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Өсімдіктердің биологиясы және биотехнологиясы институтының

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## ИЗВЕСТИЯ

НАЦИОНАЛЬНОЙ АКАДЕМИИ НАУК  
РЕСПУБЛИКИ КАЗАХСТАН  
Института биологии и биотехнологии растений

## NEWS

OF THE NATIONAL ACADEMY OF SCIENCES  
OF THE REPUBLIC OF KAZAKHSTAN  
of the Institute of Plant Biology and Biotechnology

**БИОЛОГИЯ ЖӘНЕ МЕДИЦИНА  
СЕРИЯСЫ**



**СЕРИЯ**

**БИОЛОГИЧЕСКАЯ И МЕДИЦИНСКАЯ**



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**RESULTS OF IMPLEMENTATION OF INNOVATION MODEL  
"ECHO 2016" IN KAZAKHSTAN WITHIN THE FRAMEWORK  
OF THE CONTINUOUS PROFESSIONAL DEVELOPMENT SYSTEM**

**Abstract.** In Kazakhstan, since September 2016, the ECHO (Extension for Community Healthcare Outcomes) project has been implemented since the "Center for Clinical Mentoring" was created on the basis of Kazakh Medical University of Continuing Education (KazMUNO). The main goal of training is "HIV infection"; the objective was the development of 24 AIDS centers in the Republic of Kazakhstan. At the same time, 100 doctors with 10 different specialties, including 67 infectious disease physicians (63.2%), are trained for special technological cooperation based on the principle of "Clinical Mentoring" and "Digital Medicine". Integration of digital technologies into the service sector was carried out in 9 modules, 38 topics in total. In the first phase of "ECHO" project 76 TV sessions for two groups of 50 listeners were held. From September 2016 until June 2017, during these sessions and three levels of knowledge control of project participants were conducted. 76 clinical examinations were conducted, with the provision of counseling for patients with HIV infection.

The first phase of the ECHO project was successfully completed in June 2017.

**Key words:** digital medicine, HIV infection, mentoring, innovative model.

Experts estimate that by the end of 2015, 78 million people had been infected with HIV since the epidemic began, 35 million had died from AIDS-related diseases, 36.7 million worldwide were living with HIV, and 18.2 million had access to ART. In 2014, only 62% of the 1.5 million pregnant women living with HIV received antiretroviral therapy (ART) in accordance with option "B +".

A promising vision of WHO and UNAIDS for 2016-2030 is to achieve zero levels of new HIV infections, zero HIV-related mortality, zero discrimination and, by 2030, put an end to the AIDS epidemic as a global threat to public health [1, 2].

In the provision of a "cascade" of services to HIV-infected patients, the training of medical personnel plays an important role. The specificity of education, in connection with the lack of continuous professional education of a specialist throughout life, at the beginning of the third millennium, represents the need to use the most effective educational, digital, and economically low-cost technologies.

One of the forms of training is "Mentoring", the process of transferring knowledge from a more experienced mentor to students who do not yet have sufficient experience in a particular industry. Mentoring in a broad sense is inherent in all forms of education / education systems and is an investment in the long-term development of the organization, in its "health."

The mentor is the link between the listener / cadet, helps in the formation of a professionally-oriented, competent specialist in the undergraduate and postgraduate training and medical service / organization where the specialist works, and the final "point of application" of the acquired knowledge is a patient who, in real time, will have access to quality medical care.

1. Analysis of training for practical health care shows that there is a certain gap between science, practice and education. The results of scientific research are slowly being introduced into the curative and pedagogical process. All this forces us to look for new forms of improving the training system, including the **continuous professional development (CPD)** system. The very introduction of a CPD system, whose goal is to create conditions for the constant professional growth of medical workers, will not lead to solving problems. The introduction of such system should go hand in hand with the improvement of teaching technologies, in close cooperation between a medical educational institution and practical public health [3-5].

2. In Kazakhstan, the existing traditional approaches to the training of medical workers on postgraduate training are constantly being improved. Thus, for the first time since September 2016, with the financial and technical support of international organizations, the ECHO project is being implemented in the country with the "Clinical Mentoring Center" established on the basis of KazMUNO, which is an innovative technology for improving the quality of education for health professionals, both for a medical worker and for a specific patient. The duration of the first stage of the ECHO project: September 2016 – June 2017.

3. The goals and objectives of the ECHO project are consistent with national health priorities. Thus, in the **State Health Development Program of the Republic of Kazakhstan "Densaulyk" for 2016–2019**, in the 6<sup>th</sup> direction of the Program – Enhancing the effectiveness of human resources management, item 6.2 – "Modernization of medical education", the priority tasks are to make medical education informative with the creation of an online -services and introduction of distance technologies in the education system for retraining and advanced training of specialists.

On the basis of KazMUNO, the efficiency of the integration model of digital technologies in the field of practical public health has been studied, with a view to determining the prospects for further development of digital medicine, using the example of the "ECHO" project.

It is planned that the training of doctors within the framework of the ECHO project will help to solve a number of **priority tasks**:

- transfer of modern, based on the principles of evidence-based medicine and international recommendations on the problem of HIV infection, information from mentors to students in the form of continuous education, based on an interactive, distance-learning methodology;

- development of personal potential of doctors of various profiles, development of a multidisciplinary (command) approach;

- forming in doctors such qualities as communicability, confidence, stress resistance, tolerant behavior, empathy, etc .;

- forming the communicative culture of a doctor, including personal qualities, fluency in verbal and non-verbal means of behavior;

- formation of general cultural, common professional and professional competencies both among the mentors themselves and their staff.

**4. The implementation of the ECHO project in Kazakhstan was made possible through the partnership of a number of major international and domestic organizations, namely:**

- with the support of the **CDC** Center for Infectious Disease Control (Janel Wright, SDC Deputy Director for Central Asia), within the framework of the Emergency Plan of the US President to Fight AIDS **PEPFAR**.

- with direct technical support and support of the ICAP project at Columbia University (Regional Director for Central Asia – Deryabina A.).

- with the information support of the Republican Center for AIDS Prevention and Control (Director General – Bayserkin B.).

The leading university of the republic for postgraduate education – KazMUNO (rector Isayeva R.), which provides the main expert team, the faculty of the university (PPSU), is designated as the node site.

Immediate implementation of the project is carried out by the staff of "ECHO" (clinical director of the Center for Mentoring "ECHO" – Trumova Zh.).

*The aim of the work* is to increase the capacity of medical workers to provide quality medical services to people living with HIV through clinical mentoring and the use of modern distance technologies in teaching.

*Materials and methods.* In the preparatory period (before launch) of the "ECHO" project, the direction of the training was determined: "Infectious Diseases: **HIV infection**". Territorial AIDS centers and their branches have been selected as sites, with a total of 24 sites. The listeners of the postgraduate training cycle were doctors of the clinical profile of AIDS centers. At the first stage, 100 doctors were trained at 10 specialties. The students were divided into 2 (two) groups, 50 people each. The educational-methodical complex (EMK) and the work program (WP) on the subject of the HIV-infection training cycle have been developed on the basis of international and national HIV manuals and forms. The work program includes 9 modules, 38 themes, in all, 76 sessions are planned for two groups of 50 participants each.

The Work Program was approved at the level of the Ministries of Education and Health of the Republic of Kazakhstan and an author's Certificate was obtained, registered in the Ministry of Justice (author Trumova Zh.)

Documents for presentation of clinical cases have been developed: Patient form (1) and Patient recommendations form (2).

A prerequisite for the implementation of the ECHO model is the IT connection and the speed of Internet connection. For web conferencing / tele-sessions, modern demonstration equipment installed in the workplace, a program for video conferencing ZOOM, additional equipment of 24 sites is carried out at the expense of the ECHO project.

Within the framework of the ECHO project, various pedagogical methods are used, such as: interactive methodology in the form of discussions / disputes, illustrative and heuristic (search) methods, for use by students in the daily work of modern scientific literature based on the principles of evidence-based medicine. As a control and measuring tool for assessing the knowledge of students and the effectiveness of training on-line mode, the questionnaire method and test knowledge control (input, intermediate and final testing) were applied, in total there were 3 stages for monitoring the level of knowledge of the listeners.

**Results and discussion.** The applied form of training specialists is clinical mentoring, providing participants with theoretical information, analyzing thematic complex clinical cases (including adults and children) at each video session, with the participation of highly qualified teachers of various HIV-related specialties as mentors.

The main project implementation tool is a weekly video session, lasting 60 minutes (duration can be determined on demand), aired from the Clinical Mentoring Center (Almaty) to all sites once a week, without disrupting doctors from production and workplace. Within the framework of the project, feedback was provided to participants / listeners of the training cycle.

According to the approved Work Program on HIV, training was conducted on 9 modules, including 38 topics. As of June 2017, training was completed for all 9 modules, namely:

Module 1: 1 introductory session, 2 sub-sessions conducted.

Module 2: 7 sessions, 14 sub-sessions.

Module 3: 5 sessions, 10 sub-sessions.

Module 4: 5 sessions, 10 sub-sessions.

Module 5: 5 sessions, 10 sub-sessions.

Module 6: 5 sessions, 10 sub-sessions.

Module 7: 3 sessions, 6 sub-sessions.

Module 8: 3 sessions, 6 sub-sessions.

Module 9: 4 sessions, 8 sub-sessions.

In total for the period "September 2016 – June 2017" 38 sessions were held, 76 sub-sessions for 100 participants of 24 sites of the republic.

*Listeners of the cycle.* At the beginning of the project, there were 106 trainees, among them distributing by specialty: physicians - infectious diseases adults / children 67 (63.2%), dermatologist/venereologist 8, obstetrician-gynecologists 7, pediatricians 6, phthisiatricians 6, therapists 4, narcologists 3, psychologists 3, resuscitators 2. I.e. (63.2%), of all specialties - 10. As of June 2017, the number of trainees who completed the training was 100 (6 people were eliminated for objective reasons, change of job, job exit, etc.). At each session, attendance was monitored. As a result: more than 95% of all project participants took part in more than 80% of sessions.

Control of knowledge of students. One of the key requirements of the ECHO model is the evaluation of the quality of knowledge of students before and after the implementation of the project. The evaluation included testing the level of knowledge of the participants prior to the start of the project, in the middle and after the completion of the project. Such an assessment made it possible to assess the progress and effectiveness of the educational process. At the beginning of the project and at the end of 9 modules of the Work Program of the course, 3 (three) stages of control testing of listeners were conducted on-line by specially designed tests, in the form of an entrance control of knowledge (pre-test, September 2016), intermediate (March 2017) and the final (post-test, June 2017) testing.

***For the correctness of the results, only the results of the input and final testing were compared.***

The level of knowledge of the students based on the results of the entrance testing was (pre-test, n = 100): answered "unsatisfactory" - 18%, "satisfactory" - 57%; "Good" - 22%; "Excellent" - 3%.

The level of knowledge of the students based on the results of the final testing (post-test, n = 100) was: answered "unsatisfactorily" - 1%; "Satisfactory" - 28%; "Good" - 21%; "Excellent" - 50%.

The number of listeners who answered "satisfactorily" (comparison of the pre-test with post-test) from 57% decreased 2 times to 28%; to "good" - from 22 to 21% (stably at the same level); on "excellent" - significantly increased from 3 to 50% (17 times); "Unsatisfactory" fell sharply from 18 to 1%.

Students who successfully completed the training course were issued with certificates on the Upgrading of the state standard, the loan amount of 54 hours (KazMUNO).

***Analysis of clinical cases.*** Demonstration and joint analysis of a clinical case are based on a real medical history of the HIV-infected patient; with the mandatory observance of the confidentiality of personal data (the patient was assigned an individual number).

To visualize the patient's data, each doctor reporting his clinical case and experts carefully selected the illustrative material: photographs of microscopic preparations; X-ray, ultrasound / CT / MRI data, tables, charts and algorithms. The patient's form (a short history of the disease) was demonstrated on the screens of monitors and televisions.

All listeners, with the help of a mentor / expert, studied the "medical history" – complaints, anamnesis, objective data, results of examinations (laboratory and instrumental) and treatment. Based on the above, the participants in the group isolated the leading clinical syndromes, and then formulated the preliminary and final diagnoses with its justification. During the demonstration, the clinical mentor gave an opportunity to actively speak out to any listener, encouraging the right answers. In the end, the expert gave an expert opinion, recommendations and a list of modern literature.

Over the past period, 76 cases were analyzed in video sessions, with the participation of all listeners (patients with HIV infection: adults, children, pregnant women, UGN persons). For each case, tactics of patient management were developed; specific recommendations of leading experts were given. At the end of each session, the didactic materials filled out by the experts were sent to the listeners. Forms of recommendations on patients, references to educational literature / modern publications of the most recent years (2014–2017).

A unified approach to harmonizing the efforts of national and international partners within the framework of the innovative project "ECHO" made it possible to combine the accumulated experience in the field of training medical personnel on topical issues of HIV infection for further implementation in practice, namely:

- introduce modern digital technologies in the field of practical public health in the framework of postgraduate training of AIDS center doctors;
- to form a database of mentors-experts of KazMuno;
- to train specialists on the ground, for the subsequent realization of knowledge in practice and mutual assistance;
- to create a base of future coaches from their number for continuing education in the regions;
- accumulate a database of updated materials, taking into account international requirements;
- maximally bring quality medical care to patients with HIV infection for successful implementation of the "cascade" of PLHIV services.

The application of telecommunication technology allowed to expand the geography of postgraduate distance education of doctors to the entire territory of Kazakhstan, while simultaneously encompassing the training of participants in 24 sites.



This methodology has demonstrated its great opportunities not only in terms of enrollment, but also economic efficiency, due to the low cost of training, both for managers of medical institutions and for the listeners themselves, without interruption of production.

The use of the innovative form of training "ECHO" and the improvement of methods in the teaching of clinical discipline – "HIV infection", contributed to the development of the listeners' professional competence based on the interdisciplinary approach, increased their motivation to study the discipline. At the same time, it strengthened the professional level of the university teachers themselves, expanding the possibilities of the teaching process of teaching, using the most modern, innovative approaches to postgraduate training of medical workers.

*Next steps:*

– Combining efforts of the partners in the priority order for the implementation of the 5 priority areas of the Densaulyk Program (Roadmap), on the basis of the single consolidating ECHO Center under KazMuno, which has the first practical experience in spreading the "ECHO" model recognized in the world in Kazakhstan.

– Using the experience of the "ECHO" project, established by the KazMuno Trainers' Base and training materials, in order to successfully integrate new digital technologies into the healthcare field, in the framework of other areas of postgraduate training of medical personnel.

– Integration of similar digital / training courses into the system of nursing education and professional development of nurses.

– Institutionalization of the developed materials on the scale of the Republic of Kazakhstan.

Multifaceted support from the public sector and international organizations will ensure further implementation of the idea of "Digital Medicine", give it stability, and support the long-term functioning of the innovative model of the ECHO in the Republic of Kazakhstan with a vision for the future.

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#### ҚАЗАҚСТАНДА «ЕCHO 2016» ИННОВАЦИЯЛЫҚ ҮЛГІСІН ЖҮЗЕГЕ АСЫРУ НӘТИЖЕЛЕРІ ҮЗДІКСІЗ КӘСІБИ ДАМУ ЖҮЙЕСІНІҢ НЕГІЗІНДЕ

**Аннотация.** Қазақстанда 2016 жылдың қыркүйегінен бастап «ЕCHO» жобасы ҚазМУББУ негізінде құрылған «Клиникалық жетекшілер орталығы» арқылы жүзеге асырылуда. Білім беру бағыты «АИТВ-жұқпасы» болып табылады, нысан – Қазақстан Республикасының ЖИТС-тің 24 орталығы. Арнайы, «Клиникалық тәлімгерлік» және «Сандық медицина» қағидаттарына негізделген инновациялық оқыту әдістерін

пайдалана отырып, жұмыс бағдарламасын дәрігерлер мезгілде әзірледі, соның ішінде 10 мамандық, 100 дәрігер оқытылды – жұқпалы ауру 67 (63,2%). Сандық технологиялардың денсаулық сақтау саласына интеграциясы 9 модуль бойынша, 38 тақырып бойынша жүзеге асырылды, «ЭХО» бірінші кезеңінде жалпы саны 50 адам үшін екі топ тыңдаушылар үшін 76 теледидарлық сессия өткізілді. «2016 жылғы қыркүйек – 2017 жылдың маусымы» кезеңінде жоба қатысушыларының 76 отырысы және үш деңгейлі білімді бақылау жүргізілді. АИТВ-жұқпасы бар науқастарға кеңес беру арқылы 76 клиникалық тексеру жүргізілді.

ЕСНО жобасының бірінші кезеңі 2017 жылдың маусым айында сәтті аяқталды.

**Түйін сөздер:** сандық медицина, АИТВ-жұқпасы, тәлімгерлік, инновациялық модель.

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### **РЕЗУЛЬТАТЫ ВНЕДРЕНИЯ ИННОВАЦИОННОЙ МОДЕЛИ «ЕСНО 2016» В КАЗАХСТАНЕ В РАМКАХ СИСТЕМЫ НЕПРЕРЫВНОГО ПРОФЕССИОНАЛЬНОГО РАЗВИТИЯ**

**Аннотация.** В Казахстане с сентября 2016 года реализуется проект «ЕСНО» при созданном на базе КазМУНО «Центре клинического наставничества». Направлением обучения является «ВИЧ-инфекция», объектом – 24 центра СПИД Республики Казахстан. По специально разработанной Рабочей Программе, с применением инновационной методики обучения, основанной на принципах «Клинического наставничества» и «Цифровой медицины», одновременно обучаются 100 врачей 10 специальностей, включая врачей-инфекционистов 67 человек (63,2%). Интеграция цифровых технологий в сферу здравоохранения проводилась по 9 модулям, 38 темам, всего в первой фазе «ЕСНО» проведено 76 телесессий для двух групп слушателей по 50 человек. За период «сентябрь 2016 – июнь 2017» проведено 76 сессий и три контроля уровня знаний участников проекта. Проведено 76 клинических разборов, с оказанием консультативной помощи пациентам с ВИЧ-инфекцией.

Первая фаза проекта «ЕСНО» успешно завершена в июне 2017 года.

**Ключевые слова:** цифровая медицина, ВИЧ-инфекция, наставничество, инновационная модель.

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