 - D68 արյան մակարդեղի	0.00%	0.00%	5.26%	3.85%	0.00%	0.00%	13.04%	15.00%		3	0.1%	52	7
D65 այդ թվում՝ դեֆիբրինա	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100%	100%		1	0.0%	57	1
D80 - D89 առանձին խանգալ	0.00%	0.00%	0.00%	0.00%	3.33%	0.00%	3.03%	4.76%		1	0.0%	58	18
E00-E90 Ներզատական համ	1.69%	1.62%	1.32%	1.24%	1.10%	1.15%	0.97%	1.33%		140	2.8%	11	39
E05 դրանցից՝ թիրեոտոքսի	1.04%	0.46%	0.00%	0.00%	0.21%	0.30%	0.00%	0.35%		1	0.0%	59	50
E10 շաքարային դիաբետ ինս	1.79%	2.77%	0.94%	1.70%	1.16%	1.21%	1.02%	0.92%		24	0.5%	34	44
E11 շաքարային դիաբետ ինս	2.64%	1.50%	2.22%	2.14%	1.88%	1.95%	1.74%	2.89%		105	2.1%	17	24
E23.2 ոչ շաքարային դիաբետ	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	8.33%	0.00%		0	0.0%	62	64
E85.0 պարբերական հիվանդ	1.75%	1.58%	0.72%	1.54%	2.05%	2.37%	0.86%	1.97%		4	0.1%	47	29
F00 - F99 Հոգեկան խանգար	0.35%	0.33%	0.38%	0.27%	0.37%	0.34%	0.45%	0.39%		43	0.9%	27	49
G00 - G99 Նյարդային համակ	0.42%	0.49%	0.42%	0.45%	0.51%	0.30%	0.44%	0.45%		38	0.8%	28	47
G45 դրանցից՝ ուղեղի տրան	0.11%	0.27%	0.00%	0.00%	0.05%	0.05%	0.00%	0.00%		0	0.0%	63	65
G50- G72 առանձին նյարդեր	0.39%	0.19%	0.19%	0.38%	0.19%	0.14%	0.30%	0.26%		4	0.1%	48	52
G80 մանկական ուղեղային և	0.00%	0.00%	0.00%	0.00%	1.30%	0.00%	0.00%	0.00%		0	0.0%	64	66
H00 - H59 Աչքի և նրա հավե	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%		0	0.0%	65	67

Table 87. Hospital fatality in Armenia, 2010-2017, 18 and older population (continued)

ՀՄԴ-10 Հիվանդություն	2010	2011	2012	2013	2014	2015	2016	2017	Դիագրամ	Մահեր 2017	Տոկոս՝ A00-T98	Ռանգ մահեր 2017	Ռանգ մահաբ. 2017
H25 - H26 դրանցից՝ կատար	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%		0	0.0%	66	68
H40 գլատկոմա	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%		0	0.0%	67	69
H60 - H95 Ականջի և պոկած	1.15%	0.00%	0.00%	0.00%	0.00%	0.27%	0.00%	0.00%		0	0.0%	68	70
I00 - I02 դրանցից՝ սուր ուն	0.61%	2.52%	3.03%	0.00%	0.00%	1.33%	0.00%	1.54%		1	0.0%	60	33
I00 - I99 Արյան շրջանառութ	5.75%	5.28%	5.17%	5.07%	4.74%	4.93%	4.88%	4.84%		2,899	58.9%	1	17
I05 - I09 սրտի քրոնիկ ունա	1.57%	2.93%	3.08%	1.97%	1.81%	2.07%	1.81%	1.49%		8	0.2%	43	34
I10 - I13 արյան ճնշման բարձ	0.15%	0.24%	0.13%	0.21%	0.17%	0.12%	0.12%	0.12%		12	0.2%	38	57
I20 ստենոկարդիա	0.18%	0.48%	0.07%	0.13%	0.02%	0.07%	0.13%	0.12%		11	0.2%	40	58
I21 - I23 սրտամկանի սուր ի	14.79%	12.33%	13.50%	14.60%	14.67%	15.39%	15.78%	14.45%		953	19.4%	3	9
I24 սրտի սուր իշեմիկ հիվա	4.49%	2.89%	1.65%	1.18%	0.92%	1.69%	0.91%	1.32%		14	0.3%	37	40
I25 սրտի քրոնիկ իշեմիկ հի	1.27%	1.31%	1.35%	1.44%	1.14%	1.65%	1.27%	1.00%		85	1.7%	19	42
I60 - I69 ուղեղի անոթային հ	16.54%	15.61%	14.62%	14.46%	14.53%	13.36%	13.09%	14.86%		1,274	25.9%	2	8
I60 այդ թվում՝ ենթարախնո	38.24%	29.10%	15.33%	21.09%	25.98%	30.70%	33.83%	28.38%		63	1.3%	23	3
I61 - I62 ներուղեղային և ու	43.76%	43.27%	46.37%	45.15%	40.34%	37.78%	39.61%	35.83%		397	8.1%	8	2
I63 ուղեղի ինֆարկտ	15.15%	16.17%	15.02%	13.49%	14.56%	13.10%	14.35%	17.40%		617	12.5%	4	6
I64 ինսուլտ, չճշտված որպե	15.51%	15.07%	14.30%	16.80%	23.43%	20.14%	19.01%	17.67%		138	2.8%	13	5
I65 - I66, I67.0, I, 3-9 ուղեղալ	4.00%	2.85%	2.18%	2.85%	2.66%	2.96%	1.75%	2.09%		33	0.7%	30	28
I67.2 ուղեղային արեոսկլել	3.19%	1.49%	2.58%	2.60%	2.17%	0.00%	0.00%	0.00%		0	0.0%	69	71
J00 - J06, J20 - J22 դրանցից՝	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%		0	0.0%	70	72
J00 - J99 Շնչառական օրգան	1.41%	2.77%	2.66%	2.38%	2.33%	3.37%	2.06%	1.15%		222	4.5%	10	41
J12 - J18 թոքաբորբեր	4.79%	2.78%	2.20%	2.18%	2.58%	2.29%	2.17%	2.77%		68	1.4%	22	26
J40 - J43 բրոնխիտ քրոնիկ	0.44%	0.53%	0.24%	0.17%	0.38%	0.55%	0.40%	0.33%		5	0.1%	46	51
J44, J47 թոքերի քրոնիկակա	1.86%	2.76%	2.81%	2.11%	1.21%	2.49%	2.66%	2.82%		50	1.0%	25	25
J45 - J46 աաթմա (հեղձուկ),	0.47%	0.25%	0.32%	0.47%	0.27%	0.40%	0.34%	0.18%		2	0.0%	56	54
J84 - J94 ստորին շնչական ո	4.09%	6.70%	3.30%	3.77%	3.64%	0.95%	1.55%	3.44%		16	0.3%	36	22

Table 88. Hospital fatality in Armenia, 2010-2017, 18 and older population (continued)

ՀՄԴ-10 Հիվանդություն	2010	2011	2012	2013	2014	2015	2016	2017	Դիագրամ	Մահեր 2017	Տոկոս՝ A00-T98	Ռանգ մահեր 2017	Ռանգ մահաբ. 2017
K00 - K93 Մարտոդական օրգ	1.57%	1.61%	1.59%	1.74%	1.71%	1.54%	1.91%	1.78%		443	9.0%	6	30
K25 - K26 դրանցից՝ ստամո	3.44%	3.74%	3.89%	4.06%	3.98%	4.16%	5.02%	4.73%		72	1.5%	21	19
K29 ստամոքսի և տասներկո	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%		0	0.0%	71	73
K50 - K52, K55 - K59 ոչ ինֆ	4.13%	3.42%	3.07%	3.62%	4.34%	2.52%	4.03%	6.77%		94	1.9%	18	12
K70 - K76 յարդի հիվանդութ	11.21%	9.68%	9.50%	9.08%	10.75%	8.33%	11.08%	9.99%		128	2.6%	14	10
K80 - K83 լեղապարկի և լեղ	0.64%	0.79%	0.79%	0.62%	0.58%	0.65%	0.57%	0.55%		30	0.6%	31	46
L00 - L99 Մաշկի և ենթամաշ	0.16%	0.21%	0.17%	0.16%	0.15%	0.13%	0.11%	0.16%		7	0.1%	45	55
M00 - M99 Ոսկրամկանային	0.16%	0.08%	0.08%	0.15%	0.07%	0.16%	0.07%	0.09%		11	0.2%	41	60
N00 - N19, N25 - N28 դրանց	2.65%	2.20%	2.03%	2.67%	2.33%	2.84%	2.46%	1.36%		46	0.9%	26	38
N00 - N99 Միզասեռական հս	0.48%	0.51%	0.39%	0.48%	0.48%	0.61%	0.55%	0.42%		77	1.6%	20	48
N20 - N23 միզաքարային հի	0.08%	0.16%	0.22%	0.11%	0.06%	0.03%	0.07%	0.13%		4	0.1%	49	56
N40 - N42 շագանակագեղձի	0.37%	0.57%	0.20%	0.19%	0.00%	0.06%	0.12%	0.22%		4	0.1%	50	53
O00 - O99 Հղիություն, ծննդ	0.00%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.00%		3	0.1%	53	62
P00 - P96 Պերինատալ շրջան	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%		0	0.0%	72	63
Q00 - Q99 Բնածին շերտմեն	0.02%	0.03%	0.01%	0.22%	0.09%	0.09%	0.24%	0.11%		3	0.1%	54	59
R00 - R99 Կլինիկական և լաբ	8.03%	12.85%	11.17%	8.97%	8.61%	9.03%	9.79%	8.85%		139	2.8%	12	11
S00 - T98 Վնասվածքներ, թո	1.71%	1.51%	1.42%	1.51%	1.28%	1.56%	1.51%	1.45%		294	6.0%	9	35
S02, I22, 22, 32, 42, 52, 62, 72, 82, 9	0.87%	0.76%	0.88%	0.88%	0.84%	0.89%	0.64%	1.45%		111	2.3%	16	36
S06 գլխուղեղի վնասվածք	6.83%	4.49%	5.70%	5.96%	5.37%	6.78%	8.90%	5.11%		38	0.8%	29	16
S14, 24, 34, T06.0-2, T09.3-4 ո	2.54%	0.45%	1.32%	1.05%	1.44%	0.63%	1.82%	6.56%		4	0.1%	51	13
T20 - T32 ջերմային և քիմիա	5.69%	5.03%	4.05%	5.40%	7.82%	5.37%	5.52%	5.13%		18	0.4%	35	15
T36 - T65 թունավորումներ	3.17%	2.21%	1.77%	1.75%	1.36%	1.98%	1.42%	0.97%		26	0.5%	32	43
T63.0 այդ թվում՝ օձի խայթոց	2.22%	0.73%	0.74%	0.00%	0.00%	1.89%	0.00%	0.91%		1	0.0%	61	45
Z00 - Z99 Բացի այդ՝ բնակչ	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%		0	0.0%	73	74
Z22 դրանցից՝ վարակիչ հիվ	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%		0	0.0%	74	75

Table 89. Fatality of disease groups, which have caused more than 100 deaths in 2017

ՀՄԴ-10 Հիվանդություն	2010	2011	2012	2013	2014	2015	2016	2017	Դիագրամ	Մահեր 2017	Տոկոս՝ A00-T98	Ռանգ մահեր 2017	Ռանգ մահաք. 2017
A00 -T98 Ընդամենը	1.54%	1.56%	1.56%	1.62%	1.57%	1.68%	1.70%	1.64%		4,920	100.0%	-	32
I00 - I99 Արյան շրջանառությամբ	5.75%	5.28%	5.17%	5.07%	4.74%	4.93%	4.88%	4.84%		2,899	58.9%	1	17
I60 - I69 ուղեղի անոթային հիվանդություններ	16.54%	15.61%	14.62%	14.46%	14.53%	13.36%	13.09%	14.86%		1,274	25.9%	2	8
I21 - I23 սրտամկանի սուր ինֆարկտ	14.79%	12.33%	13.50%	14.60%	14.67%	15.39%	15.78%	14.45%		953	19.4%	3	9
I63 ուղեղի ինֆարկտ	15.15%	16.17%	15.02%	13.49%	14.56%	13.10%	14.35%	17.40%		617	12.5%	4	6
C00 - D48 Նորագոյացություններ	1.81%	1.66%	1.93%	2.28%	1.87%	1.71%	2.01%	2.37%		468	9.5%	5	27
K00 - K93 Մարսողական օրգանների հիվանդություններ	1.57%	1.61%	1.59%	1.74%	1.71%	1.54%	1.91%	1.78%		443	9.0%	6	30
C00 - C97 դրանցից՝ չարորակ	2.81%	2.72%	3.10%	3.92%	2.84%	2.59%	2.63%	3.22%		436	8.9%	7	23
I61 - I62 ներուղեղային և ուղեղի արտաբերական	43.76%	43.27%	46.37%	45.15%	40.34%	37.78%	39.61%	35.83%		397	8.1%	8	2
S00 - T98 Վնասվածքներ, թունաբերություններ և հետևանքներ	1.71%	1.51%	1.42%	1.51%	1.28%	1.56%	1.51%	1.45%		294	6.0%	9	35
J00 - J99 Ընչառական օրգանների հիվանդություններ	1.41%	2.77%	2.66%	2.38%	2.33%	3.37%	2.06%	1.15%		222	4.5%	10	41
E00-E90 Ներզատական համակարգի հիվանդություններ	1.69%	1.62%	1.32%	1.24%	1.10%	1.15%	0.97%	1.33%		140	2.8%	11	39
R00 - R99 Կլինիկական և լաբորատոր հիվանդություններ	8.03%	12.85%	11.17%	8.97%	8.61%	9.03%	9.79%	8.85%		139	2.8%	12	11
I64 ինսուլտ, չճշտված որպես ինֆարկտ	15.51%	15.07%	14.30%	16.80%	23.43%	20.14%	19.01%	17.67%		138	2.8%	13	5
K70 - K76 յարդի հիվանդություններ	11.21%	9.68%	9.50%	9.08%	10.75%	8.33%	11.08%	9.99%		128	2.6%	14	10
A00 -B99 այդ թվում՝ Վարակահարուցիչ հիվանդություններ	1.06%	0.97%	0.86%	0.90%	0.86%	0.77%	0.96%	1.37%		122	2.5%	15	37
S02,12,22,32, 42,52,62,72, 82,92	0.87%	0.76%	0.88%	0.88%	0.84%	0.89%	0.64%	1.45%		111	2.3%	16	36
E11 շաքարային դիաբետ ինսուլինով բուժվող	2.64%	1.50%	2.22%	2.14%	1.88%	1.95%	1.74%	2.89%		105	2.1%	17	24

Table 90. Disease groups with above 5% fatality, 2017

ՀՄԴ-10 Հիվանդություն	2010	2011	2012	2013	2014	2015	2016	2017	Դիագրամ	Մահեր 2017	Տոկոս՝ A00-T98	Ռանգ մահեր 2017	Ռանգ մահաք. 2017
D65 այդ թվում՝ դեֆիբրիլյացիայից հետո	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100%	100%		1	0.0%	57	1
I61 - I62 ներուղեղային և ուղեղի արտաբերական	43.76%	43.27%	46.37%	45.15%	40.34%	37.78%	39.61%	35.83%		397	8.1%	8	2
I60 այդ թվում՝ ենթարախնուկային	38.24%	29.10%	15.33%	21.09%	25.98%	30.70%	33.83%	28.38%		63	1.3%	23	3
A40 - A41 սեպսիս	10.34%	28.57%	4.17%	14.29%	15.79%	16.67%	16.67%	24.39%		10	0.2%	42	4
I64 ինսուլտ, չճշտված որպես ինֆարկտ	15.51%	15.07%	14.30%	16.80%	23.43%	20.14%	19.01%	17.67%		138	2.8%	13	5
I63 ուղեղի ինֆարկտ	15.15%	16.17%	15.02%	13.49%	14.56%	13.10%	14.35%	17.40%		617	12.5%	4	6
D65 - D68 արյան մակարդակի փոփոխություններ	0.00%	0.00%	5.26%	3.85%	0.00%	0.00%	13.04%	15.00%		3	0.1%	52	7
I60 - I69 ուղեղի անոթային հիվանդություններ	16.54%	15.61%	14.62%	14.46%	14.53%	13.36%	13.09%	14.86%		1,274	25.9%	2	8
I21 - I23 սրտամկանի սուր ինֆարկտ	14.79%	12.33%	13.50%	14.60%	14.67%	15.39%	15.78%	14.45%		953	19.4%	3	9
K70 - K76 յարդի հիվանդություններ	11.21%	9.68%	9.50%	9.08%	10.75%	8.33%	11.08%	9.99%		128	2.6%	14	10
R00 - R99 Կլինիկական և լաբորատոր հիվանդություններ	8.03%	12.85%	11.17%	8.97%	8.61%	9.03%	9.79%	8.85%		139	2.8%	12	11
K50 - K52, K55 - K59 ոչ ինֆեկցիոզ	4.13%	3.42%	3.07%	3.62%	4.34%	2.52%	4.03%	6.77%		94	1.9%	18	12
S14,24,,34, T06.0-2, T09.3-4 n	2.54%	0.45%	1.32%	1.05%	1.44%	0.63%	1.82%	6.56%		4	0.1%	51	13
B15 - B19 վիրուսային հեպատիտ	1.12%	2.35%	1.70%	0.88%	1.37%	0.85%	2.48%	5.66%		25	0.5%	33	14
T20 - T32 ջերմային և քիմիական	5.69%	5.03%	4.05%	5.40%	7.82%	5.37%	5.52%	5.13%		18	0.4%	35	15
S06 գլխուղեղի վնասվածք	6.83%	4.49%	5.70%	5.96%	5.37%	6.78%	8.90%	5.11%		38	0.8%	29	16
A00 -T98 Ընդամենը	1.54%	1.56%	1.56%	1.62%	1.57%	1.68%	1.70%	1.64%		4,920	100.0%	-	32

Hospital fatality of most deadly diseases across marzes

Tables 91 and 106 present hospital **fatality of high mortality diseases** across marzes. In all Tables data for 2017 have the 3 highest and 3 lowest fatality diseases colored, which allows to easily navigate while drawing comparisons among marzes.

For example in ‘I00 - I99 Diseases of circulatory system’ hospital fatality across marzes (**Error! Reference source not found.91**), the highest rates are found in Kotayk, Shirak and Vayots Dzor and the lowest in Aragatsotn, Ararat and Tavoush.

Table 91. Hospital fatality of ‘I00 - I99 Diseases of circulatory system’ across marzes

I00 - I99 Արյան շրջանառության համակարգի հիվանդություններ									
Մարզ	2010	2011	2012	2013	2014	2015	2016	2017	Դիագրամ
ՀՀ	5.75%	5.28%	5.17%	5.07%	4.74%	4.93%	4.88%	4.84%	
ԱԳ	3.33%	2.72%	2.48%	2.93%	2.56%	2.40%	1.80%	2.61%	
ԱՄ	7.24%	6.21%	6.16%	5.64%	6.05%	7.07%	5.87%	5.19%	
ԱՐ	5.63%	5.00%	4.89%	4.73%	4.71%	3.80%	3.18%	2.66%	
ԳԵ	2.77%	3.60%	3.79%	3.53%	2.07%	2.59%	3.34%	3.13%	
ԵՐ	5.81%	5.36%	5.31%	5.16%	4.90%	5.10%	5.03%	4.98%	
ԼՈ	6.53%	6.02%	5.36%	5.44%	5.33%	5.17%	4.86%	4.95%	
ՎՈ	6.67%	6.31%	6.76%	5.98%	4.88%	5.31%	5.73%	6.56%	
ՇԻ	6.12%	4.87%	4.49%	5.76%	5.13%	5.68%	6.18%	6.14%	
ՍՅ	4.77%	4.35%	5.16%	3.64%	3.06%	3.05%	3.89%	3.18%	
ՎՋ	3.57%	5.00%	5.11%	4.72%	2.55%	6.43%	3.07%	6.00%	
ՏԱ	3.28%	3.97%	2.63%	2.11%	1.81%	2.57%	1.80%	2.66%	

During 2010-2017 fatality in Ararat induced by these diseases suggests monotonic decrease which is seen also in the Diagram of the Table. Fatality in Shirak has increased in 2015-2017.

Similar comparisons can be made across different marzes also as related other disease groups presented in relevant Tables. The follow disease groups were assessed.

- I60 - I69 Cerebrovascular diseases
- I21 - I23 Acute myocardial infarction
- I63 Cerebral infarction
- C00 - D48 Neoplasms
- K00 - K93 Diseases of digestive system
- C00 - C97 of them malignancies (including lymphoid and haematopoietic tissues)
- I61 - I62 Intracerebral and other nontraumatic intracranial hameorrhage

- S00 - T98 Injury, poisoning and sequelae of other and unspecified effects of external causes
- J00 - J99 Diseases of respiratory system
- E00-E90 Endocrine diseases, nutrition and metabolic disorders
- R00 - R99 Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified
- I64 Stroke, not specified as haemorrhage or infarction
- K50 – K52, K55 – K59 noninfective gastroenteritis and colitis, other functional intestinal disorders
- K25 - K26 of them stomach and duodenal ulcer
- I60 including subarachnoid haemorrhage

Table 92. Hospital fatality of 'I60 - I69 cerebrovascular diseases' group across marzes

I60 - I69 ուղեղի անոթային հիվանդություններ									
Մարզ	2010	2011	2012	2013	2014	2015	2016	2017	Դիագրամ
ՀՀ	16.54%	15.61%	14.62%	14.46%	14.53%	13.36%	13.09%	14.86%	
ԱԳ	7.64%	7.01%	8.59%	7.80%	9.17%	6.19%	5.59%	6.18%	
ԱՄ	16.02%	11.04%	13.60%	8.38%	12.09%	11.32%	9.49%	9.50%	
ԱՐ	8.99%	9.00%	10.39%	7.82%	7.56%	6.82%	6.76%	4.51%	
ԳԵ	2.19%	4.86%	5.56%	4.83%	2.00%	5.88%	6.93%	7.89%	
ԵՐ	20.59%	19.93%	17.48%	19.45%	18.44%	16.67%	15.16%	18.09%	
ԼՈ	13.94%	13.58%	10.98%	12.99%	13.37%	10.90%	11.41%	11.08%	
ԿՈ	14.24%	11.66%	14.60%	9.21%	10.12%	10.63%	11.44%	11.98%	
ՇԻ	13.16%	11.67%	12.91%	14.81%	12.40%	13.56%	17.65%	25.20%	
ՍԵ	16.59%	12.10%	11.46%	6.58%	9.59%	7.03%	8.67%	5.54%	
ՎՋ	8.11%	12.12%	13.16%	9.68%	5.66%	14.71%	5.36%	9.80%	
ՏԱ	6.45%	12.68%	7.69%	6.12%	6.90%	6.57%	4.65%	5.67%	

Table 93 Hospital fatality of 'I21 – I23 Acute myocardial infarction' group across marzes

I21 - I23 սրտամկանի սուր ինֆարկտ									
Մարզ	2010	2011	2012	2013	2014	2015	2016	2017	Դիագրամ
ՀՀ	14.79%	12.33%	13.50%	14.60%	14.67%	15.39%	15.78%	14.45%	
ԱԳ	16.81%	8.79%	9.38%	8.55%	10.24%	10.67%	7.32%	12.99%	
ԱՄ	12.61%	12.24%	11.09%	13.06%	16.31%	22.96%	20.85%	20.60%	
ԱՐ	11.64%	9.86%	10.38%	13.91%	16.19%	19.75%	11.27%	11.56%	
ԳԵ	14.46%	8.96%	9.09%	10.42%	10.98%	11.48%	12.77%	19.78%	
ԵՐ	16.26%	13.66%	16.09%	16.45%	15.10%	15.65%	17.40%	14.30%	
ԼՈ	21.15%	13.83%	15.58%	14.89%	20.73%	18.61%	18.48%	19.75%	
ԿՈ	14.50%	15.15%	15.92%	13.89%	19.35%	18.18%	19.20%	20.77%	
ՇԻ	8.70%	7.85%	6.82%	11.52%	9.92%	11.16%	10.68%	11.68%	
ՍԵ	9.68%	7.04%	7.69%	5.03%	8.00%	4.49%	3.48%	3.75%	
ՎՋ	12.50%	9.52%	6.25%	12.50%	5.26%	16.67%	9.09%	33.33%	
ՏԱ	7.48%	10.97%	7.73%	9.49%	5.58%	7.21%	6.59%	14.69%	

Table 94. Hospital fatality of 'I63 cerebral infarction' group across marzes

I63 ուղեղի ինֆարկտ									
Մարզ	2010	2011	2012	2013	2014	2015	2016	2017	Դիագրամ
ՀՀ	15.15%	16.17%	15.02%	13.49%	14.56%	13.10%	14.35%	17.40%	
ԱԳ	2.56%	2.70%	5.00%	3.81%	4.48%	6.25%	4.26%	9.23%	
ԱՄ	5.36%	1.33%	3.50%	2.75%	4.57%	2.66%	1.17%	1.79%	
ԱՐ	1.96%	0.00%	2.13%	4.07%	8.00%	6.92%	5.26%	2.20%	
ԳԵ	2.75%	2.38%	7.52%	3.97%	4.41%	12.28%	8.54%	6.25%	
ԵՐ	20.25%	24.20%	20.25%	19.95%	19.56%	17.53%	19.12%	23.65%	
ԼՈ	13.43%	16.48%	6.44%	8.28%	13.50%	12.92%	11.67%	8.85%	
ԿՈ	9.52%	7.59%	19.86%	13.53%	15.06%	14.81%	17.76%	21.51%	
ՇԻ	16.89%	12.99%	16.99%	17.53%	13.13%	14.79%	18.77%	25.20%	
ՍՅ	3.90%	8.84%	9.28%	4.55%	5.42%	4.39%	4.57%	3.13%	
ՎՁ	0.00%	9.09%	8.33%	0.00%	10.00%	12.50%	0.00%	33.33%	
ՏԱ	2.33%	5.77%	1.89%	6.90%	4.62%	7.69%	3.90%	5.45%	

Table 95. Hospital fatality of 'C00 - D48 Neoplasms' group across marzes

C00 - D48 Նորագոյացութիւններ									
Մարզ	2010	2011	2012	2013	2014	2015	2016	2017	Դիագրամ
ՀՀ	1.81%	1.66%	1.93%	2.28%	1.87%	1.71%	2.01%	2.37%	
ԱԳ	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
ԱՄ	0.00%	0.93%	4.00%	1.94%	0.68%	1.32%	0.00%	5.41%	
ԱՐ	0.58%	1.55%	0.61%	0.99%	0.78%	0.41%	1.19%	0.95%	
ԳԵ	0.63%	0.00%	0.00%	2.19%	1.59%	0.89%	0.85%	0.00%	
ԵՐ	2.01%	1.78%	2.05%	2.44%	1.95%	1.69%	1.98%	2.32%	
ԼՈ	1.60%	2.99%	3.43%	3.02%	2.22%	3.03%	2.29%	4.73%	
ԿՈ	0.94%	0.00%	0.76%	0.82%	0.60%	0.27%	1.16%	2.77%	
ՇԻ	0.85%	0.86%	0.99%	1.23%	1.77%	3.45%	3.12%	2.88%	
ՍՅ	1.39%	3.27%	3.18%	1.61%	3.23%	2.46%	5.13%	8.33%	
ՎՁ	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
ՏԱ	1.28%	2.90%	1.30%	5.88%	0.00%	2.63%	0.00%	2.70%	

Table 96. Hospital fatality of 'K00 - K93 Diseases of digestive system' group across marzes

K00 - K93 Մարսողական օրգանների հիվանդություններ									
Մարզ	2010	2011	2012	2013	2014	2015	2016	2017	Դիագրամ
ՀՀ	1.57%	1.61%	1.59%	1.74%	1.71%	1.54%	1.91%	1.78%	
ԱԳ	0.00%	1.97%	0.47%	0.47%	0.49%	0.00%	0.86%	0.66%	
ԱՄ	1.68%	1.88%	1.82%	1.46%	1.10%	1.65%	2.43%	2.55%	
ԱՐ	0.95%	1.10%	0.60%	1.11%	1.22%	1.12%	0.32%	0.82%	
ԳԵ	0.35%	0.62%	0.86%	0.34%	0.33%	0.00%	0.63%	0.18%	
ԵՐ	1.76%	1.70%	1.61%	1.94%	1.83%	1.57%	2.09%	1.89%	
ԼՈ	3.06%	1.20%	3.56%	2.29%	2.69%	2.61%	1.69%	2.89%	
ԿՈ	0.56%	1.01%	0.75%	0.25%	0.12%	0.14%	0.13%	0.50%	
ՇԻ	1.17%	2.03%	1.87%	1.67%	2.05%	2.30%	2.48%	1.99%	
ՍԵ	1.49%	1.80%	1.77%	1.48%	2.67%	1.18%	1.65%	0.25%	
ՎՁ	0.00%	0.00%	0.00%	0.49%	0.00%	0.53%	0.56%	0.57%	
ՏԱ	2.46%	0.72%	1.13%	1.11%	0.00%	1.30%	0.82%	1.56%	

Table 97. Hospital fatality of 'C00 - C97 of them malignancies (including lymphoid and haematopoietic tissues' group across marzes

C00 - C97 դրանցից՝ չարորակ նորագոյացություններ (ներառյալ ավշային և արյունաստեղծ հյուսվածքների)									
Մարզ	2010	2011	2012	2013	2014	2015	2016	2017	Դիագրամ
ՀՀ	2.81%	2.72%	3.10%	3.92%	2.84%	2.59%	2.63%	3.22%	
ԱԳ	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	#DIV/0!	
ԱՄ	#DIV/0!	25.00%	33.33%	28.57%	0.00%	9.09%	0.00%	25.00%	
ԱՐ	7.41%	21.74%	11.11%	20.00%	11.76%	11.11%	13.04%	15.38%	
ԳԵ	0.00%	0.00%	0.00%	75.00%	40.00%	6.25%	14.29%	0.00%	
ԵՐ	2.91%	2.67%	3.02%	3.92%	2.72%	2.37%	2.44%	2.95%	
ԼՈ	7.50%	18.75%	26.67%	22.22%	12.12%	12.20%	12.50%	24.24%	
ԿՈ	4.67%	0.00%	1.53%	1.71%	3.26%	1.69%	7.55%	20.93%	
ՇԻ	0.66%	1.42%	1.51%	2.29%	3.19%	8.04%	4.91%	6.28%	
ՍԵ	2.08%	9.09%	7.27%	2.15%	5.62%	4.29%	7.50%	15.00%	
ՎՁ	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
ՏԱ	0.00%	25.00%	33.33%	14.29%	0.00%	8.33%	0.00%	20.00%	

Table 98. Hospital fatality of 'I61 - I62 intracerebral and other nontraumatic intracranial haemorrhage' group across marzes

I61 - I62 ներուղեղային և ոչ վնասվածքային ներգանգային այլ արյունազեղումներ									
Մարզ	2010	2011	2012	2013	2014	2015	2016	2017	Դիագրամ
ՀՀ	43.76%	43.27%	46.37%	45.15%	40.34%	37.78%	39.61%	35.83%	
ԱԳ	75.00%	42.86%	36.36%	23.53%	14.71%	#DIV/0!	8.33%	0.00%	
ԱՄ	84.38%	65.38%	83.87%	57.89%	17.24%	71.43%	69.57%	42.86%	
ԱՐ	12.00%	43.90%	46.43%	83.33%	66.67%	15.79%	69.23%	58.82%	
ԳԵ	0.00%	0.00%	6.98%	8.11%	0.00%	#DIV/0!	12.50%	16.67%	
ԵՐ	43.47%	44.56%	45.77%	46.17%	45.19%	35.72%	40.05%	34.74%	
ԼՈ	70.73%	54.35%	54.17%	52.94%	38.46%	39.29%	42.86%	36.36%	
ԿՈ	44.74%	35.90%	43.75%	37.50%	23.08%	41.67%	41.67%	23.08%	
ՇԻ	55.38%	47.54%	56.25%	55.22%	65.08%	63.79%	58.90%	74.29%	
ՍՅ	29.41%	46.88%	43.33%	45.83%	31.25%	40.91%	30.77%	22.22%	
ՎՋ	60.00%	50.00%	66.67%	75.00%	33.33%	100.00%	33.33%	75.00%	
ՏԱ	33.33%	57.14%	50.00%	21.43%	24.14%	20.51%	6.25%	14.29%	

Table 99. Hospital fatality of 'S00 - T98 Injury, poisoning and sequelae of other and unspecified effects of external causes' group across marzes

S00 - T98 վնասվածքներ, թունավորումներ և արտաքին պատճառների ներգործության որոշ այլ հետևանքներ									
Մարզ	2010	2011	2012	2013	2014	2015	2016	2017	Դիագրամ
ՀՀ	1.71%	1.51%	1.42%	1.51%	1.28%	1.56%	1.51%	1.45%	
ԱԳ	1.03%	0.78%	0.70%	1.50%	1.00%	1.84%	1.14%	1.69%	
ԱՄ	1.95%	2.11%	1.88%	3.20%	2.72%	1.16%	1.17%	1.72%	
ԱՐ	2.59%	1.98%	1.22%	2.34%	1.12%	0.97%	0.57%	0.37%	
ԳԵ	1.42%	1.22%	0.94%	0.52%	0.16%	0.67%	0.36%	0.17%	
ԵՐ	1.53%	1.41%	1.40%	1.46%	1.28%	1.65%	1.63%	1.52%	
ԼՈ	1.56%	2.53%	2.23%	1.43%	1.52%	1.72%	1.20%	1.81%	
ԿՈ	3.58%	0.88%	0.61%	1.50%	0.92%	1.02%	0.80%	0.35%	
ՇԻ	2.64%	2.14%	1.46%	1.68%	1.42%	1.27%	1.72%	1.90%	
ՍՅ	3.14%	1.85%	2.11%	1.42%	1.37%	1.78%	1.93%	0.98%	
ՎՋ	0.00%	2.04%	0.00%	3.85%	5.71%	2.33%	5.00%	2.00%	
ՏԱ	1.98%	1.16%	1.60%	0.64%	0.54%	1.04%	0.00%	1.58%	

Table 100. Hospital fatality of 'J00 - J99 Diseases of digestive system' group across marzes

J00 - J99 Շնչառական օրգանների հիվանդություններ									
Մարզ	2010	2011	2012	2013	2014	2015	2016	2017	Դիագրամ
ՀՀ	1.41%	2.77%	2.66%	2.38%	2.33%	3.37%	2.06%	1.15%	
ԱԳ	0.45%	1.17%	1.43%	0.00%	1.31%	0.00%	1.54%	4.73%	
ԱՄ	1.16%	1.19%	1.20%	2.48%	0.83%	1.44%	2.01%	0.54%	
ԱՐ	2.09%	2.62%	1.50%	2.37%	3.31%	2.42%	3.11%	1.01%	
ԳԵ	0.00%	0.74%	0.81%	0.29%	0.45%	1.26%	0.60%	0.68%	
ԵՐ	1.72%	3.56%	3.51%	3.04%	3.02%	4.50%	2.45%	1.11%	
ԼՈ	0.83%	1.20%	0.69%	1.39%	1.66%	0.81%	1.19%	1.06%	
ԿՈ	0.87%	0.28%	0.78%	1.52%	0.48%	1.09%	0.54%	0.75%	
ՇԻ	0.92%	1.92%	0.91%	0.60%	1.31%	0.57%	1.20%	1.80%	
ՍՅ	0.00%	0.41%	0.42%	0.26%	0.23%	0.83%	1.38%	2.67%	
ՎՋ	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.78%	0.00%	
ՏՍ	0.00%	0.31%	0.00%	0.24%	0.72%	0.15%	1.09%	0.46%	

Table 101. Hospital fatality of 'E00-E90 Endocrine diseases, nutrition and metabolic disorders' group across marzes

E00-E90 Ներզատական համակարգի հիվանդություններ, սնուցման և նյութափոխանակության խանգարումներ									
Մարզ	2010	2011	2012	2013	2014	2015	2016	2017	Դիագրամ
ՀՀ	1.69%	1.62%	1.32%	1.24%	1.10%	1.15%	0.97%	1.33%	
ԱԳ	0.00%	2.94%	0.00%	2.67%	0.74%	0.00%	3.51%	4.41%	
ԱՄ	1.75%	0.99%	1.36%	0.67%	0.22%	0.97%	0.83%	0.52%	
ԱՐ	3.17%	2.82%	1.27%	0.43%	1.37%	2.08%	0.62%	3.36%	
ԳԵ	0.95%	0.48%	0.51%	0.00%	1.05%	1.34%	0.99%	1.18%	
ԵՐ	1.61%	1.64%	1.36%	1.33%	1.11%	1.24%	0.96%	1.31%	
ԼՈ	3.04%	1.05%	1.37%	2.15%	1.95%	1.43%	0.74%	2.11%	
ԿՈ	1.55%	1.23%	1.32%	0.58%	0.87%	0.00%	0.61%	0.00%	
ՇԻ	1.16%	2.68%	0.68%	0.48%	1.01%	0.62%	1.26%	0.54%	
ՍՅ	5.97%	0.00%	2.74%	0.00%	0.73%	0.00%	0.00%	2.15%	
ՎՋ	0.00%	0.00%	0.00%	0.00%	4.76%	0.00%	16.67%	0.00%	
ՏՍ	2.74%	3.33%	0.00%	2.53%	1.57%	0.00%	2.78%	0.00%	

Table 102. Hospital fatality of 'R00 - R99 Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified' group across marzes

R00 - R99 Գլխինիկական և լաբորատոր հետազոտ-ների ընթացքում բացահայտված և այլ խորագրերում չդասակարգված ախտանիշներ, հատկանիշներ և նորմայից շեղումներ									
Մարզ	2010	2011	2012	2013	2014	2015	2016	2017	Դիագրամ
ՀՀ	8.03%	12.85%	11.17%	8.97%	8.61%	9.03%	9.79%	8.85%	
ԱԳ	31.43%	30.00%	10.00%	14.63%	2.50%	23.73%	8.20%	8.70%	
ԱՄ	0.00%	0.00%	15.00%	25.00%	0.00%	11.67%	16.36%	17.78%	
ԱՐ	0.00%	10.00%	11.11%	0.00%	40.00%	0.00%	25.00%	16.67%	
ԳԵ	4.62%	5.63%	4.59%	4.63%	7.77%	1.06%	8.70%	3.03%	
ԵՐ	8.09%	13.10%	10.37%	7.51%	8.02%	7.62%	7.86%	7.91%	
ԼՈ	10.53%	18.52%	31.71%	34.21%	31.58%	24.00%	29.33%	26.79%	
ԿՈ	11.11%	0.00%	18.75%	5.71%	18.75%	41.67%	22.22%	16.00%	
ՇԻ	6.25%	0.00%	33.33%	0.00%	0.00%	0.00%	0.00%	0.00%	
ՍԵ	0.00%	16.67%	63.64%	26.15%	19.05%	25.00%	28.85%	17.07%	
ՎՋ	0.00%	#DIV/0!	25.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
ՏԱ	0.00%	6.67%	0.00%	8.57%	11.43%	7.84%	15.38%	6.90%	

Table 103. Hospital fatality of 'I64 stroke, not specified as haemorrhage or infarction' group across marzes

I64 ինսուլտ, չճշտված որպես արյունազեղում կամ ինֆարկտ									
Մարզ	2010	2011	2012	2013	2014	2015	2016	2017	Դիագրամ
ՀՀ	15.51%	15.07%	14.30%	16.80%	23.43%	20.14%	19.01%	17.67%	
ԱԳ	2.13%	0.00%	3.45%	11.11%	28.57%	6.67%	10.00%	16.22%	
ԱՄ	31.25%	32.61%	28.57%	15.93%	49.37%	41.84%	38.67%	34.31%	
ԱՐ	6.47%	5.60%	6.51%	6.63%	7.84%	9.32%	8.49%	4.12%	
ԳԵ	25.00%	#DIV/0!	40.00%	33.33%	5.56%	3.97%	12.20%	17.14%	
ԵՐ	13.81%	14.01%	13.99%	17.33%	24.21%	20.83%	18.81%	13.65%	
ԼՈ	57.14%	36.36%	64.71%	79.49%	66.67%	66.67%	68.42%	51.72%	
ԿՈ	26.47%	40.00%	17.65%	11.63%	15.63%	19.12%	12.35%	12.77%	
ՇԻ	54.55%	50.00%	20.00%	60.00%	33.33%	40.00%	50.00%	72.73%	
ՍԵ	43.33%	25.64%	17.02%	6.82%	20.75%	24.44%	25.00%	14.04%	
ՎՋ	0.00%	0.00%	0.00%	0.00%	9.09%	33.33%	28.57%	#DIV/0!	
ՏԱ	3.33%	12.50%	20.00%	0.00%	0.00%	0.00%	0.00%	14.29%	

Table 104. Hospital fatality of 'K50 – K52, K55 – K59 noninfective gastroenteritis and colitis, other functional intestinal disorders' group across marzes

K50 – K52, K55 – K59 ոչ ինֆեկցիոն էստերիտ և կոլիտ, աղիների այլ հիվանդություններ									
Մարզ	2010	2011	2012	2013	2014	2015	2016	2017	Դիագրամ
ՀՀ	4.13%	3.42%	3.07%	3.62%	4.34%	2.52%	4.03%	6.77%	
ԱԳ	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
ԱՄ	0.00%	28.57%	0.00%	0.42%	0.00%	0.00%	0.00%	33.33%	
ԱՐ	0.00%	0.00%	0.00%	0.00%	0.00%	10.00%	0.00%	4.35%	
ԳԵ	0.00%	2.50%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	
ԵՐ	4.13%	3.78%	3.81%	4.50%	4.43%	1.77%	4.09%	7.27%	
ԼՈ	13.95%	0.00%	9.62%	6.25%	11.43%	9.84%	5.45%	8.70%	
ԿՈ	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
ՇԻ	8.11%	1.67%	3.32%	4.95%	7.89%	6.70%	5.07%	5.75%	
ՍՅ	7.69%	2.94%	2.00%	7.14%	0.00%	0.00%	0.00%	0.00%	
ՎՋ	0.00%	0.00%	0.00%	0.00%	0.00%	50.00%	0.00%	#DIV/0!	
ՏԱ	0.00%	20.00%	0.00%	0.00%	0.00%	9.09%	15.38%	0.00%	

Table 105. Hospital fatality of 'K25 - K26 of them stomach and duodenal ulcer' group across marzes

K25 - K26 դրանցից՝ ստամոքսի և տասներկու մատնյա աղու խոց									
Մարզ	2010	2011	2012	2013	2014	2015	2016	2017	Դիագրամ
ՀՀ	3.44%	3.74%	3.89%	4.06%	3.98%	4.16%	5.02%	4.73%	
ԱԳ	0.00%	5.56%	3.33%	0.00%	5.56%	0.00%	0.00%	7.69%	
ԱՄ	6.12%	1.56%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
ԱՐ	1.52%	2.25%	1.28%	0.00%	6.06%	9.09%	3.23%	4.35%	
ԳԵ	1.01%	5.45%	8.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
ԵՐ	3.16%	3.77%	3.55%	4.46%	3.34%	3.59%	4.44%	4.36%	
ԼՈ	7.96%	1.87%	10.53%	4.40%	8.77%	11.36%	9.18%	10.23%	
ԿՈ	4.65%	1.96%	3.45%	0.00%	2.63%	0.00%	0.00%	4.00%	
ՇԻ	5.38%	7.78%	5.88%	6.00%	10.00%	9.60%	11.04%	8.26%	
ՍՅ	1.28%	1.79%	1.27%	1.32%	4.88%	2.47%	13.16%	0.00%	
ՎՋ	0.00%	0.00%	0.00%	6.67%	0.00%	0.00%	0.00%	0.00%	
ՏԱ	2.08%	0.00%	4.88%	4.65%	0.00%	2.38%	0.00%	4.35%	

Table106. Hospital fatality of 'I60 including subarachnoid haemorrhage' group across marzes

I60 աղբյուր՝ ենթարախնոթիղալ արյունազեղում									
Մարզ	2010	2011	2012	2013	2014	2015	2016	2017	Դիագրամ
ՀՀ	38.24%	29.10%	15.33%	21.09%	25.98%	30.70%	33.83%	28.38%	
ԱԳ	28.57%	0.00%	63.64%	42.86%	0.00%	50.00%	0.00%	0.00%	
ԱՄ	-	-	-	-	-	100.00%	88.89%	58.33%	
ԱՐ	66.67%	56.25%	52.63%	50.00%	40.00%	53.85%	80.00%	40.00%	
ԳԵ	0.00%	19.35%	5.88%	6.06%	0.00%	-	-	-	
ԵՐ	40.96%	31.46%	10.17%	23.48%	32.98%	36.43%	31.34%	32.00%	
ԼՈ	46.15%	39.13%	47.62%	31.25%	43.48%	15.00%	40.00%	45.45%	
ՎՈ	22.22%	11.11%	11.76%	0.00%	27.27%	28.57%	16.67%	0.00%	
ՇԻ	0.00%	0.00%	-	-	-	-	-	-	
ՍԵ	15.38%	7.69%	27.27%	9.09%	8.33%	0.00%	21.43%	25.00%	
ՎՁ	-	0.00%	0.00%	0.00%	-	50.00%	0.00%	-	
ՏԱ	42.86%	33.33%	16.67%	25.00%	22.22%	0.00%	57.14%	25.00%	

15 Bed capacity and utilization

General overview

General overview of marz bed capacity is based on the marz population, regional hospital admissions, annual bed occupancy of regional hospitals as well as the average length of hospital stay in days.

Relevant data are presented in Figure 92-A, B, C, D

Figure 92. General overview of bed capacity, 2017

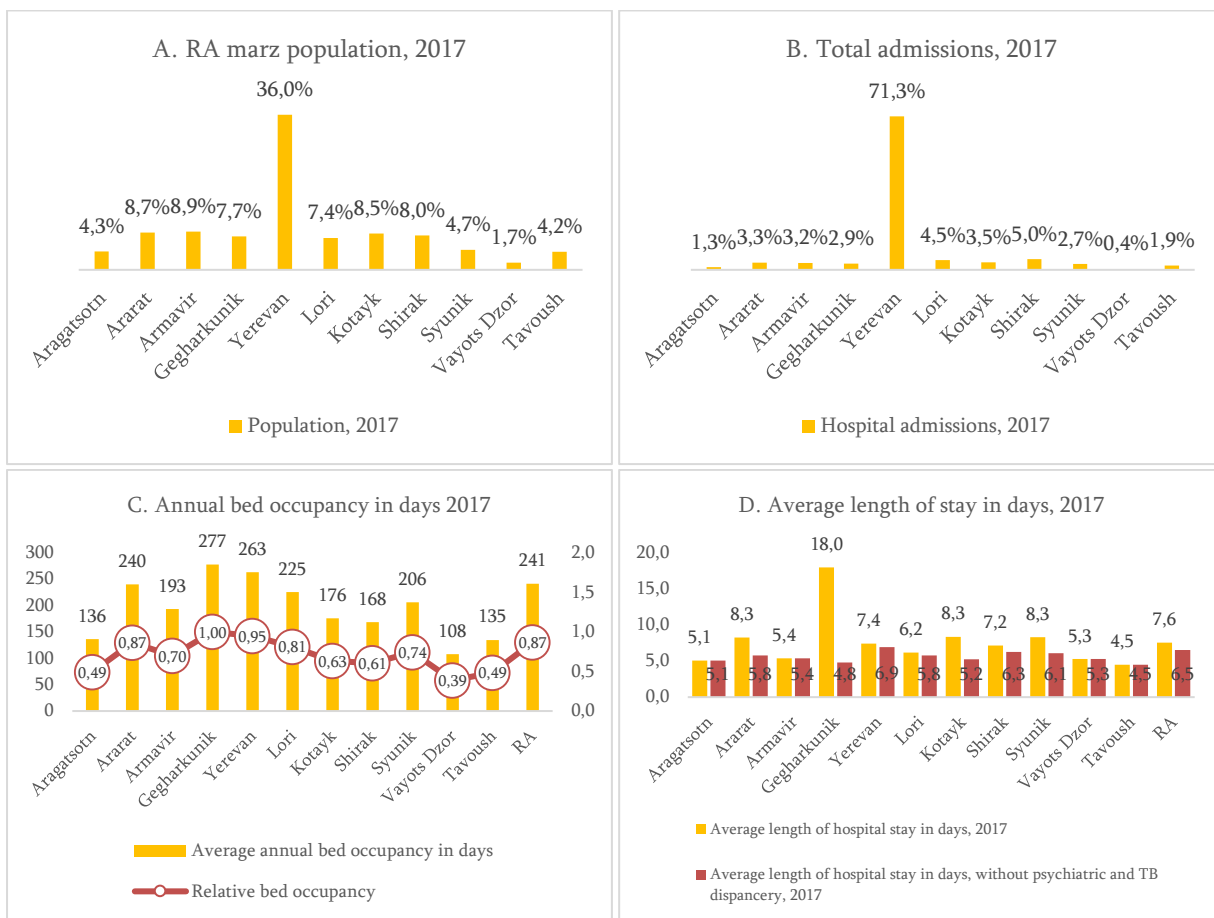


Table 107. Hospitals with psychiatric, tuberculosis haematology departments, 2017

Marz	Residence	Code	Healthcare facility
Ararat	Armash	13065	Armash Health Center after academician A. Hayrian (adults)
Ararat	Armash	13065	Armash Health Center after academician A. Hayrian (children's)
Gegharkunik	Sevan	41024	Sevan psychiatric hospital
Lori	Vanadzor	26122	Lori regional psychiatric dispensary
Kotayk	Yeghvard	41023	Clinic of neurosis and other psychological disorders
Kotayk	Abovyan	41110	Republican TB Dispansery
Shirak	Gyumri	29122	Gyumri Mental Health Center
Syunik	Kapan	72122	Syunik Regional Neuropsychiatric Dispansery
Yerevan	Yerevan	40042	ArtMed medical rehabilitation center
Yerevan	Yerevan	40098	Nubarashen psychiatric center
Yerevan	Yerevan	40113	NORK Republican mental health center
Yerevan	Yerevan	40122	Avan psychiatric clinic

As the Figure suggests patients admitted at Yerevan hospital settings significantly outnumber the number of population, as opposed to marzes. Yerevan population shares 36.0% of the country population, however Yerevan hospitals admitted 71.3% of all patients. On the one hand it is explained by majority of specialized clinics being focused in the capital, on the other hand, this tendency is the reflection of people's health behavior.

Annual bed occupancy is the highest in Gegharkunik, because Sevan Psychiatric Hospital is located in this marz. In 2017 Gegharkunik Marz had 7 hospitals with total bed capacity of 750, of which 420 were in the Sevan Psychiatric Hospital. In 2017 annual bed occupancy of this clinic was 365 days.

Figure 93. Classification of marzes by utilization of hospital bed capacity, 2017

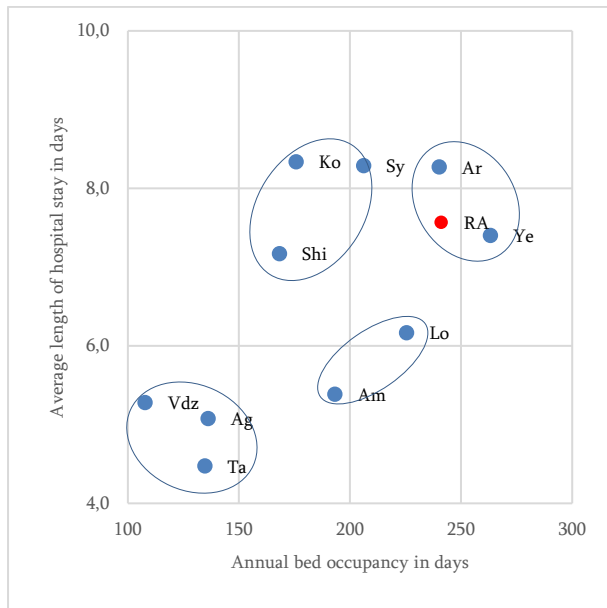


Table 108. The correlation of hospital admissions and marz population

Մարզ	2010	2011	2012	2013	2014	2015	2016	2017	Դիագրամ
Արագածոտն	0.39	0.37	0.35	0.35	0.34	0.32	0.31	0.30	
Արարատ	0.44	0.43	0.42	0.42	0.43	0.43	0.40	0.38	
Արմավիր	0.35	0.35	0.36	0.38	0.38	0.37	0.38	0.36	
Գեղարքունիք	0.43	0.43	0.39	0.41	0.40	0.41	0.40	0.38	
ք. Երևան	1.92	1.94	1.99	1.94	1.94	1.95	1.95	1.98	
Լոռի	0.65	0.62	0.59	0.60	0.61	0.62	0.62	0.61	
Կոտայք	0.54	0.52	0.47	0.50	0.48	0.46	0.45	0.42	
Շիրակ	0.74	0.69	0.66	0.70	0.69	0.66	0.65	0.62	
Սյունիք	0.54	0.56	0.56	0.60	0.60	0.57	0.58	0.58	
Վայոց ձոր	0.34	0.32	0.28	0.28	0.29	0.27	0.29	0.26	
Տավուշ	0.43	0.40	0.38	0.42	0.44	0.46	0.48	0.47	

