slukhu v Yakutii, Tyve i Bashkortostane: mneniye slyshashchikh roditeley o prichinakh poteri slukha u rebonka s posleduyushchim sravneniyem s rezul'tatami DNK-testirovaniya gena GJB2 (Sh26) [Analysis of the survey of parents of hearing-impaired children in Yakutia, Tuva and Bashkortostan: the opinion of hearing parents about the causes of hearing loss in the child, followed by a comparison with the results of DNA testing of the gene *GJB2* (Cx 26)] Meditsinskaya genetika [Medical genetics]. Moscow, 2014, V.13, №1, p.8-17 https://www.medgenjournal.ru/jour/issue/viewIssue/13/13

2. Barashkov N.A., Teryutin F.M., Pshennikova V.G., Solov'yev A.V., Fedorova S.A. Molekulyarno-geneticheskiye metody izucheniya nasledstvennykh bolezney na primere autosomno-retsessivnoy glukhoty 1 A tipa [Molecular genetic methods for studying hereditary diseases on the example of autosomal recessive deafness type 1 A] Izdatel'skiy dom SVFU [SVFU Publishing house]. Yakutsk, 2017.

3. Autosomal recessive deafness 1A (DFNB1A) in Yakut population isolate in Eastern Siberia: extensive accumulation of the splice site mutation IVS1+1G>A in *GJB2* gene as a result of founder effect / N.A. Barashkov [et al.] // Journal of Human Genetics. – 2011. – V.56. – N-8. – P. 631-639. DOI: 10.1038/jhg.2011.72

4. Associated with GJB2 Single Mutation IVS1+1G>A in the Yakut Population Isolate in Eastern Siberia / N.A. Barashkov [et al.] / PLoS One. - 2014. - Vol. 9(6). - e100848 DOI: 10.1371/journal.pone.0100848

5. Effect of Pre-test Genetic Counseling for Deaf Adults on Knowledge of Genetic Testing / Baldwin E.E [et al.] // J Genet Counsel. - 2012. - Vol. 21, №2. - P.256-272. DOI: 10.1007/s10897-011-9398-1

6. Middleton A. Prenatal diagnosis for inherited deafness: what is the potential demand? / A Middleton, J Hewison, R. Mueller // J Genet Couns 2001; 10: 121–131. https://www.ncbi.nlm.nih.gov/pubmed/11767801

7. Mitchel R.E. When parents are deaf versus hard of hearing: patterns of sign use and school placement of deaf and hard-of-hearing children / R.E. Mitchel, M.A. Karchmer. // J Deaf Stud Deaf Educ. - 2004; 9(2):133–152. DOI: 10.1093/deafed/enh017

8. Opinions of hearing parents about the causes of hearing impairment of their children with biallelic *GJB2* mutations / Solovyev A.V. [et al.] // Journal of Community Genetics. 2017. Jul;8(3):167-171. DOI: 10.1007/s12687-017-0299-3

9. A Prospective, Longitudinal Study of the Impact of GJB2/GJB6 Genetic Testing on the Beliefs and Attitudes of Parents of Deaf and Hard-of-Hearing Infants / C.G. Palmer, A. Martinez, M. Fox [et al.] // Am J Med Genet A. - 2009 - Vol. 149A, №6. - P.1169-1182 DOI: 10.1002/ajmg.a.32853

10. Schein JD. The deaf population of the United States / J.D. Schein, M.T. Delk // National Association of the deaf: 1–336 https://eric.ed.gov/?id=ED101517

11. Spectrum and Frequency of the *GJB2* Gene Pathogenic Variants in a Large Cohort of Patients with Hearing Impairment Living in a Subarctic Region of Russia (the Sakha Republic) / N.A. Barashkov, [et al.] // PLoS One. - 2016. - Vol. 11(5):e0156300. DOI: 10.1371/journal.pone.0156300

The authors

M.K. Ammosov North-Eastern Federal University:

1. CHERDONOVA Alexandra Matveyevna - student, cherdonovasasha96@gmail.com, SOLOVYEV Aisen Vasilievich - junior researcher, nelloann@mail.ru,

2. RAFAILOV Adum Mikhaylovich - Ph.D, assistant professor, archinay@mail.ru, ROMANOV Georgii Prokopievich - engineer, gpromanov@gmail.com,

3. FEDOROVA Sardana Arkad'evna - Ph.D, head lab, sardaanafedorova@mail.ru/

Yakut Science Center of Complex Medical Problems:

4. PSHENNIKOVA Vera Gennadiyevna - Ph.D, head. lab., psennikovavera@mail.ru, BARASHKOV Nikolay Alekseevich - Ph.D, head. lab., barashkov2004@mail.ru,

5. KONONOVA Sardana Kononovna - Ph.D, senior researcher, konsard@rambler.ru.

6. TERYUTIN FEDOR M. - Ph.D., Researcher, Yakut Scientific Center of Complex Medical Problems, 4, Sergelyakhskoe shosse, Yakutsk, Sakha Republic, 677010, Russian Federation. Phone: +7 (4112) 32-19-81, e-mail: rest26@mail.ru.

ORGANIZATION OF HEALTH, MEDICAL SCIENCE AND EDUCATION

S.S. Sleptsova, N.M. Gogolev, O.M. Zamorshchikova

ANALYSIS OF THE INFECTIOUS SERVICE IN THE REPUBLIC OF SAKHA (YAKUTIA)

DOI 10.25789/YMJ.2018.64.19

ABSTRACT

The main results of the infectious service were analyzed for the study of its state in the Republic of Sakha (Yakutia) during 2000-2017. Also there were given comparative characteristics with analogical indicators in the Russian Federation. According to results of 2017, the growth of morbidity in 12 infections was recorded in the Republic. Due to persisting unfavorable situation, the problem of realization of medical service to infectious patients demands to take system arrangements on deficit reduction of infectious diseases' specialists and infectious beds in hospitals; to increase financing of current medical care in the Republic of Sakha (Yakutia).

Keywords: infectious service, morbidity, infectious diseases, personnel, the death rate from infectious diseases.

Introduction

The epidemiological situation is intensive in the Republic of Sakha (Yakutia). The spread of the human immunodeficiency virus among the population and an increase in the cumulative number of infected and sick people are continuing; tuberculosis indicators have a steady downward trend. However, comparing with the average of Russian indicators, they continue to keep a sufficiently high level. The incidence of acute respiratory viral infections in the Republic of Sakha (Yakutia) is higher than the incidence rate in the Russian Federation by 45%, in the Far Eastern Federal District by 50%. Last two years expansion of the incidence of whooping cough and enterovirus infection is noted in the Republic, which is connected with contiguous cyclical rise in the incidence rate. In 2017, the incidence

rate of acute viral hepatitis in the country is 18.5% higher than last year, which is caused by an increase in the incidence of viral hepatitis A 3.9 times, while a decrease in the incidence of hepatitis B virus by 2.5 times, hepatitis C in 2,1 times. The epidemiological and epizootic situation of natural focal and zooanthroponotic infections continues to be also complex and intensive. According to retrospective epizootic-epidemiological analysis, 14 nosological forms of infectious diseases pathogens circulate, including tularemia, leptospirosis, listeriosis, pseudotuberculosis, iersiniosis and hemorrhagic fever with kidney syndrome [3].

The problems, which were arisen in the Health Care System of the Russian Federation since the beginning of 90s, are insufficient financing by Government and shortage of medical stuff. Thereby, capacity of infectious service of Russia substantially decreased during the previous period. Provision index of infectious beds in hospitals has reduced to 52% from 1990 to 2014; provision indicator of infectious diseases' specialists decreased by 16% from 2010 to 2015. According to Russian Statistics, in 2016 the number of specialists, working at the state medical organizations, shortened in 2122 people [5]. In the Republic of Sakha (Yakutia) the number of infectious beds decreased to 30,8% from 2010 to 2017; and number of infectious diseases' specialists keeps 0.6 per 10.000 population without significant dynamics.

Research aim - to study contemporary state of the infectious service in the Republic of Sakha (Yakutia) based on analysis of its main indicators during the period 2000 to 2017.

Data and methodology of the study. Reporting data of medical organizations and the Ministry of Health of the Republic of Sakha for 2000-2017 are applied in the analysis, as well as statistic data of demographic state and morbidity compound in the Republic, statistic data of basic indicators of diseases in Russia; also, materials of case studies of infectious service issues. There was used graphical method of comparative analysis and Software of MS Excel to show line chart of data.

Results and discussion. In agreement with official facts, dynamics of improvement of demographic and health indicators of population from 2005 to 2013 in Russia slowed down for last three years [5]. For the last 3 years, the tendency of reducing the death rate is observed by demographic of the Republic of Sakha (Fig. 1). As reported by Russian Statistics from 2017, in the Republic the main reasons of the death were non-infectious diseases: as circulatory system illness – 44, 4%, neoplasia – 16, 8%, inner causes – 16, 1%, that correspond the mortality compound in Russia and Far Eastern Federal District. Specific gravity of the main reasons of the population's death is 77, 3%. 127 people have died by infectious and parasitic diseases, which is more than 1% of the whole number of deceased. In the Republic of Sakha (Yakutia), expected life duration grows up to 71, 68 years old on 2017 that is lower in 1.02 year than national indicators [4].

Confirming to results of 2017, in the Republic the growth of acute intestinal infections incidence is checked up adjusted etiology on 12,8%, including virus intestinal infectious on 22,9%, rotavirus infections of them on 25,6%, enterovirus infections on 12,2%, acute hepatitis in 3.8 times, whooping cough in 2.3 times, infectious mononucleosis on 34,3%, ARVI on 5%, bacterial community-acquired pneumonia on 32,9%, as well as caused by pneumococci in 2.6 times. Excess of Russian indicators of diseases in average is registered by infections as follows: enterovirus infections in 2 times, salmonellosis on 27,7%, ARVI on 31,2%, chronic virus hepatitis B in 3.6 times, chronic virus hepatitis C in 1.5 times, careering of chronic virus hepatitis B on 32,7%, whooping cough in 2.9 times, varicella on 11,7% [3].

Total death rate from infectious diseases in the Republic of Sakha (Yakutia) has grown in 1.15 times from 2000 to 2017 and consisted 13.2 cases per 10000 population. The Figure 2 presents comparative diagram of death rate from infectious diseases in the Russian Federation, where the results in the Republic is lower in 1.5-2 times comparing with national indicators [4].

Now, constitutional and primordial incidences of infectious diseases in the Republic have tendency to constant reduction. Thus in studied period, constitutional incidence of infectious diseases decreased on 37,1%, from 4274,3 to 2685,2 per 100000 population respectively (Figure 3). Here with constitutional incidence of population in the Republic increased on 25,8% by the main classes of diseases from 2000 to 2016; 7735,0 to 10438,4 per 10000 population [4].

Organization of infectious services in the Russian Federation presented by infectious diseases rooms, infectious units of multi-field hospitals, municipal and regional infectious hospitals, some of which are the platform for the department of infectious diseases and scientific research institutes [2]. Adult infectious unit of the "Municipal Hospital" for 123 beds in Yakutsk, and 24 infectious units for 164 beds hosted by municipal and central regional hospitals introduce in-patient infectious service of the Republic. In total 390 infectious beds are in Yakutia.

As of 2017, 65 specialists work in infectious service of the Republic of Sakha (Yakutia). They are infectious diseases' specialists of republican and administrative faculties, members of the department of the infectious diseases, phthisiology and dermathovenerology of the NEFU Institute of Medicine, medical residents

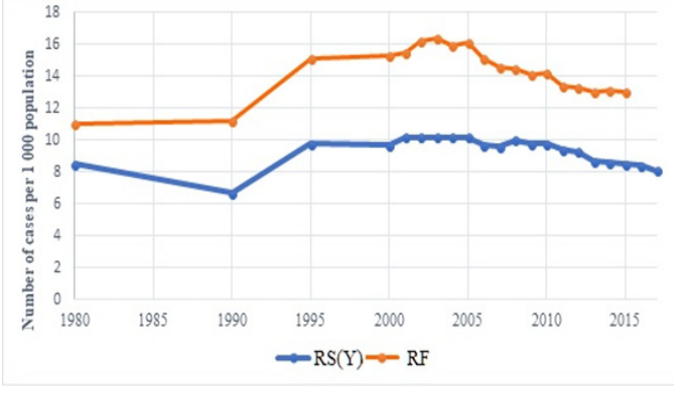

Fig.1. Overall death rate dynamics in the Republic of Sakha (Yakutia) comparing with the Russian Federation

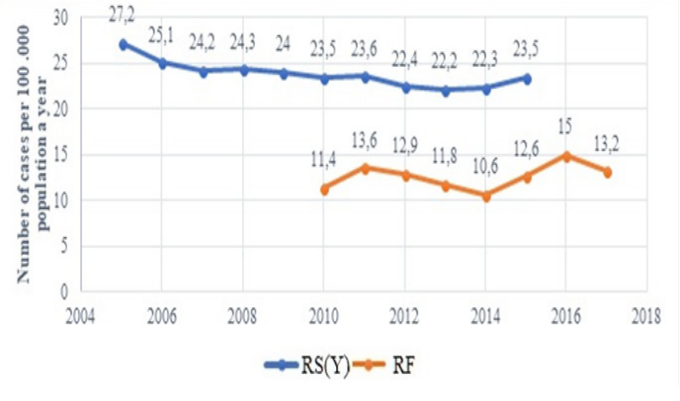

Fig.2. Dynamics of the death rate from infectious diseases in the Republic of Sakha (Yakutia) in comparison with Russian Federation

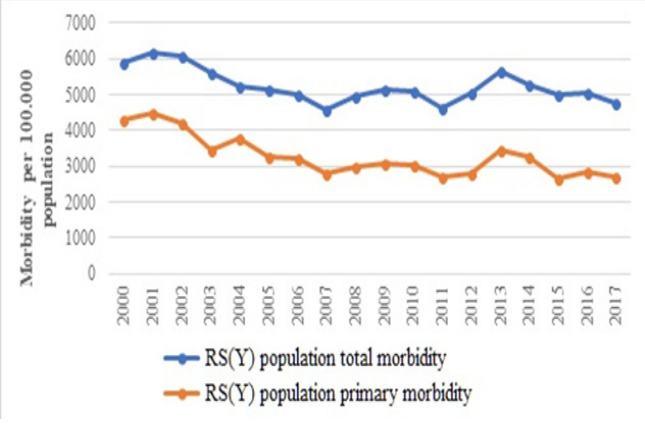

Fig.3. Dynamics of infectious diseases incidence in the Republic of Sakha (Yakutia)

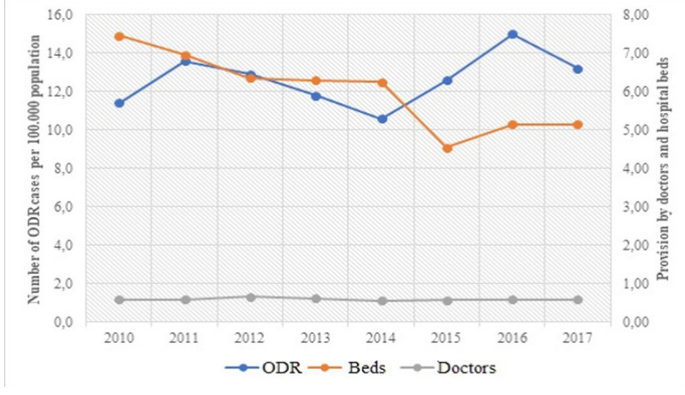

Fig.4. The dynamics of the overall death rate (ODR) and supply of infectious diseases' doctors and infectious beds in the Republic of Sakha (Yakutia) in the period of 2000 to 2017

and graduate students, from which 25 specialists (47,2%) work in Yakutsk, 29 specialists (52,7%) are in regions. Staff composition consists of 46, 4% doctors with a higher qualifying category, 16, 1% a first level and 7, 1% a second-level qualifications.

General categorization of doctors equals 69, 6%, that is explained by a large number of young specialists under 35 years old (36, 6%) in staff, the number of retirement specialists is 43, 6 %. Among infections disease specialists in the Republic, there are 12 excellent workers (17,9%) of Public Health of Yakutia, 9 excellent workers (13,4%) of Public Health of Russia, 3 candidates of Medical Science (4,5%); 2 habilitated doctors (2,9%). On the territory of the Republic 9 regions from 34 do not have infectious specialists; there are Allaikhovskiy, Abyiskiy, Anabarskiy, Eveno-Bytantaiskiy, Momsky, Ust-Mayskiy, Kobyayskiy, Zhiganskiy, Namsky regions.

There were applied comparison of sufficiency indicators of infections specialists and beds in hospitals on the dynamics of the death rate from infectious diseases. As it is shown on the Figure 4, the growth of the death rate from infectious incidence was followed by reduction of bedspace on 30,8% during the studied period.

Analogical works on the analysis of the indicators of infectious service in the Russian Federation were made by group of authors under the supervision of Academic of RAS (Russian Academy of Sciences) N. D. Yushchuk and principal of High School Organization and Management of Health Care Service G. E. Ulumbekova, where the similar results were taken. According to their analysis, unsatisfactory indicators of the death rate from some of infectious and parasitic diseases connect with steady reduction of infectious service capacity; namely lowering of the number of beds in infectious hospitals on 52% from 1990 to 2014; and decreasing of infectiologists sufficiency on 16%from 2010 to 2014. This regressive analysis shows that redundancies of infectiologists bring to one more case of the death from infectious diseases [1].

Conclusion. Epidemiological situation of infectious diseases in Yakutia that has developed in recent years continues to be unstable in spite of significant achievements in the Health Care System. In addition, the growth of sickness rate from 12 infectious nosology is observed in the Republic as in the Russian Federation. The death rate from infectious diseases increased in 1.15 times from 2010 to 2017 and was 13.2 cases per 100000 population. This is followed by reduction of bedspace on 30, 8%.

In view of the above, organization of medical service to infectious diseases calls for systemic actions in lowering the deficit of infectious beds and hospitals of the Republic with appropriate increase of funding in the given medical care.

References

1. Yushchuk N.D. Ulumbekova G.E. Palevsky S.A. Ginoyan A.B. Kalashnikov A.V. Akberdieva E.A. Analiz osnovnykh pokazatelej deyatel'nosti infektsionnoj sluzhby Rossijskoj Federatsii [Analysis of the main indicators of infectious diseases Service of the Russian Federation] Zhurnal Infektsionnye bolezni [Infectious illness journal], №3, Moscow: GEOTAR-Media, 2016, pp. 13-22. URL:https://cyberleninka.ru/article/n/analiz-osnovnyh-pokazateley-deyatelnosti-infektsionnoy-sluzhby-rossiyskoy-federatsii

2. Yuschuk N.D. Vengerov Y.Ya. Infekcionny`e bolezni: nacional`noe rukovodstvo [Infectious diseases: national leadership] Seriya Nacional`ny`e rukovodstva [National guidelines] Moscow: GEOTAR-Media, 2015, pp. 17-20. URL: http://www.rosmedlib.ru/book/ISBN9785970432655.html

3. O sostoyanii sanitarno-e`pidemiologicheskogo blagopoluchiya naseleniya v Rossijskoj Federacii po Respublike Saxa (Yakutiya) za 2017 god [On the state of sanitary and epidemiological welfare of the population in the Russian Federation for the Republic of Sakha (Yakutia) in 2017] Gosudarstvenny`j doklad Federal`noi sluzhbyi po nadzoru v sfere zashhity` prav potrebitelej i blagopoluchiya cheloveka po Respublike Saxa (Yakutiya) [State report of Federal service on surveillance for consumer rights protection and human wellbeing] Yakutsk, 2017, pp 98-191. URL: http://fguz-sakha.ru/gos_doklad

4. Baza danny`x Rosstat [Database of Rosstat] URL: http://www.gks.ru

5. Baza danny`x Saxa (Yakutiya) stat [Database of Sakha (Yakutia) stat] URL:http://sakha.gks.ru

The authors

1. Sleptsova Snezhana Spiridonovna - MD, Doctor of Medical Sciences, Head of Department of Infectious Diseases, phthisiatrics and dermatovenerology of Medical Institute the North-Eastern Federal University named after M.K. Ammosov, 677016, Yakutsk, ul. Oyunsky, 27, Russia. Tel. 8-914-2718770. E-mail:sssleptsova@yandex.ru

2. Gogolev Nikolai Mihailovich - candidate of Medical Sciences, Director of Medical Institute the North-Eastern Federal University named after M.K. Ammosov, 677016, Yakutsk, ul. Oyunsky, 27, Russia. Tel. 8-924-1687966. E-mail: gogrcemp@mail.ru

3. Zamorshchikova Olga Mihailovna - resident of Medical Institute the North-Eastern Federal University named after M.K. Ammosov, 677016, Yakutsk, ul. Oyunsky, 27, Russia, 8-924-866-41-95. E-mail: olya-botty@mail.ru.