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MAINTENANCE AND HEALTH PROMOTION OF ADOLESCENT – PLEDGE OF SUSTAINABLE DEVELOPMENT OF SOCIETY AND STATE (CURRENT STATUS OF THE ISSUE)

The article presents submitted data of population dynamics of adolescent (10-17 years old) in Russian Federation over the period of 1995—2012. In the presence of reduction by 8,2 million of adolescent population the top-priority task of adolescent health and life maintenance was declared. The article deals with physical growth and development statistics of schoolchildren of 15-19 years old: as opposed to peers of 80-es increase of length, body weight and circumference of chest as well as reduction of muscle strength is observed. On the ground of the data analysis of authoritative statistical reporting the increase of morbidity rate by factor of 1,4 was detected over the last 10 years. It has been established that the true morbidity level is above the authoritative by the factor of 1,5. The number of adolescent at the age of 10-15 referred to 1st and 2nd health groups decreased almost on 20%, at the same time pathological processes become chronic. The reproductive and mental health of adolescent at the age of 15-17 years was analyzed over the last 10 years. The rate of mental health disorders in adolescent living in country is more than in the peers living in cities by the factor of 1,2-1,4. The rate of period disorders, salpingitis and oothecitis increased in girls under 10 years and ones at the age of 15-17. The rate and structure of child disability was analyzed. It was fixed that leading causes of adolescent disability are mental disorders, diseases of nervous system, congenital anomalies. The most commonly encountered seed of physical dysfunction is capacity to study. It is demonstrated that there is misreporting on both child disability in totally and adolescent disability in Russian Federation. After the analysis of particular provisions of legislation concerning medical and social issues of child disability the weak points were detected. The morbidity rate of adolescent was studied: primary cause of death in adolescent is extrinsic factor (more than 70%), the leading one is suicide. Road traffic accidents and accidental poisoning comes then. The medical and social consequences of high morbidity, disability and mortality rates of adolescent were considered as labour, reproductive and military potential of society and state. Short-term and long-term plans focused on decrease of morbidity, disability and mortality rates of adolescent were formulated on the basis of submitted data. search for solution is supposed to be nationwide and local as well (public health service, education, social protection).

Keywords: *adolescents, morbidity, incapacitation, mortality, reproductive and mental health of adolescents, medical-social consequences of adolescent health aggravation, measures on adolescent health improvement.*

According to the Convention on the Rights of the Child of the United Nations (UN), a child means every human being below the age of majority. Adolescence is the age period from 10 to 17 years inclusively (17 years 11 months 29 days).

Adolescence takes place in the second decade of life, when physical, psychological and reproductive foundations of a human being are laid for subsequently effective life.

Reduction in the adolescent population has been observed in recent years [1]. The adolescent population (10-17 years of age) was 10.7 mn by January 1, 2013. In the period from 1995 to 2012 inclusively, the adolescent population reduced by 8.2 mn (43.1%). The worst reduction

(double) is observed in older adolescent population (15-17 years of age). In the period from 1989 to 2012, the share of adolescents in the total population structure reduced from 11.2 to 7.5%. In this situation, preservation of life and health of each adolescent is of strategic importance for the state, and the adolescent population requires top-priority attention of the state, the society and families.

Physical development is a crucial criterion of evaluating health condition of children, including adolescents, as it reflects influence of various factors on the growing body [2, 3].

Observations conducted in 1990-2012 revealed significant increase in body length, body weight and chest circumference in all the age-sex groups of schoolchildren (10-15 years of age) in comparison with their age-peers from the previous generations. Right hand muscular strength decreased by 8.9-9.8 kg in boys and by 7.9-9.4 kg in girls.

The number of adolescent schoolchildren with disharmonious physical development decreases throughout senior grades: 6-8% of boys and girls have body weight deficiency, 7-9% - body weight excess [3].

Another important factor characterizing health status is the rate and structure of morbidity. According to the official statistics, the total morbidity of older adolescents (15-17 years of age inclusively) increased from 163,849.8 to 228,138.6 per 100,000 adolescents in the past 10 years (2002-2012).

Such a drastic increase is primarily caused by diseases of the respiratory tract, eye and eye appendage, musculoskeletal system, digestive tract and nervous system, traumas and intoxications. They constitute more than 80% in the structure of adolescent morbidity [4].

The appealed adolescent morbidity (official statistics) is far from the real adolescent morbidity. In order to analyze it, the Scientific Center of Children's Health performed a multicenter study of pediatric morbidity, which involved more than 300,000 children, 70,000 of whom were adolescents of 15-17 years of age, utilizing a specially developed methodology. The established real (completed) morbidity rate established as a result of that study exceeded the official statistical data twice in large cities (4,403 and 2,122 cases per 1,000 adolescents, respectively), 1.7 times in small cities (3,648 and 2,166 cases per 1,000 adolescents, respectively) and 1.5 times in rural areas (3,507 and 2,290 cases per 1,000 adolescents, respectively) [5].

The 5 most frequent diseases constituting up to 75% of the completed morbidity structure are respiratory tract diseases. They constitute 25-50% of all the diseases of schoolchildren. Diseases of the musculoskeletal system, digestive tract, eye, eye appendage and nervous system are somewhat less frequent. It ought to be emphasized that a considerable amount of the aforementioned diseases are preventable by means targeted and differentiated preventive measures.

Scientific studies indicate the progressive increase in the number of adolescents classified to health groups III-IV in the process of education; this results in a corresponding decrease in the number of schoolchildren classified to health groups I-II. Thus, 52.6% of schoolchildren are classified to health groups I-II at the age of 10 years and 33.5% - at the age of 15 years; 48.4% of schoolchildren are classified to health groups III-IV at the age of 10 years and 66.5% - at the age of 15 years [6].

A significant rate of increase in the spread of chronic pathologies is observed among schoolchildren. The rate thereof increased by 53.9% in the 5th-grade schoolchildren by the 9th grade (from 671 to 1,033 per 1,000 examined children) [6, 7].

Mental health of adolescents is another important parameter. According to the official statistics, 279,000 adolescents of 15-17 years of age suffered from mental and behavioral disorders in 2012. The total morbidity rate of mental and behavioral disorders among adolescents increased by 11.3% in the past ten years.

The most frequent mental disorders are behavioral syndromes, non-psychotic and neurotic disorders associated with stress and somatoform disorders, the rate whereof increased from 244.6 to 372.5 per 100,000 adolescents of 15-17 years of age (+52.3%) in the past 10 years [6-8].

Comparative analysis of statistical parameters of mental morbidity among the adolescents in cities and in rural areas demonstrates higher morbidity rate increase among rural adolescents. A range of negative factors affecting morbidity of adolescents of this social group has been identified: socio-demographic causes (population size change, drain of the more active, adaptable and, therefore, healthy rural dwellers to the cities) and insufficiently effective psychiatric care rendering to adolescents in rural areas.

High total adolescent morbidity may be caused by a clearer clinical manifestation and structuralization of mental disorders in adolescence [8].

Psychotropic abuse among children and adolescents is a major social issue associated with mental health condition. The rate of psychotropic-associated mental and behavioral disorders among adolescents of 15-17 years of age was 2,041.0 per 100,000 in 2012, constituting more than 30% of all the mental and behavioral disorders. The total rate of psychotropic-associated disorders in boys is 1.8 times higher than in girls (2,549.6 and 1,408.1 per 100,000 adolescents of 15-17 years of age of respective sex). The dynamics of frequency of the psychotropic-associated conditions has been characterized by reduction in the past ten years.

The spread of non-psychotropic-associated mental disorders among adolescents was 4,755.4 per 100,000 people of this age group; this rate has increased by 32.4% since 2002 [4].

Steady aggravation of the borderline mental pathology shall be considered one of the medical-social issues [7]. According to the Scientific Center of Children's Health, clinically defined forms of borderline mental disorders are observed in 10% of the students of educational establishments. The so called premorbid mental disorders are identified in 60% of adolescents. Borderline disorders of varying severity are detected in 55.6% of older adolescents. The rate of neuroses has increased drastically – 11.3 per 1,000 examined adolescents. The number of patients with accented characteristic peculiarities has risen up to 70%. This aggravates the risk of behavioral deviations, phobic and depressive neurotic disorders.

Reproductive health status, which directly affects demographic situation in the country, is a crucial medical-social parameter of adolescent well-being.

According to the official statistics on the results of prophylactic medical examination of children under 14 years of age, 12% of the newly detected diseases were associated with reproductive malfunctions in 2012.

The rate of menstrual disorders has increased 1.4 and 1.2 times in girls under 14 years of age (from 3,472 to 4,925 per 100,000 children) and girls of 15-17 years of age inclusively (from 1,007 to 1,257 per 100,000 of age-peers), respectively in the past 10 years; the rate of salpingites and oophorites has also increased 1.4 times (from 1,251 to 1,735 per 100,000 girls of 15-17 years of age).

Results of the special studies indicate that the rate of menstrual disorders is 2 times higher in 10-14-year-old adolescents and 3 times higher in 15-17-year-old adolescents than the official statistical data [9].

Reproductive health issues are closely associated with deviations of reproductive behavior of adolescent girls. 41.9% of adolescent girls have had sexual intercourse by the age of 18 years; by the age of 15 years – 3.9%, by the age of 16 years – 11%, by the age of 17 years – 24%. 19% of 15-19-year-old adolescent girls residing in different regions of Russia have had 2 or more sexual partners within 1 year. The adolescents studying at schools and universities are the most sexually liberated.

The spread of the sexually transmitted infections (STI) remains urgent. Although the STI rate in 15-19-year-old girls decreased 4-6 times in the past 15 years, it still remains high: 1.5-2 times higher than in the group of girls over 20 years of age.

Russia retains the highest birth and abortion rate among mothers under 20 years of age in Europe. Persistently high rate of abortions among the primigravidas (11.2-11.5% of the total amount of abortions), primarily among adolescent girls and young women is a serious problem. According to the Federal State Statistics Service, 11,884 adolescent girls terminated pregnancy in 2013.

Preservation of reproductive health of adolescent boys is a crucial aspect of the issue. The following data indicate serious problems with reproductive health of boys. In the past 10 years, the rate of andrologic diseases among all the children increased 1.5 times. More than 50% of boys have diseases that may impede realization of the reproductive function in the future.

Cryptorchism is observed in 30% of premature infants and 4% of term infants. Every year, ca. 500 neonates in the Russian Federation are born with Klinefelter syndrome, ca. 5,000 neonates – with hypospadias, ca. 150 neonates – with epispadia and extrophy. Varicocele, the peak whereof is observed when a boy goes through puberty, is observed in 140-190 out of 1,000 children of 14-15 years of age [10].

Various specialists are engaged in treating reproductive health disorders of children and adolescents: obstetricians-gynecologists, pediatric endocrinologists, urologists, including pediatrics urologists-andrologists, pediatric surgeons and pediatricians. Unfortunately, the amount of specialists in pediatric gynecology and urology-andrology constitutes only 8-10% of the total amount of gynecologists and urologists, which is extremely insufficient. Deficiency of competent personnel, especially in the outpatient-polyclinic sphere, results in insufficient quality of prophylaxis [10]. Moreover, lack of such specialization as “pediatric gynecology” complicates to a large extent effective prevention and treatment of reproductive disorders in girls.

511,000 disabled children were registered in the Russian Federation in 2012, i.e. 195.6 per 10,000 children, whereas in 2002 there were 620,300 disabled children, i.e. 197.6 per 10,000 children. There were 266,523 disabled adolescents (10-17 years of age), whereas in 2002 there were 407,654 disabled adolescents. The incapacitation rate is the highest among older adolescents (15-17 years of age); in 2012, it equaled 315.4 per 10,000 children of the relevant age.

Younger adolescents (10-14 years of age) constitute the largest group of disabled children [1, 4]. Incapacitation as a result of life activity limitation is based on the disease leading to the consequences, predetermining infeasibility for children to lead a regular age-adequate lifestyle.

Mental and behavioral disorders, nervous system diseases and congenital anomalies constituted more than 60% of the incapacitation-inducing diseases in 2012. Ca. 20% of the nosological structure of incapacitation is comprised of consequences of infectious and somatic diseases.

It ought to be mentioned that the rate of incapacitation induced by diseases of the respiratory tract, urinary system, skin, hypoderm and musculoskeletal system decreases when the rate of such diseases increases.

According to the experts of the WHO Regional Office for Europe, the rate of disabled children in Russia must not exceed 3%. At the same time, the number of disabled children was 511,000 in 2012, i.e. less than 2% of the total amount of children (26.1 mn). Undercount of pediatric incapacitation is estimated at 260,000 children at the least, more than a half of whom are adolescents (due to imperfection of the current legislation and regulatory legal acts).

The incapacitation structure according to the primary life activity limiting factor remains stable. The incapacitation caused by limitation of the ability to adequately behave, move, control the body and use hands aggravates with age and reaches its peak at the age of 15-17 years. Life activity limitation in the form of inability to look after oneself and communicate with other people is most often observed at the age of 10-14 years. The limitation of ability to control one's behavior and educational ability aggravate in the late adolescence.

The Russian Federation ratified the UN Convention on the Rights of Persons with Disabilities (Federal Law No. 46 of 03.05.2012). Ratification of the Convention is supposed to establish additional guarantees of provision, protection and development of social and economic rights of persons with disabilities and serve as a guide mark for further improvement of legal regulation in the sphere of social security of persons with disabilities.

At the same time, the classifications and criteria currently used in the process of medical-social evaluation (developed on the basis of the International classification of disorders, life activity limitations and social failure) do not ensure objectivity and reliability of the appraisal of life activity limitations of disabled children, do not take into account effect of the environmental

factors on the disabled person's life activity, age criteria of life activity limitation and functional status.

The International Classification of Functioning, Disability and Health (ICF, WHO, 2001) is based on improved and objectivized approaches to the detection of body malfunctions in the aspect of age (in children) and the life activity limitations induced thereby [4].

A non-recurring transition to the use of the ICF for resolving expert issues in the Russian Federation is required for a more effective implementation of the system of medical-social evaluation and medical rehabilitation of disabled persons.

Federal Law No. 181 "On social security of disabled persons in the Russian Federation" of 24.11.1995 defines the state policy towards disabled persons, including social security of disabled children.

Along with its benefits, the law has the following drawbacks:

- medical-social evaluation of disabled children is not clearly defined; no articles referring to both complex rehabilitation and organization of life activity of disabled children;
- mechanisms of development and implementation of the individual rehabilitation program;
- limitation of rights of disabled children regarding access to education and socialization by introducing such terms as "inability to education", "inability to socialize";
- educational services are not evenly distributed along different regions of Russia.

Legal regulation in the sphere of exercise of children's rights, including rights of disabled children, of health protection requires targeted improvement, according to the National Strategy of Acting on Behalf of the Children in 2012-2017 (see cl. 3, section IV) approved by the decree of the President of the Russian Federation on June 2, 2012 [11].

Adolescent mortality rate decrease has been observed in the recent years; however, they still constitute a significant share in the structure of pediatric mortality (2012 – 20.3%). 7,980 people of 10-19 years of age died in 2012, 1,979 of whom were 10-14 years of age (early adolescence).

Reduction in the adolescent mortality rate of almost all the causes has been observed in the past ten year [1, 4], especially of infectious diseases (by 50%), traumas and intoxications (by 37.4%) and neoplasms (by 27.3%). Reduction in the mortality rate of diseases of the nervous system (by 23.7%) and respiratory tract (by 20.8%) is slower.

The adolescent death cause structure concentration reached its peak in comparison with childhood: traumas and intoxications constitute more than 70% (2012 – 73.6%) of the causes of death at this age; other causes appear insignificant in this setting. Neoplasms (5.9%) and diseases of the circulatory system (5.4%) are the second and their most frequent causes of death.

The main external cause of adolescent mortality is suicide; according to the data for 2012, suicides constitute ca. ¼ of the causes (24.3%). One of the most acute problems of modern Russia – suicide rate among adolescents – is the highest in Europe. Increase in this rate raise serious concerns. 260 adolescent suicides were registered in 2009, in 2012 – 487 cases of deaths of adolescents of intentional self-inflicted injury [4].

Road accidents constitute 23.9% of all external causes of death. The urgency of the road injury rate problem in Russia is caused by global motorization, insufficient safety of vehicles, low professional level of drivers, low level of road culture, lack of timely and complete medical care rendering to the injured. Every ninth road accident involves minors; a considerable amount of road accidents (56.9%) are observed in the summer holidays (from May to September).

Accidental intoxications constitute 9.4% of the mortality structure. On the one hand, intoxications may result from suicides; on the other hand, the fact that adolescents often experiment with chemical substances, using them as drug surrogates, shall not be ignored. Other considerable external causes of death of Russian adolescents are drowning (6%) and homicides (5.5%).

Conditions and style of life significantly affect health development of adolescents. They are characterized by:

- considerable educational stress, intensification of the educational process;

- unsatisfactory diet organization and diet quality worsening in the family and educational establishments;
- low physical activity;
- high engagement in additional education;
- regular and rather long computer use;
- nonobservance of the age-dependent day regimen;
- health / bad health behavioral stereotypes;
- frequent combination of studies and work.

All these negative factors are quite widespread among the modern adolescents and, therefore, negatively affect health development of adolescents in the period of body growth and development [12-14].

The cited data on morbidity, incapacitation and mortality of adolescents demonstrate crucial role thereof in the preservation of labor, intellectual, reproductive and military potential of Russia.

Thus, adolescent morbidity increase leads to increase in social deadadaptation and disintegration. A lot of senior high school students (65.9%) are limited in the choice of profession and professional education profile for medical reasons. There is almost no selection on the basis of health condition, which is why adolescents with a chronic pathology (8-20%) limiting their suitability to the mastered profession enter educational establishments; this reduces labor potential of the state.

Degradation of reproductive health in boys and girls predetermines reproductive loss of the state; this directly affects demographic situation in the country. Ca. 3 mn married couples in Russia are infertile. 40% of the cases of matrimonial sterility result from andrologic or endocrine pathology in men; 50% of the cases are associated with female sterility resulting from reproductive system pathology and some extragenital diseases. 10% of infertile couples feature sterility of both spouses [10].

Military potential is also at a risk. Initial military registration (IMR) performed in 2013 involved more than 630,000 boys. Medical examination revealed diseases in 59.1% of the boys (2010 - 62.1%). The diseases were diagnosed for the first time in 23.9% of the boys (2010 - 22.9%). According to the examination, every second (52.7%) boy was classified as temporarily unfit, fit with restrictions and unfit for military service, i.e., pronounced chronic diseases with malfunction of organs or systems, which impede military draft, were detected.

The number of boys directed to an additional examination for specifying diagnosis is growing. More than 108,000 boys (17.1% of the total amount of examined patients) were directed to the IMR for an additional examination (2010 – 15.5%). This indicates insufficient quality of the examination and monitoring of adolescents at the stage of the initial military registration [4].

The structure of the pathology leading to military fitness limitation has remained stable for the recent years; it includes endocrine diseases, eating and metabolic disorders (primarily due to insufficient nutrition), mental disorders (primarily due to mental retardation), diseases of the circulatory system, nervous system and musculoskeletal system.

Results of medical examination performed at the initial military registration of boys for the past 2 years indicate that the military fitness rate has slightly increased all over the territory of the Russian Federation (from 66.8 to 68.8%).

Thus, it appears that a systemic approach in the framework of legislation improvement, development and implementation of special federal and regional programs is required in order to resolve the issue of adolescents' health protection. Targeted coordinated measures of federal and regional legislative and executive authorities, services of the state and municipal healthcare, social security, education and sports systems, local government bodies, scientific and social organizations shall be the primary mechanism of implementation of these programs.

The cited data allow formulating a list of long- and short-term measures aimed at a radical improvement of the adolescents' health protection system in the Russian Federation. Development and adoption of a Federal Law "On children's health protection in the Russian

Federation”, as well as development and validation of the State Program “Adolescents’ health protection in Russia” of the Russian Federation shall become the primary measures.

It is reasonable to establish a multilevel care rendering system in order to increase accessibility and quality of medical rehabilitation of children with chronic pathology and disabled children: establish a federal scientific-methodological center for medical rehabilitation, organize construction of interregional and regional medical centers, establish and equip medical rehabilitation units at hospitals, infant orphanages and central district polyclinics

It is necessary to develop and approve the list of medical contraindications against school leavers entering organizations of professional educations as students of various majors and profiles in order to utilize labor resources rationally.

It is necessary to ensure development of the pediatric urology-andrology and gynecology service given the actual need of adolescents in these types of medical care and introduce specialty “pediatric gynecologist” into the Nomenclature of medical and pharmaceutical posts in order to improve the system of reproductive health protection measures.

In order to organize work on preservation and promotion of health of students, it is necessary to recover the system of medical care of children at educational establishments by implementing such measures as reconstitution of medical inspection rooms at general education establishments, equipment thereof with the modern medical equipment and social support for doctors and paramedical personnel working at educational establishments.

It is reasonable to develop a system of measures on the development of urgent psychological aid services for children, including children and adolescents in difficult circumstances, development of a network of regional centers, pediatric and adolescent medical-social and psychological aid units at municipal pediatric polyclinics. Moreover, it is necessary to develop educational programs for students and teachers undergoing postgraduate education on the prevention of suicides and addiction to psychotropic agents.

In order to objectivize medical-social evaluation, introduction of the classifications and criteria of diagnosing incapacitation developed on the basis of the ICF provisions shall be ensured for examination of children and adolescents at medical-social evaluation establishments; it is also advisable to develop and introduce criteria of medical rehabilitation efficacy evaluation.

It is necessary to distinguish between the following age groups: 0-4, 5-9, 10-14, 15-17 years – in terms of the state statistical data on the health status of children (morbidity, incapacitation, mortality etc.). Moreover, regular analysis of the adolescent health status both on the basis of scientific studies and in the course of evaluation of the official statistics ought to be provided.

Resolution of the mentioned tasks requires interdepartmental approach and coordinated actions of various executive bodies: Ministry of Health of Russia, Ministry of Education of Russia, Ministry of Labor of Russia, Federal Drug Control Service of the Russian Federation, Federal Service for Surveillance on Consumer Rights Protection and Human Wellbeing and other concerned agencies.

Implementation of the aforementioned suggestions will help to achieve decrease in adolescent morbidity, incapacitation and mortality rates in the Russian Federation and thus will raise their social adaption and considerably improve their integration into the modern society.

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