

Минздрава России; 2008-2017 [Дата обращения 22.02.2019]. Режим доступа: [http://www.oncology.ru/service/statistics/malignant\\_tumors/](http://www.oncology.ru/service/statistics/malignant_tumors/) [Malignant Neoplasms in Russia (Morbidity and Mortality) [Electronic resource]. Moscow: Moscow Scientific and Research Oncological Institute – Branch of the Federal State Budgetary Institution “National Medical Research Center” of the Ministry of Health of Russia; 2008-2017 [Access date: February 22, 2019]. Access link: [http://www.oncology.ru/service/statistics/malignant\\_tumors/](http://www.oncology.ru/service/statistics/malignant_tumors/) (In Russ.)]

4. Слепцова С.С., Билукина И.Ф. Предикторы развития гепатоцеллюлярной карциномы у больных хроническими вирусными гепатитами в Республике Саха (Якутия). *Инфекционные болезни: новости, мнения, обучение*. 2019; Т. 8, № 1; 28–33. DOI: 10.24411/2305-3496-2019-11003 [Sleptsova SS, Bilyukina IF. Predictors of Hepatocellular Carcinoma in Patients with Chronic Viral Hepatitis in the Sakha (Yakutia) Republic. *Infectious Diseases: News, Opinions, Training*. 2019; 1 (8): 28–33. (In Russ.)] DOI: 10.24411 / 2305-3496-2019-11003

5. Слепцова С.С., Рахманова А. Г., Шаройко В. В. Роль вирусных гепатитов в развитии первичного рака печени в Якутии. *Инфекционные болезни: новости, мнения, обучение*. 2015; 3; 76-82. [Sleptsova SS, Rakhmanova AG, Sharoyko VV. The Role of Viral Hepatitis in the Development of Primary Liver Cancer in Yakutia. *Infectious Diseases: News, Opinions, Training*. 2015; 3; 76-82. (In Russ.)]

6. Иванов П.М., Томский М.И., Мыреева С.А. [и др.]. Смертность населения Республики Саха (Якутия) от злокачественных новообразований в начале третьего тысячелетия и её социально-экономические последствия.

*Якутский медицинский журнал*. 2013; 2 (42):5-8. Ivanov PM, Tomsky MI, Myreeva SA [et al.] Mortality of the population of the Republic Sakha (Yakutia) from malignant neoplasms at the beginning of the third millennium and its socio-economic consequences. *Yakut medical journal*. 2013; 2 (42): 5-8. (In Russ.)]

7. Статистический ежегодник Республики Саха (Якутия) [Электронный ресурс]. 2017 [Дата обращения 22.02.2019]. Режим доступа: [http://sakha.gks.ru/wps/wcm/connect/rosstat\\_ts/sakha/ru/publications/official\\_publications/electronic\\_versions/4272910047c730b98fa9afed3bc4492f](http://sakha.gks.ru/wps/wcm/connect/rosstat_ts/sakha/ru/publications/official_publications/electronic_versions/4272910047c730b98fa9afed3bc4492f) [Statistical Yearbook of the Sakha (Yakutia) Republic [Electronic resource]. 2017 [Access date: February 22, 2019] Access link: [http://sakha.gks.ru/wps/wcm/connect/rosstat\\_ts/sakha/ru/publications/official\\_publications/electronic\\_versions/4272910047c730b98fa9afed3bc4492f](http://sakha.gks.ru/wps/wcm/connect/rosstat_ts/sakha/ru/publications/official_publications/electronic_versions/4272910047c730b98fa9afed3bc4492f) (In Russ.)]

8. Бугаева Т.Т., Иванов П.М., Алексеева М.Н. и др. Факторы, влияющие на частоту заболевания первичным раком печени в Якутии. *Якутский медицинский журнал*. 2009; 3 (27): 27-29. [Bugayeva TT, Ivanov PM, Alekseeva MN [et al.]. Factors affecting the incidence of primary liver cancer in Yakutia. *Yakut Medical Journal*. 2009; 3 (27):27-29. (In Russ.)]

9. Семенов С. И., Саввин Р.Г., Никитина С.Г., Максимова С.С., Кривошапкин В.Г., Слепцова С.С. Эпидемиологическая ситуация по вирусным гепатитам в Республике Саха (Якутия). *Российский журнал гастроэнтерологии, гепатологии, колопроктологии*. 2015; 25 (4); 53-58. [Seменов SI, Savvin RG, Nikitina SG, Maksimova SS, Krivoschapkin VG, Sleptsova SS. Epidemiological Situation of Viral Hepatitis in the Sakha (Yakutia) Republic. *Russian Journal of*

*Gastroenterology, Hepatology, Coloproctology*. 2015; 25 (4):53-58. (In Russ.)]

10. Ahmad OB, Boschi-Pinto C, Lopez AD, Murray CJL, Lozano R, Inoue M. Age standardization of Rates: a new WHO standard. GPE Discussion Paper series: no 31 [Internet]. WHO; 2001 [cited 28.07.2018]. Available from: <http://www.who.int/healthinfo/paper31.pdf> (Access date: July 28, 2018).

11. Choi E, Lee S, Nhung BC, Suh M, Park B, Jun JK, Choi KS. Cancer mortality-to-incidence ratio as an indicator of cancer management outcomes in Organization for Economic Cooperation and Development countries. *Epidemiol Health*. 2017 Feb 5; 39:e2017006. DOI: 10.4178/epih.e2017006. eCollection 2017.

### Credits

Egorova Aitalina Grigorievna, MD–PhD, Head of the Department of Epidemiology of Chronic Non-Communicable Diseases of the Yakutsk Scientific Center for Complex Medical Problems, Yakutsk, Russia, +79142346411, e-mail: aitalina@mail.ru, ORCID: 0000-0002-8526-9644.

Klimova Tatyana Mikhailovna, MD–PhD, Associate Professor at the Department of Pharmacology and Pharmacy of the M.K. Ammosov North-Eastern Federal University's Medical Institute, Senior Researcher at the Department of Epidemiology of Chronic Noncommunicable Diseases of Yakutsk Scientific Center for Complex Medical Problems, Yakutsk, Russia, +79142336724, e-mail: biomeddykt@mail.ru, ORCID: 0000-0003-2746-0608..

Romanova Anna Nikolaevna, MD–PhD, Director of Yakutsk Scientific Center for Complex Medical Problems, Yakutsk, Russia, +79681518887, e-mail: ranik@mail.ru, ORCID: 0000-0002-4817-5315.

## SCIENTIFIC REVIEWS AND LECTURES

I.V. Kononova, M.P. Kirillina, L.N. Afanasyeva,  
P.V. Nikiforov, F.A. Zakharova, S.N. Mamaeva, S.R. Antonov

## IMMUNOGENICITY INDICATORS OF VACCINES AGAINST THE HUMAN PAPILLOMA VIRUS IN FEMALES ACCORDING TO SCIENTIFIC DATA, PUBLISHED IN THE INTERNET SYSTEM

### ABSTRACT

The article outlines the features of searching in the Internet system for scientific articles on the effectiveness of vaccination against human papillomavirus. Publications containing data on the immunogenicity of human papillomavirus vaccines in girls and young women in the long-term period are analyzed. The age of the patients, the principles of formation of comparison groups, materials and laboratory methods, the duration of the research, the name of the used vaccines were established.

In Internet the search for scientific publications on the vaccination efficacy against HPV is valid and based on matches of the user keywords with the article title words.

Internet provides equal opportunities for researchers the availability of sharing knowledge, regardless of the publisher's rating and the number of citations.

The vaccination efficacy against HPV includes an evaluation of the vaccines' immunogenicity. The HPV vaccine immunogenicity in girls and young women from 9 to 25 years old, in the long-term period from 3 to 7 years, is determined by the level of

antibodies against HPV vaccine and the frequency of immune system cells sensitized to HPV. Patients participating in the studies were vaccinated by various schedule with Cervarix (human papillomavirus bivalent vaccine) and Gardasil (human papillomavirus quadrivalent vaccine).

**Keywords:** HPV, human papillomavirus, vaccines, cancer, immunogenicity.

**Introduction.** Given the lot of scientific publications in the health sciences, for clinicians who, due to their work, are busy, it is difficult to "keep up" with constantly updated literature. Therefore, articles analyzing scientific research are an effective method of obtaining the

necessary information. In addition, such articles are a kind of tool that allows medical doctors to determine the relevance of their own unique experience and the opportunity to share it in the publications and participation in professional events.

We have been interested to establish

features of the search and preliminary analysis of scientific articles with open access to the Internet, devoted to the effectiveness of vaccination, including the immunogenicity of vaccines against human papillomavirus (HPV). The article authors plan to make future research with a similar focus among of the Republic of Sakha (Yakutia) residents.

**Materials and methods.** Publications were searched for on the first three pages of the Google Internet System (IS) on January 23-25, 2019, by keywords (KW) "hvp, efficacy, vaccine, protection, immunity, immunogenicity, cervix, cancer, infection," in various combinations. The location was Yakutsk. The inclusion criteria of selected publications (5 in total) are presented in Table 1.

In accordance with our interest for future research work, we set ourselves the initial tasks - to find scientific articles in the IS, using the KW, and for further search in scientific databases - to determine the most frequently used keywords by the selected articles authors (authKW); then find out the features of the IS's search, depending on the use of KW and authKW. To design our future project, it was decided to select articles containing original data assessing the vaccines immunogenicity in girls and young women over a long-term period (more than 2 years) and to determine the age of the participants, and to clarify the formation of comparison groups, the study periods, what materials and laboratory methods are used, Brand and generic names of vaccines.

**Results and discussion.** With the using of KW's six combinations, as well as the inclusion criteria, 22 articles were selected [5-26]. The search results are presented in Table 2. The largest amount - 7 articles, were issued using the option "hvp vaccine efficacy protection immunity" (5 words in total).

The article of D.M. Harper et al. [14] was found in larger amount, 5 times out of 6, the first two words in the title of which is matched with the first two words of the printed KW. Since the number of scientific articles returned by the IS did not depend on the number of KW used per one search, and the largest amount of articles were returned using five words, we also decided to identify the five authKW, most often included in the publication's separate line. We considered establishing au-

Table 1

The inclusion criteria of selected publications

The criteria	Characteristic
Publication's type	Scientific article
Access to full version	Open
Language	English
Publication's term	Since 2010 up to nowadays
doi	Yes

Table 2

Publications' search results depending on the keywords' use

Search option	Number of Reference	Publications' amount	(Ranking*)
hvp vaccine efficacy (words' total amount – 3)	[9, 11, 14, 20]	4	(4)
hvp vaccine efficacy protection ( words' total amount – 4)	[9, 10, 14, 20, 25]	5	(3)
hvp vaccine efficacy protection immunity ( words' total amount – 5)	[12, 15, 16, 19, 21, 22, 26]	7	(1)
hvp vaccine efficacy protection immunity cervix cancer ( words' total amount – 7)	[13, 14, 15, 20, 21, 26]	6	(2)
hvp vaccine efficacy protection immunity cervix cancer cervical infection ( words' total amount – 9)	[5, 8, 14, 18, 23]	5	(3)
hvp vaccine efficacy protection immunogenicity cervix cancer cervical infection ( words' total amount – 9)	[6, 14, 17, 24, 26]	5	(3)

Note \* - ranking was carried out in descending order of the selected publications' amount.

Table 3

Keywords and publications in which they are highlighted

Keyword	Number of Reference	Publications' amount
vaccine (vaccines)	[6, 9, 14, 16, 18, 19, 20, 26]	8
HPV	[5, 6, 14, 15, 16, 20, 24]	7
human	[9, 18, 19, 24, 26]	5
cancer	[5, 14, 17, 18, 19]	5
papillomavirus	[9, 15, 17, 18, 19]	5

Table 4

**Publications' indicators where the immunogenicity of HPV vaccines in girls and young women over a long-term period studied**

Number of Reference	Females' age	Main indicators of the comparison groups formation	Materials	Lab methods	The duration of long-term period	Vaccine's Brand name
[5]	10-23	1. The number of doses received vaccine (1.2 or 3) 2. the period between the 1st and next doses (60th, 180th day and later)	Plasma	Determination of the binding antibodies against the vaccine protein L1 of HPV 16, 18, 6 and 11 concentration of based on multiplex technology (Luminex)	From 48 months to 7 years	Gardasil
[12]	16-23	1. The number of months between the first dose of vaccine and the time of the laboratory test	Serum	1. Determination of the neutralizing antibodies against the vaccine protein L1 of HPV 16, 18, 6 and 11 concentration based on multiplex technology (Luminex) 2. Determination of the total antibodies against HPV vaccine virus particles 16, 18, 6 and 11 concentration based on multiplex technology (Luminex)	After 7, 24, 48, 108 months	Gardasil
[16]	14-17	1. The number of doses received vaccine (1.2 or 3)	Capillary blood	The definition of IgG against HPV - 16, 18, 31, 33, 45, 52, 58 based on multiplex technology (Luminex)	Up to 4.5 years from the first dose of vaccine	Cervarix
[24]	9-25	1. The number of doses received vaccine (1.2 or 3) 2. the term between the 1st and next doses (6 and 12 months)	Serum	1. Determination of the anti-HPV-16 and anti-HPV-18 antibodies concentration on the basis of ELISA 2. Determination of the neutralizing antibodies against HPV-16 and 18 concentration, based on PBNA	Up to 36 months from the first dose of vaccine	Cervarix
			Lymphocytes	1. Determination of CD4 + and CD8 + T cells specific for HPV-16/18/31/45 by intracellular cytokine staining 2. Determination of the B-memory cells to HPV-16/18/31/45 by the enzyme immunoassay (ELISPOT)		

thKW for the further search of scientific literature in special databases.

The authKW's analysis allowed us to single out five such words, these were "HPV, vaccine (vaccines), human, cancer, papillomavirus", presented in Table 3. Of the articles, the largest amount of authKW, 4 out of 5 often used, had P.

Basu's et al. article [19], which appeared in the pool of the most effective article search (Table 2). It should be noted that 10 articles (almost half of the 22 articles) were not included in the analysis, since autKW were not highlighted in them. If we compare the KW - "hvp, efficacy, vaccine, protection, immunity, immunogenicity,

cervix, cancer, cervical, infection", and five commonly used authKW - "HPV, vaccine (vaccines), human, cancer, papillomavirus", you might see that only 3 words matched.

Then we made an analysis of the matches of article title words with KW we determine that the larger amounts had

the words "hpv, vaccine, efficacy, cancer, immunogenicity". In general, the title of 21 articles out of 22 contained KW in various quantities and combinations. That is, the search in the IS is based on matches of the selected by the user words with the article title words.

The amount of the selected articles's citing was heterogeneous - the spread ranged from 0 in D. Gunawardane [13] to 187 in M. Stanley et al. [23]. Both are review articles, an article by M. Stanley et al., 2010, is in a journal published since 2006, includes the following branches of biomedical knowledge: Infectious Diseases, Epidemiology, Oncology, Cancer Research, the journal has a SiteScore 2017 of 2.21 [1]. D. Gunawardane's article had released in 2018, devoted to the safety and cost-effectiveness of HPV vaccination (the name of the article includes the word "effective" without economic definition), published in the journal, which has existed since 2011, includes one branch of medical knowledge: General Medicine, has the SiteScore 2017 - 0.17 [2]. That is confirmed - IS provides almost equal opportunities for authors for the availability of their scientific publications to users regardless of the publisher's rating. We would like to draw attention to that, authKW words are not highlighted in both articles.

Since we want to make research to evaluate efficacy of the girls and young women vaccination against HPV over a long-term period (more than 2 years), scientific papers from 22 articles returned by IS, which included similar indicators and assessed immunogenicity of vaccines based on original studies were selected. These articles' (total 4 articles) analysis is presented in Table 4.

The minimum age of females was 9 years, the maximum - 25 years, the maximum difference of age - 16 years [24]. The comparison groups were formed by several signs - by the number of vaccination doses - from one [5, 12] to three [5, 16, 24], by the term period between the first and others doses of vaccination - from 1 month to 12 months [24]. The minimum term period from the first dose vaccination to the time of taking the biomaterial (on the basis of more than 2 years) was 36 months [17], the maximum - 7 years [5].

The samples (materials) studied were plasma [5], serum [12, 24], venous blood leukocytes [24], and capillary blood [16]. In three of the four papers, laboratory assays were provided on the multiplex technology basis. They determined the concentration of binding (neutralizing)

antibodies against the vaccine protein L1 of HPV 16, 18, 6 and 11, total antibodies against the vaccine HPV, IgG against HPV - 16, 18, 31, 33, 45, 52, 58. L.M. Huang et al. determined the concentration of neutralizing antibodies by BNA, pseudovirion-based neutralization assay, anti-HPV-16 and -18 antibodies by ELISA, the cellular immunity was determined by the frequencies of sensitized to HPV CD4 + and CD8 + T cells and memory B cells [24].

Brand names for vaccines in selected studies are Cervarix and Gardasil. Cervarix's generic name is human papillomavirus bivalent vaccine. Gardasil is named human papillomavirus quadrivalent vaccine. Both vaccines are registered in the Russian Federation [3, 4].

### Conclusion

In Internet the search for scientific publications on the vaccination efficacy against HPV is valid and based on matches of the user keywords with the article title words.

Internet provides equal opportunities for researchers the availability of sharing knowledge, regardless of the publisher's rating and the number of citations.

The vaccination efficacy against HPV includes an evaluation of the vaccines' immunogenicity. The HPV vaccine immunogenicity in girls and young women from 9 to 25 years old, in the long-term period from 3 to 7 years, is determined by the level of antibodies against HPV vaccine and the frequency of immune system cells sensitized to HPV. Patients participating in the studies were vaccinated by various schedule with Cervarix (human papillomavirus bivalent vaccine) and Gardasil (human papillomavirus quadrivalent vaccine).

### References

1. База данных Scopus. [Scopus database (In Russ.)]. <https://www.scopus.com/sourceid/5700191215?origin=sbrowse> (Date of access February, 4, 2019).
2. База данных Scopus. [Scopus database (In Russ.)]. <https://www.scopus.com/sourceid/19900192321>. (Date of access February, 4, 2019).
3. Министерство здравоохранения Российской Федерации [Ministry of Health care of Russian Federation (In Russ.)]. [https://grls.rosminzdrav.ru/Grls\\_View\\_v2.aspx?routingGuid=12b4dc22-b6c2-4976-87c5-fc2d4e180620&t=](https://grls.rosminzdrav.ru/Grls_View_v2.aspx?routingGuid=12b4dc22-b6c2-4976-87c5-fc2d4e180620&t=). (Date of access February, 10, 2019).
4. Министерство здравоохранения Российской Федерации [Ministry of Health care of Russian Federation (In Russ.)]. [https://grls.rosminzdrav.ru/Grls\\_View\\_v2.aspx?routingGuid=10f1f54f-78d1-4b34-a0a1-52d981b8c040&t=](https://grls.rosminzdrav.ru/Grls_View_v2.aspx?routingGuid=10f1f54f-78d1-4b34-a0a1-52d981b8c040&t=). (Date of access February, 4, 2019).

5. Sankaranarayanan R, Joshi S, Muwonge R, et al. Can a single dose of human papillomavirus (HPV) vaccine prevent cervical cancer? Early findings from an Indian study. *Vaccine*. 2018; 36(32 Pt A):4783-4791. doi:10.1016/j.vaccine.2018.02.087.

6. Toft L, Tolstrup M, Sehr P, et al. Comparison of the immunogenicity of Cervarix® and Gardasil® human papillomavirus vaccines for oncogenic non-vaccine serotypes HPV-31, HPV-33, and HPV-45 in HIV-infected adults. *Human Vaccines and Immunotherapeutics*. 2014; 10(5):1147-1154. doi: 10.4161/hv.27925

7. Douglas RL. HPV vaccination to prevent cervical cancer and other HPV-associated disease: from basic science to effective interventions. *Journal of Clinical Investigation*. 2016; 126(1):5-11. doi: <https://doi.org/10.1172/JCI85446>.

8. Johnson HC, Lafferty EI, Eggo RM, et al. Effect of HPV vaccination and cervical cancer screening in England by ethnicity: a modelling study. *The Lancet Public Health*. 2018; 3(1):e44. doi: [https://doi.org/10.1016/S2468-2667\(17\)30238-4](https://doi.org/10.1016/S2468-2667(17)30238-4)

9. Basu P, Banerjee D, Singh P, et al. Efficacy and safety of human papillomavirus vaccine for primary prevention of cervical cancer: A review of evidence from phase III trials and national programs. *South Asian Journal of Cancer*. 2013; 2(4):187-192. doi: 10.4103/2278-330X.119877

10. Giuliano AR, Palefsky JM, Goldstone S, et al. Efficacy of Quadrivalent HPV Vaccine against HPV Infection and Disease in Males. *The New England Journal of Medicine*. 2011; 364(5):401-411. doi: 10.1056/NEJMoa0909537

11. Harder T, Wichmann O, Klug SJ, et al. Efficacy, effectiveness and safety of vaccination against human papillomavirus in males: a systematic review. *BMC Medicine*. 2018; 16:110. doi: <https://doi.org/10.1186/s12916-018-1098-3>

12. Nygård M, Saah A, Munk C et al. Evaluation of the Long-Term Anti-Human Papillomavirus 6 (HPV6), 11, 16, and 18 Immune Responses Generated by the Quadrivalent HPV Vaccine. *Clinical and Vaccine Immunology*. 2015; 22(8):943-948. doi: 10.1128/CI.00133-15

13. Gunawardane D. Human Papilloma Virus Vaccination for cervical cancer prevention. Is it safe and effective? *Bangladesh Journal of Medical Science*. 2018; 17(3):329-336. doi: <https://doi.org/10.3329/bjms.v17i3.36985>

14. Harper DM, DeMars LR. HPV vaccines - A review of the first decade. *Gynecologic Oncology*. 2017; 146(1):196-204. doi: <https://doi.org/10.1016/j.ygyno.2017.04.004>

15. Handisurya A, Schellenbacher C, Haitel A, et al. Human papillomavirus vaccination induces neutralising antibodies in oral mucosal fluids. *British Journal of Cancer*. 2016; 114(4):409-416. doi:10.1038/bjc.2015.462

16. Donken R, Schurink-van't Klooster TM, Schepp RM, et al. Immune Responses After 2 Versus 3 Doses of HPV Vaccination up to 4½ Years After Vaccination: An Observational Study Among Dutch Routinely Vaccinated Girls. *The Journal of Infectious Diseases*. 2017; 215(3):359-367. doi: <https://doi.org/10.1093/infdis/jiw588>



17. Van Damme P, Olsson SE, Block S, et al. Immunogenicity and Safety of a 9-Valent HPV Vaccine. *Pediatrics*. 2015; 136(1):28-29. doi: 10.1542/peds.2014-3745

18. Kaarthigeyan K. Cervical cancer in India and HPV vaccination. *Indian Journal of Medical and Paediatric Oncology*. 2012; 33(1):7-12. doi: 10.4103/0971-5851.96961

19. Basu P, Bhatla N, Ngoma T, et al. Less than 3 doses of the HPV vaccine – Review of efficacy against virological and disease end points. *Human Vaccines and Immunotherapeutics*. 2016; 12(6):1394-1402. doi: 10.1080/21645515.2016.1146429

20. De Vincenzo R, Conte C, Ricci C [et al.]. Long-term efficacy and safety of human papillomavirus vaccination. *International Journal of Women's Health*. 2014; 2014(6):999-1010. doi:10.2147/IJWH.S50365

21. Mariani L, Venuti A. HPV vaccine: an overview of immune response, clinical protection, and new approaches for the future. *Journal of Translational Medicine*. 2010; 8:105. doi:10.1186/1479-5876-8-105

22. Brisson M, B  nard   , Drolet M, et al. Population-level impact, herd immunity, and elimination after human papillomavirus vaccination: a systematic review and meta-analysis of predictions from transmission-dynamic models. *The Lancet Public Health*. 2016; 1(1):e8-17. doi: 10.1016/S2468-2667(16)30001-9

23. Stanley M. HPV - immune response to infection and vaccination. *Infectious Agents and Cancer*. 2010; 5:19. doi:10.1186/1750-9378-5-19

24. Huang L-M, Puthanakit T, Cheng-Hsan

C, et al. Sustained Immunogenicity of 2-dose Human Papillomavirus 16/18 AS04-adjuvanted Vaccine Schedules in Girls Aged 9-14 Years: A Randomized Trial. *Journal of Infectious Diseases*. 2017; 215(11):1711-1719. doi: 10.1093/infdis/jix154

25. Lehtinen M, Lagheden C, Luostarinen T, et al. Ten-year follow-up of human papillomavirus vaccine efficacy against the most stringent cervical neoplasia end-point—registry-based follow-up of three cohorts from randomized trials. *BMJ Open*. 2017; 7:e015867. doi: 10.1136/bmjopen-2017-015867

26. Turner TB, Huh WK. HPV vaccines: Translating immunogenicity into efficacy. *Human Vaccines and Immunotherapeutics*. 2015; 12(6):1403-1405. doi: 10.1080/21645515.2015.1103936.

### The authors

Kononova Irina Vasilyevna – Candidate of Medical Sciences, the Research Worker of YSC CMP Department of epidemiology of chronic non-communicable diseases Laboratory of Precancerogenesis and Malignant Tumors, e-mail: irinakon.07@mail.ru, 677000, Yakutsk, Sergelyakhskoye shosse, 4, FGBNU "The Yakut Scientific Center of Complex Medical Problems";

Kirillina Marya Petrovna – Candidate of Biological Sciences, the Leading Research Worker – the Head of YSC CMP Department of epidemiology of chronic non-communicable diseases Laboratory of Precancerogenesis and Malignant Tumors, 677000, Yakutsk, Sergelyakhskoye shosse, 4, FGBNU "The

Yakut Scientific Center of Complex Medical Problems"; the Head of North-Eastern Federal University named after M. K. Ammosov Medical Institute Pathomorphology, Histology and Cytology Educational and Scientific Laboratory, Yakutsk, ulitsa Belinskogo, 58;

Afanasyeva Lena Nikolaevna – Candidate of Medical Sciences, Doctor of Medicine, Oncologist, Chief of GBU Yakutian Republican Oncology Center, 677000, Yakutsk, ulitsa Sverdlova, 3, k.2.

Nikiforov Petr Vladimirovich – Doctor of Medicine, Oncologist, Surgeon of GBU Yakutian Republican Oncology Center General Surgery Department, 677000, Yakutsk, ulitsa Sverdlova, 3, k.2;

[Zakharova Fedora Appolonovna – Doctor of Medical Sciences, Professor of North-Eastern Federal University named after M. K. Ammosov, Medical Institute \[Department of Normal and Pathological Physiology\]\(#\), 677000, Yakutsk, ulitsa Belinskogo, 58.](#)

Mamaeva Sargylana Nikolaevna - Candidate of Physical and Mathematical Sciences, the Associate Professor of North-Eastern Federal University named after M. K. Ammosov Physics and Technology Institute Department of General and Experimental Physics, 677000, Yakutsk, ulitsa Belinskogo, 58.

Antonov Stepan Romanovich – Candidate of Physical and Mathematical Sciences, the Associate Professor of North-Eastern Federal University named after M. K. Ammosov Physics and Technology Institute Department of Radio Physics and Electronics, 677000, Yakutsk, ulitsa Belinskogo, 58.

**S.V. Romanov, O.P. Abaeva**

## ATTITUDE OF THE POPULATION TOWARDS THE POST-MORTEM ORGAN DONATION IN FOREIGN COUNTRIES AND THE REGION OF RUSSIA AND THE SOURCES OF INFORMATION INVOLVED IN ITS SHAPING

### ABSTRACT

This study focuses on the need to shape attitude of the Russian people to support the development of the post-mortem organ donation program. The **aim** of the work was to study the attitude of the population to the post-mortem organ donation and to determine the sources of information involved in its shaping, based on a study of the results of medical and sociological researches in foreign countries and analysis of survey data from a group of people in the region of Russia. The objectives of the study were: to study, according to data from sources of literature, the results of population surveys in countries around the world about attitudes towards participation in programs of post-mortem organ donation; explore the importance of different sources of information involved in the shaping of public opinion on this issue; to analyse the attitude of the group of the population of the region of Russia, in which transplant operations of human organs are performed, towards the possibility of participation in programs of post-mortem organ donation and sources of information that are important for its shaping. The study was based on the publications of the RSCI and PubMed and the results of a survey of 250 patients at the federal medical center where organ transplant operations are performed. The analysis of publications demonstrates the multi-stage process of shaping a position of support for the post-mortem organ donation among the population of the countries of the world - from understanding the humanity of this activity to concrete steps to support it. At the same time, propaganda of organ donation is important through the involvement of the media, educational system resources, and scientific professional communities. In Russia, it is necessary to start outreach with the population concerning organ donation from the first stage, to facilitate an understanding of the need for its development in order to save the lives of seriously ill people, and therefore systematic work is needed using opportunities primarily from television and Internet sources.

**Keywords:** post-mortem organ donation, sources of information for the public.